

This section presents the Central City Framework in more detail and explains the analysis behind it



strategic directions

SECTION 5

Strategic Direction:

4

An Accessible and Connected City

Strategies aimed at making moving around in the central city's street network attractive to all modes of transport

Increasing accessibility and connectivity will make the central city easier and more attractive to get to and move around in. A strong focus is on the balance in accommodating all modes of transport, ranging from strategic through-traffic, including freight, to the most vulnerable pedestrian. At the same time, all central city activities are promoted when the transport network, especially high intensity roads, are compatible with the surrounding land-uses.

Motorised traffic would benefit most from a transport network that is safe and efficient and offers sufficient opportunities to access car parking. A vital city centre encourages people to move around on foot to engage with activities and other people. The pedestrian experience which includes the safety and comfort on footpaths and in public places should therefore be improved. Enhancement of the cycling opportunities will help grow a safe and connected bicycle network. Scope for improvement to the passenger transport network exists, making the bus system serving the central city and its user better, whilst minimising negative the local impacts of fumes and noises.

Initiatives under this Strategic Direction include:

- Reducing the severance and lack of accessibility caused by the State Highway's one-way pair
- Improving the pedestrian experience within the central city
- Making cycling through and within the central city more attractive and safer
- Encouraging bus usage and reducing the negative effects of bus traffic
- Accommodating car parks
- Small improvements to the central city traffic situation, including balancing vehicles and pedestrians in The Octagon, Princes and George Streets



5.4.1 Two-waying Crawford Street and Cumberland Street

The strategic north-south vehicle connection through the central city is currently accommodated through State Highway 1, consisting of the one-way pair. It is proposed that for the benefit of the central city DCC and NZTA apply for funding in the Regional Land Transport Plan to undertake a thorough analysis of the desirability and feasibility of changes to this State Highway system, including traffic modelling.

As part of this Central City Framework and the Precinct Plan for the Warehouse District the focus will be on the area south of the Leviathan Hotel, i.e. north-bound Crawford Street and south-bound Cumberland Street. However, it is envisaged that any changes should not preclude changes in the situation north of this point.

It is proposed that Crawford Street will be transformed in a two-way city street with increased pedestrian and cycling amenity. Cumberland Street (south of the Leviathan Hotel) will be transformed to a two-way State Highway, with a focus on through-movement.

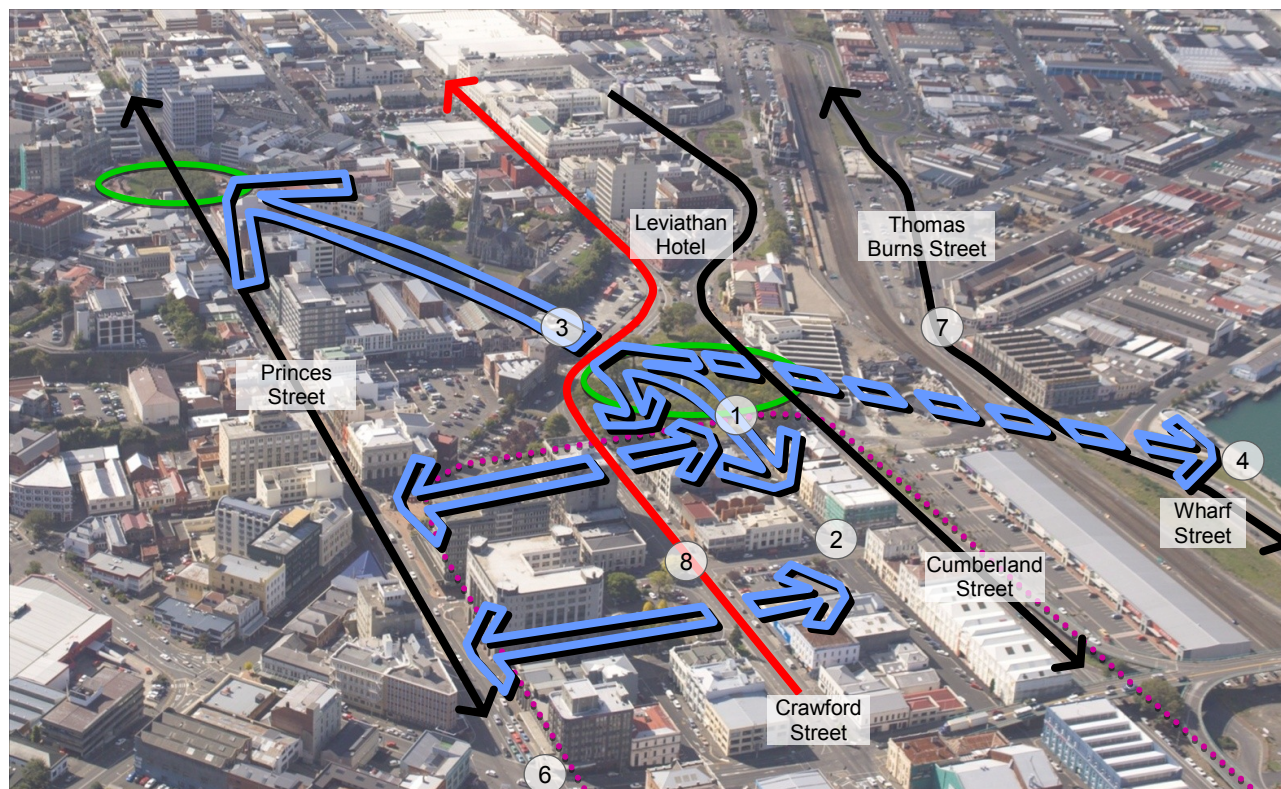
KEY BENEFITS FOR THE CENTRAL CITY

As part of this Central City Framework and Warehouse District Precinct Plan, the following benefits are identified (refer to Figure 5-17 for some of the numbers).

1) Better integration CBD - Warehouse District

The initiatives as described would reduce severance through the central city to one corridor (the combination of Cumberland and the railway line), instead of two. It is easier to focus on improving the crossing opportunities of one corridor than two.

This reducing in severance will lead to a better integration of the area around The Octagon with the Warehouse District. This will lead to increased economic synergies if the Warehouse District were developed as Dunedin's Creative Quarter, as this Framework promotes.



ABOVE FIG. 5-17: Connectivity benefits of two-waying the one-way pair south of the Leviathan Hotel and removing the State Highway status of Crawford Street and concentrating this on Cumberland Street

2) Revitalisation of the Warehouse District

Improving the liveability of the Warehouse District will increase the ability to establish the Warehouse District as a cohesive precinct with contiguous high quality open space. Queens Gardens is envisaged to function as the Warehouse District's premiere open space as well as provide a destination for workers and visitors to the central city. The land uses in the area surrounding Crawford Street will benefit from streetscape improvements with high quality open space and increased street parking. The accessibility of land uses in this street would also be improved.

3) Connectivity between signature open spaces

Reducing severance will provide a high amenity link between signature open spaces, i.e. The Octagon, First Church and Queens Gardens. This improved pedestrian connectivity, combined with reduced negative impact from high volumes of traffic on the western edge of Queens Gardens will open up possibilities for more regular events in Queens Gardens, relieving The Octagon of some events that are not suitable for this location.

4) Connectivity between the central city and the Steamer Basin

The Queens Gardens area is critical in providing a landing point for a possible crossing opportunity in the long term across Cumberland Street and the rail lines. Improved connectivity between The Octagon and Queens Gardens will assist in improving the connectivity between the central city and the Chinese Gardens and the Settlers Museum in the short term, through to the Steamer Basin in the long term.

5) Legibility of the central city network *(not indicated in the image)*

One-way situations often frustrate drivers trying to intuitively navigate through a place they are not familiar with. Two-waying would make the street system easier to understand for visitors, as the situation would reflect the 'normal' urban situation with connected two-way streets on all sides of city blocks.

6) Reduction in congestion in the five-way intersection

Two-waying Crawford Street would enable all 12 manoeuvres (8 turning and 4 straight-through) at intersections and specifically at the Jetty Street intersection. This would relieve traffic in the nearby 5-way intersection (Manse – Stafford – Princes – Jetty), currently taking some of the movement displaced from the one-way intersections.

It would also enable a more balanced flow (longer phases) for east-west traffic crossing Crawford Street and specifically in Jetty Street. This would reduce the lengths of the queues and again contribute to a reduction of the congestion in the five-way intersection.

7) Reduction in heavy vehicles near the central city

Two-waying the one-way pair and abolishing Crawford Street as a State Highway would, with design measures as described below, lead to a reduction in northbound truck movement (port traffic) through the Warehouse District and around Queens Gardens. A reduction of heavy vehicle movement in close proximity of the central city would lead to an improvement in air quality and a reduction in vibration and noises in the central city.

8) Pedestrian safety in Crawford Street

Transforming Crawford Street would improve pedestrian safety locally, both along the street as well as for crossing it. It would also provide the city with a safer cycling corridor. Crawford Street is indicated as a strategic north-south cycling corridor in the Council's Strategic Cycling Network.

9) Reduction in vehicle kilometres travelled *(not indicated in the image)*

Having fewer one-way streets would lead to an overall reduction in the vehicle kilometres travelled in and around the central city as it reduces the need to take detours and makes trips more direct. This has economic, environmental and even social benefits.

FLOW-ON BENEFITS OF TWO-WAYING

- The Dowling Street car park, land owned by the Council, could be redeveloped to facilitate additional linkages between The Octagon and Queens Gardens and provide attractive frontage and activities on the edge of the Gardens. Parking should be incorporated.
- The grounds of First Church will become more prominent due to their location on the route between The Octagon and Queens Gardens. This may provide an opportunity for enhancement of these grounds as semi-public open space.
- The land south-east of the church land, owned by Leviathan Hotel and currently used for parking, would provide a key development opportunity facing Queens Gardens and addressing a calmed city street (as opposed to the current State Highway). If the church land would possibly be used for a walkway between Moray Place and Queens Gardens (in addition to an improved Burlington Street), this site would, combined with possible development, also have to accommodate the continuation of this track and bridge the considerable level difference.

ADDRESSING THE DISADVANTAGES OF TWO-WAYING THE ONE-WAY PAIR

The main disadvantages of two-waying the one-way pair include the flow of heavy vehicles, arguably some traffic safety issues and the financial costs involved.

Heavy vehicles

The likely design for Crawford Street, in line with this Central City Framework, would deter heavy vehicles. There is a risk this could increase the northbound heavy vehicle flow on Cumberland Street, heading for SH88 and the port. Crossing the railway line via Jetty Street as most heavy vehicles currently do, would be impossible due to the grade separation between Jetty and Cumberland Streets. It is therefore likely that trucks would continue through Cumberland Street Central and Frederick or Saint Andrew Streets. This would result in a net increase in heavy vehicles in close proximity of the central city.

To counter this, it is crucial that heavy vehicles coming from the south are encouraged to take the Andersons Bay / Strathallan / Wharf route to connect with SH88, instead of Crawford / Jetty or Cumberland / Frederick. A number of measures are required:

- Signage should direct heavy vehicles entering the city from the southern motorway and headed for the port to take the desired route.
- The right turn into Andersons Bay Road should be made more attractive and time-effective. Concept designs that address this issue do already exist.
- Improvements to the intersections on either end of Strathallan Street (investigations on this issue are currently underway) are also required. A detailed analysis of issues further along this route, including along Wharf Street, Thomas Burns Street and at the St Andrew Street-Anzac Avenue intersection is required to determine ways of making this route more attractive for heavy vehicles than Crawford or Cumberland Streets. The MWH Strategic Network Plan provides a way in which Strathallan Street would become much more logical and legible than the use of Jetty Street for much of the port precinct traffic. However the costs of the southern part of the MWH proposals are likely to be prohibitive in respect of such a major intervention, especially in the short term.
- After improvements to the intersections on either end of Strathallan Street a ban for trucks turning into Jetty Street, northbound in Crawford Street would assist forcing port traffic to follow the Wharf Street route. Perhaps the first time trucks may continue along

Cumberland Street and turn right at St Andrew or Frederick Streets, but if these sections provide too much friction a preference for the Wharf Street option may arise.

- Crawford Street should be made unattractive for heavy through-traffic by design measures with a focus on local access, pedestrian amenity and street parking.

Traffic safety

Some may argue that one-way State Highways would be safer for vehicles than a two-way State Highway as in the latter situation there are more conflict points and the possibility of head-on collisions is introduced.

Although the envisaged vehicle speed will very likely be 50 km/h, this issue should be addressed in the design of Cumberland Street, through good intersection design, and consideration of a solid median or other forms of central barriers. Two conceptual options for Cumberland Street are presented in this report.

Financial implications

The works as described involve the financial costs of the upgrade works in Cumberland and Crawford Streets between The Oval and the Leviathan corner; and other roads around Queens Gardens. The revised functionality of the intersections also necessitate changes to parts of the sides streets, Gordon, Wolseley, Jervois, Police, Jetty, Liverpool and Water Streets.

Design solutions may include the retention of kerbs and underground services. Conceptual cross sections presented in this report are aimed to be as cost-effective as possible.

NORTH OF THE LEVIATHAN HOTEL

Changes to the one-way pair north of the Leviathan Hotel are outside the scope of this project. However, high level analysis suggests that retaining Castle Street as a two-way State Highway, and converting Cumberland Street Central into a city street also delivers benefits for the

central city. Several of the aforementioned benefits apply as well. In addition, it would:

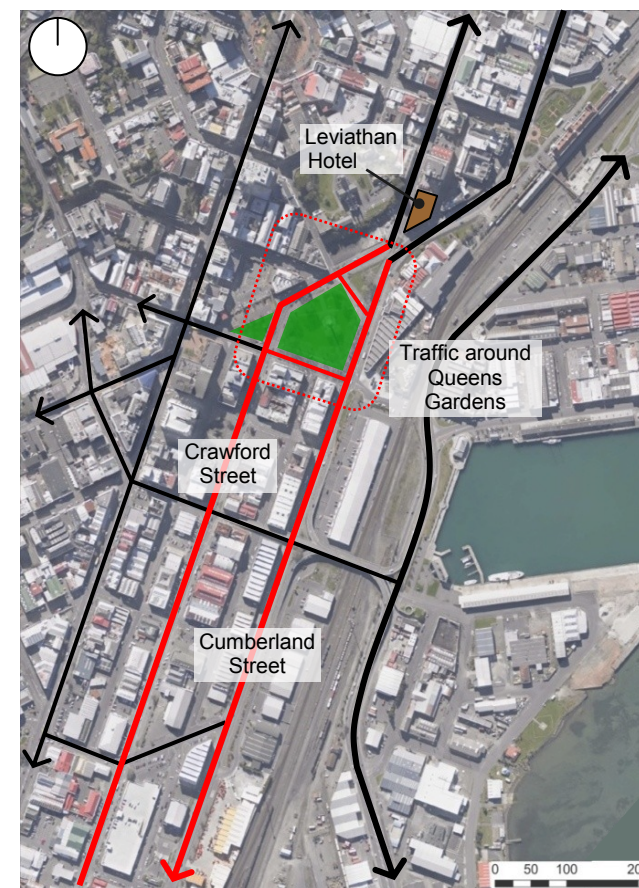
- Reduce the severance of the route between The Octagon and the railway station to one point instead of the current two;
- Benefit land uses around Cumberland Street Central; and,
- Accommodate northbound heavy traffic on the easternmost route, further away from the central city, if not already re-routed via Strathallan / Wharf / Thomas Burns.

Additional consideration

The University of Otago is currently investigating the benefits of changes to some parts of the road network around the campus. One of these changes includes the two-waying of Cumberland Street north of Albany Street, the removal of the westernmost S-bend and the continuation of Great King Street. Although Cumberland Street south of Albany Street would in this option remain one-way northbound and Castle Street South would remain one-way southbound, this option could be revised to become compatible with two two-way streets south of Albany Street.

MAJOR ROADING CHANGES

The proposed two-waying would lead to changes to several key streets in the southern part of the central city, capitalising on the opportunities and benefits described before. These streets are indicated in Figure 5-18 and presented in the following sections.



ABOVE FIG. 5-18: Major roading changes proposed in the following sections: Cumberland Street south of Leviathan Hotel, Crawford Street, traffic around Queens Gardens (includes Rattray Street-East, Burlington Street-extension and High Street-central)

5.4.2 The design of Cumberland Street south of the Leviathan Hotel

The proposed two-way of Cumberland Street south of the Leviathan Hotel necessitates the redesign of this State Highway. From an urban design point of view it provides opportunities to enhance this new entrance into the central city and more specifically, past the Warehouse District. Any design should enable showcasing the envisaged revitalised image of the Creative Quarter and complement the heritage buildings, many of which are in the process of restoration, and others envisaged to be restored over the coming years.

The basis for consideration of the two-way form (as SH1) of Cumberland Street has been the "Dunedin Future Strategic Network" plan by MWH Consultants. This plan is not precise in detail, but is an excellent basis for consideration of salient issues.

Discussions with NZTA have outlined:

- NZTA favours two through-traffic lanes in each direction for the State Highway.
- Cycle lanes are desirable.
- A median is highly desirable, with a single wire barrier being an option that could be considered.

- Strategies to reduce traffic loadings and congestion on Jetty Street in the morning peak and at the five-way intersection on Princes Street are sought in conjunction with any changes being made.

CUMBERLAND STREET DESIGN CONCEPTS

The existing carriageway of Cumberland Street south of Queens Gardens is around 18 metres wide, as scaled from the MWH drawings. A basic carriageway of four lanes (say 4 x 3.3 metres) plus a median / right turn lane allowance of 3 metres will absorb 16.2 metres of the carriageway width, leaving inadequate space for properly sized cycle lanes and no space of car parking if the through lane configuration is to be maintained.

Therefore (subject to detailed measurements and design) it is highly likely that all parking will be lost and that only one cycle lane can be provided. Currently cycling only goes southbound, and although not ideal, a cycle lane for southbound cycling only may be the only possible solution within the constraints. Signage should direct northbound cyclists into Crawford Street.

For the above listed reasons we see that a likely typical section for Cumberland Street will be one of the options illustrated in Figure 5-19A and B (AutoCad sketches of

workshop drawings purposed to explore the dimensions within the cross section of the road reserves). It should be noted that the MWH Strategic Network Plan allows for a median of about 1 metre in width, and introduces some parallel parking where there is no right turn lane.

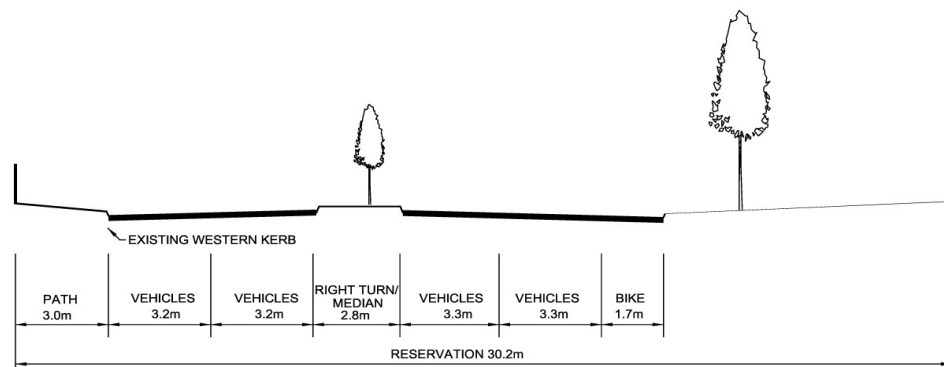
Clearly there will need to be a balance between the following factors that are competing for space in the road network:

- Parking
- Cycle lane / lanes
- Median width (hence streetscape and pedestrian safety implications).

Both concepts assume the retention of the existing kerb for cost reasons. If this is departed from, alternative cycle and footpath arrangements may be possible:

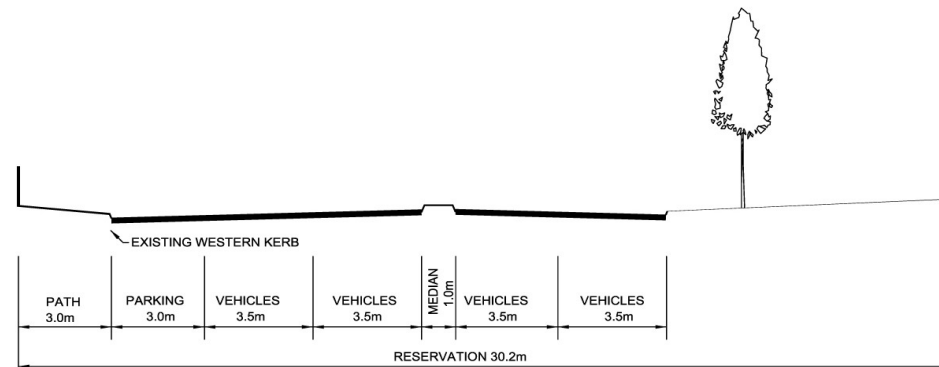
- Option A: Reduction of the footpath to 2.3m and the installation of a 0.7m (landscaped or painted) buffer between the bike lane and general vehicle lane.
- Option A: Reduction of two easternmost traffic lanes to 3.2m each, reduction of bike lane to 1.5m and the installation of 0.4m wide buffer between the bike lane and the general vehicle lane.
- Option A: Reduction of footpath to 1.9m, four vehicle lanes of 3.2m; cycle lanes in both directions of 1.5m.

Cumberland Street between Rattray and Jervois Streets - proposed Option A



ABOVE FIG. 5-19A: Proposed cross section Option A of Cumberland Street between Rattray Street and Jetty Street (Looking north)

Cumberland Street between Rattray and Jervois Streets - proposed Option B



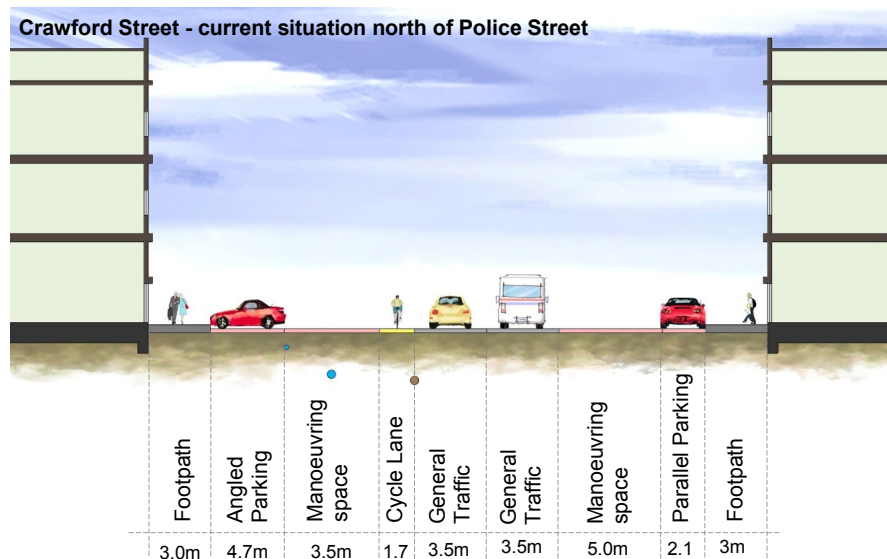
ABOVE FIG. 5-19B: Proposed cross section Option B of Cumberland Street between Rattray Street and Jetty Street (Looking north); Parking lane is omitted where turning lanes are to be provided

5.4.3 The design of Crawford Street

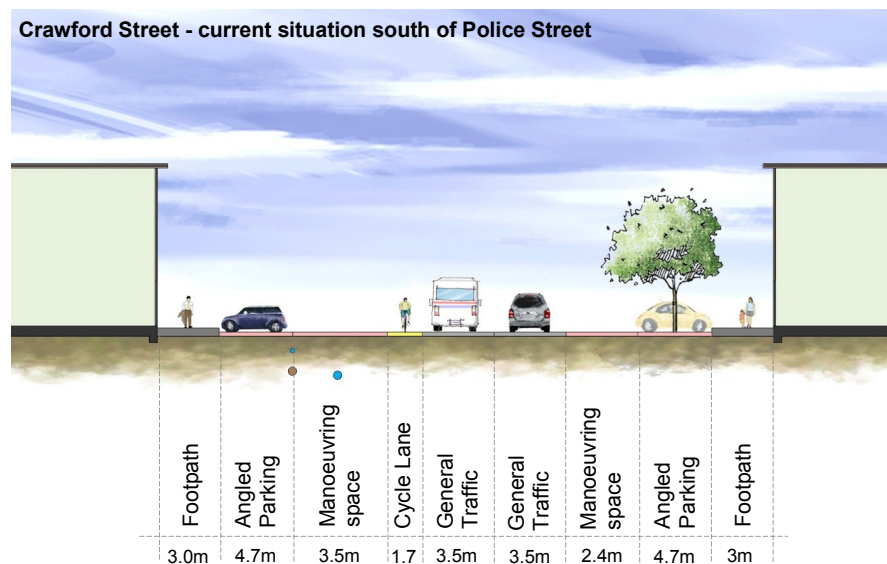
Over the following pages, several options for the design of Crawford Street are presented and discussed. All these options are conceptual only, but are designed with consideration of the location of current underground services and the approximate locations of kerbs and storm water channels. The main aim of these design concepts is to illustrate the opportunities presented by the proposed two-waying in the light of the envisaged revitalisation of the Warehouse District as the Creative Quarter with vibrant commercial and residential activities.

Crawford Street could be transformed from a through-traffic dominated environment to a city street balancing the needs of all road users. Its new function will be focussed towards local access, on-street parking, land use access, and pedestrian and cycling amenity.

Crawford Street is currently a State Highway with northbound one-way traffic. Its width is approximately 30m between buildings. The current cross sections of the different segments are shown in Figures 5-20 and 5-21. The street consistently includes two lanes of general northbound traffic, one northbound on-street cycle lane, parking with wide manoeuvring strips on either side of the street and footpaths of approximately 3m in width.



ABOVE FIG. 5-20: Existing cross section of Crawford Street between Queens Gardens and Police Street



ABOVE FIG. 5-21: Existing cross section of Crawford Street between Police Street and Jervois Street

CRAWFORD STREET - OPTION A

Option A features the following attributes:

- Upgrade of the footpath and retention of the existing kerb and channel on the western side.
- A widened footpath (4.8m) on the eastern side. This is the most sunny side as it is slightly north facing and catches the setting westerly sun. Spaces for informal gathering and on-street commercial activity would be created with furniture. Trees could be used to provide shelter.
- Two general traffic lanes (one in each direction), each 3.1m wide.
- On-street cycle lanes on both sides of the street, each 1.8m wide.
- Parallel on-street parking on both sides with the parking bays interrupted by sporadic street trees that soften the appearance of the street and, along with the parked cars, provide a sense of separation between moving traffic and pedestrians. Consideration should be given to semi-permeable paving, to decrease storm water run-off and provide a softer image when these parking bays are not used.
- Wide central median with wide perpendicular parking bays, and safety zones on either side. Parking areas are interrupted with areas of tree planting.
- The estimated on-street parking capacity is approximately 406 spaces, assuming 186 spaces on the kerbsides and 220 in the centre.

Note: some traffic engineering guides, including AustRoads Part 11 express safety concerns about central street parking. Those concerns are generic, and relate to right angles central parking manoeuvres interacting with through-traffic. The concerns are not correlated with the following important design and management features of this option:

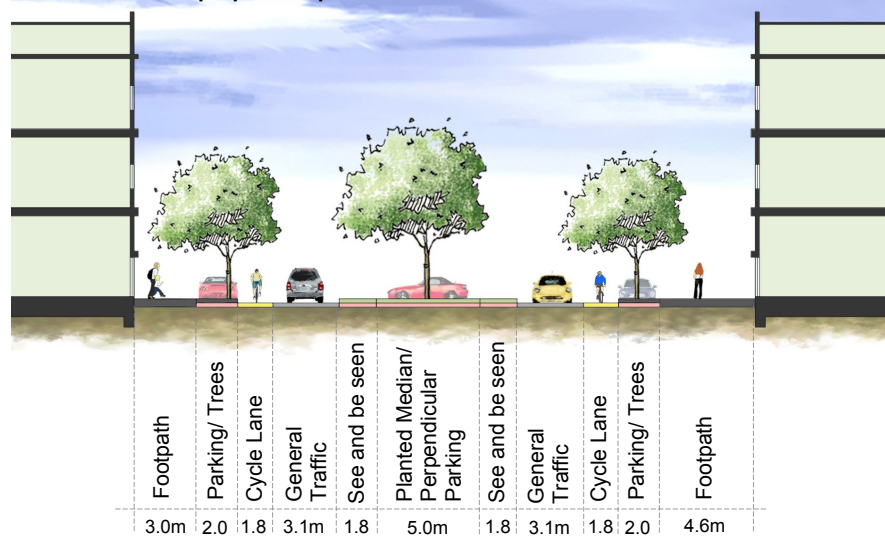
- This cross section includes 1.8 metres “see and be seen” zones between the central parking spaces and the through travel lanes.
- The wider than typical (2.5 metres) spaces allow easier manoeuvring into and from the central space in comparisons with conventional configuration.
- The proposal for generally long term (mostly all day) parking in the centre will minimise vehicle movements associated with those spaces.

Accordingly it is submitted that the design presented in Option A has no exceptional inherent safety problems.



Example of a street with a central perpendicular parking zone

Crawford Street - proposed Option A



ABOVE FIG. 5-22: Proposed cross section for Crawford Street, Option A

Crawford Street - proposed Option A



ABOVE FIG. 5-23: Proposed redesign of Crawford Street, Option A (artist's impression only)

CRAWFORD STREET - OPTION B

Option B features the following attributes:

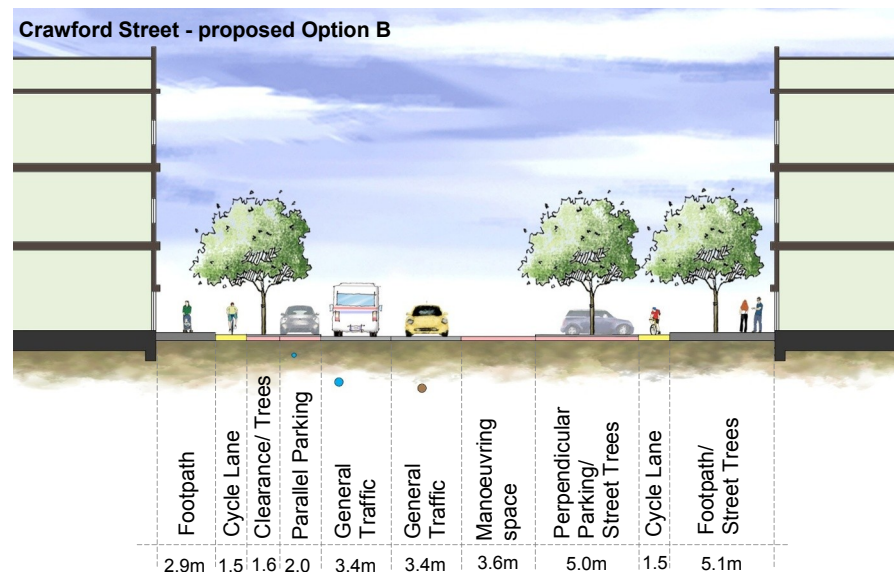
- Upgrade of the footpath and retention of the existing kerb and channel on the western side.
- A widened footpath (5.1m) on the eastern side. This is the most sunny side as it is slightly north facing and catches the setting westerly sun. Spaces for informal gathering and on-street commercial activity would be created with furniture. Trees could be used to provide shelter.
- Off-street cycle lanes on both sides of the street, possibly separated from the footpaths by a small kerb or other barrier. In this arrangement cyclists form part of the pedestrian environment, which improves their experience of the streetscape.¹
- Two general traffic lanes (one in each direction), each 3.4m wide.
- Parallel on-street parking on the western side with a safety margin between the cycling and the parked cars for opening doors. This area would also accommodate street trees that soften the appearance of the street and provide a sense of separation between moving traffic and pedestrian and cyclists.
- Perpendicular on-street parking on the eastern side with a manoeuvring zone behind it. Parking bays would be interrupted by sporadic street trees.
- The estimated on-street parking capacity is approximately 276 spaces, assuming 93 parallel on the kerbside and 183 perpendicular on the kerbside.

¹The off-street cycling arrangement, although beneficial from a cycling safety point of view, (which encourages cycling, with associated health benefits) has some disadvantages as well:

- It forms a separation between parking and the footpath and buildings.
- The traffic situation in New Zealand is not fully geared up to deal with it at intersections.
- It may lead to conflicts between cyclists and pedestrians that need to be managed because of unfamiliarity with the situation.
- It is a solution that is more suitable to be consistently applied over a longer distance.



Crawford Street - current situation (source: Google Streetview)



ABOVE FIG. 5-24: Proposed cross section for Crawford Street, Option B

Crawford Street - proposed Option B



ABOVE FIG. 5-25: Proposed Crawford Street redesign, Option B (artist's impression only)

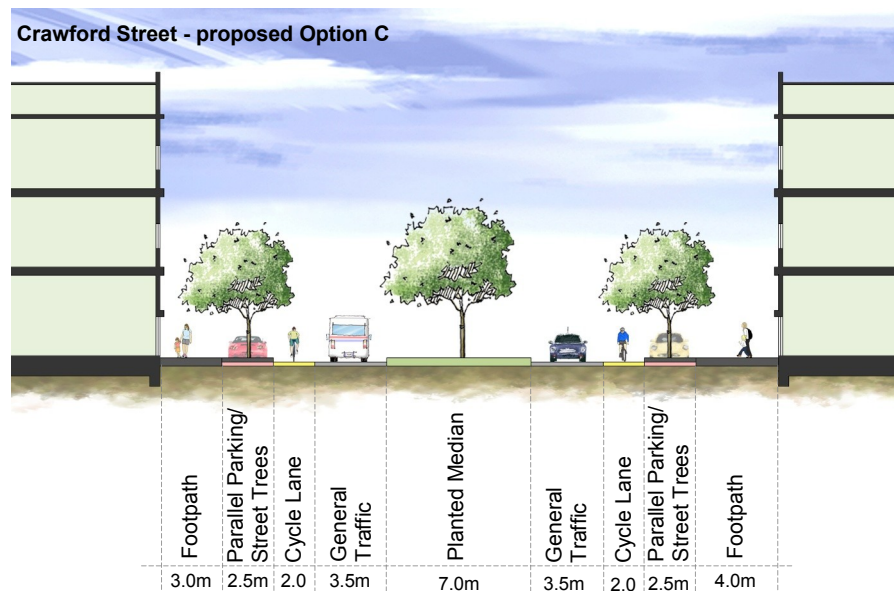
CRAWFORD STREET - OPTION C

Option C features the following attributes:

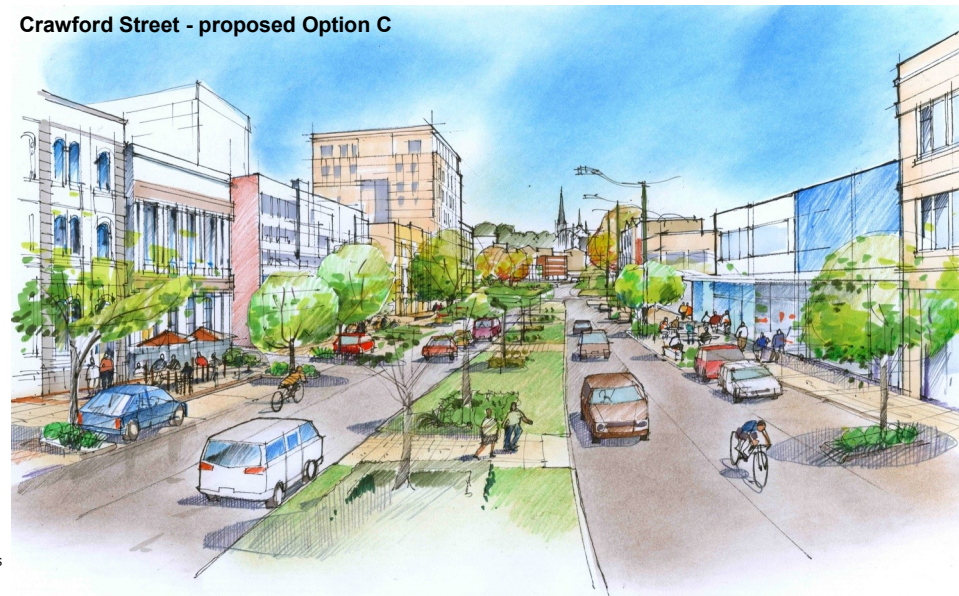
- Upgrade of the footpath and retention of the existing kerb and channel on the western side.
- A widened footpath (4m) on the eastern side. This is the most sunny side as it is slightly north facing and catches the setting westerly sun. Spaces for informal gathering and on-street commercial activity would be created with furniture.
- Parallel on-street parking on both sides, interrupted by sporadic street trees. These street trees provide shelter for pedestrians, soften the appearance of the street and along with the parked cars provide a sense of separation between moving traffic and pedestrians.
- Two general traffic lanes (one in each direction) each 3.5m wide.
- On-street cycle lanes on both sides of the street, with a 2.0m width providing for opportunities to avoid opening car doors on one side and moving traffic on the other side.
- A 7m-wide solid median that accommodates large trees and low planting, softening the appearance of the street. The solid median would also provide opportunities for land use access and u-turns (7m is sufficient to accommodate the full length of a car). In dedicated areas it would accommodate pedestrian refuges as well.
- The estimated on-street parking capacity is approximately 186 spaces, assuming 93 parallel on each the kerbside.



RIGHT FIG. 5-27: Proposed Crawford Street redesign, Option C (artist's impression only)



ABOVE FIG. 5-26: Proposed cross section for Crawford Street, Option C



CRAWFORD STREET - OPTION D

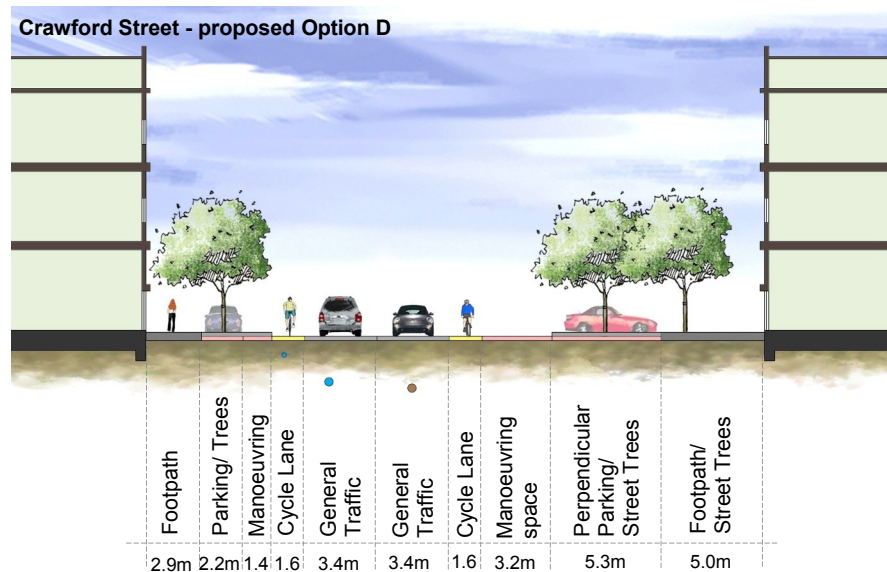
Option D features the following attributes:

- Upgrade of the footpath and retention of the existing kerb and channel on the western side.
- A widened footpath (5.0m) on the eastern side. This is the most sunny side as it is slightly north facing and catches the setting westerly sun. Spaces for informal gathering and on-street commercial activity would be created with furniture. Trees could be used to provide shelter.
- Two general traffic lanes (one in each direction), each 3.4m wide.
- On-street cycle lanes on both sides, separated from parked cars by manoeuvring zones.
- Parallel on-street parking on the western side with a safety margin / manoeuvring zone between the cycling and the parked cars for opening doors. Parking bays would be interrupted by sporadic street trees that soften the appearance of the street and, along with the parked cars, provide a sense of separation between moving traffic and pedestrians.
- Perpendicular on-street parking on the eastern side with a manoeuvring zone behind it. Parking bays would also be interrupted by sporadic street trees.
- The estimated on-street parking capacity is approximately 276 spaces, assuming 93 parallel on the kerbside and 183 perpendicular on the kerbside.

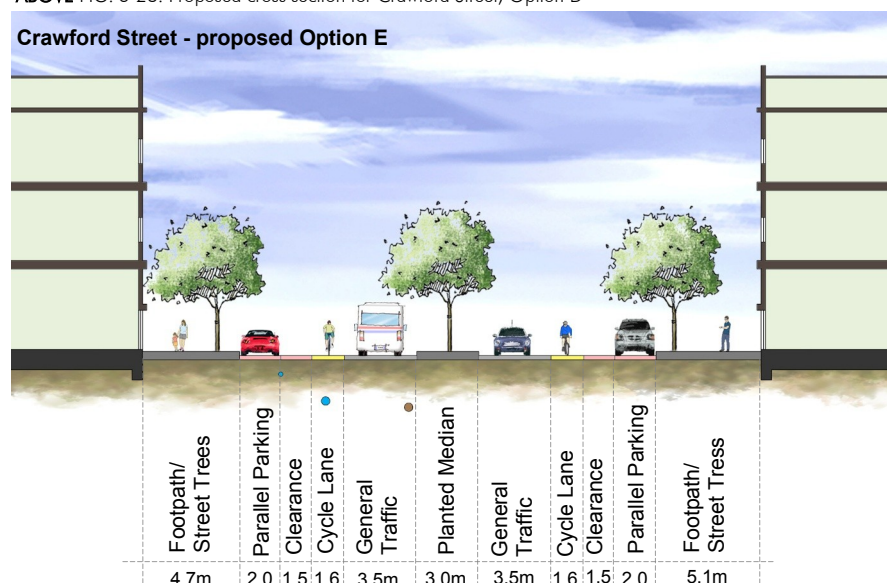
CRAWFORD STREET - OPTION E

Option E features the following attributes:

- Widening of the footpaths on both sides, with an emphasis on the eastern side. This is the most sunny side as it is slightly north facing and catches the setting westerly sun. Spaces for informal gathering and on-street commercial activity would be created with furniture. Trees would provide shelter for pedestrians, soften the appearance of the street and, along with the parked cars, provide a sense of separation between moving traffic and pedestrians.
- Two general traffic lanes (one in each direction) each 3.5m wide.
- Parallel on-street parking on both sides.
- An on-street cycle lane on each side of the street, separated from the on-street car parking zone by clearances for manoeuvring and opening car doors.
- A 3m-wide solid median that accommodates large trees and low planting, softening the appearance of the street. The solid median would also provide opportunities for turning bays and pedestrian refuges in dedicated areas.
- The estimated on-street parking capacity is approximately 186 spaces, assuming 93 parallel on each the kerbside.



ABOVE FIG. 5-28: Proposed cross section for Crawford Street, Option D



ABOVE FIG. 5-29: Proposed cross section for Crawford Street, Option E

5.4.4 Traffic around Queens Gardens

To accommodate the proposed two-way street condition in Crawford Street and Cumberland Street south of Queens Gardens it will be necessary to alter the available vehicle movements through several intersections around Queens Gardens.

The redistribution of vehicle movements will result in reduction in traffic loadings on Rattray Street / Queens Gardens and the connection across the Gardens between Burlington Street and Cumberland Street, provided that most of the movements logically available at surrounding intersections are facilitated.

A reduction in traffic loadings will allow a reduction in the space to be used for turning lanes around the Gardens (more public open space and / or car parking) and also wider footpaths in key areas. The southern side of Queens Gardens in particular would benefit from a wider footpath (refer to the artist's impression in Figure 5-30)

The concept plan for traffic management around Queens Gardens (Figure 5-31) includes the following elements:

- A five metre wide footpath on the southern side of Rattray Street / Queens Gardens.
- Parallel parking along the southern side of Rattray Street, adjacent to the widened footpath. This parking will provide a valuable encouragement to activation of the land use along Queens Gardens, and will also enhance the amenity of the footpath (note: these car parks are not shown on the artist's impression).
- Medians at least three metres wide in Crawford, High and Rattray Streets and Burlington Street extension, to separate traffic movements, provide pedestrian refuges for informal crossings, to break up otherwise large expanses of asphalt paving, and to allow planting and / or other landscape treatments.
- Cumberland Street generally as designed on the MWH Strategic Network plans. Other options are also available as designed in Section 5.4.2 of this report.
- Crawford Street is shown per Option A as described and illustrated in Section 5.4.3.
- Opposite the Leviathan Hotel, in front of the existing hotel car park, there is allowance for a future "Shared Zone", intended to encourage a change of use of the car park along the interface with the street and Queens Gardens. A connection for cyclists and vehicles to connect through to Cumberland Street Central is provided.
- Burlington is configured as a two-way connection in which the eastbound lane only allows for a right turn into Cumberland (southbound). The choice to use Burlington Street (extension) for greater traffic flows than High Street (extension, in front of the Leviathan Hotel car park) is to maximise connectivity with Cumberland Street, leading to a reduction of traffic on Rattray Street.
- Shared spaces are shown for Vogel and Bond Streets.

Rattray Street - possible new situation



ABOVE FIG. 5-30: Possible redesign of Rattray Street after two-waying of the one-way pair south of Leviathan Hotel (artist's impression only)



RIGHT FIG. 5-31: Possible redesign of the streets around Queens Gardens after two-waying of the one-way pair south of Leviathan Hotel (concept design only)

5.4.5 Railway crossing

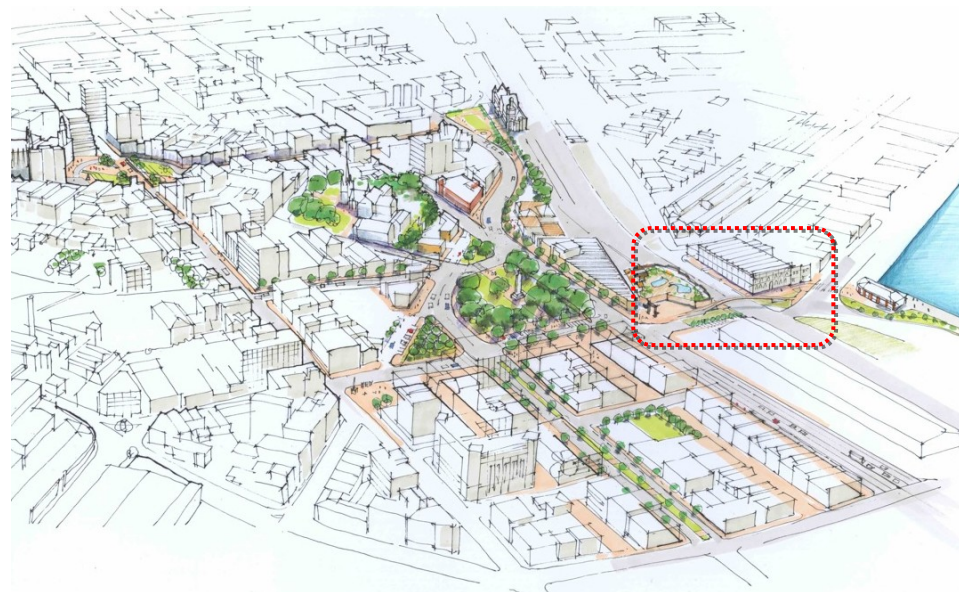
Dunedin residents continue to express a desire for improved connectivity between the city and the harbour, overcoming the obstacle formed by the railway and its shunting yards. The Council has recently assessed a large number of options for improvement of this connection for pedestrians and cyclists. These options included:

- Rattray Street:
 - Pedestrian-cycle bridge 'landmark'
 - Pedestrian-cycle bridge 'functional'
 - At-grade Pedestrian-cycle Crossing (shunting remains)
 - At-grade Pedestrian-cycle Crossing (shunting moved)
 - Underpass
- Jetty Street overbridge enhancements
- Pedestrian-cycle bridge between Railway Station and Settlers Museum
- Pedestrian-cycle bridge from Queens Gardens.

A large number of aspects were considered including safety, accessibility, connectivity, regeneration effect, heritage and cost. The assessment identified a preference for a bridge from Queens Gardens across Cumberland Street, the railway line and Thomas Burns Street. This proposal has recently been deferred by the Council, meaning that a possible connection would not be decided upon in the immediate term.

This Central City Framework is not premised on any of the options, nor construction in the short term. With the proposed pedestrian connectivity between The Octagon and Queens Gardens and changes to Cumberland Street, it is envisaged that this Framework would lead to improvement of the connectivity to the Chinese Gardens / Settlers Museum area, making a crossing at the bottom of Rattray Street more logical and desirable.

In the meantime the Jetty Street overbridge and the station bridge will function as the main crossings. If activity in the Steamer Basin area increases, consequential increased use of the Jetty Street crossing will possibly result in an increase in pedestrian activity in the Warehouse District, leading to more vibrancy of the area.



ABOVE FIG. 5-32: Possible location of a possible future pedestrian bridge across the railway line and Thomas Burns Street (artist's impression only)

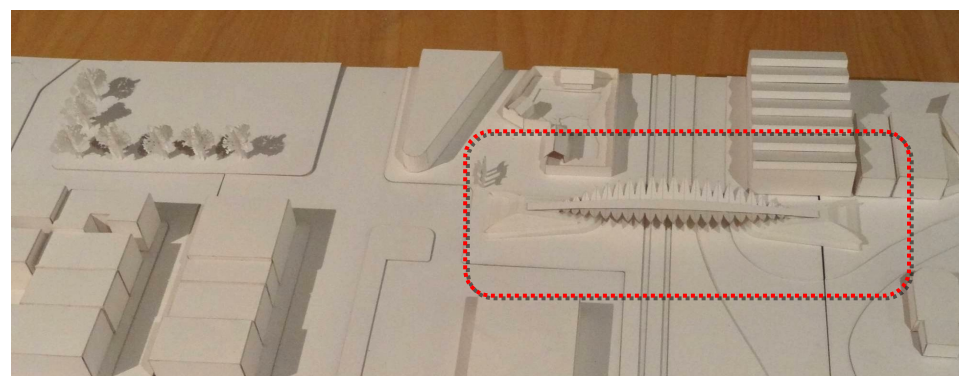


Photo of a model produced by Architecture Van Brandenburg, featuring a possible design of a landmark pedestrian bridge across the railway line and Thomas Burns Street at the end of Rattray Street

5.4.6 Car Parking in the Warehouse District

The Gabites Porter (2007) Parking Study identifies no need for additional car parks in the immediate term. However, the envisaged long term revitalisation of the Warehouse District may result in different dynamics, in case the general current reliance on private cars remains unchanged.

CONSIDERATIONS

It can be argued that it will prove to be challenging to achieve viable new buildings or heritage restoration if the full parking requirement is to be supplied on-site. This would be the case even with generous on-street provision, as many of the envisaged activities (commercial and residential) would require secure, allocated parking within walking distance. Currently the Dowling Street car park is over-subscribed, with a respectable waiting list.

IMPACTS OF THE PROPOSED TWO-WAYING

Currently the available parking is:

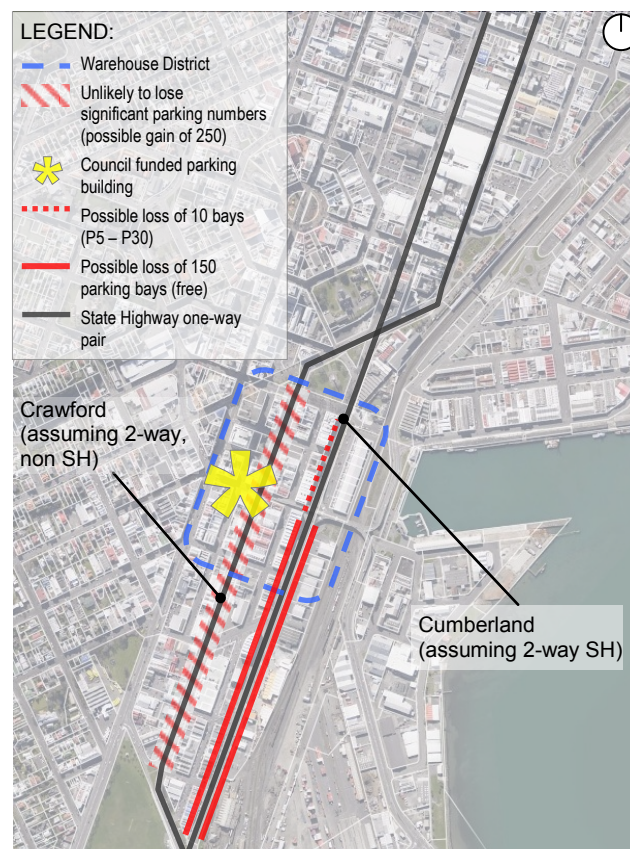
Crawford Street

Generally angle parking on one side, with either parallel or angle parking on the other side. Around 250 spaces are available south of Queens Gardens, with various time controls in place.

Based on high-level assumptions for the frequency of trees and the location of driveways, Crawford Street cross section Option A (Fig. 5-22) would increase the parking supply by approximately 156 spaces, Options B and D by approximately 26, and Options C and E would lead to a decrease of approximately 64 spaces.

Cumberland Street

There are around 150 spaces on street between Queens Gardens and Anderson Bay Road. The two-way design would variously lead to most of those spaces being lost, as described above.



ABOVE FIG. 5-33: Parking and the Warehouse District

Net impacts

Adoption of Option A for Crawford Street would allow an increase in overall parking supply, with the exact increase being a function of detailed design. Consideration of the number and location of median openings, driveway rationalisation effects, and provision for tree planting will all affect the final outcomes.

If Option A is adopted it is recommended that the “centre of street” parking spaces be managed generally for longer term parking than the parallel spaces along the edges. That would reduce the potential impacts of parking on



Examples of car parking buildings

traffic movements, and is most likely the logical replacement for Cumberland Street parking losses.

These central car parks, and on-street parking generally, could be transformed into hard or soft public spaces or spaces to park bicycles, in case a desire to reduce the reliance on the private car leads to a reduction in the need for car parking space in the city.

PROPOSALS

For these reasons, the following initiatives are proposed:

- The on-site parking requirement in the Warehouse District should be lowered in order to attract (re) development.
- A Council-funded multi-level parking building with secure and lease-able as well as publicly accessible car parks should be considered for a location within the Warehouse District. An active building edge should be provided on ground floor level to retain vitality of the street edge.
- Private or public-private partnership development of a multi-level parking building should be encouraged, possibly on existing vacant or the under developed sites in the area.

5.4.7 Footpaths and lighting

FOOTPATHS

In order to enhance the city centre as a pedestrian-focussed environment, high-quality footpaths are crucial. Based on an assessment of the footpath quality within the study area (refer to the result of this overleaf), a prioritised strategy for footpath upgrades has been identified. Typical upgrades include paving, furniture, and possibly public art and landscaping. Refer to Figure 5-34 for the priorities. Highlights include:

First priority:

Access to key areas.

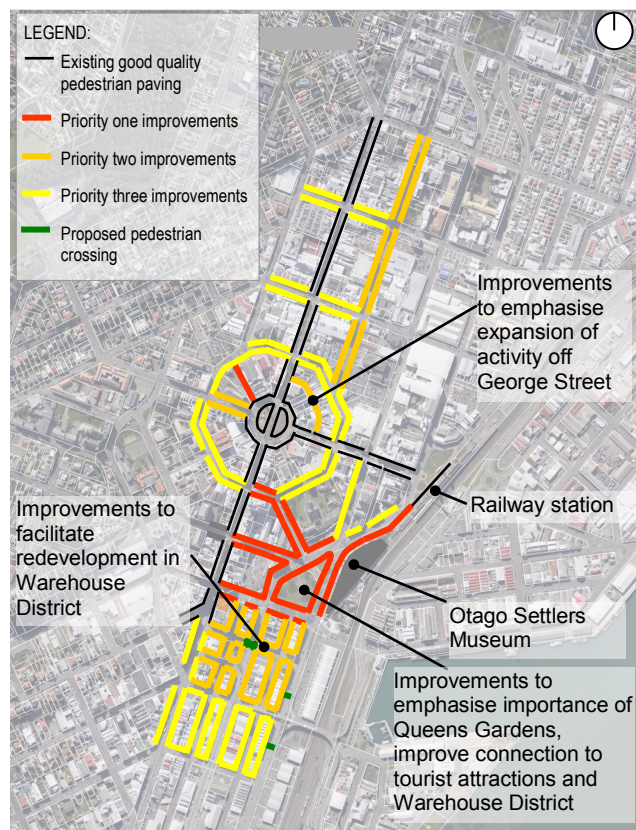
- The area around Queens Gardens, including Dowling and Rattray Streets and High Street in front of the museum to improve the experience for pedestrians walking between the Octagon area, the Warehouse District and the railway station area.
- Harrop Streets as an area with importance to The Octagon and the link to a proposed public open space adjacent to the Council's Filleul Street car park.

Second Priority

- The northern part of the Warehouse District:
 - Redesign of Crawford Street
 - Vogel and Bond Streets redesigned as shared spaces
 - Redesign of Cumberland Street
 - Pedestrian crossings across Cumberland Street and Crawford Street (Water Street intersection)
- Upper Stuart Street as an areas with importance to The Octagon.
- Bath and Great King Streets to encourage central city retail in areas off George Street.

Third Priority

Areas where the footpath quality is generally better and areas that are of a less strategic importance in terms of transformation of the central city and the Warehouse District.



ABOVE FIG. 5-34: Proposed pedestrian linkage improvements

Other issues

- Uneven brick-paved surfaces in and around The Octagon pose a safety concern, especially for the elderly.
- The footpath maintenance regime should be improved and for upgrades a low-maintenance paving should be selected.
- The pedestrian route between the station and the stadium (outside the scope of this project) needs improvement in several locations. The need for a pedestrian crossing across St Andrew Street (at the Anzac Avenue intersection) is under consideration.



ABOVE FIG. 5-35: Proposed pedestrian lighting improvements

PEDESTRIAN-ORIENTED LIGHTING

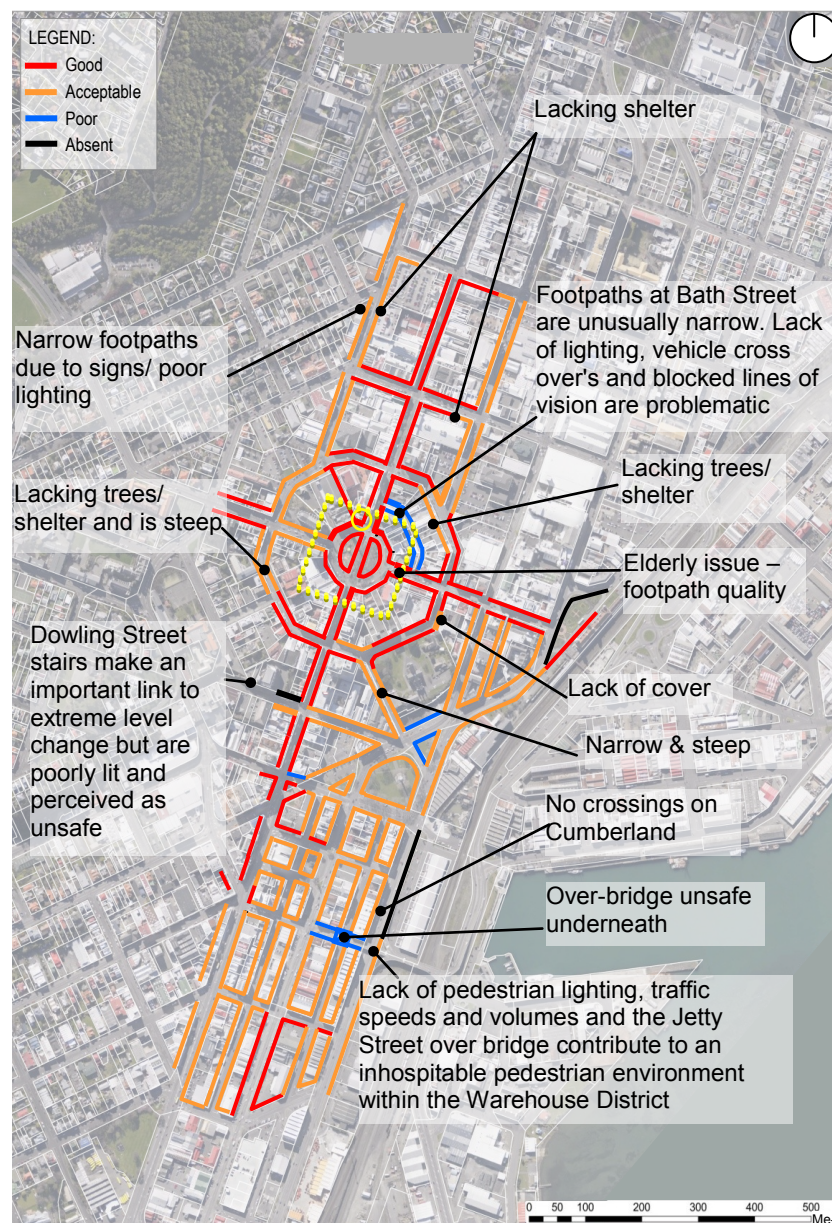
Proposed improvements to the lighting of footpaths are identified in Figure 5-35, based on an assessment and strategic prioritisation.

As with the proposed footpath upgrades, the focus should be placed on areas of strategic importance such as the area between The Octagon, Queens Gardens, the railway station and the Settlers Museum. The areas of boutique retailing on Moray Place and Bath Street and with emerging retail, one block off George Street have also been selected.

Background information: Footpath Assessment

Footpaths within the study area have been assessed according to the following criteria:

- Suitability of width, considering pedestrian numbers;
- Ease of use affected by vehicle crossings and poorly located furniture, signage, and café / restaurant seating;
- The presence or lack of lighting resulting in uninviting pedestrian routes at night, even if the footpath quality is otherwise fine; and
- Physical condition including state of repair, quality of workmanship, suitable grades and provision of access ramps.



RIGHT FIG. 5-36: Footpath assessment

5.4.8 Cycling

The Council has adopted a Strategic Cycle Network, which includes the central city. Due to its compact form and relatively flat topography the central city has potential to be very accessible by bike. While principally every city street should be a cycle street, practically the directness of connections as well as the local conditions make certain streets more conducive to cycling than others. Cycle routes currently run through the area, predominantly in a north-south direction. These are however located on the one-way pair where cyclists are forced to mix with high-speed State Highway traffic. On Cumberland Street these cycle lanes are on the eastern side of the road, meaning cyclists have to cross both streets to access the central city. This is particularly dangerous and difficult south of Queens Gardens where the speed limit is 60km/h and there are no signalised intersections. There are also few controls on Crawford Street. Although these cycle lanes are strategic for their connectivity between the city centre, tertiary campus, and North and South Dunedin, they are narrow and not user-friendly.

The Council's Strategic Cycle Network (Figure 5-37) provides for improvements in this situation. It introduces measures to make Princes and George Streets as well as Great King Street more attractive for cyclists, particularly the latter as an important link between the campus / hospital and the central city. The proposed two-waying of the SH one-way pair will provide opportunities to make Crawford Street more attractive to cyclists, and specifically to cyclists with a destination outside the central city. Particularly in the situation that the one-way situation north of the Leviathan Hotel is retained, there is a need to provide an alternative route. The direct link with Great King Street provided by Lower Stuart Street and Moray Place in the identified location, will function as this alternative.

PROPOSED CHANGES

East-west connectivity could be improved by better facilitating cyclists on Lower Stuart Street between The

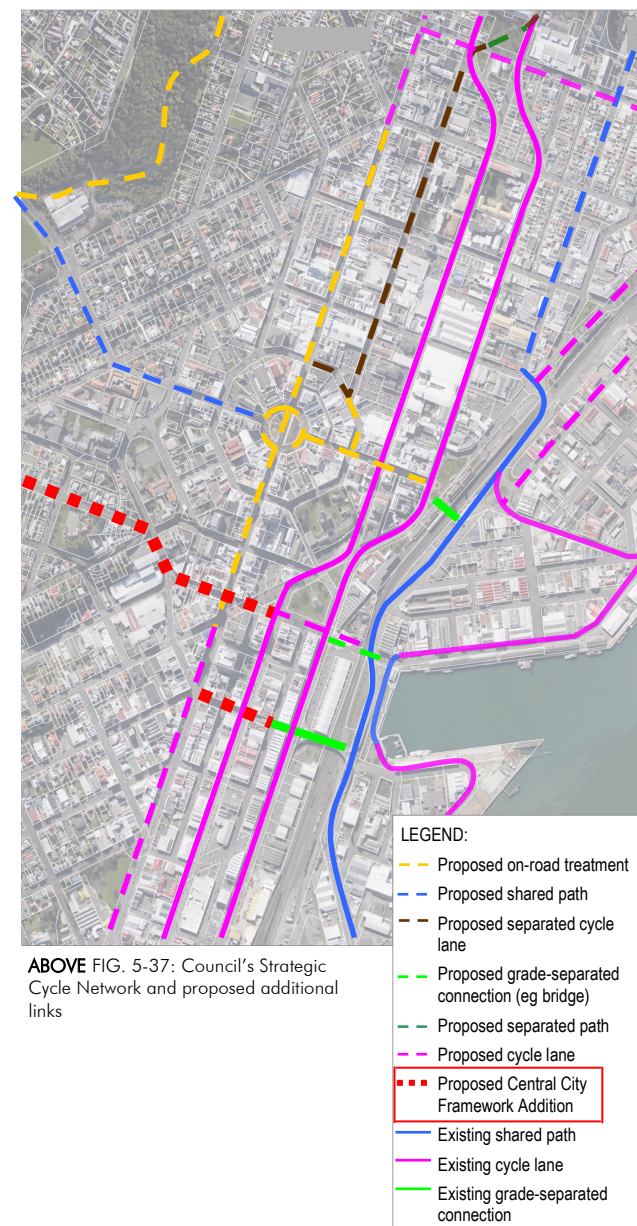
Octagon and the railway station, where the current bridge functions as a link across the railway line. Another improvement would be Rattray Street, connecting the town belt with Princes Street and the north-south routes on Crawford and Cumberland Streets. A possible future railway crossing could extend this route to the Dunedin harbourside area and the Ravensbourne and the Portsmouth Drive paths. In the interim, the Jetty Street bridge could fulfil this role and should be made safer for cyclists by better road marking. This should be accompanied with improvements in Jetty Street between Princes and Vogel Streets.

BICYCLE PARKING AND OTHER FACILITIES

Cycle parking is one of the most important end-of-trip facilities to encourage cycling. Bicycle parking, and general provision of cycling infrastructure in the central city could be improved. Dunedin has not increased its number of cycle parks at the rate specified in its Cycling Strategy. There are some cycle stands throughout the central city. However many are older style racks that only support one wheel which cyclists are reluctant to use, or hitching rails which are not easily identifiable as cycle stands. There are many viable options available for high quality locally manufactured cycle stands and there are many sites in the central city where cycle parking could be provided. George Street provides the greatest scope in this respect, although alternatives for the using the limited footpath space should be found.

Recently the Council has commenced work on a cycle parking plan and is working with local providers to construct bike strands.

District Plan rules requiring office developments to include cycling facilities such as storage and showers are another way to encourage cycling in the central city.



ABOVE FIG. 5-37: Council's Strategic Cycle Network and proposed additional links

5.4.9 Buses through George and Princes Streets

Currently a number of bus routes include bus stops in George and Princes Streets. This is in line with the Otago Regional Council's (ORC) objective of making the buses as prominent as possible and delivering passengers in the retail heart of Dunedin.

However, the current configuration of bus stops and the presence of buses also have disadvantages:

- Buses park close to shops and pedestrians on the footpath, often waiting for several minutes with the engines running, leading to nuisance from noise and fumes. This also applies to buses moving through the street.
- Due to limited space on the footpath, the queue of waiting bus passengers sometimes leads to blockages of the footpath and in front of shops.
- Buses moving in and out of bus bays lead to traffic conflicts with other vehicles and cyclists.
- During events in George Street and The Octagon, some buses follow an alternative route, resulting in confusion for particular visitors and other infrequent bus users.

OPTIONS

In response to these issues several options for reconfiguration of the bus route as well as bus stops are assessed:

1. Improve conditions through kerb build-outs with the bus stopping within the carriageway (at greater distance of shops), while cars and cyclists wait behind the stopping bus.
2. Improve conditions through locating bus bays at the approaches of intersections combined with turning bays instead of mid-block. This would include 'queue jump' opportunities for the bus at traffic lights and Barnes dance-style pedestrian crossings.
3. Remove the bus from the George Street retail area and reroute via Moray Place and Great King Street. A possible sub-option would be to apply this only to the northbound buses while retaining the southbound buses in George Street.

ASSESSMENT

1) Kerb build-outs

Disadvantages:

- Will not tackle the issue of re-routing during events.
- Will result in delays for other traffic, although with the proposal to reroute through-traffic via the proposed 'Western Inner Relief Road' (refer to Section 5.4.10) this may be of less concern.
- Costly construction of kerb build-outs if existing ones can not be used (build-outs need to be long enough to get on and off at the same time).

Advantages:

- Will keep buses further away from footpaths and shops.
- Does not require re-routing and major change to timetables.
- May result in an increase in parking bays or footpath space.
- Kerb build-outs assist in wayfinding and provide more space for information panels.
- Prioritises buses.

2) Bus bays at intersection approaches

Disadvantages:

- Buses need transponder technology to operate traffic lights.
- Costly reconstruction of bus and turning bays.
- May negatively impact on flow of turning traffic.
- Does not entirely tackle the negative impact on pedestrians and businesses as buses will still be in close proximity of shops and footpaths.
- Will not tackle the issue of re-routing during events.

Advantages:

- Will lead to efficient and safe pedestrian crossing opportunities.
- Does not require re-routing and major change to timetables.
- Prioritises buses.
- May result in an increase in parking bays or footpath space.
- May lead to time savings for the bus as it 'jumps the queue' at traffic lights.

3) Remove the bus from George Street or reduce the number of buses using George Street

Disadvantages:

- Bus routes are difficult to change as contracts of the different route operators are not aligned in time.
- The steep footpaths may deter less able bus passengers from walking between the George Street and Great King Street or Moray Place.
- Changes to a system that passengers are familiar with.
- Due to the lack of a feasible option parallel to Princes Street, this will not improve conditions in Princes Street.

Advantages:

- This will be the most effective way of tackling the abovementioned issues relative to buses in George Street.
- This improves the connectivity to the hospital which main entrance is located on Great King Street.

PROPOSALS

It is proposed to work with the ORC on more detailed analysis and design testing of these options that are aimed at improving the bus system to the benefit of the central city's vitality and the bus viability. Option 1 seems most advantageous and feasible, while Options 2 and 3 are considered worth exploring further as well.

It is also proposed to aim for a situation with fewer events in The Octagon and George that require road closures. This will lead to less disruption of the bus services and the greater consistency will improve the legibility for bus users and particularly infrequent users and those unfamiliar with the local situation.

ORC is considering to over time replace the buses with smaller, electrical vehicles and thus reducing noise and fume impacts on the street environment. This is however dependent on market conditions.



ABOVE FIG. 5-38: The Council-proposed 'Western Inner Relief Road'

5.4.10 Other Traffic proposals

WESTERN INNER RELIEF ROAD

The Council's Transportation Planning Department is currently considering a proposal for the 'Western Inner Relief Road', an arterial route, using the existing street network (refer to Figure 5-38). Its intent is to reduce through-traffic through central parts of Princes and George Streets as well as The Octagon, making it more attractive to slower modes and vehicles with a local destination. This proposal is supported in this Central City Framework.

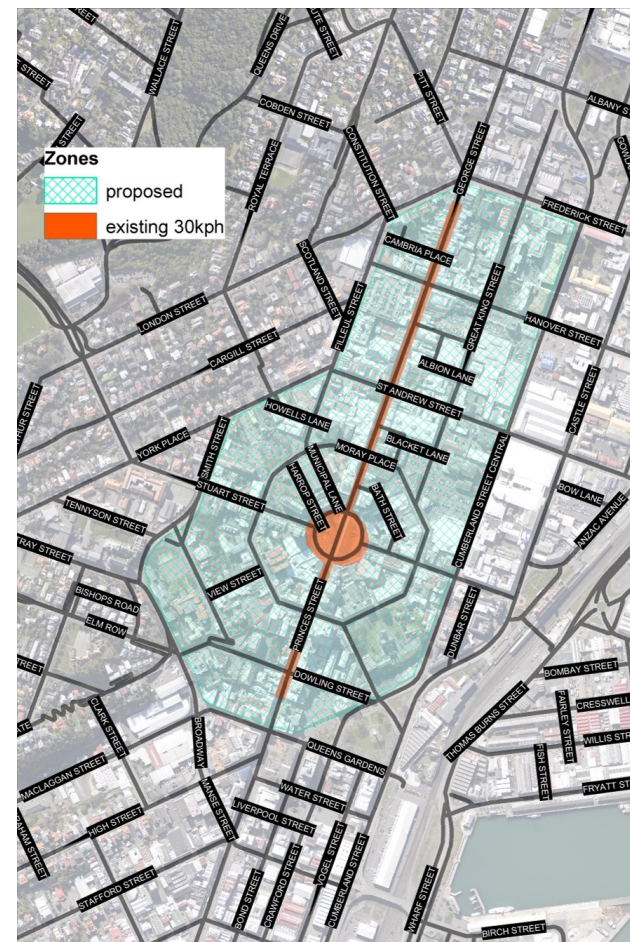
Improved signage should promote this route and possible detailed works to several intersections should still be identified. This route should be seen as an *integrator*, as opposed to a *separator*. Speed limits along this route will have to remain 50kph and the design of these streets and intersections should be such that they are not conducive to speeding.

Particular attention should be paid to allowing full land-use access and on-street parking. Cycling and pedestrian conditions, including crossing, should be enhanced, rather than detracted from as this route is located between the inner suburbs and the central city. It also passes several schools.

EXTENDING THE 30KPH ZONE

Health Impact Assessments (high-level analysis only) show that the Council-proposed extension of the 30kph zone in the central city (refer to Figure 5-39) would lead to health benefits. It would also lead to improved safety and amenity for pedestrians. Dunedin is currently ranked as second highest in New Zealand for pedestrian injury rate. Extending the speed limit zone is supported in this Framework.

It is important though to accompany this proposal by traffic calming measures. Drivers take their cue from street design and the surrounding environment and reducing speed limits without appropriate design interventions may not be sufficient to change driver behaviour. Currently, despite the 30km/h speed limit on George and Princes Streets some drivers still exceed that speed limit.



ABOVE FIG. 5-39: The Council-proposed extension of the 30kph zone

Making the 30kph zone too large would work counterproductive as well, since drivers can easily 'forget' that they are in a dedicated zone. The recommended outcome would be to clearly signal the 'entrances' to the 30kph zone, install traffic calming measures and restrict the zone to a logical area based on existing land uses and streetscape.

ON-STREET PARKING IN RETAIL AREAS

From the perspective of the economic performance of the city centre it is important that car parking is not concentrated in one area but is scattered throughout the city centre in order to establish a balanced system of origin and destination walking paths. For this reason, on-street car parks should be seen as a valuable resource and should be re-instated or retained where possible. Car parks also provide the necessary buffer between moving vehicles and pedestrians on the footpath.

It is also important for city centre parking to be charged as charging increases the effective supply of spaces by increasing turnover. All available evidence on the performance of retail before and after charged parking shows that retail performance improves with charged car parking. If the Council wishes to associate car parking with public realm improvements it can use the collections from parking revenues for streetscape and public realm improvements in an area.

TRAFFIC IN THE OCTAGON

The community and other stakeholders have expressed a desire for greater pedestrian focus in The Octagon and particularly on the outer street segments. From a traffic network and circulation perspective there are opportunities to calm and reduce traffic flows along these streets. The following issues should be considered:

- North-western segment (in front of the Municipal Chambers): currently used for one-way traffic, parking, taxi's - could be calmed down.
- North-eastern segment (in front of Amcal pharmacy): currently used for one-way traffic, parking, taxi's, deliveries - could be calmed down, retention of deliveries important.
- South-eastern segment (in front of the Regent): currently used for one-way traffic, deliveries - could be calmed down, retention of deliveries important.
- South-western segment (in front of art gallery): currently used for one-way traffic, buses, parking - should be retained for its strategic traffic function.

TAXI STAND LOCATION

It is proposed that a relocation of the southbound taxi stand from the Lower Octagon to Princes Street should be investigated. The reason for this is the limited space for both bar clientele and waiting customers at the current taxi stand. This could often lead to conflicts or an unpleasant atmosphere. For this reason, some taxi companies have decided not to use this taxi stand anymore late at night. The idea to use the bus bay (not used late at night) on the corner of Princes Street and The Octagon should be further explored.

Northbound taxi's could remain in their current location in front of the Municipal Chambers (in the northern part of the Upper Octagon) with a possible extension into George Street over time, possibly also using the bus bay. Refer to Figure 5-40 for the locations described.

PRINCES STREET

Between The Octagon and Rattray Street

The focus in this section should be on improvements to the existing micro public spaces (refer to Section 5.5.9).

Between Rattray Street and Police Street

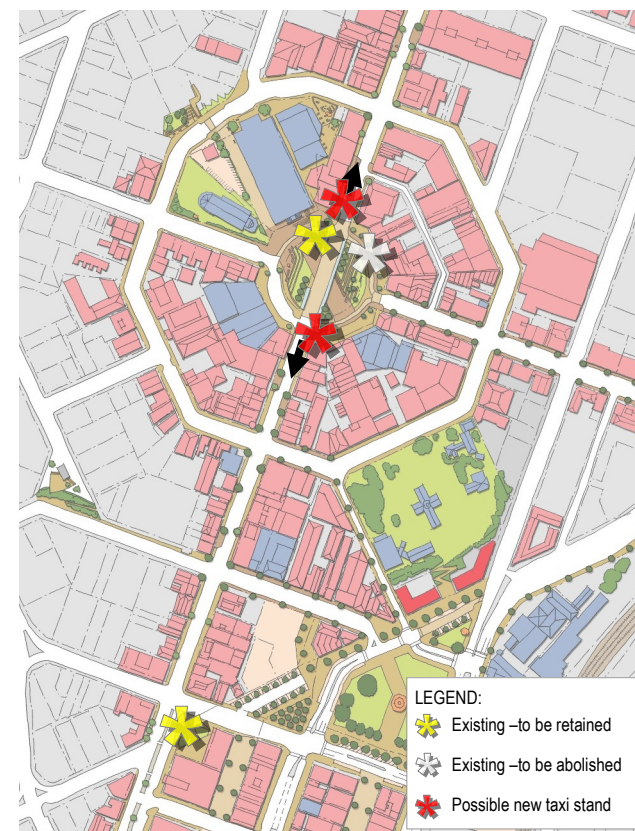
The aim for this section should be to make it less vehicle dominated and more inviting. As a result of the proposed traffic improvements (two-way Crawford Street, promotion of the Western Inner Relief Road) there may be scope to widen the existing solid median and introduce more trees that act as windbreakers, and reduce the sterility and perceived width of the street to give heritage buildings more prominence.

South of Police Street

The character of Princes Street currently changes in the vicinity of the Police Street intersection. Buildings south of that point do not address the street as actively as north of it. Several sites also have direct vehicle access.

It is proposed that a central median with trees and low planting should be investigated for Princes Street south of Police Street, for the following reasons:

- It would soften the appearance of a strongly traffic-dominated environment.



ABOVE FIG. 5-40: Central city taxi stand locations

- It would provide a greater sense of enclosure, currently limited due to inconsistency in the location and bulk of buildings (large interruptions exist in the form of Market Reserve and The Oval).
- Trees would help reduce the exposure to the cold southerly winds currently negatively impacting on the environment in Princes Street.
- With interruptions in the appropriate locations, it would assist with traffic making a right-turn and therefore benefiting land uses.
- It would improve pedestrian crossing opportunities, e.g. to access Market Reserve.