Downtown West

Integrated Transport Assessment

December 2024

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TRANSPORTATION SPECIALISTS

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Project: **Downtown West**
Title: **Integrated Transport Assessment**
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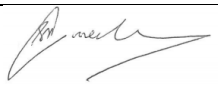
18 July 2023	A – 50%	R1A230718	B A Coomer-Smit	
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SUMMARY OF OUR TRANSPORT ASSESSMENT

Precinct Properties New Zealand Limited has commissioned Flow Transportation Specialists Ltd to identify and assess the transport planning and traffic engineering matters relating to the proposed Downtown West development, located at 2 Lower Hobson Street in the Auckland City Centre ("**Site"**).

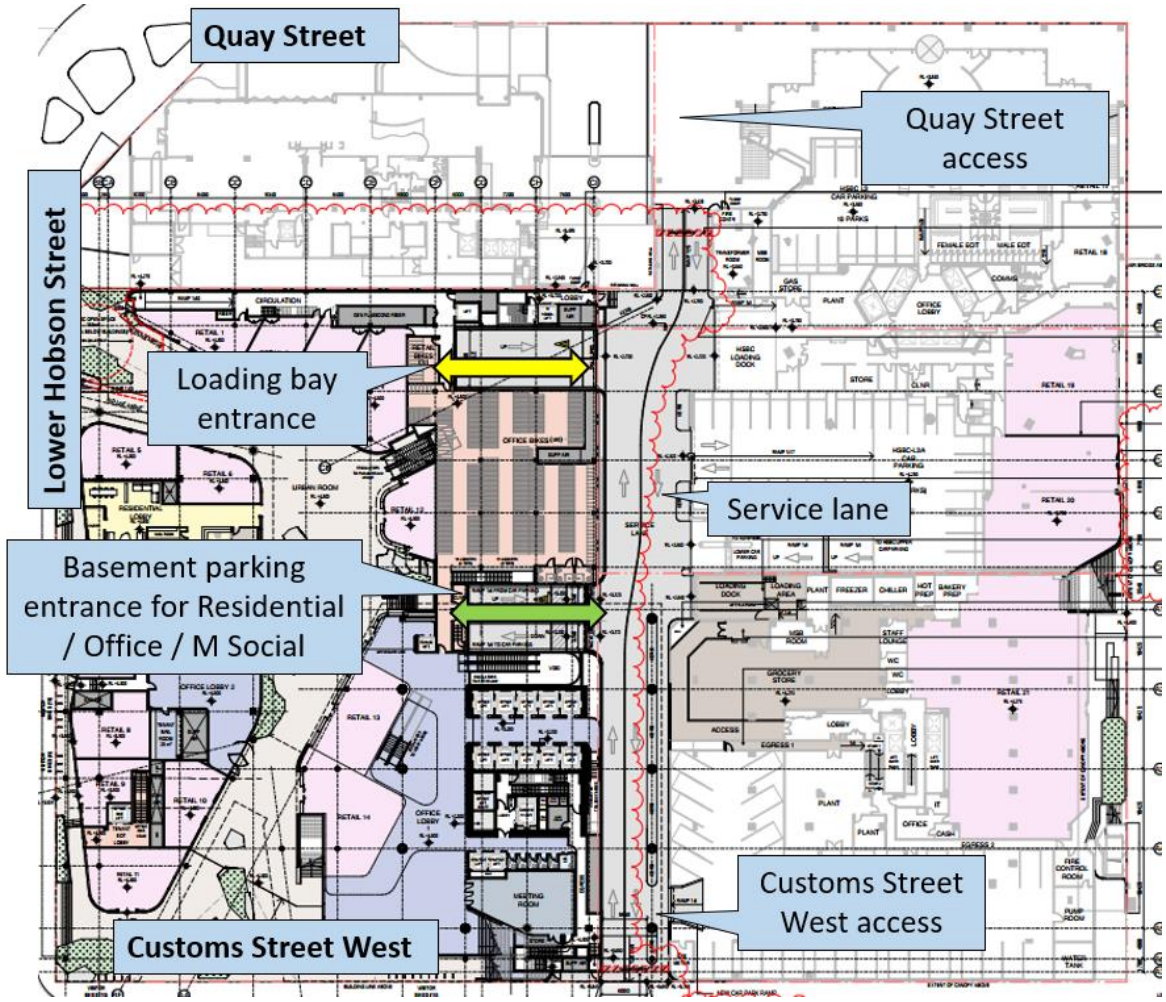
The proposed Development

The proposed development includes the demolition of the existing Downtown Carpark building (together with the Lower Hobson Street pedestrian bridge and Customs Street West vehicle ramp located within part of the road reserve) and redevelopment of the Site to provide for a mixed-use precinct providing for commercial, residential, retail, food and beverage and civic uses (**Development**).

The redevelopment involves 3 podium buildings, 2 towers and 5 levels of shared basement parking (plus a plant level), including new public spaces and a new laneway network to provide connectivity within the city centre. In addition, the proposed development involves modifications to the podia of existing adjacent buildings (HSBC and AON) to facilitate the new laneway network.

Figure S1 below shows a plan of Level 00 of the Development, showing vehicle access points.

Figure S1: Level 00 plan of Proposed Development



The Development includes the following key transport engineering elements.

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- 247 apartment units, consisting of 25,028 m^2 GFA total
- 79,204 m^2 GFA of commercial offices
- 2,033 m^2 GFA of retail/ restaurant activities, assumed to be primarily food and beverage
- Vehicle access will be provided as follows
    - Vehicle access will be provided through the existing service lane, which in turn has vehicle access onto Quay Street and Customs Street West. The service lane accessway will be upgraded to accommodate two-way vehicle movement
    - The Quay Street vehicle crossing from the service lane will remain unchanged from the existing situation. This crossing is subject to a Vehicle Access Restriction – General Control under the Unitary Plan
    - The design of the Customs Street West vehicle crossing will be modified, with the crossing being in a similar location to the existing one. The width of the crossing will be 6.0 m at the property boundary
    - Both Quay Street and Customs Street West are classified as arterial roads in the Unitary Plan
    - Car and van access can occur via both the Quay Street and Customs Street West crossings. As a result of vertical clearance limitation resulting from the Development's podium design over part of the service lane, all truck access to the Development is required to be through the Quay Street crossing
    - The existing vehicle crossings serving the Downtown Carpark onto Customs Street West and Fanshawe Street will no longer be required and will be removed.
- 540 parking spaces, accessed from the service lane, will be provided across 5 levels of basement parking as follows.
    - This will be allocated as follows
        - 121 spaces will be allocated to the adjacent M Social site and are off-site parking spaces
        - 247 spaces for residents
        - 150 spaces for offices
        - 1 carwash space for residential use
        - 10 facility management spaces
        - 11 drop-off spaces
    - 23 tandem parking spaces will be provided, which will be allocated to the same residential unit or office tenancy
    - 24 accessible parking spaces will be provided
    - All parking spaces will be provided over several basement levels. The main parking basement will be accessed via an entrance from the service lane. Some of the facility

management parking spaces will be accessed from the loading entrance from the service lane.

- 5 loading spaces, designed to accommodate 8.3 m trucks, are provided in a separate loading area. Access to this area is via the service lane and a servicing access, which is separated from the primary basement entrance servicing the car parking provision
- The Development provides 1,165 secure bicycle parking spaces and 64 visitor bicycle parking stands. These will be supported by 53 showers and 642 lockers to provide end-of-trip facilities
- A network of pedestrian connections within the Site connecting Lower Hobson Street and Customs Street West.

Alignment with central and local government landuse and transport planning policy

The Development aligns well with the objectives set out in central and local government landuse and transport planning policy documents. It is a high-density residential and commercial development located with excellent access to public transport, well connected for cycling and walking and a significant number of services and amenity within short walking distance.

The Site location, in combination with reducing the existing on-site parking supply by around 70% compared to the existing Downtown Carpark, discourages the use of private vehicles as a mode of travel and contributes to Auckland's reductions in transport-based greenhouse gas emissions.

Auckland Unitary Plan transport matters

Under the Auckland Unitary Plan ("**Unitary Plan**") transport related rules, the Development has a Discretionary activity status because the Development's basement will be used for 121 off-site parking spaces. This relates to an existing agreement whereby the M Social hotel, located directly to the north of the Site, has the use of 121 off-site parking spaces in the existing Downtown Carpark, and as such, provision needs to be made in the Development. This arrangement will not result in any adverse transport effects, as it is an existing situation. The traffic demands of this offsite parking have been included in our traffic assessment.

The provision and design of all transport facilities, including vehicle crossings, accessways, car and bicycle parking provision, loading facilities and pedestrian facilities, all comply with the standards of the Unitary Plan except for the vertical clearance requirements associated with service vehicles and accessible parking spaces.

- For service vehicles, this relates to the section of the service lane between the Quay Steet access and the access to the basement loading area. (3.8 m vertical clearance is required, and 3.6 m clearance is provided). This is an existing situation and we have observed that this small non-compliance of 200 mm still allows for trucks to use the service lane to access the existing loading docks on the service lane. Notwithstanding this and to manage the effects of the Development's vertical clearance restrictions, we recommend that a Servicing Management Plan be required to ensure that all servicing vehicles that access the Development comply with the necessary vertical clearance restrictions.

- For accessible parking, 2.5 m of vertical clearance is not provided for all of the parking spaces or access areas. We have assessed accessible parking design standards, and consider the available vertical clearance is appropriate.

The Unitary Plan specifies that tandem or stacked spaces are permitted for residential activities. While the final parking allocation has not been determined, the tandem spaces could potentially be allocated to the office activities. We consider this can be managed by allocating the tandem spaces to the same office tenancies. The users of these spaces will be regular users, and use of the tandem spaces can be coordinated and managed as required.

Under Plan Change 79 of the Unitary Plan, additional accessible parking spaces are required for all activities. The standards require a total of 51 accessible parking spaces, whereas 24 are proposed. The proposed provision will be sufficient to meet the residential accessible parking requirements but results a shortfall for the office and retail activities. We consider that the proposed provision is acceptable as excellent and accessible public transport options are available in close proximity to the Site.

Under the Unitary Plan, Quay Street and Customs Street West access have vehicle access restrictions. We have accordingly completed an assessment of the Development's use of these accesses, having regard to the relevant restricted discretionary activity criteria in the Unitary Plan. We conclude that the location and design of these crossings are such that there is adequate sight distance for these crossings to function safely and efficiently under the predicted traffic demands.

Traffic effects assessment

With regard to access, we note that the number and design of the Site's vehicle access will have positive transport effects compared to the existing situation, as all access and vehicle crossings associated with the existing Downtown Carpark will be removed.

The removal of the existing crossings on Customs Street West into the Downtown Carpark will provide a safer environment for pedestrians, noting that these are the only locations where pedestrian crashes have been recorded to have occurred over the past 5 years.

The SATURN results show the following for all scenarios and peak periods.

- Vehicles generally reroute away from the routes serving the existing Downtown Carpark (Sturdee Street, the Lower Hobson Street slip lane adjacent to the Site), towards the routes directed to the Development's access points (Quay Street, Customs Street West and the Lower Hobson Street Flyover)
- The change in vehicle volumes is mostly concentrated in the areas near the Development and Downtown Carpark access points. No significant changes in vehicle volumes are predicted in the wider network
- No increases of vehicle delays of more than 10 seconds are predicted in any scenario, both in the local area and the wider network. All scenarios show a decrease in delays at the Downtown Carpark exit ramp onto Fanshawe Street, as this signalised intersection will no longer be required

- The Development will have negligible impact on overall vehicle travel times across the network, with average journey times for all vehicles increasing up to 1 second compared to the future baseline
- No noticeable change to bus route travel times are predicted. There will be some small increases and decreases of -14 to +13 seconds for some bus routes.

Overall, we consider that the results of the SATURN network modelling have shown that the existing road network can efficiently accommodate the traffic demands of the Development.

The SIDRA results show that under the Development scenario traffic demands,

- The Customs Street West access is predicted to operate with minimal delays under all Development scenarios, with LOS A for all movements. This access operates as a left-in / left-out access
- The Quay Street access is predicted to perform well
  - No noticeable changes are predicted in the AM peak
  - In the PM peak, the right turn out delays are predicted to increase from 20 to 23 seconds
  - In both peak periods, the right turn operates at LOS C, and all other movements operate at LOS A
- While the turning volumes from the service lane are predicted to increase, there is generally a decrease in through traffic volumes due to the redistribution of the existing Downtown Carpark trips away from the local area.

In summary, we believe that both access points of the service lane can operate within capacity. The results do not indicate there will be any safety concerns as a result of turning traffic and congestion.

Construction traffic effects

Demolition of the Downtown Carpark building and associated structures is expected to occur over a 10 to 12-month period. This will consist of the following stages, with indicative timeframes shown in brackets (assuming a 12-month scenario).

- Stage 1 – Removal of Lower Hobson Street pedestrian overbridge (48 hours)
- Stage 2 – Demolition of the west section of the Downtown Carpark building, with a crane located on Lower Hobson Street (3 months)
- Stage 3 – Demolition of the west section of the Downtown Carpark building, with a crane located within the Site (3 months)
- Stage 4 – Demolition of the east section of the Downtown Carpark building (6 months)
- Stage 5 – Removal of Downtown Carpark ramp over Customs Street West onto Fanshawe Street (1 week).

Following the demolition of the existing car parking building, an indicative construction programme is set out below, with construction occurring over the following phases. When considered alongside the

demolition, the total duration of these construction phases is anticipated to occur for approximately 6 years. We note that some of the phases listed below may overlap with each other.

- Enabling works – 6 months
- Excavation – 9 months
- Basement construction – 14 months
- Main construction (of towers and podiums) – 40 months

We anticipate that the different stages of demolition and construction will require closures of roads, traffic lanes and pedestrian footpaths for roads in the surrounding area. This is to provide a separated loading area and access points for construction vehicles, and to provide safe separation between the public and live work zones.

We anticipate that a Construction Traffic Management Plan ("**CTMP**") can safely manage construction traffic effects during demolition and construction. We believe the CTMP should be prepared based on the following principles

- Protect the public from construction activities
- Contain the construction works within the Site where possible
- Minimise unnecessary pedestrian, road and bus lane closures. Provide safe alternatives where any closures are required
- Undertake the construction in an efficient manner to avoid prolonging any required road or footpath closures
- Provide consideration to the Auckland Transport's Temporary Traffic Management Guidelines
- Avoid Quay Street as a construction vehicle route.

We note that a contractor has not been appointed at this time. The programme and methodology will be subject to the contractor applying their own methodology once appointed.

Conclusions and recommended mitigation measures

We consider that there are no traffic engineering or transport planning reasons why the Development should not be approved, subject to conditions of consent being required.

- The development and implementation of a Servicing Management Plan to ensure that all servicing vehicles that access the Development comply with the necessary vertical clearance restrictions
- On the service at the Quay Street, access measures are implemented to improve visibility between exiting trucks and inbound vehicles. We have assumed a convex mirror will be provided
- The development and implementation of a Construction Traffic Management Plan for the demolition and construction phases is to be developed to safely manage construction effects.

CONTENTS

APPENDICES

1 INTRODUCTION TO THIS REPORT

Precinct Properties New Zealand Limited has commissioned Flow Transportation Specialists Ltd to identify and assess the transport planning and traffic engineering matters relating to the proposed Downtown West development, located at 2 Lower Hobson Street in the Auckland City Centre ("**Site"**).

The proposed development includes the demolition of the existing Downtown Carpark building (together with the Lower Hobson Street pedestrian bridge and Customs Street West vehicle ramp located within part of the road reserve) and redevelopment of the Site to provide for a mixed-use precinct providing for commercial, residential, retail, food and beverage and civic uses ("**Development"**).

The redevelopment involves 3 podium buildings, 2 towers and 5 levels of shared basement parking, including new public spaces and a new laneway network to provide connectivity within the city centre. In addition, the Development involves modifications to the podia of existing adjacent buildings (HSBC and AON) to facilitate the new laneway network.

In particular, the Development contains 247 residential apartment units, 2,033 m^2 of retail/restaurant gross floor area ("**GFA"**) activities and 79,204 m^2 GFA of commercial offices. These activities will be supported by car parking, loading spaces, bicycle parking, and end-of-trip facilities. Vehicle access will be provided via the existing service lane, extending between Customs Street West and Quay Street.

This Transport Assessment forms part of the Assessment of Environmental Effects report supporting the resource consent application for the Development and addresses the transport planning and traffic engineering matters associated with the Development, including:

- a description of the Development, focussing on transport related matters (refer to Section 2)
- Background to this transport assessment, including
    - the previous 5 August 2024 version of this report, which was lodged with Auckland Council ("**Council**") and the subsequent landuse and design changes made to the Development and included in this Transport Assessment
    - our assessment of the subsequent Section 92 requests from Council
    - a summary of updates to this assessment compared to the previous version (refer to Section 3).
- an assessment of the Development against the relevant transport standards and provisions contained in the Auckland Unitary Plan – Operative in Part ("**Unitary Plan**") (refer to Section 4)
- a description of relevant transport strategies and policy with regard to the Development (refer to Section 5)
- a description of the surrounding transport environment as it relates to the Site to give context to this Transport Assessment (refer to Sections 6 and 7) including:
    - the Site location and surrounding land use activities
    - the existing surrounding road network

- transport elements of the existing Site including existing vehicle access provisions and traffic generation
- an assessment of the historic crash record in the vicinity of the Site
- the accessibility of the Site with regard to various transport modes.

- an assessment of the transport elements and resulting effects of the Development having regard to the relevant Unitary Plan design standards and controls, including:
  - an assessment of the access arrangements, focussing on the vehicular and pedestrian access associated with the Development (refer to Section 8)
  - a parking and servicing assessment, including an assessment of the design and adequacy of the parking and loading areas to support the Development (refer to Section 9)
  - a traffic assessment, including the number of vehicle trips the Development is likely to generate during peak hours and an assessment of the likely effect this traffic may have on the operation of the surrounding road network during weekday peak commuter hours.

    This assessment includes detailed traffic modelling using SATURN and SIDRA traffic modelling software (refer to Section 10)
  - a preliminary assessment of construction traffic effects relating to the demolition of the Downtown Carpark and construction of the Development (refer to Section 11)
  - a summary of our recommended mitigation measures (refer to Section 12).

2 WHAT ARE THE LANDUSE AND TRANSPORT ELEMENTS OF THE DEVELOPMENT?

The ground floor / site plan of the Development is shown in Figure 1 and a full set of drawings of the Development is attached to the resource consent application.

The Development includes the following key transport engineering elements.

- 247 apartment units, consisting of 25,028 m^2 GFA total
- 79,204 m^2 GFA of commercial offices
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- Vehicle access will be provided as follows.
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- 540 parking spaces, accessed from the service lane, will be provided across 5 levels of basement parking as follows.
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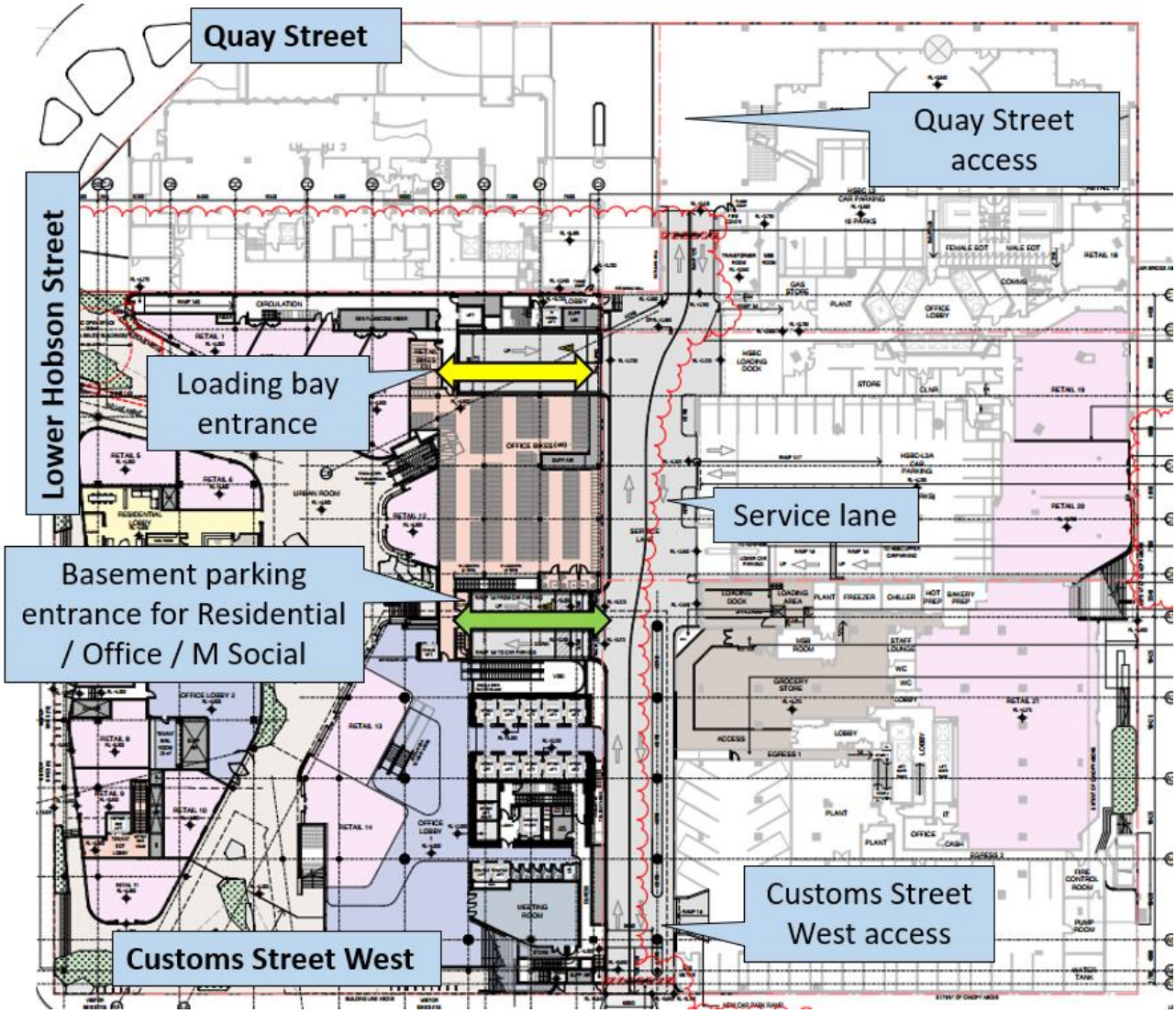
- The Development provides 1,165 secure bicycle parking spaces and 64 visitor bicycle parking stands. These will be supported by 53 showers and 642 lockers to provide end-of-trip facilities
- A network of pedestrian connections within the Site connecting Lower Hobson Street and Customs Street West.

Figure 1: Level 00 plan of the Development



3 LODGED VERSION, SECTION 92 RESPONSES AND RESULTING UPDATES

A previous version of this report, dated 5 August 2024, was originally lodged with Auckland Council ("**lodged version**").

This report has been prepared to update this lodged version and includes updated transport assessments taking account of

- changes to the Development yields and parking provisions, as summarised in Table 1. The main change is the increase in office GFA and the reduction of the number of apartments. The number of parking spaces has also reduced
- responses to Council's Section 92 requests with regard to the lodged version
- providing an updated Preliminary CTMP and Transport Assessment for the demolition activity, as attached in Appendix H.

Table 1: Changes to development metrics compared to lodged version

Metric	Lodged version size	Proposed size	Difference compared to lodged version
Apartments (units)	331	247	-84
Apartments (m^2 GFA)	38,263	25,028	-13,235
Office (m^2 GFA)	62,176	79,204	+17,028
Retail (m^2 GFA)	2,888	2,033	-855
Car parking spaces (total)	624	540	-84
Accessible parking spaces	14	24	+10
Secure bicycle parking spaces	1,048	1,165	+117
Visitor bicycle parking spaces	61	64	+3

Compared to the lodged version, the Development's design changes related to transport include,

- the removal of the proposed secure line and drop-off space in the service lane. Drop-off spaces will now be provided inside the basement on Level B01
- changes to the car basement access point on the service lane
- changes to the loading bay design, but not the number of spaces
- changes to the internal car parking layout.

The Section 92 requests following the lodgement of the lodged version were provided by Council in a letter dated 23 September 2024. The responses to the Section 92 responses are provided by Barker & Associates as part of the application material.

As a result of these changes and responses to the Section 92 requests, this assessment provides the following additional information compared to the lodged version.

- An assessment of the new Plan Change 79 transport standards of the Unitary Plan

- An updated modelling assessment, accounting for the change in landuse activities and using an updated office trip generation rate based on the results of surveys undertaken at Commercial Bay
- Updated vehicle tracking assessments
- An updated construction assessment, providing potential truck access options, and referring to the updated Preliminary CTMP and Transport Assessment for the demolition.

4 THE AUCKLAND UNITARY PLAN CONTEXT OF THE SITE

4.1 What Unitary Plan zoning, overlays and designations apply to this site?

As shown in Figure 2, the Site is zoned Business – City Centre in the Unitary Plan and is located in the Downtown West Sub-Precinct B Precinct.

- Quay Street, Lower Hobson Street and Customs Street West are all classified as arterial roads in the Unitary Plan and are therefore subject to Vehicle Access Restrictions
- Quay Street is subject to a General Vehicle Access Restriction Control.

Figure 2: Unitary Plan zoning and controls of Site

4.2 What are the transport matters in the H8 Business City Centre Zone?

We understand that the Development has an overall Discretionary activity status under the Unitary Plan.

Notwithstanding this, and to provide context to the Transport Assessment, we highlight the following Restricted Discretionary activity criteria applicable to transport (and excluding urban design matters) as set out in H8.8.2 (1) as follows:

> *"(1) new buildings and external alterations and additions to buildings not otherwise provided for:*
>
> *(c) design of parking, access and servicing:*
>
> *(iii) whether vehicle crossings and accessways are designed to reduce vehicle speed, be visually attractive and clearly signal to pedestrians the presence of a vehicle crossing or accessway;*

(v) whether separate vehicle and pedestrian access are provided within parking areas. Shared pedestrian and vehicle access may be appropriate where a lane or street is proposed within a development site. The shared space should prioritise pedestrian movement;

(vii) for commercial activities, whether suitable provision is made for onsite rubbish storage and sorting of recyclable materials that:

- *is a sufficient size to accommodate the rubbish generated by the proposed activity;*
- *is accessible for rubbish collection; and*
- *for new buildings, is located within the building*

(viii) where appropriate, whether a waste management plan is provided and:

- *includes details of the vehicles to be used for rubbish collection to ensure any rubbish truck can satisfactorily enter and exit the site; and*

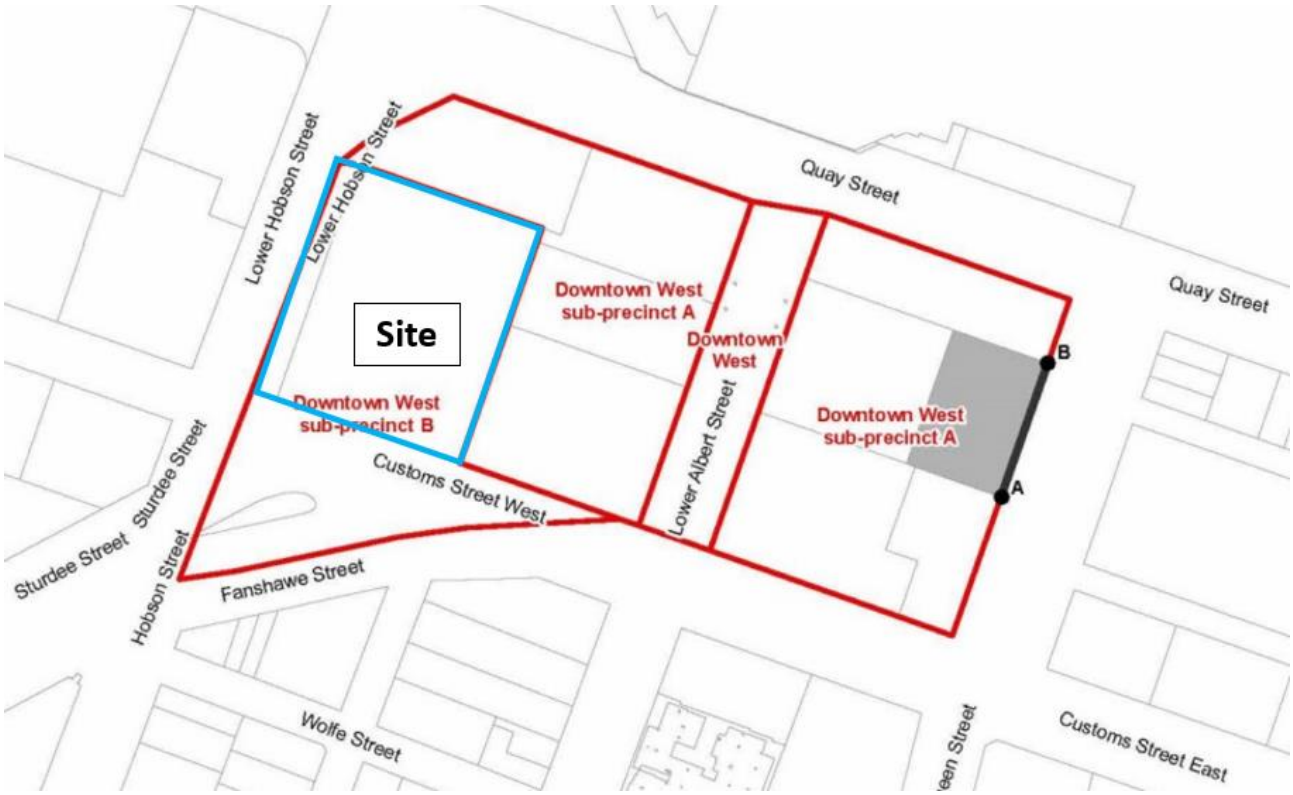
(x) whether the development is able to be adequately served by wastewater and transport infrastructure."

We have provided an assessment against these H8 Business Centre Zone standards and assessment criteria in Appendix A.

4.3 What are the transport matters in the Downtown West, Precinct Sub-Precinct B?

The location of the Site within the Downtown West Precinct Plan is shown in Figure 3.

Figure 3: Downtown West Precinct Plan



In the Downtown West Precinct, Sub-Precinct B, the following activity statuses apply:

- New buildings, and alterations and additions to buildings – Restricted Discretionary activity
- Open space or through-site links – Restricted Discretionary activity
- Vehicle, cycle and pedestrian access – Restricted Discretionary activity
- Development that does not comply with Standard I205.6.2 Pedestrian connections – Restricted discretionary activity (this standard is addressed elsewhere in the application documents).

The relevant transport related assessment criteria are set out in I205.8.2 of the Unitary Plan and are as follows:

> *"(1) new buildings, and alterations and additions to buildings:*
>
> > *(b) the assessment criteria in H8.8.2(1) of the Business - City Centre zone rules for new buildings and/or alterations and additions to buildings apply.*
>
> *(2) open spaces or through-site links:*
>
> > *(a) the transport network (roads, public transport connections, pedestrian connections and cycle connections) is generally provided in the location identified in the precinct plan to achieve a legible street network. Where no location is identified, an integrated and efficient street and pedestrian network should be provided, including connections to existing and future streets and networks;*
>
> *(3) vehicle, cycle and pedestrian access and circulation:*
>
> > *(a) the transport network (roads, public transport connections, pedestrian connections and cycle connections) is generally provided in the location identified in the precinct plan to achieve a legible street network. Where no location is identified, an integrated and efficient street and pedestrian network should be provided, including connections to existing and future streets and networks"*

Our assessment against these assessment criteria is provided in Appendix A.

4.4 What are the transport matters in Chapter E40 Temporary Activities?

Chapter E40 of the Unitary Plan contains rules for temporary activities.

Activity A20 in Table E40.4.1 outlines that temporary activities associated with building construction up to 24 months are classified as Permitted activities. Other activities not provided for as Permitted activities are classified as Restricted Discretionary activities.

Given that construction of the Development will take longer than 24 months, a Restricted Discretionary activity status applies under E40.

The relevant transport related assessment criteria are set out in E40.8.2(2) of the Unitary Plan and are as follows.

(2) the extent to which the activity will have adverse effects on traffic movement, parking, public transport and pedestrian safety and access, and the extent to which these effects can be adequately addressed through:

(a) the location, scale and intensity of the activity;

(b) the duration, hours, times and day/s of the week on which the event will occur;

(c) the provision made to address any impacts from traffic generated by the activity, including impacts on public transport, and other activities at the location;

(d) [deleted]

(e) the provision made for pedestrian safety and to address any restrictions on public access.

Our assessment against these assessment criteria is provided in Appendix A.

4.5 Plan Change 79

We note that Plan Change 79 (PC79) Amendments to the Transport Provision have been legal and effective since 9 August 2024. The lodged version of this report did not provide an assessment of PC79.

Accordingly, we have now provided an assessment of the PC79 standards, which is provided in Appendix A. The applicable infringements are summarised in Section 4.6.

4.6 Our assessment of Chapter E27 Transport matters

We have undertaken an assessment against the provisions of Chapter E27 Transport (with details included in Appendix A of this report). In terms of Chapter E27, the Development has a Discretionary activity status under the following standards.

Restricted Discretionary activities

- E27.4.1 (A2) Parking, loading, access and Electric Vehicle Supply Equipment, which is an accessory activity, but which does not comply with the standards for parking, loading, access and Electric Vehicle Supply Equipment (as outlined below)
- E27.4.1 (A5) Construction or use of a vehicle crossing where a Vehicle Access Restriction applies under Standards E27.6.4.1(2) or E27.6.4.1(3)
- E27.4.1 (A6) Use of an existing vehicle crossing where a Vehicle Access Restriction applies under Standard E27.6.4.1(1) to service the establishment of a new activity, a change of activity type, the expansion or intensification of an existing activity or where a building(s) is constructed, or additions to buildings that are not permitted activities in Table H8.4.1 Activity table; Table H9.4.1 Activity table; or Table H10.4.1 Activity table.

Discretionary activities

- E27.4.1 (A16) Off-site parking.

In particular, the Development infringes the following standards of E27.

- E27.6.4.1(1) Vehicle access restrictions: The use of an existing vehicle crossing subject to Vehicle Access Restriction – General Control (Quay Street)
- E27.6.4.1(2 and 3) Vehicle access restrictions: Vehicle access onto arterial roads (Quay Street and Customs Street West)
- E27.6.3.3(3) Stacked parking: 23 tandem spaces are proposed which could potentially be allocated to the office activity, whereas only residential is permitted
- E27.6.3.5 Vertical clearance: The available vertical clearance associated with the loading area is 3.6 m, which is less than the 3.8 m required. Accessible parking spaces require 2.5 m of vertical clearance, whereas 2.3 – 2.4 m is provided for areas accessing the spaces
- PC79 E27.6.3.2(A) Accessible parking: 24 accessible parking spaces are provided, whereas not less than 51 spaces are required

We have assessed the Development against the relevant design-related assessment criteria, namely:

- E27.8.2 (9) and E27.8.2 (11) relating to the Development's vehicle access provisions
- E27.8.2.(8) relating to vertical clearance where loading is required, and accessible parking spaces.
- PC79 – E27.8.2.(4A) relating to providing less than the required number of accessible parking spaces

Our assessment of these Section E27 matters against the relevant assessment criteria is provided in Appendix A.

We conclude that these infringements will have no noticeable impacts on the safe and efficient operation of the Site or the surrounding transport network.

5 OUR CONSIDERATION OF RELEVANT TRANSPORT STRATEGIES

Over the last decade, land use and transport planning has taken a distinct change in direction in Auckland, with a focus on enabling a choice of transport modes, reducing deaths and serious injuries, encouraging compact urban development and addressing climate change. Government policies and plans provide a clear direction to integrate land use and transportation planning and to reduce the reliance on single occupant vehicle trips.

Key themes within central and local government plans and policies include

- the need for single occupant vehicles to be minimised by integrating land use and transport planning so that urban forms and transport services reduce the distance or time required to access social and economic opportunities (AP 2050[1]), (Unitary Plan[2]), (ATAP[3]), Transport Emissions Reduction Pathway (TERP)[4]
- supporting a mode shift for trips in urban areas from private vehicles to more efficient, low cost modes like walking, cycling and public transport (AP2050), (Unitary Plan), (ATAP), (RLTP 2024 Draft[5]), (RPTP 2024 Draft[6]) (TERP)
- mobility is a means to achieve better access but is not an end goal in itself (AP 2050)
- reducing deaths and serious injuries in the transport system (GPS 2024[7]), (AP 2050), (ATAP), (RLTP 2024 Draft), (TERP)
- reducing greenhouse gas and harmful pollutant emissions from transport and improving public health outcomes by substantially increasing the use of lower emission modes, such as walking and cycling, providing frequent and affordable public transport, and promoting integrated land use and transport planning (AP 2050), (Unitary Plan), (ATAP), (RLTP 2024 Draft), (RPTP 2024 Draft), (TERP)
- enabling a quality compact urban form (AP 2050), (Unitary Plan)
- unlocking growth near centres and rapid transit stations (AP 2050), (Unitary Plan), (ATAP), (RPTP 2024 Draft) (NPS-UD 2020)[8]
- removing minimum car parking requirements (NPS-UD 2020)
- adding new roads or widening existing ones is increasingly expensive and difficult, and existing transport corridors will need to accommodate much of the increase in travel as Auckland's population grows (AP 2050), (RLTP 2024 Draft)
- using a "scenarios-based" approach to planning and decision-making, where strategies and major investments are assessed against a range of potential futures (AP 2050)

[1] Auckland Plan 2050, Auckland Council
[2] Auckland Unitary Plan, Auckland Council
[3] Auckland Transport Alignment Project, New Zealand Government and Auckland Council
[4] Transport Emissions Reduction Pathway
[5] Regional Land Transport Plan draft 2024– 2034, Auckland Transport
[6] Regional Public Transport Plan draft 2024 – 2031, Auckland Transport
[7] Government Policy Statement on Land Transport 2024-2034 (GPS 2024), New Zealand Government
[8] National Policy Statement on Urban Development 2020

- the City Centre should have safe, healthy and sustainable travel options both inwards and outwards. This will improve people's access and choice of transport modes (CCMP 2020)[9]

Further information and details on these points are included in Appendix B.

We consider that the Development aligns well with the objectives set out in these various policy documents. It is a high-density residential development located with excellent access to public transport and a significant number of services and amenity within short walking distance. The Site location, in combination with reducing the existing on-site parking supply by around 70% compared to the existing Downtown Carpark, discourages the use of private vehicles as a mode of travel and contributes to Auckland's reductions in transport-based greenhouse gas emissions.

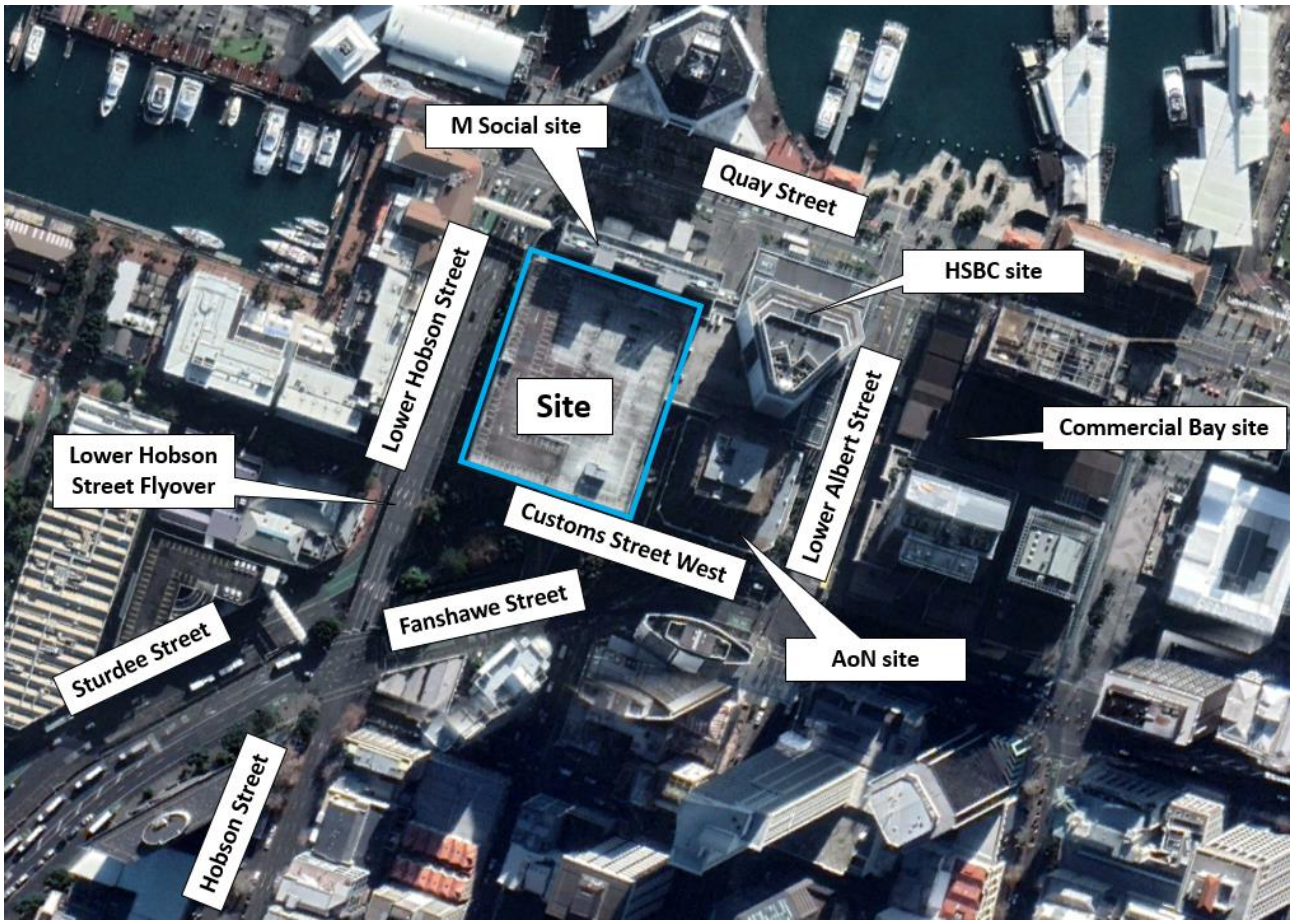
[9] City Centre Masterplan 2020

6 THE ENVIRONMENT NEAR THE SITE

6.1 Location of the Site

As shown in previous Figure 3 and Figure 4 below, the Site is located to the north of Customs Street West and east of Lower Hobson Street in the Auckland City Centre.

Figure 4: Site and immediately surrounding transport network



6.2 What are the land use activities around the Site?

The land use of the area surrounding the Site is shown in Figure 4 above. Being located in the City Centre, there is a range of land use activities in the surrounding area, including commercial, residential, retail, and restaurants.

There are several sites located near the Development Site, including:

- M Social hotel immediately to the north
- HSBC and AON office buildings immediately to the east
- Commercial Bay development is located to the east, on the opposite side of Lower Albert Street.

As such, the Site is well located to other complementary land uses in the surrounding area.

6.3 The road network surrounding the Site

The relevant roads surrounding the Site are Quay Street, Lower Hobson Street, Customs Street West and Fanshawe Street.

All roads in the City Centre have a speed limit of 30 km/h. This excludes Hobson Street, Nelson Street and Fanshawe Street, which have a speed limit of 40 km/h.

6.3.1 Traffic volumes

The latest traffic volume data available for the local area obtained from Auckland Transport's traffic count database is summarised in Table 2 below.

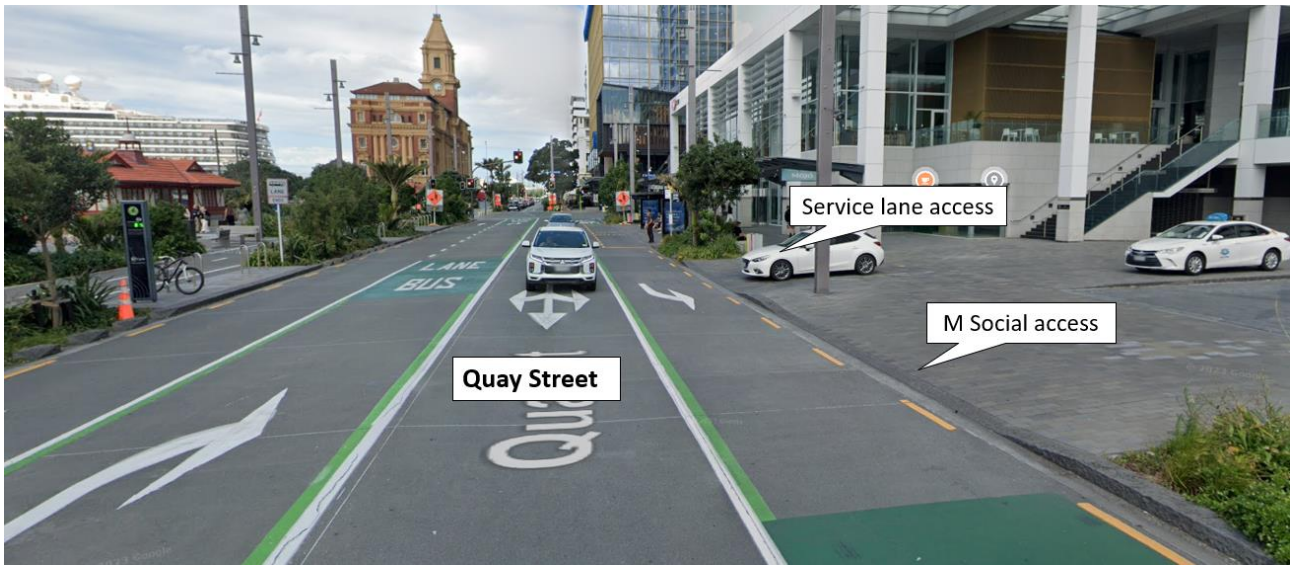
Table 2: Auckland Transport traffic volume data

Road	Mid-block location	Count Date	Average Daily Weekday Traffic (vpd)	AM / PM Peak Hour Volume (vph)
Quay Street	Lower Albert Street to Lower Hobson Street	21/03/2024	11,521	727 / 926
Lower Hobson Street	Quay Street to Fanshawe Street	30/04/2019	10,470	760 / 732
Customs Street West	Albert Street to Queen Street	9/06/2023	15,910	1,337 / 1,255
Customs Street West	Market Place to Market Lane	18/01/2023	1,433	110 / 115

6.3.2 Quay Street

The existing layout of Quay Street in the vicinity of the Site is shown in Figure 5.

Figure 5: Quay Street layout near the Site (looking east)

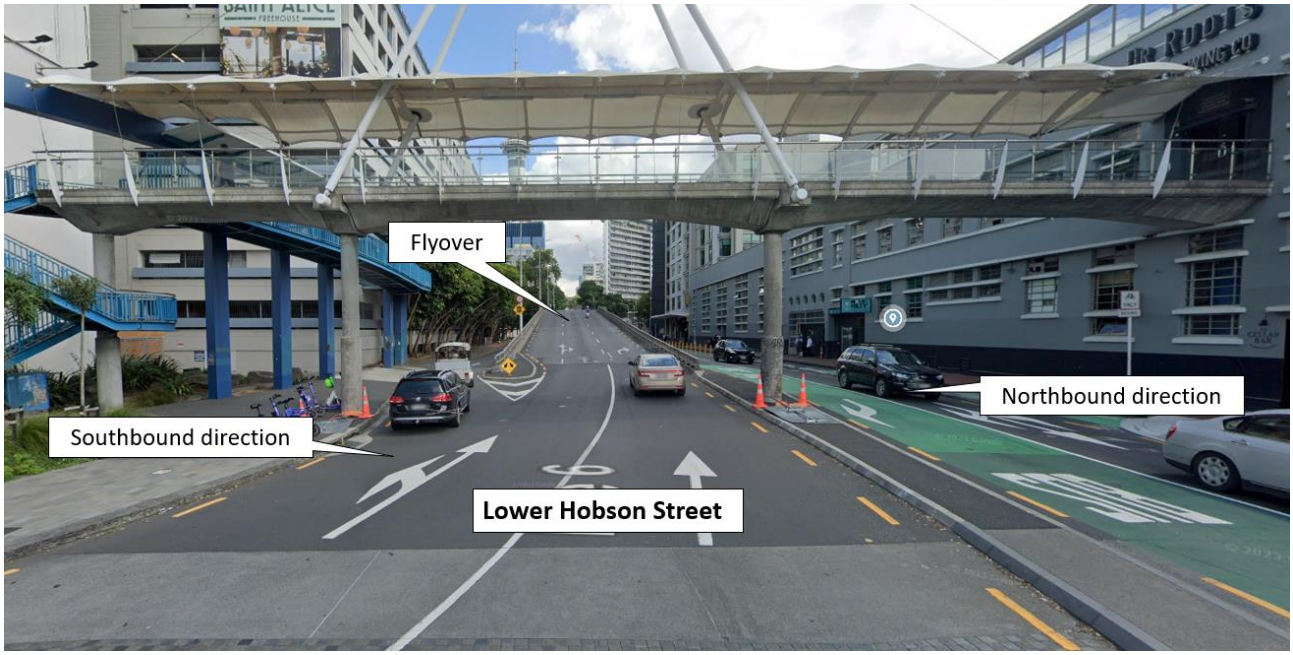


- Quay Street has 4 lanes in total in the vicinity of the Site. This consists of one general traffic lane in each direction and bus lanes in each direction
- Dedicated cycle lanes are provided on the northern side of Quay Street on the opposite side of Quay Street from the Site
- Wide footpaths are provided on each side
- Bus stops are provided on the south side, east of the service lane access
- The service lane highlighted in the figure provides access to existing HSBC and AON buildings.

6.3.3 Lower Hobson Street

The existing layout of Lower Hobson Street in the vicinity of the Site is shown in Figure 6.

Figure 6: Lower Hobson Street layout near the Site (looking south)



- Lower Hobson Street is split into 3 distinct sections. This includes the flyover and northbound and southbound sections
- The flyover provides a connection from Quay Street to Hobson Street, which provides access to SH1 further to the south. The flyover initially has 2 lanes, which increases to 3 and then 4 lanes on the approach to the Fanshawe Street intersection
- The southbound direction section is located directly adjacent to the Site. It includes 1 to 2 traffic lanes and a footpath on the east side
- The northbound direction section has 1 general traffic lane and 1 bus lane. Bi-directional protected cycle lanes and footpaths are provided on the west side of the street.

6.3.4 Customs Street West

The existing layout of Customs Street West in the vicinity of the Site is shown in Figure 7.

Figure 7: Customs Street West layout near the Site (looking west)

- The section of Customs Street West fronting the Site operates in a one-way eastbound direction. It includes 2 general traffic lanes and a bus lane
- Footpaths are provided on the north side only
- Bus stops are provided east of the service lane access
- The Downtown Carpark has two primary access and egress points.
    - Vehicle crossings along the road frontage on ground level, with separate crossings accommodating inbound and outbound vehicle movements
    - An overhead ramp towards Fanshawe Street, accommodating outbound movements only.

6.3.5 Fanshawe Street

The existing layout of Fanshawe Street is shown in Figure 8.

Figure 8: Fanshawe Street layout near the Site (looking west)

- The section of Customs Street West fronting the Site operates in a one-way westbound direction. It includes 3 general traffic lanes and 1 bus lane
- The Downtown Carpark has an exit onto Fanshawe Street, which forms a signalised intersection.
- Footpaths are provided on both sides. We note that the footpath on the north side is narrow and does not provide a proper connection between the Downtown Carpark exit and Albert Street to the east. Pedestrians can cross at the signalised intersection of Fanshawe Street / Hobson Street.

6.4 The existing Site

The Site currently accommodates the Auckland Transport Downtown Carpark.

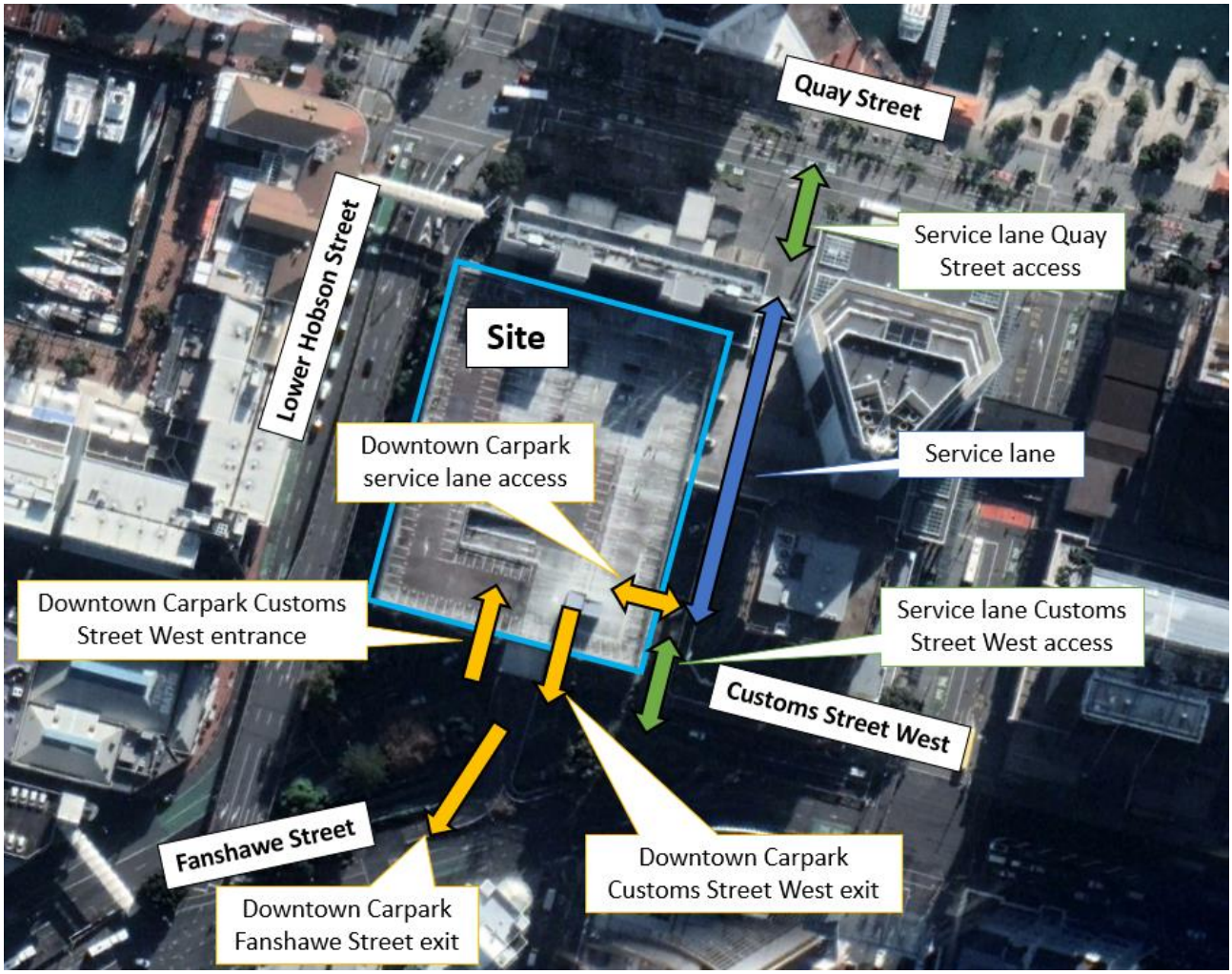
It provides 1,944 parking spaces, which are generally available to the public. There is a mix between short-term public use and long-term leased spaces.

6.4.1 Existing vehicle access

A map of the existing vehicle access points serving the Site is shown in Figure 9, overleaf. The following access points are provided.

- Downtown Carpark entry and exit vehicle crossings onto Customs Street West
- Downtown Carpark exit onto Fanshawe Street. The exit forms a signalised intersection with Fanshawe Street
- A service lane between Quay Street and Customs Street West serves the adjacent activities, including the M Social, HSBC and AON buildings. The service lane generally accommodates two-way movement
- The Downtown Carpark building has an existing access onto the service lane. This particular access point is controlled by a roller door and is not used as an access point by the public.

Figure 9: Existing vehicle access



6.4.2 The service lane's layout

Photos of the existing layout of the service lane are shown in Figure 10 and Figure 11. A plan view layout of the service lane is shown in Figure 12.

The existing service lane includes the following features.

- The service lane serves the adjacent activities, including the M Social, HSBC and AON buildings
- The service lane is wide enough to accommodate two-way vehicle movement at some locations, but there are pinch points at other locations where it is narrower and can only accommodate one-way vehicle movement
- On the eastern side of the service lane, there are multiple vehicle entrances into the AON and HSBC parking areas, and 2 areas for truck loading
- A painted pedestrian pathway is provided on the west side of the service lane
- There are vertical height restrictions of 3.6 m at the north end of the service lane due to existing overhead structures
- While the service lane is private, it can, and is, be used by vehicles as a through route between Customs Street West and Quay Street.

Figure 10: Service lane layout, looking south on Quay Street

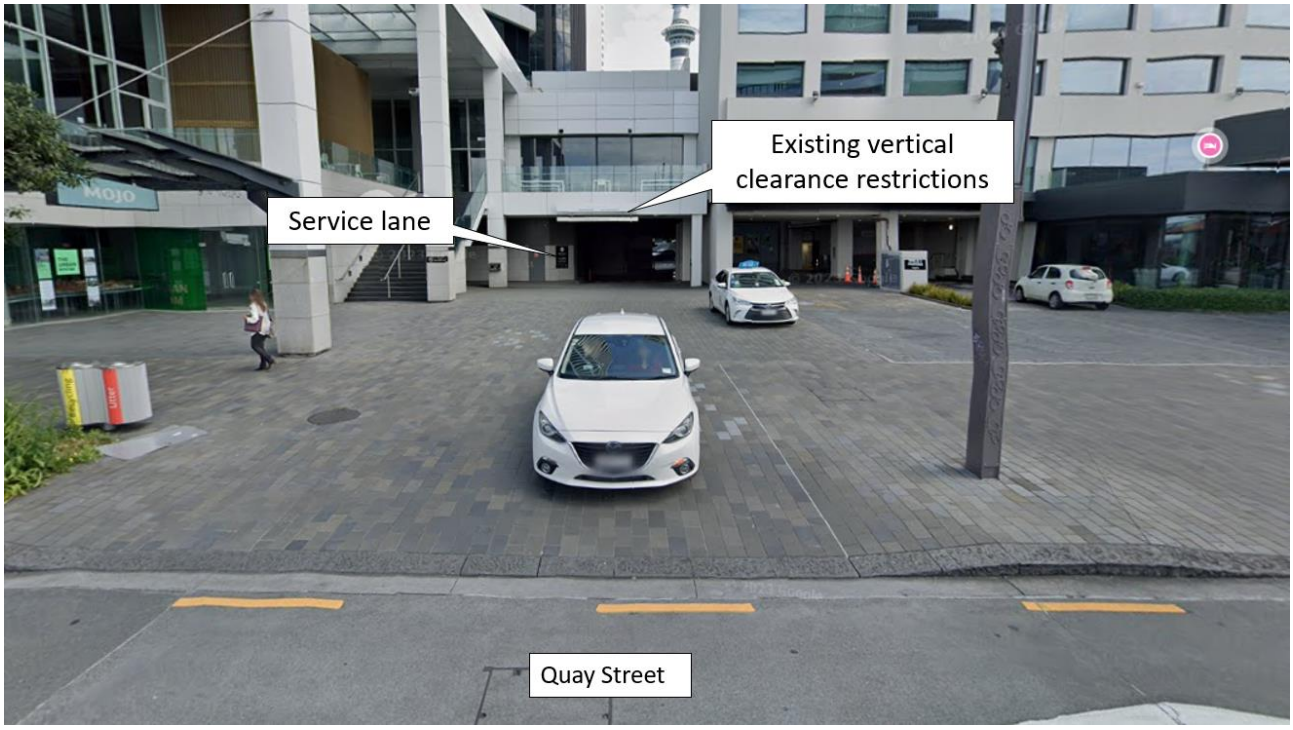
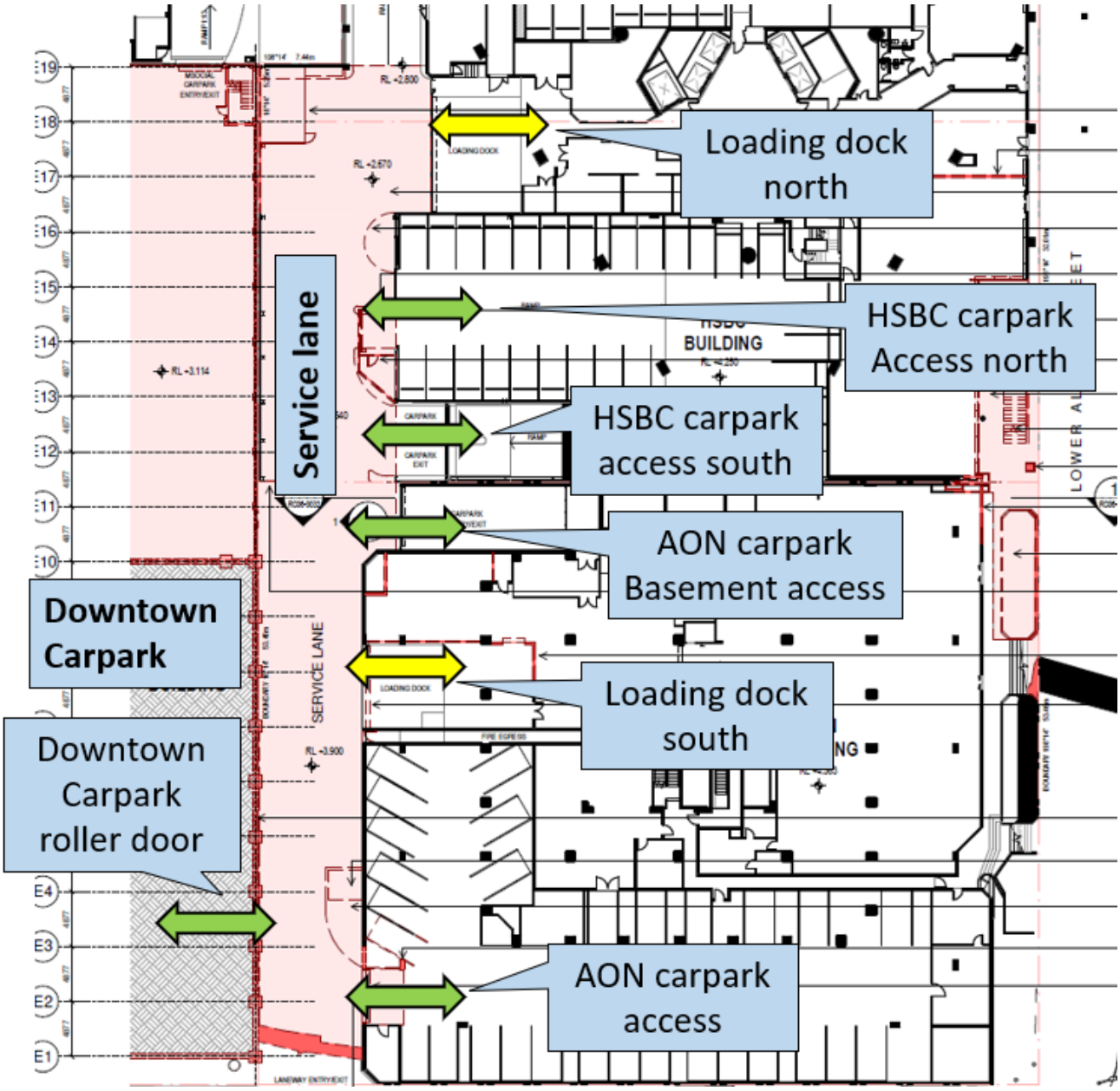


Figure 11: Service lane layout, looking north on Customs Street West

Figure 12: Layout of existing accesses on the service lane



6.4.3 Existing Downtown Carpark parking utilisation and traffic volumes

Auckland Transport has provided us with the following information about the existing utilisation of the Downtown Carpark.

- Figure 13 shows the daily inbound and outbound traffic volumes for the week of 1 – 7 May 2023
- During weekday peak hours, the average Downtown Carpark volumes from Tuesday to Thursday 2 – 4 May 2023 were approximately 300 vehicles per hour in the morning ("**AM"**) peak (7 – 8 am) and 380 vehicles per hour in the evening ("**PM"**) peak (5 – 6 pm)
- Based on data from April 2022 to April 2023, the average, casual occupancy of parking spaces ranges from approximately 40 – 60 %.

Figure 13: Downtown Carpark daily traffic volumes, 1 – 7 May 2023 (provided by Auckland Transport)

DTCP - Entry and Exits: Week 1 – May 2023

Date	Day	In total	Out Total
1/05/2023	Monday	1821	1825
2/05/2023	Tuesday	2184	2170
3/05/2023	Wednesday	2501	2466
4/05/2023	Thursday	2588	2577
5/05/2023	Friday	2547	2370
6/05/2023	Saturday	2833	2659
7/05/2023	Sunday	1919	2255

6.4.4 Existing service lane traffic volumes

We undertook traffic surveys of the use of the service lane and surrounding intersections on Tuesday, 30 May 2023, during the morning and evening peak periods. Table 3 and Table 4 show the resulting peak hour volumes of the service lane.

Table 3: Service lane AM peak hour traffic volumes, 7 – 8 am, 30 May 2023

Service lane access	In vehicle trips			Out vehicle trips			Total
	Left	Right	Total	Left	Right	Total	
Quay Street	38	2	40	42	13	55	**95**
Customs Street West	135	n/a	135	6	n/a	6	**141**
Total	**173**	**2**	**175**	**48**	**13**	**61**	**236**

Table 4: Service lane PM peak hour traffic volumes, 5– 6 pm, 30 May 2023

Service lane access	In vehicle trips			Out vehicle trips			Total
	Left	Right	Total	Left	Right	Total	
Quay Street	8	1	9	87	76	163	**172**
Customs Street West	92	n/a	92	5	n/a	5	**97**
Total	**100**	**1**	**101**	**92**	**76**	**168**	**269**

The results show that:

- during the AM and the PM peak hours, the Customs Street West access is primarily used as an inbound access for vehicles, with low volumes of outbound movements

- the Quay Street access has a similar amount of inbound and outbound movements in the AM peak period. During the PM peak period, the majority of exiting vehicles use the Quay Street access to exit both left and right onto Quay Street. There were almost no right in turning movements at the Quay Street access during both peak hours as vehicles arriving from the west and wanting to access the service lane can rather turn left into the service lane from Customs Street West.

Existing service vehicle volumes using the service lane are provided in Table 5 below. This data was obtained from the Mobile Dock system for the week of 14 to 20 October 2024.

Table 5: Existing service vehicle volumes on the service lane

	Monday 14/10/2024	Tuesday 15/10/2024	Wednesday 16/10/2024	Thursday 17/10/2024	Friday 18/10/2024	Weekday average
Total servicing vehicles per day	24	7	6	6	7	**10**
Total servicing vehicle movements per day	48	14	12	12	14	**20**
AM peak hour vehicle movements	6	0	2	0	0	**2**
PM Peak hour vehicle movements	4	2	0	1	1	**2**

These servicing demand results show that

- on average, there are 10 servicing vehicles per day during weekdays. The highest daily demand was 24 servicing vehicles per day which occurred on a Monday
- the daily vehicle movements are twice the number of vehicle trips, accounting for inbound and outbound trips
- the average number of vehicle movements during weekday peak hours is low at 2 movements per hour. The highest peak hour service volumes were 6 movements per hour, occurring on a Monday
- While not shown in the table above, no servicing volumes occurred during the weekend
- We consider that these existing servicing volumes are very low.

6.5 Crashes that have occurred near the Site

We have undertaken a search of crash records in the subject site using the New Zealand Transport Agency's (NZTA) Crash Analysis System (CAS). The searches cover a five-year period from 2019 to 2023, and crashes in 2024 till date.

We have assessed each recorded crash, injury severity level (i.e., non-injury, minor, serious, and fatal) and other factors such as crash year, weather conditions and road conditions within the following areas:

- Quay Street service lane access

- Customs Street West service lane access
- Downtown Carpark accesses onto Customs Street West and Fanshawe Street (which will both be removed).

We have considered an area with a 50 m radius on all the accesses mentioned above for the crash search history. The extent of our crash search is shown in Figure 14 below with the crash numbers recorded in each year shown in Table 6.

Figure 14: Crash locations, type and severity of crash

Table 6: Number of crashes by area

Section of Crash	Fatal	Serious	Minor	Non-injury	Total
Service Lane access at Custom Street West	0	0	0	3	**3**
Service Lane access at Quay Street	0	0	0	6	**6**
Downtown car park access at Fanshawe Street	0	0	0	3	**3**
Downtown car park access at Custom Street West	0	0	2	0	**2**
Others	0	0	3	7	**8**
Total	**0**	**0**	**5**	**17**	**22**

Of the 22 crashes that were recorded to have occurred, there were no serious or fatal injury crashes, with 5 minor and 17 non-injury crashes reported.

- 6 crashes occurred at the service lane access on Quay Street, all of them being non-injury crashes. All crashes were due to a combination of drivers losing control while turning, colliding with another vehicle from behind or while merging, and crashing while a vehicle making a U-turn. We note that none of these crashes directly involved turning in and out of the service lane, and no crashes involved pedestrians
- 3 crashes occurred at the service lane access at Customs Street, all of them being non-injury crashes. These crashes involved lane changing and overtaking another vehicle. None of these crashes directly involved turning in and out of the service lane, and no crashes involved pedestrians
- 2 crashes were recorded at the Downtown Carpark access on Custom Street West, both were minor injury crashes. Both of these 2 minor crashes were due to a driver failing to notice a pedestrian crossing while turning into the Downtown Carpark
- 3 non-injury crashes were recorded at the Downtown Carpark access on Fanshawe Street
    - 2 of the crashes were due to a vehicle jumping the red signal and colliding with another vehicle coming out of the Downtown Carpark
    - 1 crash resulted from a crash at the Fanshawe Street and Hobson Street intersection, which extended back towards the Downtown Carpark access.
- There were 8 crashes recorded which were outside our assessment area, including crashes on Hobson Street and at the intersection of Hobson Street and Fanshawe Street (3 were minor injury crashes and 5 non-injury crashes)
- As mentioned previously, no crashes were recorded as a result of vehicles entering/exiting the service lane from Quay Street and Customs Street West.

7 HOW THE SITE IS ACCESSED BY DIFFERENT TRANSPORT MODES

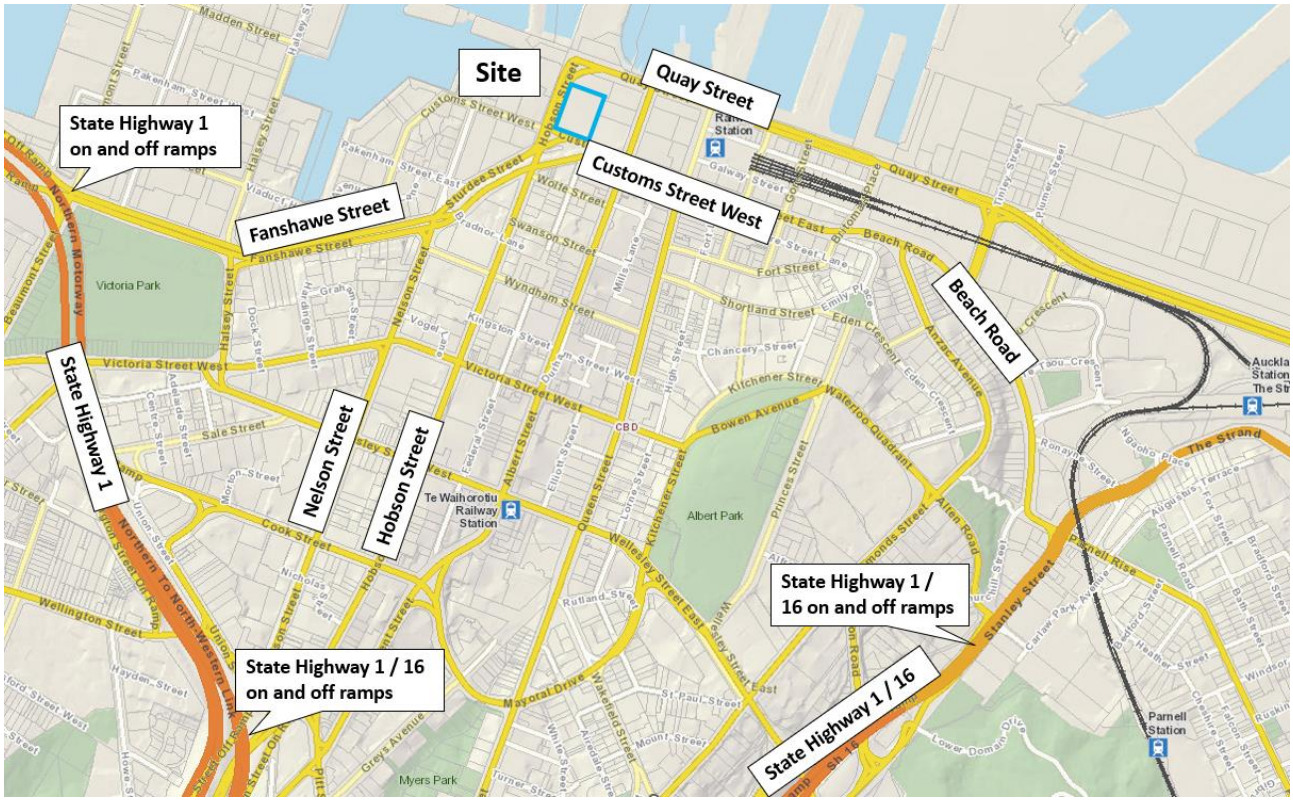
7.1 The Site's private vehicle accessibility

As shown in Figure 15, the Site is well located for accessibility to the road network.

- Access to the State Highway (SH) network is available at several locations
  - SH1 to the west near Fanshawe Street
  - SH1 and SH16 to the south via Hobson Street and Nelson Street
  - SH1 and SH16 to the southeast via Beach Road and Stanley Street.
- Access to the arterial road network is available immediately through Quay Street and Customs Street West. There are other arterial roads near the Site in the City Centre, including Fanshawe Street, Hobson Street and Nelson Street.

This provides the Site with very good access to the wider network.

Figure 15: Site location in the strategic transport network

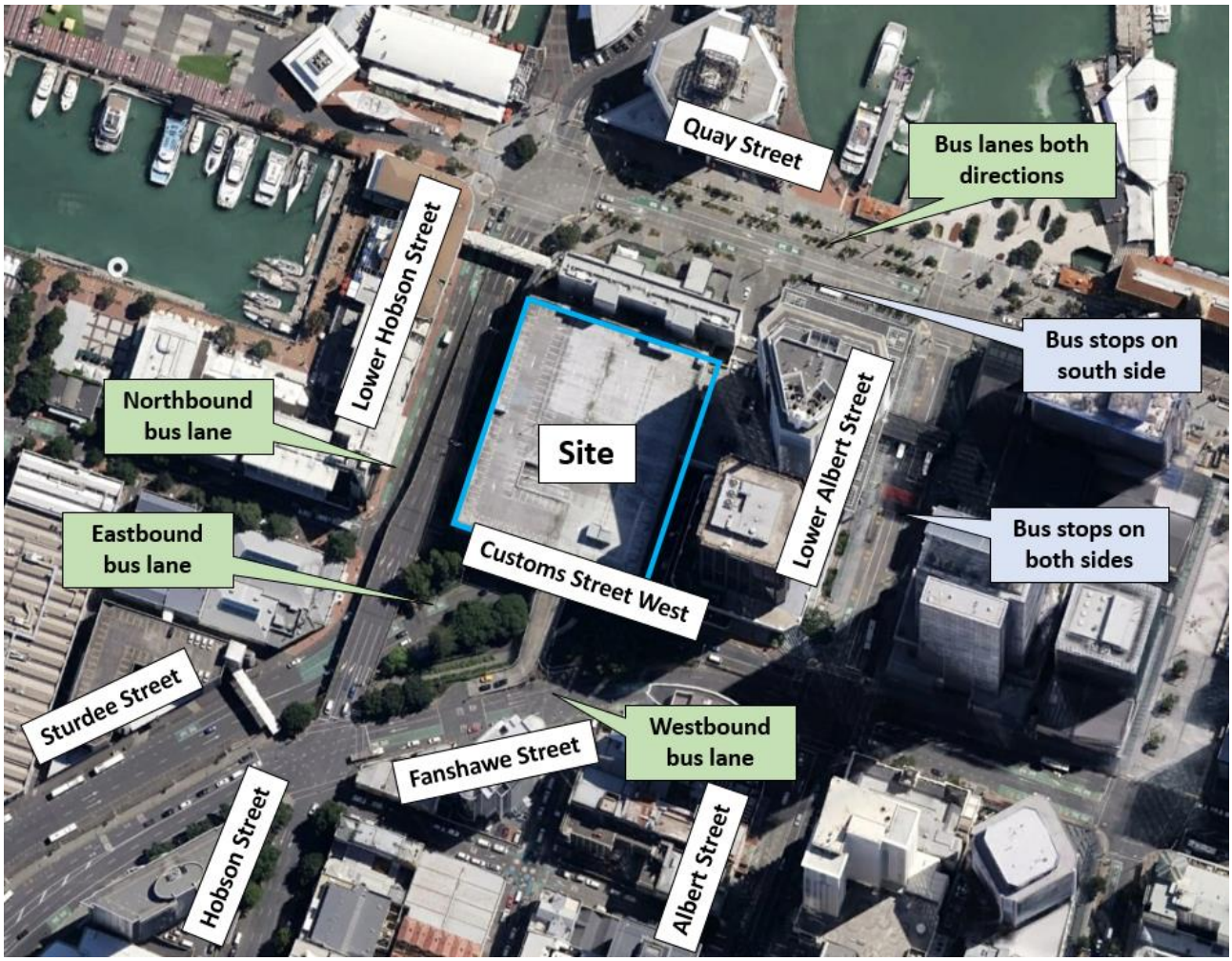


7.2 Site's accessibility for public transport users

7.2.1 Bus facilities near the Site

A map of the existing bus facilities in the area surrounding the Site is shown in Figure 16.

Figure 16: Bus facilities in the surrounding area



For the area surrounding the Site, the following public transport facilities are provided:

- bus lanes on
  - Lower Hobson Street, northbound direction
  - Quay Street, both directions
  - Lower Albert Street, both directions
  - Customs Street West, eastbound direction
  - Fanshawe Street, westbound direction.
- bus stops on
  - Quay Street, south side
  - Lower Albert Street, both sides.

The following bus routes travel on the roads surrounding the Site.

- The Quay Street bus stops serve the 95 and 97 routes to the North Shore. Buses on this route turn left onto the Lower Hobson Street flyover and then right onto Fanshawe Street
- The northbound bus stops on Lower Albert Street serves the NX1 route. Buses on this route left onto Quay Street, then left onto the Lower Hobson Street flyover and then right onto Fanshawe Street
- The southbound bus stops on Lower Albert Street serve the 11, 105, 106, WX1, 18, 195 and 209 routes. These all travel directly south onto Albert Street
- A number of bus routes travel across the Site frontage on Customs Street West, including the City Link, Inner Link, 95, 97, 931, 933, and 939 routes.

7.2.2 Public transport connectivity

With the Site being located some 250 m from the Britomart Transport Centre, the Site has excellent public transport accessibility.

In particular, the Site has access to the following public transport facilities.

- The Britomart train station has frequent trains running along the Eastern, Western, Southern and Onehunga Lines. Accessibility via train will be further improved to other parts of Auckland City once the City Rail Link is currently scheduled to be completed in November 2025. The Site will also be approximately 600 m walking distance from Aotea Station (via the Victoria Street entrance) once the City Rail Link is complete, providing good access from two train stations
- The Downtown ferry terminal connects Auckland City with suburbs on the North Shore and in west and east Auckland, and the islands of the Hauraki Gulf. It is located within 200 m of the Site, on the opposite side of Quay Street
- Many bus services are accessible in the immediate area surrounding the Site, as outlined in Table 7. Lower Albert Street is a bus interchange, and as outlined above, there are other bus stops located on Quay Street and Customs Street West.

Table 7: Existing bus routes near the Site

Route	Route Description	Frequency	Nearest bus stop
NX1	Hibiscus Coast to City (via Northern Busway)	At least every 6-10 minutes at peak times. At least every 30 minutes at other times.	Lower Albert Street
City Link	Karangahape Rd, Queen St, Wynyard Quarter	At least every 15 minutes, 7 am – 7 pm, 7 days a week. Frequencies may be lower in the early mornings and evenings	Queen Street or Fanshawe Street
105	Westmere to City	At least every 30 minutes, 7 am – 7 pm, 7 days a week	Customs Street West

Table 7: Existing bus routes near the Site

Route	Route Description	Frequency	Nearest bus stop
106	City, Freemans Bay, Karangahape Rd, City (one-way loop)	At least every 30 minutes, 7 am – 7 pm, 7 days a week	Customs Street West
95B / 95C	City to Glenfield	At least every 30 minutes, 7 am – 7 pm, 7 days a week	Quay Street
97B / 97R	City to Birkdale / Beach Haven	At least every 30 minutes, 7 am – 7 pm, 7 days a week	Quay Street

7.3 The Site's accessibility for pedestrians and cyclists

The following facilities are provided for pedestrians in the surrounding area.

- Footpath widths typically exceed 1.8 m
- All roads generally have footpaths on both sides. One exception is Customs Street West, immediately southeast of the Site, which only has a footpath on the north side
- Most intersections in the City Centre are signalised, which provides signalised crossing points for pedestrians. Intersections in the surrounding area include Quay Street / Lower Hobson Street, Quay Street / Lower Albert Street, Lower Albert Street / Customs Street West, and Customs Street West / Lower Hobson Street.

Figure 17 shows the existing cycle network in the City Centre area, including the following facilities.

- Dedicated cycleways are provided on Quay Street, connecting Tamaki Drive to the east of the Site. Some sections of Quay Street have protected cycleways instead of fully dedicated cycleways.
- Protected cycleways are provided on several roads in the surrounding area, including Lower Hobson Street and Nelson Street
- The Light Path quiet route is generally a fully off-road cycle route, which provides a connection to West Auckland. This can be accessed at the southern end of Nelson Street. A cyclist from the Site can access the Light Path through routes containing protected cycleways
- The City Centre network contains other shared paths and quiet routes for cyclists. Routes are available through Wynyard Quarter and the harbour to the west.

In summary, we consider the Site has a very high level of accessibility for pedestrians and cyclists. The pedestrian and cycle facilities will support people who undertake multi-modal trips, such as walking combined with public transport.

Figure 17: Cycle network in the vicinity of the Site

8 HOW PEOPLE AND VEHICLES WILL ACCESS THE DEVELOPMENT

8.1 Vehicle access provision

As previously mentioned, and as shown in Figure 18, vehicle access to the Development will be provided via the private service lane extending between Customs Street West and Quay Street.

- Separate access to the basement parking and servicing area is taken from the service lane
- Due to vertical clearance constraints and as explained further in Section 9.4.2, heavy vehicle movements will only be able to access the Development via Quay Street.

Figure 18: The Development's vehicle access provision

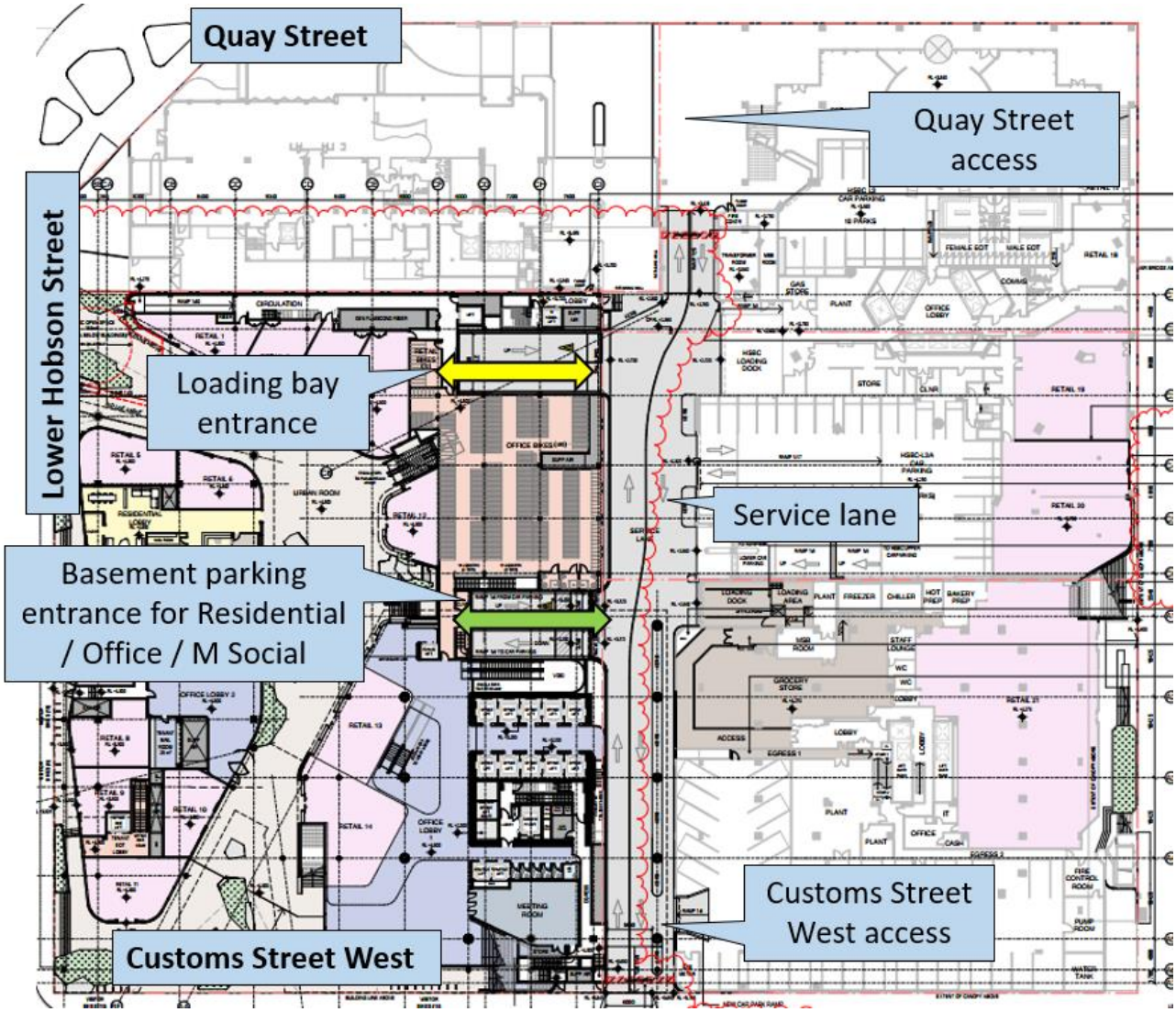
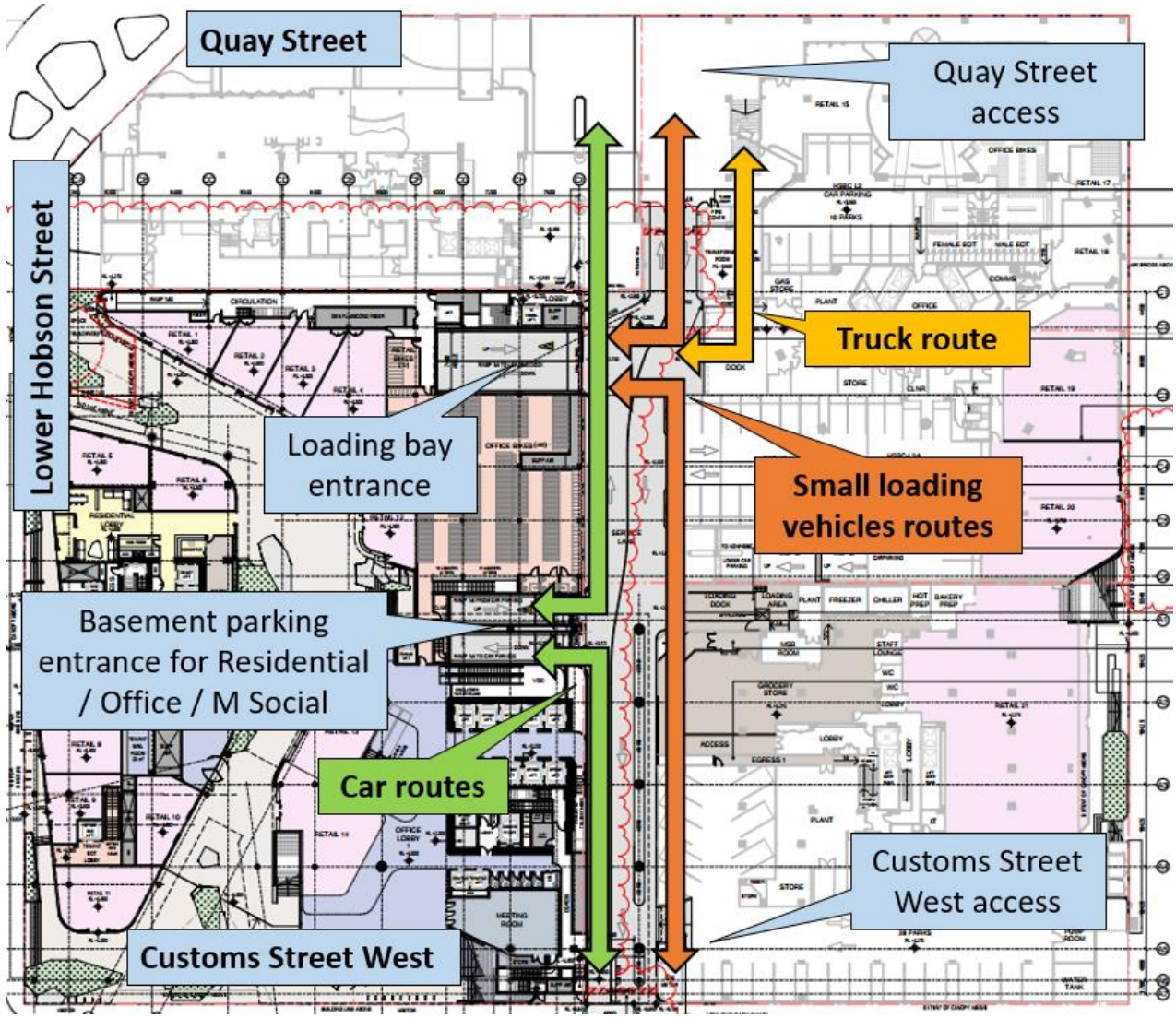


Figure 19 shows the access routes for different vehicle types.

- Cars will be able to use either access at Quay Street or Customs Street West
- Small loading vehicles such as vans will also be able to use either access at Quay Street or Customs Street West

- Trucks will be required to use the Quay Street access only due to vertical clearance constraints due to the design on the podium level above at the Customs Street West end of the service lane.

Figure 19: Access routes for different vehicle types



8.2 Vehicle access assessment

The Unitary Plan specifies the following design rules relating to the Development's vehicle access:

- Vehicle crossings in Centres serving 10 or more parking spaces and providing for two-way traffic movements, need to be 5.5 – 6.0 m wide, measured at the property (Standard E27.6.4.2(2) and Table E27.6.4.3.2)
- Vehicle accessways in Centres serving 10 or more parking spaces providing for two-way movements need to have a minimum formed width of 5.5 m and 1.5 m pedestrian access for rear sites (Standard E27.6.4.3(1) and Table E27.6.4.3.2).

8.2.1 Customs Street West vehicle crossing assessment

The Customs Street West vehicle crossing will be in a similar location to the existing service lane crossing and there will be some minor changes to the design of the crossing.

- The 6.0 m width of the vehicle crossing at the property boundary accommodates two-way vehicle movement and complies with the Unitary Plan design requirements. Vehicle tracking in Appendix E shows that 2 cars or vans can enter and exit the access at the same time
- There are effectively no modifications to existing sightlines from this crossing compared to the existing situation. Drivers of exiting vehicles have excellent visibility looking west along Customs Street West. Once the existing Downtown Carpark is removed, there is likely to be improved visibility with the removal of the ramp to Fanshawe Street and the removal of the existing Downtown Carpark vehicle crossings on Customs Street West
- Customs Street West is classified as an arterial road, meaning Vehicle Access Restrictions apply in the Unitary Plan (Standard E27.6.4.1(2) and (3)).

8.2.2 Quay Street vehicle crossing assessment

No modifications are anticipated to the existing and consented Quay Street vehicle crossing.

- The width of the vehicle crossing at the property boundary is not clearly defined, as this section of Quay Street is designed as a slow-speed shared environment with pedestrians. Given there is no change to the existing crossing's design or location, and that the crash records show there are no safety concerns associated with the design and operation of this crossing, we consider that the crossing is acceptable to cater for access to the Development
- There are no changes to existing sightlines compared to the existing situation. Drivers of exiting vehicles have excellent visibility looking west towards Lower Hobson Street and east towards Lower Albert Street
- Quay Street is classified as an arterial road. Furthermore, this section of Quay Street is subject to Vehicle Access Restrictions – General Control. Use of an existing crossing with a General Control triggers Vehicle Access Restrictions in the Unitary Plan (Standard E27.6.4.1(1)).

In summary, vehicle access restrictions apply to both vehicle crossings as Customs Street West and Quay Street are both classified as arterial roads in the Unitary Plan, and Quay Street is subject to Vehicle Access Restrictions – General Control. Use of both accesses is a Restricted Discretionary Activity as outlined in Table E27.4.1 (A5) and (A6).

Please refer to Appendix A for our assessment against the Unitary Plan Restricted Discretionary Activity assessment criteria.

Taking into account our traffic effects assessments of the Development provided in Section 10, which assesses the traffic demands resulting from the Development through these accesses, we believe the proposed vehicle accesses can operate efficiently and safely.

We also note that the number and design of the Site's vehicle access will have positive transport effects compared to the existing situation, as all access and vehicle crossings associated with the existing Downtown Carpark will be removed.

- The removal of the existing crossings on Customs Street West into the Downtown Carpark will provide a safer environment for pedestrians, noting that these are the only locations where pedestrian crashes have been recorded to have occurred over the past 5 years

- The removal of the signalised access associated with the Downtown Carpark's egress into Fanshawe Street results in improved efficiencies for cars and buses on Fanshawe Street travelling westbound.

8.2.3 Service lane assessment

The service lane will be modified to provide a continuous width of at least 5.85 m. This accommodates two-way vehicle movement and meets the minimum Unitary Plan requirement of a 5.5 m formed access width (Standard E27.6.4.3(1) and Table E27.6.4.3.2).

The layout of the service lane accommodates two-way car movement, as shown in Appendix E.

The proposed layout of the service lane will contain a 1.5 m wide separated footpath along the eastern side. While this is not intended to accommodate a high number of pedestrians, people walking will be able to use this if needed and be separated from vehicles. This will be a safer facility compared to the existing painted pathway (shown previously in Figure 11). Section 8.3 provides further information on how pedestrians will be able to access the Site and basement levels from areas other than the service lane and why pedestrians will be unlikely to use the service lane as a main route.

8.2.4 Changes to existing parking and loading on the service lane

Due to design changes in the service lane, 'loading dock south' shown in previous Figure 12 needs to be relocated. Sheet 5 of Appendix E shows 8.3 m truck tracking of the relocated loading dock position. While the truck needs to use the full width of the service lane to reverse into the loading dock, this is the same as the existing arrangement.

The area used for the relocated 'loading dock south' is currently used as an access into the AON basement carpark. To retain access to the AON basement, the HSBC carpark access south shown in Figure 12 will be used from the service lane. As shown in the plans for B01, a new opening will be provided in the wall to connect the AON basement and the HSBC carpark.

8.3 Access for pedestrians and cyclists

The Development will contain the following access provisions for pedestrians and cyclists:

- On Level 00, the Customs Street West and Lower Hobson Street frontages will integrate with the public footpaths to pedestrians and cyclists to enter the Site. These areas will be accessible to the public. This provides connections to the activities, lobby areas and bicycle parking trips on the ground floor
- Lifts and stairs are provided on the ground floor to provide connectivity to other levels. Car parking and bicycle parking on basement levels will be accessed through these areas
- Level 01 provides internal public circulation from the Site to the AON and HSBC buildings. These circulation areas provide direct connections to Quay Street and Lower Albert Street
- Figure 20 and Figure 21 show that the Development will provide very good pedestrian and cycle connectivity in the east-west and north-south directions respectively.

While it is intended that most pedestrians will use the separated pedestrian and cyclist areas outlined above, the service lane will be upgraded to have improved pedestrian facilities. As shown previously in Figure 11, there is a painted pedestrian pathway along the west side of the service lane. The proposed layout of the service lane will contain a 1.5 m wide separated footpath along the east side. While this is not intended to accommodate a high number of pedestrians, people walking will be able to use this if needed and be separated from vehicles. This will be a safer facility compared to the existing painted pathway. We note that while these pedestrian facilities on the service lane will be improved, they are not intended to be used as a pedestrian access route to access the proposed basement parking or loading areas.

In summary, we consider the Development will have very good connectivity for pedestrians and cyclists.

Figure 20: Proposed east-west pedestrian and cyclist connectivity (drawing by Warren and Mahoney)

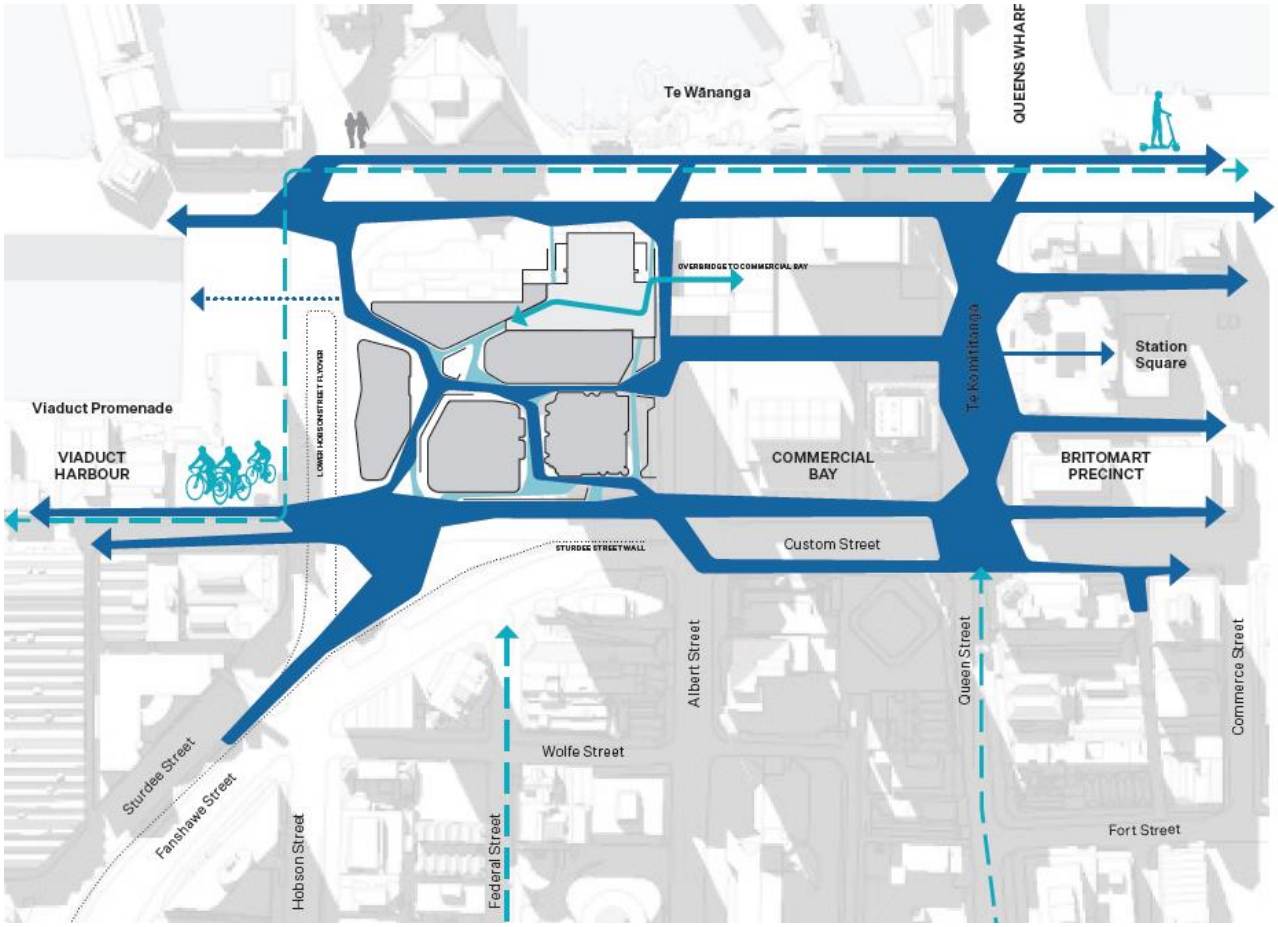
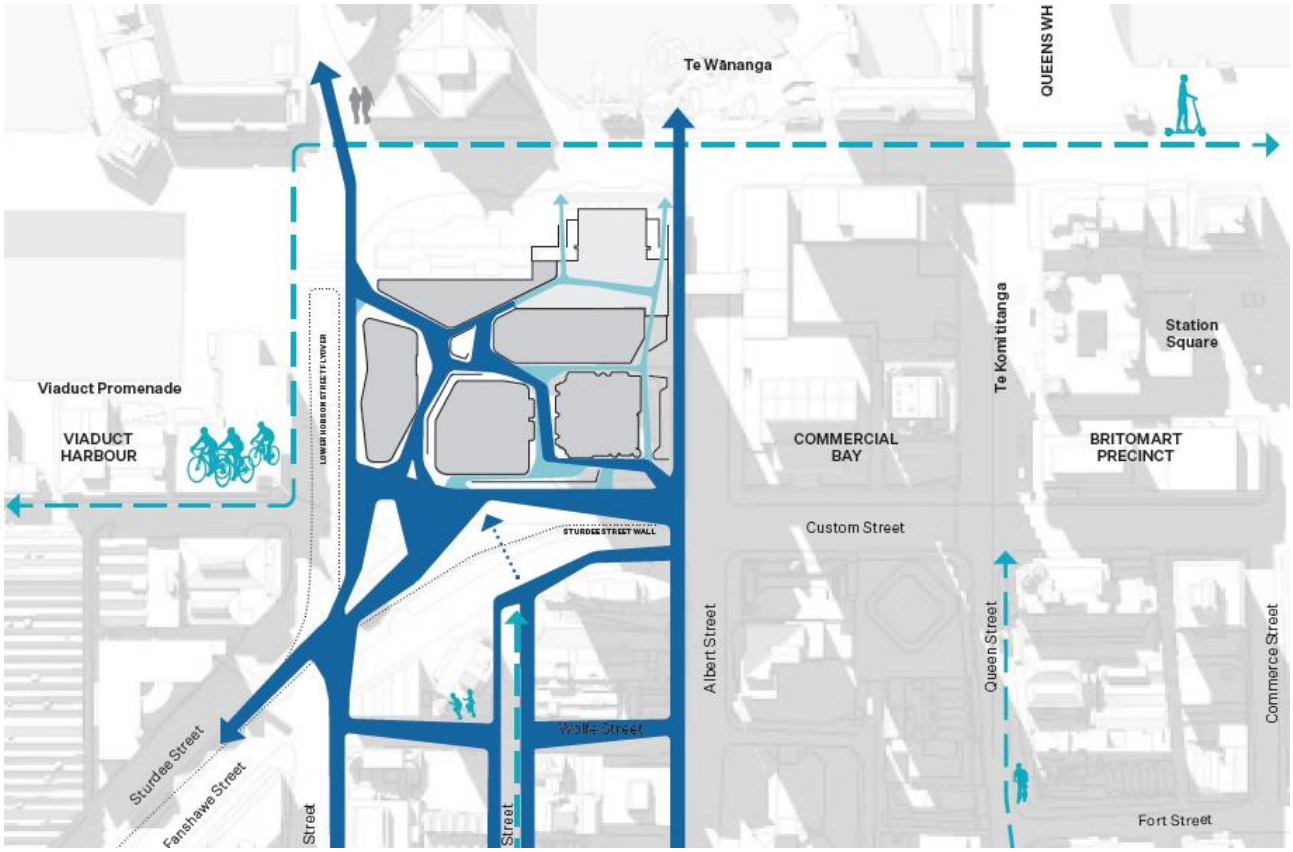


Figure 21: Proposed north-south pedestrian and cyclist connectivity (drawing by Warren and Mahoney)



9 THE DEVELOPMENT'S PARKING AND SERVICING FACILITIES

9.1 Parking for cars

9.1.1 Unitary Plan maximum car parking requirement

For activities in the Business–City Centre zone, the Unitary Plan (Standard E27.6.2(1) and Table E27.6.2.1) specifies maximum parking provision rates of

- Dwellings <75m^2 GFA, maximum of 0.7 per dwelling
- Dwellings ≥75 and < 90m^2 GFA, maximum of 1.4 per dwelling
- Dwellings ≥90m^2 GFA, maximum of 1.7 per dwelling
- Dwellings – visitor spaces, maximum of 0.2 per dwelling
- All other activities, 1 per 200m^2 GFA.

The maximum number of parking spaces permitted by the Unitary Plan for the Development is 808 spaces, as shown in Table 8 below.

Table 8: Unitary Plan car parking requirement assessment

Activities	Size	Maximum parking rates	Maximum parking spaces
Dwellings under 75m^2	61 units	0.7 per dwelling	42.7
Dwellings between 75 m^2 and 90m^2	23 units	1.4 per dwelling	32.2
Dwellings greater than 90m^2	163 units	1.7 per dwelling	277.1
Dwellings – Visitor parking	247 units	0.2 per dwelling	49.4
All other activities (non-residential)	81,237 m^2 GFA	1 per 200m^2 GFA	406.2
Sub-total – residential dwellings, resident parking			**401 (401.4)**
Total permitted			**808 (807.6)**

9.1.2 Number of car parking spaces to be provided and assessment

A total of 540 parking spaces will be provided over multiple basement levels. Plans of each of these basement levels are shown in Appendix C.

Parking will be allocated as follows.

- 121 spaces will be allocated to the adjacent M Social site and are off-site parking spaces
- 247 spaces for residents
- 150 spaces for offices
- 1 carwash space for residential use
- 10 facility management spaces
- 11 drop-off spaces.

As such, the Development complies with the maximum Unitary Plan requirements.

We note that the 121 spaces allocated to M Social are not part of the maximum parking requirements as this is classified as off-site parking. This is discussed in Section 9.1.4 below. We also note that even if the 121 M Social spaces were included, the total number of parking spaces at 540 spaces, is still well less than the maximum number of 808 parking spaces permitted under the Unitary Plan.

9.1.3 Accessible car parking provision and assessment

We have assessed the accessible parking requirements based on the standards before and after PC79 was introduced.

Pre – PC79 assessment

The pre-PC79 version of the Unitary Plan (note provided within E27.6.2) specifies that accessible parking is provided in accordance with "New Zealand Building Code D1/AS1 New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001)". These standards specify the following for the number of accessible parking spaces required, based on the total number of parking spaces required:

- 1 – 20 parking spaces: No less than 1 accessible parking space is required
- 21 – 50 parking spaces: No less than 2 accessible parking spaces are required
- Every additional 50 spaces: No less than 1 additional accessible parking space is required.

These accessible parking requirements apply to non-residential activities and based on the provision of 292 spaces for non-residential parking, 7 accessible spaces are required.

There are 24 accessible spaces, which exceeds this requirement. These are provided throughout levels B05 to B01.

We note that if residential parking was included in the above accessible parking calculation (540 spaces total), then 12 accessible spaces would be required. With a provision of 24 accessible spaces, this requirement is satisfied.

PC79 assessment

The PC79 accessible parking requirements and provisions are as follows. Further detail of the calculations for these requirements are provided in Appendix A.

- Residential
  - Not less than 11 accessible parking spaces are required for the residential activity
  - E27.6.3.2(A) Table 2 specifies not less than 11 accessible spaces are required for 225 to 250 dwellings (247 dwellings are proposed).
- Office
  - Not less than 37 accessible parking spaces are required for the office activity
  - E27.6.3.2(A) Step 1 assessment: The total theoretical parking demand is 1,760 spaces, based on a rate of 1 space per 45 m^2 GFA and a proposed office GFA of 79,204 m^2 GFA

- E27.6.3.2(A) Step 2 assessment: The theoretical demand of 1,760 spaces is higher than the actual provision of 150 parking spaces for the office activity. As outlined in Table 1 of the standards, 1,760 spaces result in a requirement of not less than 37 accessible parking spaces.

- Retail
  - Not less than 3 accessible parking spaces are required for the retail activity
  - E27.6.3.2(A) Step 1: the total theoretical parking demand is 81 spaces, based on a rate of 1 space per 25 m2 GFA and a proposed retail GFA of 2,033 m2 GFA
  - E27.6.3.2(A) Step 2: The theoretical demand of 81 spaces is higher than the actual provision of no parking spaces for the retail activity. As outlined in Table 1 of the standards, 81 spaces result in a requirement of not less than 3 accessible parking spaces.
- Accounting for all activities, not less than 51 accessible parking spaces are required under PC79
- The proposed layout provides 24 accessible parking spaces in total, which does not meet the PC79 minimum requirements

While the allocation of accessible parking spaces will be determined at a later stage, we have assumed that the following allocation for the purposes of assessing the infringement

- Residential: 11 accessible spaces (complies)
- Offices: 13 accessible spaces (does not comply, 37 required)
- Retail: 0 accessible spaces (does not comply, 3 required)

In summary, the accessible parking requirement is satisfied for residential, but not the office or retail activities.

We have provided an assessment against the applicable Plan Change 79 assessment criteria in Appendix A. We consider the shortfall of accessible parking spaces is acceptable because

- No accessible parking is necessary for retail, as no parking spaces will be allocated to the retail activity
- The office activity has a theoretical parking demand of 1,760 spaces, which is significantly higher than the actual provision of 150 office spaces. The "New Zealand Building Code D1/AS1 New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001)" standard assesses accessible parking spaces on the actual provision of parking spaces. Based on 150 spaces, 4 accessible parking spaces would be required. This is achieved with the assumed provision of 13 accessible parking spaces
- The Site has excellent public transport accessibility in the surrounding area (including high frequency bus stops on Quay Street and Lower Albert Street), which will reduce the reliance on private vehicle trips.

Vertical clearances of accessible parking

We note that there will be infringement of the Unitary Plan standard for the required vertical clearances of accessible parking spaces. Refer to Section 9.1.7.

9.1.4 Off-site car parking provision and assessment

The 121 M Social parking spaces are not related to activities within the Development and are considered off-site parking spaces. Off-site parking is classified as a Discretionary activity in the Unitary Plan (Table E27.4.1, (A16)).

These spaces will be used exclusively by the adjacent M Social site, which is located immediately north of the Development. We understand that the use of these off-site parking spaces is an existing arrangement with the Downtown Carpark, and as such, provision needs to be made in the Development.

The same number of spaces will be retained compared to the existing situation. Therefore, there will be no change in traffic effects due to this parking provision.

9.1.5 Car parking space dimensions and manoeuvring assessment

The number of car parking spaces by basement level and type are summarised in Table 9.

The different types of spaces include:

- Accessible: as outlined Section 9.1.3 and designed for the NZS: 4121- 2001 standards
- Facility management: designed as regular user spaces for staff members of the development, which are located within the loading area
- Regular: spaces designed for regular users such as residents and office staff members
- Casual: spaces which could be used by visitors who are not regular users
- Drop-off: drop-off spaces, designed as parallel spaces on level B01
- Carwash: for residential use only, designed as a regular user space
- Tandem: parking spaces in a horizontally stacked configuration, with a second space being located behind the first.

Table 9: Number of car parking spaces by basement level and type

Level	Accessible	Facility management	Regular	Casual	Drop off	Carwash	Tandem	Total
B05	6		133				8	147
B04	6		131				6	143
B03	6		131			1	6	144
B02	2	7	57				3	69
B01	4		26	5	2			37
Total	**24**	**7[10]**	**478**	**5**	**2[11]**	**1**	**23**	**540**

[10] While the site plans show 7 facility management spaces, we have assessed 10 drop-off spaces in this report. The 3 remaining spaces could come from the regular spaces

[11] While the site plans show 2 drop-off spaces, we have assessed 11 drop-off spaces in this report. These 11 drop-off spaces could include the 4 accessible spaces, 5 casual spaces and 2 drop-off spaces on Level B01

Tandem parking spaces could potentially be allocated to either units or office tenancies. This infringes Standard E27.6.3.3(3) which specifies that residential spaces may be stacked (but does not specify offices). While the exact parking allocated has not been determined at this stage, we have assessed this infringement to provide flexibility for the tandem spaces to be allocated to either the residential or office activities. If the spaces are allocated to offices, we consider these can be managed by allocating them to the same office tenancy. As the spaces will be used by regular users and by the same residential unit or office tenancy, use of the tandem spaces can be coordinated and managed appropriately.

Dimensions of all the parking spaces comply with the regular and casual user dimensions specified in the Unitary Plan (Standard E27.6.3.1 and Table E27.6.3.1.1).

- The majority of spaces are intended for regular users such as residents and staff members
- A small number of spaces could potentially be used by visitors for drop-off activities, and are designed based on the casual user standards
- The majority of spaces are 90-degree parking spaces. The exceptions are the parallel drop-off spaces on Level B01
- The Warren and Mahoney architectural drawings show the dimensions of all parking spaces and aisle widths. All spaces are at least 5.0 m long. The width of the spaces is noted within each space (i.e. R2.7 means a regular space with a 2.7 m width, C2.5 means a casual user space with a 2.5 m width).

The layout of the proposed car park spaces and a tracking assessment for an 85th-percentile car are shown in Appendix E. This tracking assessment shows that

- all parking spaces can be satisfactorily accessed
- the aisles, ramp and service lane layout can accommodate two-way car movement.

9.1.6 Parking and access gradients assessment

The Unitary Plan specifies the following maximum requirements for parking and access gradients.

- Vehicle access (Standard E27.6.4.4(1) and Table E27.6.4.4.1)
  - Used by heavy vehicles: 1 in 8 (12.5%)
  - Used by all other activities: 1 in 6 (16.7%).
- Change in gradients of more than 1 in 8 (12.5%) at the summit or 1 in 6.7 (15%) at a sag must include transitions with a minimum length of 2 m (Standard E27.6.4.4(2))
- Vehicle accesses must be designed so that where the access adjoins the road, there is sufficient space onsite for a platform so that vehicles can stop safely and check for pedestrians and other vehicles prior to exiting. For all other activities, a 6 m platform is required with a gradient no steeper than 1 in 20 (5%) (Standard E27.6.4.4(3)
- The gradient of any parking space must not exceed 1 in 20 (5%) for regular parking spaces and 1 in 25 (4%) for accessible parking spaces (Standard E27.6.3.6(3))
- The gradient for manoeuvring areas must not exceed 1 in 8 (12.5%) (Standard E27.6.3.6(4)).

Gradients are provided as follows.

- All parking spaces and manoeuvring areas are contained within the basement and are flat
- The ramps for the car parking areas have a gradient of 1 in 6 (16.7%). Transitions are provided at the top and bottom of these ramps, with a length of 2 m and gradient of 1 in 10 (10%). The change in gradients is within the limits where transitions are required
- The loading bay ramp has a gradient of 1 in 8 (12.5%), which will accommodate heavy vehicles
- The Customs Street West access has a 1 in 20 (5%) platform over a length of 6 m from the property boundary. The Quay Street access will remain unchanged, and has a relatively flat gradient near the property boundary.

As such, all gradients comply with the Unitary Plan standards.

9.1.7 Assessment of car vertical clearances

The Unitary Plan specifies the following minimum vertical clearance requirements as follows (Standard E27.6.3.5)

- 2.1 m where access and/or parking for cars is provided for residential activities
- 2.3 m where access and/or parking for cars is provided for all other activities
- 2.5 m where access and/or accessible parking for people with disabilities is provided
- 3.8 m where loading is required.

Appendix D provides vertical clearance profiles of the parking and access areas, prepared by Warren and Mahoney. These profiles show the following vertical clearances are provided:

- The carpark ramp entrance has a clearance of 2.4 m, and the ramp provides at least 2.3 m of clearance. This meets the Unitary Plan requirements for car access
- The south end of the service lane between Customs Street West and the carpark entrance has a clearance of at least 2.9 m. This meets the Unitary Plan requirements for car access
- While not shown in Appendix D, the parking areas will meet the Unitary Plan vertical clearance requirements for regular car access
- The loading area access and ramp have a clearance of 3.8 m, satisfying the requirements where loading is required
- The vertical clearance of the service lane between the carpark entrance and Quay Street is 3.6 m. This does not meet the Unitary Plan requirements as loading vehicles will require access through this area. We note that this is an existing feature of the service lane, and these vertical clearance restrictions currently apply. Refer to Section 9.4.2 for further discussion.

For accessible parking, we note the following

- The Unitary Plan requires 2.5 m where access and/or accessible parking for people with disabilities is provided. This is not provided for access to the accessible spaces, as areas of the basement provide 2.3 m of vertical clearance
- We have considered 2 design standards for the vertical clearance of accessible parking spaces.
    - NZS 4121:2001 Design for Access and Mobility – Buildings and Associated Facilities

        - Refer to Figure 22 for a diagram of the clearance envelope
        - This specifies 2.5 m of vertical clearance to be maintained from the vehicle entry to the carpark. This reflects the Unitary Plan requirement of 2.5 m vertical clearance for the parking space and access areas, and is not provided
        - The front of the parking space can have a lower vertical clearance for ducting or other purposes
        - The intention of this standard is to provide space for a wheelchair during hoist operations
    - AS/NZS 2890.6:2009 Parking Facilities: Part 6: Off-street Parking for People with Disabilities
        - Refer to Figure 23 for a diagram of the clearance envelope
        - This specifies a minimum vertical clearance of 2.2 m from the vehicle entry to the parking space. This is achieved with the basement design
        - The front of the parking space can have a lower vertical clearance
        - Again, the intention of this standard is to provide space for a wheelchair during hoist operations, but it is assumed the wheelchair will be hoisted on top of the car once it is parked, and not mounted while it is accessing the parking space from the entrance.
- For access areas to the accessible spaces
    - The Unitary Plan and NZS 4121:2001 specify 2.5 m of vertical clearance, whereas AS/NZS 2890.6:2009 specify 2.2 m
    - As 2.3 m is proposed, we consider this is acceptable as it meets the AS/NZS 2890.6:2009 standard
- For the vertical clearance of the accessible parking spaces
    - Refer to Appendix D which provides vertical clearance profiles for all of the accessible parking spaces on each level, based on the NZS 4121:2001 and AS/NZS 2890.6:2009 standards
    - The profiles are provided on all levels, except for Level B03. As shown in Appendix D, the parking spaces on B03 will have a 2.4 m vertical clearance (0.1 m shortfall) over a 0.6 m length due to overhead columns. This will apply under both design standards. This will affect up to 6 accessible parking spaces on Level B03
    - We consider this infringement is acceptable because the accessible spaces on Level B03 will be allocated to regular users (either office staff members or residents), who will be familiar with the clearance limitation. The shortfall applies to a small area. As the regular users will be familiar with the clearance limitation, they will be able to use a suitable wheelchair hoist mechanism.
- In summary, the accessible parking spaces do not provide the required vertical clearance under the Unitary Plan. However, we consider the infringements are acceptable as they design is consistent with accessible parking design standards.

Figure 22: NZS 4121:2001 accessible parking clearance envelope

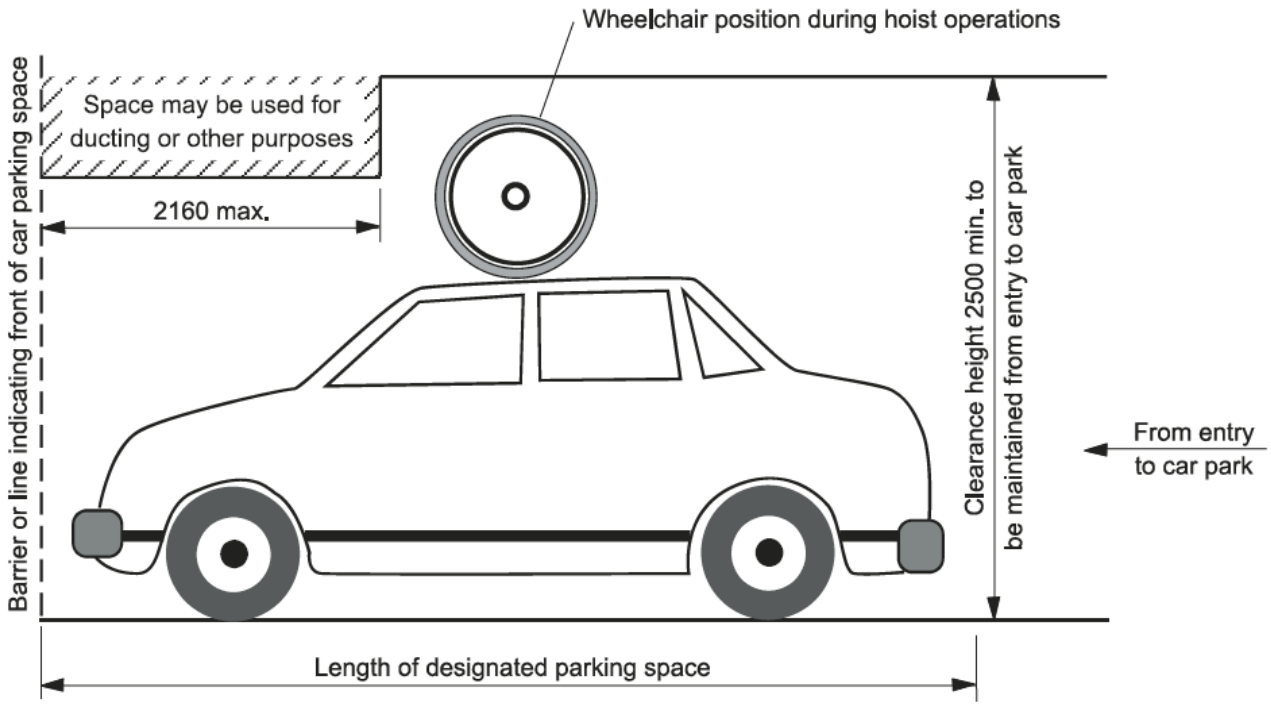
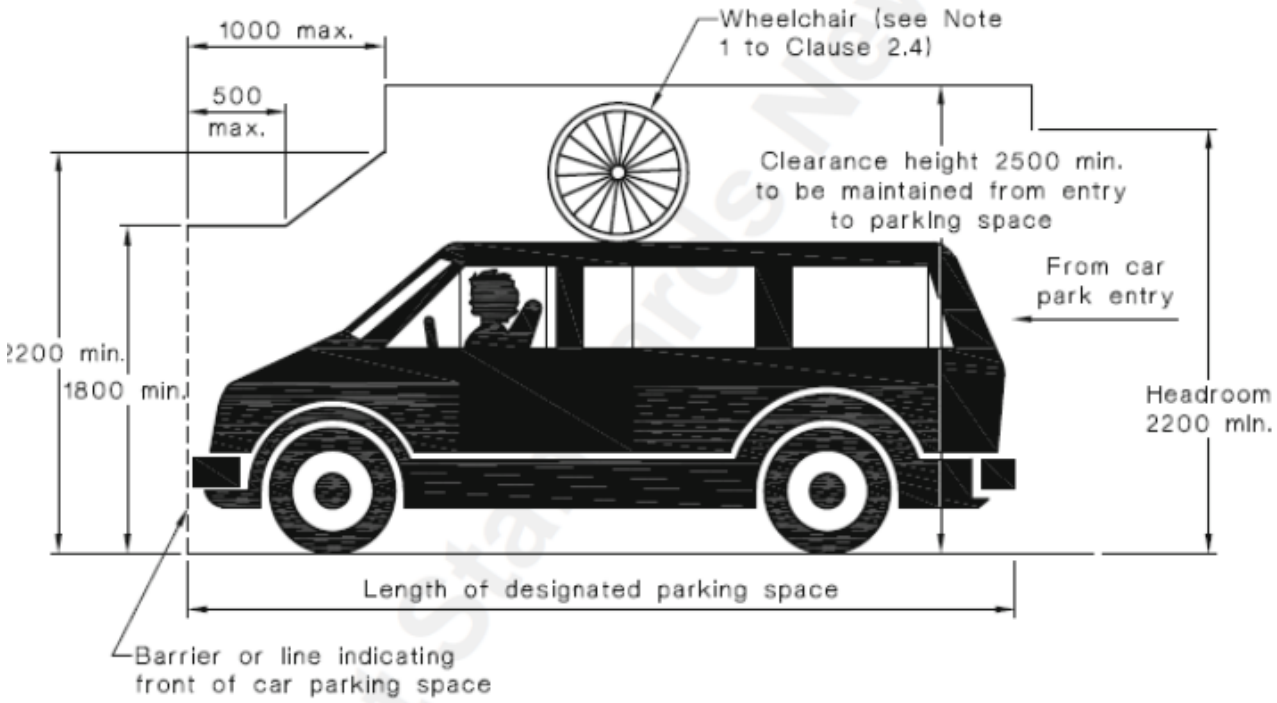


Figure 23: AS/NZS 2890.6:2009 accessible parking clearance envelope



In summary, the vertical clearances comply with the Unitary Plan, where car access is provided but not where loading is required, or for accessible parking spaces. Section 9.4.2 provides further detail and assessment of the infringement for loading vertical clearances and the resulting loading strategy.

9.2 Parking for bicycles

9.2.1 Unitary Plan bicycle parking requirement

The Unitary Plan specifies the following minimum bicycle parking requirements for the proposed activities (Standard E27.6.2(6) and Table E27.6.2.5)

- Residential activities to have a minimum of:
  - 1 visitor (short-stay) space per 20 dwellings
  - 1 secure (long stay) per dwelling without a dedicated garage. PC79 also specifies no secure space is required where a basement parking space is provided, which would apply in this case. To be conservative, we have assumed each dwelling will need a secure bicycle parking space.
- Offices with GFA greater than 10,000 m^2 GFA to have a minimum of:
  - 10 visitor (short-stay) spaces plus 1 space per 2,000 m2 GFA over 10,000 m2
  - 1 secure bicycle parking per 300 m2 GFA office.
- Food and beverage retail activities with GFA greater than 350 m^2 GFA of:
  - 1 visitor (short-stay) space per 350 m2 GFA
  - 1 secure bicycle parking per 300 m2 GFA.
- All other retail activities with GFA greater than 500 m^2 GFA up to 5,000 m^2 GFA to have a minimum of:
  - 1 visitor (short-stay) space per 500 m2 GFA
  - 1 secure bicycle parking per 300 m2 GFA of office.

Table 10 summarises the number of minimum bicycle parking required for the Development. We have conservatively assumed all retail will be food and beverage, as these have higher bicycle parking requirements compared to 'all other retail.' In summary, a minimum of 63 visitor (short-stay) spaces and 518 secure (long-stay) spaces are required.

Table 10: Minimum Unitary Plan bicycle parking requirements

Activities	Size	Minimum bicycle parking requirements	
		Visitor (short-stay)	Secure (long-stay)
Residential	247 units	12.4	247.0
Offices (commercial)	79,204 m^2	44.6	264.0
Retail – food and beverage	2,033 m^2	5.8	6.8
Total		**63 (62.8)**	**518 (517.8)**

9.2.2 Bicycle parking provision and assessment

The number of bicycle parking spaces by basement level and type are summarised in Table 11. Level B01 also contains 25 secure spaces for scooters, but we have not included these in this table.

In summary, the number of bicycle parking spaces meets the minimum Unitary Plan visitor (short-stay) requirements and exceeds the secure (long-stay) requirements.

Table 11: Number of bicycle parking spaces by level and type

Level	Visitor (short-stay)	Secure (long-stay)			
		Resident	Office	Retail	Total
B05		85			85
B04		85			85
B03		65			65
B02					0
B01	14[12]	240	198		438
Level 00	50		480	12	492
Total	**64**	**475**	**678**	**12**	**1,165**

9.3 End-of-trip facilities requirements and assessment

End-of-trip facilities are required in the Unitary Plan (Standard E27.6.2(7) and Table E27.6.2.6) to support office activities.

Based on the provision of 79,204 m^2 GFA of office activities, the Unitary Plan requires 22 showers and changing areas with space for storage of clothing.

Level 00 and B01 contain 56 showers to meet the Unitary Plan requirements. Furthermore, 711 lockers are provided near the showers which can be used for storage of clothing.

9.4 Servicing and loading assessment

9.4.1 Number of loading spaces

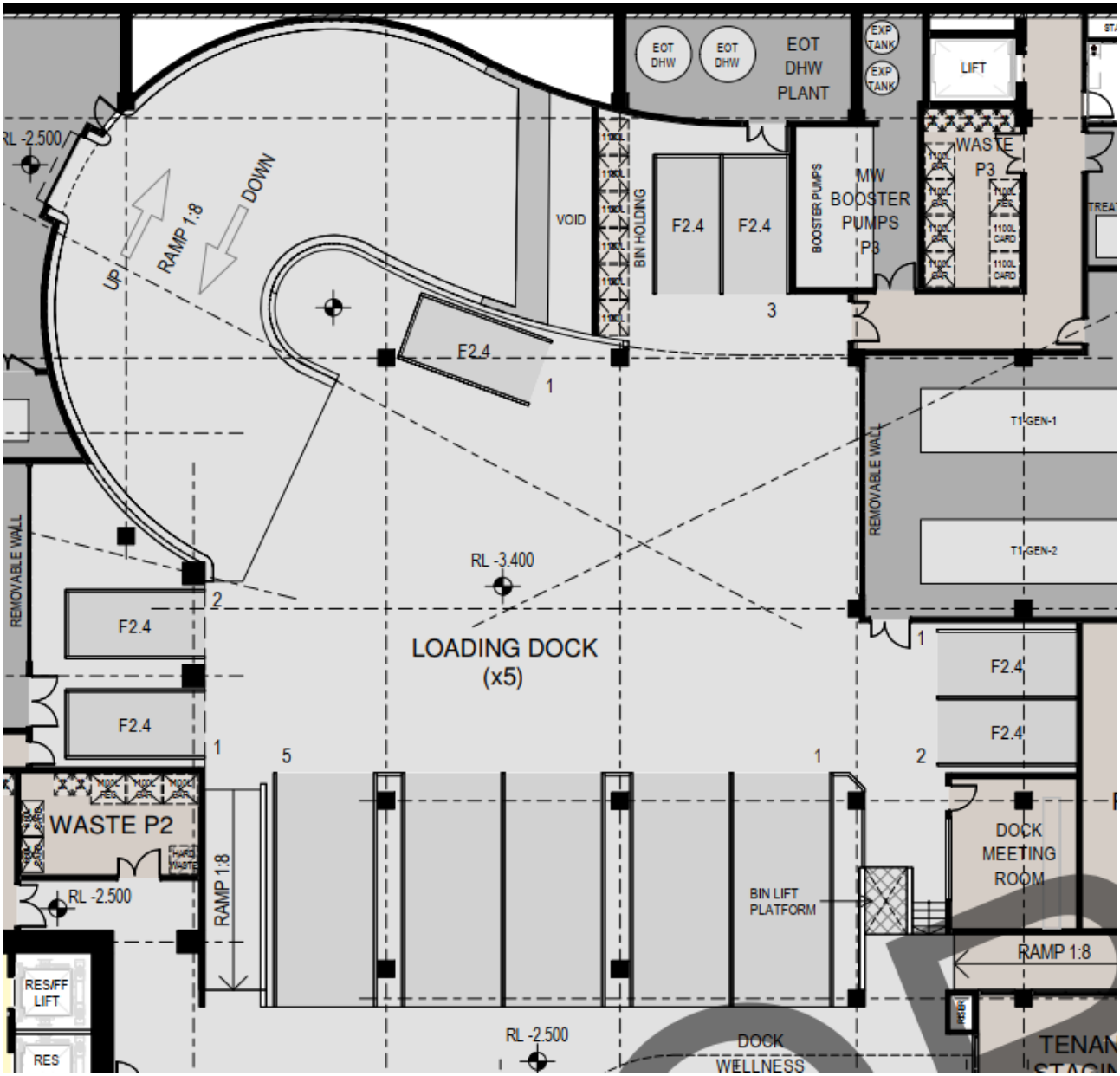
The Unitary Plan specifies the minimum number of loading spaces in Standard E27.6.2(8) and Table E27.6.2.7.

The Development has 2,033 m^2 GFA of retail activity, 79,204 m^2 GFA of office activity and 25,028 m^2 GFA of residential activity. Taking this into account, the Unitary Plan requires 4 onsite loading spaces (1 space to service the retail activity and 3 spaces for the office and residential activities).

[12] 14 spaces for residential visitors will be provided in the secure area on Level B01. Residents will be able to provide access to this area for the visitors

A total of 5 loading spaces is provided, which complies with the Unitary Plan. These loading spaces are provided in a separate loading area on Level B02, as shown in Figure 24.

Figure 24: The Development's loading provision



9.4.2 Vertical clearance for servicing vehicles and resulting servicing strategy

As outlined in Section 9.1.7, the following assessment relates to where servicing vehicles require access, taking into account that the Unitary Plan requires vertical clearances of 3.8 m associated with loading facilities.

Vertical clearances on the Site associated with servicing operations are as follows.

- The south end of the service lane between Customs Street West and the entrance to the basement car parking has a clearance of at least 2.9 m due to the design on the podium level above
- The loading area access and ramp have a clearance of 3.8 m, satisfying the requirements where loading is required

- The vertical clearance of the service lane between the entrance to the basement car parking and Quay Street is 3.6 m. We note that this is an existing feature of the service lane, and these vertical clearance restrictions currently apply. The existing signposted vertical clearance restriction of 3.6 m is shown in Figure 25.

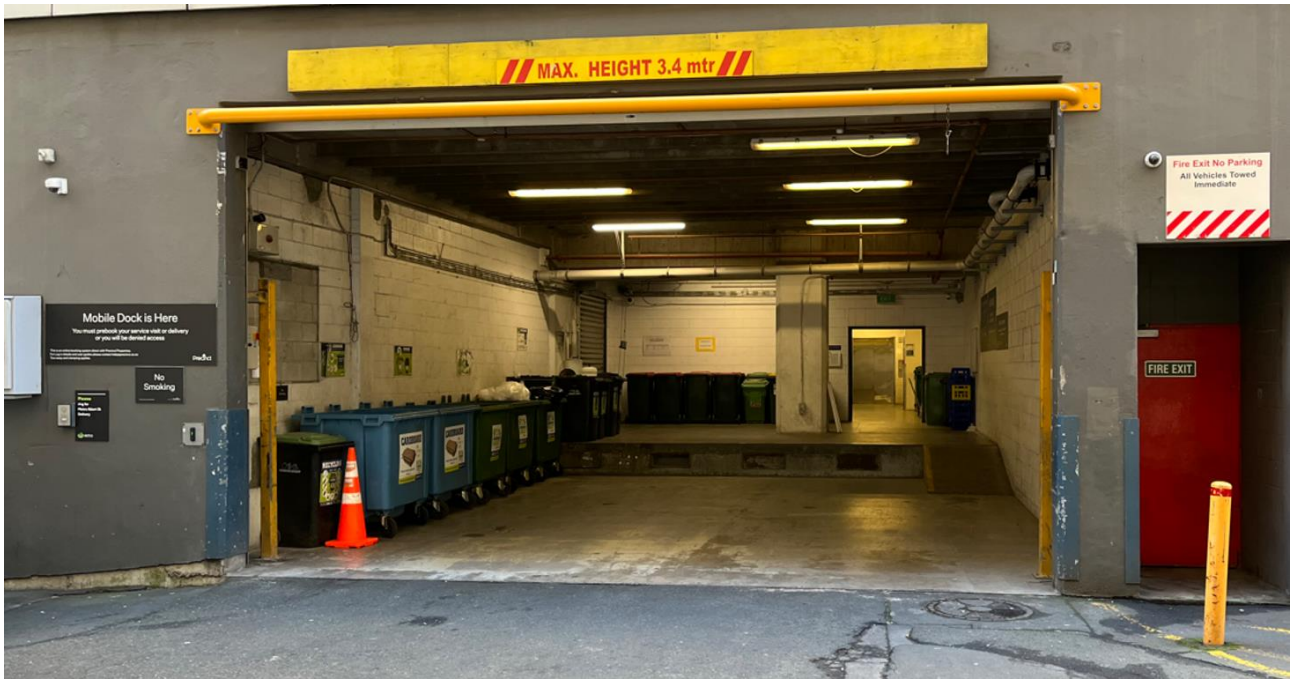
Figure 25: Sign posted vertical clearance restriction of 3.6 m on existing service lane

These vertical clearance restrictions mean that:

- most trucks will not be able to access the Site via the southern section of the service lane (between Customs Street West and the entrance to the basement car parking) due to the 2.9 m clearance. We note that vans may be able to use this access, as they typically have a height of up to 2.5 m
- due to the limitations at the south end of the service lane, trucks will need to enter and exit the Site via Quay Street
- while the internal loading area will have a vertical clearance of 3.8 m, the main constraint is the existing vertical clearance at the south end of the service lane. There are currently signposted vertical clearance restrictions of 3.6 m, due to overhead structures and services. These clearances will mean that taller trucks will be restricted from accessing the Development's loading area

We note that the vertical clearance restriction at the north end of the service lane is an existing situation. Trucks already access this area while using the existing loading docks on the service lane. Figure 26 shows one of the existing loading docks on the service lane which has a sign posted 3.4 m vertical clearance restriction. This provides evidence that loading can take place in the service lane with overall vertical clearance restrictions of 3.4 – 3.6 m. Therefore, there is no change from existing, other than an increase in demand for loading vehicles.

Figure 26: Existing service lane loading dock with 3.4 m vertical clearance restriction



To manage the effects of the Development's vertical clearance restrictions, we recommend that a Servicing Management Plan be required to ensure that all servicing vehicles that access the Development comply with the necessary vertical clearance restrictions. The Servicing Management Plan will include, but not limited to:

- The loading dock will be managed by a Dock Manager located at the proposed loading dock
- To book a parking space within the dock will be via an automated booking system such as 'Mobile Dock'. This is currently used for the existing loading spaces in the service lane and Commercial Bay. This system manages any queuing related issues by booking spaces and lengths of time for loading vehicles
- The system is integrated with access control & CCTV systems allowing license plate recognition to navigate any potential security barriers with an approved booking
- The booking system will make the user aware of the vertical clearance restrictions.

9.4.3 Vehicle tracking assessment of loading vehicles

The Development has been designed to accommodate trucks up to 8.3 m in length.

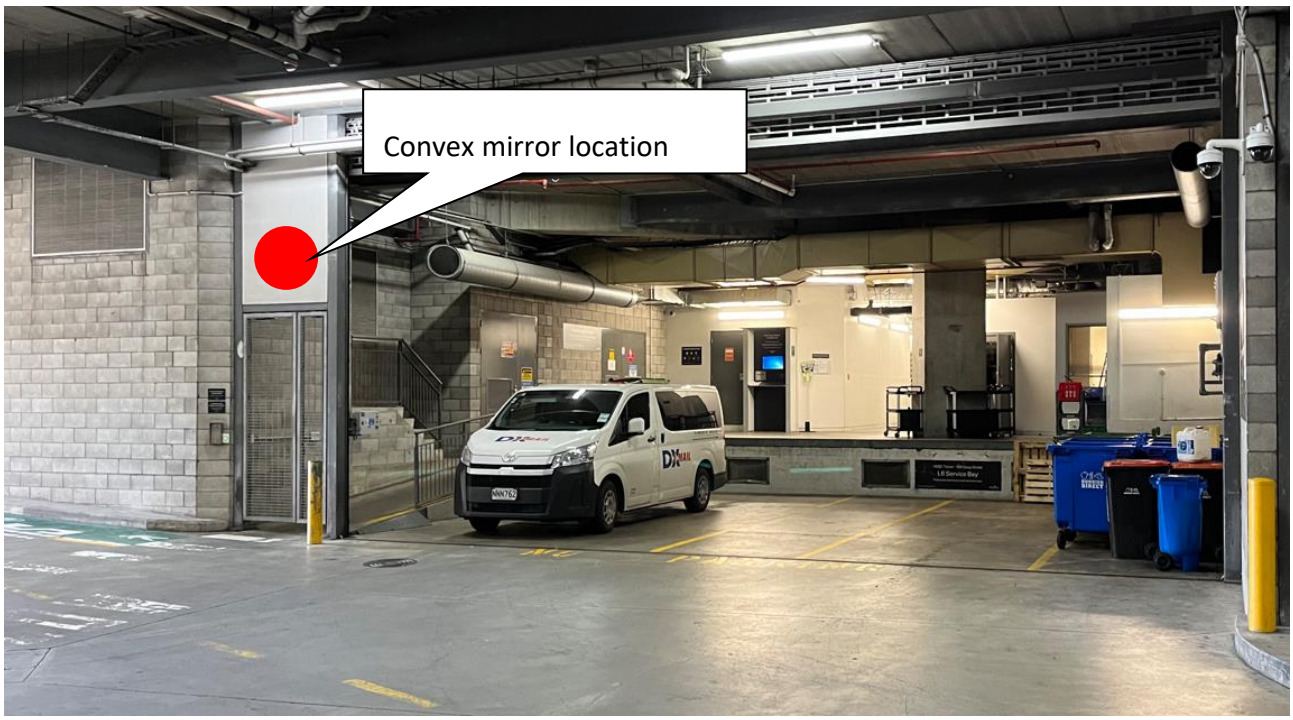
All the proposed loading bays are 3.6 m wide and 8.4 m long. These designs meet the Unitary Plan loading space size requirements outlined in Standard E27.6.3.2 and Table E27.6.3.2.1.

We have provided a vehicle tracking assessment in Appendix E of the operation of the loading spaces and the service lane.

- The loading area is separated from other parking areas and has a dedicated ramp entrance from the service lane
- The layout of the loading ramp and loading bays ensures that no reversing onto the service lane or external road network is required

- At the curved section of the ramp, only 1 truck will be able to use the ramp at once. There will be visibility available between the loading area and the ramp, which will allow trucks to give-way to each other at either if there is an inbound vs outbound truck
- The loading spaces are designed for a truck to reverse into the space so that they can unload on platforms at the end of each space. Trucks can exit the loading spaces in a forward direction
- Due to the servicing strategy outlined in Section 9.4.2, all trucks will need to enter and exit via Quay Street.
    - As shown in Sheet 1 of the vehicle tracking, a truck can enter the loading area while passing a car on the service lane
    - Sheet 1 also shows that a truck exiting the loading area and turning left towards Quay Street will use almost the full width of the service lane. This is due to an existing pinch point in the service lane between a transformer room and the M Social building. This means that outbound trucks will need to give-way to any inbound vehicle at this section of the service lane. To mitigate this, a convex mirror has been proposed, refer to the location in Figure 27. A loading dock booking system, through the implementation of a Servicing Management Plan, can also schedule truck movements to minimise movements during busy periods.

Figure 27: Proposed convex mirror location



10 TRAFFIC EFFECTS OF THE DEVELOPMENT

10.1 Unitary Plan traffic generation and assessment requirements

Standard E27.6.1(2) of the Unitary Plan specifies that a development in the Business–City Centre Zone is exempt from the Trip Generation standard (E27.6.1(1)). As such, typically, any development in this zone does not require a detailed traffic assessment to be undertaken.

Despite the Development being exempt from any Unitary Plan requirement to undertake a traffic assessment, Auckland Transport and Auckland Council, through the pre-application process, have requested that this be undertaken so that the traffic effects on the efficiency and safety of the surrounding road network resulting from the Development can be understood (i.e., use of the Development's access points).

As such, the following traffic assessment

- determines the AM and PM peak hour traffic generation of the Development
- assesses the AM and PM network traffic effects of the Development using SATURN traffic modelling software
- assesses the predicted operation of the Development's Quay Street and Customs Street West accesses during the AM and PM peak hours using SIDRA traffic modelling software.

We note that SATURN is primarily used as a tool to assess the traffic effects of traffic assignment on a road network. To undertake a more detailed modelling assessment at accesses and nearby intersections, we have also used the SIDRA modelling software.

10.2 The Development's predicted traffic generation

10.2.1 Trip generation rates

The following weekday peak hour vehicle trip rates are applicable to the Development.

As the number of parking spaces will be limited and will primarily be allocated, we have based our trip generation assessment on a per carpark basis.

Residential dwellings

For residential dwellings, we have adopted rates from the RTA guidelines[13].

These guidelines provide rates for residential developments surveyed in the Sydney metropolitan area, with all of the developments being:

- close to public transport
- greater than 6 storeys

[13] The Road and Traffic Authority of New South Wales (RTA), *Guide to Traffic Generating Developments, Version 2.2, 2002 & Guide to Traffic Generating Developments, Updated traffic surveys, 2013.*

- primarily residential in nature.

These features all apply to the proposed Development.

- We note that once the City Rail Link project is completed, the Site will have further improved access to public transport. The Site is already located close to the Britomart Station and served by multiple bus services
- While the proposed Development also contains office and retail/ restaurant activities, these rates were based on developments primarily residential in nature. This is still appropriate to use, as we are applying this trip generation rate to parking allocated to residents only.

These RTA guidelines provide trip generation rates for residential dwellings on a per parking space basis as follows.

- AM peak hour: 0.15 trips per parking space
- PM peak hour: 0.12 trips per parking space.

These rates reflect that the majority of residents who own a car parking space will not travel during peak periods. The Site's location in the City Centre, close to public transport and other activities, means that residents are not reliant on car travel during peak periods.

Offices

To determine the vehicle trip generation for the Development's office activities, we have undertaken traffic surveys of the adjacent Commercial Bay site.

- Commercial Bay is operated by Precinct Properties (who is the Applicant for this Development) and is located 100 m east of the Site. As such, the trip characteristics for offices will represent the Development well
- Commercial Bay has 274 fully allocated parking spaces for offices. This means that a per carpark trip generation rate can be calculated from the surveys data.

For the surveys and trip generation rates

- We undertook surveys on Tuesday 19 and Wednesday 20 November, 2024
- The peak hour volumes of the office parking spaces were recorded as follows
    - AM peak hour:
        - Tuesday: 88 vehicles per hour
        - Wednesday: 79 vehicles per hour
    - PM peak hour:
        - Tuesday: 76 vehicles per hour
        - Wednesday: 64 vehicles per hour
- The results show that the Tuesday counts were higher than the Wednesday counts
- Based on a full allocation of 274office parking spaces, the peak hour trip generation rates for Commercial Bay are as follows

- AM peak hour rate: 0.32 trips per hour per parking space
- PM peak hour rate: 0.28 trips per hour per parking space

M Social

The trips associated with the 121 M Social parking spaces exist as part of the Downtown Carpark. The same allocation of parking spaces will be provided as part of the Development. Therefore, there will be no change in the volume of trips for M Social compared to the existing one.

For the purposes of undertaking the modelling, we have assumed a trip generation rate for these parking spaces. We have adopted the office trip generation rate, as we consider a rate based on a fixed number of parking spaces to be appropriate.

Drop-off spaces

The Development will provide 11 drop-off spaces on Level B01. We note that there is no published trip generation rates available for drop-off spaces, as this would vary on many factors such as the conditions of use, the activities it serves, the location and the number of spaces available. As such, we have estimated the trip generation based on a first principles assessment.

We have assumed that during peak hours, each drop-off space will generate 12 trips per hour per space (6 inbound, 6 outbound).

- This assumes a high turnover rate of 1 drop-off space per 10 minutes
- For the 11 drop-off spaces, this would result in 144 trips during peak periods
- We consider this is conservative, as it assumes these drop-off spaces will be almost fully utilised throughout peak periods.

Facility management

For the 10 facility management spaces, we have assumed the same trip rate as office spaces. These will be used by staff members, who will likely arrive and depart the Site in a similar manner as office workers.

Servicing trips

As our trip generation assessment is based on parking allocation, we have made additional allowances for servicing vehicles.

We have used service vehicle trip generation rates from the TRICS trip generation database. This collates survey data for developments in the UK and Ireland.

We have use rates for each activity as follows

- Offices
  - AM peak: 0.020 per 100 m^2 GFA
  - PM peak: 0.023 per 100 m^2 GFA
- Residential
  - AM peak: 0.019 per unit

- PM peak: 0.029 per unit

- Retail food and beverage
  - AM peak: 0.097 per 100 m^2 GFA
  - PM peak: 0.189 per 100 m^2 GFA.

For comparison, Commercial Bay (serving both office and retail activities) generates the following servicing vehicle movements during network peak hours, based on data from 14 to 20 October 2024. The peak hour demands are relatively low, as servicing vehicles typically travel during interpeak periods.

- AM peak: 10 to 17 vehicles per hour
- PM peak: 0 to 9 vehicles per hour
- Interpeak periods: up to 25 vehicles per hour.

10.2.2 Trip generation volumes

As summarised in Table 12, when applying the trip generation rates for each activity, the anticipated worse-case trip generation of the Development is 293 trips in the AM peak hour and 282 trips in the PM peak hour.

Table 12: Weekday peak hour trip generation of Development

Activity	Size	Trip rate		Trip generation (vph)	
		AM	PM	AM	PM
Office per parking space	150 spaces	0.32 per parking space	0.28 per parking space	48.0	42.0
Residential per parking space	247 spaces	0.15 per parking space	0.12 per parking space	37.1	29.6
M Social per parking space	121 spaces	0.32 per parking space	0.28 per parking space	38.7	33.9
Facilities management per parking space	10 spaces	0.32 per parking space	0.28 per parking space	3.2	2.8
Drop-off spaces	11 spaces	12 per space per hour	12 per space per hour	144.0	144.0
Office – servicing	79,204 m^2	0.020 per 100 m^2 GFA	0.023 per 100 m^2 GFA	15.8	18.2
Residential – servicing	247 units	0.019 per unit	0.029 per unit	4.7	7.2
Retail food and beverage - servicing	2,033 m^2	0.097 per 100 m^2 GFA	0.189 per 100 m^2 GFA	2.0	3.8
Total				**293**	**282**

10.3 SATURN network traffic modelling

10.3.1 SATURN traffic modelling methodology

The City Centre 2031 SATURN model has been prepared by the Auckland Forecasting Centre (AFC) and assesses the morning (AM) and (PM) peak hours during a weekday. This model is a tool used to assess vehicle movements in the City Centre.

- The layout of the road network in the model is shown in Figure 28
- The model is based on the future 2031 year. This accounts for the City Rail Link being completed. All current road closures associated with the City Rail Link have, therefore, been removed. The model also accounts for future bus routes that will apply to the City Centre once the City Rail Link is completed
- The model only includes committed and funded road projects in the City Centre, which can be considered as part of the existing legal environment. One of these included projects is the Wellesley Street bus improvements
- No unfunded or uncertain projects are included in the model, such as the removal of the Lower Hobson Street flyover
- To account for future traffic volumes in 2031, AFC applied growth factors to different types of trips in the model, as summarised in Table 13. 2023 volumes were used as a baseline for the growth factors. The growth factors generally predict a small increase in traffic volumes from 2023 to 2031.

This model is appropriate to use as the timeframe aligns with the completion of the Development. The only other version of the City Centre SATURN model that AFC has available is for 2023, which will not fully capture the road network when the Development is completed.

Figure 28: City Centre SATURN model layout

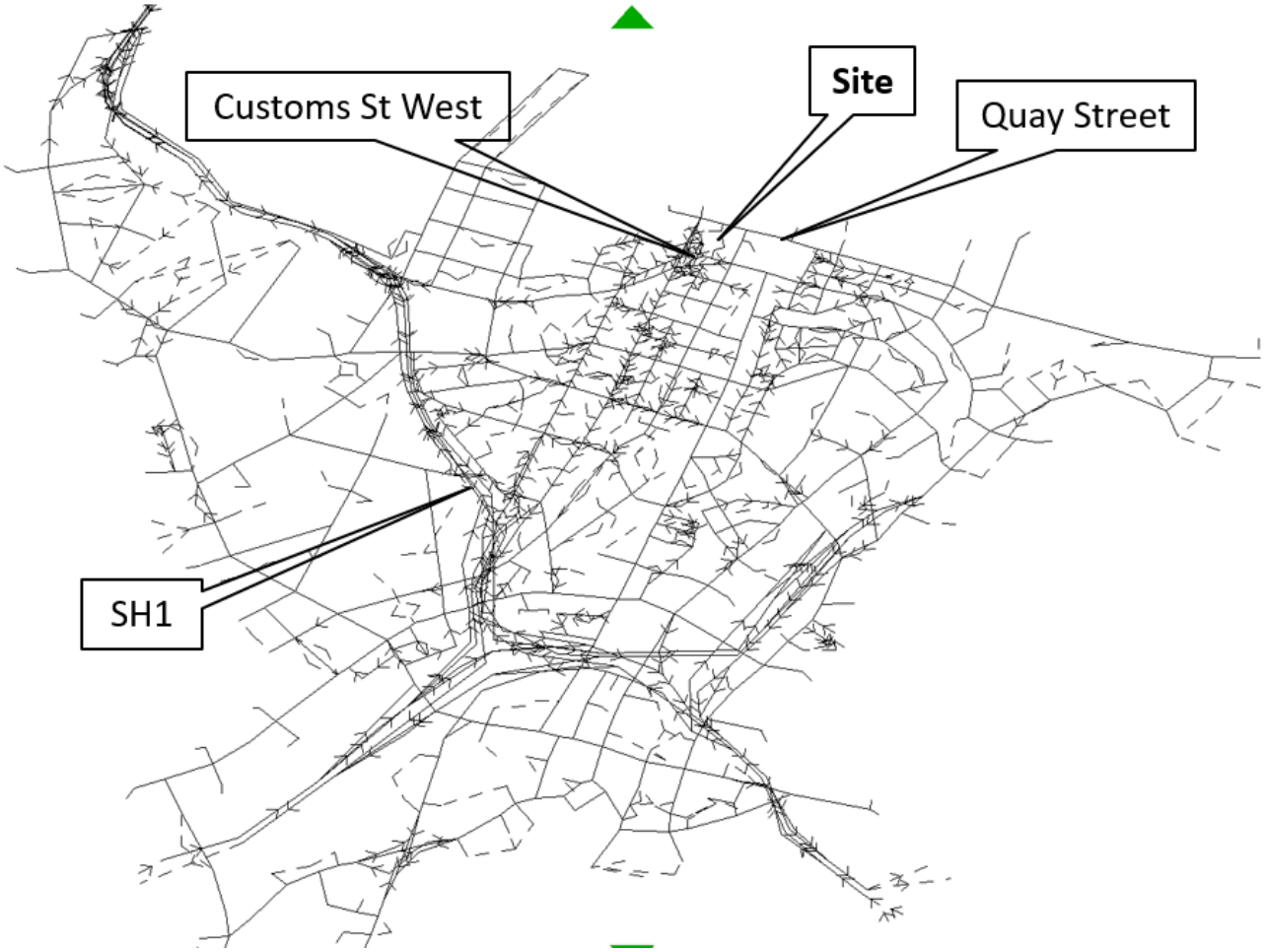


Table 13: Model demand growth applied from 2023 to 2031, by AFC (% change from 2023)

Peak period	1 Total demands	2 Intra CBD (From CBD to CBD)	3 From CBD to Outside CBD	4 Outside CBD into CBD	5 Through (Outside CBD to Outside CBD)	CBD related (2 + 3+ 4)
AM peak	+3.6%	+2.9%	+1.3%	-0.6%	+6.1%	+0.3%
PM peak	+2.8%	+1.8%	-2.4%	+1.5%	+5.6%	-0.7%

Using the 2031 City Centre SATURN model provided by AFC, we have created the following scenarios.

Scenario 1: Future Baseline

This scenario assumes the same external road network as per the AFC 2031 model. With regard to the traffic demands, we have made adjustments to the demands of the service lane and Downtown Carpark to align with observed traffic data.

Scenario 2: Development

This scenario models the traffic effects of the Development and assumes that all vehicles that presently use the Downtown Carpark are redistributed to other nearby car parking facilities. The scenario assumes

the same external road network as per the AFC 2031 model and removes the Downtown Carpark signalised intersection at Fanshawe Street. The changes to traffic demands include:

- changes to the Downtown Carpark demands to 0
- the creation of a new zone for the Development with access onto the service lane, such that demands can choose to access the service lane via Quay Street or Customs Street West access. The zone uses the trip generation demands outlined in Section 10.2.2
- the reassignment of existing trips to and from the Downtown Carpark to other parking facilities in the City Centre
    - The full difference between the existing Downtown Carpark demands and the M Social parking trip generation (outlined in Section 10.2.2) was reallocated to other parking facilities. This is effectively a 100% reallocation of existing Downtown Carpark trips
    - In this regard, we adopted a methodology suggested by AFC to select where these carpark trips would be reassigned. This methodology was based on carpark occupancy survey data originally provided by Auckland Transport Parking for privately owned parking sites in the City Centre.

10.3.2 SATURN modelling results

The SATURN model outputs for the above scenarios are provided in Appendix F.

Volume and delay differences on the road network

The following outputs are provided in Appendix F, which show delay and volume difference diagrams.

- Actual volume differences between the Future Baseline scenario and the Development scenario. The differences are shown in Passenger Car Units ("**PCUs**") per hour, where a standard vehicle is 1 PCU and a heavy vehicle is 2 PCUs. Only differences of over 10 PCUs are shown
- Delay differences between the Future Baseline scenario and the Development scenario in seconds. Only differences of over 10 seconds are shown
- Diagrams are provided for the Development scenario for the AM and PM weekday peak period
- The blue lines represent a decrease in volume/delay when compared to the Future Baseline, whereas the green line represents an increase.

We summarise the results below.

These results predict the changes to the operation of the road network resulting from the removal of the Downtown Carpark and the implementation of the Development.

AM peak

- Vehicles generally reroute away from Sturdee Street and the Lower Hobson Street slip lane adjacent to the Site, and towards Quay Street, Customs Street West and the Lower Hobson Street Flyover

- No changes of vehicle delays are predicted over 10 seconds. The Downtown Carpark exit ramp onto Fanshawe Street is predicted to have a reduction in delay as this signalised intersection will no longer be required

PM peak

- Vehicles generally reroute away from Sturdee Street and the Lower Hobson Street slip lane adjacent to the Site, and towards Quay Street, Customs Street West and the Lower Hobson Street Flyover
- Similar to the AM peak, the Downtown Carpark exit ramp onto Fanshawe Street is predicted to have a reduction in delay as this signalised intersection is no longer required.

We note that while more vehicle trips on the network are modelled due to the additional trip generation from the Development and all Downtown Carpark trips being redistributed, there are no noticeable increases in network vehicle delays.

Average journey times

Table F1 in Appendix F provides a summary of the average travel time per vehicle, per modelled scenario and peak period.

This shows a 0 to 1 second increase for all vehicles, when comparing Scenario 1 and 2. This shows the Development will have negligible impact on overall vehicle travel times across the network.

Bus journey times

Table F2 in Appendix F provides a summary of the bus route journey ties, per modelled scenario and peak period.

This shows very small changes to bus route travel times, ranging from -14 to +13 seconds. Most bus routes are not affected. This shows that buses will not be adversely impacted in a noticeable manner by the additional Development trips and the redistributed Downtown Carpark trips.

10.3.3 Discussion on the SATURN network model results

The SATURN results show the following for all scenarios and peak periods:

- Vehicles generally reroute away from the routes serving the existing Downtown Carpark (Sturdee Street, the Lower Hobson Street slip lane adjacent to the Site), towards the routes directed to the Development's access points (Quay Street, Customs Street West and the Lower Hobson Street Flyover)
- The change in vehicle volumes is mostly concentrated in the areas near the Development and Downtown Carpark access points. No significant changes in vehicle volumes are predicted in the wider network
- No increases of vehicle delays of more than 10 seconds are predicted in any scenario, both in the local area and the wider network. All scenarios show a decrease in delays at the Downtown Carpark exit ramp onto Fanshawe Street, as this signalised intersection will no longer be required

- The Development will have negligible impact on overall vehicle travel times across the network, with average journey times for all vehicles increasing up to 1 second compared to the future baseline
- No noticeable change to bus route travel times are predicted. There will be some small increases and decreases of -14 to +13 seconds for some bus routes.

Overall, we consider that the results of the SATURN network modelling have shown that the existing road network can efficiently accommodate the traffic demands of the Development.

10.4 SIDRA Intersection traffic modelling

10.4.1 SIDRA model methodology

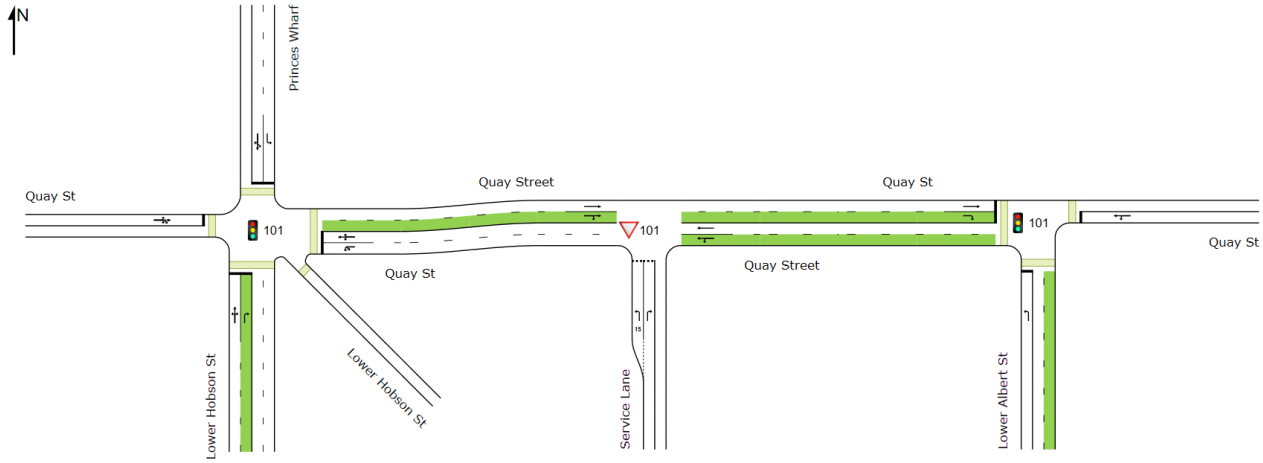
The SIDRA Intersection modelling software has been used to provide a more detailed assessment of the traffic effects resulting from the Development with a focus on the Development's accesses onto Quay Street and Customs Street West. SIDRA provides more detailed outputs for vehicle delay and queue lengths at an intersection level when compared to the SATURN assessment.

We have created SIDRA Intersection networks at both service lane access points on Quay Street and Customs Street West, as follows.

Quay Street

- The layout of the Quay Street network is shown in Figure 29
- This includes the Quay Street service lane access, the Quay Street / Lower Hobson Street and the Quay Street / Lower Albert Street signalised intersections
- As the service lane and M Social east access are located within 5 – 10 m of each other, we have modelled this as a combined access with a right-out turn lane and a short left-out lane. Based on our observations of the traffic survey footage, we noticed some vehicles from the service lane using the M Social access turn left-out, if there was a queue of right-out turning vehicles. The SATURN and SIDRA models account for the existing demands at both access points
- The M Social west access is not included in the model. As this access is primarily for left-out turning movements onto Quay Street and is separated from the service lane access by 30 – 40 m, we consider it will not impact the operation of the service lane access in the modelling.

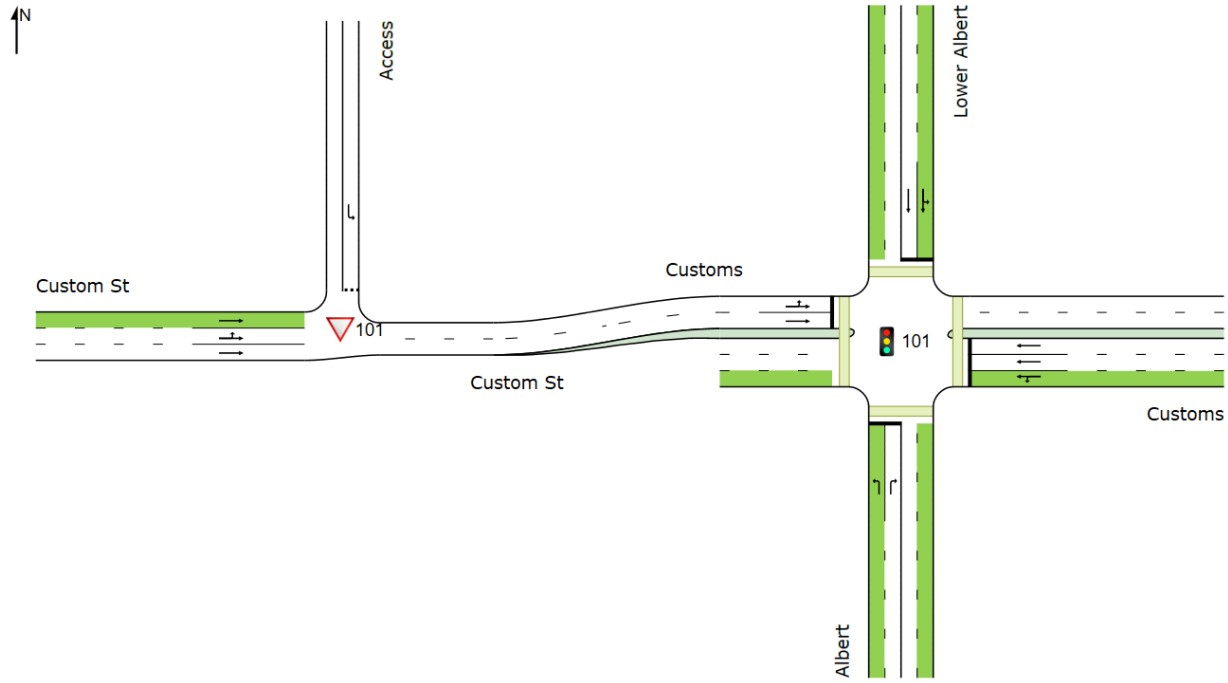
Figure 29: SIDRA layout of Quay Street network



Customs Street West

- The layout of the Quay Street network is shown in Figure 30
- This includes the service lane access and the Customs Street West and Lower Albert Street signalised intersection.

Figure 30: SIDRA layout of Customs Street West network



Turning count volumes

Figure 31 and Figure 32 show the turning volume demands at both service lane access for each scenario and peak period. These turning volumes were extracted from the SATURN models, and include existing demands on the service lane. Through volumes on Quay Street and Customs Street West are also shown, which are affected by the redistribution of the existing Downtown Carpark trips.

Figure 31: Scenario 1 (Future Baseline) turning volumes at service lane access points

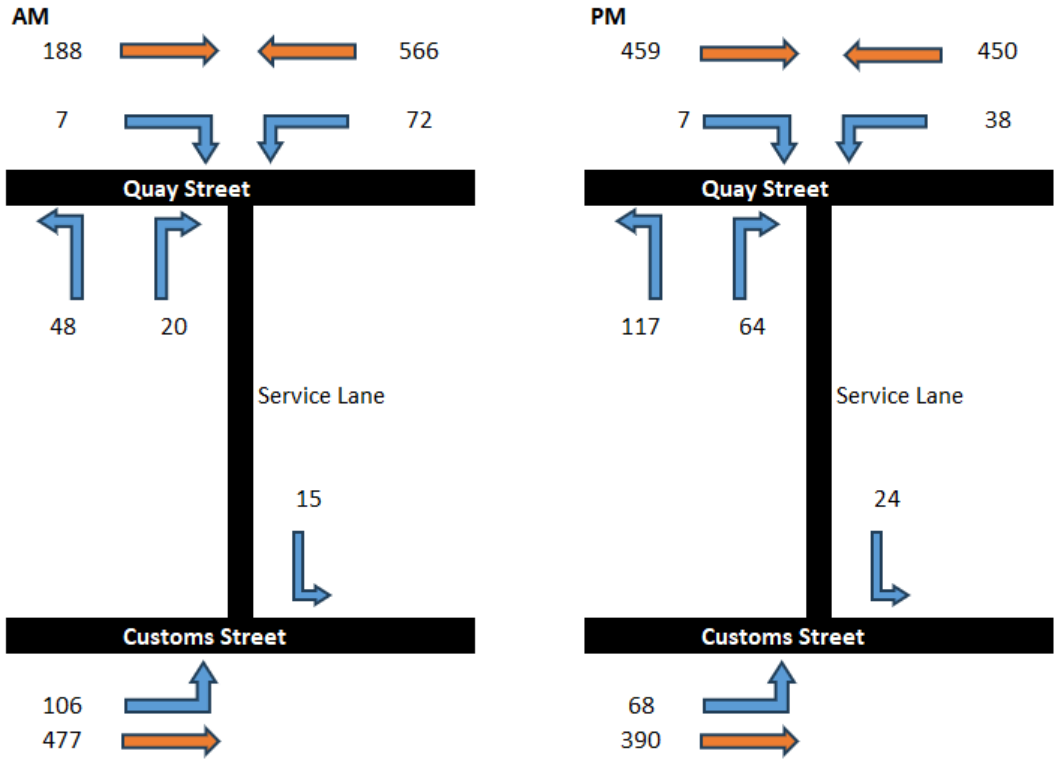
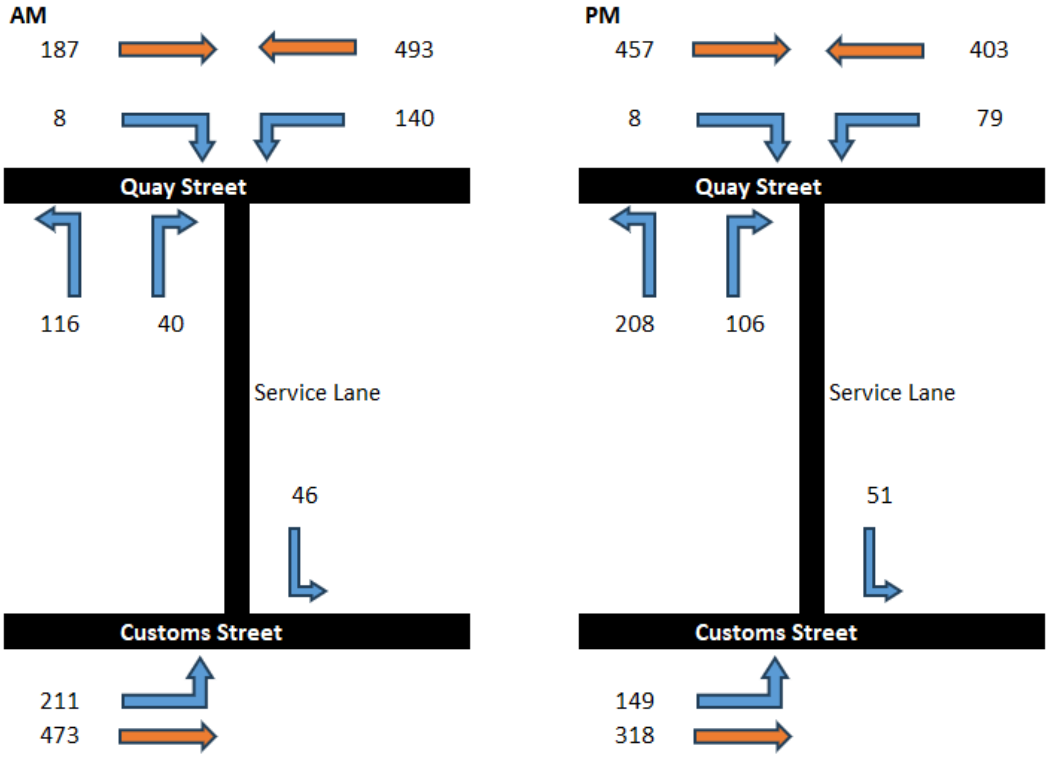


Figure 32: Scenario 2 (Development) turning volumes at service lane access points



10.4.2 SIDRA modelling results

The SIDRA model outputs are provided in Appendix G[14]. Movement summary results, including average delay, level of service ("**LOS**")[15] , degree of saturation and queue length, are provided for each scenario during the AM and PM peak periods, focusing on the service lane access points.

Table 14 to Table 17 below summarise the Level of Service and average delay for the existing situation and for each of the Development scenarios at the Quay Street and the Customs Street West access during the AM and PM peak hours.

Table 14: Quay Street access: SIDRA results AM peak hour

Approach	Scenario 1		Scenario 2	
	LOS	Ave delay	LOS	Ave delay
Service Lane left turn	A	4.9	A	4.9
Service lane right turn	C	15.2	C	15
Quay Street east left turn	A	4.3	A	4.3
Quay Street east through	A	0.1	A	0
Quay Street west through	A	0.2	A	0.2
Quay Street west right turn	A	9.1	A	8.6
All vehicles	**NA**	**1**	**NA**	**1.8**

Table 15: Quay Street access: PM peak hour

Approach	Scenario 1		Scenario 2	
	LOS	Ave delay	LOS	Ave delay
Service Lane left turn	A	4.9	A	5
Service lane right turn	C	19.8	C	22.9
Quay Street east left turn	A	4.3	A	4.3
Quay Street east through	A	0	A	0
Quay Street west through	A	0.1	A	0.1
Quay Street west right turn	A	7.2	A	7
All vehicles	**NA**	**1.7**	**NA**	**2.9**

[14] In the SIDRA outputs, Scenario 1 is titled 'DM Scenario 1' and Scenario 2 is titled 'ERV2'

[15] Level of Service is an index of performance of traffic on a roadway or intersection and is based on measures such as vehicle delay. It provides a measure of performance on a scale of A to F, with LOS A representing the best operating conditions from a traveller's perspective, and LOS F the worst. LOS A represents free flow conditions, while LOS B and LOS C represent reasonably free flow / stable free flow conditions. LOS D and LOS E represents approaching or at unstable flow conditions but operating within capacity. LOS F represents breakdown of traffic flow conditions.

Table 16: Custom Street West access: AM peak hour

Approach	Scenario 1		Scenario 2	
	LOS	Ave delay	LOS	Ave delay
Service lane left turn	A	5.5	A	5.4
Customs St West left turn	A	3.9	A	3.9
Customs St West through	A	0	A	0
All vehicles	**NA**	**0.8**	**NA**	**1.4**

Table 17: Customs Street West access: PM peak hour

Approach	Scenario 1		Scenario 2	
	LOS	Ave delay	LOS	Ave delay
Service lane left turn	A	5.5	A	5.2
Customs St West left turn	A	3.9	A	3.9
Customs St West through	A	0	A	0
All vehicles	NA	0.7	NA	1.5

10.4.3 Discussion of SIDRA modelling results

The SIDRA results show the following.:

- The Customs Street West access is predicted to operate with minimal delays under all Development scenarios, with LOS A for all movements. This access operates as a left-in / left-out access
- The Quay Street access is predicted to perform well
  - No noticeable changes are predicted in the AM peak
  - In the PM peak, the right turn out delays are predicted to increase from 20 to 23 seconds
  - In both peak periods, the right turn operates at LOS C, and all other movements operate at LOS A
- While the turning volumes from the service lane are predicted to increase, there is generally a decrease in through traffic volumes due to the redistribution of the existing Downtown Carpark trips away from the local area.

In summary, we believe that both access points of the service lane can operate within capacity. The results do not indicate there will be any safety concerns as a result of turning traffic and congestion.

11 ASSESSMENT OF DEMOLITION AND CONSTRUCTION EFFECTS

This resource consent application includes the demolition of the existing Downtown Carpark building and the construction of the Development. Both of these will result in construction traffic effects, which will require active management to minimise adverse effects.

We note that the project is in a relatively early stage, and as such, a contractor has not been appointed. On this basis, we have undertaken a preliminary assessment of construction effects during the demolition and construction phases.

11.1 Demolition traffic assessment

To assess the demolition of the existing Downtown Carpark building and associated structures, we have prepared a 'Preliminary CTMP and Transport Assessment', ("**Demolition Assessment**") which is attached in Appendix H. This report has been updated from the previous lodged 5 July 2024 version to respond to Section 92 requests from Auckland Transport and Council.

To summarise, demolition is expected to occur over a 10 to 12-month period. This will consist of the following stages, with indicative timeframes shown in brackets (assuming a 12-month scenario).

- Stage 1 – Removal of Lower Hobson Street pedestrian overbridge (48 hours)
- Stage 2 – Demolition of the west section of the Downtown Carpark building, with a crane located on Lower Hobson Street (3 months)
- Stage 3 – Demolition of the west section of the Downtown Carpark building, with a crane located within the Site (3 months)
- Stage 4 – Demolition of the east section of the Downtown Carpark building (6 months)
- Stage 5 – Removal of Downtown Carpark ramp over Customs Street West onto Fanshawe Street (1 week).

The Demolition Assessment report provides further details with regard to the following matters.

- Auckland Transport's Temporary Traffic Management Guidelines
- Construction hours
- Heavy vehicle routes
- The proposed demolition methodology for Stages 1 to 5
- Pedestrian and cyclist safety assessment and diversion mitigation
- Public transport assessment
- Local access assessment
- Contractor parking assessment and mitigation
- Construction traffic generation
- Transport network effects of road and lane closures
- Vehicle tracking of construction vehicles

- Make good works of the adjacent road network
- Auckland Unitary Plan assessment of temporary activities.

The demolition transportation effects are proposed to be managed and mitigated through the implementation of a Construction Traffic Management Plan ("**CTMP"**). Our assessment concludes that subject to a final CTMP being prepared and implemented by a contractor once appointed, the transport effects resulting from the demolition of the Downtown Carpark can be safely and efficiently managed and mitigated.

11.2 Construction traffic assessment

We anticipate that the construction of the Development will follow much of the same methodology outlined in the Demolition assessment in Appendix H. A CTMP will be required to manage construction traffic effects during this stage.

We anticipate the following will also apply to the construction phase, as already outlined in the demolition assessment.

- Construction hours
- Pedestrian and cyclist safety assessment and diversion mitigation
- Local access assessment
- Contractor parking assessment and mitigation.

We outline the potential differences between construction and demolition in the sections below.

11.2.1 Construction programme

The proposed works involve the following construction of the following:

- A 6-level basement
- Two main towers (commercial and residential)
- Three podiums.

Following the demolition of the existing car parking building, an indicative construction programme is set out below, with construction occurring over the following phases. When considered alongside the demolition, the total duration of these construction phases is anticipated to occur for approximately 6 years. We note that some of the phases listed below may overlap with each other.

- Enabling works – 6 months
- Excavation – 9 months
- Basement construction – 14 months
- Main construction (of towers and podiums) – 40 months

The programme will be subject to a contractor being appointed and developing their own detailed construction methodology.

11.2.2 Construction traffic methodology

Given the overall length of construction and the different phases that will occur, the exact construction traffic methodology is likely to vary to adapt to the requirements and methodology of the contractor. Given the uncertainties and the range of construction activities that will occur over the construction period, it is important to provide flexibility for the methodology to be developed at a later stage.

Similar to the initial CTMP prepared for the demolition phase of the Development, the CTMP for the construction phase will be prepared based on the following principles:

- Protect the public from construction activities
- Contain the construction works within the Site where possible
- Minimise unnecessary pedestrian, road and bus lane closures. Provide safe alternatives where any closures are required
- Undertake the construction in an efficient manner to avoid prolonging any required road or footpath closures
- Provide consideration to the Auckland Transport's Temporary Traffic Management Guidelines
- Avoid Quay Street as a construction vehicle route.

For the purposes of providing a preliminary construction traffic methodology assessment, we prepared several construction access options.

- These options are provided in Appendix I
- Based on feedback provided by Auckland Transport through the Section 92 process, all options avoid Quay Street as a construction vehicle route
- The options are summarised as follows.
    - Option 1a
        - Construction loading on the Lower Hobson Street slip lane
        - This is the same as Stage 3 in the Demolition Assessment
        - This assumes that trucks will access the site from underneath the Lower Hobson Street flyover. Temporary adjustments will be required of the kerb, signpost and signal post to accommodate 12.6 m rigid trucks (or similar truck sizes)
        - A full closure of the Lower Hobson Street flyover will be required
        - Assuming that trucks are not able to enter the Site directly, trucks will be required to reverse up the Lower Hobson Street slip lane. This will require management controls by the contractor, to safely manage truck movements
        - A footpath closure will be required on Lower Hobson Street and parts of Customs Street West to protect pedestrians from construction works and truck movements. A temporary pedestrian crossing could be created on Customs Street West to retain some pedestrian connectivity in this area
        - This option may be suitable when trucks are not able to access the Site directly, and when large trucks are not required for construction

- It would not be suitable for large trucks, as they would not be able to enter from underneath the flyover. It may also not be suitable where there are concentrated truck volumes due to the need to manage reversing truck movements in a contained area.

- Option 1b
  - This is a variation on Option 1a. The difference is that trucks would enter and exit the Site directly, upon accessing the construction area from underneath the flyover
  - The tracking shows a truck entering and exiting the Site from a nominal location, but this would depend on the types of construction works occurring within the Site, and the space available for trucks to turn
  - This option provides more flexibility compared to Option 1a, as it does not have the reversing trucks on the Lower Hobson Street slip lane
  - We note that there may be limited times for when this option could be applied. During the excavation or basement construction phase, there may not be suitable gradients for a truck to directly access the Site. Furthermore, when the towers and podiums are being constructed, there will likely be limited space within the Site for trucks to manoeuvre as the buildings increase in size.
- Option 2
  - Construction loading on Customs Street West
  - This assumes construction loading will occur on Customs Street West, by using the existing bus lane
  - This can accommodate a 19.45 semi-trailer (or other large trucks), which will likely be required for some parts of construction, for example the transport of large structural columns or beams
  - If Lower Hobson Street slip lane is not required for construction access, it could potentially remain open to allow right turns at the south end. However, we note that this would potentially require the kerbs and signal posts to be readjusted, assuming these are modified during the demolition period (or if Option 1a and 1b are implemented first)
  - As it requires the closure of a bus lane, this option should be limited where practical to do so, to minimise impacts on buses
  - The effects of these closures will be similar to Stage 4 of the Demolition Assessment, as this also assumes the bus lane may need to be closed for some periods of the demolition works.
- Option 3
  - Construction loading within the Site
  - This assumes no road closures, and that a construction vehicle will be able to enter and exit directly from the Site
  - The tracking shows a truck entering and exiting the Site from a nominal location, but this would depend on the types of construction works occurring within the Site, and the

space available for trucks to turn. The tracking shows a 12.6 m rigid truck, as a larger truck could potentially have difficulties entering and exiting the Site in a forward direction

- We note that there may be limited times for when this option could be applied. During the excavation or basement construction phase, there may not be suitable gradients for a truck to directly access the Site. Furthermore, when the towers and podiums are being constructed, there will likely be limited space within the Site for trucks to manoeuvre as the buildings increase in size.

We note that these options are not an exhaustive list of options, and the contractor may develop different options in the final CTMP. However, there will be limited locations for alternatives given Quay Street will not be supported as a construction vehicle route, and the Site has frontages to only Customs Street West and Lower Hobson Street.

11.2.3 Construction traffic generation

Of the construction activities, it is expected that the demolition and excavation activities will generate the highest amount of heavy vehicle movements onto the surrounding road network. This will depend on the size/type of trucks used to remove material. For our assessment, we have considered 3 types of trucks – a truck and trailer unit, a semi-trailer truck and a 12.6 m rigid truck.

To estimate the number of heavy vehicle movements, we have assumed the following:

- 130,000 m^3 volume of earthworks
- Assumed bulking factor of 1.3
- 9-month programme (234 working days, assuming a 6-day working week).

Table 18 summarises the estimated number of heavy vehicle movements during earthworks based on the three different truck sizes.

Table 18: Assessment of heavy vehicle generation during earthworks

Truck type	Carry capacity (m^3)	Total no. of trucks	Average trucks per day	Average truck movements per day
12.6m large rigid truck	10	16,900	72	144
19.45m semi-trailer truck	13	13,000	56	111
23m truck and trailer	20	8,450	36	72

We note the following about truck volumes during earthworks:

- Depending on the truck size, there could be an average of 36 – 72 trucks per day (72 – 144 truck movements per day) during earthworks
- Based on a weekday working period between 7 am to 6 pm, there could be an average of 3 to 7 trucks per hour (6 to 14 truck movements per hour)
- From a transport effects perspective, we consider that an average of 3 to 7 trucks per hour (6 to 14 truck movements per hour) can be accommodated if a separated truck loading area is provided. We note that traffic volumes in the local area will be reduced as the Downtown Carpark would have already been demolished at this point in time, more than offsetting construction traffic
- Our demolition assessment has already modelled 7 trucks per hour (14 truck movements per hour) for Stages 1 to 5 of the demolition. This modelling provides an overview of potential construction effects during weekday peak periods
- We note that the volumes of heavy vehicles on a daily and hourly will ultimately be dependent on the methodology the contractor develops.

The construction phase will also generate light vehicle movements:

- While contractors will be encouraged to use public transport or park in other areas in the City Centre, there may still be some staff who need to drive directly to the Site on some occasions
- This could involve light vehicles driving in and out of the construction zone on the Lower Hobson Street lane adjacent to the building if this is used during any part of construction
- We note that on-site parking may be restricted or limited during specific stages of construction, notably excavation and once the structures have been established
- This information can be provided in a final CTMP when a contractor is appointed.

11.2.4 Conclusion of construction traffic effects

In summary, we consider that construction traffic effects can be managed with the implementation of a CTMP. This can be provided as a condition of consent and developed in further detail by the contractor once appointed.

12 MITIGATION MEASURES

We recommend the following mitigation measures be provided for the Development.

- The development and implementation of a Servicing Management Plan to ensure that all servicing vehicles that access the Development comply with the necessary vertical clearance restrictions
- On the service at the Quay Street, access measures are implemented to improve visibility between exiting trucks and inbound vehicles. We have assumed a convex mirror will be provided
- The development and implementation of a CTMP for the demolition and construction phases, to safely manage construction effects.

13 CONCLUSIONS

Alignment with central and local government landuse and transport planning policy

The Development aligns well with the objectives set out in central and local government landuse and transport planning policy documents. It is a high-density residential and commercial development located with excellent access to public transport, well connected for cycling and walking and a significant number of services and amenity within short walking distance.

The Site location, in combination with reducing the existing on-site parking supply by around 70% compared to the existing Downtown Carpark, discourages the use of private vehicles as a mode of travel and contributes to Auckland's reductions in transport-based greenhouse gas emissions.

Unitary Plan transport matters

Under the Unitary Plan transport related rules, the Development has a Discretionary activity status because the Development's basement will be used for 121 off-site parking spaces. This relates to an existing agreement whereby the M Social hotel, located directly to the north of the Site, has the use of 121 off-site parking spaces in the existing Downtown Carpark, and as such, provision needs to be made in the Development. This arrangement will not result in any adverse transport effects, as it is an existing situation. The traffic demands of this offsite parking have been included in our traffic assessment.

The provision and design of all transport facilities, including vehicle crossings, accessways, car and bicycle parking provision, loading facilities and pedestrian facilities, all comply with the standards of the Unitary Plan except for the vertical clearance requirements associated with service vehicles and accessible parking spaces.

- For service vehicles, this relates to the section of the service lane between the Quay Steet access and the access to the basement loading area. (3.8 m vertical clearance is required, and 3.6 m clearance is provided). This is an existing situation and we have observed that this small non-compliance of 200 mm still allows for trucks to use the service lane to access the existing loading docks on the service lane. Notwithstanding this and to manage the effects of the Development's vertical clearance restrictions, we recommend that a Servicing Management Plan be required to ensure that all servicing vehicles that access the Development comply with the necessary vertical clearance restrictions.
- For accessible parking, 2.5 m of vertical clearance is not provided for all of the parking spaces or access areas. We have assessed accessible parking design standards, and consider the available vertical clearance is appropriate.

The Unitary Plan specifies that tandem or stacked spaces are permitted for residential activities. While the final parking allocation has not been determined, the tandem spaces could potentially be allocated to the office activities. We consider this can be managed by allocating the tandem spaces to the same office tenancies. The users of these spaces will be regular users, and use of the tandem spaces can be coordinated and managed as required.

Under Plan Change 79 of the Unitary Plan, additional accessible parking spaces are required for all activities. The standards require a total of 51 accessible parking spaces, whereas 24 are proposed. The proposed provision will be sufficient to meet the residential accessible parking requirements but have a shortfall for the office and retail activities. We consider that the proposed provision is acceptable as excellent and accessible public transport options are available in close proximity to the Site.

Under the Unitary Plan, Quay Street and Customs Street West access have vehicle access restrictions. We have accordingly completed an assessment of the Development's use of these accesses, having regard to the relevant restricted discretionary activity criteria in the Unitary Plan. We conclude that the location and design of these crossings are such that there is adequate sight distance for these crossings to function safely and efficiently under the predicted traffic demands.

Traffic effects assessment

With regard to access, we note that the number and design of the Site's vehicle access will have positive transport effects compared to the existing situation, as all access and vehicle crossings associated with the existing Downtown Carpark will be removed.

The removal of the existing crossings on Customs Street West into the Downtown Carpark will provide a safer environment for pedestrians, noting that these are the only locations where pedestrian crashes have been recorded to have occurred over the past 5 years.

The SATURN results show the following for all scenarios and peak periods.

- Vehicles generally reroute away from the routes serving the existing Downtown Carpark (Sturdee Street, the Lower Hobson Street slip lane adjacent to the Site), towards the routes directed to the Development's access points (Quay Street, Customs Street West and the Lower Hobson Street Flyover)
- The change in vehicle volumes is mostly concentrated in the areas near the Development and Downtown Carpark access points. No significant changes in vehicle volumes are predicted in the wider network
- No increases of vehicle delays of more than 10 seconds are predicted in any scenario, both in the local area and the wider network. All scenarios show a decrease in delays at the Downtown Carpark exit ramp onto Fanshawe Street, as this signalised intersection will no longer be required
- The Development will have negligible impact on overall vehicle travel times across the network, with average journey times for all vehicles increasing up to 1 second compared to the future baseline
- No noticeable change to bus route travel times are predicted. There will be some small increases and decreases of -14 to +13 seconds for some bus routes.

Overall, we consider that the results of the SATURN network modelling have shown that the existing road network can efficiently accommodate the traffic demands of the Development.

The SIDRA results show that under the Development scenario traffic demands,

- The Customs Street West access is predicted to operate with minimal delays under all Development scenarios, with LOS A for all movements. This access operates as a left-in / left-out access
- The Quay Street access is predicted to perform well
    - No noticeable changes are predicted in the AM peak
    - In the PM peak, the right turn out delays are predicted to increase from 20 to 23 seconds
    - In both peak periods, the right turn operates at LOS C, and all other movements operate at LOS A
- While the turning volumes from the service lane are predicted to increase, there is generally a decrease in through traffic volumes due to the redistribution of the existing Downtown Carpark trips away from the local area.

In summary, we believe that both access points of the service lane can operate within capacity. The results do not indicate there will be any safety concerns as a result of turning traffic and congestion.

Construction traffic effects

Demolition of the Downtown Carpark building and associated structures is expected to occur over a 10 to 12-month period. This will consist of the following stages, with indicative timeframes shown in brackets (assuming a 12-month scenario).

- Stage 1 – Removal of Lower Hobson Street pedestrian overbridge (48 hours)
- Stage 2 – Demolition of the west section of the Downtown Carpark building, with a crane located on Lower Hobson Street (3 months)
- Stage 3 – Demolition of the west section of the Downtown Carpark building, with a crane located within the Site (3 months)
- Stage 4 – Demolition of the east section of the Downtown Carpark building (6 months)
- Stage 5 – Removal of Downtown Carpark ramp over Customs Street West onto Fanshawe Street (1 week).

Following the demolition of the existing car parking building, an indicative construction programme is set out below, with construction occurring over the following phases. When considered alongside the demolition, the total duration of these construction phases is anticipated to occur for approximately 6 years. We note that some of the phases listed below may overlap with each other.

- Enabling works – 6 months
- Excavation – 9 months
- Basement construction – 14 months
- Main construction (of towers and podiums) – 40 months

We anticipate that the different stages of demolition and construction will require closures of roads, traffic lanes and pedestrian footpaths for roads in the surrounding area. This is to provide a separated

loading area and access points for construction vehicles, and to provide safe separation between the public and live work zones.

We anticipate that a Construction Traffic Management Plan (CTMP) can safely manage construction traffic effects during demolition and construction. The CTMP will be prepared based on the following principles

- Protect the public from construction activities
- Contain the construction works within the Site where possible
- Minimise unnecessary pedestrian, road and bus lane closures. Provide safe alternatives where any closures are required
- Undertake the construction in an efficient manner to avoid prolonging any required road or footpath closures
- Provide consideration to the Auckland Transport's Temporary Traffic Management Guidelines
- Avoid Quay Street as a construction vehicle route.

We note that a contractor has not been appointed at this time. The programme and methodology will be subject to the contractor applying their own methodology once appointed.

Conclusions and recommended mitigation measures

We consider that there are no traffic engineering or transport planning reasons why the Development should not be approved, subject to conditions of consent being required.

- The development and implementation of a Servicing Management Plan to ensure that all servicing vehicles that access the Development comply with the necessary vertical clearance restrictions
- On the service at the Quay Street, access measures are implemented to improve visibility between exiting trucks and inbound vehicles. We have assumed a convex mirror will be provided
- The development and implementation of a Construction Traffic Management Plan for the demolition and construction phases is to be developed to safely manage construction effects.

APPENDIX A Unitary Plan assessment

CHAPTER E27 TRANSPORT ASSESSMENT

Chapter E27 Transport Standards

E27 Standard	Assessment
E27.6.1. Trip generation	
(1) Where a proposal (except where excluded in Standard E27.6.1(2)) exceeds one of the following thresholds: (a) a new development in Table E27.6.1.1 (b) 100 v/hr (any hour) for activities not specified in Table E27.6.1.1 requiring a controlled or restricted discretionary land use activity consent in the applicable zone where there are no requirements for an assessment of transport or trip generation effects. This standard does not apply to development activities provided for as permitted in the applicable zone; or (c) a proposed subdivision of land which has capacity under this Plan to accommodate more than 100 dwellings Resource consent for a restricted discretionary activity is required (2) Standard E27.6.1(1) Does not apply where: (a) a proposal is located in the Business – City Centre Zone	**Does not apply** The Development is located within the Business – City Centre Zone
PC79 - E27.6.1. Trip generation (1) Where a proposal (except where excluded in Standard E27.6.1(2)) exceeds one of the following thresholds: (a) a new development or subdivision in Table E27.6.1.1; or (b) 100 v/hr (any hour) for activities not specified in Table E27.6.1.1 requiring a controlled or restricted discretionary land use activity consent in the applicable zone where there are no requirements for an assessment of transport or trip generation effects. This standard does not apply to development activities provided for as permitted in the applicable zone resource consent for a restricted discretionary activity is required.	**Does not comply** The Development is located within the Business – City Centre Zone
E27.6.2. Number of parking and loading spaces	
(1) The number of parking spaces must meet rates specified in Table E27.6.2.1 ***(T11 – T14) Residential: Dwellings*** ◆ T11 Dwellings <75m2 GFA, maximum of 0.7 per dwelling ◆ T12 Dwellings ≥75 and < 90m2 GFA, maximum of 1.4 per dwelling ◆ T13 Dwellings ≥90m2 GFA, maximum of 1.7 per dwelling ◆ T14 Visitor spaces, maximum of 0.2 per dwelling ***(T15) All other activities*** ◆ Maximum of 1:200 m^2 GFA	**Complies** Refer to Section 9.1.1
(6) Bicycle parking (a) the activities specified in Table E27.6.2.5 must provide the minimum number of bicycle parking spaces specified; and (b) the following bicycle parking requirements apply to new buildings and developments ***(T81) Residential: Developments of 20 or more dwellings*** ◆ Minimum of 1 visitor space per 20 dwellings ◆ Minimum of 1 secure space per dwelling without a dedicated garage ***(T86) Offices: greater than 10,000 m^2 GFA*** ◆ Minimum 10 spaces plus 1 space per 2,000 m^2 above 10,000 m^2	**Complies** Refer to Section 9.2

◆ Minimum 1 secure space per 300 m^2 GFA of office ***(T88) Retail: Food and beverage: Greater than 350 m^2 GFA*** ◆ Minimum 1 visitor space per 350 m^2 GFA ◆ Minimum 1 secure space per 300 m^2 GFA ***(T90) Retail: All other retail: greater than 500 m^2 GFA up to 5,000 m^2 GFA*** ◆ Minimum 1 visitor space per 500 m^2 GFA ◆ Minimum 1 secure space per 300 m^2 GFA of office	
PC79 - (6) Bicycle parking (e) the activities specified in Table E27.6.2.5 must provide the minimum number of bicycle parking spaces specified; (aa) for residential developments, the required secure long–stay bicycle parking must be located and designed in a manner that (is): i. not part of any required outdoor living space or landscaped area; ii. in a location accessible from either the road, vehicle access, pedestrian access or car parking area; iii. sheltered from the weather; iv. lockable and secure; xii. the following bicycle parking requirements apply to new buildings and developments ***(T81) Residential: All residential developments*** ◆ Minimum of 1 visitor space per 20 for developments of 20 or more dwellings ◆ Minimum of 1 secure space per dwelling without a dedicated garage or basement car parking space	**Complies** Refer to Section 9.2 We note that the difference of the PC79 standards for bicycle parking is that secure bicycle parking is not required for residential activities with a basement car parking space. Given all residential units will have a basement parking space, no secure bicycle parking spaces for the residential activity are technically required.
(7) End-of-trip facilities: (a) the activities specified in Table E27.6.2.6 must provide end-of-trip facilities as listed below; and (b) the following end-of-trip facilities requirements apply to new buildings and development ***(T106-107) Offices, education facilities, hospitals*** ◆ Greater than 2,500 m^2 up to 7,500 m^2 GFA. Two showers and changing area with space for storage of clothing ◆ Every additional 7,500 m^2 GFA. Two additional showers and changing area with space for storage of clothing.	**Complies** Refer to Section 9.3
(8) Number of loading spaces: (a) all activities must provide loading spaces as specified in Table E27.6.2.7 ***(T108 – T111) Retail and industrial activities*** ◆ Up to 300 m^2 GFA, no loading spaces required ◆ 300 m^2 to 5000 m^2 GFA, 1 loading space required ◆ 5,000 m^2 to 10000 m^2 GFA, 2 loading spaces required ◆ Greater than 10,000 m^2, 3 loading spaces required plus 1 space for every additional 10,000 m^2 ***(T113 – T115) All other activities*** ◆ Up to 5,000 m^2 GFA, no loading spaces required ◆ 5000 m^2 to 20,000 m^2 GFA, 1 loading space required ◆ Greater than 20,000 m^2 GFA, 2 loading spaces required ◆ Greater than 90,000 m^2 GFA, 3 loading spaces required plus 1 for every additional 40,000 m^2	**Complies** Refer to Section 9.4.1
Note: Accessible parking	**Complies**

(a) where parking is provided, parking spaces are to be provided for people with disabilities and accessible routes from the parking spaces to the associated activity or road as required by the New Zealand Building Code D1/AS1. The dimensions and accessible route requirements are detailed in the New Zealand Building Code D1/AS1 New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001)	Refer to Section 9.1.3
PC79 - (8) Number of loading spaces: (a) residential activities where part of the site has frontage to an arterial road as identified on the planning maps, must provide loading as specified in Table E27.6.2.7A. **Add New Table E27.6.2.7A Minimum small loading space requirements** **Activity** / **GFA/Number of dwellings** / **Minimum rate** (T111B) / Developments where all dwellings have individual pedestrian access directly from a public road / No loading space required (T111B) / Up to 9 dwellings without individual pedestrian access directly from a public road / No loading space required (T111B) / Greater than 9 dwellings up to 5,000m² without individual pedestrian access directly from a public road / 1* (T111B) / Greater than 5,000m² / NA	**Complies** The Development has greater than 5,000m² GFA, so no small loading spaces are required
E27.6.3.1. Size and location of parking spaces	
(1) Every parking space must (a) comply with the minimum dimensions given in Table E27.6.3.1.1 and Figure E27.6.3.1.1; and (b) be located on the same site as the activity to which it relates unless one of the following criteria is met: (i) the parking is located in an H7 Open Space Zone and the reserve, park or recreation area consists of more than one adjoining Certificate of Title. In that case, the parking must be located within the same reserve, park or recreation area as the activity to which it relates; or (ii) resource consent is granted to an alternative arrangement, such as shared parking, offsite parking, or non-accessory parking. (c) [deleted] (d) be kept clear and available at all times the activity is in operation, except where stacked parking is permitted by Standard E27.6.3.3(3) below (e) be located outside any area designated for road widening; and (f) parking located in part of any yard on the site (where it is permitted in the zone) must not: (i) impede vehicular access and movement on the site; and (ii) infringe any open space and landscape requirements for the relevant zone; and (g) not to be sold or leased separately from the activity for which it provides parking as an accessory activity unless a resource consent is granted to an alternative arrangement such as shared parking or off-site parking.	**Complies** (a) all parking spaces comply with the minimum dimensions (b) parking will be located on the same site. The M Social parking spaces will be a continuation of the existing off-site parking arrangement (c) are not used for any other purpose (d) all parking spaces will be kept clear and available (e) all parking spaces are located outside any area designated for road widening; (f) Parking does not (i) impede vehicular access and movement on the site; and (ii) infringe any open space and landscape requirements for the relevant zone (g) parking spaces will not to be sold or leased
PC79 - E27.6.3.1. Size and location of parking spaces (1) Every parking space must (a) comply with the minimum dimensions given in Table E27.6.3.1.1 and Figure E27.6.3.1.1; except accessible parking dimensions and accessible route requirements must be designed in accordance with the New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121- 2001); and	**Complies** The parking spaces are designed to meet these requirements While some accessible parking spaces will not fully have 2.5 m of vertical clearance, we have assessed this under E27.6.3.5

E27.6.3.2. Size and location of loading spaces	
(1) Every loading space must: (a) comply with the minimum dimensions given in Table E27.6.3.2.1; and (b) be located on the same site as the activity to which it relates and be available at all times while the activity is in operation; and (c) be located outside any area designated for road widening; and (d) comply with the following when any yard of a site is used to provide the loading space (where it is permitted within the zone): (i) ensure that the footpath or access to the rear of the site or access to an adjacent property is not blocked at any time; and (ii) the use of the loading space does not create a traffic hazard on the road at any time.	**Complies** Refer to Section 9.4.3
PC79 - E27.6.3.2. Size and location of loading spaces (1) Every loading space must: (a) comply with the minimum dimensions given in Table E27.6.3.2.1; and (e) have a maximum crossfall of 1:50 (2%) in all directions	**Complies** All loading spaces will be flat
PC79 - E27.6.3.2(A). Accessible Parking	
(1) Accessible parking must be provided for all new activities, changes of activity type, and/or the expansion or intensification of an existing activity in all zones, except for those listed below in E27.6.3.2(A)(2): (2) Accessible parking is not required in the following zones, unless car parking is provided on-site, in which case the required number of accessible parking spaces must be determined in accordance with Table 1 or Table 2 below, whichever is relevant: Business Zones: a) Business – City Centre Zone; b) Business – Metropolitan Centre Zone; c) Business – Town Centre Zone; d) Business – Local Centre Zone; e) Business – Mixed Use Zone; f) Business – Neighbourhood Centre Zone. Residential Zones: a) Residential - Terrace Housing and Apartment Buildings Zone. (3) For residential developments in residential zones (excluding the Terrace Housing and Apartment Buildings Zone unless car parking is provided on-site), accessible parking spaces must be provided for developments of 10 or more dwellings on a site. (4) The required number of onsite accessible parking spaces provided must be calculated using the following method: i. For non-residential land uses: Step 1 - Use the Parking Demand Guidelines in Appendix 23 to determine the theoretical parking demand. Offices: a minimum of 1 per 45 m2 GFA Retail – all other retail (including food and beverage): 1 per 25 m2 GFA Step 2 - Use Table 1 – Number of accessible parking spaces – Non-Residential, below to determine the required number of accessible car park spaces based on either the number of parking spaces that are proposed to be provided or the theoretical parking demand calculated in step 1, whichever is the higher. **Table 1 – Number of accessible parking spaces – Non-Residential land uses**	**Does not comply** Refer to Section 9.1.3 (1) Accessible car parking is required under this standard. (2) While the Site is located in the Business – City Centre zone, parking is already proposed on-site. For offices, 150 spaces are proposed For retail, no parking spaces are proposed (3) Not applicable (4) (i) Step 1: The theoretical parking demand for non-residential activities is: • Offices: 1,760 spaces for theoretical demand (1 space per 45 m^2 GFA, 79,204 m^2 proposed) • Retail food and beverage: 81 spaces for theoretical demand (1 space per 25 m^2 GFA, 2,033 m^2 proposed). However, we note that no on-site parking is proposed for the retail activity Step 2: For non-residential land uses: For both offices and retail, the theoretical demand is higher than the actual parking provision. Based on the theoretical demand and Table 1, the number of accessible spaces required is • Offices: not less than 37 • Retail food and beverage: not less than 3 For residential land uses: 247 residential units are proposed. Based on Table 2, not less than 11 accessible spaces are required. For all activities, not less than 51 accessible parking spaces are required

Total number of parking spaces provided or theoretical parking spaces, whichever is the higher	Number of accessible parking spaces
1 – 20	Not less than 1
21 – 50	Not less than 2
For every additional 50 parking spaces or part of a parking space	Not less than 1

ii. For retirement villages, supported residential care, visitor accommodation and boarding houses. The same method for calculating the required number of onsite accessible parking spaces for non-residential uses in 4(i) applies.

iii. For residential land uses the required number of accessible parking spaces provided must be in accordance with Table 2 below:

Table 2 – Number of accessible parking spaces – Residential land uses

Number of dwellings	Number of accessible parking spaces
10 - 19	Not less than 1
20 - 29	Not less than 2
30 – 50	Not less than 3
For every additional 25 dwellings or units	Not less than 1

24 accessible parking spaces are proposed, which does not meet the minimum requirement of 51 spaces. We have assumed this provision is sufficient to cover the residential requirement, but not the office or retail requirements

E27.6.3.3. Access and manoeuvring	
(1) Every parking space must have driveways and aisles for entry and exit of vehicles to and from the road, and for vehicle manoeuvring within the site. Access and manoeuvring areas must accommodate the 85 percentile car tracking curves in Figure E27.6.3.3.1	**Complies** Refer to Section 9.1.5 and 9.4.3 Refer to tracking assessments attached to this report – no reverse manoeuvring is required onto the road
(2) For every loading space accommodating heavy vehicles the access and manoeuvring areas associated with that loading space must comply with the tracking curves set out in the NZTA guidelines: RTS 18: NZ on-road tracking curves (2007)	**Complies** Refer to Section 9.4 While 'NZTA guidelines: RTS 18: NZ on-road tracking curves (2007)' outline an 8 m rigid truck, we have used an 8.3 m rigid truck. We consider that an 8.3 m accounts for the 8 m truck in this guideline, and is slightly larger
PC79 - (2A) For every loading space required by Table E27.6.3.2.1.(T137A) the access and manoeuvring areas associated with that loading space must accommodate the 6.4m van tracking curves set out in Figure E27.6.3.3.3.	**Does not apply** Loading is not required under Table E27.6.3.2.1.(T137A)
(3) Where a dwelling provides more than one parking space, these may be stacked. Stacked parking means access is required through another parking space.	**Does not comply** Refer to Section 9.1.5 Tandem parking is proposed. These spaces could potentially be allocated to office tenancies, whereas the standard specifies dwellings only.
E27.6.3.4. Reverse manoeuvring	
(1) Sufficient space must be provided on the site so vehicles do not need to reverse off the site or onto or off the road from any site where any of the following apply: (a) Four or more parking spaces are served by a single access; (b) there is more than 30m between the parking space and the road boundary of the site; or (c) access would be from an arterial road or otherwise within a Vehicle Access Restriction covered in Standard E27.6.4.1.	**Complies** Sufficient space is provided such that no reverse manoeuvring onto Customs Street West or Quay Street is required

PC79 - E27.6.3.4A. Heavy vehicle access	
(1) Where a site in a residential zone provides heavy vehicle access it must provide sufficient space on the site so an 8m heavy vehicle does not need to reverse onto or off the site or road, with a maximum reverse manoeuvring distance within the site of 12m (2) Heavy vehicle access and manoeuvring areas associated with access required by E27.6.3.4A(1) must comply with the tracking curves set out in the Land Transport New Zealand Road and traffic guidelines: RTS 18: New Zealand on-road tracking curves for heavy motor vehicles (2007).	**Not Relevant** The Development is not located in a residential zone
E27.6.3.5. Vertical clearance	
(1) To ensure vehicles can pass safely under overhead structures to access any parking and loading spaces, the minimum clearance between the formed surface and the structure must be: (a) 2.1m where access and/or parking for cars is provided for residential activities (b) 2.3m where access and/or parking for cars is provided for all other activities (c) 2.5m where access and/or accessible parking for people with disabilities is provided; or (d) 3.8m where loading is required.	**Does not comply** Refer to Section 9.1.7 and 9.4.2 Vertical clearance on the service lane is 3.6 m where servicing vehicles will travel, which is lower than the 3.8 m standard where loading is required Vertical clearances for access areas of accessible parking areas will not be 2.5 m. Accessible parking spaces on Level B03 will not have 2.5 m of full vertical clearance Vertical clearance in all other areas will meet the required standards
PC79 – E27.6.3.5. Vertical clearance (1) To ensure vehicles can pass safely under overhead structures to access any parking and loading spaces, the minimum clearance between the formed surface and the structure must be: (c) 2.5m where access and/or accessible parking is provided and/or required; (ca) 2.8m where loading is required for residential activities denoted with an asterisk (*) in Table E27.6.2.7A; (cb) 3.8m where heavy vehicle access in Standard E27.6.3.4A is provided; or	**Does not comply** The same infringements as per E27.6.3.5 above apply. The PC79 amendments do not change this infringement
E27.6.3.6. Formation and gradient	
(1) Except for Standard E27.6.3.6(2) below, the whole area of parking and loading spaces, and manoeuvring areas and aisles must be formed, drained, provided with an all-weather surface to prevent dust and nuisance, and be marked out or delineated. This must be done before the activity to which those parking and loading spaces relate commences, and maintained for as long as that activity is continued.	**Complies** All parking and manoeuvring areas will be formed and drained with an all weather surface
(3) The gradient for the surface of any parking space must not exceed: (a) 1 in 25 (4%) in any direction for accessible spaces for people with disabilities; or (b) 1 in 20 (5%) in any direction for other spaces.	**Complies** Refer to Section 9.1.6 Parking spaces will be located in the basement and flat
(4) The gradient for the manoeuvring area must not exceed 1 in 8 (12.5%)	**Complies** Refer to Section 9.1.6 The maximum gradient for parking spaces is not more than 1:8
E27.6.3.7. Lighting	
(1) Lighting is required where there are 10 or more parking spaces which are likely to be used during the hours of darkness. The parking and manoeuvring areas and associated pedestrian routes must be adequately lit during use in a manner that complies with the rules in Section E24 Lighting.	**Can Comply** Lighting will be provided, this will be confirmed as part of the future Building Consent
PC79 - E27.6.3.7. Lighting (2) Lighting is required, in residential zones to primary pedestrian access, vehicle access, parking and manoeuvring areas, where any of the following apply: (a) There are four or more dwellings accessible from a primary pedestrian access which is not adjacent to a vehicle access; (b) There are 10 or more parking spaces; or	**To be assessed by others** The Development is not located in a residential zone. Lighting is assessed elsewhere in the application documents.

(c) There are 10 or more dwellings. Adequate lighting must be provided during the hours of darkness in a manner that complies with the rules in Section E24 Lighting.	
E27.6.4.1. Vehicle Access Restrictions	
(1) Vehicle Access Restrictions apply and new vehicle crossings must not be constructed to provide vehicle access across that part of a site boundary which is subject to: (a) a Vehicle Access Restriction – General Control as shown on the planning maps in the Business – City Centre Zone; or (b) a Key Retail Frontage Control as shown on the planning maps	**A vehicle access restriction applies** The Quay Street service lane vehicle crossing is subject to a Vehicle Access Restriction – General Control. The Quay Street vehicle crossing is existing, and will not be modified
(2) Standard E27.6.4.1(3) below applies in any of the following circumstances: (a) a new vehicle crossing is proposed; (b) a new activity is established on a site; (c) there is a change of type of activity	**E27.6.4.1(3) applies** A new activity will be established on site
(3) Vehicle Access Restrictions apply and vehicle crossings must not be constructed or used to provide vehicle access across that part of a site boundary which (a) is located within 10m of any intersection as measured from the property boundary, illustrated in Figure E27.6.4.1.1; (b) is subject to the following types of Vehicle Access Restriction as identified on the planning maps in the zones listed in Table E27.6.4.1.1; (c) has frontage to an arterial road as identified on the planning maps; (d) is located closer than 30m from a railway level crossing limit line	**A vehicle access restriction applies** **The vehicle crossing:** (a) Is not located within 10m of any intersection as measured from the property boundary (b) Is not subject to the following types of Vehicle Access Restriction as identified on the planning maps in the zones listed in Table E27.6.4.1.1 (The Vehicle Access Restriction – General Control is covered by Standard E27.6.4.1(1)(a)); (c) Has frontages to arterial roads (Quay Street and Customs Street West) as identified on the planning maps; (d) Is not located closer than 30m from a railway level crossing limit line
E27.6.4.2. Width and number of vehicle crossings	
(1) The maximum number of vehicle crossings permitted for any site and separation distance between crossings is specified in Table E27.6.4.2.1. ***(T143) Sites subject to a Vehicle Access Restriction General Control in the Business – City Centre Zone*** ◆ No crossings permitted ***(T144) Sites subject to E27.6.4.1(2) and (3)*** ◆ One crossing per 50m of site frontage ◆ 2m where two crossings on adjacent sites can be combined and where the combined crossings do not exceed a total width of 6m at the property boundary, no minimum separation distance will apply ◆ Minimum of 6m separation between crossing serving the same site	**Complies** The Quay Street frontage is subject to a Vehicle Access Restriction General Control. No crossings are permitted. However, we note that the existing crossing will be utilised. Therefore, there will not be any change on Quay Street for the number of crossings. One crossing on the Customs Street West frontage is proposed, which will be an upgrade of an existing crossing for the service lane. The crossing is not adjacent to any other crossings. The existing Downtown Carpark crossings on Customs Street West will be removed.
(2) The width of a vehicle crossing(s) must meet the minimum width and not exceed the maximum width as specified in Table E27.6.4.3.2. ***(T153) Centres (serving 10 spaces or more)*** ◆ Minimum width of crossing at site boundary of 5.5m (two-way) ◆ Maximum width of crossing at site boundary of 6.0m (two-way)	**Complies** Refer to Section 8.2
(3) With the exception of vehicle crossings on unsealed roads, all vehicle crossings must be designed and constructed to maintain the level, colour, and materials of the footpath to clearly identify to vehicles that pedestrians have priority.	**Complies** The vehicle crossing will be constructed in general accordance with AT vehicle crossing design standards and will maintain a consistent level, colour and material as the adjacent footpath.

<table>
<tr><td>(5) Where a vehicle crossing is altered or no longer required, the crossing, or redundant section of crossing, must be reinstated as berm and/or footpath and the kerbs replaced. The cost of such work will be borne by the owner of the site previously accessed by the vehicle crossing</td><td>Will comply
The applicant will reinstate the berm, footpath and kerb at their cost for the redundant vehicle crossings service the Downtown Carpark</td></tr>
<tr><td colspan="2">E27.6.4.3. Width of vehicle access and queuing requirements</td></tr>
<tr><td>(1) Every on-site parking and loading space must have vehicle access from a road, with the vehicle access complying with the following standards for width:
(a) passing bays are provided in accordance with Table E27.6.4.3.1;
(T148) All other zones
◆ Where the length of access exceeds 50m and the width of access is less than 5.5m, passing bays are required at a maximum of 50m spacing
◆ Passing bays should be at least 5.5m wide over 7m with 45 degree tapers
(b) meeting the minimum formed access width specified in Table E27.6.4.3.2.
(T153) Centres (serving 10 spaces or more)
Minimum width of 5.5m (providing for two-way movement), 1.5 m pedestrian access for rear sites</td><td>Complies
Refer to Section 8.2.3
The accessways are at least 5.5 m which accommodate two-way vehicle movement
As outlined in Section 8.3, pedestrians will be able to access the Site through many locations</td></tr>
<tr><td>PC79 - E27.6.4.3. Width of vehicle access and queuing requirements
(1) Every on-site parking and loading space must have vehicle access from a road, with the vehicle access complying with the following standards:
c) meeting the minimum speed management measure spacing specified in Table E27.6.4.3.3
Table E27.6.4.3.3 Speed management requirements
<table>
<tr><th>Activity</th><th>Length of vehicle access</th><th>Location of minimum speed management measures</th></tr>
<tr><td>(T156A) Residential zones</td><td>Exceeds 30m</td><td>Not more than 10m from the site boundary with the legal road; and not more than 30m spacing between speed management measures.</td></tr>
</table>
Note: Where heavy vehicle access and speed management measures are required, the design of speed management measures should include consideration of heavy vehicle requirements.</td><td>Complies
(c) The Development is not located in a residential zone, so no speed management measures are required under this standard</td></tr>
<tr><td>(2) Access must be designed so that vehicles using or waiting to use fuel dispensers, ticket vending machines, remote ordering facilities and devices, entrance control mechanisms, or other drive-through facilities do not queue into the adjoining road reserve or obstruct entry to or exit from the site.</td><td>Complies
No mechanisms are proposed on the service lane</td></tr>
<tr><td colspan="2">E27.6.4.4. Gradient of vehicle access</td></tr>
<tr><td>(1) The gradient of the access must not be steeper than specified in Table E27.6.4.4.1:
(T157) vehicle access serving any other residential activities
◆ Maximum gradient of 1:5 (20%)
(T158) vehicle access used by heavy vehicles
◆ Maximum gradient of 1:8 (12.5%)
(T159) vehicle access serving all other activities
◆ Maximum gradient of 1:6 (16.7%)</td><td>Complies
Refer to Section 9.1.6</td></tr>
<tr><td>(2) To avoid the underside of the car striking the ground, as illustrated in Figure E27.6.4.4.2, access with a change in gradient exceeding 1 in 8 (greater than 12.5 per cent change) at the summit or a 1 in 6.7 (15 per cent change) at a sag must include transition sections to achieve adequate ground clearance, refer to Figure E27.6.4.4.3. Typically, a transition section requires a minimum length of 2m.</td><td>Complies
Refer to Section 9.1.6</td></tr>
<tr><td>(3) All vehicle access must be designed so that where the access adjoins the road there is sufficient space onsite for a platform so that vehicles can stop safely and check for pedestrians and other vehicles prior to exiting. This is illustrated in Figure E27.6.4.4.4. The platform must have a maximum gradient no steeper than 1 in 20 (5 per cent) and a minimum length of 4m for residential activities and 6m for all other activities.</td><td>Complies
Refer to Section 9.1.6</td></tr>
</table>

E27.6.5. Design and location of off-road pedestrian and cycling facilities	
(1) The design and location of the proposed facility shall provide connections to existing pedestrian and cycling routes and facilities. *(2) The width of the path is designed to accommodate the anticipated number and type of users.* *(3) The surface of the path is designed to safely provide for the anticipated number and type of users.*	**Not Relevant** This standard only applies to public facilities located outside of the legal road.
PC79 - E27.6.6. Design and location of pedestrian access in residential zones	
(1) Where two or more dwellings are proposed in residential zones, primary pedestrian access must be provided which meets the following: (a) have the minimum pedestrian access width and separation specified in Table E27.6.6.1 for its full length; Note 1: Works within the legal road, such as connections to public footpaths, require prior approval from Auckland Transport as the road controlling authority. This approval is separate and additional to any land use or subdivision approval required. (c) have a gradient no greater than: (i) 1 in 12 for pedestrian access which is not adjacent to vehicle access; (ii) the maximum vehicle access gradient as specified in Table E27.6.4.4.1 where the pedestrian access is adjacent to vehicle access; (e) have a surface treatment which is firm, stable and slip resistant in any weather conditions; (f) provide direct and continuous access to the dwellings from a public footpath; (g) be free from permanent obstructions and have a clear height of at least 2.1m for its full length. (2) A minimum clear width of 3m and a minimum clear height of 2.1m for its full length is required for primary pedestrian access where not adjacent to vehicle access and serving: (a) up to three dwellings and has a length greater than 50m; or (b) four or more dwellings (3) For the purposes of (2) above, the clear width may include: (a) the minimum 1.8m formed primary pedestrian access width; (b) landscape treatment with a maximum mature height of 600mm; (c) lighting infrastructure. (4) Standards E27.6.6(1), (2) and (3) above do not apply where: (a) up to three dwellings are proposed on a site and vehicle access is provided to each dwelling; or (b) a dwelling directly fronts and has direct access to a street. (5) For four or more dwellings in residential zones, pedestrian access must be provided to each parking space within a parking area (excluding garages) consisting of four or more parking spaces served by the same vehicle access and: (a) have a minimum width of 1.2m; (b) be vertically separated from trafficable areas as shown in Figure E27.6.4.3.1; (c) connect to the primary pedestrian access or the dwellings associated with those parking spaces; (d) have a surface treatment which is firm, stable and slip resistant in any weather condition; and (e) be free from permanent obstructions and have a clear height of 2.1m for its full length. This standard does not apply where the pedestrian access forms part of a primary pedestrian access.	**Not Relevant** The Development is not located in a residential zone.
PC79 - E27.6.7. Provision for electric vehicle charging	
Purpose: to ensure that any undercover car parks for new semi-detached dwellings or for new dwellings within a terrace or apartment building are provided with the capability to install Electric Vehicle Supply Equipment.	**To be assessed by others** Electric vehicle charging is assessed elsewhere in the application documents.

(1) Any new dwellings with car parking (with the exception of new detached dwellings) must provide each undercover car park with the capability to install Electric Vehicle Supply Equipment with designated space for the necessary conduit, circuit and metering between the car park and an electrical distribution board on the same building storey, or ground level if the car parking space is at ground level. (a) This standard does not apply to any car parking permanently allocated to visitors.	

Summary of E27 standards infringements

- E27.6.4.1(1) Vehicle access restrictions: use of an existing vehicle crossing subject to Vehicle Access Restriction – General Control (Quay Street)
- E27.6.4.1(2 and 3) Vehicle access restrictions: vehicle access onto an arterial road (Customs Street West)
- E27.6.3.3(3) Stacked parking: 23 tandem spaces are proposed which could potentially be allocated to the office activity, whereas only residential is permitted
- E27.6.3.5 Vertical clearance: height restrictions for servicing vehicles – 3.6 m of vertical clearance is provided whereas 3.8 m is required. Accessible parking spaces require 2.5 m of vertical clearance, whereas 2.3 – 2.4 m is provided for areas accessing the spaces
- PC79 E27.6.3.2(A) Accessible parking: 24 accessible parking spaces are provided, whereas not less than 51 spaces are required

Chapter E27 Transport Restricted Discretionary Assessment Criteria

E27.8.2.(8) – Infringes on design standards for parking/loading areas or access **Infringements: Height restrictions for servicing vehicles – 3.6 m of vertical clearance is provided whereas 3.8 m is required** **Accessible parking spaces require 2.5 m of vertical clearance, whereas 2.3 – 2.4 m is provided for areas accessing the spaces** **Stacked parking: 23 tandem spaces are proposed which could potentially be allocated to the office activity, whereas only residential is permitted**	
Assessment Criteria	**Comment**
(A) effects on the safe and efficient operation of the adjacent transport network having regard to: *(i) the effect of the modification on visibility and safe sight distances;* *(ii) existing and future traffic conditions including speed, volume, type, current accident rate and the need for safe manoeuvring;* *(iii) existing pedestrian numbers, and estimated future pedestrian numbers having regard to the level of development provided for in this Plan; or* *(iv) existing community or public infrastructure located in the adjoining road, such as bus stops, bus lanes, footpaths and cycleways.* **(B)** effects on pedestrian amenity or the amenity of the streetscape, having regard to: *(i) the effect of additional crossings or crossings which exceed the maximum width; or* *(ii) effects on pedestrian amenity and the continuity of activities and pedestrian movement at street level in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone and Business – Local Centre Zone.* **(C)** the practicality and adequacy of parking, loading and access arrangements having regard to: *(i) site limitations, configuration of buildings and activities, user requirements and operational requirements;* *(ii) the ability of the access to accommodate the nature and volume of traffic and vehicle types expected to use the access. This may include considering whether a wider vehicle crossing is required to:* • *comply with the tracking curve applicable to the largest vehicle anticipated to use the site regularly;* • *accommodate the traffic volumes anticipated to use the crossing, especially where it is desirable to separate left and right turn exit lanes;* - *the desirability of separating truck movements accessing a site from customer vehicle movements;* - *the extent to which reduced manoeuvring and parking space dimensions can be accommodated because the parking will be used by regular users familiar with the layout, rather than by casual users, including the manoeuvres required to enter and exit parking spaces;* *(iii) any use of mechanical parking installation such as car stackers or turntables does not result in queuing beyond the site boundary; or* *(iv) any stacked parking is allocated and managed in such a way that it does not compromise the operation and use of the parking area.*	Refer to Section 9.4.2 for service vehicles Refer to Section 9.1.7 for accessible parking spaces Refer to Section 9.1.5 for tandem space allocation (A) Not applicable. The vertical clearance within the service lane or the accessible parking spaces will not affect the adjacent transport network. Tandem space parking allocation for the office activity will not affect the operation of the adjacent transport network. (B) Not applicable. The vertical clearance within the service lane or the accessible parking spaces will not affect pedestrian amenity or amenity of the streetscape. Tandem space parking allocation for the office activity will not affect pedestrian amenity or amenity of the streetscape. (C) (i) The existing layout of the service lane and the surrounding buildings mean there is already existing vertical clearance restrictions which will affect servicing vehicles. Trucks currently use the service lane with these restrictions in place. These restrictions will continue to apply, and can be managed with a Servicing Management Plan. For accessible parking spaces, there are internal vertical clearance restrictions such as overhead columns. The tandem space allocation can be managed by office users. (ii) Infringements are not applicable to manoeuvring at the access (iii) Not applicable (iv) The tandem spaces can be managed by office users if allocated to the same tenancy. The tandem spaces are located on levels B02 to B05, which contain 3 to 8 tandem spaces per level. The spaces are located in areas which are not accessed from the main circulating aisles, which means they will not compromise the operation and use of the parking area.
PC79 – E27.8.2.(8) – Infringes on design standards for parking/loading areas or access under Standard E27.6.3, E27.6.4.2, E27.6.4.3, E27.6.4.4 and E27.6.6 **Infringements: Height restrictions for servicing vehicles – 3.6 m of vertical clearance is provided whereas 3.8 m is required** **Accessible parking spaces require 2.5 m of vertical clearance, whereas 2.3 – 2.4 m is provided for areas accessing the spaces** **Stacked parking: 23 tandem spaces are proposed which could potentially be allocated to the office activity, whereas only residential is permitted**	
(A) effects on the safe and efficient operation of the adjacent transport network having regard to: *(i) the effect of the modification on visibility and safe sight distances;* *(ii) existing and future traffic conditions including speed, volume, type, current accident rate and the need for safe manoeuvring;* *(iii) existing pedestrian numbers, and estimated future pedestrian numbers having regard to the level of development provided for in this Plan;* *(iv) existing community or public infrastructure located in the adjoining road, such as bus stops, bus lanes, footpaths and cycleways- and* *(v) the extent to which the management plan for the development identifies and mitigates risk to all site and road users.* (B) effects on pedestrian amenity or the amenity of the streetscape, having regard to: *(i) the effect of additional crossings or crossings which exceed the maximum width; or*	Refer to E27.8.2.(8) above for our assessment of the majority of these items. The PC79 amendments are highlighted in red text to the left. (A)(v) We have recommended a Servicing Management Plan to control loading activities, which will ensure trucks comply with the vertical clearance restrictions. For the affected accessible spaces, these will be allocated to regular users who will be familiar with the restricted clearances. For the tandem spaces, if these are allocated to the office activity, they will need to be allocated to the same tenancy to ensure use of the spaces can be coordinated (D) Not applicable, the Site is not located in a residential zone (E) The service lane will not be serviced by emergency vehicles. FENZ vehicles require 4 m of vertical clearance. We note this is not provided in the current design. It is anticipated that

(ii) effects on pedestrian amenity and the continuity of activities and pedestrian movement at street level in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone and Business – Local Centre Zone. (C) the practicality and adequacy of parking, loading and access arrangements having regard to: *(i) site limitations, configuration of buildings and activities, user requirements and operational requirements;* *(ii) the ability of the access to accommodate the nature and volume of traffic and vehicle types expected to use the access. This may include considering whether a wider vehicle crossing is required to:* • *comply with the tracking curve applicable to the largest vehicle anticipated to use the site regularly;* • *accommodate the traffic volumes anticipated to use the crossing, especially where it is desirable to separate left and right turn exit lanes;* - *the desirability of separating truck movements accessing a site from customer vehicle movements;* - *the extent to which reduced manoeuvring and parking space dimensions can be accommodated because the parking will be used by regular users familiar with the layout, rather than by casual users;* *(iii) any use of mechanical parking installation such as car stackers or turntables does not result in queuing beyond the site boundary; or* *(iv) any stacked parking is allocated and managed in such a way that it does not compromise the operation and use of the parking area.* (D) the safety and practicality of pedestrian access, in residential zones, having regard to: *(i) site limitations, configuration of buildings and activities, user requirements and operational requirements;* *(ii) the number of dwellings / future occupants that a primary pedestrian access is serving;* *(iii) the extent to which a primary pedestrian access is direct, continuous, obstruction-free and safely accommodates different users and abilities including minimisation of gradients, provision of landing areas and avoidance of steps;* *(iv) space limitations and constraints within basement parking areas;* *(v) the safety of pedestrians where a pedestrian access crosses trafficable areas, considering the design of the crossing, visibility between drivers and pedestrians, and vehicle speeds;* *(vi) the extent to which the design incorporates Crime Prevention Through Environmental Design principles;* *(vii) the extent to which the design incorporates Universal Design principles, including the extent to which a primary pedestrian access is slip-resistant under all conditions and where primary pedestrian access is not adjacent to vehicle access and includes steps, provides a footpath and/or ramps as specified in NZS 4121:2001 Design for access and mobility: Buildings and associated facilities;* *(viii) the need to separate pedestrian areas from vehicle access, parking, manoeuvring and reversing areas; and* *(ix) the avoidance of conflict between users.* (E) The safety and functionality of emergency responder access.	emergency services will be able to utilise Customs Street West or Lower Hobson Street during emergencies.
E27.8.2.(9) – Use of existing vehicle where vehicle access restriction applies under Standard E27.6.4.1(1) **Infringement: use of the existing Quay Street vehicle crossing subject to a Vehicle Access Restriction – General Control**	
Assessment Criteria	**Comment**
(A) Effect on transport network *(i) effects of the location and design of the access on the safe and efficient operation of the adjacent transport network having regard to:* • *visibility and safe sight distances;* • *existing and future traffic conditions including speed, volume, type, current accident rate, and the need for safe manoeuvring;* • *proximity to and operation of intersections;* • *existing pedestrian numbers, and estimated future pedestrian numbers having regard to the level of development provided for in the this Plan; or* • *existing community or public infrastructure located in the adjoining road, such as bus stops, bus lanes and cycleways.* **(B)** Street and pedestrian amenity:	Refer to Section 8.2.2 (A) (i) • Visibility will not change compared to existing. Visibility is available looking towards the Lower Hobson Street intersection in the west and the Lower Albert Street intersection in the east direction • Quay Street has a speed limit of 30 km/h. No injury crashes have been reported in the past five years. Safe manoeuvring is available • The access has at least 50 m of separation from Lower Hobson Street and Lower Albert Street

(i) the effects on the continuity of activities and pedestrian movement at street level in the Business – City Centre Zone, Business-Metropolitan Centre Zone, Business – Town Centre Zone and Business – Local Centre Zone; or (ii) *the extent to which the existing crossing is to be upgraded as a part of the development so as to improve the visual amenity of the street.*	• Pedestrian volumes are likely high in this area of the City Centre. The Development will provide new north-south and east-west connectivity for pedestrians to potentially encourage pedestrians to travel away from the access • While there are bus stops east of the access, there will be no physical change compared to existing. Any vehicles using the access will be required to give-way to buses, and will need to comply with the bus lane restrictions (B) (i) While there will be an increase in vehicle volumes using the access, pedestrians will still be able to safely walk through the Quay Street access. The layout of the street operates as a shared space, promoting a low speed environment. There is good visibility between pedestrians and vehicles at this location. (ii) Not applicable, the existing crossing on Quay Street will not change
E27.8.2.(11) – Construction/use of new vehicle crossing where vehicle access restriction applies **Infringement: vehicle access onto an arterial road – Customs Street West**	
Assessment Criteria	**Comment**
(A) this applies where a Vehicle Access Restriction is identified in Standard E27.6.4.1(2) and Standard E27.6.4.1(3), other than a Vehicle Access Restriction Level Crossing or a Vehicle Access Restriction Motorway Interchange: *(i) effects of the location and design of the access on the safe and efficient operation of the adjacent transport network having regard to:* • *visibility and safe sight distances* • *existing and future traffic conditions including speed, volume, type, current accident rate, and the need for safe manoeuvring;* • *proximity to and operation of intersections;* • *existing pedestrian numbers, and estimated future pedestrian numbers having regard to the level of development provided for in this Plan* • *existing community or public infrastructure located in the adjoining road, such as bus stops, bus lanes and cycleways;* *(ii) the effects on the continuity of activities and pedestrian movement at street level in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone and Business – Local Centre Zone; or* *(iii) the practicability and adequacy of the access arrangements considering site limitations, arrangement of buildings and activities, user requirements and operational requirements, proximity to and operation of intersections, having regard to:* • *the extent to which the site can reasonably be served by different access arrangements including:* - *access from another road;* - *shared or amalgamated access with another site or sites* - *via a frontage road, such as a slip lane or service road; or* • *the extent to which the need for access can reasonably be avoided by entering into a shared parking and/or loading arrangement with another site or sites in the immediate vicinity* **(B)** for any proposed access within a Vehicle Access Restriction Motorway Interchange Control: *(i) the intensity, scale and traffic generating nature of activities on the site are such that any adverse effects on the safe and efficient operation of the motorway interchange are avoided, remedied or mitigated; or* *(ii) the extent to which, when considered against other access opportunities for the site, comparable or better outcomes are achieved in terms of effects on the safe and efficient operation of the interchange* **(C)** for any proposed access within a Vehicle Access Restriction Level Crossing Control: *(i) effects on the safe and efficient operation of the level crossing; or* (ii) *the practicability and adequacy of the access arrangements having regard to site limitations, arrangement of buildings and activities, user requirements and operational requirements.*	Refer to Section 8.2.1 (A) (i) • The access is in almost the same location as existing. There will be minimal changes to existing visibility, for an existing vehicle looking west along Customs Street West. Visibility may be improved with the removal of the Downtown Carpark ramp onto Fanshawe Street • Customs Street West has a speed limit of 30 km/h. The only minor injury crashes reported on Customs Street West were related to the Downtown Carpark access, which will be removed as part of the Development • The access has at least 60 m of separation from Lower Albert Street. As Customs Street West operates in a one-way direction, there will likely be minimal impact on this intersection • Pedestrian volumes are likely high in this area of the City Centre. The Development will provide new north-south and east-west connectivity for pedestrians to potentially encourage pedestrians to travel away from the access • There is existing bus parking on Customs Street West. The access will not impact on this parking. (ii) While there will be an increase in vehicle volumes using the access, pedestrians will still be able to safely walk through the Customs Street West access. We note pedestrian movement will be improved on Customs Street West with the removal of the existing Downtown Carpark vehicle accesses (iii) As the Site is surrounded by roads which are classified as arterial roads, it is not possible to avoid having access onto an arterial road. The service lane access onto Customs Street West is already a form of a shared access arrangement with the AON and HSBC parking areas (B) Not applicable (C) Not applicable

PC79 – E27.8.2.(4A) – any activity or development that provides less than the required number of accessible parking spaces under Standard E27.6.3.2.(A): Infringement: 24 accessible parking spaces are provided, whereas not less than 51 spaces are required	
(A) the trip characteristics of the proposed activities on the site requiring accessible parking spaces; (B) the extent to which it is physically practicable to provide the required accessible parking spaces on the site including in terms of the existing location of buildings, the type of the existing building(s) site dimensions, topography and the availability of access to the road; (C) the availability and capacity of alternative accessible parking in the immediate vicinity, including on street and other public accessible car parking, with an accessible route to and from the building designed in accordance with New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001), to provide the additional parking sought for the proposal; (D) mitigation measures to provide accessible parking which may include measures such as by entering into a shared accessible parking arrangement with another site or sites in the immediate vicinity (E) the availability of alternatives to private vehicle trips in the immediate vicinity with access to public transport by an accessible route designed in accordance with New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001) and a maximum distance of 200m.	Refer to Section 9.1.3 (A) Residential: Sufficient accessible parking will be provided to satisfy the requirement for the residential activity Office: The office activity will be served by 150 parking spaces, which is much lower than the theoretical demand of 1,760 spaces. The assumed accessible provision of 13 spaces is considered sufficient for the office activity, noting that a total of 150 spaces are proposed. This is sufficient under the "New Zealand Building Code D1/AS1 New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001)" standard Retail: No car parking is provided for retail at all, so it is not considered necessary to provide any accessible parking for retail. The retail activity will be food and beverage, and is not intended to serve people who will drive directly into the City Centre (B) Compared to the lodged version, 10 additional accessible parking spaces have been provided to account for the PC79 standards (C) No other accessible parking will be available in the immediate vicinity (D) It is not practical or considered necessary to enter into a shared arrangement for this development (E) The site has excellent public transport accessibility, being located close to frequent bus routes on Quay Street and Lower Albert Street. This will provide excellent public transport accessibility for the site to reduce reliance on private vehicle trips. The bus stops are easily accessible from the site.

Chapter H8 Business City Centre Zone Restricted Discretionary Assessment Criteria

Assessment Criteria	Comment
H8.8.2(1) new buildings and external alterations and additions to buildings not otherwise provided for	
Assessment Criteria	**Comment**
(C) Design of parking, servicing and access: *(i) whether parking is located, in order of preference, underground, to the rear of building or separated from the street frontage by uses that activate the street;* *(ii) where parking is provided at lower building levels, the extent to which it is fully sleeved with active uses or activities that provide passive surveillance of the street and contribute to pedestrian interest and vitality. Above this, the extent to which car parking is fully screened on*	Applicable to transport: (iii), (v), (viii), (x) (iii) Vehicle crossings and accessways are designed to have low vehicle speeds. All access comply with the Unitary Plan requirements for width, so are not oversized to encourage higher vehicle speeds. The access can be used with different surface treatments and materials to signal to pedestrians the presence of a vehicle crossing

Assessment Criteria	Comment
all sides of the building using design methods that present facades that are visually attractive and avoid night time light spill, noise and air quality effects on nearby sites and streets and public open spaces; *(iii)* *whether vehicle crossings and accessways are designed to reduce vehicle speed, be visually attractive and clearly signal to pedestrians the presence of a vehicle crossing or accessway;* *(iv)* *whether pedestrian access between parking areas, building entrances/lobbies and the street provide equal access for people of all ages and physical abilities, a high level of pedestrian safety and be visually attractive;* *(v)* *whether separate vehicle and pedestrian access are provided within parking areas. Shared pedestrian and vehicle access may be appropriate where a lane or street is proposed within a development site. The shared space should prioritise pedestrian movement* *(vi)* *whether ramps visible from the street are avoided, however, where necessary, whether they are minimal in length and integrated into the design of the building;* *(vii)* for commercial activities, whether suitable provision is made for onsite rubbish storage and sorting of recyclable materials that: • *is a sufficient size to accommodate the rubbish generated by the proposed activity;* • *is accessible for rubbish collection; and* • *for new buildings, is located within the building* *(viii)* where appropriate, whether a waste management plan is provided and: • *includes details of the vehicles to be used for rubbish collection to ensure any rubbish truck can satisfactorily enter and exit the site; and* • *provides clear management policies to cater for different waste management requirements of the commercial tenancy and residential activities* *(ix)* for alterations or additions to existing buildings where it is not possible to locate the storage area within the building, whether they are located in an area not visible from the street or public open spaces; *(x)* whether the development is able to be adequately served by wastewater and transport infrastructure; and *(xi)* whether servicing elements (including venting and air-conditioning units) are located on the roof of the building or internal to the site and not on street-facing facades. Where this is not possible (e.g. alterations to a shop front), the extent to which servicing: • *forms an integrated element of the building façade; and* • *is located so that it minimises adverse effects such as noise/odour on neighbouring sites and the public realm;*	(v) Pedestrian and vehicle movements are designed to be fully separated. While the service lane has a pedestrian path, the primary route into the basement parking areas will be through lifts inside the buildings (viii) While a Waste Management Plan is not included, we understand it will be provided as condition of consent. The loading area contains 5 loading spaces and can accommodate 8.3 m trucks, which will be sufficient for rubbish trucks to enter and exit the site (x) the development is adequately served by transport infrastructure

Chapter H8 Business City Centre Zone Controlled Activity Assessment Criteria

Assessment Criteria	Comment
H8.7.2(1) demolition of buildings	
Assessment Criteria	**Comment**
(A) Pedestrian amenity and safety: *(i) whether sites containing buildings that are proposed to be demolished have significant adverse effects on the quality and amenity of the public realm and the safety and efficiency of the surrounding transport network. In particular:* • *whether a high-quality and safe temporary hard or landscaped edge is provided along the site boundaries so that a defined boundary to streets and public open spaces is maintained. Including the provision and maintenance of continuous pedestrian cover within areas subject to the verandah standard; and* • *whether an edge treatment designed to reduce its vulnerability to graffiti and vandalism is maintained;* ***(B) reuse of building materials:*** *(i) the extent to which demolished materials are reused and recycled as much as possible;* ***(C) site condition post-demolition*** *(i) if the site is not developed following demolition, the extent to which the site is landscaped to provide a good standard of visual amenity and whether the site will not be used for temporary or permanent parking* ***(D) traffic generation*** *(i) with regard to the effects of building demolition on the transport network:* • *proposed hours of operation;* • *the frequency and timing of truck movements to and from the site; and* • *the location of vehicle access.*	Refer to the demolition assessment in Appendix H

Downtown West Precinct Restricted Discretionary Assessment Criteria

Assessment Criteria	Comment
I205.8.2 Downtown Precinct	
Assessment Criteria	**Comment**
(1) ***new buildings, and alterations and additions to buildings:*** (a) - (b) the assessment criteria in H8.8.2(1) of the Business - City Centre zone rules for new buildings and/or alterations and additions to buildings apply (c) the proposed building, alteration or addition relative to the location of infrastructure servicing the area and open space should result in an integrated network that is adequate to meet the needs of the overall development area; **(2)** ***open spaces or through-site links:*** (a) the transport network (roads, public transport connections, pedestrian connections and cycle connections) is generally provided in the location identified in the precinct plan to achieve a legible street network. Where no location is identified, an integrated and efficient street and pedestrian network should be provided, including connections to existing and future streets and networks; (b) public open spaces are generally provided in the location(s) identified in the precinct plan to meet the needs of the local community. Where no location is identified, open space should be provided to and located to serve the future needs of the local community; and (c) layout and design of public open space should meet the demand of future occupants of the site and be of a high quality, providing for public use and accessibility, views, sunlight access and wind protection within the application area. **(3)** ***vehicle, cycle and pedestrian access and circulation:*** (a) the transport network (roads, public transport connections, pedestrian connections and cycle connections) is generally provided in the location identified in the precinct plan to achieve a legible street network. Where no location is identified, an integrated and efficient street and pedestrian network should be provided, including connections to existing and future streets and networks;	(1) (a) n/a (b) Refer to the table above for our assessment against the applicable transport criteria (c) Not applicable to transport 2 (a) As outlined in Section 8.3, the Development has good east-west and north-south pedestrian connectivity. A legible street network is provided as the service lane provides vehicle connectivity to Customs Street West and Quay Street. Public transport connections are available through the pedestrian connectivity towards Quay Street and Lower Albert Street. (b) Not applicable to transport (c) Not applicable to transport 3 (a) See 2(a) above

Chapter E40 Temporary Activities Restricted Discretionary Assessment Criteria

Assessment Criteria	Comment
E40.8.2 Temporary Activities	
Assessment Criteria	**Comment**
(2) *the extent to which the activity will have adverse effects on traffic movement, parking, public transport and pedestrian safety and access, and the extent to which these effects can be adequately addressed through:* (a) the location, scale and intensity of the activity; (b) the duration, hours, times and day/s of the week on which the event will occur; (c) the provision made to address any impacts from traffic generated by the activity, including impacts on public transport, and other activities at the location; (d) [deleted] (e) the provision made for pedestrian safety and to address any restrictions on public access.	Refer to Section 11 (a) The construction is anticipated to primarily affect the Lower Hobson Street and Customs Street West frontages. The scale and intensity of constructing a development of this size means that there may be potential road lane and pedestrian footpath closures required during some parts of construction, to safely separate the public from construction activity. (b) Construction will occur during standard operating hours during weekdays and weekends. Full use of these hours will be required to minimise the overall duration of construction. Construction and demolition is anticipated to occur over a period of around 6 years (c) While the construction phase will generate trips associated with construction works including heavy vehicles, there will be a reduction in demand in the local road network as the Downtown Carpark would have already been removed. Heavy vehicle trips should be coordinated and scheduled by the contractor to minimise these from being concentrated during peak times for vehicles and public transport (d) n/a (e) Some restrictions and closures of pedestrian access along Lower Hobson Street and Customs Street West may be required to avoid conflicts between pedestrians and construction activities. This will depend on the staging of the construction, dependent on a contractor being appointed. If pedestrian footpath closures are required, then alternative pathways should and can be signposted.

APPENDIX B Relevant central and local policy guidance

Relevant central and local policy and guidance

Government Policy Statement on Land Transport 2024

The Government Policy Statement on Land Transport (GPS 2024) sets out the government's priorities for expenditure from the National Land Transport Fund over the next 10 years. The GPS 2024 is the government's main statutory lever to ensure investment in land transport by the New Zealand Transport Agency (the Transport Agency) and local government reflects government priorities over 10 years.

The current GPS came into effect on 1 July 2024.

GPS 2024 is built around four strategic priorities

- Economic Growth and Productivity
- Increased Maintenance and Resilience
- Safety
- Value for Money.

https://www.transport.govt.nz/area-of-interest/strategy-and-direction/government-policy-statement-on-land-transport-2024

Auckland Plan 2050

The Auckland Plan 2050 (AP2050) is a long-term spatial plan for Auckland, developed by Auckland Council (AC) with, and on behalf of, all Aucklanders. AC consider that Auckland has a shared responsibility for implementing it. The AP2050 outlines the big issues facing Auckland and recommends the way in which Aucklanders and others involved in the future of Auckland can best respond to them. The Development Strategy and six Outcomes set Auckland's strategy to 2050. They consider how Auckland will address the key challenges of high population growth and environmental degradation, and how to ensure shared prosperity for all Aucklanders. The plan is intended to set high level direction for Auckland.

https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/Pages/default.aspx

Auckland Unitary Plan

The Unitary Plan helps Auckland meet its economic and housing needs by determining:

- what can be built and where
- how to create a higher quality and more compact Auckland
- how to provide for rural activities
- how to maintain the marine environment.

Regional Policy Statements (RPS) are provided for Urban Growth and Form, and Infrastructure Transport and Energy. These RPS identify that growth should be provided in a way that integrates land use and transport planning, achieves a compact urban form, and facilitates transport choice.

Chapter E27 Transport provides objectives, policies and standards relating to transport. Of note Policy E27.3.(1)(b)(i) states that developments within Business – City Centre Zone do not need to manage adverse effects on and integrate with the transport network by measures such as travel planning, providing alternatives to private vehicle trips, staging development or undertaking improvements to the local transport network. But developments within this zone that are not to be classified as "Permitted" may have other requirements to assess their transport effects.

https://unitaryplan.aucklandcouncil.govt.nz/pages/plan/Book.aspx?exhibit=AucklandUnitaryPlan_Print

Auckland Transport Alignment Project

The Auckland Transport Alignment Project (ATAP) Report provides advice on recommended investment priorities for 2021-31 to reflect the Government and Auckland Council's shared direction for transport. ATAP was updated in 2021 to give gives effect to the Government's intention for its transport priorities to shape Auckland's urban form and development. It focuses on encouraging the shift from private cars to public transport, walking and cycling and addressing Auckland's longer-term challenges of climate change and housing development.

https://www.transport.govt.nz//assets/Uploads/Report/ATAP20212031.pdf

Auckland Regional Land Transport Plan Draft 2024 – 2034

The Regional Land Transport Plan (RLTP2024Draft) details the areas that AT, NZTA and KiwiRail seek to focus on in response to the Auckland region's transport challenges. It also outlines the proposed 10-year investment programme for specific transportation projects.

The RLTP2024Draft is currently in a draft format, with public consultation having recently closed. The next RLTP will be submitted to NZTA on 1 August 2024.

This Draft RLTP responds to government transport policy outcomes as follows:

- Fast and connected – improvements that make public transport faster, more accessible and more reliable, for example:
    - quicker, more reliable journeys on buses, trains and ferries
    - providing more choices when it comes to public transport across the city.
- Resilient – investments that ensure the network is ready for challenges, for example:
    - protecting roads and other infrastructure to ensure they are less vulnerable to storms and flooding.
- Productive – projects that support regional growth and productivity, for example:
    - rolling out technology to better manage traffic flow and make journeys quicker and more reliable at peak times
    - delivering cost-efficient cycleways and walking routes to give people more choices on how they want to travel.

- Safe – investments that support a network that gets everyone home safely, for example:
    - continuing the road safety programme to prevent deaths and serious injuries over the next 10 years.
- Sustainable – investments that help us reduce our transport emissions, for example:
    - continue the roll-out of the electric bus fleet
    - deliver the first phase of electric ferries.

The RLTP2024Draft includes the following projects in the City Centre. These projects are predominantly focused on improving public transport facilities and services in the City Centre.

- Downtown Crossover Bus Facilities (AT)
- Wynyard Quarter Integrated Road Programme (AT)
- Midtown Bus Improvements (AT)
- Albert and Vincent Street Bus Priority Improvements (AT)
- City Rail Link (CRLL) and Day One projects (AT/KiwiRail)
- Weigh Right Stanley Street (NZTA)
- Decarbonisation of Ferries Stage 1 (AT).

https://at.govt.nz/about-us/transport-plans-strategies/regional-land-transport-plan

Auckland Regional Public Transport Plan 2023-2031

The Regional Public Transport Plan 2023-2031 (RPTP2023) for Auckland outlines Auckland Transport's strategy for improving and managing the city's public transport system over the next eight years. The key initiatives from the plan are summarised in Table B below.

Table Bb1: Key initiatives of the RPTP2023

Initiatives	Actions
Fixing Current Issues	◆ Addressing bus driver shortages, which were resolved by mid-2023 ◆ Completing KiwiRail's rail network rebuild by early 2026 to reduce service disruptions
Increasing Service Frequency	◆ Implementing 10 new frequent bus routes by 2027, with an additional three routes by 2031 ◆ Improving train frequencies to every 7.5 minutes during peak times by 2026 ◆ Expanding ferry services on multiple routes by 2025
Speeding Up Travel Times	◆ Completing the City Rail Link to double the number of people within 30 minutes of central Auckland. ◆ Adding more bus lanes and priority measures at intersections
Making Fares More Affordable	◆ Introducing a weekly fare cap for unlimited travel at a fixed price. ◆ Continuing Government-funded half-price fares for under-25s and free fares for children under 13

Enhancing Accessibility	◆ Implementing an Accessibility Action Plan and improving infrastructure for those with mobility needs. ◆ Expanding audio announcements on buses and making other accessibility upgrades
Reducing Carbon Emissions	◆ Transitioning 75 % of the bus fleet to zero-emission vehicles by 2031. ◆ Introducing electric ferries by 2025 and electric trains to Pukekohe by 2026
Inter-Regional Services	◆ Supporting improvements to inter-regional services like the Te Huia train between Auckland and Hamilton, provided they do not negatively impact local services

It guides the design and delivery of public transport services, information, and infrastructure in Auckland over the next eight years, split into short-, medium-, and long-term timeframes. The plan describes the public transport network that AT proposes for the region, identifies the services that are integral to the network, outlines the contractual units these services will sit in, and sets out the objectives and policies that apply to those services.

https://at.govt.nz/about-us/transport-plans-strategies/regional-public-transport-plan-2023-2031-rptp

National Policy Statement on Urban Development 2020

The National Policy Statement for Urban Development (NPS-UD) 2020 sets out the objectives and policies for planning for well-functioning urban environments under the Resource Management Act 1991. The NPS-UD 2020 comes into effect on 20 August 2020. It has 7 objectives which include supporting climate change initiatives, supporting local authority decision making on urban development, the principles of the Treaty of Waitangi, improving housing affordability, and enabling well-functioning urban environments.

https://www.mfe.govt.nz/sites/default/files/media/Towns%20and%20cities/AA%20Gazetted%20-%20NPSUD%2017.07.2020%20pdf.pdf

City Centre Masterplan 2020[16]

The CCMP is the key guiding document for the Auckland Council whānau, setting the strategic direction for the city centre over the next 20 years.

It applies the Auckland Plan to the city centre through ten outcomes, to be delivered through eight transformational moves and Access for Everyone (A4E).

The 10 outcomes present the overall strategic direction for the city centre and waterfront. They critically support the eight transformational moves and associated opportunities for future and current projects.

These outcomes are

- Outcome 1: Tāmaki Makaurau - Our place in the world

  Tāmaki Makaurau / Auckland's city centre is a place where we actively recognise and celebrate our historic heritage as a driver of positive change and placemaking.

[16] The CCMP is a non-statutory guiding document that sets the high-level vision and strategic direction for Auckland's city centre

- Outcome 2: Connected city centre

  The city centre in Tāmaki Makaurau / Auckland should have safe, healthy and sustainable travel options both inwards and outwards. This will improve people's access and choice of transport modes.

- Outcome 3: Accessible and inclusive city centre

  This outcome focuses on an accessible and inclusive city centre. We want a city centre that is welcoming to all in Tāmaki Makaurau.

- Outcome 4: Green city centre

  This outcome is about restoring our biodiversity and ecological systems (Mauri Tu). Doing this will deliver a healthy and happy city centre in Tāmaki Makaurau.

- Outcome 5: Public life

  Public space or realm is the glue that holds the city centre together, the canvas for public life. It needs to work well for everyone who spends time in Tāmaki Makaurau. This outcome aims to for everyone in the city centre to feel safe and comfortable, and experience enjoyment.

- Outcome 6: Residential city centre neighbourhoods

  Auckland's city centre is an increasingly popular place to live. As the city centre population grows and matures, this outcome shapes the city centre's public realm, housing supply and social infrastructure to deliver a highly liveable city centre.

- Outcome 7: Quality built form

  This outcome aims to deliver a well-designed and planned city centre. It links the City Centre Masterplan and Waterfront Plan to Auckland's statutory planning and design tools.

- Outcome 8: Heritage defined city centre

  We want to increase understanding, protection and conservation of city centre heritage places, landscapes and stories. Our city centre should actively recognise and celebrate Auckland's historic heritage as a driver of positive change and placemaking.

- Outcome 9: Sustainable city centre

  This outcome aims to shape our approach to transport, air quality, water quality and climate change in the city centre. It focuses on the Auckland Climate Action Framework and Outcome 5 of the Auckland Plan 2050.

- Outcome 10: Prosperous city centre

  This outcome sets out practical ways to develop the city centre so it can continue to thrive as an economic centre and cater for the needs of our diverse population. The city centre will enable business and urban development, and deliver a globally-competitive quality of life within a flourishing economy.

https://www.aucklandccmp.co.nz/

Transport Emissions Reduction Pathway

In December 2020, the New Zealand government declared a climate emergency - and is on a pathway to net zero emissions by 2050. The Transport Emissions Reduction Pathway (TERP) was endorsed by Auckland Transport's board and adopted by Auckland Council in August 2022. Auckland's transport system accounts for just over 40 per cent of the city's total emissions. Aucklanders have one of the highest transport emissions per capita (person) in the world. To halve transport emissions in Auckland by 2030, it is crucial that we make significant changes to the way we travel.

The TERP sets out 11 areas for transforming Auckland's transport system and land use planning that align with the government's Emissions Reduction Plan.

They are

- making walking and cycling safer, easier and more accessible
- using public transport much more
- prioritising and resourcing sustainable transport
- reducing travel where possible and appropriate
- making neighbourhoods safer with less traffic
- putting things closer to where people live
- using vehicles powered by electricity
- enabling new transport options
- using low emission buses, trains and ferries
- making freight and services cleaner and more efficient
- helping Aucklanders make sustainable transport choices.

While the targets set out in the government's Emissions Reduction Plan are at a national level and the numbers in the TERP are specific to Auckland, their focus and actions are well aligned.

https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/Pages/transport-emissions-reduction-pathway.aspx

APPENDIX C Plans of parking levels

Figure C1: Level B05 layout

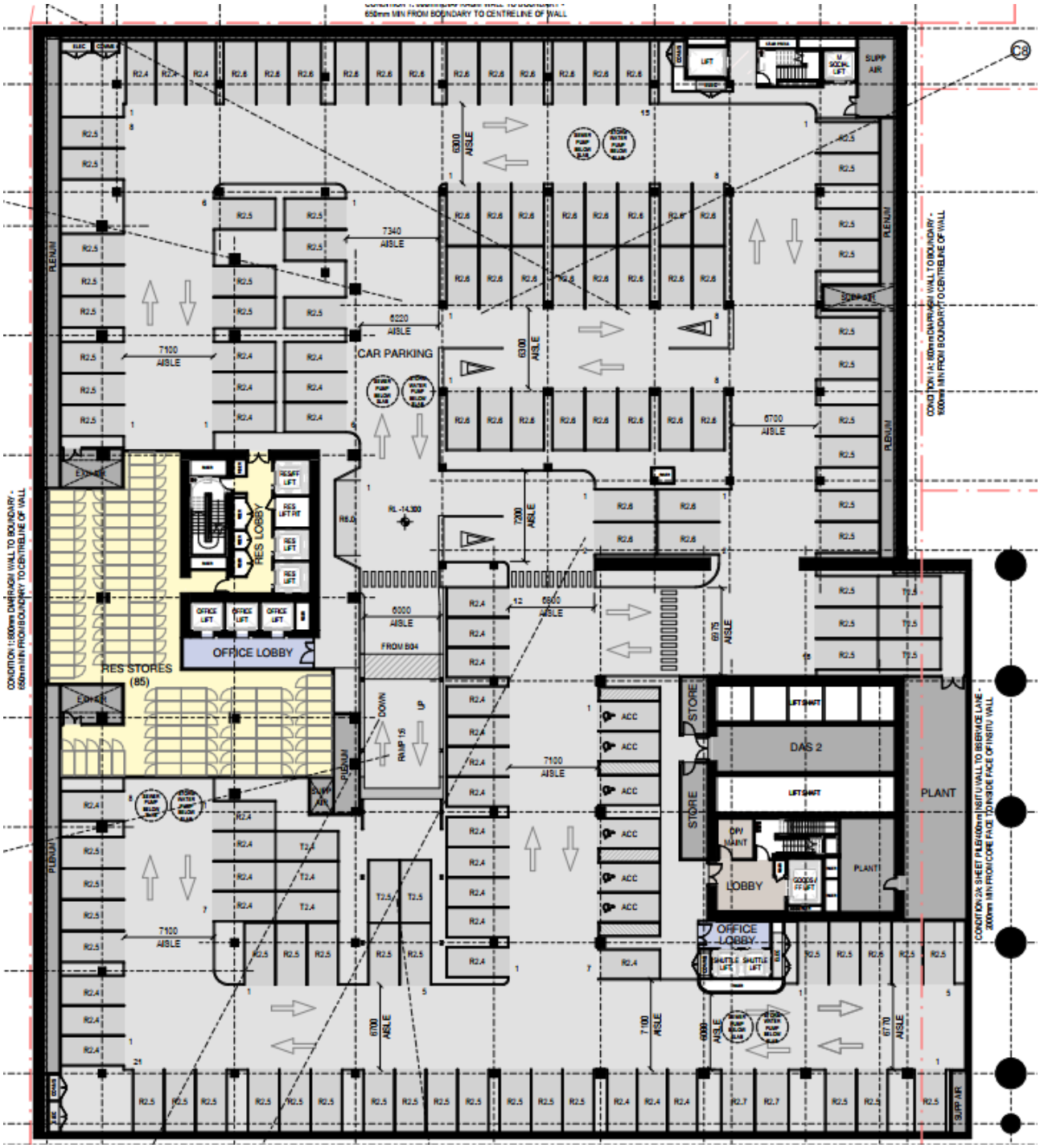


Figure C1: Level B04 layout

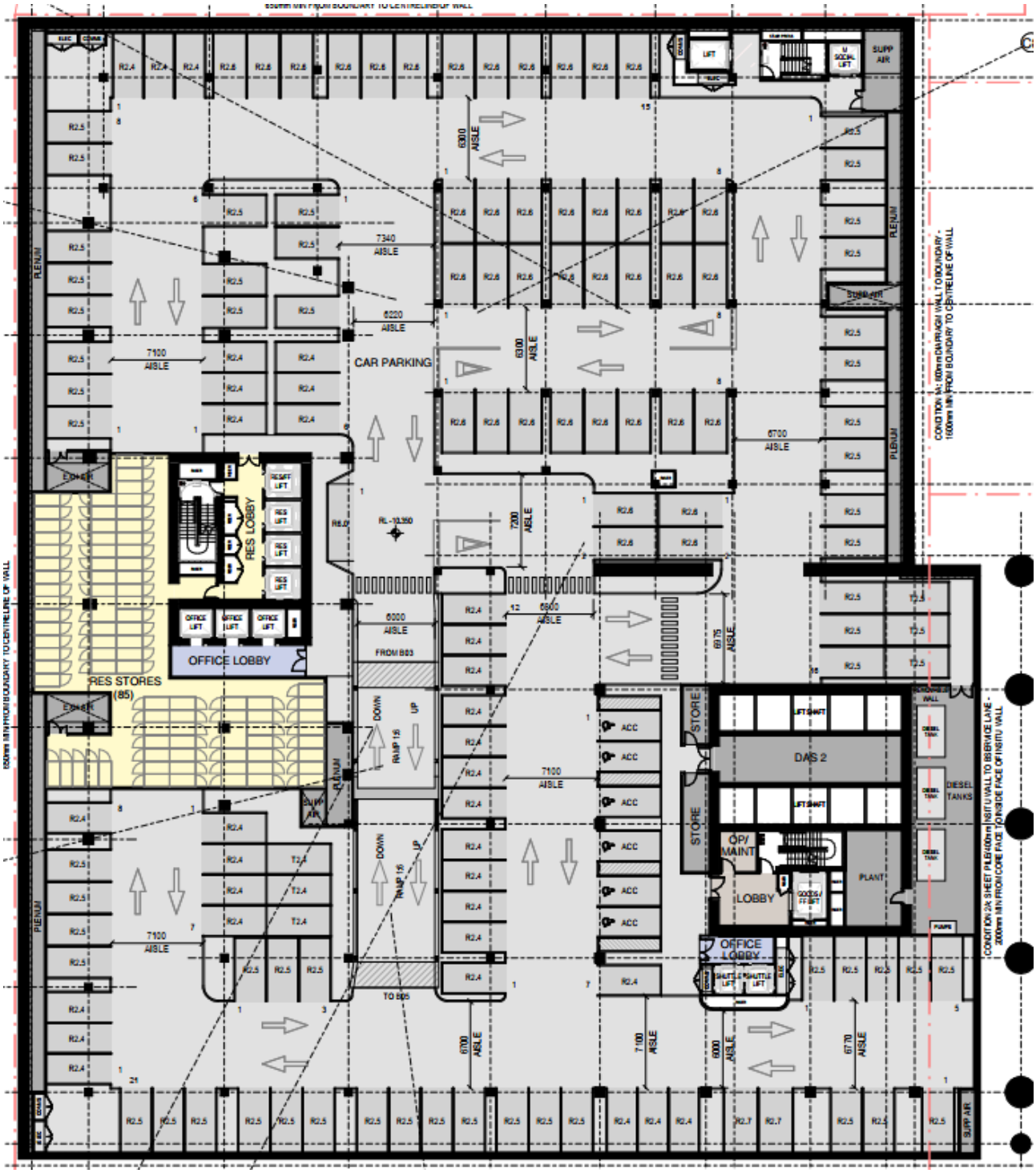


Figure C1: Level B03 layout

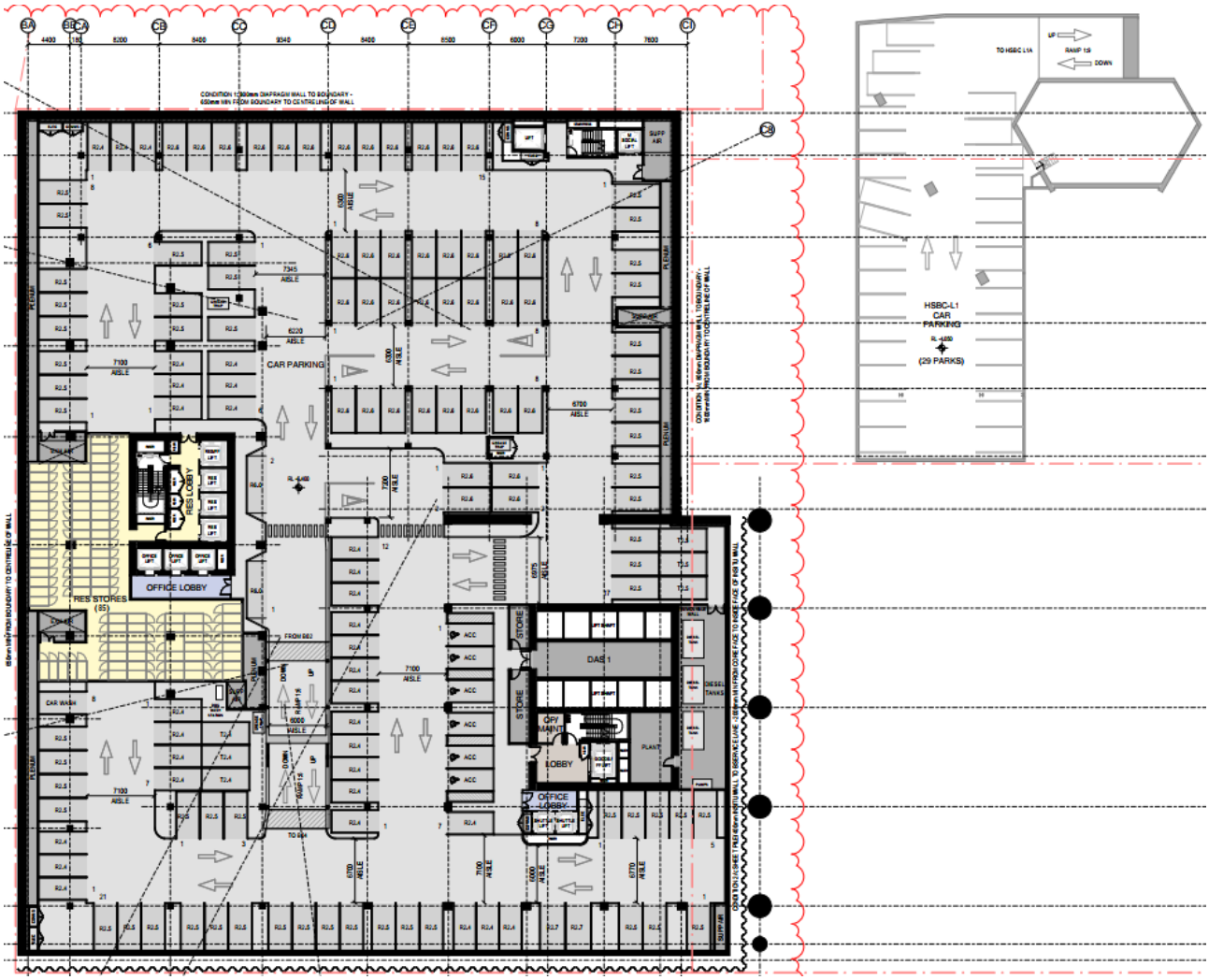


Figure C1: Level B02 layout

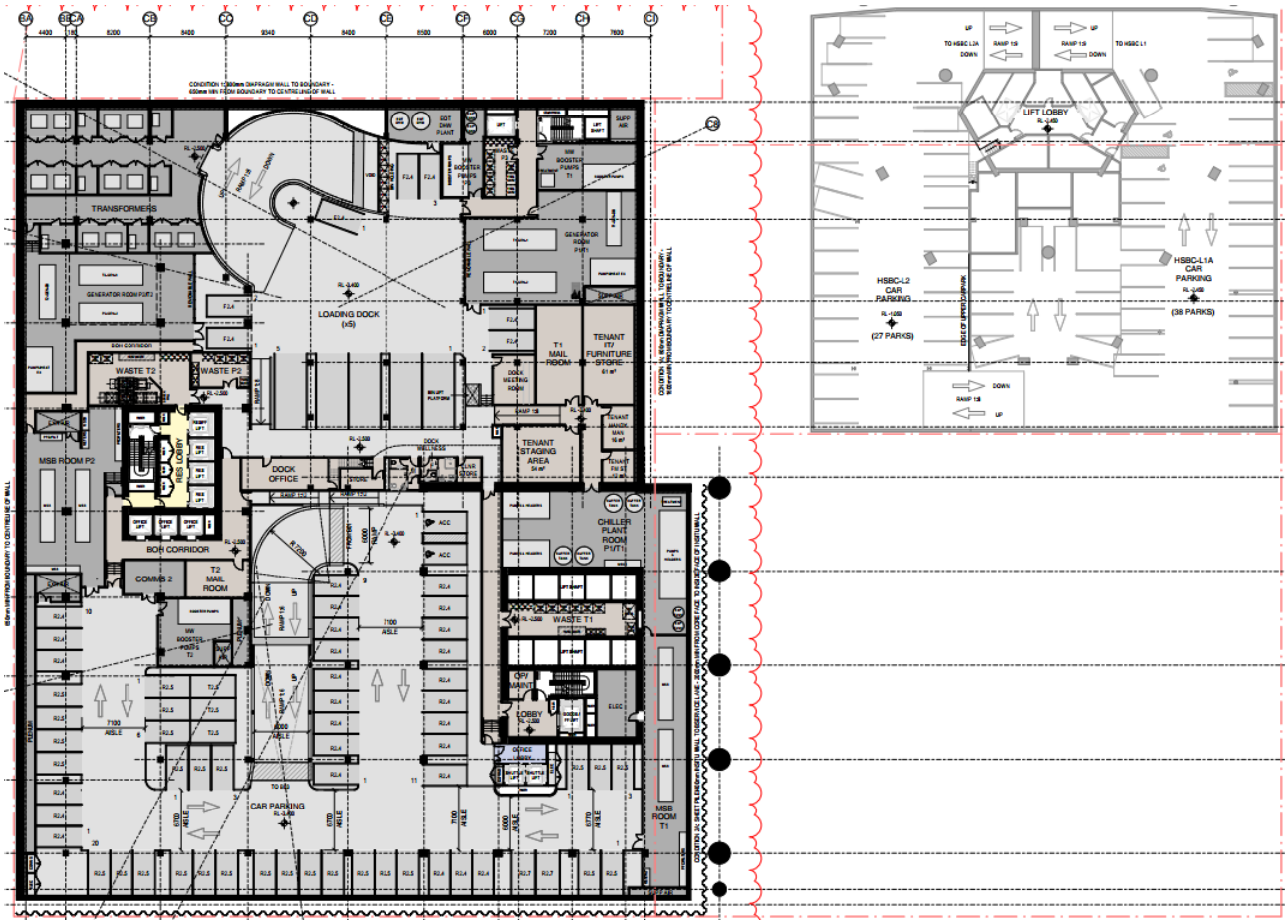


Figure C1: Level B01 layout

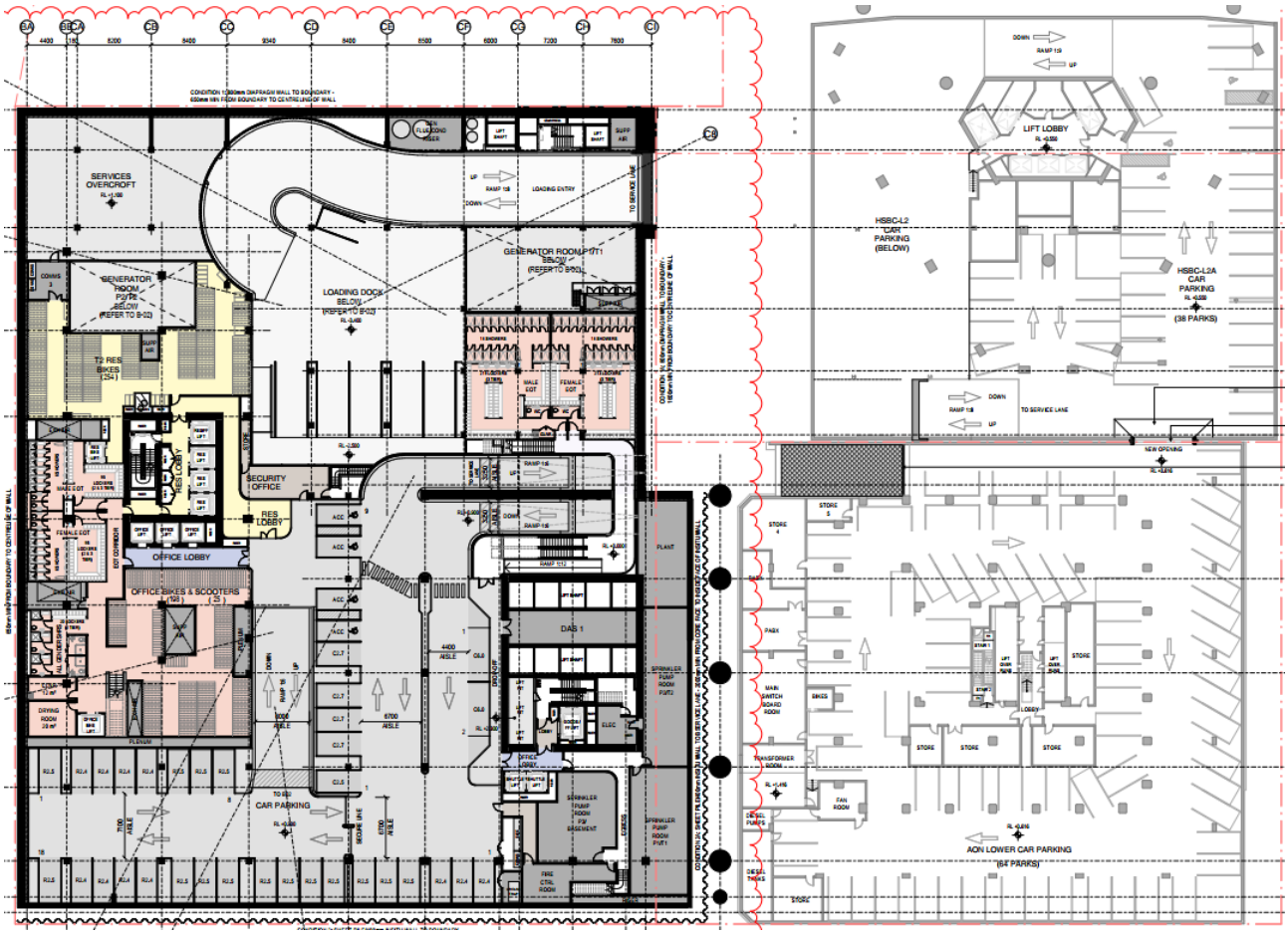
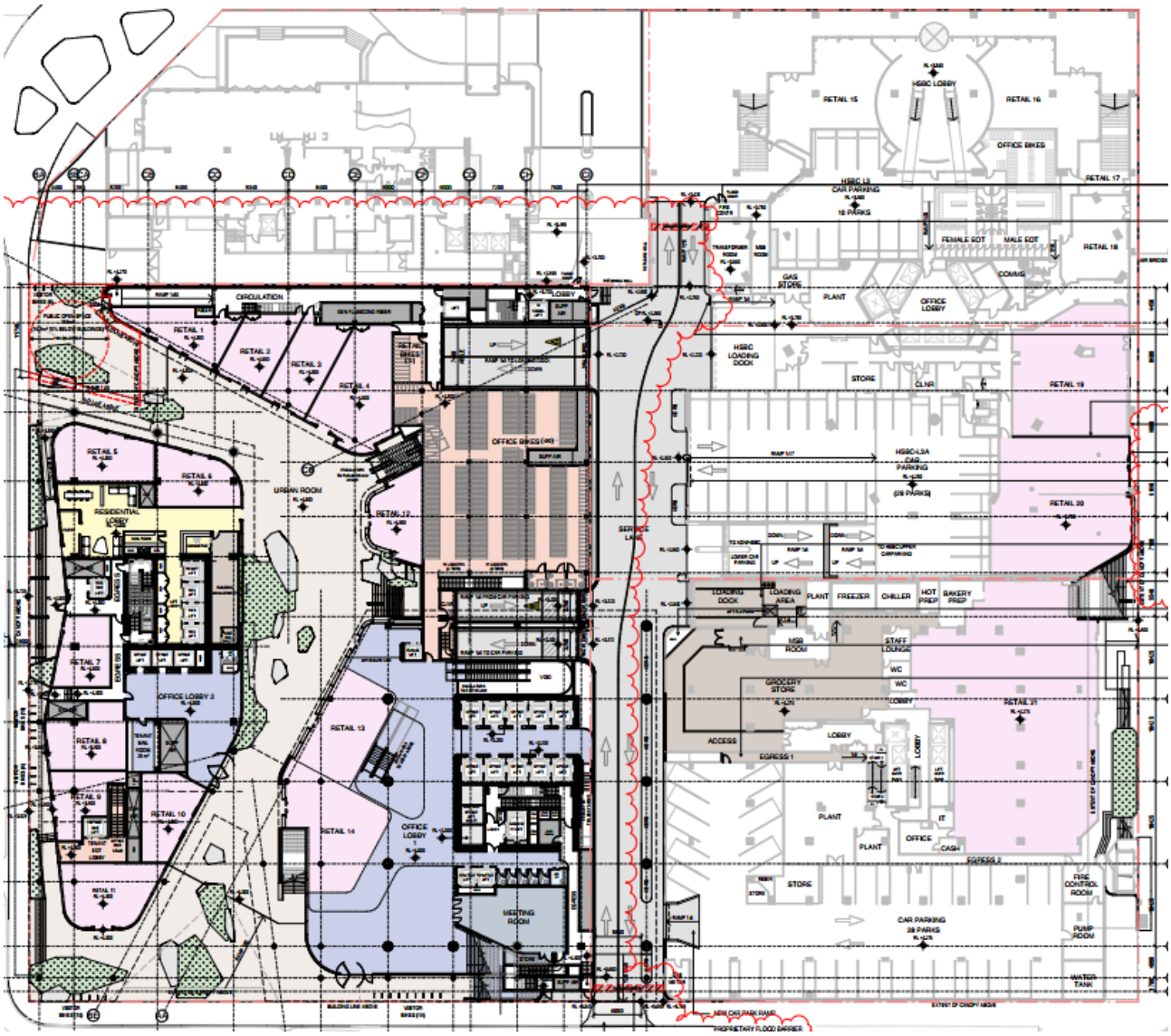
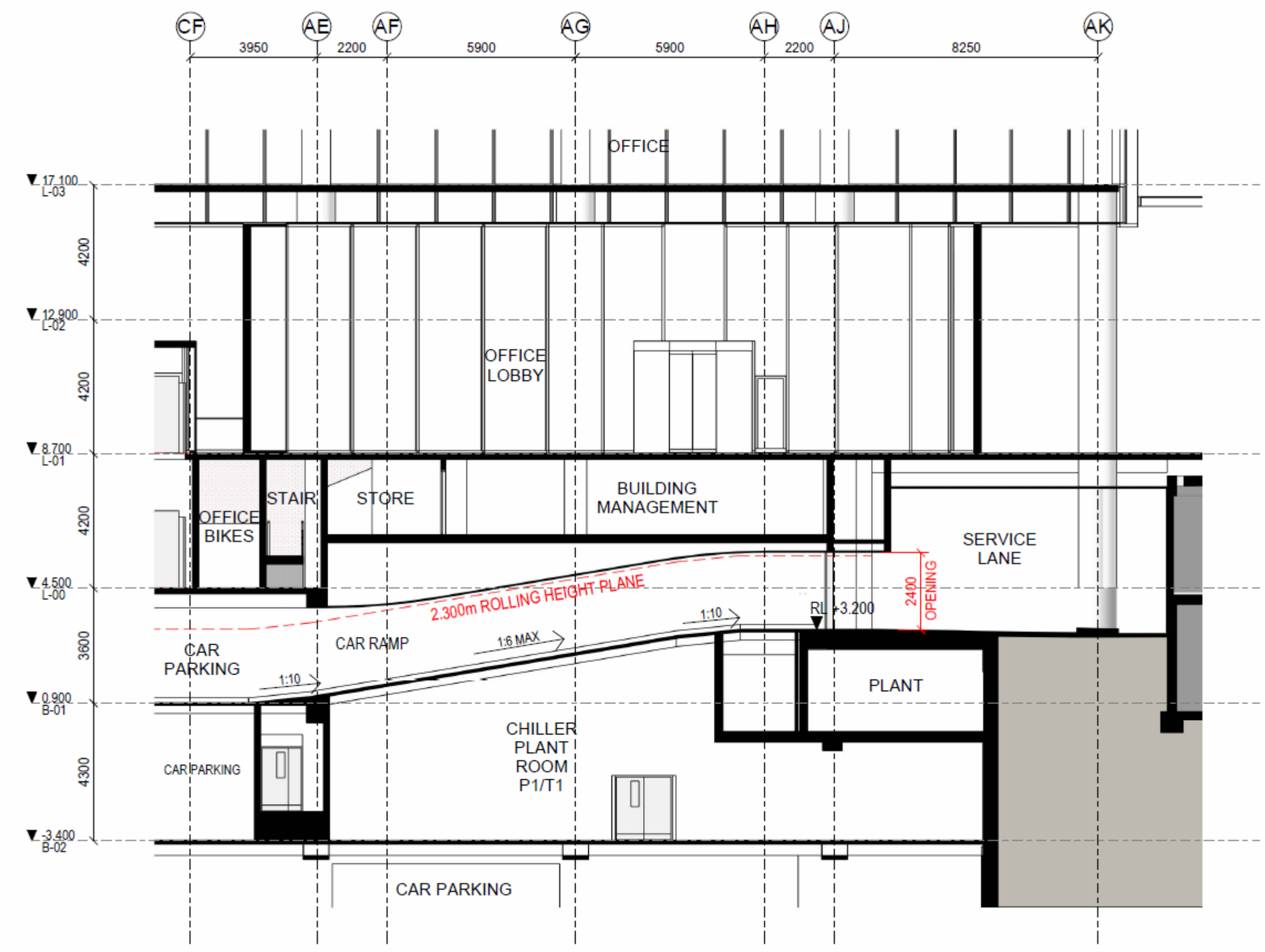


Figure C1: Level B00 layout

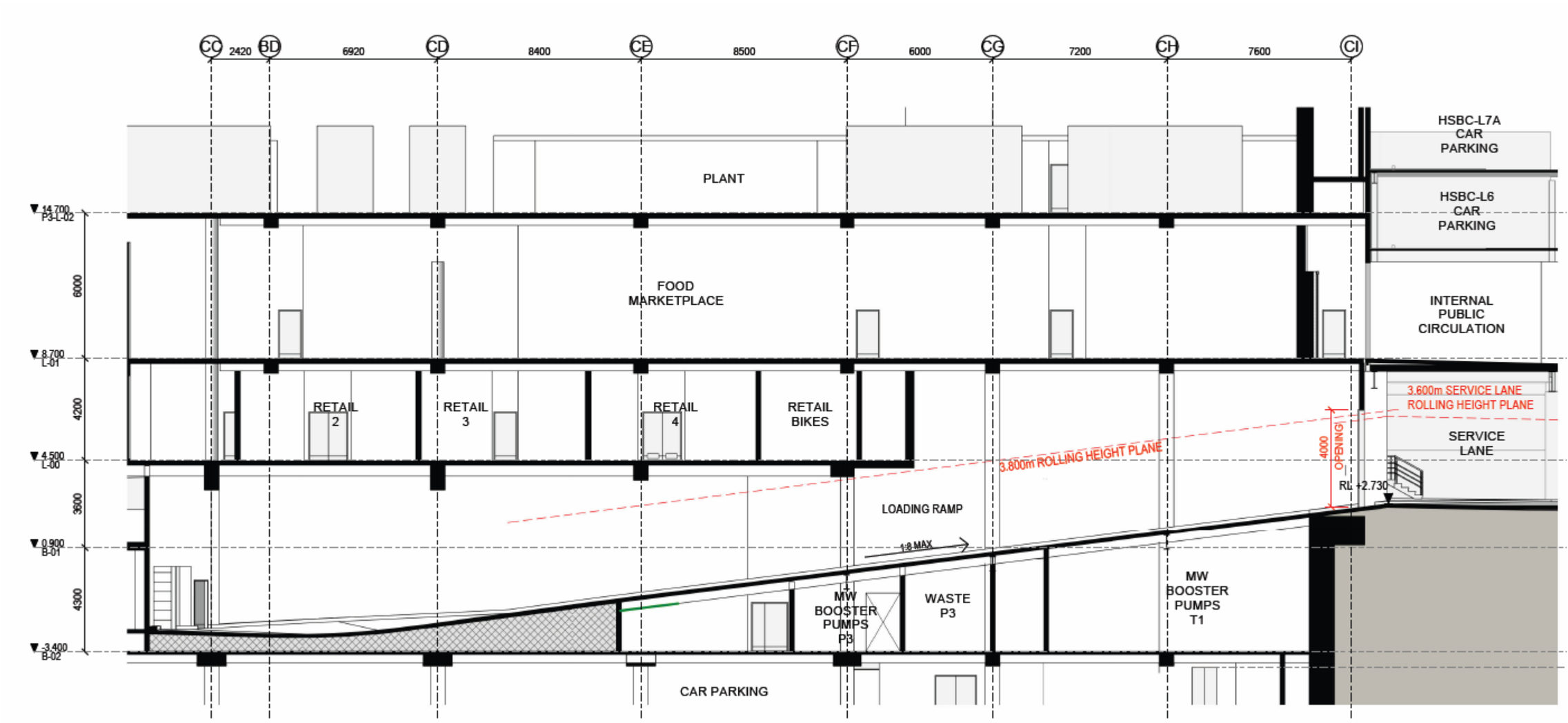


APPENDIX D Vertical clearance profiles

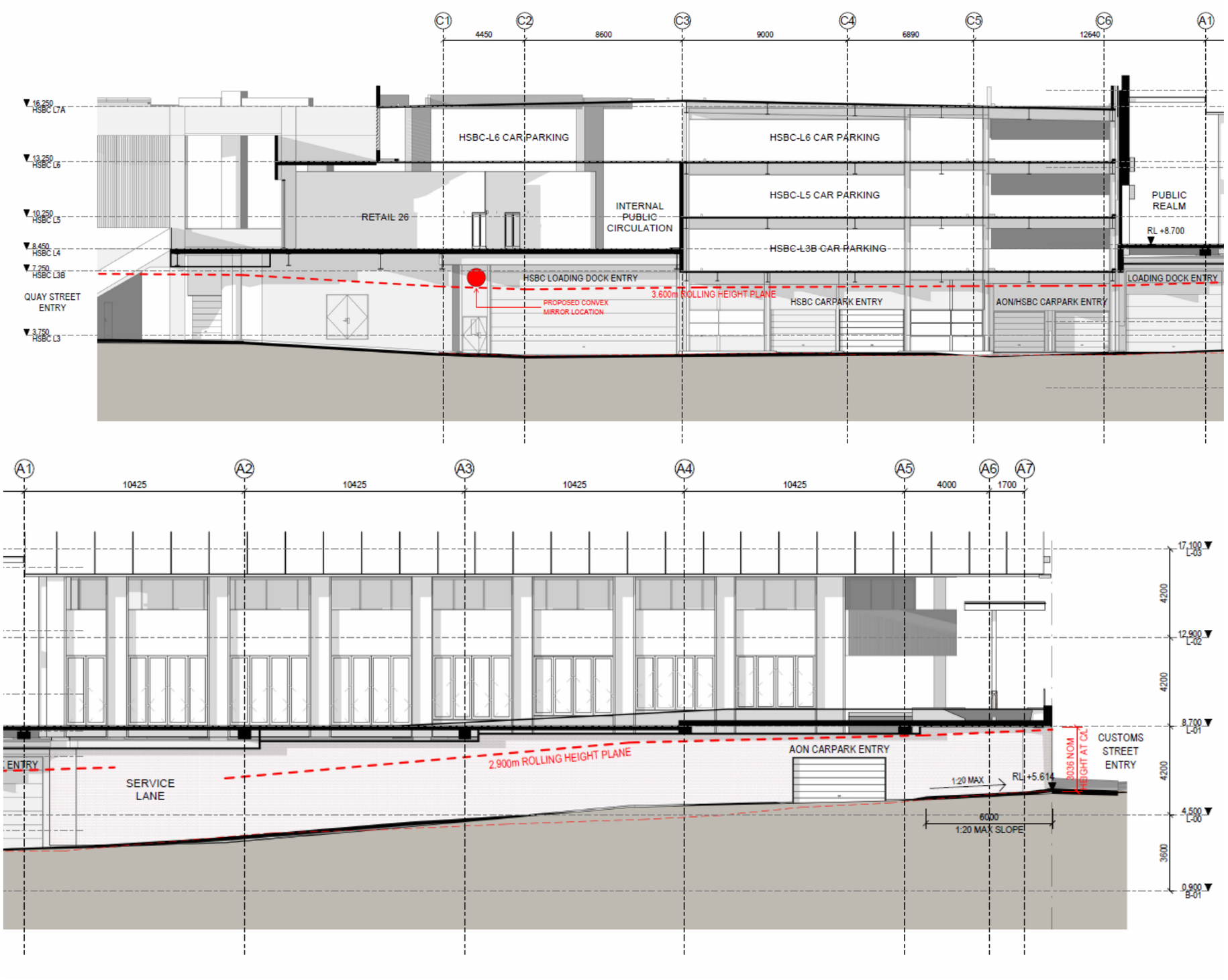
Vertical clearance of carpark ramp and access



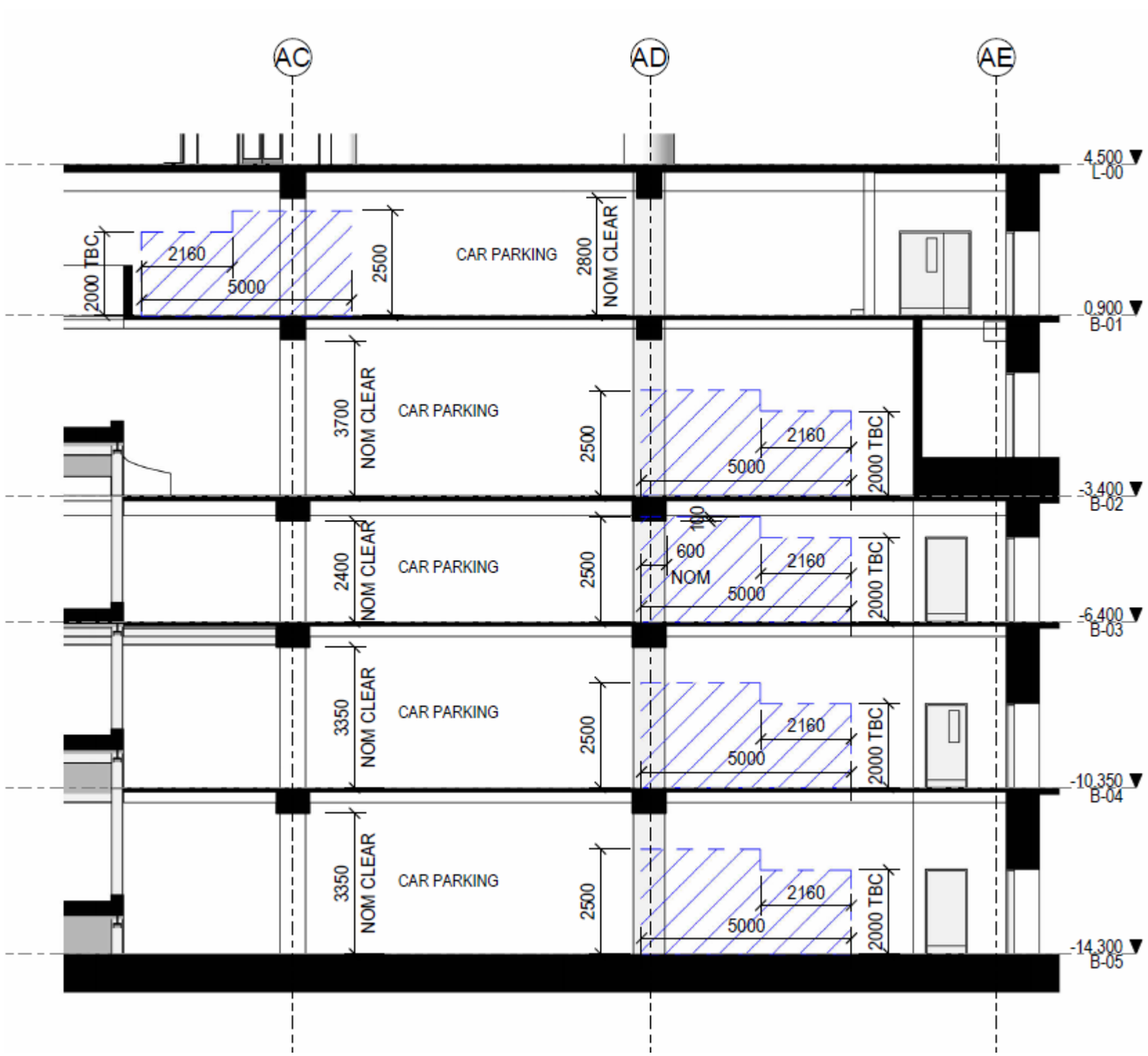
Vertical clearance of loading bay ramp and access



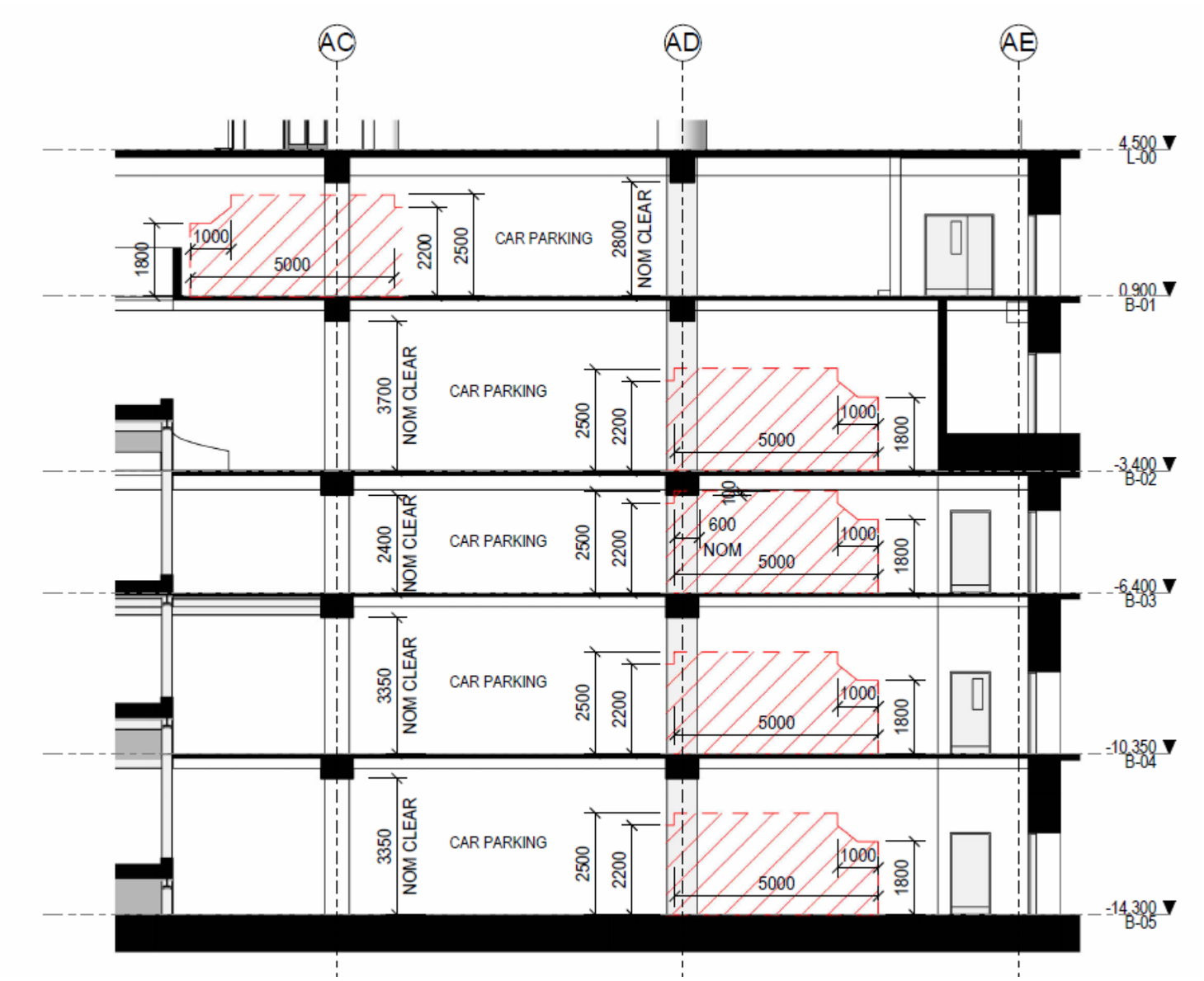
Vertical clearance of service lane



Vertical clearance envelopes of accessible parking spaces, based on NZS 4121:2001



Vertical clearance envelopes of accessible parking spaces, based on AS/NZS 2890.6



APPENDIX E Vehicle tracking assessments

GROUND FLOOR

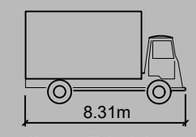
Suggested location for a Convex Mirror

Suggested location for a Convex Mirror

TRUCK OUTBOUND FROM THE RAMP MEANS NO OTHER VEHICLE CAN PASS AT THE SAME TIME

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



Medium Rigid truck
vehicle width: 2.44m
lock to lock time: 6.00s
track width: 2.44m
turning radius: 8.99m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

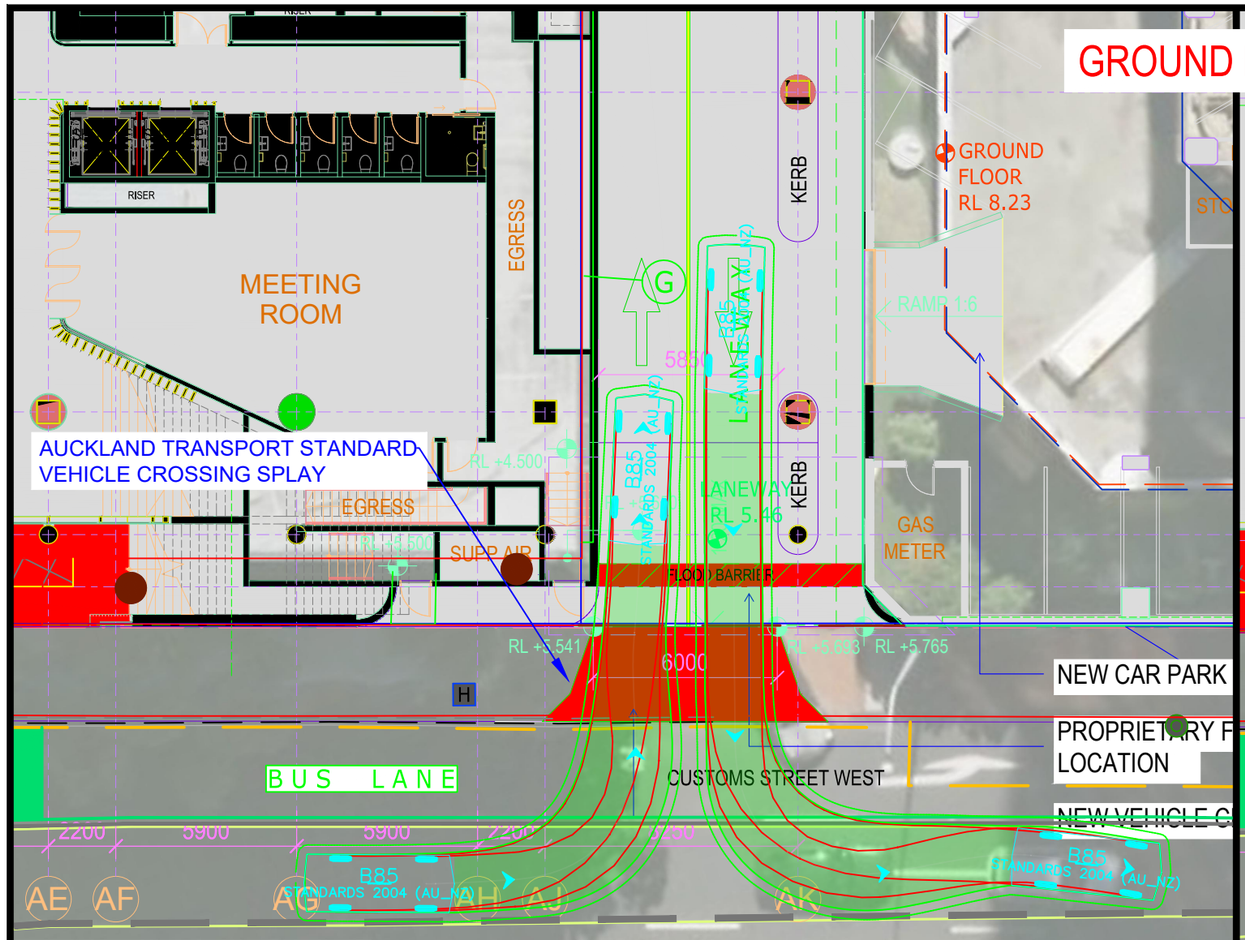
SHEET TITLE: GROUND FLOOR
VEHICLE TRACKING - 8.3m TRUCK

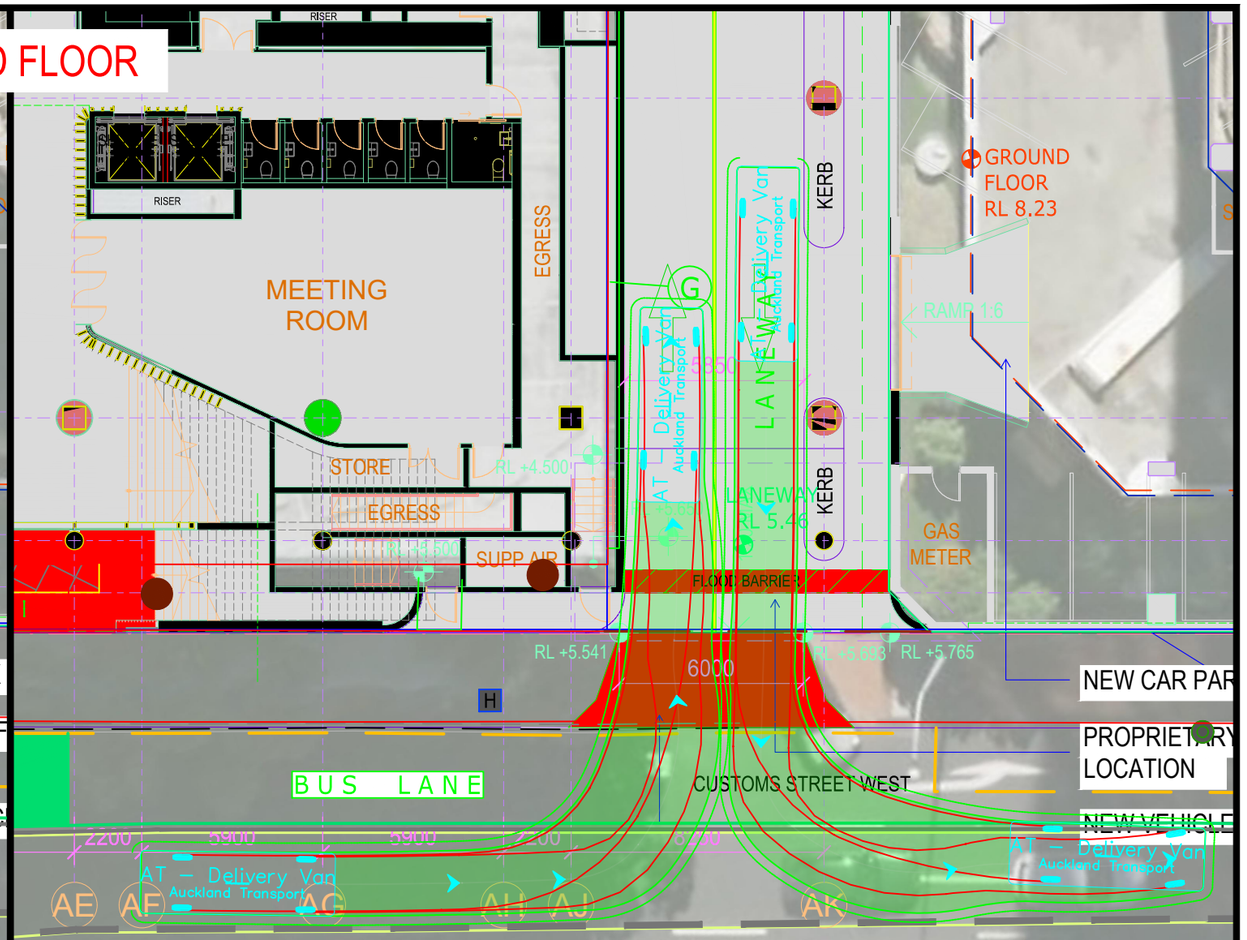
DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 01 of 18
REV: AA

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
p 09 970 3820 | f 09 970 3890 | www.flownz.com

GROUND FLOOR

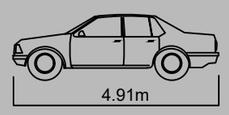




vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car

vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

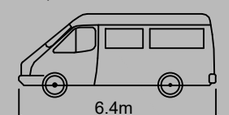
Not to Scale

NOT FOR CONSTRUCTION

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



6.4m Van

vehicle width: 2.05m
lock to lock time: 4.00s
track width: 1.81m
turning radius: 7.2m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: GROUND FLOOR - VEHICLE TRACKING CUSTOM STREET AND SERVICE LANE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 02 of 18

REV: AA

flow
TRANSPORTATION SPECIALISTS
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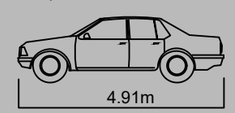
GROUND FLOOR

C8
ESCALATORS TO PUBLIC REALM ABOVE
URBAN ROOM
RL +4.500
RETAIL 12
RL +4.500
SUP
18 LOCKERS (2 TIER)
51 LOCKERS (3 TIER)
RAMP 1:6 FROM CAR PARKING
UP
CLNR
B85 STANDARDS 2004 (AU_NZ)
B50
ROLLER DOOR
SERVICE LANE
KERB
RL +2.820
RAMP 1:17
HSE
PAR
RL
(29 P
DOWN
TO AON/HSBC
LOWER CAR PARKING
RAMP 1:8
UP
DOWN
RAMP 1:8
UP
TO HSBC UPP
CARPARKIN
RL +2.840
LOADING DOCK
LOADING AREA
PLANT
FREEZER
CHILLE
LIFT PLATFORM
1:8
1:12
RISER
MSB ROOM
STAFF LOUNGE
WC
WC
DOWN
RAMP 1:6 TO CAR PARKING
A/H SECURE LINE
VOID
ESCALATORS TO EOT BELOW
RL +3.200
RL +3.200
GROCERY STORE
RL +4.274
RETAIL 13
ESCALATORS TO LOBBY ABOVE
5.85m
ACCESS
EGRESS 1
RETAIL 14
OFFICE LOBBY
RL +2.300
LOBBY
COMMS
STAIR PRESS
STAIR PRESS
MECH RISER
STAIR PRESS
ELEC/ COMMS
ESCALATOR TO LOBBY ABOVE

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car
vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: GROUND FLOOR
VEHICLE TRACKING - B85 DESIGN VEHICLE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 03 of 18
REV: AA

flow
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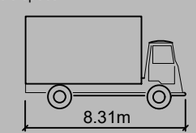
GROUND FLOOR

DOWN
ICE BIKES ( )
SUPP AIR
PARKING
ROLLER DOOR
VOID
DOWN
RKING
RAMP 1:17
KERB
SERVICE LANE
AT Design Vehicle – 8.3m Truck
Auckland Transport Design Vehicles
RL +2.820
RL +2.840
TO AON/HSBC
LOWER CAR PARKING
DOWN
RAMP 1:8
UP
LOADING DOCK
LOADING AREA
LIFT PLATFORM
RISER
MSB ROOM
GROCERY STORE
RL +4.274
ACCESS
EGRESS 1
5.85m
BIKES ( )
SUPP AIR
KING
RL +3.200
RL +3.123
3250
ROLLER DOOR
DOWN
G
VOID
AT – Truck – 8.3m
Auckland Transport
SERVICE LANE
RAMP 1:17
KERB
TO AON/HSBC
LOWER CAR PARKING
DOWN
RAMP 1:8
UP
LOADING DOCK
LOADING AREA
PLANT
LIFT PLATFORM
RISER
MSB ROOM
ACCESS
5.85m

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Medium Rigid truck
vehicle width: 2.44m
lock to lock time: 6.00s
track width: 2.44m
turning radius: 8.99m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: GROUND FLOOR - AON LOADING DOCK VEHICLE TRACKING - 8.3m TRUCK

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 04 of 18
REV: AA

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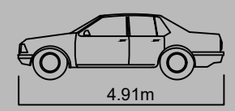
BASEMENT 01

RL -2.500
CLNR
TO SERVICE LANE
3250 AISLE
RAMP 1:6 UP
RAMP 1:6 DOWN
B85 STANDARDS 2004 (AU_NZ)
RAMP 1:12
RL +0.900
RL +0.000
2.4m
DAS 1
6m
DROP-OFF
4400 AISLE
6700 AISLE
6000 AISLE
RAMP 1:6 DOWN
RAMP 1:6 UP
SECURITY OFFICE
RES LOBBY
PLANT
SPRINKLER PUMP ROOM P2/T2
GOODS / FF LIFT
LOBBY
RISER
ELEC
COMMS
OFFICE LOBBY
SHUTTLE LIFT
SPRINKLER PUMP ROOM P3/ BASEMENT
TO B02
CAR PARKING
SECURE LINE
RL +2.600

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car
vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 01
VEHICLE TRACKING - B85 DESIGN VEHICLE
DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 05 of 18
REV: AA

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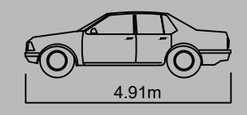
BASEMENT 01

SECURITY OFFICE
RES LOBBY
CLNR
RL -2.500
TO SERVICE LANE
3250 AISLE
RAMP 1:6
UP
DOWN
RL +0.900
RAMP 1:12
2.4m
DAS 1
4400 AISLE
PLENUM
6m
DROP-OFF
RAMP 1:6
6000 AISLE
6700 AISLE
RISER
GOODS / FF LIFT
LOBBY
ELE
OFFICE LOBBY
SHUTTLE LIFT
SPRINKLER PUMP ROOM P3/ BASEMENT
ELEC.
HWMS.
TO B02
CAR PARKING
SECURE LINE
B85 STANDARDS 2004 (AU_NZ)
RL +2.400

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car
vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 01
VEHICLE TRACKING - B85 DESIGN VEHICLE
DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 06 of 18
REV: AA

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650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

BASEMENT 02

DITION 1: 800mm DIAPRAGM WALL TO BOUNDARY -
mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

RL -2.500
UP
RAMP 1:8
DOWN
EOT DHW
EOT DHW
EOT DHW PLANT
EXP TANK
EXP TANK
LIFT
1100L
1100L GAR
1100L REC
1100L CARD
WASTE P3
MW BOOSTER PUMPS P3
BOOSTER PUMPS
TREATMENT
AT Design Vehicle – 8.3m – Truck
Auckland Transport Design Vehicles
T1-GEN-1
T1-GEN-2
REMOVABLE WALL
LOADING DOCK
(x5)
WASTE P2
660L CARD
HARD WASTE
RAMP 1:8
BIN LIFT PLATFORM
DOCK MEETING ROOM
RES/FF LIFT
RES LIFT
OFFICE LIFT
RISER
DOCK OFFICE
STORE
DOCK WELLNESS
CLNR STORE
TENANT STAGING AREA
54 m²
RAMP 1:12
PUMPS & HEADERS
FROM B01
6000
RAMP
R 7200
RL -3.400
STAIR PRESS
TREATMENT

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:

8.31m

Medium Rigid truck
vehicle width: 2.44m
lock to lock time: 6.00s
track width: 2.44m
turning radius: 8.99m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - 8.3m TRUCK

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 07 of 18
REV: AA

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P:\PREP\002 Downtown Carpark redevleopment\Drawings\Our Drawings\30. Update to the building GFA and servce lane\PREP002-QS-SW01-AA - 2024.12.13.dwg Ronak Gupta 13/12/2024 9:30 am

650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

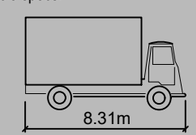
DITION 1: 800mm DIAPRAGM WALL TO BOUNDARY -
OUNDARY TO CENTRELINE OF WALL

BASEMENT 02

EOT DHW PLANT
EOT DHW
EXP TANK
LIFT
STAIR PRESS
WASTE P3
MW BOOSTER PUMPS P3
BOOSTER PUMPS
1100L GAR
1100L REC
1100L CARD
TREATMENT
VOID
BIN HOLDING
T1-GEN-1
T1-GEN-2
REMOVABLE WALL
RL -2.500
RL -3.400
RAMP 1:8
UP
DOWN
AT Design Vehicle – 8.3m Truck Auckland Transport Design Vehicles
LOADING DOCK (x5)
WASTE P2
HARD WASTE
1100L REC
1100L GAR
660L CARD
BIN LIFT PLATFORM
DOCK MEETING ROOM
RAMP 1:12
RES/FF LIFT
RES LIFT
OFFICE LIFT
RISER
DOCK OFFICE
STORE
DOCK WELLNESS
CLNR STORE
TENANT STAGING AREA
54 m²
PUMPS & HEADERS
FROM B01
6000 RAMP
R 7200

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Medium Rigid truck
vehicle width: 2.44m
lock to lock time: 6.00s
track width: 2.44m
turning radius: 8.99m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - 8.3m TRUCK

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 08 of 18
REV: AA

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P:\PREP\002 Downtown Carpark redevleopment\Drawings\Our Drawings\30. Update to the building GFA and servce lane\PREP002-QS-SW01-AA - 2024.12.13.dwg Ronak Gupta 13/12/2024 9:30 am

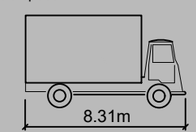
BASEMENT 02

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY -
FROM BOUNDARY TO CENTRELINE OF WALL

DHW PLANT
MW BOOSTER PUMPS P3
WASTE P3
EOT DHW PLANT
LIFT
LOADING DOCK (x5)
BIN LIFT PLATFORM
DOCK MEETING ROOM
WASTE P2
RES LOBBY
RES/FF LIFT
RES LIFT
OFFICE LIFT
RISER
DOCK OFFICE
STORE
DOCK WELLNESS
CLNR STORE
TENANT STAGING AREA 54 m²
PUMPS & HEADERS
RAMP 1:8
RAMP 1:12
RL -2.500
RL -3.400
FROM B01
R 7200
T2 MAIL
CORRIDOR
T1 GEN-1
T1 GEN-2
REMOVABLE WALL

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Medium Rigid truck
vehicle width: 2.44m
lock to lock time: 6.00s
track width: 2.44m
turning radius: 8.99m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - 8.3m TRUCK
DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 09 of 18
REV: AA

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BASEMENT 02

650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

RL -2.500 | RL -3.400 | RAMP 1:8 | RAMP 1:12 | UP | DOWN

Vehicle – 8.3m Medium Rigid Truck

AT Design Auckland Transport Design Vehicles – Truck

LOADING DOCK (x5)

DHW PLANT | EXP TANK | EOT DHW PLANT | LIFT

MW BOOSTER PUMPS P3 | WASTE P3 | 1100L GAR | 1100L REC | 1100L CARD | 660L CARD

WASTE P2 | HARD WASTE

BIN LIFT PLATFORM

DOCK MEETING ROOM

DOCK OFFICE | STORE | CLNR STORE | DOCK WELLNESS

TENANCY STAGING AREA 54 m²

RES LOBBY | RES/FF LIFT | RES LIFT | OFFICE LIFT | RISER

CORRIDOR | T2 MAIL

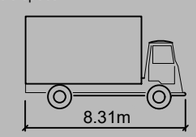
FROM B01 | R 7200 | 6000 RAMP

T1-GEN-1 | T1-GEN-2 | REMOVABLE WALL | PUMPS & HEADERS

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Medium Rigid truck

vehicle width: 2.44m
lock to lock time: 6.00s
track width: 2.44m
turning radius: 8.99m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - 8.3m TRUCK

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 10 of 18
REV: AA

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BASEMENT 02

MIN FROM BOUNDARY TO CENTRELINE OF WALL

LOADING DOCK (x2)

LOADING DOCK (x5)

WASTE P2

WASTE P3

MW BOOSTER PUMPS P3

DHW PLANT

EOT DHW PLANT

DOCK OFFICE

DOCK WELLNESS

DOCK MEETING ROOM

CLNR STORE

STORE

T1 MAIL

T2 MAIL

RES LOBBY

RES/FF LIFT

RES LIFT

OFFICE LIFT

LIFT

STAIR PRESS

Bin LIFT PLATFORM

RAMP 1:8

RAMP 1:12

RAMP 6000

R 7200

FROM B01

RL -2.500

RL -3.400

AT Design Vehicle – 8.3m Auckland Transport design Vehicles – Truck

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:

8.31m

Medium Rigid truck

vehicle width: 2.44m
lock to lock time: 6.00s
track width: 2.44m
turning radius: 8.99m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - 8.3m TRUCK

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 11 of 18
REV: AA

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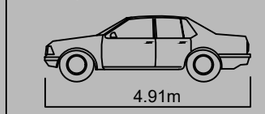
BASEMENT 02

LOADING DOCK (x5)
WASTE P2
WASTE P3
DHW PLANT
MW BOOSTER PUMPS P3
BIN LIFT PLATFORM
DOCK MEETING ROOM
DOCK OFFICE
DOCK WELLNESS
TENANT STAGING AREA 54 m²
CLNR STORE
STORE
T2 MAIL
RAMP 1:8
RAMP 1:12
RES/FF LIFT
RES LIFT
OFFICE LIFT
B85 STANDARDS 2004 (AU_NZ)
R 7200
FROM B01
6000 RAMP
RL -2.500
RL -3.400

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car
vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - B85 DESIGN VEHICLE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 12 of 18
REV: AA

flow
TRANSPORTATION SPECIALISTS
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BASEMENT 02

8400 | 9340 | 8400 | 8500 | 6000

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY - 650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY - 650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

RL -2.500

UP

RAMP 1:8

DOWN

EOT DHW

EOT DHW

EOT DHW PLANT

EXP TANK

EXP TANK

LIFT

STAIR

1100L GAR

1100L REC.

1100L CARD

WASTE P3

MW BOOSTER PUMPS P3

BOOSTER PUMPS

BIN HOLDING

VOID

TREATM

REMOVABLE WALL

T1 GEN-1

T1 GEN-2

RL -3.400

B85 STANDARDS 2004 (AU_NZ)

LOADING DOCK (x5)

1100L REC.

1100L GAR

660L CARD

WASTE P2

HARD WASTE

RAMP 1:8

BIN LIFT PLATFORM

DOCK MEETING ROOM

RAMP 1:8

RISER

RES/FF LIFT

RES LIFT

RES LUBBY

DOCK OFFICE

STORE

DOCK WELLNESS

M

F

CLNR STORE

TENANT STAGING AREA 54 m²

FFICE LIFT

RAMP 1:12

1100L

1 B01

WP

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

4.91m

85th Percentile Car

vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG

CHECKED: HS | DATE: 18/11/2024

SCALE: 0 10m

1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED

PROJECT: DOWNTOWN CARPARK REDEVELOPMENT

LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - B85 DESIGN VEHICLE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 13 of 18

REV: AA

flow
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P:\PREP\002 Downtown Carpark redevleopment\Drawings\Our Drawings\30. Update to the building GFA and servce lane\PREP002-QS-SW01-AA - 2024.12.13.dwg Ronak Gupta 13/12/2024 9:30 am

BASEMENT 02

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY - 650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

BOH CORRIDOR
COMMS 2
T2 MAIL ROOM
BOOSTER PUMPS
MW BOOSTER PUMPS T2
SUPP AIR
EXH AIR
PLENUM
OFFICE LIFT
RES LIFT
RISER
MSB
RAMP 1:12
RAMP 1:6
DOWN
UP
FROM B01
TO B03
7100 AISLE
6700 AISLE
6000 AISLE
CAR PARKING
DOCK OFFICE
STORE
CHILLER PLANT ROOM P1/T1
PUMPS & HEADERS
BUFFER TANK
TREATMENT
PUMPS & HEADERS
MSSB
WASTE T1
1100L REC.
1100L GAR.
BIN PRESS
HARD WASTE
B5W BALE
EXP TANK
OP/ MAINT
LOBBY
GOODS / FF LIFT
ELEC
OFFICE LOBBY
SHUTTLE LIFT
COMMS
RL -2.500

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

4.91m

85th Percentile Car
vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 02
VEHICLE TRACKING - B85 DESIGN VEHICLE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 14 of 18
REV: AA

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BASEMENT 03/04/05

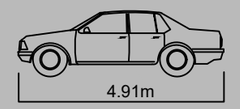
CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY -
650mm MIN FROM BOUNDARY TO CENTRELINE OF DIAPRAGM WALL

OFFICE LIFT
OFFICE LIFT
OFFICE LIFT
RISER
OFFICE LOBBY
RES STORES
EXH AIR
FROM B02
PLENUM
DOWN
UP
RAMP 1:6
SUPP AIR
DOG WASH STATION
GREASE TRAP
7100 AISLE
6975 AISLE
STORE
STORE
LIFT SHAFT
DAS 1
OP/ MAINT
PLANT
LOBBY
GOODS / FF LIFT
RISER
RISER
RISER
OFFICE LOBBY
SHUTTLE LIFT
SHUTTLE LIFT
RISER
COMMS
ELEC
B8
TO B04
6000 AISLE
7100 AISLE
6000 AISLE
COMMS
ELEC
BE
AA
AB

CONDITION 2: SHEET PILE/400mm INSITU WALL TO BOUNDARY -
2075mm MIN FROM BOUNDARY TO CENTRELINE OF INSITU WALL

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car

vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 03/04/05
VEHICLE TRACKING - B85 DESIGN VEHICLE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 15 of 18
REV: AA

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BASEMENT 03/04/05

ELEC
COMMS
STAIR PRESS
M SOCIAL LIFT
SUPP AIR
ELEC
6300 AISLE
PLENUM
7345 AISLE
GREASE TRAP
SUPP AIR
7100 AISLE
CAR PARKING
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
GREASE TRAP
RISER
EXH AIR
RISER
RISER
RISER
RISER
RES/FF LIFT
RES LIFT
RES LIFT
RES LIFT
RES LOBBY
OFFICE LIFT
OFFICE LIFT
OFFICE LIFT
RISER
OFFICE LOBBY
RES STORES
EXH AIR
FROM B02
PLENUM
DOWN
UP
RAMP 1:6
SUPP AIR
DOG
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
B85 STANDARDS 2004 (AU_NZ)
GREASE TRAP
RISER
STORE
STORE
LIFT SHAFT
DAS 1
REMOVABLE WALL
DIESEL TANK
DIESEL TANK
DIESEL TANKS
PLENUM
PLENUM
C8
H
H

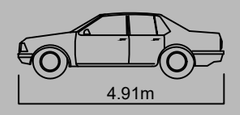
CONDITION 1A: 800mm DIAPRAGM WALL TO BOUNDARY - 1600mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY - 650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY - 650mm MIN FROM CORE FACE TO INSIDE FACE OF INSITU WALL

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car
vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

DESIGN: RG | DRAWN: RG
CHECKED: HS | DATE: 18/11/2024
SCALE: 0 10m
1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD
CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 03/04/05
VEHICLE TRACKING - B85 DESIGN VEHICLE
DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 16 of 18
REV: AA

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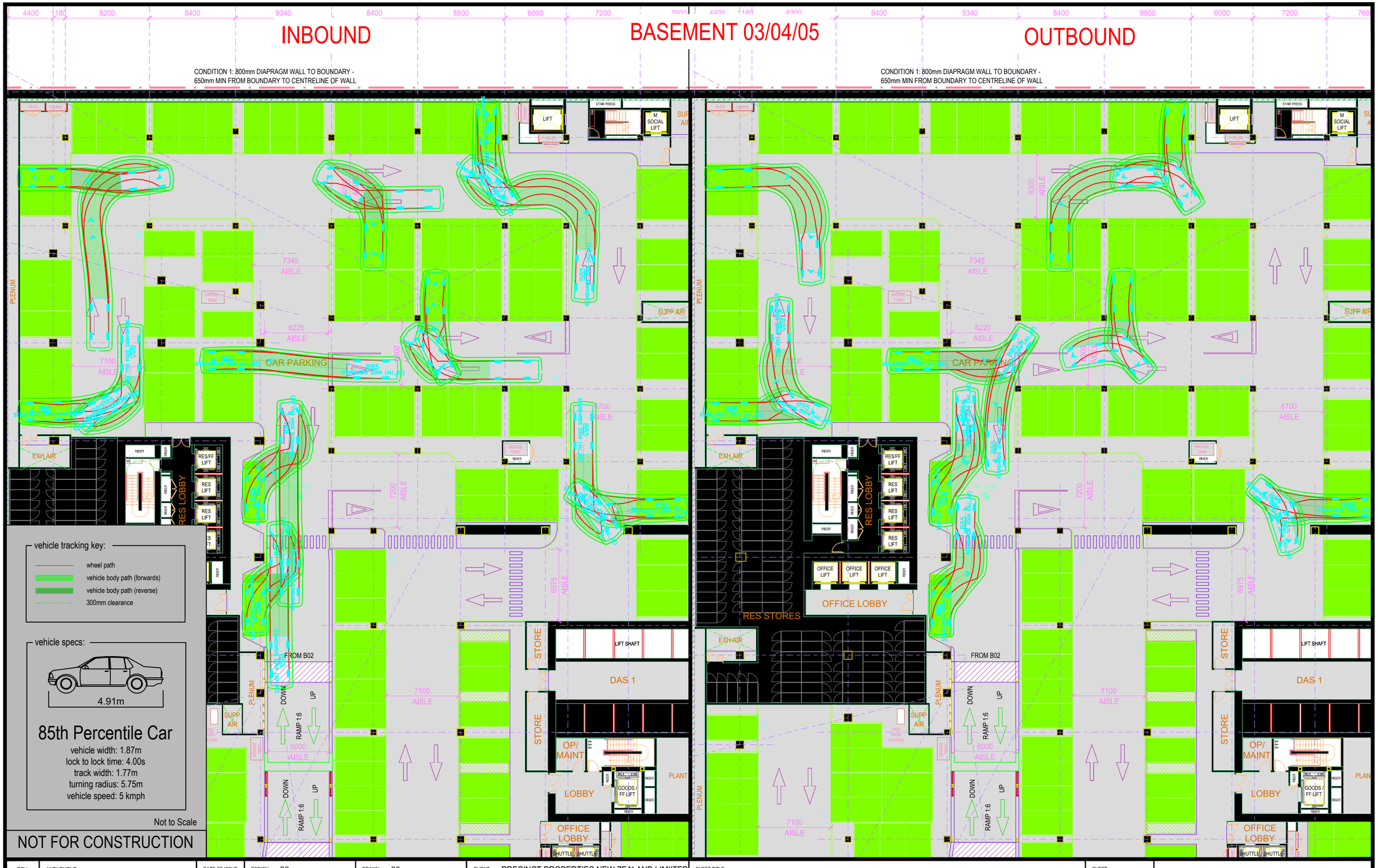
INBOUND

BASEMENT 03/04/05

OUTBOUND

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY -
650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL

CONDITION 1: 800mm DIAPRAGM WALL TO BOUNDARY -
650mm MIN FROM BOUNDARY TO CENTRELINE OF WALL



vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

85th Percentile Car

vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	18/11/2024

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1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 03/04/05
VEHICLE TRACKING - B85 DESIGN VEHICLE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 17 of 18
REV: AA

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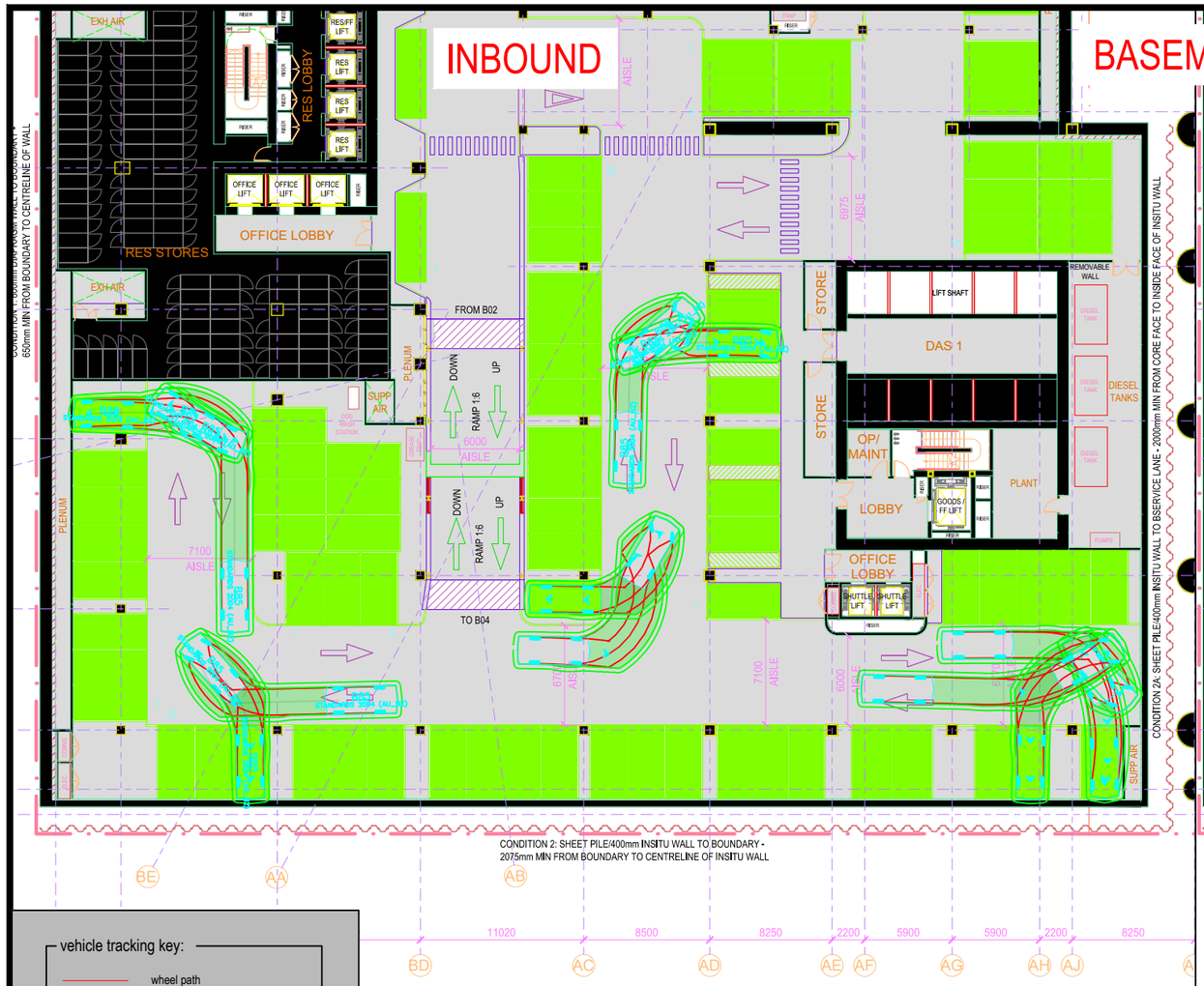
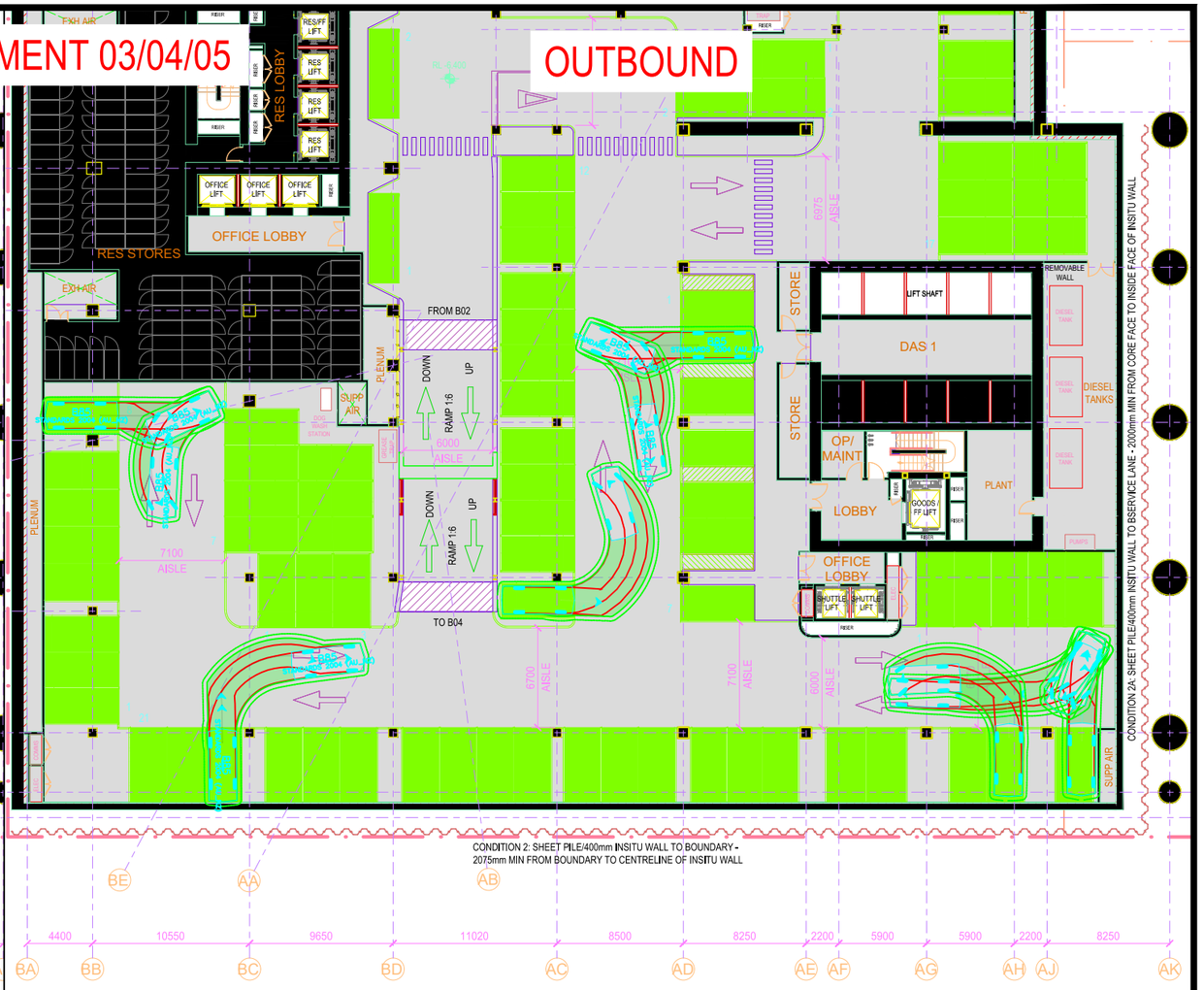
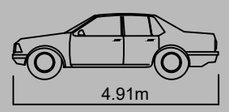




vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



85th Percentile Car

vehicle width: 1.87m
lock to lock time: 4.00s
track width: 1.77m
turning radius: 5.75m
vehicle speed: 5 kmph

Not to Scale

NOT FOR CONSTRUCTION

REV	AMENDMENT	DATE OF ISSUE
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1:250 @ A3

CLIENT: PRECINCT PROPERTIES NEW ZEALAND LIMIITED
PROJECT: DOWNTOWN CARPARK REDEVELOPMENT
LOCATION: AUCKLAND CBD

CONCEPT DESIGN RESET

SHEET TITLE: BASEMENT 03/04/05
VEHICLE TRACKING - B85 DESIGN VEHICLE

DRAWING NUMBER: PREP002-QS-SW01-AA

SHEET: 18 of 18
REV: AA

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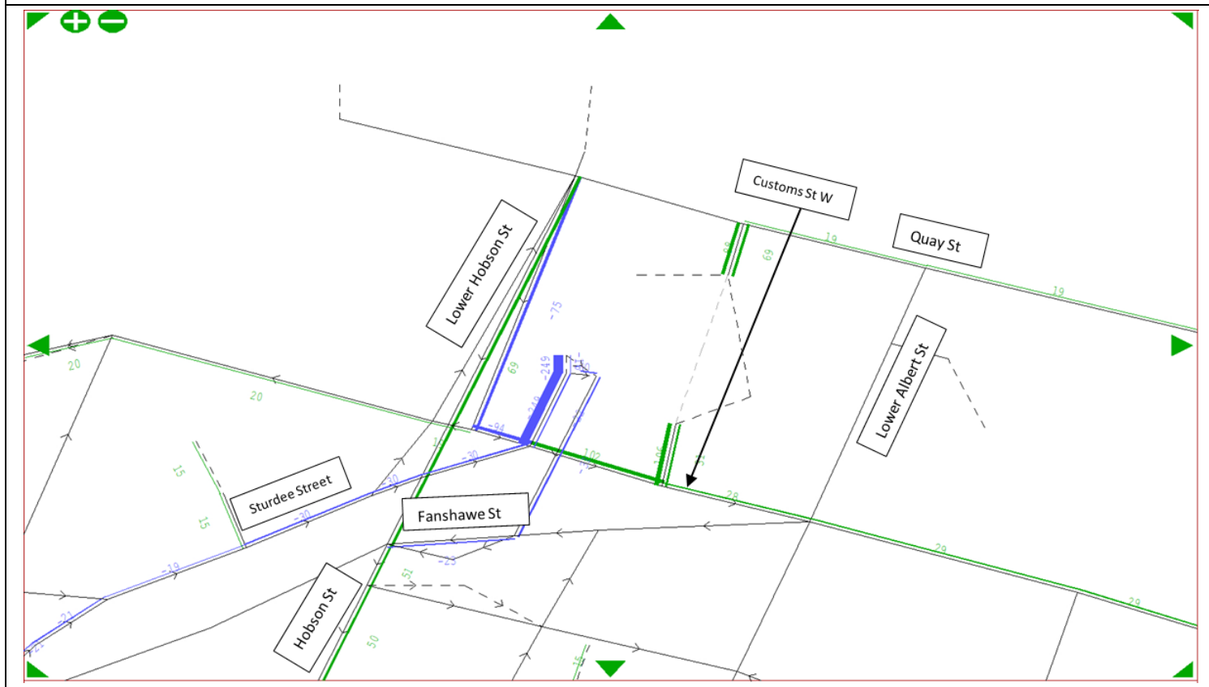
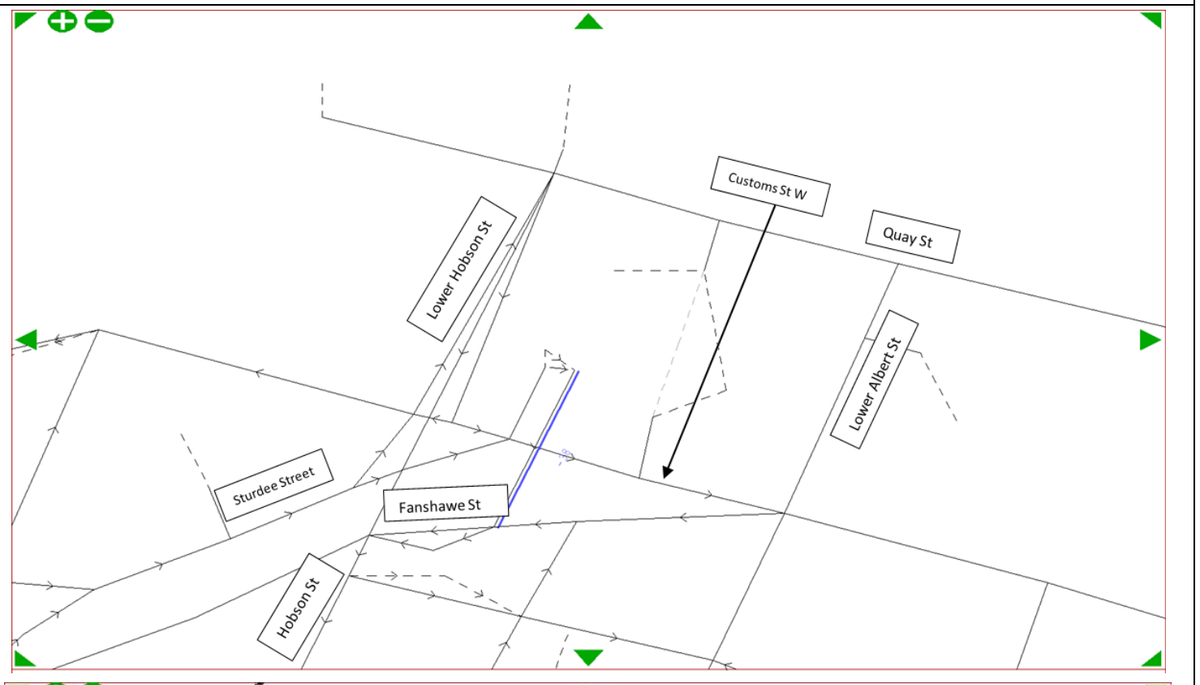
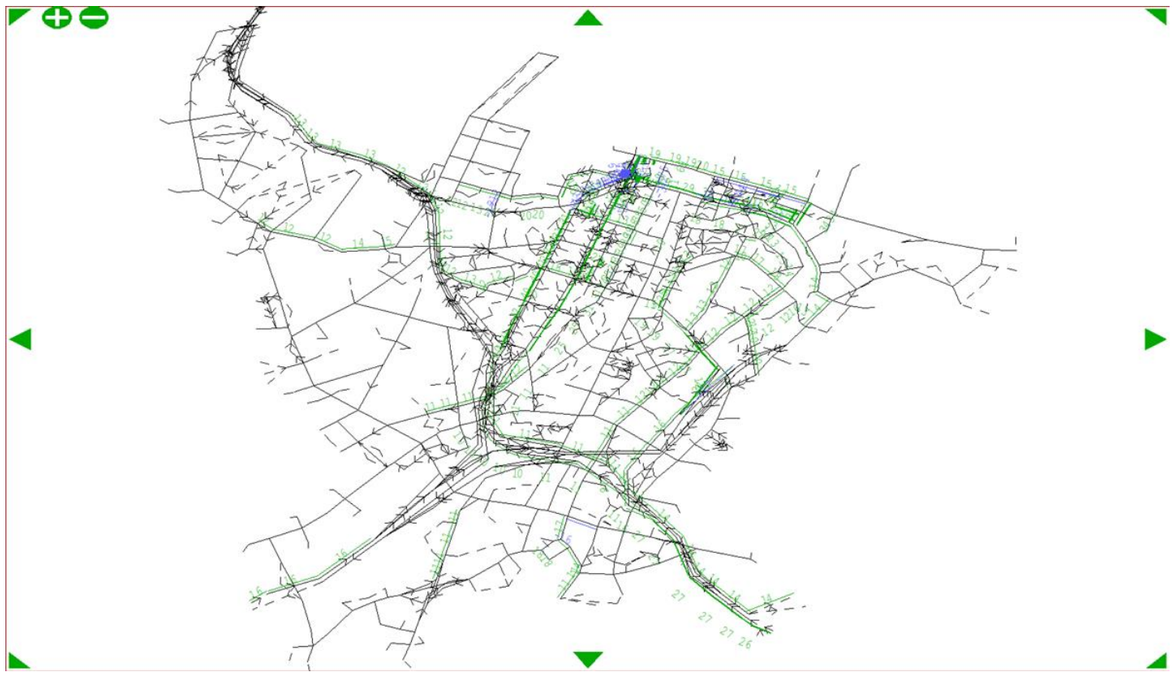
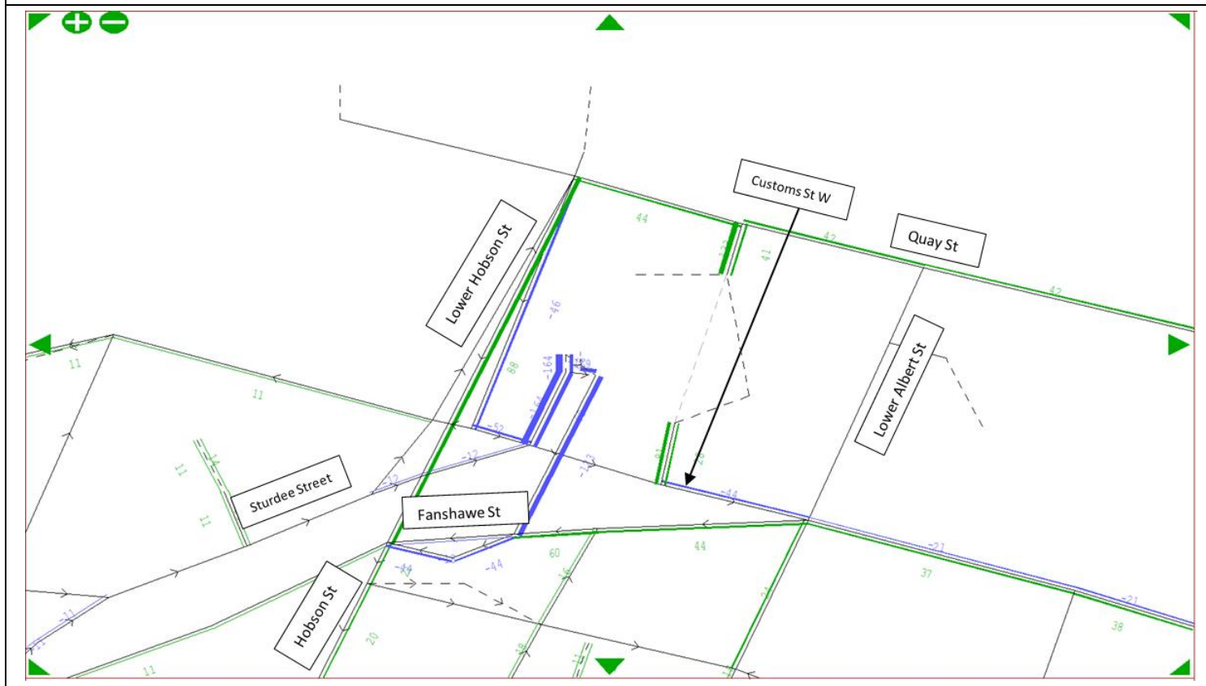
APPENDIX F SATURN model results

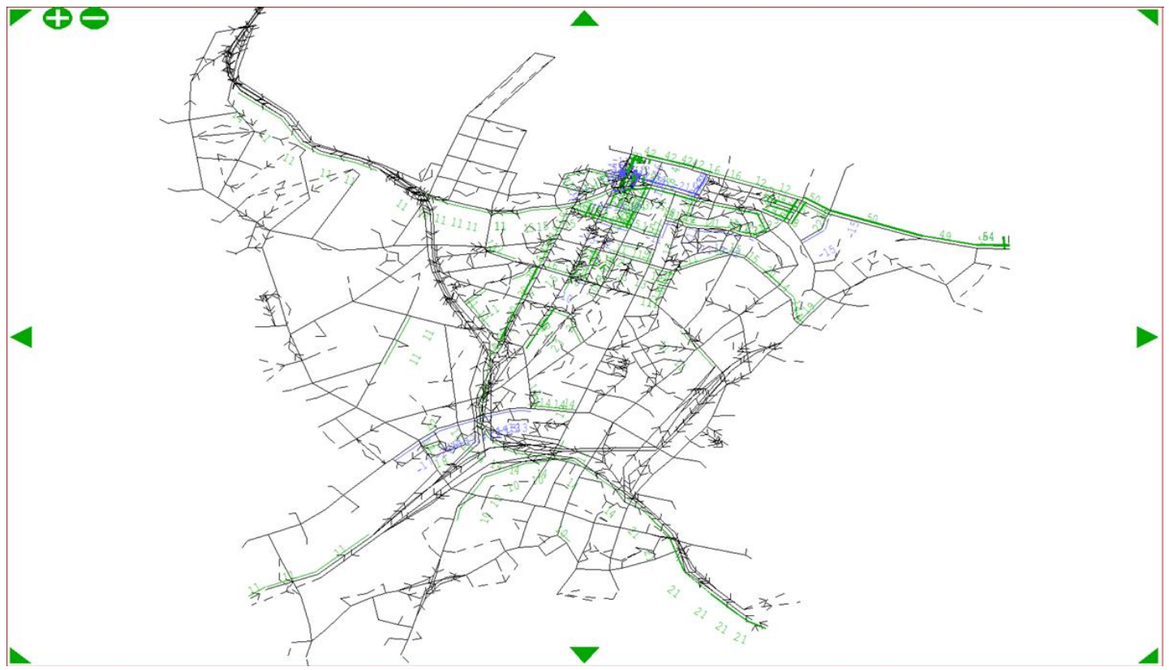
SATURN model volume and delay difference diagrams between the baseline scenario and development scenarios

Scenario 2 Development vs Scenario 1 Future Baseline AM	
Volume difference diagram (PCUs per hour)	**Delay difference diagram (seconds)**
	
	

Scenario 2 Development vs Scenario 1 Future Baseline PM

Volume difference diagram (PCUs per hour)





Delay difference diagram (seconds)

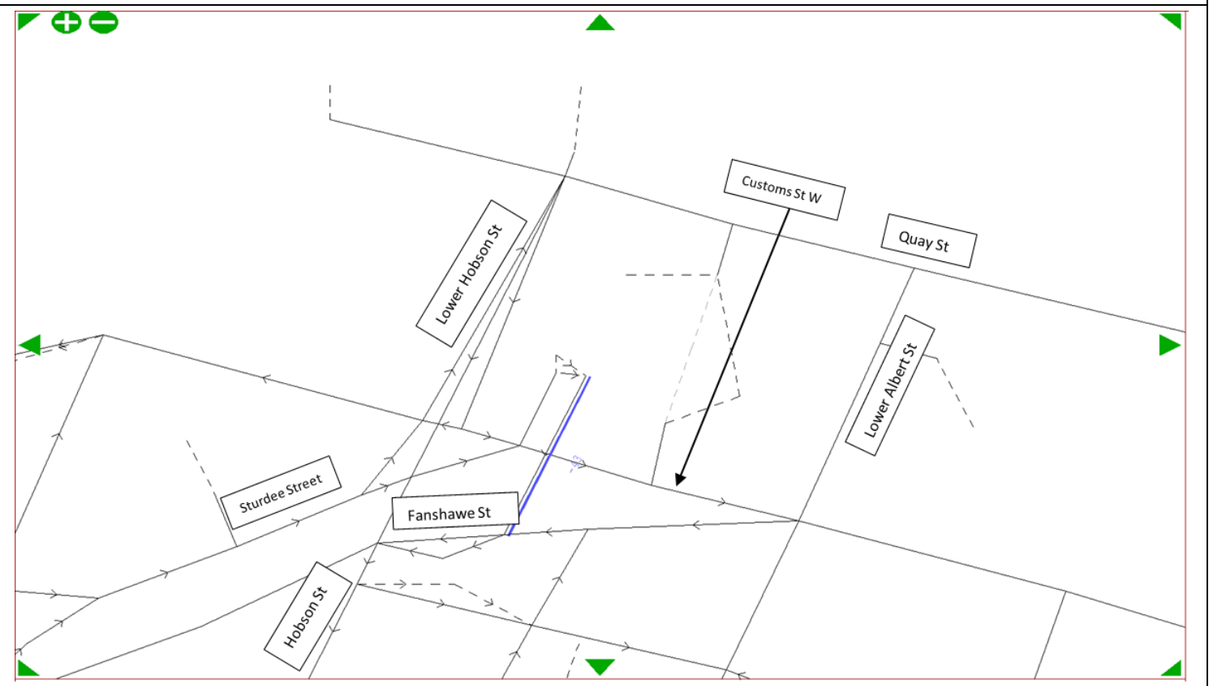


Table F1: Average travel time per vehicle per modelled scenario

Peak Period	Scenario 1	Scenario 2		
	Travel Time	Travel Time (Min:Sec)	Time Difference (Min:Sec)	Percentage Change
AM	06:26	06:27	00:01	0%
PM	06:45	06:45	00:00	0%

Table F2: Bus route travel times per modelled scenario, AM & PM peak period (bus route changes highlighted in yellow, travel time % changes over 5% highlighted in orange)

AM	Scenario 1	Scenario 2			PM	Scenario 1	Scenario 2		
Bus Route	Travel Time (Min:Sec)	Travel Time (Min:Sec)	Time Difference (Sec)	Percentage Change	Bus Route	Travel Time (Min:Sec)	Travel Time (Min:Sec)	Time Difference (Sec)	Percentage Change
101i	17:38	17:45	7	1%	101i	17:30	17:26	-4	0%
101o	15:37	15:37	0	0%	101o	16:13	16:15	2	0%
105i	20:37	20:35	-2	0%	105i	20:35	20:25	-10	-1%
105o	15:29	15:29	0	0%	105o	15:07	15:07	0	0%
106	29:31	29:29	-2	0%	106	29:49	29:43	-6	0%
11Ti	19:34	19:34	0	0%	11Ti	19:07	18:56	-11	-1%
11To	14:21	14:21	0	0%	11To	14:01	14:01	0	0%
11Wi	19:34	19:34	0	0%	11Wi	19:07	18:56	-11	-1%
11Wo	14:21	14:21	0	0%	11Wo	14:01	14:01	0	0%
18i	19:34	19:34	0	0%	18i	19:07	18:56	-11	-1%
18o	14:21	14:21	0	0%	18o	14:01	14:01	0	0%
195i	19:38	19:38	0	0%	195i	19:36	19:26	-10	-1%
195o	14:17	14:17	0	0%	195o	13:57	13:58	1	0%
20i	14:19	14:22	3	0%	20i	15:10	15:10	0	0%
20o	14:20	14:20	0	0%	20o	14:39	14:38	-1	0%
209i	19:34	19:34	0	0%	209i	19:07	18:56	-11	-1%
209o	14:21	14:21	0	0%	209o	14:01	14:01	0	0%
22Ni	14:09	14:11	2	0%	22Ni	13:11	13:11	0	0%
22No	14:36	14:49	13	1%	22No	14:33	14:43	10	1%
22Ri	14:09	14:11	2	0%	22Ri	13:11	13:11	0	0%
22Ro	14:36	14:49	13	1%	22Ro	14:33	14:43	10	1%
24Bi	14:15	14:17	2	0%	24Bi	13:20	13:21	1	0%
24Bo	14:13	14:25	12	1%	24Bo	14:01	14:11	10	1%
24Ri	14:15	14:17	2	0%	24Ri	13:20	13:21	1	0%
24Ro	14:13	14:25	12	1%	24Ro	14:01	14:11	10	1%
252i	17:23	17:29	6	1%	252i	17:23	17:25	2	0%
252o	09:16	09:16	0	0%	252o	09:17	09:19	2	0%
253i	17:23	17:29	6	1%	253i	17:23	17:25	2	0%
253o	09:16	09:16	0	0%	253o	09:17	09:19	2	0%
25Bi	09:14	09:14	0	0%	25Bi	10:20	10:23	3	0%
25Bo	07:37	07:38	1	0%	25Bo	07:28	07:28	0	0%

25Li	09:14	09:14	0	0%	**25Li**	10:20	10:23	3	0%
25Lo	07:37	07:38	1	0%	**25Lo**	07:28	07:28	0	0%
27Hi	12:29	12:30	1	0%	**27Hi**	12:23	12:23	0	0%
27Ho	12:17	12:29	12	2%	**27Ho**	12:22	12:32	10	1%
27Ti	12:29	12:30	1	0%	**27Ti**	12:23	12:23	0	0%
27To	12:17	12:29	12	2%	**27To**	12:22	12:32	10	1%
27Wi	12:29	12:30	1	0%	**27Wi**	12:23	12:23	0	0%
27Wo	12:17	12:29	12	2%	**27Wo**	12:22	12:32	10	1%
295i	10:22	10:23	1	0%	**295i**	10:38	10:38	0	0%
295o	12:13	12:16	3	0%	**295o**	12:06	12:05	-1	0%
30i	10:22	10:23	1	0%	**30i**	10:38	10:38	0	0%
30o	12:13	12:16	3	0%	**30o**	12:06	12:05	-1	0%
309i	10:22	10:23	1	0%	**309i**	10:38	10:38	0	0%
309o	12:13	12:16	3	0%	**309o**	12:06	12:05	-1	0%
321i	10:13	10:16	3	0%	**321i**	08:59	09:01	2	0%
321o	09:18	09:28	10	2%	**321o**	09:31	09:41	10	2%
70i	19:08	19:10	2	0%	**70i**	19:13	19:16	3	0%
70o	10:51	10:57	6	1%	**70o**	09:52	09:48	-4	-1%
72Xi	18:57	19:03	6	1%	**72Xi**	19:03	19:05	2	0%
72Xo	11:34	11:40	6	1%	**72Xo**	10:53	10:53	0	0%
75i	15:39	15:42	3	0%	**75i**	15:23	15:25	2	0%
75o	15:51	15:56	5	1%	**75o**	14:56	14:52	-4	0%
755i	08:40	08:40	0	0%	**755i**	07:22	07:20	-2	0%
755o	07:50	08:04	14	3%	**755o**	07:37	07:49	12	3%
76i	06:32	06:23	-9	-2%	**76i**	06:08	06:05	-3	-1%
76o	06:34	06:43	9	2%	**76o**	07:13	07:24	11	3%
774i	06:32	06:23	-9	-2%	**774i**	06:08	06:05	-3	-1%
774o	06:34	06:43	9	2%	**774o**	07:13	07:24	11	3%
775i	06:32	06:23	-9	-2%	**775i**	06:08	06:05	-3	-1%
775o	06:34	06:43	9	2%	**775o**	07:13	07:24	11	3%
802i	12:53	12:56	3	0%	**802i**	13:49	13:47	-2	0%
802o	11:46	11:50	4	1%	**802o**	11:35	11:35	0	0%
82i	12:53	12:56	3	0%	**82i**	13:49	13:47	-2	0%
82o	11:46	11:50	4	1%	**82o**	11:35	11:35	0	0%
866i	15:57	15:58	1	0%	**866i**	17:59	17:57	-2	0%
866o	18:31	18:31	0	0%	**866o**	18:34	18:34	0	0%
923i	12:53	12:56	3	0%	**923i**	13:49	13:47	-2	0%
923o	11:46	11:50	4	1%	**923o**	11:35	11:35	0	0%
924i	12:53	12:56	3	0%	**924i**	13:49	13:47	-2	0%
924o	11:46	11:50	4	1%	**924o**	11:35	11:35	0	0%
931i	17:02	17:01	-1	0%	**931i**	19:14	19:15	1	0%
931o	13:17	13:14	-3	0%	**931o**	12:00	11:56	-4	-1%
933i	17:02	17:01	-1	0%	**933i**	19:14	19:15	1	0%
933o	13:17	13:14	-3	0%	**933o**	12:00	11:56	-4	-1%
939i	17:02	17:01	-1	0%	**939i**	19:14	19:15	1	0%

939o	13:17	13:14	-3	0%	**939o**	12:00	11:56	-4	-1%
95Bi	07:05	07:06	1	0%	**95Bi**	08:40	08:41	1	0%
95Bo	07:47	07:48	1	0%	**95Bo**	07:27	07:29	2	0%
95Ci	07:05	07:06	1	0%	**95Ci**	08:40	08:41	1	0%
95Co	07:47	07:48	1	0%	**95Co**	07:27	07:29	2	0%
966i	15:57	15:58	1	0%	**966i**	17:59	17:57	-2	0%
966o	18:31	18:31	0	0%	**966o**	18:34	18:34	0	0%
97Bi	07:05	07:06	1	0%	**97Bi**	08:40	08:41	1	0%
97Bo	07:47	07:48	1	0%	**97Bo**	07:27	07:29	2	0%
97Ri	07:05	07:06	1	0%	**97Ri**	08:40	08:41	1	0%
97Ro	07:47	07:48	1	0%	**97Ro**	07:27	07:29	2	0%
CTY	35:54	35:56	2	0%	**CTY**	36:01	36:05	4	0%
INNi	30:40	30:36	-4	0%	**INNi**	30:37	30:39	2	0%
INNo	33:24	33:29	5	0%	**INNo**	33:46	33:49	3	0%
NX1i	07:05	07:06	1	0%	**NX1i**	08:40	08:41	1	0%
NX1o	07:47	07:48	1	0%	**NX1o**	07:27	07:29	2	0%
NX2i	14:02	14:05	3	0%	**NX2i**	14:59	14:58	-1	0%
NX2o	13:01	13:03	2	0%	**NX2o**	13:16	13:17	1	0%
OUTi	22:09	22:17	8	1%	**OUTi**	21:11	21:08	-3	0%
OUTo	20:06	20:10	4	0%	**OUTo**	20:38	20:41	3	0%
TMKi	06:32	06:23	-9	-2%	**TMKi**	06:08	06:05	-3	-1%
TMKo	06:34	06:43	9	2%	**TMKo**	07:13	07:24	11	3%
WX1i	20:07	20:05	-2	0%	**WX1i**	19:11	18:58	-13	-1%
WX1o	14:23	14:23	0	0%	**WX1o**	14:53	14:55	2	0%

APPENDIX G SIDRA model results

MOVEMENT SUMMARY

Site: S101 [Quay Street Access + M social - AM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Lane															
7	L2	All MCs	48	12.5	48	12.5	0.075	4.9	LOS A	3.9	30.4	0.13	0.50	0.13	44.0
9	R2	All MCs	20	15.0	20	15.0	0.064	15.2	LOS C	0.2	1.8	0.69	0.85	0.69	35.5
Approach			68	13.2	68	13.2	0.075	7.9	LOS A	3.9	30.4	0.29	0.60	0.29	41.1
East: Quay Street															
10	L2	All MCs	72	18.1	72	18.1	0.070	4.3	LOS A	3.6	34.6	0.00	0.37	0.00	44.7
11	T1	All MCs	597	14.2	597	14.2	0.492	0.1	LOS A	3.6	34.6	0.00	0.02	0.00	48.2
Approach			669	14.6	669	14.6	0.492	0.5	NA	3.6	34.6	0.00	0.06	0.00	46.4
West: Quay Street															
5	T1	All MCs	226	46.5	226	46.5	0.119	0.2	LOS A	0.1	1.2	0.04	0.04	0.04	46.4
6	R2	All MCs	7	28.6	7	28.6	0.043	9.1	LOS A	0.1	1.2	0.21	0.24	0.21	45.1
Approach			233	45.9	233	45.9	0.119	0.5	NA	0.1	1.2	0.04	0.05	0.04	46.2
All Vehicles			970	22.1	970	22.1	0.492	1.0	NA	3.9	34.6	0.03	0.09	0.03	45.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: A101 [Quay St / Lower Albert St - AM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Albert St															
1	L2	All MCs	28	14.3	28	14.3	0.094	36.9	LOS D	1.0	7.8	0.87	0.70	0.87	11.1
Approach			28	14.3	28	14.3	0.094	36.9	LOS D	1.0	7.8	0.87	0.70	0.87	11.1
East: Quay St															
4	L2	All MCs	20	25.0	20	25.0	0.981	82.6	LOS F	43.9	336.0	1.00	1.56	1.78	12.1
5	T1	All MCs	609	10.5	609	10.5	* 0.981	77.8	LOS E	43.9	336.0	1.00	1.56	1.78	8.9
Approach			629	11.0	629	11.0	0.981	77.9	LOS E	43.9	336.0	1.00	1.56	1.78	9.0
West: Quay St															
11	T1	All MCs	208	33.7	208	33.7	0.221	8.9	LOS A	4.1	36.6	0.50	0.43	0.50	35.2
12	R2	All MCs	38	100.0	38	100.0	* 0.199	38.2	LOS D	1.4	18.4	0.89	0.73	0.89	13.2
Approach			246	43.9	246	43.9	0.221	13.4	LOS B	4.1	36.6	0.56	0.47	0.56	29.6
All Vehicles			903	20.0	903	20.0	0.981	59.1	LOS E	43.9	336.0	0.88	1.24	1.42	11.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lower Albert St											
P1	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
East: Quay St											
P2	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
West: Quay St											
P4	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
All Pedestrians		150	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: L101 [Quay St / Lower Hobson St - AM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Hobson St															
1	L2	All MCs	20	25.0	20	25.0	0.686	44.6	LOS D	11.2	100.5	0.97	0.85	1.01	24.1
2	T1	All MCs	43	23.3	43	23.3	0.686	39.8	LOS D	11.2	100.5	0.97	0.85	1.01	25.3
3	R2	All MCs	214	48.1	214	48.1	0.686	43.8	LOS D	11.2	100.5	0.95	0.83	0.98	23.3
Approach			277	42.6	277	42.6	0.686	43.2	LOS D	11.2	100.5	0.95	0.84	0.99	23.7
East: Quay St															
4b	L3	All MCs	286	12.9	286	12.9	0.775	38.8	LOS D	12.6	97.9	0.95	0.90	1.02	25.4
4	L2	All MCs	325	13.5	325	13.5	*0.775	41.8	LOS D	12.6	97.9	0.98	0.91	1.10	23.3
5	T1	All MCs	1	0.0	1	0.0	0.775	84.0	LOS F	10.7	85.5	1.00	0.92	1.17	8.9
6	R2	All MCs	33	30.3	33	30.3	0.775	88.3	LOS F	10.7	85.5	1.00	0.92	1.17	9.3
Approach			645	14.1	645	14.1	0.775	42.9	LOS D	12.6	97.9	0.97	0.90	1.07	23.6
North: Princes Wharf															
7	L2	All MCs	18	16.7	18	16.7	0.054	39.8	LOS D	0.7	5.7	0.84	0.69	0.84	8.7
7a	L1	All MCs	4	0.0	4	0.0	0.635	57.4	LOS E	3.6	27.7	1.00	0.82	1.11	22.2
8	T1	All MCs	64	12.5	64	12.5	*0.635	54.2	LOS D	3.6	27.7	1.00	0.82	1.11	22.5
9	R2	All MCs	1	0.0	1	0.0	0.635	58.7	LOS E	3.6	27.7	1.00	0.82	1.11	10.1
Approach			87	12.6	87	12.6	0.635	51.4	LOS D	3.6	27.7	0.97	0.79	1.06	20.8
West: Quay St															
10	L2	All MCs	1	0.0	1	0.0	0.529	61.1	LOS E	1.9	15.1	1.00	0.76	1.06	9.2
11	T1	All MCs	1	0.0	1	0.0	*0.529	56.6	LOS E	1.9	15.1	1.00	0.76	1.06	5.1
12a	R1	All MCs	6	16.7	6	16.7	0.529	59.7	LOS E	1.9	15.1	1.00	0.76	1.06	20.5
12	R2	All MCs	28	14.3	28	14.3	0.529	61.2	LOS E	1.9	15.1	1.00	0.76	1.06	20.2
Approach			36	13.9	36	13.9	0.529	60.8	LOS E	1.9	15.1	1.00	0.76	1.06	19.8
All Vehicles			1045	21.5	1045	21.5	0.775	44.3	LOS D	12.6	100.5	0.96	0.87	1.05	23.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Lower Hobson St											
P1	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
SouthEast: RoadName											
P5	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Quay St											
P2	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
North: Princes Wharf											
P3	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Quay St											
P4	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians		250	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Customs / Albert / Lower Albert - AM (Site Folder: Customs st DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Albert															
1	L2	All MCs	117	32.5	117	32.5	0.412	38.8	LOS D	4.4	39.8	0.92	0.78	0.92	26.1
3	R2	All MCs	85	18.8	85	18.8	* 0.735	52.1	LOS D	3.9	31.7	1.00	0.90	1.26	28.8
Approach			202	26.7	202	26.7	0.735	44.4	LOS D	4.4	39.8	0.96	0.83	1.07	27.5
East: Customs															
4	L2	All MCs	24	29.2	24	29.2	0.098	21.9	LOS C	1.3	13.8	0.71	0.63	0.71	37.3
5	T1	All MCs	741	16.6	741	16.6	* 0.659	28.0	LOS C	13.2	103.7	0.92	0.79	0.92	30.7
Approach			765	17.0	765	17.0	0.659	27.8	LOS C	13.2	103.7	0.91	0.79	0.91	31.0
North: Lower Albert															
7	L2	All MCs	1	0.0	1	0.0	0.235	48.9	LOS D	0.9	11.0	0.98	0.70	0.98	25.1
8	T1	All MCs	39	97.4	39	97.4	* 0.235	44.3	LOS D	0.9	11.0	0.98	0.70	0.98	25.7
Approach			40	95.0	40	95.0	0.235	44.4	LOS D	0.9	11.0	0.98	0.70	0.98	25.7
West: Customs															
10	L2	All MCs	163	37.4	163	37.4	0.552	32.0	LOS C	9.2	82.4	0.89	0.79	0.89	17.8
11	T1	All MCs	381	24.4	381	24.4	0.552	27.0	LOS C	10.0	84.8	0.89	0.76	0.89	30.8
Approach			544	28.3	544	28.3	0.552	28.5	LOS C	10.0	84.8	0.89	0.77	0.89	27.8
All Vehicles			1551	24.2	1551	24.2	0.735	30.6	LOS C	13.2	103.7	0.91	0.79	0.93	29.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Albert											
P1	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
East: Customs											
P2	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
North: Lower Albert											
P3	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

West: Customs										
P4 Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
All Pedestrians	200	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Custom Street Access - AM (Site Folder: Customs st DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Access															
7	L2	All MCs	15	6.7	15	6.7	0.012	5.5	LOS A	0.0	0.3	0.34	0.53	0.34	43.1
Approach			15	6.7	15	6.7	0.012	5.5	LOS A	0.0	0.3	0.34	0.53	0.34	43.1
West: Custom St															
10	L2	All MCs	106	23.6	106	23.6	0.177	3.9	LOS A	0.0	0.0	0.00	0.19	0.00	45.7
11	T1	All MCs	529	28.7	529	28.7	0.177	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	45.0
Approach			635	27.9	635	27.9	0.177	0.6	NA	0.0	0.0	0.00	0.09	0.00	45.4
All Vehicles			650	27.4	650	27.4	0.177	0.8	NA	0.0	0.3	0.01	0.10	0.01	45.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Quay Street Access + M social - PM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Lane															
7	L2	All MCs	117	14.5	117	14.5	0.178	4.9	LOS A	3.2	24.9	0.14	0.49	0.14	43.9
9	R2	All MCs	64	12.5	64	12.5	0.407	19.8	LOS C	0.9	7.2	0.80	0.97	0.99	32.6
Approach			181	13.8	181	13.8	0.407	10.2	LOS B	3.2	24.9	0.38	0.66	0.44	39.1
East: Quay Street															
10	L2	All MCs	38	18.4	38	18.4	0.049	4.3	LOS A	1.2	12.4	0.00	0.29	0.00	45.4
11	T1	All MCs	481	18.7	481	18.7	0.353	0.0	LOS A	1.2	12.4	0.00	0.02	0.00	48.5
Approach			519	18.7	519	18.7	0.353	0.3	NA	1.2	12.4	0.00	0.04	0.00	47.3
West: Quay Street															
5	T1	All MCs	497	18.3	497	18.3	0.253	0.1	LOS A	0.8	5.8	0.01	0.01	0.01	48.7
6	R2	All MCs	7	14.3	7	14.3	0.040	7.2	LOS A	0.1	0.9	0.15	0.19	0.15	46.0
Approach			504	18.3	504	18.3	0.253	0.2	NA	0.8	5.8	0.01	0.02	0.01	48.4
All Vehicles			1204	17.8	1204	17.8	0.407	1.7	NA	3.2	24.9	0.06	0.12	0.07	43.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Quay St / Lower Albert St - PM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Albert St															
1	L2	All MCs	78	12.8	78	12.8	* 0.244	37.2	LOS D	2.8	22.0	0.89	0.75	0.89	11.0
Approach			78	12.8	78	12.8	0.244	37.2	LOS D	2.8	22.0	0.89	0.75	0.89	11.0
East: Quay St															
4	L2	All MCs	5	20.0	5	20.0	0.761	36.2	LOS D	16.7	130.9	0.97	0.90	1.05	21.4
5	T1	All MCs	411	13.9	411	13.9	* 0.761	31.5	LOS C	16.7	130.9	0.97	0.90	1.05	17.4
Approach			416	13.9	416	13.9	0.761	31.5	LOS C	16.7	130.9	0.97	0.90	1.05	17.4
West: Quay St															
11	T1	All MCs	523	11.5	523	11.5	0.521	12.8	LOS B	12.7	97.9	0.68	0.60	0.68	31.1
12	R2	All MCs	38	100.0	38	100.0	0.186	37.1	LOS D	1.4	18.1	0.88	0.73	0.88	13.4
Approach			561	17.5	561	17.5	0.521	14.4	LOS B	12.7	97.9	0.69	0.61	0.69	29.3
All Vehicles			1055	15.7	1055	15.7	0.761	22.9	LOS C	16.7	130.9	0.81	0.74	0.84	22.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lower Albert St											
P1	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
East: Quay St											
P2	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
West: Quay St											
P4	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
All Pedestrians		150	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Quay St / Lower Hobson St - PM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Hobson St															
1	L2	All MCs	8	25.0	8	25.0	0.897	59.1	LOS E	25.6	199.1	1.00	1.05	1.31	20.6
2	T1	All MCs	51	15.7	51	15.7	* 0.897	54.3	LOS D	25.6	199.1	1.00	1.05	1.31	21.6
3	R2	All MCs	404	20.3	404	20.3	0.897	56.9	LOS E	25.6	199.1	0.98	1.02	1.26	19.9
Approach			463	19.9	463	19.9	0.897	56.6	LOS E	25.6	199.1	0.98	1.03	1.26	20.1
East: Quay St															
4b	L3	All MCs	153	15.7	153	15.7	0.635	32.5	LOS C	12.2	97.9	0.86	0.83	0.86	27.5
4	L2	All MCs	421	18.8	421	18.8	0.635	35.4	LOS D	12.2	97.9	0.91	0.83	0.91	25.4
5	T1	All MCs	1	0.0	1	0.0	* 0.635	89.6	LOS F	9.6	78.2	0.97	0.83	0.98	9.6
6	R2	All MCs	23	17.4	23	17.4	0.635	93.9	LOS F	9.6	78.2	0.97	0.83	0.98	10.2
Approach			598	17.9	598	17.9	0.635	37.0	LOS D	12.2	97.9	0.90	0.83	0.90	25.4
North: Princes Wharf															
7	L2	All MCs	99	9.1	99	9.1	0.298	44.6	LOS D	4.4	33.5	0.90	0.77	0.90	7.9
7a	L1	All MCs	3	0.0	3	0.0	0.682	61.0	LOS E	3.9	30.1	1.00	0.84	1.16	21.5
8	T1	All MCs	66	13.6	66	13.6	* 0.682	57.7	LOS E	3.9	30.1	1.00	0.84	1.16	21.7
9	R2	All MCs	1	0.0	1	0.0	0.682	62.2	LOS E	3.9	30.1	1.00	0.84	1.16	9.6
Approach			169	10.7	169	10.7	0.682	50.1	LOS D	4.4	33.5	0.94	0.80	1.01	15.8
West: Quay St															
10	L2	All MCs	1	0.0	1	0.0	0.438	65.4	LOS E	1.3	9.4	1.00	0.71	1.01	8.7
11	T1	All MCs	1	0.0	1	0.0	* 0.438	60.9	LOS E	1.3	9.4	1.00	0.71	1.01	4.8
12a	R1	All MCs	4	0.0	4	0.0	0.438	64.0	LOS E	1.3	9.4	1.00	0.71	1.01	19.7
12	R2	All MCs	16	12.5	16	12.5	0.438	65.5	LOS E	1.3	9.4	1.00	0.71	1.01	19.5
Approach			22	9.1	22	9.1	0.438	65.0	LOS E	1.3	9.4	1.00	0.71	1.01	18.7
All Vehicles			1252	17.5	1252	17.5	0.897	46.5	LOS D	25.6	199.1	0.94	0.90	1.05	21.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec

South: Lower Hobson St										
P1 Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
SouthEast: RoadName										
P5 Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
East: Quay St										
P2 Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
North: Princes Wharf										
P3 Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
West: Quay St										
P4 Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
All Pedestrians	250	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Customs / Albert / Lower Albert - PM (Site Folder: Customs st DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Albert															
1	L2	All MCs	121	32.2	121	32.2	0.276	34.6	LOS C	4.6	41.2	0.81	0.76	0.81	27.4
3	R2	All MCs	229	9.2	229	9.2	* 0.730	49.3	LOS D	11.2	84.7	1.00	0.88	1.09	29.5
Approach			350	17.1	350	17.1	0.730	44.3	LOS D	11.2	84.7	0.93	0.84	0.99	29.0
East: Customs															
4	L2	All MCs	39	17.9	39	17.9	0.145	25.6	LOS C	2.2	21.5	0.78	0.68	0.78	34.4
5	T1	All MCs	613	19.7	613	19.7	* 0.702	39.1	LOS D	13.7	109.6	0.96	0.85	1.00	26.7
Approach			652	19.6	652	19.6	0.702	38.2	LOS D	13.7	109.6	0.95	0.84	0.98	27.3
North: Lower Albert															
7	L2	All MCs	1	0.0	1	0.0	0.305	58.1	LOS E	1.1	14.5	0.99	0.71	0.99	22.9
8	T1	All MCs	45	86.7	45	86.7	* 0.305	53.3	LOS D	1.2	14.5	0.99	0.71	0.99	23.4
Approach			46	84.8	46	84.8	0.305	53.4	LOS D	1.2	14.5	0.99	0.71	0.99	23.4
West: Customs															
10	L2	All MCs	47	72.3	47	72.3	0.606	42.4	LOS D	10.0	91.8	0.94	0.80	0.94	15.2
11	T1	All MCs	419	27.0	419	27.0	0.606	37.2	LOS D	10.7	92.2	0.94	0.80	0.94	27.1
Approach			466	31.5	466	31.5	0.606	37.7	LOS D	10.7	92.2	0.94	0.80	0.94	26.3
All Vehicles			1514	24.7	1514	24.7	0.730	39.9	LOS D	13.7	109.6	0.95	0.82	0.97	27.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Albert											
P1	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Customs											
P2	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
North: Lower Albert											
P3	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

West: Customs										
P4 Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians	200	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Custom Street Access - PM (Site Folder: Customs st DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Access															
7	L2	All MCs	24	8.3	24	8.3	0.019	5.5	LOS A	0.1	0.6	0.32	0.53	0.32	43.2
Approach			24	8.3	24	8.3	0.019	5.5	LOS A	0.1	0.6	0.32	0.53	0.32	43.2
West: Custom St															
10	L2	All MCs	68	20.6	68	20.6	0.144	3.9	LOS A	0.0	0.0	0.00	0.15	0.00	46.0
11	T1	All MCs	442	32.8	442	32.8	0.144	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	45.4
Approach			510	31.2	510	31.2	0.144	0.5	NA	0.0	0.0	0.00	0.07	0.00	45.7
All Vehicles			534	30.1	534	30.1	0.144	0.7	NA	0.1	0.6	0.01	0.09	0.01	45.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Quay Street Access + M social - AM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Lane															
7	L2	All MCs	116	12.9	116	12.9	0.176	4.9	LOS A	5.4	41.9	0.14	0.49	0.14	43.9
9	R2	All MCs	40	20.0	40	20.0	0.124	15.0	LOS C	0.4	3.6	0.68	0.85	0.68	35.7
Approach			156	14.7	156	14.7	0.176	7.5	LOS A	5.4	41.9	0.28	0.59	0.28	41.5
East: Quay Street															
10	L2	All MCs	140	18.6	140	18.6	0.112	4.3	LOS A	2.1	18.5	0.00	0.43	0.00	44.2
11	T1	All MCs	524	13.5	524	13.5	0.383	0.0	LOS A	2.1	18.5	0.00	0.03	0.00	47.9
Approach			664	14.6	664	14.6	0.383	0.9	NA	2.1	18.5	0.00	0.11	0.00	45.3
West: Quay Street															
5	T1	All MCs	225	46.7	225	46.7	0.118	0.2	LOS A	0.1	1.3	0.04	0.04	0.04	46.3
6	R2	All MCs	8	25.0	8	25.0	0.044	8.6	LOS A	0.1	1.3	0.22	0.25	0.22	45.1
Approach			233	45.9	233	45.9	0.118	0.5	NA	0.1	1.3	0.04	0.05	0.04	46.1
All Vehicles			1053	21.6	1053	21.6	0.383	1.8	NA	5.4	41.9	0.05	0.17	0.05	43.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Quay St / Lower Albert St - AM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Albert St															
1	L2	All MCs	28	14.3	28	14.3	0.094	36.9	LOS D	1.0	7.8	0.87	0.70	0.87	11.1
Approach			28	14.3	28	14.3	0.094	36.9	LOS D	1.0	7.8	0.87	0.70	0.87	11.1
East: Quay St															
4	L2	All MCs	20	25.0	20	25.0	0.975	77.6	LOS E	42.1	322.0	1.00	1.51	1.72	12.7
5	T1	All MCs	605	10.4	605	10.4	* 0.975	72.8	LOS E	42.1	322.0	1.00	1.51	1.72	9.4
Approach			625	10.9	625	10.9	0.975	72.9	LOS E	42.1	322.0	1.00	1.51	1.72	9.5
West: Quay St															
11	T1	All MCs	227	33.0	227	33.0	0.240	9.0	LOS A	4.5	40.3	0.51	0.43	0.51	35.1
12	R2	All MCs	38	100.0	38	100.0	* 0.199	38.2	LOS D	1.4	18.4	0.89	0.73	0.89	13.2
Approach			265	42.6	265	42.6	0.240	13.2	LOS B	4.5	40.3	0.56	0.48	0.56	29.9
All Vehicles			918	20.2	918	20.2	0.975	54.6	LOS D	42.1	322.0	0.87	1.19	1.36	12.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lower Albert St											
P1	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
East: Quay St											
P2	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
West: Quay St											
P4	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
All Pedestrians		150	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Quay St / Lower Hobson St - AM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 101 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Hobson St															
1	L2	All MCs	20	25.0	20	25.0	0.662	43.6	LOS D	11.0	99.0	0.96	0.84	0.98	24.4
2	T1	All MCs	43	23.3	43	23.3	0.662	38.9	LOS D	11.0	99.0	0.96	0.84	0.98	25.5
3	R2	All MCs	213	48.4	213	48.4	0.662	42.9	LOS D	11.0	99.0	0.94	0.82	0.95	23.5
Approach			276	42.8	276	42.8	0.662	42.3	LOS D	11.0	99.0	0.94	0.82	0.96	23.9
East: Quay St															
4b	L3	All MCs	212	11.3	212	11.3	0.757	37.4	LOS D	12.6	97.9	0.94	0.88	0.98	25.9
4	L2	All MCs	393	13.5	393	13.5	* 0.757	39.8	LOS D	12.6	97.9	0.96	0.89	1.05	23.9
5	T1	All MCs	1	0.0	1	0.0	0.757	85.6	LOS F	10.0	79.5	1.00	0.90	1.15	8.8
6	R2	All MCs	33	30.3	33	30.3	0.757	89.9	LOS F	10.0	79.5	1.00	0.90	1.15	9.3
Approach			639	13.6	639	13.6	0.757	41.7	LOS D	12.6	97.9	0.96	0.89	1.03	23.9
North: Princes Wharf															
7	L2	All MCs	19	15.8	19	15.8	0.057	40.3	LOS D	0.8	6.1	0.84	0.69	0.84	8.6
7a	L1	All MCs	3	0.0	3	0.0	0.633	58.0	LOS E	3.6	27.6	1.00	0.82	1.11	22.1
8	T1	All MCs	64	12.5	64	12.5	* 0.633	54.7	LOS D	3.6	27.6	1.00	0.82	1.11	22.4
9	R2	All MCs	1	0.0	1	0.0	0.633	59.3	LOS E	3.6	27.6	1.00	0.82	1.11	10.0
Approach			87	12.6	87	12.6	0.633	51.7	LOS D	3.6	27.6	0.97	0.79	1.05	20.6
West: Quay St															
10	L2	All MCs	1	0.0	1	0.0	0.548	61.8	LOS E	2.0	15.6	1.00	0.76	1.08	9.1
11	T1	All MCs	2	0.0	2	0.0	* 0.548	57.3	LOS E	2.0	15.6	1.00	0.76	1.08	5.0
12a	R1	All MCs	5	20.0	5	20.0	0.548	60.4	LOS E	2.0	15.6	1.00	0.76	1.08	20.3
12	R2	All MCs	29	13.8	29	13.8	0.548	61.9	LOS E	2.0	15.6	1.00	0.76	1.08	20.1
Approach			37	13.5	37	13.5	0.548	61.4	LOS E	2.0	15.6	1.00	0.76	1.08	19.4
All Vehicles			1039	21.3	1039	21.3	0.757	43.4	LOS D	12.6	99.0	0.96	0.86	1.02	23.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lower Hobson St											

P1	Full	50	44.8	LOS E	0.1	0.1	0.94	0.94	198.6	200.0	1.01
SouthEast: Lower Hobson St											
P5	Full	50	44.8	LOS E	0.1	0.1	0.94	0.94	198.6	200.0	1.01
East: Quay St											
P2	Full	50	44.8	LOS E	0.1	0.1	0.94	0.94	198.6	200.0	1.01
North: Princes Wharf											
P3	Full	50	44.8	LOS E	0.1	0.1	0.94	0.94	198.6	200.0	1.01
West: Quay St											
P4	Full	50	44.8	LOS E	0.1	0.1	0.94	0.94	198.6	200.0	1.01
All Pedestrians		250	44.8	LOS E	0.1	0.1	0.94	0.94	198.6	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Custom Street Access - AM (Site Folder: Customs St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Access															
7	L2	All MCs	46	8.7	46	8.7	0.036	5.4	LOS A	0.1	1.1	0.30	0.53	0.30	43.3
Approach			46	8.7	46	8.7	0.036	5.4	LOS A	0.1	1.1	0.30	0.53	0.30	43.3
West: Custom St															
10	L2	All MCs	211	23.2	211	23.2	0.206	3.9	LOS A	0.0	0.0	0.00	0.32	0.00	44.6
11	T1	All MCs	525	29.0	525	29.0	0.206	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	44.2
Approach			736	27.3	736	27.3	0.206	1.1	NA	0.0	0.0	0.00	0.15	0.00	44.5
All Vehicles			782	26.2	782	26.2	0.206	1.4	NA	0.1	1.1	0.02	0.17	0.02	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Customs / Albert / Lower Albert - AM (Site Folder: Customs St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Albert															
1	L2	All MCs	117	32.5	117	32.5	0.412	38.8	LOS D	4.4	39.8	0.92	0.78	0.92	26.1
3	R2	All MCs	88	18.2	88	18.2	* 0.758	52.6	LOS D	4.1	32.9	1.00	0.92	1.30	28.7
Approach			205	26.3	205	26.3	0.758	44.7	LOS D	4.4	39.8	0.96	0.84	1.09	27.5
East: Customs															
4	L2	All MCs	22	31.8	22	31.8	0.096	21.8	LOS C	1.2	13.4	0.71	0.62	0.71	37.4
5	T1	All MCs	745	17.0	745	17.0	* 0.665	28.0	LOS C	13.3	104.9	0.92	0.79	0.92	30.7
Approach			767	17.5	767	17.5	0.665	27.9	LOS C	13.3	104.9	0.92	0.79	0.92	30.9
North: Lower Albert															
7	L2	All MCs	1	0.0	1	0.0	0.235	48.9	LOS D	0.9	11.0	0.98	0.70	0.98	25.1
8	T1	All MCs	39	97.4	39	97.4	* 0.235	44.3	LOS D	0.9	11.0	0.98	0.70	0.98	25.7
Approach			40	95.0	40	95.0	0.235	44.4	LOS D	0.9	11.0	0.98	0.70	0.98	25.7
West: Customs															
10	L2	All MCs	165	37.0	165	37.0	0.576	32.2	LOS C	9.8	86.8	0.90	0.80	0.90	17.7
11	T1	All MCs	406	23.4	406	23.4	0.576	27.3	LOS C	10.6	89.1	0.90	0.77	0.90	30.7
Approach			571	27.3	571	27.3	0.576	28.7	LOS C	10.6	89.1	0.90	0.78	0.90	27.8
All Vehicles			1583	24.1	1583	24.1	0.758	30.8	LOS C	13.3	104.9	0.92	0.79	0.93	29.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Albert											
P1	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
East: Customs											
P2	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
North: Lower Albert											
P3	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
West: Customs											

P4 Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
All Pedestrians	200	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Quay Street Access + M social - PM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Service Lane															
7	L2	All MCs	208	14.4	208	14.4	0.328	5.0	LOS A	4.6	36.1	0.17	0.49	0.17	43.8
9	R2	All MCs	106	12.3	106	12.3	0.647	22.9	LOS C	1.8	13.9	0.87	1.10	1.33	30.9
Approach			314	13.7	314	13.7	0.647	11.0	LOS B	4.6	36.1	0.41	0.70	0.56	38.4
East: Quay Street															
10	L2	All MCs	79	19.0	79	19.0	0.075	4.3	LOS A	1.0	9.3	0.00	0.38	0.00	44.7
11	T1	All MCs	434	18.9	434	18.9	0.361	0.0	LOS A	1.0	9.3	0.00	0.03	0.00	47.8
Approach			513	18.9	513	18.9	0.361	0.7	NA	1.0	9.3	0.00	0.08	0.00	45.9
West: Quay Street															
5	T1	All MCs	495	18.6	495	18.6	0.252	0.1	LOS A	2.0	15.5	0.01	0.02	0.01	48.6
6	R2	All MCs	8	12.5	8	12.5	0.040	7.0	LOS A	0.1	1.0	0.16	0.20	0.16	45.9
Approach			503	18.5	503	18.5	0.252	0.2	NA	2.0	15.5	0.01	0.02	0.01	48.3
All Vehicles			1330	17.5	1330	17.5	0.647	2.9	NA	4.6	36.1	0.10	0.20	0.14	41.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Quay St / Lower Albert St - PM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Albert St															
1	L2	All MCs	78	12.8	78	12.8	* 0.244	37.2	LOS D	2.8	22.0	0.89	0.75	0.89	11.0
Approach			78	12.8	78	12.8	0.244	37.2	LOS D	2.8	22.0	0.89	0.75	0.89	11.0
East: Quay St															
4	L2	All MCs	5	20.0	5	20.0	0.747	35.6	LOS D	16.2	126.5	0.96	0.88	1.03	21.7
5	T1	All MCs	404	13.6	404	13.6	* 0.747	30.8	LOS C	16.2	126.5	0.96	0.88	1.03	17.6
Approach			409	13.7	409	13.7	0.747	30.9	LOS C	16.2	126.5	0.96	0.88	1.03	17.7
West: Quay St															
11	T1	All MCs	563	11.7	563	11.7	0.562	13.2	LOS B	12.7	97.9	0.70	0.62	0.70	30.7
12	R2	All MCs	38	100.0	38	100.0	0.186	37.1	LOS D	1.4	18.1	0.88	0.73	0.88	13.4
Approach			601	17.3	601	17.3	0.562	14.7	LOS B	12.7	97.9	0.71	0.63	0.71	29.1
All Vehicles			1088	15.6	1088	15.6	0.747	22.4	LOS C	16.2	126.5	0.82	0.73	0.84	22.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lower Albert St											
P1	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
East: Quay St											
P2	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
West: Quay St											
P4	Full	50	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05
All Pedestrians		150	36.8	LOS D	0.1	0.1	0.93	0.93	190.6	200.0	1.05

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Quay St / Lower Hobson St - PM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Lower Hobson St															
1	L2	All MCs	8	25.0	8	25.0	0.899	59.4	LOS E	25.7	200.1	1.00	1.06	1.31	20.6
2	T1	All MCs	51	15.7	51	15.7	* 0.899	54.6	LOS D	25.7	200.1	1.00	1.06	1.31	21.5
3	R2	All MCs	404	20.5	404	20.5	0.899	57.2	LOS E	25.7	200.1	0.98	1.02	1.26	19.8
Approach			463	20.1	463	20.1	0.899	56.9	LOS E	25.7	200.1	0.98	1.03	1.27	20.0
East: Quay St															
4b	L3	All MCs	109	14.7	109	14.7	0.661	32.9	LOS C	12.2	97.9	0.87	0.84	0.87	27.4
4	L2	All MCs	509	18.1	509	18.1	0.661	35.5	LOS D	12.2	97.9	0.91	0.84	0.92	25.5
5	T1	All MCs	1	0.0	1	0.0	* 0.661	89.9	LOS F	10.7	86.1	0.97	0.84	0.99	9.7
6	R2	All MCs	23	17.4	23	17.4	0.661	94.2	LOS F	10.7	86.1	0.97	0.84	0.99	10.2
Approach			642	17.4	642	17.4	0.661	37.2	LOS D	12.2	97.9	0.91	0.84	0.91	25.3
North: Princes Wharf															
7	L2	All MCs	100	9.0	100	9.0	0.301	44.7	LOS D	4.5	33.8	0.90	0.77	0.90	7.9
7a	L1	All MCs	3	0.0	3	0.0	0.682	61.0	LOS E	3.9	30.1	1.00	0.84	1.16	21.5
8	T1	All MCs	66	13.6	66	13.6	* 0.682	57.7	LOS E	3.9	30.1	1.00	0.84	1.16	21.7
9	R2	All MCs	1	0.0	1	0.0	0.682	62.2	LOS E	3.9	30.1	1.00	0.84	1.16	9.6
Approach			170	10.6	170	10.6	0.682	50.1	LOS D	4.5	33.8	0.94	0.80	1.01	15.8
West: Quay St															
10	L2	All MCs	1	0.0	1	0.0	0.420	65.4	LOS E	1.2	9.0	1.00	0.70	1.00	8.7
11	T1	All MCs	1	0.0	1	0.0	* 0.420	60.8	LOS E	1.2	9.0	1.00	0.70	1.00	4.8
12a	R1	All MCs	3	0.0	3	0.0	0.420	63.9	LOS E	1.2	9.0	1.00	0.70	1.00	19.7
12	R2	All MCs	16	12.5	16	12.5	0.420	65.5	LOS E	1.2	9.0	1.00	0.70	1.00	19.5
Approach			21	9.5	21	9.5	0.420	65.0	LOS E	1.2	9.0	1.00	0.70	1.00	18.6
All Vehicles			1296	17.4	1296	17.4	0.899	46.4	LOS D	25.7	200.1	0.94	0.90	1.05	22.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Lower Hobson St											

P1	Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
SouthEast: Lower Hobson St											
P5	Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
East: Quay St											
P2	Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
North: Princes Wharf											
P3	Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
West: Quay St											
P4	Full	50	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00
All Pedestrians		250	46.8	LOS E	0.1	0.1	0.94	0.94	200.6	200.0	1.00

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Custom Street Access - PM (Site Folder: Customs St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Access															
7	L2	All MCs	51	9.8	51	9.8	0.038	5.2	LOS A	0.2	1.1	0.26	0.51	0.26	43.4
Approach			51	9.8	51	9.8	0.038	5.2	LOS A	0.2	1.1	0.26	0.51	0.26	43.4
West: Custom St															
10	L2	All MCs	149	20.1	149	20.1	0.149	3.9	LOS A	0.0	0.0	0.00	0.32	0.00	44.7
11	T1	All MCs	370	37.3	370	37.3	0.149	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	43.7
Approach			519	32.4	519	32.4	0.149	1.1	NA	0.0	0.0	0.00	0.15	0.00	44.5
All Vehicles			570	30.4	570	30.4	0.149	1.5	NA	0.2	1.1	0.02	0.18	0.02	44.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Customs / Albert / Lower Albert - PM (Site Folder: Customs St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Albert															
1	L2	All MCs	124	31.5	124	31.5	0.282	34.7	LOS C	4.7	42.1	0.82	0.76	0.82	27.4
3	R2	All MCs	251	8.8	251	8.8	* 0.798	52.2	LOS D	12.9	97.0	1.00	0.94	1.18	28.8
Approach			375	16.3	375	16.3	0.798	46.4	LOS D	12.9	97.0	0.94	0.88	1.06	28.5
East: Customs															
4	L2	All MCs	34	20.6	34	20.6	0.138	25.6	LOS C	2.0	20.4	0.78	0.68	0.78	34.2
5	T1	All MCs	654	20.9	654	20.9	* 0.757	41.1	LOS D	15.3	123.6	0.98	0.90	1.06	26.1
Approach			688	20.9	688	20.9	0.757	40.3	LOS D	15.3	123.6	0.97	0.89	1.05	26.6
North: Lower Albert															
7	L2	All MCs	1	0.0	1	0.0	0.305	58.1	LOS E	1.1	14.5	0.99	0.71	0.99	22.9
8	T1	All MCs	45	86.7	45	86.7	* 0.305	53.3	LOS D	1.2	14.5	0.99	0.71	0.99	23.4
Approach			46	84.8	46	84.8	0.305	53.4	LOS D	1.2	14.5	0.99	0.71	0.99	23.4
West: Customs															
10	L2	All MCs	47	72.3	47	72.3	0.554	41.9	LOS D	8.9	82.9	0.93	0.78	0.93	15.4
11	T1	All MCs	374	28.9	374	28.9	0.554	36.7	LOS D	9.5	83.3	0.93	0.78	0.93	27.3
Approach			421	33.7	421	33.7	0.554	37.2	LOS D	9.5	83.3	0.93	0.78	0.93	26.3
All Vehicles			1530	25.2	1530	25.2	0.798	41.4	LOS D	15.3	123.6	0.95	0.85	1.02	27.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Albert											
P1	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
East: Customs											
P2	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
North: Lower Albert											
P3	Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
West: Customs											

P4 Full	50	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01
All Pedestrians	200	44.3	LOS E	0.1	0.1	0.94	0.94	198.1	200.0	1.01

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

Site: A101 [Quay St / Lower Albert St - AM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, D
Output Phase Sequence: A, B, D
Reference Phase: Phase B
Offset: NA

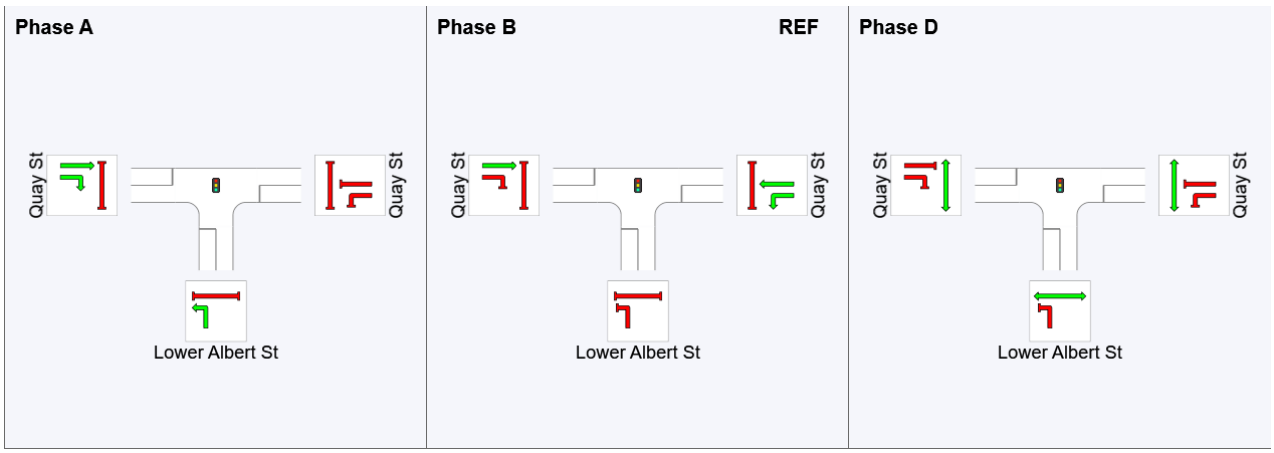
Phase Timing Summary

Phase	A	B	D
Phase Change Time (sec)	63	0	35
Green Time (sec)	15	30	19
Phase Time (sec)	20	39	26
Phase Split	24%	46%	31%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]

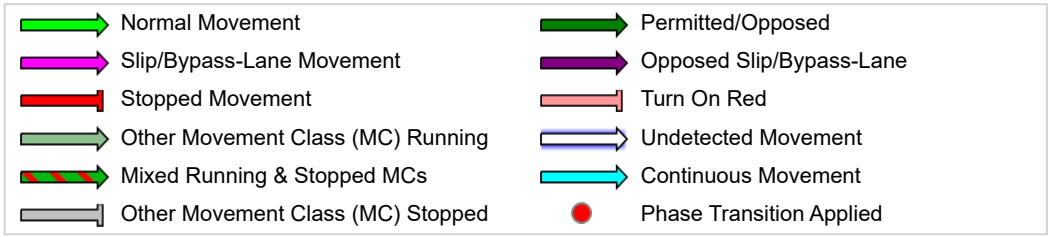
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



PHASING SUMMARY

Site: L101 [Quay St / Lower Hobson St - AM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D, E
Output Phase Sequence: A, B, C, D, E
Reference Phase: Phase B
Offset: NA

Phase Timing Summary

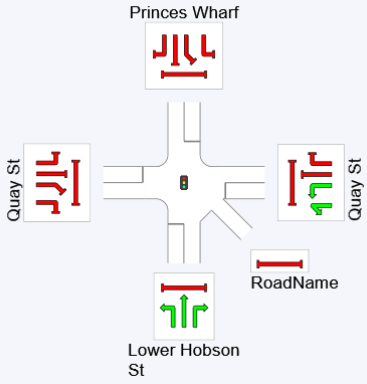
Phase	A	B	C	D	E
Phase Change Time (sec)	72	0	13	27	37
Green Time (sec)	23	6	6	4	30
Phase Time (sec)	30	14	12	9	35
Phase Split	30%	14%	12%	9%	35%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

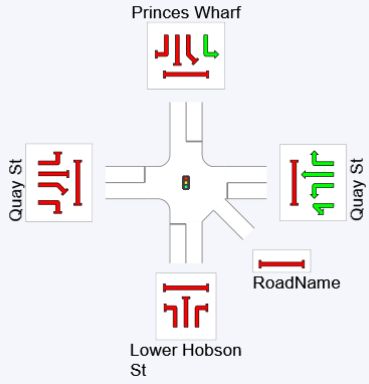
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence

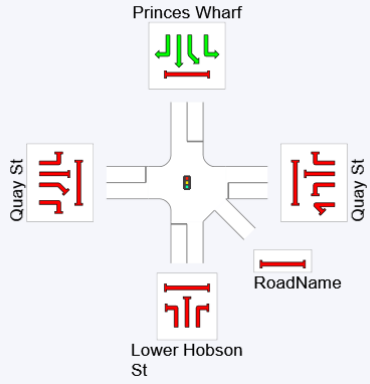
Phase A



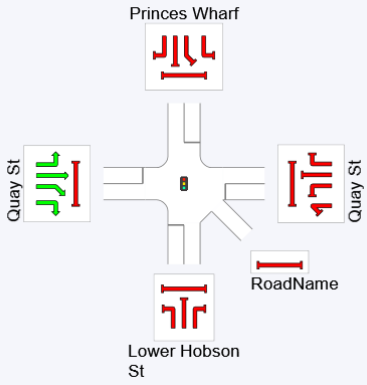
Phase B REF



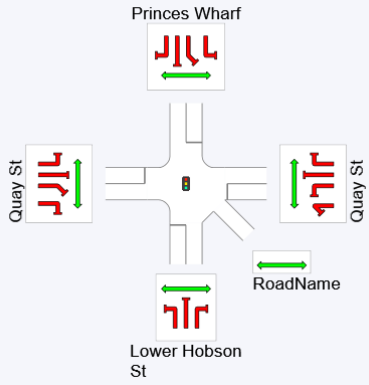
Phase C



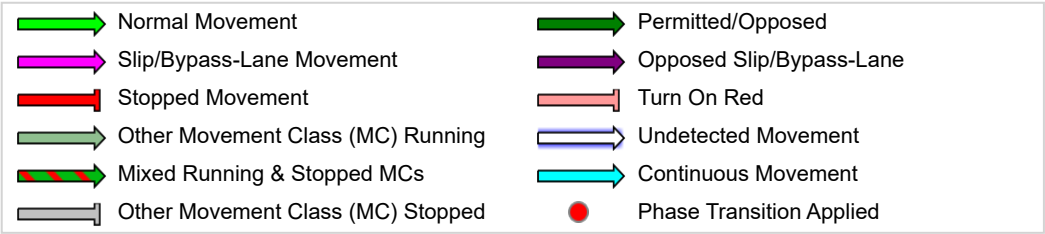
Phase D



Phase E



REF: Reference Phase
VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Customs / Albert / Lower Albert - AM (Site Folder: Customs st DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St AM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: NA

Phase Timing Summary

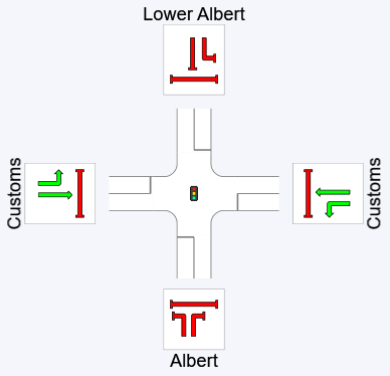
Phase	A	B	C	D
Phase Change Time (sec)	51	0	10	20
Green Time (sec)	26	6	6	25
Phase Time (sec)	30	10	12	33
Phase Split	35%	12%	14%	39%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

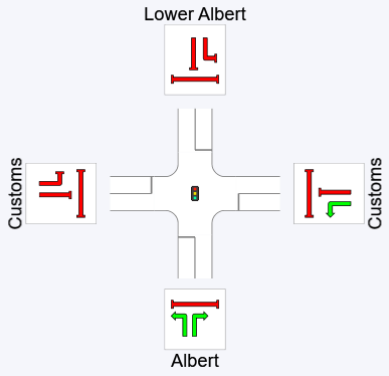
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence

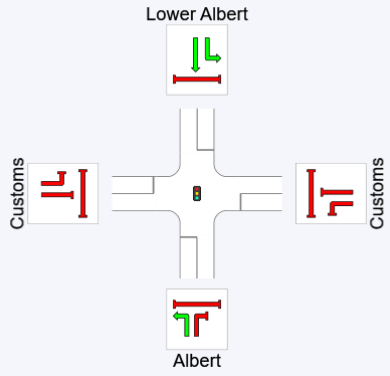
Phase A



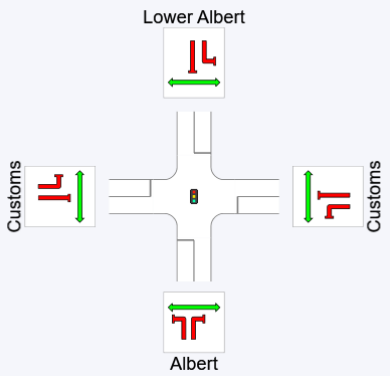
Phase B **REF**



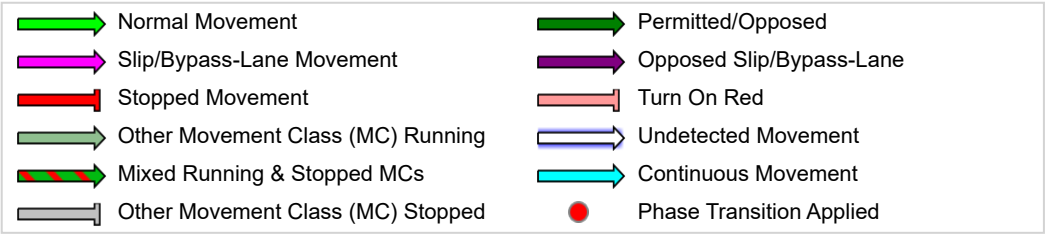
Phase C



Phase D



REF: Reference Phase
VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Quay St / Lower Albert St - PM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, D
Output Phase Sequence: A, B, D
Reference Phase: Phase B
Offset: NA

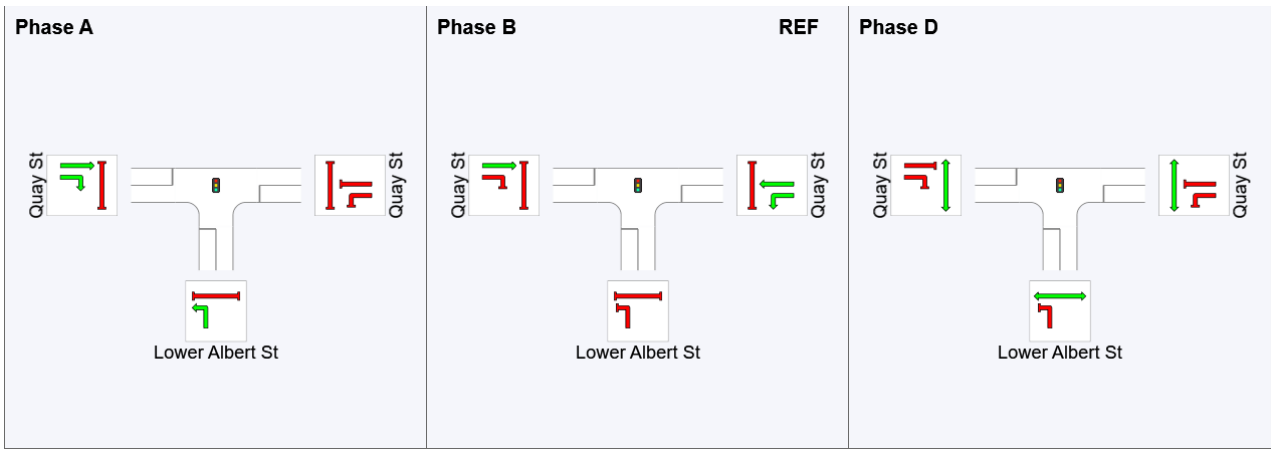
Phase Timing Summary

Phase	A	B	D
Phase Change Time (sec)	62	0	31
Green Time (sec)	16	26	22
Phase Time (sec)	21	35	29
Phase Split	25%	41%	34%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]

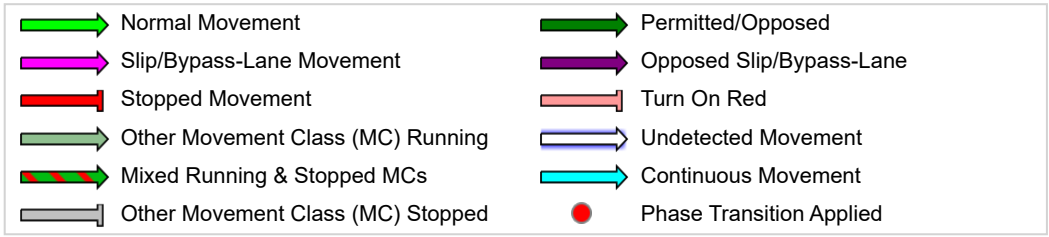
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Quay St / Lower Hobson St - PM (Site Folder: Quay St DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D, E
Output Phase Sequence: A, B, C, D, E
Reference Phase: Phase B
Offset: NA

Phase Timing Summary

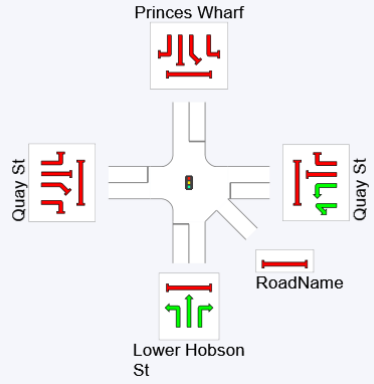
Phase	A	B	C	D	E
Phase Change Time (sec)	71	0	13	27	36
Green Time (sec)	29	6	6	3	31
Phase Time (sec)	36	14	12	7	36
Phase Split	34%	13%	11%	7%	34%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

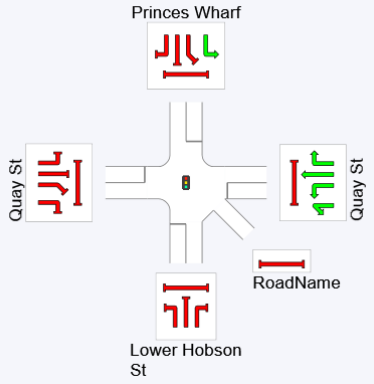
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence

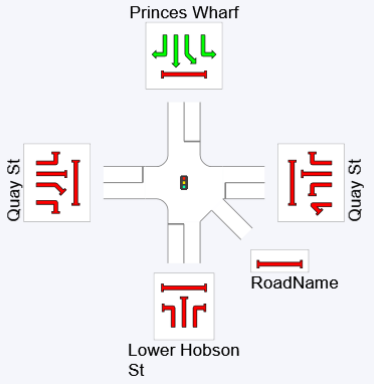
Phase A



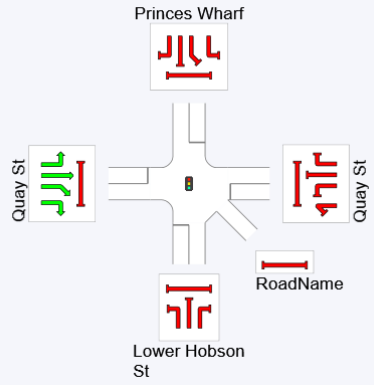
Phase B **REF**



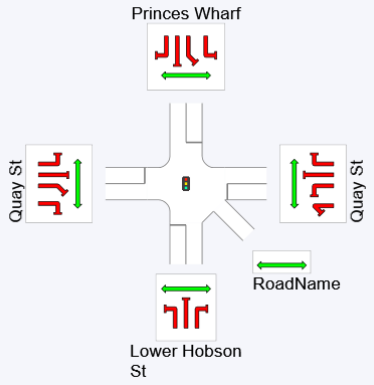
Phase C



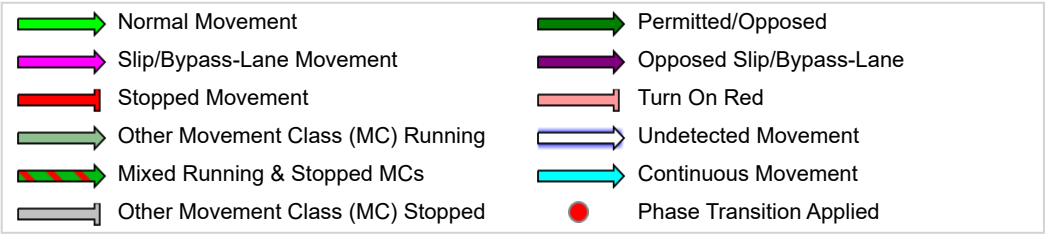
Phase D



Phase E



REF: Reference Phase
VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Customs / Albert / Lower Albert - PM (Site Folder: Customs st DM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St PM (Network Folder: DM Scenario 1)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: NA

Phase Timing Summary

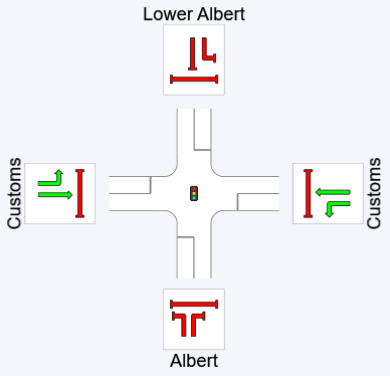
Phase	A	B	C	D
Phase Change Time (sec)	69	0	23	34
Green Time (sec)	24	18	6	29
Phase Time (sec)	29	23	12	36
Phase Split	29%	23%	12%	36%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

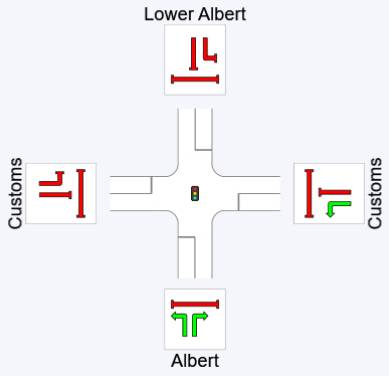
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence

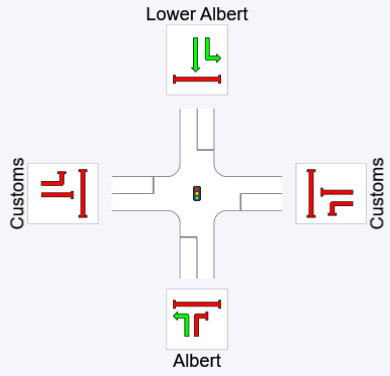
Phase A



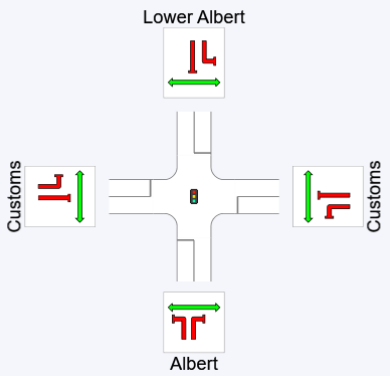
Phase B **REF**



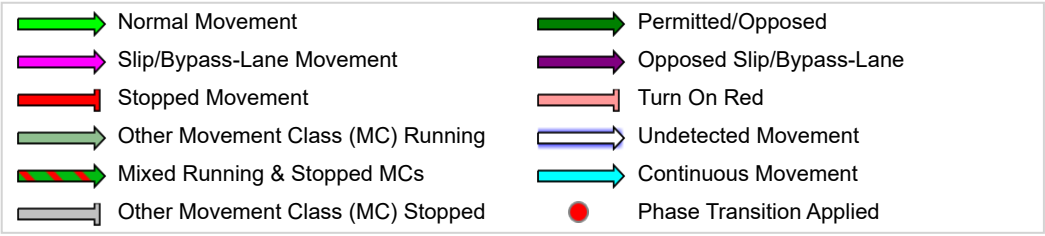
Phase C



Phase D



REF: Reference Phase
VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Quay St / Lower Albert St - AM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, D
Output Phase Sequence: A, B, D
Reference Phase: Phase B
Offset: NA

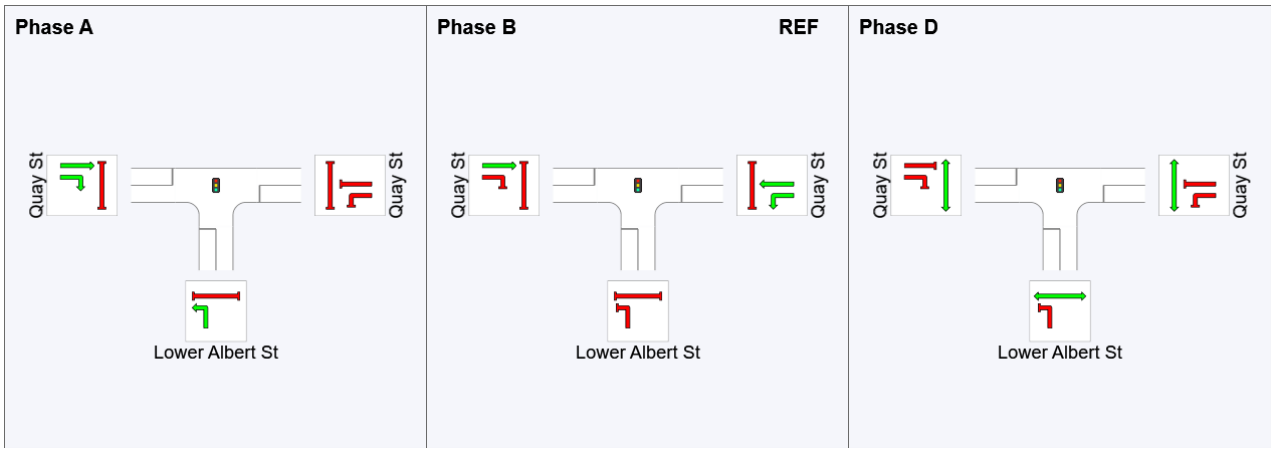
Phase Timing Summary

Phase	A	B	D
Phase Change Time (sec)	63	0	35
Green Time (sec)	15	30	19
Phase Time (sec)	20	39	26
Phase Split	24%	46%	31%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence



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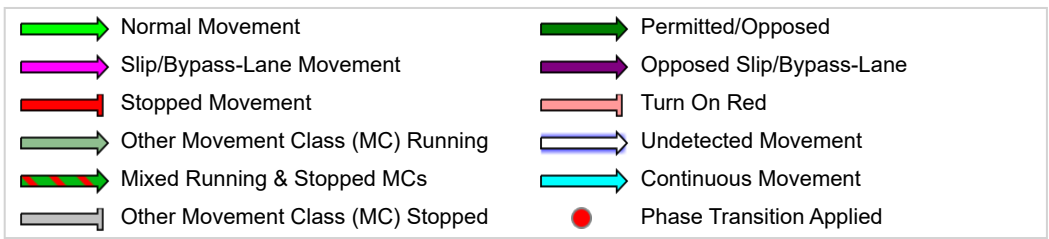
VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Quay St / Lower Hobson St - AM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 101 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D, E
Output Phase Sequence: A, B, C, D, E
Reference Phase: Phase B
Offset: NA

Phase Timing Summary

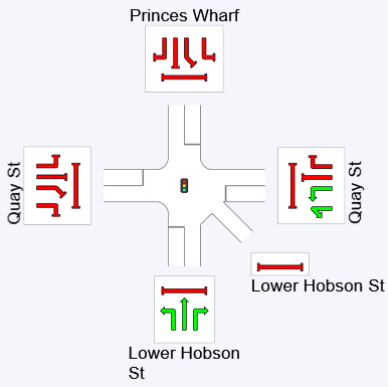
Phase	A	B	C	D	E
Phase Change Time (sec)	72	0	13	27	37
Green Time (sec)	24	6	6	4	30
Phase Time (sec)	31	14	12	9	35
Phase Split	31%	14%	12%	9%	35%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

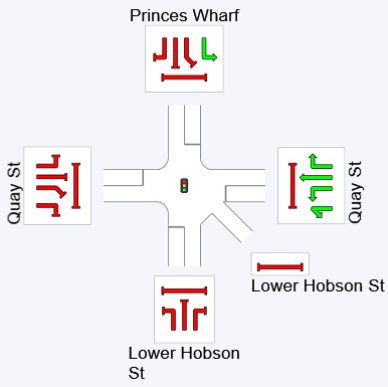
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence

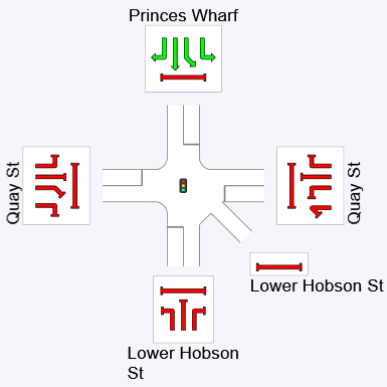
Phase A



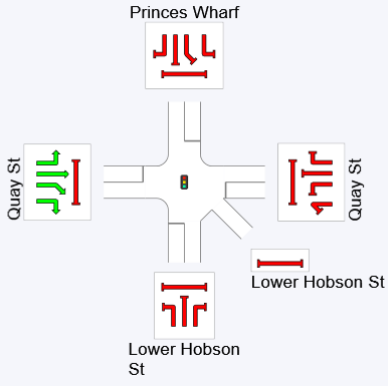
Phase B REF



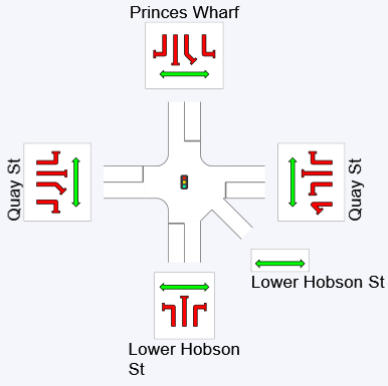
Phase C



Phase D

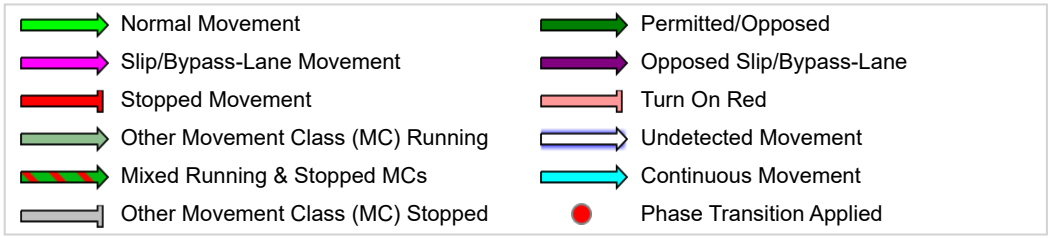


Phase E



REF: Reference Phase

VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Customs / Albert / Lower Albert - AM (Site Folder: Customs St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St AM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: NA

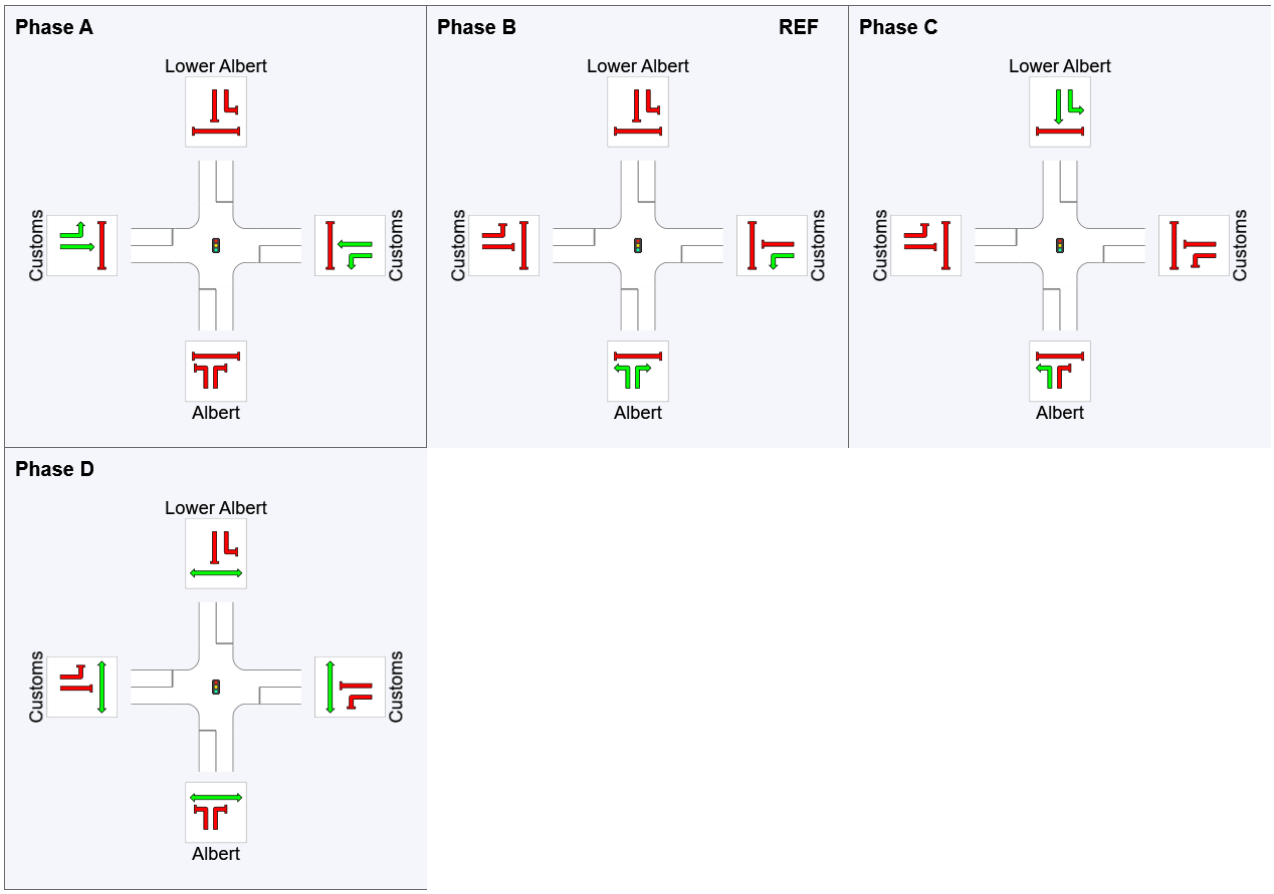
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	51	0	10	20
Green Time (sec)	26	6	6	25
Phase Time (sec)	30	10	12	33
Phase Split	35%	12%	14%	39%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

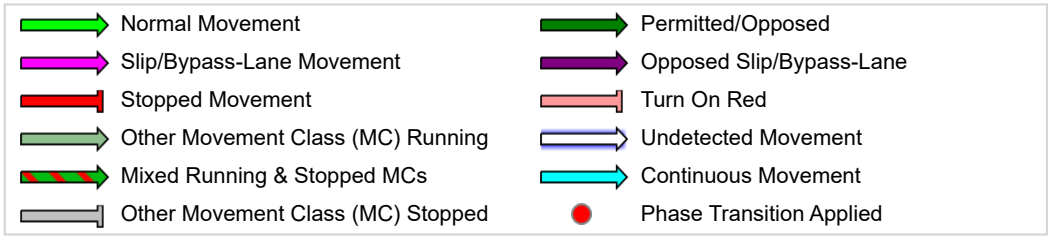
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Quay St / Lower Albert St - PM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, D
Output Phase Sequence: A, B, D
Reference Phase: Phase B
Offset: NA

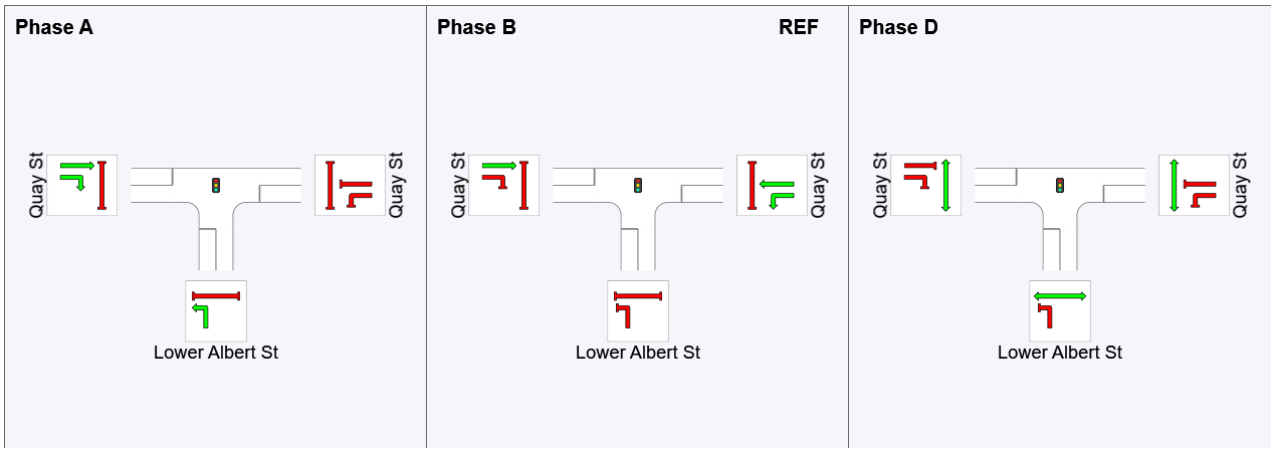
Phase Timing Summary

Phase	A	B	D
Phase Change Time (sec)	62	0	31
Green Time (sec)	16	26	22
Phase Time (sec)	21	35	29
Phase Split	25%	41%	34%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]

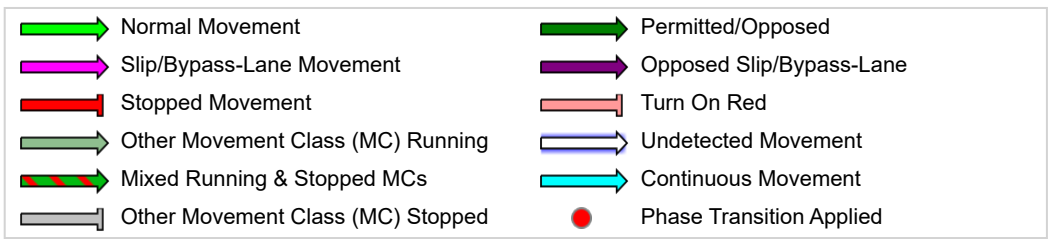
See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Quay St / Lower Hobson St - PM (Site Folder: Quay St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 105 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D, E
Output Phase Sequence: A, B, C, D, E
Reference Phase: Phase B
Offset: NA

Phase Timing Summary

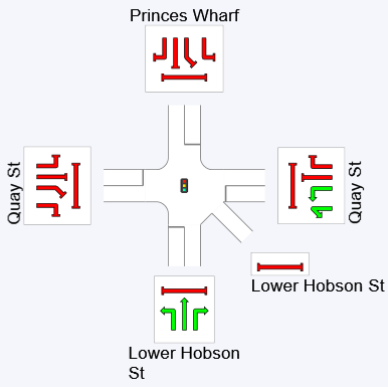
Phase	A	B	C	D	E
Phase Change Time (sec)	71	0	13	27	36
Green Time (sec)	29	6	6	3	31
Phase Time (sec)	36	14	12	7	36
Phase Split	34%	13%	11%	7%	34%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

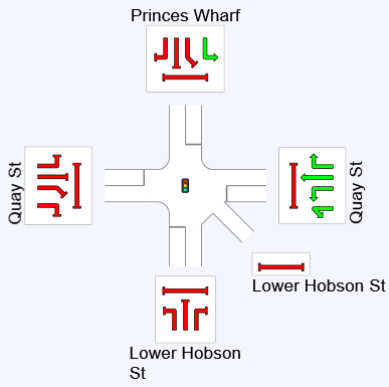
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence

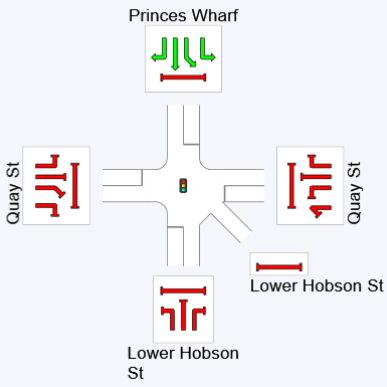
Phase A



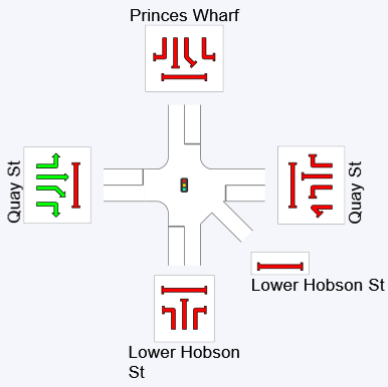
Phase B **REF**



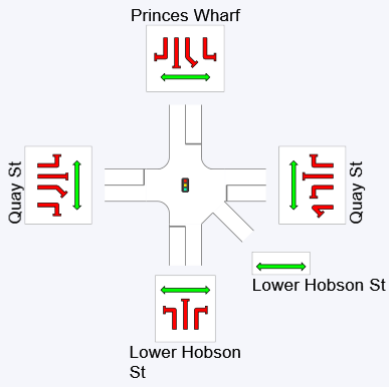
Phase C



Phase D

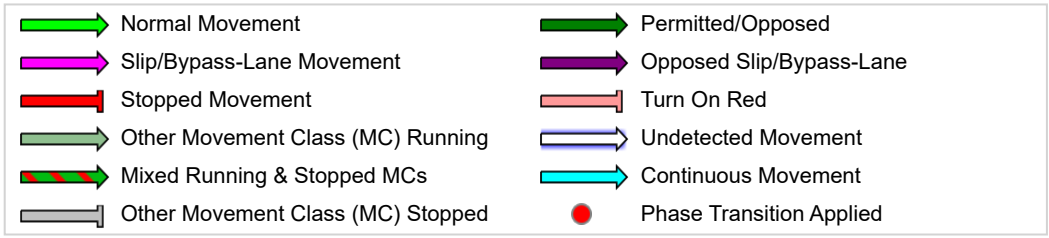


Phase E



REF: Reference Phase

VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Customs / Albert / Lower Albert - PM (Site Folder: Customs St ERV2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Customs St PM (Network Folder: ERV2)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site User-Given Phase Times)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times specified by the user
Phase Sequence: Four-Phase Leading Right Turns
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D
Reference Phase: Phase B
Offset: NA

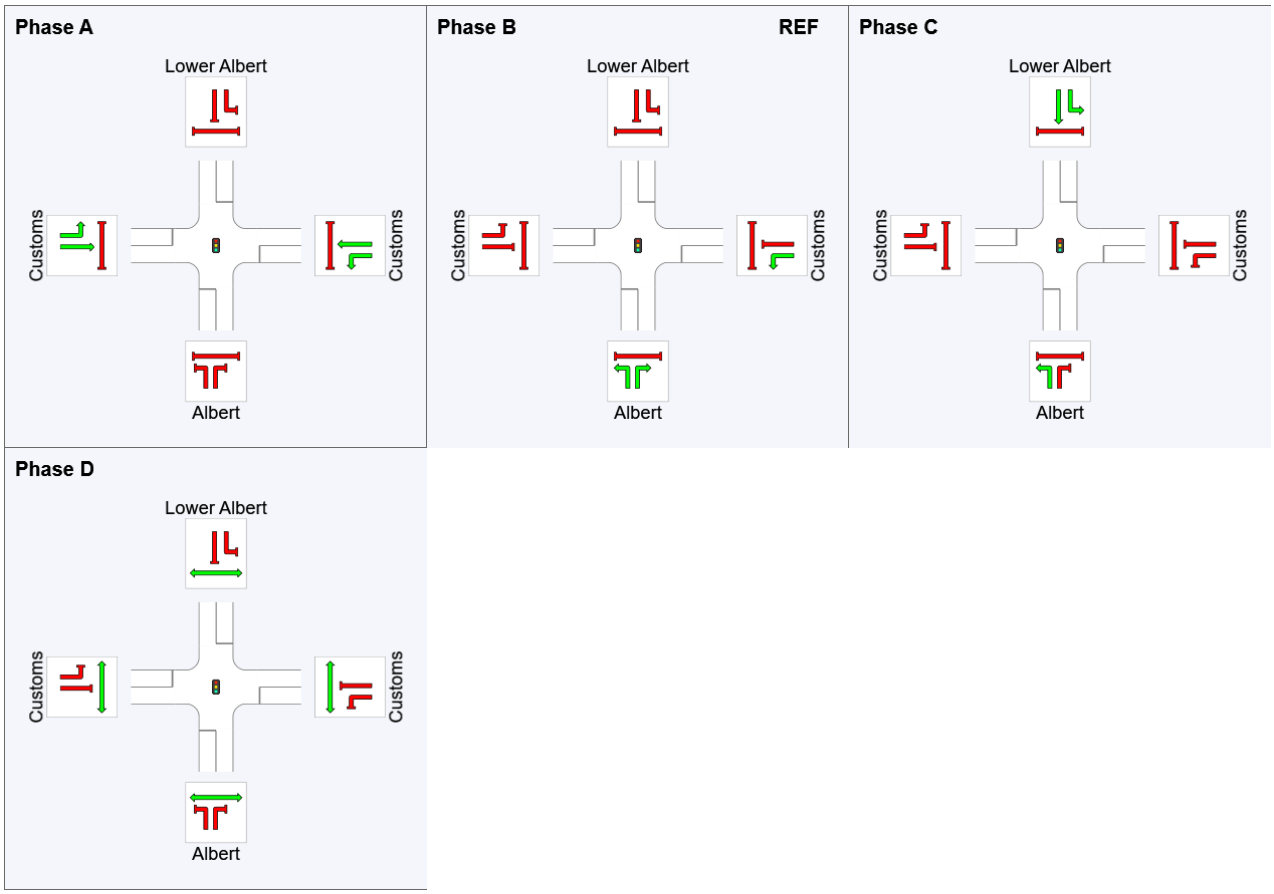
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	69	0	23	34
Green Time (sec)	24	18	6	29
Phase Time (sec)	29	23	12	36
Phase Split	29%	23%	12%	36%
Phase Frequency (%)	100.0[1]	100.0[1]	100.0[1]	100.0[1]

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

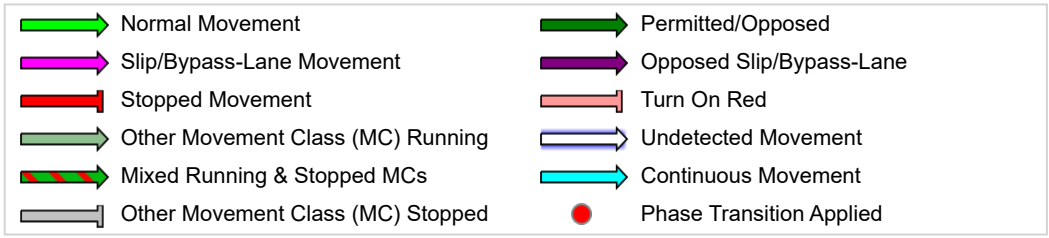
1 Phase Frequency has been given with User-Specified Phase Times.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



APPENDIX H Demolition assessment

Downtown Carpark Demolition

Preliminary CTMP and Transport Assessment

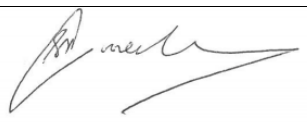
December 2024

flow
TRANSPORTATION SPECIALISTS

flow
TRANSPORTATION SPECIALISTS

Project: Downtown Carpark Demolition
Title: Preliminary CTMP and Transport Assessment
Document Reference: P:\PREP\002 Downtown Carpark redevleopment\ITA and reporting\Demolition TA\R3B241205 Demolition Draft CTMP.docx
Prepared by: Harry Shepherd and Sagar Malakappa
Reviewed by: Bronwyn Coomer-Smit

Revisions:

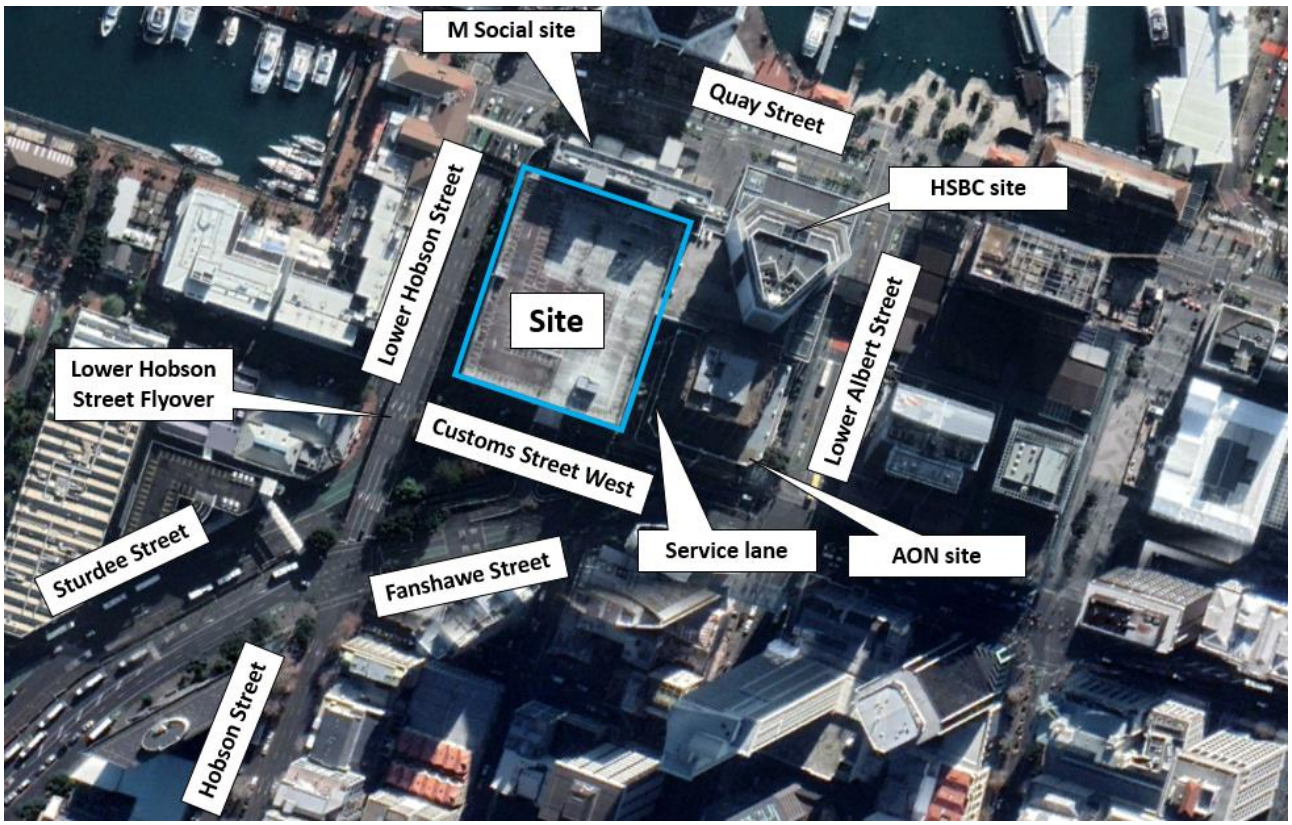
Date	Status	Reference	Approved by	Initials
4 December 2024	Updated draft	R3A241204	BA Coomer-Smit	
5 December 2024	Updated final	R3B241205	BA Coomer-Smit	

SUMMARY OF OUR ASSESSMENT

This report outlines and assesses the transportation effects of the proposal to demolish the Downtown Carpark ("**the Proposal**"), located at 2 Lower Hobson Street, Auckland City Centre ("**Site"**), as shown in Figure S1.

- The report supports the resource consent application for the demolition of the existing carpark building and associated structures
- This report has been prepared to update the previous 15 July 2024 Downtown Carpark Demolition, Preliminary CTMP and Transport Assessment, which was lodged with Auckland Council ("**Council**"). In particular, this assessment and report
  - responds to Council's Section 92 requests
  - incorporates feedback provided by Auckland Transport through several meetings and post-meeting minutes.

Figure S1: Site and immediately surrounding transport network



The Proposal's transportation effects are proposed to be managed and mitigated through the implementation of a Construction Traffic Management Plan (**"CTMP"**). This report describes the proposed Preliminary CTMP, which outlines how the Site and surrounding transport network can be managed across the various demolition stages to ensure that the network can operate efficiently and safely for all transport users. A final, more detailed CTMP will be provided prior to construction commencing once a contractor has been appointed.

The Proposal will occur over a 1 year period. This will consist of the following stages, with indicative timeframes shown in brackets.

- Stage 1 – Removal of Lower Hobson Street pedestrian overbridge (48 hours)
- Stage 2 – Demolition of the west section of the Downtown Carpark building, with a crane located on Lower Hobson Street (3 months)
- Stage 3 – Demolition of the west section of the Downtown Carpark building, with a crane located within the Site (3 months)
- Stage 4 – Demolition of the east section of the Downtown Carpark building (6 months)
- Stage 5 – Removal of Downtown Carpark ramp over Customs Street West onto Fanshawe Street (1 week).

Our approach for construction traffic has been prepared based on the following principles.

- Protect the public from demolition activities
- Contain the demolition works within the Site where possible
- Minimise unnecessary pedestrian, road and bus lane closures. Provide safe alternatives where any closures are required
- Undertake the demolition in an efficient manner to avoid prolonging any required road closures
- Provide consideration to the Auckland Transport's Temporary Traffic Management Guidelines
- Avoid Quay Street as a construction vehicle route.

Our assessment of the proposed preliminary CTMP to enable the demolition of the Downtown Carpark building concludes the following.

- Construction vehicle loading can be safely provided on Lower Hobson Street, with the closure to general traffic of the existing southbound slip lane located adjacent to the Site. Construction vehicles will enter from Nelson Street or Fanshawe Street from the west, enter the Site from underneath the flyover, and exit through the Customs Street West end
- As requested by Auckland Transport, construction vehicle routes have been developed to avoid Quay Street
- Additional lane closures on Lower Hobson Street and Customs Street West will be required at different stages throughout the demolition. Where possible, these lane closures should be minimised and aim to keep bus lanes open where safe and practical to do so
- Full road closures on Lower Hobson Street and Customs Street West will be required to remove the pedestrian overbridge and carpark ramp. These closures are unavoidable and will occur for approximately 48 hours and 1 week, respectively. This will require some bus routes to be temporarily diverted
- Footpath closures and pedestrian diversion routes will be required in the immediate surrounding area to protect the public from live work zones, overhead works, and construction vehicles. Alternative pedestrian paths are available for diversion routes. The CTMP will include an option to provide a temporary pedestrian crossing on Customs Street West

- The volume of construction traffic will be relatively low on a daily and hourly basis, as they will be spread across the 1-year demolition period
- We have assessed the traffic effects of these stages, including the proposed road closures that are required to be implemented in association with each stage of the demolition. This traffic modelling assessment shows that the demolition and associated road closures will increase delays on some roads but decrease on others. The largest delays are predicted to occur during Stage 1 and Stage 5, where full closures on Lower Hobson Street and Customs Street West are required to remove overhead structures. These stages will also have temporary impacts on buses, and some rerouting will be required. We note that these stages will be for 48 hours and 1 week, respectively. The other stages that occur for a longer duration will have small delays and impacts on the surrounding road network. On average, vehicle journey times are predicted to increase by 1 to 4% for all of the stages
- The demolition adequately addresses the assessment criteria of the Unitary Plan.

As such, subject to a final CTMP being prepared and implemented by a contractor once appointed, we conclude that the transport effects resulting from the demolition of the Downtown Carpark can be safely and efficiently managed and mitigated.

CONTENTS

APPENDICES

1 PURPOSE OF THIS ASSESSMENT

This report outlines and assesses the transportation effects of the proposal to demolish the Downtown Carpark ("**the Proposal**"), located at 2 Lower Hobson Street, Auckland City Centre ("**Site**"). The report supports the resource consent application for the demolition of the existing carpark building and associated structures.

The Proposal's transportation effects are proposed to be managed and mitigated through the implementation of a Construction Traffic Management Plan ("**CTMP**"). This report describes the proposed Preliminary CTMP, which outlines how the Site and surrounding transport network can be managed across the various demolition stages to ensure that the network can operate efficiently and safely for all transport users. A final, more detailed CTMP will be provided prior to construction commencing once a contractor has been appointed.

Our assessment includes the following matters.

- Background to this updated assessment, including
  - the previous 15 July 2024 version of this report, which was lodged with Auckland Council ("**Council**")
  - our assessment of the subsequent Section 92 requests from Council
  - a summary of updates made to this assessment compared to the previous version.
- Information providing context to our assessment, including a description of the location of the Site and the surrounding transport network
- An outline of the proposed demolition works, including the proposed staging and programming, construction hours, proposed heavy vehicle route and construction access
- An assessment of the Proposal having regard to Auckland Transport's Temporary Traffic Management Guidelines
- A transport assessment of the demolition works, including
  - details with regard to the transport aspects of each stage of the demolition works and mitigation measures that will need to be implemented
  - an outline of pedestrian diversions to ensure a safe pedestrian environment during each stage of the demolition
  - an assessment of impacts on public transport
  - an assessment of impacts on local access points
  - a prediction of the traffic generation associated with the demolition works
  - an assessment of the traffic effects resulting from the proposed road closures associated with each stage of the demolition
  - a tracking assessment of construction vehicles
  - contractor parking and effects

- a description of the transport-related works to be completed once the demolition has been completed.

- an assessment of the works under the applicable Auckland Unitary Plan ("**Unitary Plan**") standards for demolition works.

In conclusion, we consider that the demolition of the Downtown Carpark can be safely undertaken, subject to implementing a detailed CTMP once a contractor has been appointed.

We consider that subject to the implementation of this CTMP, the wider road network can be appropriately managed to safely and efficiently accommodate the traffic effects of the various road closures.

2 LODGED VERSION, SECTION 92 RESPONSES AND RESULTING UPDATES

A previous version of this report, dated 15 July 2024, was originally lodged with Auckland Council ("**lodged version**").

This report has been prepared to update this lodged version and includes updated transport assessments taking account of

- responses to Council's Section 92 requests
- incorporating feedback provided by Auckland Transport through several meetings and post-meeting minutes.

The Section 92 requests following the lodgement of the lodged version were provided by Council in a letter dated 27 August 2024. Our responses to these specific Section 92 requests are provided in Appendix A.

As a result of these Section 92 requests, this assessment provides the following additional information compared to the lodged version.

- An updated modelling assessment, using the most recent City Centre SATURN model and making adjustments based on certain of the Section 92 requests, such as redistributing all existing Downtown Carpark trips to other parking facilities in the Auckland City Centre
- The completion of additional assessment using the SATURN model to assess the impacts of the Proposal on bus routes and journey times
- Updates to Stages 1 to 5 of the demolition works
- Diversion routes for Lower Hobson Street and heavy vehicles travelling through the Auckland City Centre ("**City Centre**")
- Additional information about pedestrian diversion routes
- An assessment of the Proposal having regard to Auckland Transport's Temporary Traffic Management Guidelines
- The provision of options for potential bus route diversions during Stage 1 and Stage 5.

We have held several meetings with Auckland Transport since the previous version of the report was lodged.

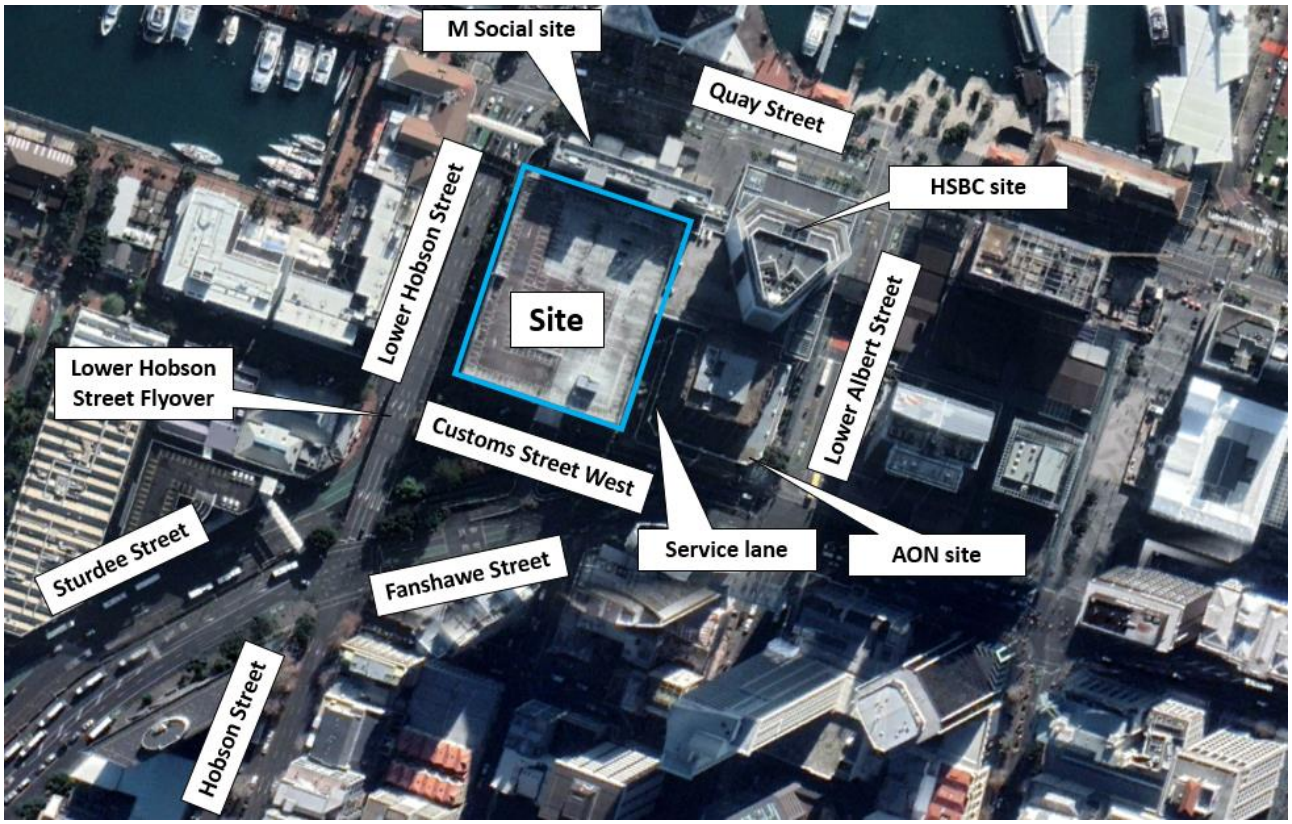
- Several post meeting comments were received from Auckland Transport, dated 15 October 2024. We have also provided our responses to these post-meeting minutes in Appendix A
- As a result of these post meeting minutes, the construction vehicle routes and associated assessment in this report have been updated to avoid Quay Street.

3 BACKGROUND CONTEXT

3.1 Site location

As shown in Figure 1, the Site is located north of Customs Street West and east of Lower Hobson Street in the City Centre.

Figure 1: Site and immediately surrounding transport network



3.2 Land use activities around the Site

The land use of the area surrounding the Site is shown in Figure 1. Being located in the City Centre, there is a range of land use activities in the surrounding area. This includes commercial, residential retail, and restaurants.

The main activities located near the Site, including

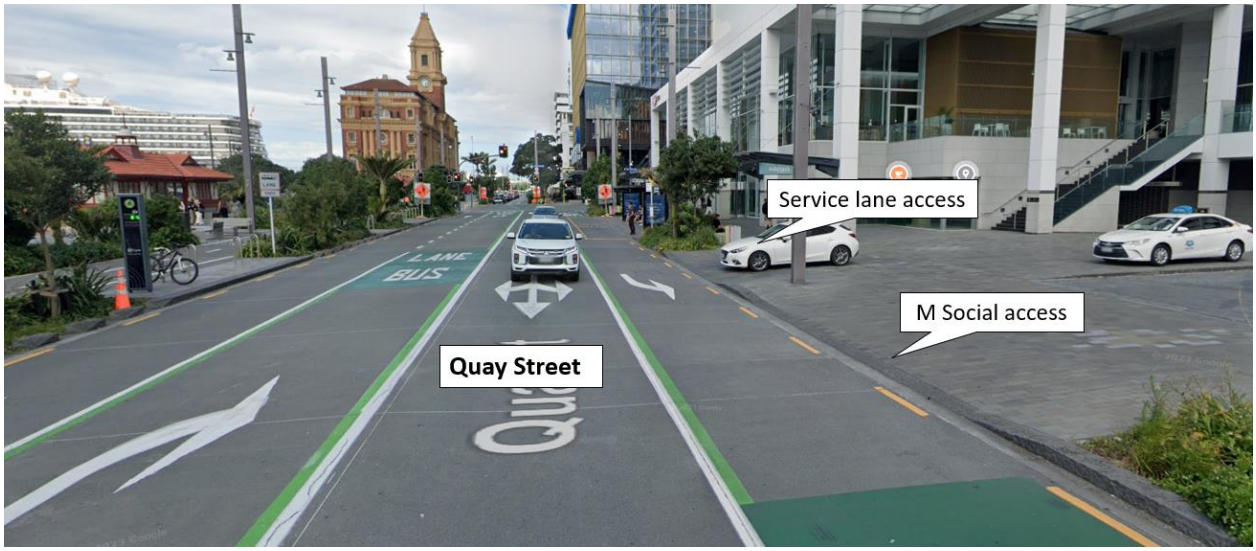
- M Social hotel immediately to the north
- HSBC and AoN office buildings immediately to the east
- Commercial Bay development is located to the east, on the opposite side of Lower Albert Street.

3.3 Road network surrounding the Site

3.3.1 Quay Street

The existing layout of Quay Street in the vicinity of the Site is shown in Figure 2.

Figure 2: Quay Street layout near the Site (looking east)

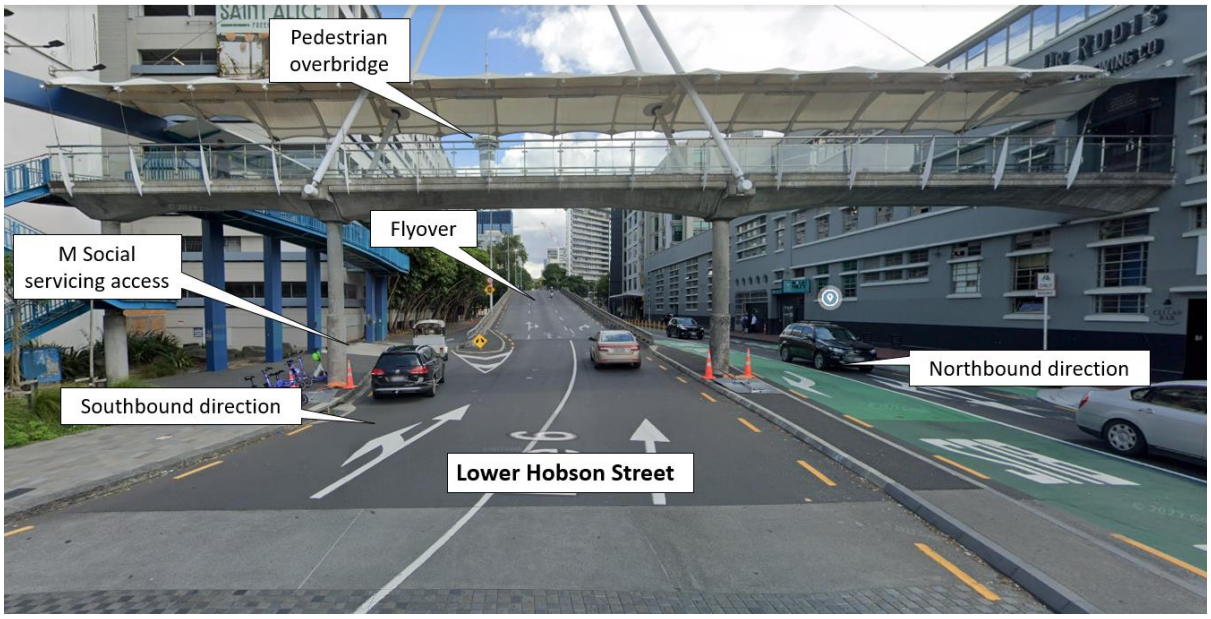


- Quay Street has 4 lanes in total in the vicinity of the Site. This consists of one general traffic lane in each direction and bus lanes in each direction
- Dedicated cycle lanes are provided on the northern side of Quay Street on the opposite side of Quay Street from the Site
- Wide footpaths are provided on each side
- Bus stops are provided on the south side, east of the service lane access
- The service lane highlighted in the figure provides access to existing HSBC and AoN buildings
- Quay Street has signposted heavy vehicle restrictions, which restrict trucks over 14.5 m in length (including trailers).

3.3.2 Lower Hobson Street

The existing layout of Lower Hobson Street in the vicinity of the Site is shown in Figure 3.

Figure 3: Lower Hobson Street layout near the Site (looking south)



- Lower Hobson Street is split into 3 distinct sections. This includes the flyover and northbound and southbound sections
- The flyover provides a connection from Quay Street to Hobson Street, which provides access to SH1 further to the south. The flyover initially has 2 lanes, which increases to 3 and then 4 lanes on the approach to the Fanshawe Street intersection
- The southbound direction section is located directly adjacent to the Site. It includes 1 to 2 traffic lanes and a footpath on the east side
- The northbound direction section has 1 general traffic lane and 1 bus lane. Bi-directional protected cycle lanes and footpaths are provided on the west side of the street
- A pedestrian overbridge is located at the north end of Lower Hobson Street, which provides a connection between the 204 Quay Street site on the west side to the Downtown Carpark and the footpath at ground level on the east side
- A vehicle access is located on the east side of Lower Hobson Street, for M Social servicing.

3.3.3 Customs Street West

The existing layout of Customs Street West in the vicinity of the Site is shown in Figure 4.

Figure 4: Customs Street West layout near the Site (looking west)

- The section of Customs Street West fronting the Site operates in a one-way eastbound direction. It includes 2 general traffic lanes and a bus lane
- Footpaths are provided on the north side only
- Bus stops are provided west of the service lane access
- The Downtown Carpark has two primary access and egress points.
    - Vehicle crossings along the road frontage on ground level, with separate crossings accommodating inbound and outbound vehicle movements
    - An overhead ramp towards Fanshawe Street, accommodating outbound movements only.

3.3.4 Fanshawe Street

The existing layout of Fanshawe Street is shown in Figure 5.

Figure 5: Fanshawe Street layout near the Site (looking west)

- The section of Customs Street West fronting the Site operates in a one-way westbound direction. It includes 3 general traffic lanes and 1 bus lane
- The Downtown Carpark has an exit onto Fanshawe Street, which forms a signalised intersection
- Footpaths are provided on both sides. We note that the footpath on the north side is narrow and does not provide a proper connection between the Downtown Carpark exit and Albert Street to the east. Pedestrians can cross at the signalised intersection of Fanshawe Street / Hobson Street.

3.4 The existing Site

The Site currently accommodates the Auckland Transport Downtown Carpark.

It provides 1,944 parking spaces, which are generally available to the public. There is a mix between short-term public use and long-term leased spaces.

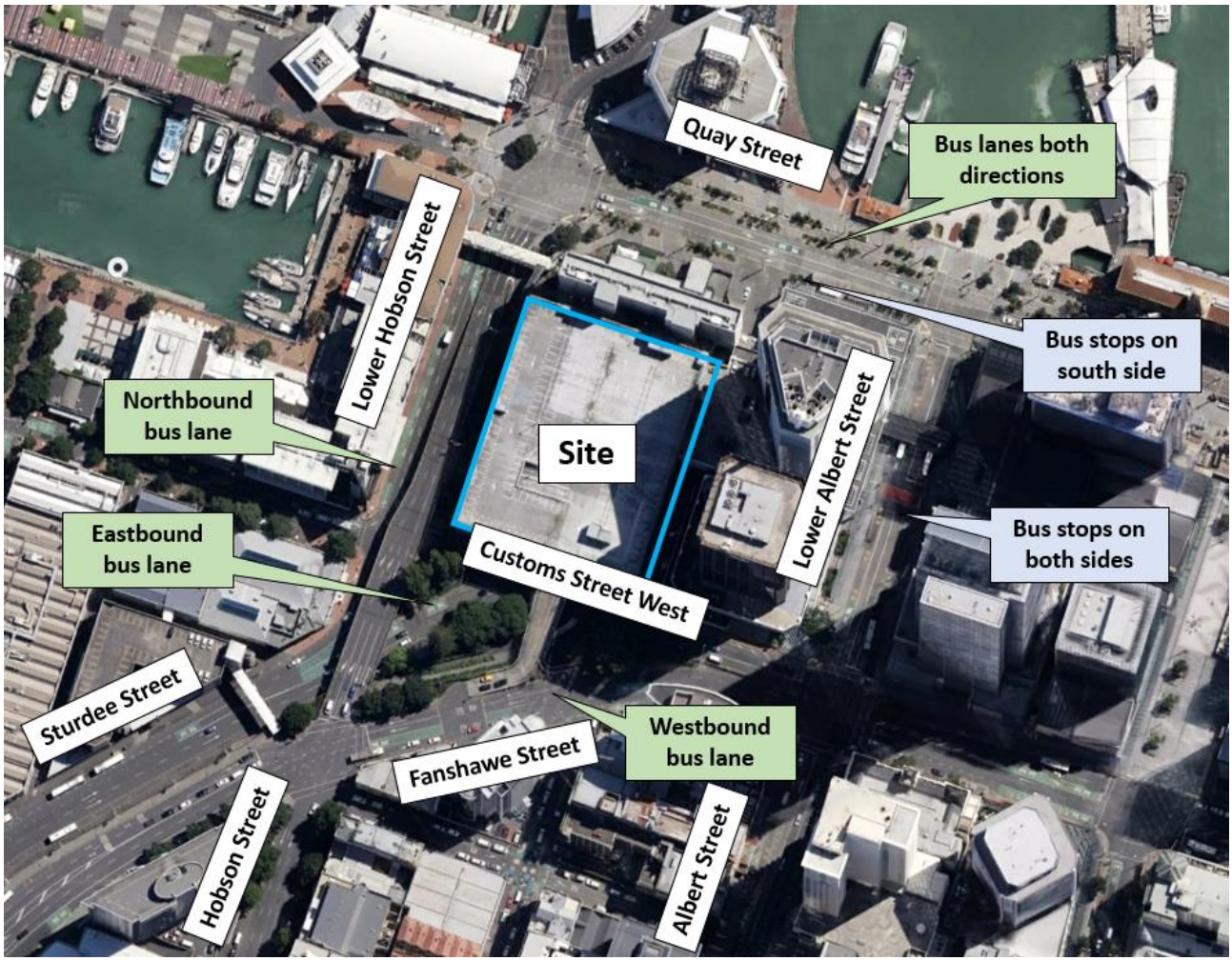
The Site has the following access points

- Two primary access points
  - Vehicle crossings along the road frontage on ground level, with separate crossings accommodating inbound and outbound vehicle movements
  - An overhead ramp towards Fanshawe Street, accommodating outbound movements only.
- Two secondary access points
  - A sliding door access onto the Customs Street West / Quay Street service lane
  - A roller door access onto the Quay Street frontage from the M Social site.

3.5 Public transport in the vicinity of the Site

A plan of the bus facilities in the area surrounding the Site is shown in Figure 6.

Figure 6: Bus facilities in the surrounding area



In summary, there are:

- bus lanes on
  - Lower Hobson Street, northbound direction
  - Quay Street, both directions
  - Lower Albert Street, both directions
  - Customs Street West, eastbound direction
  - Fanshawe Street, westbound direction.
- bus stops on
  - Quay Street, south side
  - Lower Albert Street, both sides.

The following bus routes travel on the roads surrounding the Site.

- The Quay Street bus stops serve the 95 and 97 routes to the North Shore. These buses turn left onto the Lower Hobson Street flyover and then right onto Fanshawe Street
- The northbound bus stops on Lower Albert Street serve the NX1 route. These buses turn left onto Quay Street, then left onto the Lower Hobson Street flyover and then right onto Fanshawe Street
- The southbound bus stops on Lower Albert Street serve the 11, 105, 106, WX1, 18, 195 and 209 routes. These all travel directly south onto Albert Street
- A number of bus routes travel across the Site frontage on Customs Street West, including the City Link, Inner Link, 95, 97, 931, 933, and 939 routes.

As such, it is concluded that the roads surrounding the Site are busy bus routes, although there are no bus stops directly adjacent to the Site.

3.6 Pedestrian and cyclist facilities in the vicinity of the Site

The following facilities are provided for pedestrians and cyclists

- As outlined in Section 3.3, footpaths are generally provided on both sides of the road in the surrounding area. There are a number of signalised intersections which provide safe crossing facilities for pedestrians. Pedestrian volumes are high given the City Centre location.
- The following separated cycle facilities are provided in the following areas near the Site
    - Quay Street has a bi-directional cycleway on the north side
    - Lower Hobson Street has a bi-directional cycleway on the west side between Customs Street West and Quay Street
    - Customs Street West (west of Lower Hobson Street) has a bi-directional cycleway on the north side.

Footpaths on Quay Street and Customs Street East adjacent to the Site are well-used by pedestrians. The CTMP will, therefore, need to include appropriate pedestrian diversions.

Cycle paths on Lower Hobson Street and Quay Street are separated and located away from the immediate Site frontages.

4 TEMPORARY TRAFFIC MANAGEMENT GUIDELINES

Through the Section 92 requests provided by Auckland Council, we obtained the "Temporary Traffic Management Guidelines 2022 to 2025" ("**TTMG**") document from Auckland Transport.

- This document provides guidelines to manage temporary traffic management within the City Centre
- The guidelines seek to apply key principles and apply the outcomes from the Auckland Network Operating Plan to manage construction works and effects within the City Centre.

The TTMG provides 9 broad rules that are designed to enable the Auckland Network Operating Plan outcomes.

We have provided our assessment of the Proposal having regard to the TTMG in Appendix A, under Section A4, 'Suggested changes/recommendation #1'.

We note that the updated proposed methodology of the demolition works has attempted to incorporate these principles where safe and practical to do so. Still, we note that some compromises of the guidelines will be required.

5 THE PROPOSED DEMOLITION WORKS

The demolition of the Downtown Carpark will occur over a 1 year period. This will consist of the following stages, with indicative timeframes shown in brackets.

- Stage 1 – Removal of the Lower Hobson Street pedestrian overbridge, with a crane located on Lower Hobson Street (48 hours)
- Stage 2 – Demolition of the west section of the Downtown Carpark building, with a crane located on Lower Hobson Street (3 months)
- Stage 3 – Demolition of the west section of the Downtown Carpark building, with a crane located within the Site (3 months)
- Stage 4 – Demolition of the east section of the Downtown Carpark building, with a crane located within the Site (6 months)
- Stage 5 – Removal of Downtown Carpark ramp over Customs Street West onto Fanshawe Street, with a crane located within the Site (1 week).

5.1 Construction hours

We anticipate that standard construction hours will be adequate for the Site and these works, namely

- 7:00 am to 6:00 pm, Monday to Friday
- 8:00 am to 5:00 pm Saturday.

Some works may be required on Sunday, particularly for Stage 1 and Stage 5, where the pedestrian overbridge and carpark ramps are removed. These will require full road closures over shorter periods, so utilising a Sunday would minimise effects during peak weekday periods. We note that any works on Sundays would need to consider constraints and conditions from other specialties, such as noise.

5.2 Heavy vehicle routes

As shown in previous Figure 1, the Site is located at the corner of Lower Hobson Street and Customs Street West in the City Centre. It, therefore, has good vehicle accessibility to/from the State Highway ("**SH**") network.

Figure 7 below illustrates how trucks are anticipated to enter and exit the Site based on loading areas provided on the Lower Hobson Street slip lane alongside the Site frontage.

- All trucks enter the Site from Fanshawe Street or Nelson Street from the SH
- Construction vehicle access will be provided underneath the Lower Hobson Street flyover. The construction loading one will be provided on the Lower Hobson Street slip lane
- Trucks will exit the Site onto Customs Street West/Beach Road towards SH16/Stanley Street.

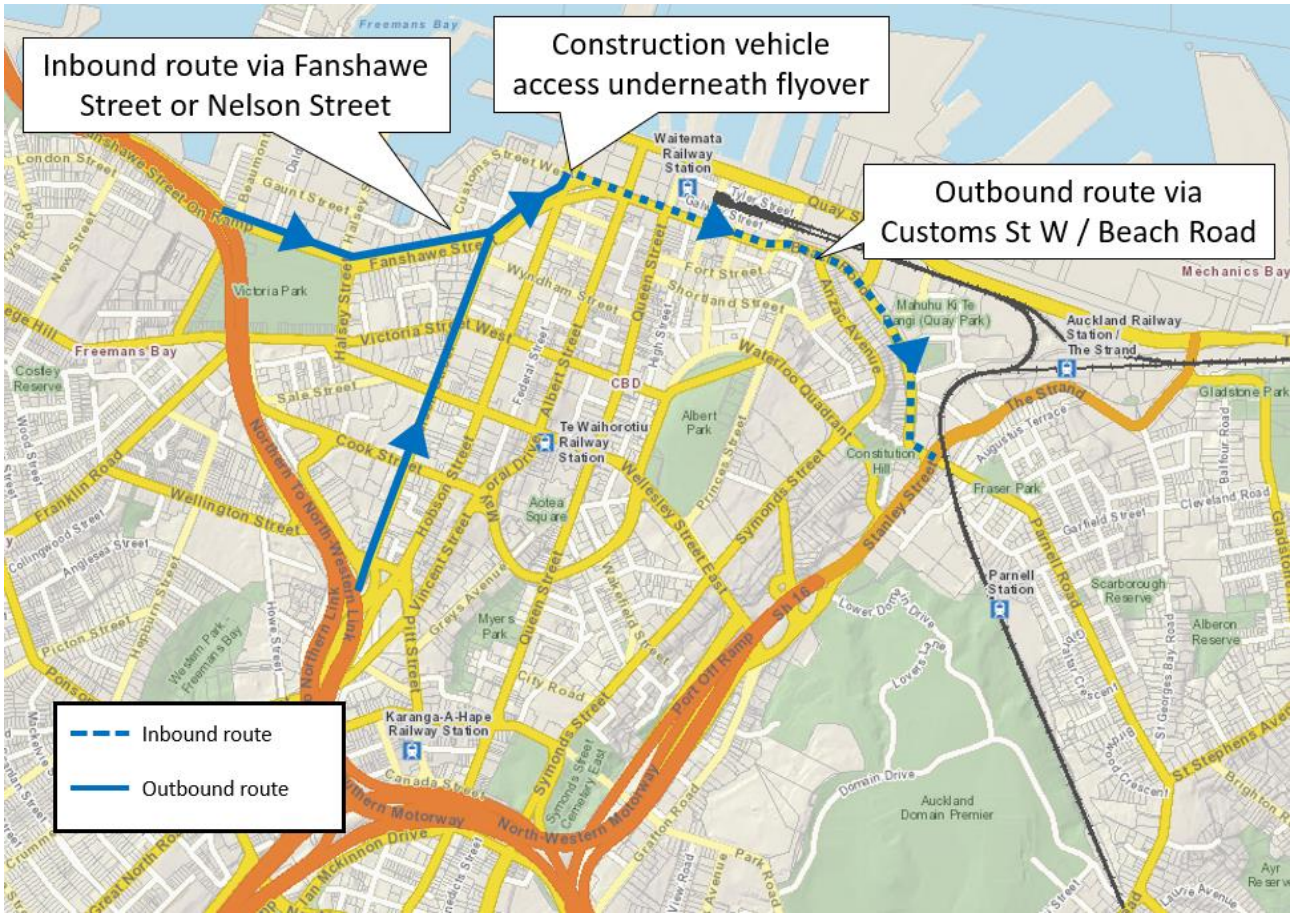
These routes are all classified in the Unitary Plan as arterial roads and have signalised intersections. This provides a road network designed to safely and efficiently accommodate heavy vehicles.

This heavy vehicle route avoids Quay Street, which was requested by Auckland Transport as per the post meeting minutes and confirmed via a subsequent meeting Auckland Transport.

We note that it is not possible for construction vehicles to simultaneously enter and exit the City Centre via the west, as requested by Auckland Transport. While construction vehicles can enter via the west, they are unable to also exit via the west (and simultaneously avoid Quay Street) due to the one-way circulation of Customs Street West.

When approaching the Customs Street West/Lower Albert Street intersection, construction vehicles must continue straight through in the east direction, as left and right turns onto Lower Albert Street and Albert Street, respectively, are not permitted.

Figure 7: Heavy vehicle routes



5.3 Construction vehicle access

Construction vehicle access is proposed underneath the Lower Hobson Street flyover, as shown in Figure 8. Construction vehicles will be required to turn right in from the Lower Hobson Street bus lane, which is permitted 50 m prior to an intersection.

To accommodate this access for a 12.6 m rigid truck, the following modifications to the access point will be required, as shown in Figure 9.

- The signals will need to be reconfigured to account for the change in circulation. The section underneath the flyover currently accommodates westbound vehicles in a one-way direction, but this will need to change to allow for construction vehicles to travel in the eastbound direction
- The kerb will require temporary realignment
- A signal post and signpost will need to be temporarily removed. Both of these posts are directed towards westbound vehicles underneath the flyover, which will not be served under the proposed construction vehicle access layout.

Figure 8: Construction vehicle access on Lower Hobson Street

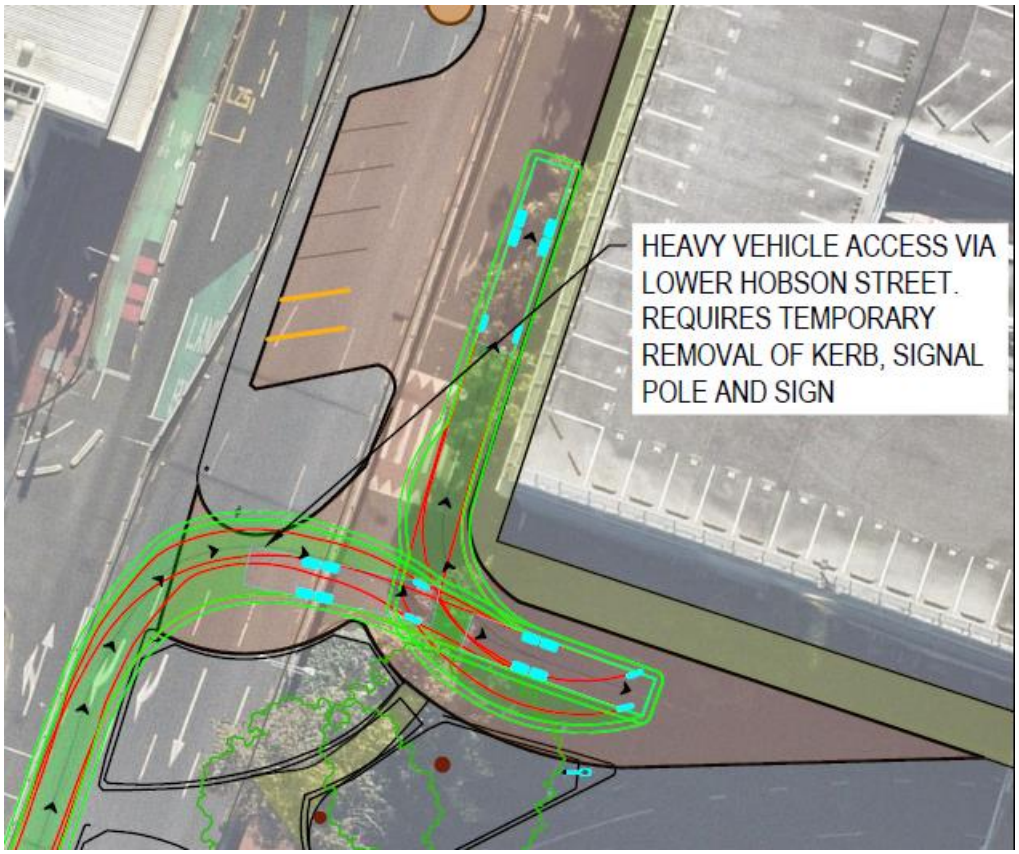
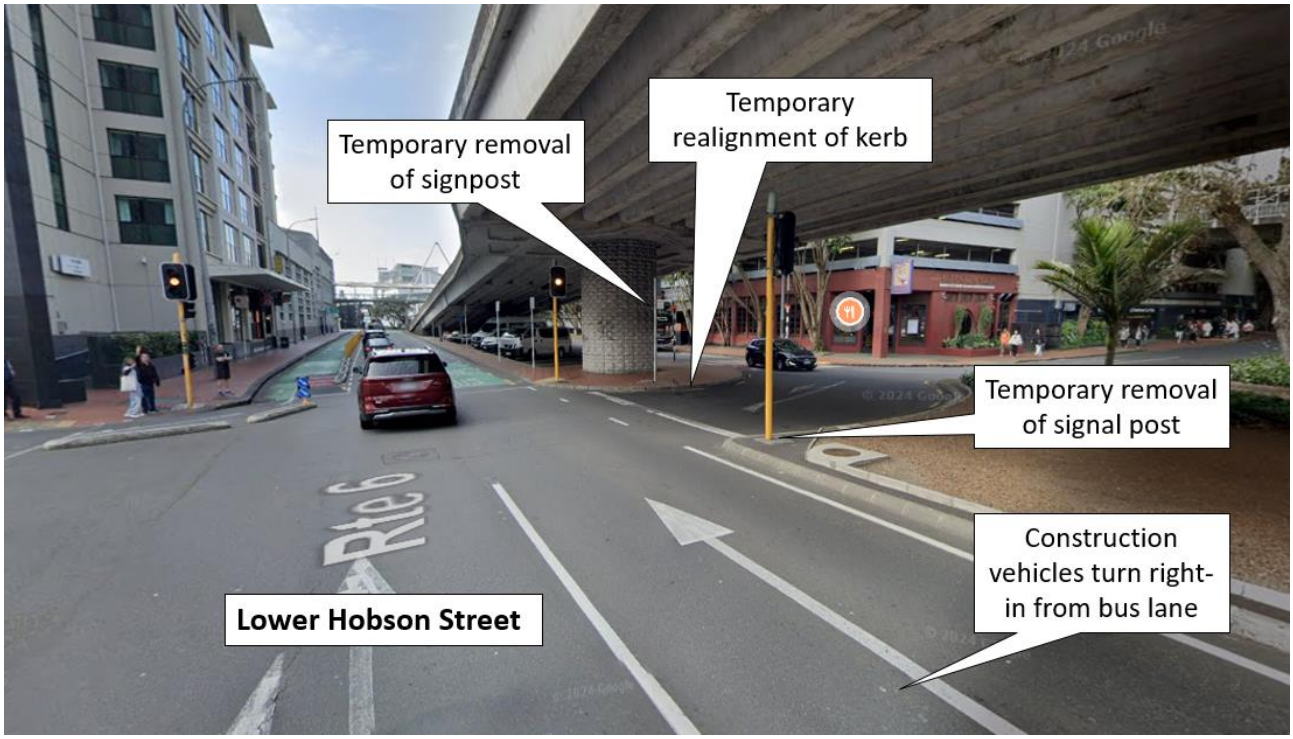


Figure 9: Changes required to accommodate construction vehicle access



6 DEMOLITION WORKS TRANSPORT ACCESS METHODOLOGY, ASSESSMENT AND MITIGATION

Our approach to managing construction traffic has been prepared based on the following principles:

- Protect the public from demolition activities
- Contain the demolition works within the Site where possible
- Minimise unnecessary pedestrian, road and bus lane closures. Provide safe alternatives where any closures are required
- Undertake the demolition in an efficient manner to avoid prolonging any required road closures
- Provide consideration to the TTMG
- Avoid Quay Street as a construction vehicle route.

The Downtown Carpark site has significant constraints relating to the demolition activity.

- There are two road frontages, Lower Hobson Street and Customs Street West
- The existing Downtown Carpark building is built up to the property boundary
- These constraints mean that road and footpath closures are necessary to protect the public from construction work zones, construction vehicles and overhead works.

The pedestrian overbridge and carpark ramp on Lower Hobson Street and Customs Street West, respectively, both have vehicles and pedestrians passing underneath. For these reasons, it is not possible to remove these structures without avoiding a full road closure.

Noting that as a contractor has not been appointed, we have assessed the transport implications of Stages 1 to 5 based on the information currently available. It is anticipated that further details, as required, will be provided in the final CTMP.

6.1 Stage 1: See Figure 10

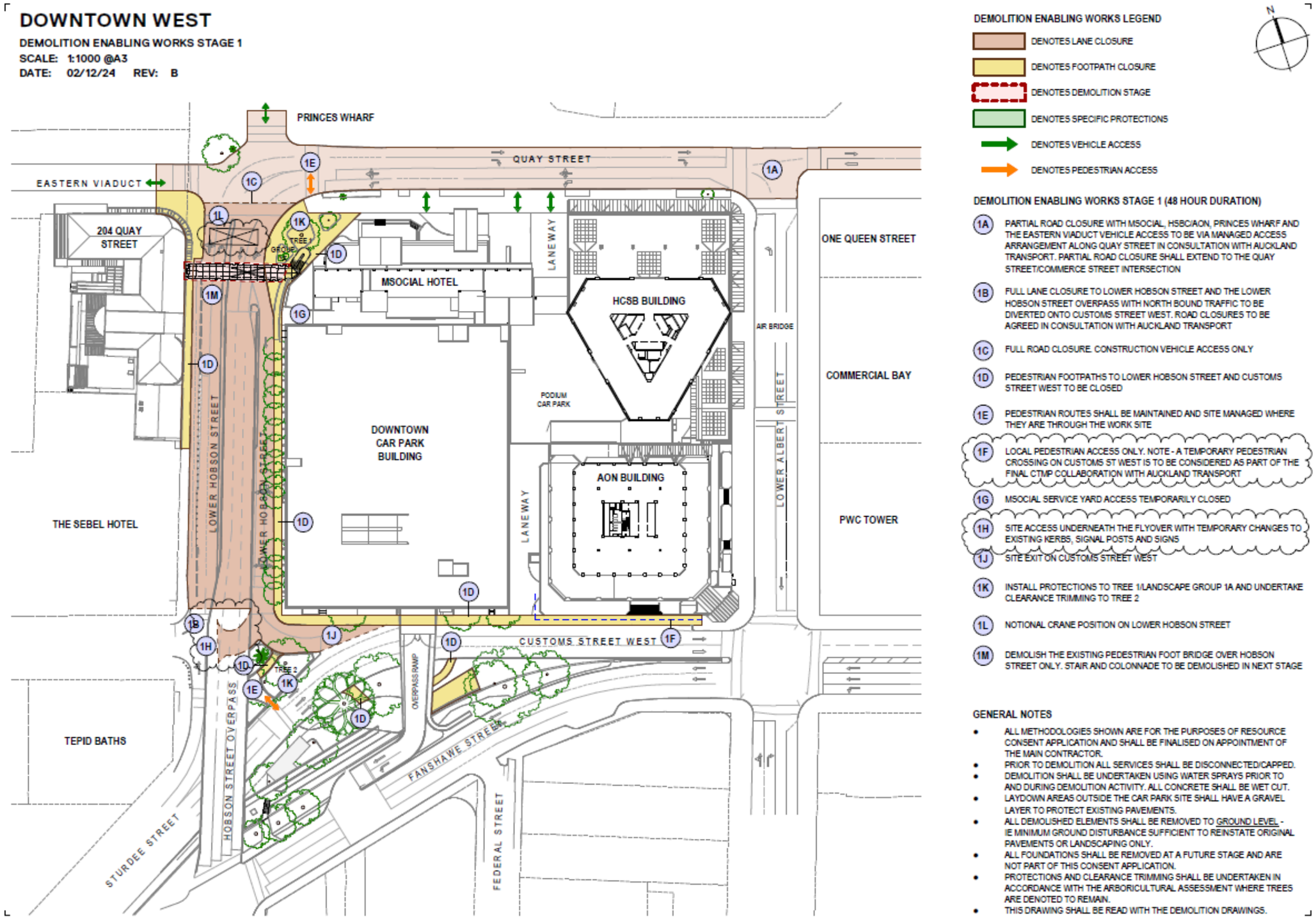
Stage 1 involves the removal of the Lower Hobson Street pedestrian overbridge.

- The overbridge will require a full road closure of Lower Hobson Street as the bridge spans across all traffic lanes
- It is anticipated that the bridge can be removed within 48 hours. This work could be scheduled to occur in a weekend to minimise the impact on traffic
- The full road closure of Lower Hobson Street will require the following:
    - At the southern end, northbound traffic on Lower Hobson Street will need to be diverted from Sturdee Street onto Customs Street West towards the west and east
    - At the northern end, all movements into Lower Hobson Street from Quay Street, Eastern Viaduct and Princes Wharf will be closed to the public. To minimise traffic entering this area and needing to undertake a U-turn, access into Quay Street (west of Commerce Street) will be limited to local traffic only

- The M Social servicing access on the Lower Hobson Street slip lane will need to be fully closed due to the proximity to the bridge structure.

- Construction vehicle access can be provided from underneath the Lower Hobson Street flyover. Construction vehicles can exit onto Customs Street West. Please refer to Sections 5.2 and 5.3 for additional discussion of this matter
- Pedestrian access on Lower Hobson Street and around the Site perimeter will need to be closed to the public to prevent pedestrians from entering a live work zone. Alternative pedestrian paths are available and will need to be signposted to divert pedestrians. Please refer to Section 7 for additional discussion and assessment of this matter
- As Lower Hobson Street accommodates bus routes, buses will need to be diverted onto Customs Street West towards Lower Albert Street for the 48 hour duration. Please refer to Section 8 and Appendix D for details regarding bus diversions.

Figure 10: Stage 1 works

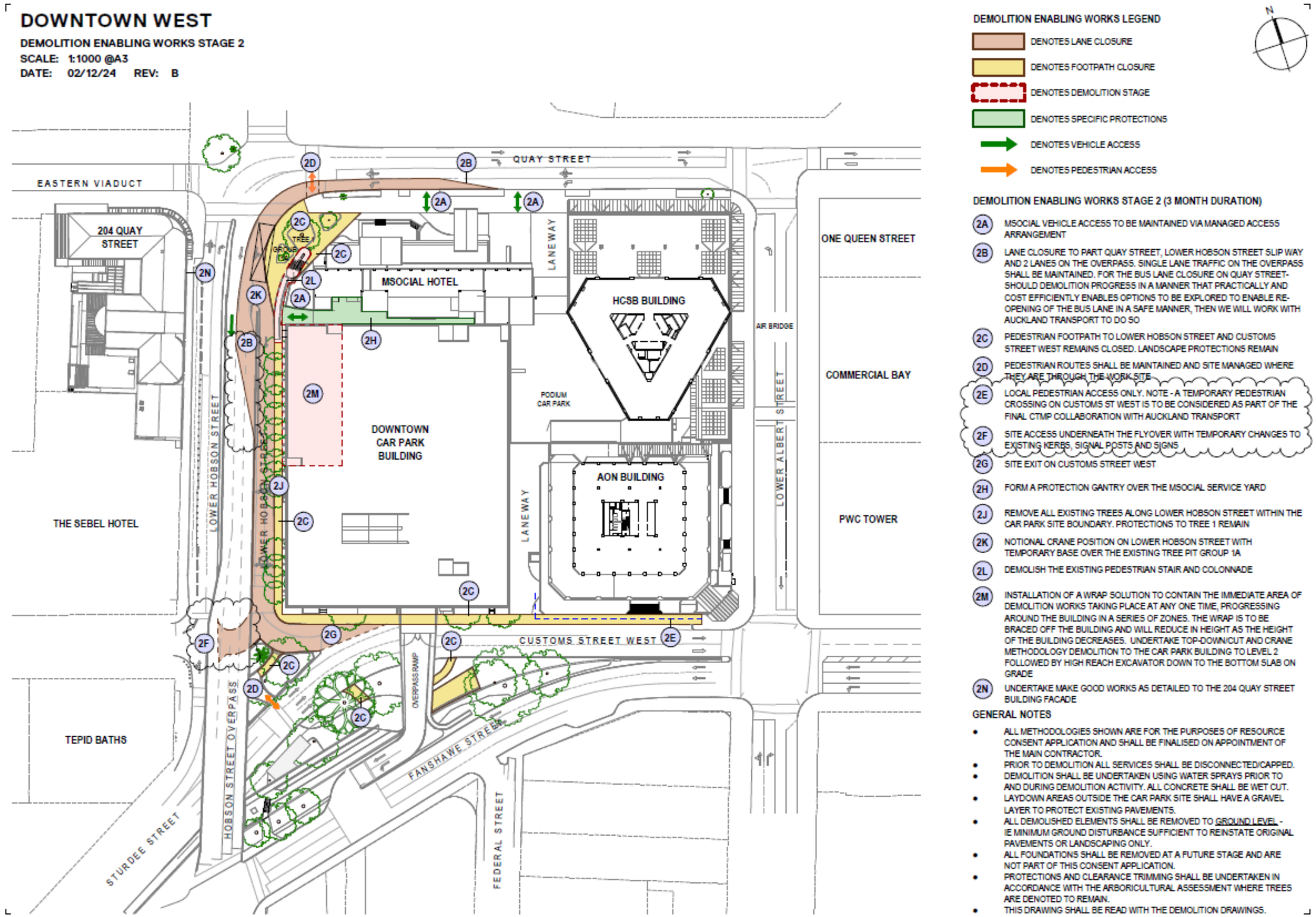


6.2 Stage 2: See Figure 11

Stage 2 involves the demolition of the west section of the Downtown Carpark building, with the crane being located on Lower Hobson Street.

- As the Downtown Carpark building will be in place, it is not possible to place a crane within the Site for the initial stage. The crane is required to be located in the road reserve for the first 3 months until the crane can be relocated within the Site
- As shown indicatively in the drawing sets, a 300T mobile crane can be located on Lower Hobson Street. A temporary base may be required over a tree pit to provide space for the crane stabilisers
- Construction vehicle access will be provided in the Lower Hobson Street slip lane adjacent to the Site. This will provide an area where construction vehicles can load and unload, and transport demolition material off-site
- To separate public access from the crane and truck access, some lane closures will be required.
    - The Lower Hobson Street slip lane adjacent to the Site will be closed to provide construction vehicle access and a loading area
    - One to 2 lanes on the Lower Hobson Street flyover will need to be closed to provide space for construction vehicles and flexibility for the crane to operate
    - To provide an entry point for construction vehicles and to provide a taper for the Lower Hobson Street flyover closures, 1 westbound lane on Quay Street may need to be closed. In the final CTMP, we recommend that an option should be explored that could potentially provide bus priority on Quay Street before vehicles are required to merge into 1 lane on the Lower Hobson Street flyover.
- Construction vehicle access can be provided from underneath the Lower Hobson Street flyover. Construction vehicles can exit onto Customs Street West. Please refer to Sections 5.2 and 5.3 for additional discussion of this matter
- The existing M Social service access on Lower Hobson Street will need to have managed access restrictions. This will require coordination between the contractor and M Social
- The existing M Social vehicle accesses on Quay Street can be maintained. The lane closure on Quay Street will need to maintain these accesses, which can be managed by contractors onsite
- Pedestrian access on Lower Hobson Street and around the Site perimeter will need to be closed to the public, to prevent pedestrians from entering a live work zone. Alternative pedestrian paths are available and will need to be signposted to divert pedestrians. Please refer to Section 7 for additional discussion and assessment of this matter.

Figure 11: Stage 2 works



DEMOLITION ENABLING WORKS LEGEND

- DENOTES LANE CLOSURE
- DENOTES FOOTPATH CLOSURE
- DENOTES DEMOLITION STAGE
- DENOTES SPECIFIC PROTECTIONS
- DENOTES VEHICLE ACCESS
- DENOTES PEDESTRIAN ACCESS

DEMOLITION ENABLING WORKS STAGE 2 (3 MONTH DURATION)

- 2A MSOCIAL VEHICLE ACCESS TO BE MAINTAINED VIA MANAGED ACCESS ARRANGEMENT
- 2B LANE CLOSURE TO PART QUAY STREET, LOWER HOBSON STREET SLIP WAY AND 2 LANES ON THE OVERPASS. SINGLE LANE TRAFFIC ON THE OVERPASS SHALL BE MAINTAINED. FOR THE BUS LANE CLOSURE ON QUAY STREET- SHOULD DEMOLITION PROGRESS IN A MANNER THAT PRACTICALLY AND COST EFFICIENTLY ENABLES OPTIONS TO BE EXPLORED TO ENABLE RE-OPENING OF THE BUS LANE IN A SAFE MANNER, THEN WE WILL WORK WITH AUCKLAND TRANSPORT TO DO SO
- 2C PEDESTRIAN FOOTPATH TO LOWER HOBSON STREET AND CUSTOMS STREET WEST REMAINS CLOSED. LANDSCAPE PROTECTIONS REMAIN
- 2D PEDESTRIAN ROUTES SHALL BE MAINTAINED AND SITE MANAGED WHERE THEY ARE THROUGH THE WORK SITE
- 2E LOCAL PEDESTRIAN ACCESS ONLY. NOTE - A TEMPORARY PEDESTRIAN CROSSING ON CUSTOMS ST WEST IS TO BE CONSIDERED AS PART OF THE FINAL CTMP COLLABORATION WITH AUCKLAND TRANSPORT
- 2F SITE ACCESS UNDERNEATH THE FLYOVER WITH TEMPORARY CHANGES TO EXISTING KERBS, SIGNAL POSTS AND SIGNS
- 2G SITE EXIT ON CUSTOMS STREET WEST
- 2H FORM A PROTECTION GANTRY OVER THE MSOCIAL SERVICE YARD
- 2J REMOVE ALL EXISTING TREES ALONG LOWER HOBSON STREET WITHIN THE CAR PARK SITE BOUNDARY. PROTECTIONS TO TREE 1 REMAIN
- 2K NOTIONAL CRANE POSITION ON LOWER HOBSON STREET WITH TEMPORARY BASE OVER THE EXISTING TREE PIT GROUP 1A
- 2L DEMOLISH THE EXISTING PEDESTRIAN STAIR AND COLONNADE
- 2M INSTALLATION OF A WRAP SOLUTION TO CONTAIN THE IMMEDIATE AREA OF DEMOLITION WORKS TAKING PLACE AT ANY ONE TIME, PROGRESSING AROUND THE BUILDING IN A SERIES OF ZONES. THE WRAP IS TO BE BRACED OFF THE BUILDING AND WILL REDUCE IN HEIGHT AS THE HEIGHT OF THE BUILDING DECREASES. UNDERTAKE TOP-DOWN/CUT AND CRANE METHODOLOGY DEMOLITION TO THE CAR PARK BUILDING TO LEVEL 2 FOLLOWED BY HIGH REACH EXCAVATOR DOWN TO THE BOTTOM SLAB ON GRADE
- 2N UNDERTAKE MAKE GOOD WORKS AS DETAILED TO THE 204 QUAY STREET BUILDING FACADE

GENERAL NOTES

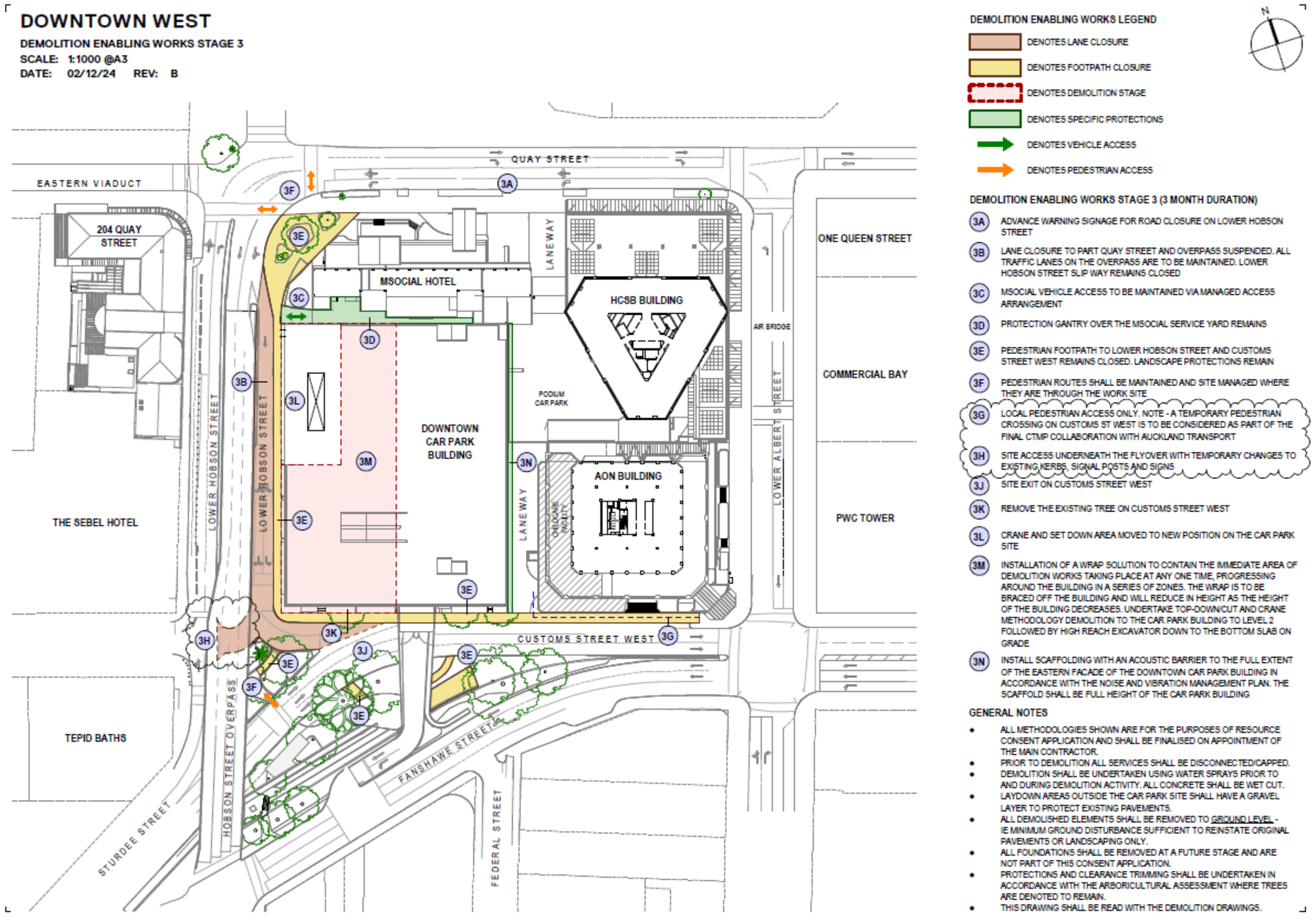
- ALL METHODOLOGIES SHOWN ARE FOR THE PURPOSES OF RESOURCE CONSENT APPLICATION AND SHALL BE FINALISED ON APPOINTMENT OF THE MAIN CONTRACTOR.
- PRIOR TO DEMOLITION ALL SERVICES SHALL BE DISCONNECTED/CAPPED.
- DEMOLITION SHALL BE UNDERTAKEN USING WATER SPRAYS PRIOR TO AND DURING DEMOLITION ACTIVITY. ALL CONCRETE SHALL BE WET CUT.
- LAYDOWN AREAS OUTSIDE THE CAR PARK SITE SHALL HAVE A GRAVEL LAYER TO PROTECT EXISTING PAVEMENTS.
- ALL DEMOLISHED ELEMENTS SHALL BE REMOVED TO GROUND LEVEL - IE MINIMUM GROUND DISTURBANCE SUFFICIENT TO REINSTATE ORIGINAL PAVEMENTS OR LANDSCAPING ONLY.
- ALL FOUNDATIONS SHALL BE REMOVED AT A FUTURE STAGE AND ARE NOT PART OF THIS CONSENT APPLICATION.
- PROTECTIONS AND CLEARANCE TRIMMING SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE ARBORICULTURAL ASSESSMENT WHERE TREES ARE DENOTED TO REMAIN.
- THIS DRAWING SHALL BE READ WITH THE DEMOLITION DRAWINGS.

6.3 Stage 3: See Figure 12

Stage 3 involves the demolition of the west section of the Downtown Carpark building, with the crane being located within the Site.

- This is effectively a continuation of Stage 2, but the crane can be located within the Site after space is created following initial demolition work
- Stage 3 is anticipated to last for 3 months
- The Lower Hobson Street slip lane adjacent to the Site will be closed to provide construction vehicle access and a loading area, separated from public access
- No closures on Quay Street will be required as the crane will not be located in the road reserve as per Stage 2
- Construction vehicle access can be provided from underneath the Lower Hobson Street flyover. Construction vehicles can exit onto Customs Street West. Please refer to Sections 5.2 and 5.3 for additional discussion of this matter
- The existing M Social service access on Lower Hobson Street will need to have managed access restrictions. This will require coordination between the contractor and M Social
- Pedestrian access on the Lower Hobson Street and Customs Street site frontages will need to be closed to the public to prevent pedestrians from entering a live work zone. Alternative pedestrian paths are available and will need to be signposted. Please refer to Section 7 for additional discussion and assessment of this matter.

Figure 12: Stage 3 works



DEMOLITION ENABLING WORKS LEGEND

- DENOTES LANE CLOSURE
- DENOTES FOOTPATH CLOSURE
- DENOTES DEMOLITION STAGE
- DENOTES SPECIFIC PROTECTIONS
- DENOTES VEHICLE ACCESS
- DENOTES PEDESTRIAN ACCESS

DEMOLITION ENABLING WORKS STAGE 3 (3 MONTH DURATION)

- 3A ADVANCE WARNING SIGNAGE FOR ROAD CLOSURE ON LOWER HOBSON STREET
- 3B LANE CLOSURE TO PART QUAY STREET AND OVERPASS SUSPENDED. ALL TRAFFIC LANES ON THE OVERPASS ARE TO BE MAINTAINED. LOWER HOBSON STREET SLIP WAY REMAINS CLOSED
- 3C MSOCIAL VEHICLE ACCESS TO BE MAINTAINED VIA MANAGED ACCESS ARRANGEMENT
- 3D PROTECTION GANTRY OVER THE MSOCIAL SERVICE YARD REMAINS
- 3E PEDESTRIAN FOOTPATH TO LOWER HOBSON STREET AND CUSTOMS STREET WEST REMAINS CLOSED. LANDSCAPE PROTECTIONS REMAIN
- 3F PEDESTRIAN ROUTES SHALL BE MAINTAINED AND SITE MANAGED WHERE THEY ARE THROUGH THE WORK SITE
- 3G LOCAL PEDESTRIAN ACCESS ONLY. NOTE - A TEMPORARY PEDESTRIAN CROSSING ON CUSTOMS ST WEST IS TO BE CONSIDERED AS PART OF THE FINAL CTMP COLLABORATION WITH AUCKLAND TRANSPORT
- 3H SITE ACCESS UNDERNEATH THE FLYOVER WITH TEMPORARY CHANGES TO EXISTING KERBS, SIGNAL POSTS AND SIGNS
- 3J SITE EXIT ON CUSTOMS STREET WEST
- 3K REMOVE THE EXISTING TREE ON CUSTOMS STREET WEST
- 3L CRANE AND SET DOWN AREA MOVED TO NEW POSITION ON THE CAR PARK SITE
- 3M INSTALLATION OF A WRAP SOLUTION TO CONTAIN THE IMMEDIATE AREA OF DEMOLITION WORKS TAKING PLACE AT ANY ONE TIME, PROGRESSING AROUND THE BUILDING IN A SERIES OF ZONES. THE WRAP IS TO BE BRACED OFF THE BUILDING AND WILL REDUCE IN HEIGHT AS THE HEIGHT OF THE BUILDING DECREASES. UNDERTAKE TOP-DOWN/CUT AND CRANE METHODOLOGY DEMOLITION TO THE CAR PARK BUILDING TO LEVEL 2 FOLLOWED BY HIGH REACH EXCAVATOR DOWN TO THE BOTTOM SLAB ON GRADE
- 3N INSTALL SCAFFOLDING WITH AN ACOUSTIC BARRIER TO THE FULL EXTENT OF THE EASTERN FACADE OF THE DOWNTOWN CAR PARK BUILDING IN ACCORDANCE WITH THE NOISE AND VIBRATION MANAGEMENT PLAN. THE SCAFFOLD SHALL BE FULL HEIGHT OF THE CAR PARK BUILDING

GENERAL NOTES

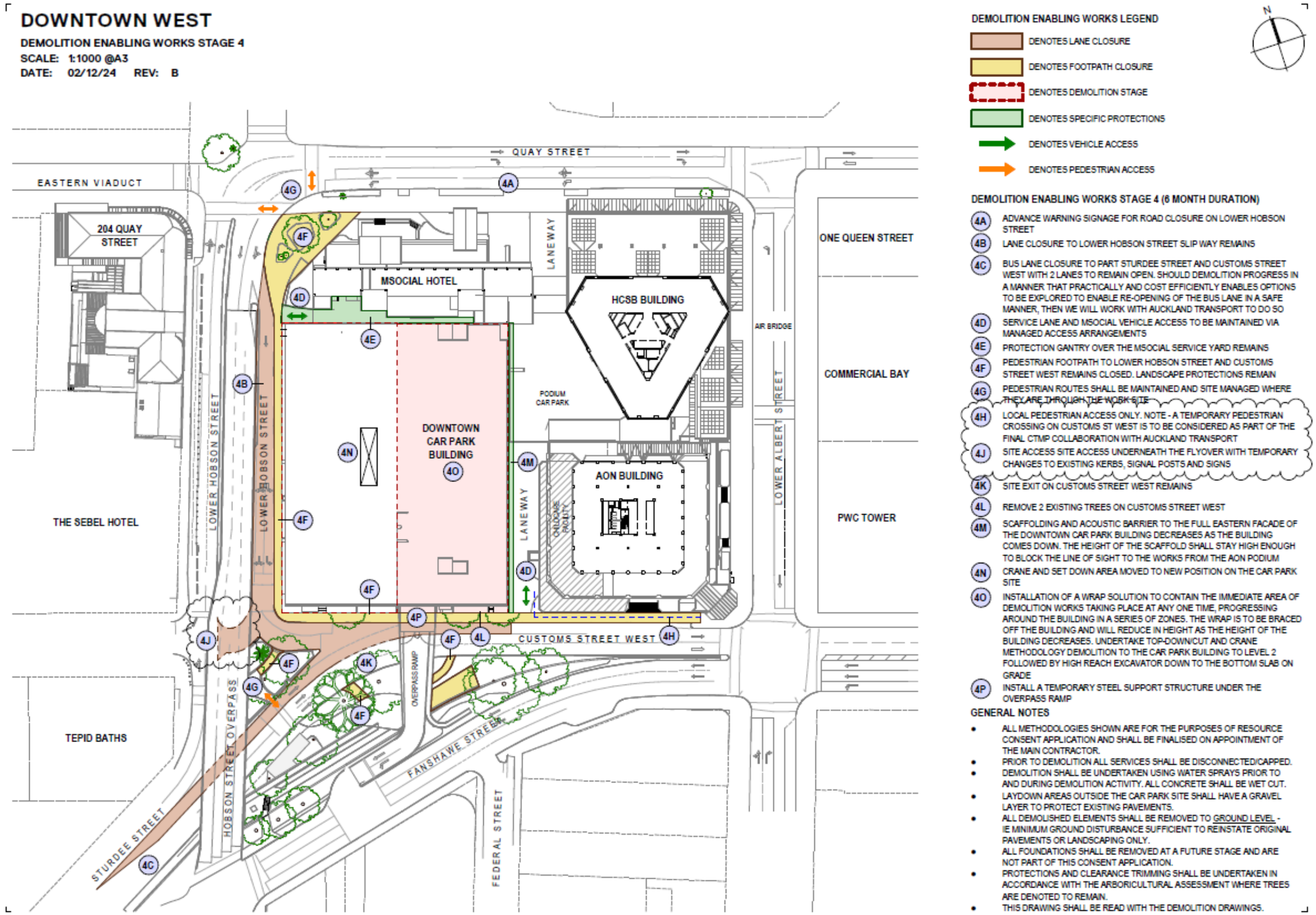
- ALL METHODOLOGIES SHOWN ARE FOR THE PURPOSES OF RESOURCE CONSENT APPLICATION AND SHALL BE FINALISED ON APPOINTMENT OF THE MAIN CONTRACTOR.
- PRIOR TO DEMOLITION ALL SERVICES SHALL BE DISCONNECTED/CAPPED.
- DEMOLITION SHALL BE UNDERTAKEN USING WATER SPRAYS PRIOR TO AND DURING DEMOLITION ACTIVITY. ALL CONCRETE SHALL BE WET CUT.
- LAYDOWN AREAS OUTSIDE THE CAR PARK SITE SHALL HAVE A GRAVEL LAYER TO PROTECT EXISTING PAVEMENTS.
- ALL DEMOLISHED ELEMENTS SHALL BE REMOVED TO GROUND LEVEL - IE MINIMUM GROUND DISTURBANCE SUFFICIENT TO REINSTATE ORIGINAL PAVEMENTS OR LANDSCAPING ONLY.
- ALL FOUNDATIONS SHALL BE REMOVED AT A FUTURE STAGE AND ARE NOT PART OF THIS CONSENT APPLICATION.
- PROTECTIONS AND CLEARANCE TRIMMING SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE ARBORICULTURAL ASSESSMENT WHERE TREES ARE DENOTED TO REMAIN.
- THIS DRAWING SHALL BE READ WITH THE DEMOLITION DRAWINGS.

6.4 Stage 4: See Figure 13

Stage 4 involves the demolition of the east section of the Downtown Carpark building, with the crane being located within the Site.

- This is effectively a continuation of Stage 3, but there will be further impacts on Stage 4 to provide a work zone buffer on Customs Street West
- Stage 4 is anticipated to last for 6 months
- The same construction management and access measures along Lower Hobson Street apply as per Stage 3
- As Stage 4 involves scaffolding and demolishing the east section of the Downtown Carpark building, a greater work zone is required along Customs Street West to provide protection from overhead works
- In addition to the Lower Hobson Street lane closure outlined in Stage 3, a bus lane on Customs Street West will need to be closed alongside the Site frontage for some parts of Stage 4. This bus lane will need to be closed early prior to the signalised pedestrian crossing to avoid merging of buses into general traffic near the work zone. We note that the bus lane will only need to be closed while demolition works are occurring near the Customs Street West frontage, to provide a safety buffer for the public. Therefore, this bus lane closure will not occur for the full duration of Stage 4. The CTMP will include measures to keep bus lanes open where safe and practical to do so, and minimising any unnecessary closures
- Construction vehicle access can be provided from underneath the Lower Hobson Street flyover. Construction vehicles can exit onto Customs Street West. Please refer to Sections 5.2 and 5.3 for additional discussion of this matter
- The existing M Social service access on Lower Hobson Street will need to have managed access restrictions. These managed access restrictions will involve M Social servicing vehicles to have permitted access through the Lower Hobson Street lane closure so that they can access the M Social loading area. This will require coordination between the contractor and M Social, as the timing of the vehicle movements will need to occur independently of any possible overhead works
- Pedestrian access on the Lower Hobson Street and Customs Street West site frontages will need to be closed to the public, to prevent pedestrians from entering a live work zone. Alternative pedestrian paths are available and will need to be signposted. Refer to Section 7 for additional discussion and assessment of this matter.

Figure 13: Stage 4 works



DEMOLITION ENABLING WORKS LEGEND

- DENOTES LANE CLOSURE
- DENOTES FOOTPATH CLOSURE
- DENOTES DEMOLITION STAGE
- DENOTES SPECIFIC PROTECTIONS
- DENOTES VEHICLE ACCESS
- DENOTES PEDESTRIAN ACCESS

DEMOLITION ENABLING WORKS STAGE 4 (6 MONTH DURATION)

- 4A ADVANCE WARNING SIGNAGE FOR ROAD CLOSURE ON LOWER HOBSON STREET
- 4B LANE CLOSURE TO LOWER HOBSON STREET SLIP WAY REMAINS
- 4C BUS LANE CLOSURE TO PART STURDEE STREET AND CUSTOMS STREET WEST WITH 2 LANES TO REMAIN OPEN. SHOULD DEMOLITION PROGRESS IN A MANNER THAT PRACTICALLY AND COST EFFICIENTLY ENABLES OPTIONS TO BE EXPLORED TO ENABLE RE-OPENING OF THE BUS LANE IN A SAFE MANNER, THEN WE WILL WORK WITH AUCKLAND TRANSPORT TO DO SO
- 4D SERVICE LANE AND MSOCIAL VEHICLE ACCESS TO BE MAINTAINED VIA MANAGED ACCESS ARRANGEMENTS
- 4E PROTECTION GANTRY OVER THE MSOCIAL SERVICE YARD REMAINS
- 4F PEDESTRIAN FOOTPATH TO LOWER HOBSON STREET AND CUSTOMS STREET WEST REMAINS CLOSED. LANDSCAPE PROTECTIONS REMAIN
- 4G PEDESTRIAN ROUTES SHALL BE MAINTAINED AND SITE MANAGED WHERE THEY ARE THROUGH THE WORK SITE
- 4H LOCAL PEDESTRIAN ACCESS ONLY. NOTE - A TEMPORARY PEDESTRIAN CROSSING ON CUSTOMS ST WEST IS TO BE CONSIDERED AS PART OF THE FINAL CTMP COLLABORATION WITH AUCKLAND TRANSPORT
- 4J SITE ACCESS SITE ACCESS UNDERNEATH THE FLYOVER WITH TEMPORARY CHANGES TO EXISTING KERBS, SIGNAL POSTS AND SIGNS
- 4K SITE EXIT ON CUSTOMS STREET WEST REMAINS
- 4L REMOVE 2 EXISTING TREES ON CUSTOMS STREET WEST
- 4M SCAFFOLDING AND ACOUSTIC BARRIER TO THE FULL EASTERN FACADE OF THE DOWNTOWN CAR PARK BUILDING DECREASES AS THE BUILDING COMES DOWN. THE HEIGHT OF THE SCAFFOLD SHALL STAY HIGH ENOUGH TO BLOCK THE LINE OF SIGHT TO THE WORKS FROM THE AON PODIUM
- 4N CRANE AND SET DOWN AREA MOVED TO NEW POSITION ON THE CAR PARK SITE
- 4O INSTALLATION OF A WRAP SOLUTION TO CONTAIN THE IMMEDIATE AREA OF DEMOLITION WORKS TAKING PLACE AT ANY ONE TIME, PROGRESSING AROUND THE BUILDING IN A SERIES OF ZONES. THE WRAP IS TO BE BRACED OFF THE BUILDING AND WILL REDUCE IN HEIGHT AS THE HEIGHT OF THE BUILDING DECREASES. UNDERTAKE TOP-DOWN/CUT AND CRANE METHODOLOGY DEMOLITION TO THE CAR PARK BUILDING TO LEVEL 2 FOLLOWED BY HIGH REACH EXCAVATOR DOWN TO THE BOTTOM SLAB ON GRADE
- 4P INSTALL A TEMPORARY STEEL SUPPORT STRUCTURE UNDER THE OVERPASS RAMP

GENERAL NOTES

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- DEMOLITION SHALL BE UNDERTAKEN USING WATER SPRAYS PRIOR TO AND DURING DEMOLITION ACTIVITY. ALL CONCRETE SHALL BE WET CUT.
- LAYDOWN AREAS OUTSIDE THE CAR PARK SITE SHALL HAVE A GRAVEL LAYER TO PROTECT EXISTING PAVEMENTS.
- ALL DEMOLISHED ELEMENTS SHALL BE REMOVED TO GROUND LEVEL - IE MINIMUM GROUND DISTURBANCE SUFFICIENT TO REINSTATE ORIGINAL PAVEMENTS OR LANDSCAPING ONLY.
- ALL FOUNDATIONS SHALL BE REMOVED AT A FUTURE STAGE AND ARE NOT PART OF THIS CONSENT APPLICATION.
- PROTECTIONS AND CLEARANCE TRIMMING SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE ARBORICULTURAL ASSESSMENT WHERE TREES ARE DENOTED TO REMAIN.
- THIS DRAWING SHALL BE READ WITH THE DEMOLITION DRAWINGS.

6.5 Stage 5: See Figure 15

Stage 5 involves the removal of the Downtown Carpark ramp over Customs Street West onto Fanshawe Street.

- This is expected to occur for 1 week within the 3-month period of Stage 5
- The bridge will require full road closure of Customs Street West in front of the Site as the ramp spans across all traffic lanes
- The overall road closures outlined in Stage 4 will apply but with the following additional closures.
    - Customs Street West along the Site frontage will be fully closed, as it will not be safe to have any traffic or vehicles passing underneath while the ramp is being removed. All eastbound traffic approaching from Sturdee Street will need to be diverted towards Lower Hobson Street. Heavy vehicles will need to be diverted earlier to avoid Quay Street. We have provided further details in this section below
    - To provide a work zone buffer on Fanshawe Street, a general traffic lane may need to be closed.
- Construction vehicles can enter through Customs Street West, where the road closure begins, and also exit out onto Customs Street West
- The existing M Social service access on Lower Hobson Street will need to have managed access restrictions. This will require coordination between the contractor and M Social
- There is a service lane along the eastern frontage of the Site. This serves the HSBC and AON buildings. While Customs Street West is fully closed, the service lane access on Customs Street West will need to be closed. Vehicles using the service lane can use the Quay Street vehicle access. This service lane is operated by Precinct Properties, who is the Applicant for this demolition works resource consent
- Pedestrian access on the Lower Hobson Street and Customs Street West site frontages will need to be closed to the public, to prevent pedestrians from entering a live work zone. The pedestrian footpaths next to the ramp will also need to be closed, which will restrict pedestrian access from Fanshawe Street to Customs Street West. Alternative pedestrian paths are available and will need to be signposted. Refer to Section 7 for additional discussion and assessment of this matter.

As Customs Street West accommodates bus routes, buses will need to be diverted onto Lower Hobson Street for the 1 week duration. Please refer to Section 8 and Appendix D for details about bus diversions.

The road closure of Customs Street West will require heavy vehicles to be diverted early, in order to avoid Quay Street (which is subject to heavy vehicle restrictions)

- Advance warning signs will be provided throughout the City Centre to advise drivers of the Customs Street West closure, so they can use an alternative route
- VMS signage on the motorway can advise drivers heading from the Harbour Bridge of the closure so they can access the City Centre via SH16, if they were originally planning to use Customs Street West as a through route. Other measures to encourage drivers to reroute could include messages

on the radio. Our modelling assessment has shown that some vehicles will use SH16 as an alternative route

- If any drivers are not able to divert using the wider network and approach the Customs Street West closure, then it will be necessary to divert these vehicles onto Lower Hobson Street / Quay Street
- We note that heavy vehicles cannot be diverted onto Quay Street due to the sign posted restrictions of trucks over 14.5 m in length.
  - The VMS signage can assist these vehicles in guiding them to use an alternative route to access the City Centre
  - If any heavy vehicles are approaching from Fanshawe Street or Nelson Street, they should be diverted onto Fanshawe Street, and then turn right into Hobson Street. This will direct these vehicles back onto the motorway, where they can use an alternative route
  - This diversion route is shown in Figure 14
  - We note that as this route is designated for over-dimension trucks already, it is not necessary to demonstrate vehicle tracking for this route
- Details of the final diversion routes will be agreed with Auckland Transport in the final CTMP.

Figure 14: Customs Street West diversion route for heavy vehicles

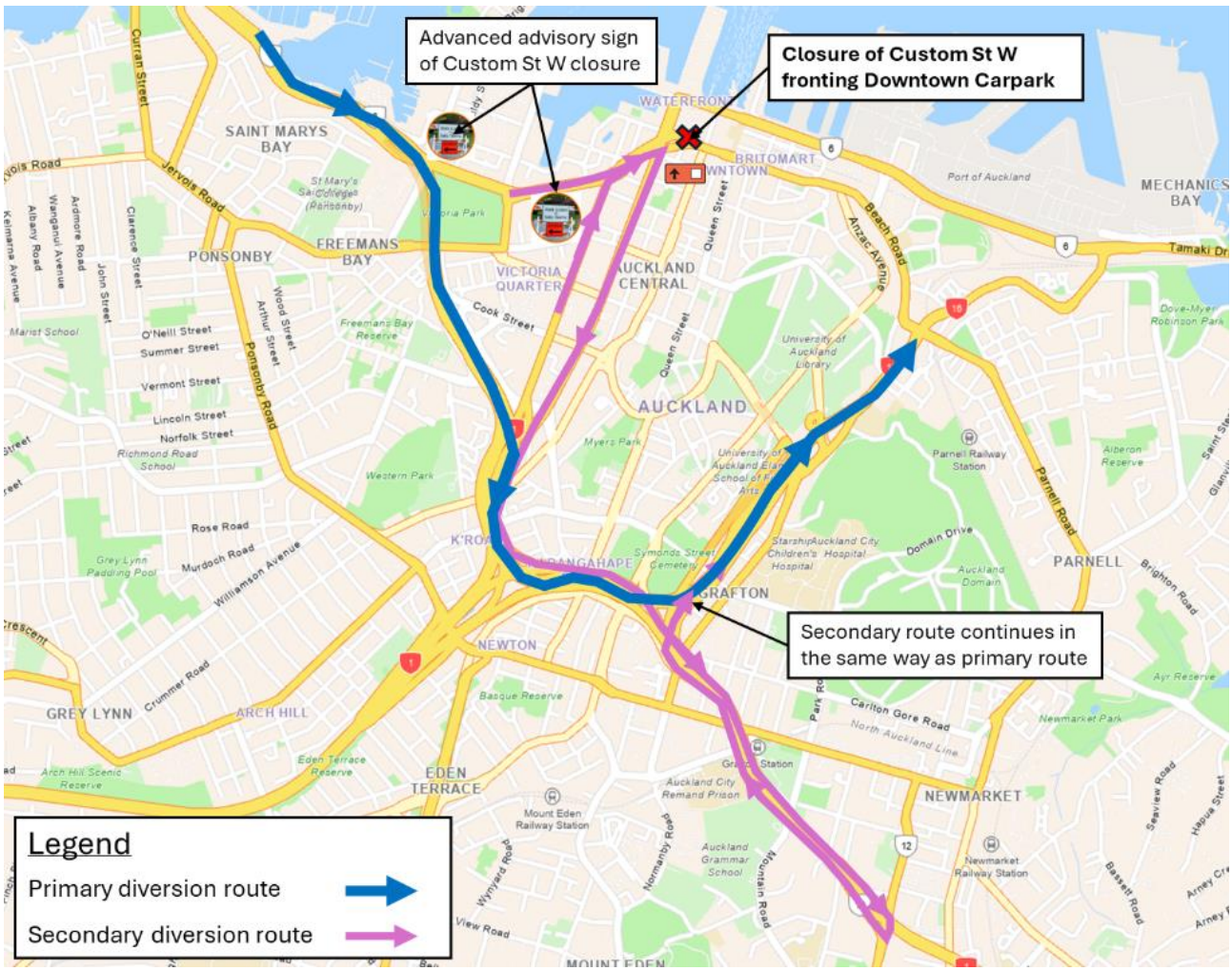
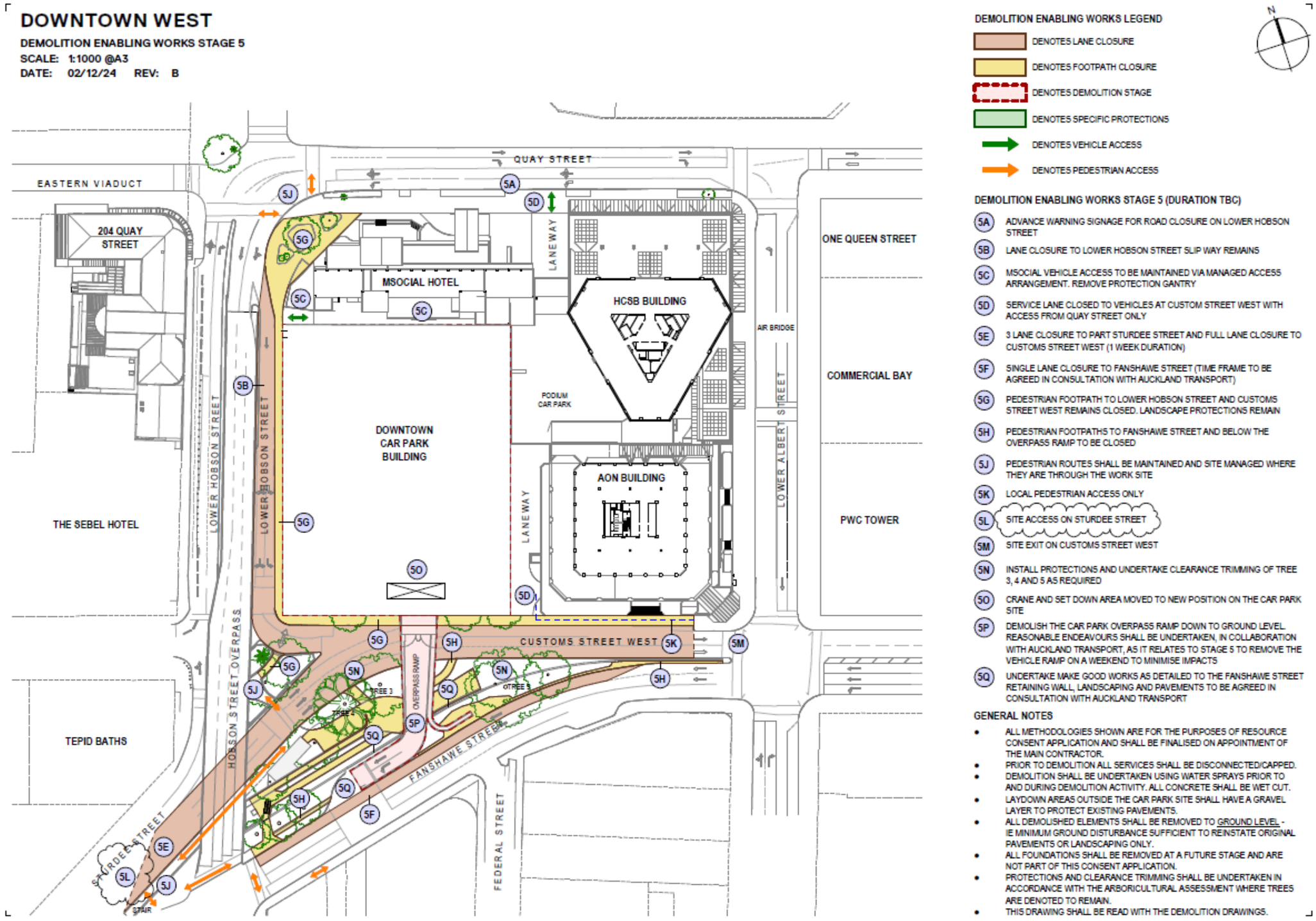


Figure 15: Stage 5 works



DEMOLITION ENABLING WORKS LEGEND

- DENOTES LANE CLOSURE
- DENOTES FOOTPATH CLOSURE
- DENOTES DEMOLITION STAGE
- DENOTES SPECIFIC PROTECTIONS
- DENOTES VEHICLE ACCESS
- DENOTES PEDESTRIAN ACCESS

DEMOLITION ENABLING WORKS STAGE 5 (DURATION TBC)

- 5A ADVANCE WARNING SIGNAGE FOR ROAD CLOSURE ON LOWER HOBSON STREET
- 5B LANE CLOSURE TO LOWER HOBSON STREET SLIP WAY REMAINS
- 5C MSOCIAL VEHICLE ACCESS TO BE MAINTAINED VIA MANAGED ACCESS ARRANGEMENT. REMOVE PROTECTION GANTRY
- 5D SERVICE LANE CLOSED TO VEHICLES AT CUSTOM STREET WEST WITH ACCESS FROM QUAY STREET ONLY
- 5E 3 LANE CLOSURE TO PART STURDEE STREET AND FULL LANE CLOSURE TO CUSTOMS STREET WEST (1 WEEK DURATION)
- 5F SINGLE LANE CLOSURE TO FANSHAWE STREET (TIME FRAME TO BE AGREED IN CONSULTATION WITH AUCKLAND TRANSPORT)
- 5G PEDESTRIAN FOOTPATH TO LOWER HOBSON STREET AND CUSTOMS STREET WEST REMAINS CLOSED. LANDSCAPE PROTECTIONS REMAIN
- 5H PEDESTRIAN FOOTPATHS TO FANSHAWE STREET AND BELOW THE OVERPASS RAMP TO BE CLOSED
- 5J PEDESTRIAN ROUTES SHALL BE MAINTAINED AND SITE MANAGED WHERE THEY ARE THROUGH THE WORK SITE
- 5K LOCAL PEDESTRIAN ACCESS ONLY
- 5L SITE ACCESS ON STURDEE STREET
- 5M SITE EXIT ON CUSTOMS STREET WEST
- 5N INSTALL PROTECTIONS AND UNDERTAKE CLEARANCE TRIMMING OF TREE 3, 4 AND 5 AS REQUIRED
- 5O CRANE AND SET DOWN AREA MOVED TO NEW POSITION ON THE CAR PARK SITE
- 5P DEMOLISH THE CAR PARK OVERPASS RAMP DOWN TO GROUND LEVEL. REASONABLE ENDEAVOURS SHALL BE UNDERTAKEN, IN COLLABORATION WITH AUCKLAND TRANSPORT, AS IT RELATES TO STAGE 5 TO REMOVE THE VEHICLE RAMP ON A WEEKEND TO MINIMISE IMPACTS
- 5Q UNDERTAKE MAKE GOOD WORKS AS DETAILED TO THE FANSHAWE STREET RETAINING WALL, LANDSCAPING AND PAVEMENTS TO BE AGREED IN CONSULTATION WITH AUCKLAND TRANSPORT

GENERAL NOTES

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- LAYDOWN AREAS OUTSIDE THE CAR PARK SITE SHALL HAVE A GRAVEL LAYER TO PROTECT EXISTING PAVEMENTS.
- ALL DEMOLISHED ELEMENTS SHALL BE REMOVED TO GROUND LEVEL - IE MINIMUM GROUND DISTURBANCE SUFFICIENT TO REINSTATE ORIGINAL PAVEMENTS OR LANDSCAPING ONLY.
- ALL FOUNDATIONS SHALL BE REMOVED AT A FUTURE STAGE AND ARE NOT PART OF THIS CONSENT APPLICATION.
- PROTECTIONS AND CLEARANCE TRIMMING SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE ARBORICULTURAL ASSESSMENT WHERE TREES ARE DENOTED TO REMAIN.
- THIS DRAWING SHALL BE READ WITH THE DEMOLITION DRAWINGS.

7 PEDESTRIAN AND CYCLIST SAFETY ASSESSMENT AND DIVERSION MITIGATION

As previously mentioned, the Site is located in the heart of the Auckland City Centre, and the Site frontages are part of a busy pedestrian environment. To protect the public from a live work zone, overhead works and construction vehicles, appropriate barriers and other safeguards will need to be in place to prevent unauthorised access into the Site by pedestrians, where they may be exposed to safety hazards.

To supplement the information provided in Section 6, Figure 16, Figure 17 and Figure 18 show pedestrian footpath closures and diversions throughout the different stages to ensure that pedestrian effects are safely managed.

We specifically note the following about pedestrian access.

- The footpaths along the Lower Hobson Street slip lane will need to be closed for the full duration of the demolition, as this lane will accommodate construction vehicle access and loading
- Some sections of the Customs Street West footpath will also need to be closed for the full duration of the demolition. As construction vehicles will need to reverse into the Lower Hobson Street slip lane, it will not be safe to keep the footpath open near the southwest corner of the Site. Depending on the works occurring within the demolition stage, it may also not be safe to maintain pedestrian access if demolition works are occurring near the road frontages
- Local pedestrian access on Customs Street West between Lower Albert Street and the service lane can be maintained. This will ensure the AON building, service lane and existing childcare centre can still be accessed by pedestrians in these areas if needed. Public access will need to be restricted at Lower Albert Street, and contractors will need to manage access to authorised people only
- The utilisation of the existing footpath network, pedestrian diversion options include using Quay Street, or Fanshawe Street via the stairwell. Given the stairwell may not be friendly for mobility or visually impaired pedestrians, Quay Street will be used as the primary pedestrian diversion route. The CTMP will also include measures to ensure mobility or visually impaired pedestrians have safe alternatives
- The CTMP will explore an option to include a temporary pedestrian crossing on Customs Street West, to maintain some pedestrian access on Customs Street West. Figure 19 shows a potential location for this temporary crossing. This could be opened during periods of the demolition where works are not occurring along the southeast corner of the Site.

Cycle facilities will be unaffected during most stages. The only instance where a cycleway will need to be closed is during Stage 1, when the Lower Hobson Street pedestrian overbridge is being removed.

- This will require the closure of the bi-directional cycleway on the west side of Lower Hobson Street
- To provide a connection between Quay Street and Sturdee Street, cyclists may need to dismount and travel through the Viaduct to avoid conflicts with pedestrians

- Alternatively, cyclists could be redirected to the bus lane on Customs Street West
- Another option is for cyclists to use the pedestrian diversions for Stage 1, as shown in Figure 16, but this would involve cyclists needing to use stairs. If this did occur, additional mitigation such as wheeling ramps, could be provided for cyclists

Given that Stage 1 is anticipated to occur for a very short duration of 48 hours and during a weekend, we consider that cycle diversions can be managed for this period. We recommend that the CTMP clearly outlines how cyclists will be diverted during Stage 1, which will require consultation with Auckland Transport.

Figure 16: Pedestrian closures and diversions for Stage 1

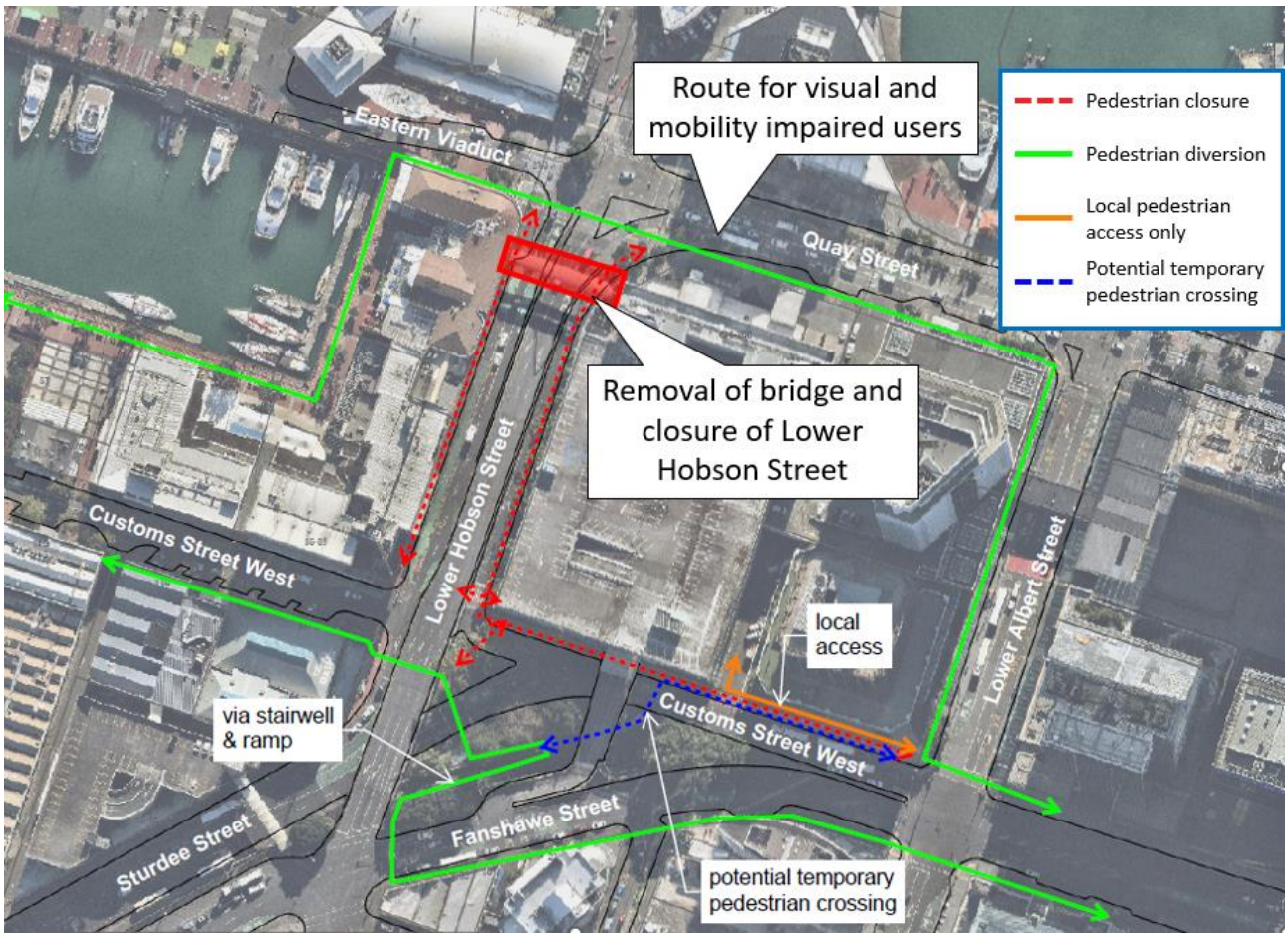


Figure 17: Pedestrian closures and diversions for Stages 2, 3 and 4

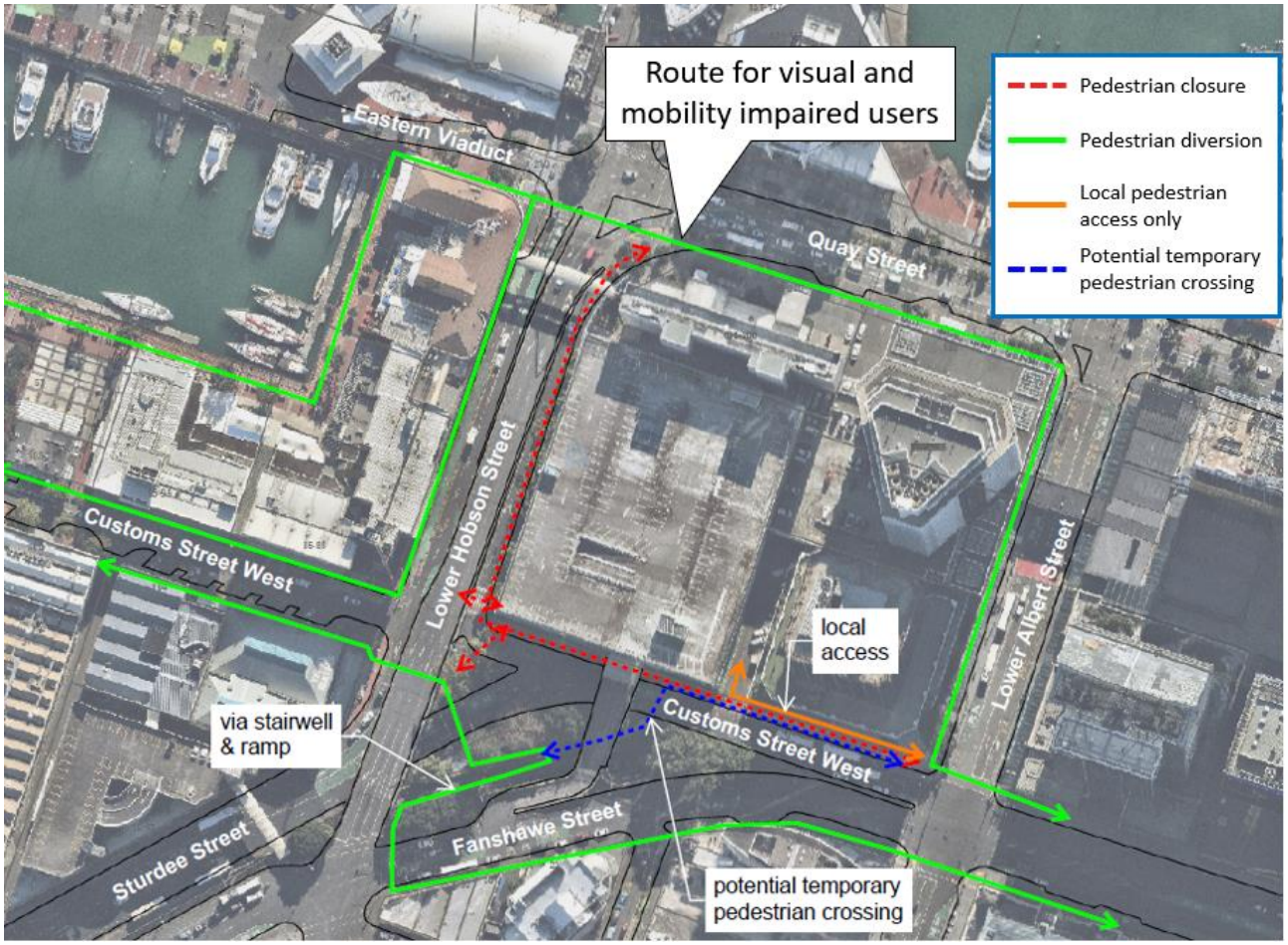


Figure 18: Pedestrian closures and diversions for Stage 5

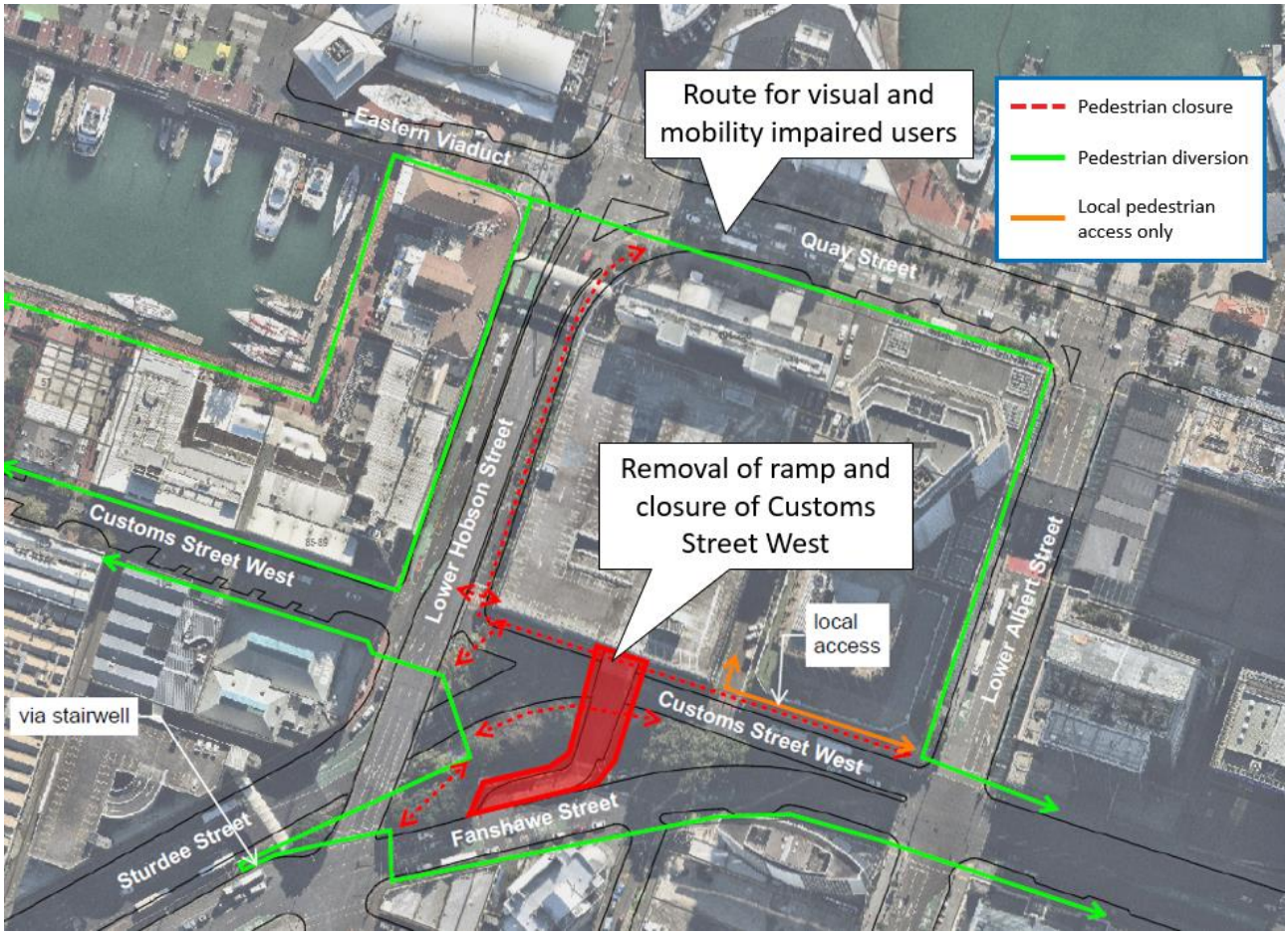
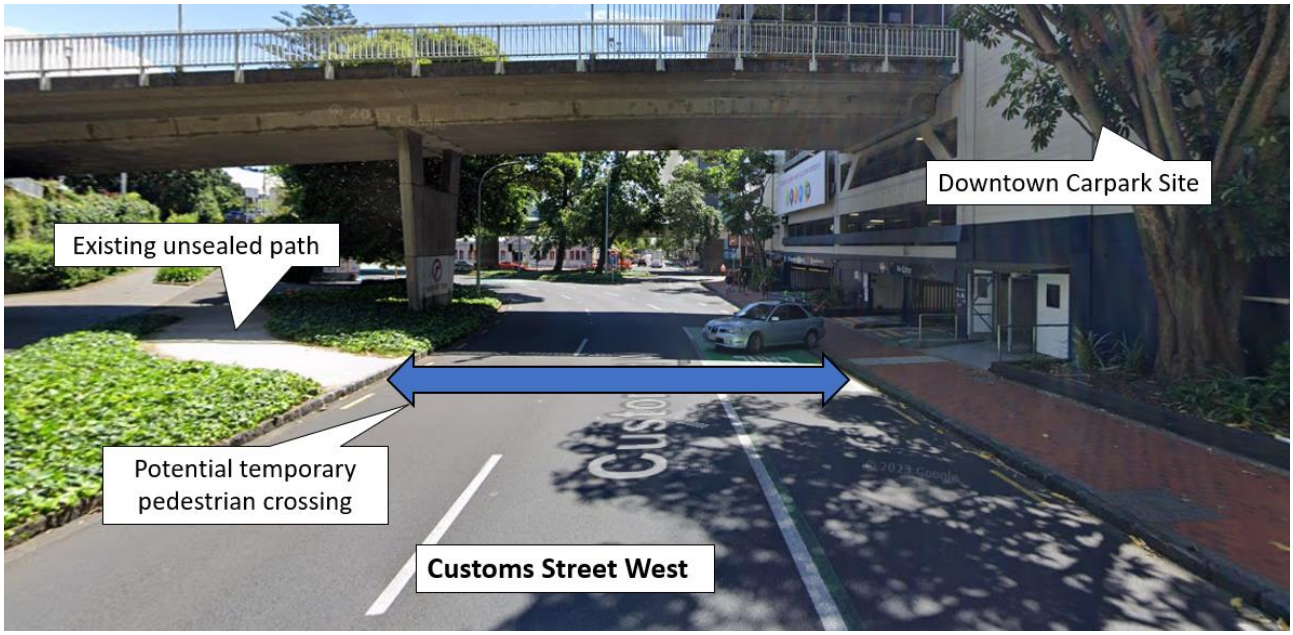


Figure 19: Potential temporary pedestrian crossing on Customs Street West



8 PUBLIC TRANSPORT ASSESSMENT

The bus routes and bus lanes that will be affected during the various stages of the demolition are as follows.

- Stage 1
  - A full road closure will be required on Lower Hobson Street, which will require some bus routes to be rerouted.
- Stage 2
  - To provide sufficient space for a crane on Lower Hobson Street, the Lower Hobson Street flyover will be narrowed to one lane
  - This will require the 2 westbound lanes on Quay Street to merge into 1. While we have assumed that the bus lane on Quay Street will need to be closed, we recommend that in the final CTMP, an option should be explored which could potentially provide bus priority on Quay Street before vehicles are required to merge into one lane on the Lower Hobson Street flyover.
- Stage 4
  - A bus lane on Customs Street West will need to be closed alongside the Site frontage for some parts of Stage 4
  - This bus lane will need to be closed early prior to the signalised pedestrian crossing to avoid merging of buses into general traffic near the work zone
  - We note that the bus lane will only need to be closed while demolition works are occurring near the Customs Street West frontage, to provide a safety buffer for the public. Therefore, this bus lane closure will not occur for the full duration of Stage 4. The CTMP will include measures to keep bus lanes open where safe and practical to do so, minimising any unnecessary closures.
- Stage 5
  - A full road closure will be required on Customs Street West, which will require some bus routes to be rerouted.

An assessment of the effects of the above on bus journey times (using the City Centre SATURN model) is provided in Section 12.2.3.

We have provided an assessment of alternative bus routes for Stages 1 and 5. Please refer to Appendix D, which contains details of potential alternative bus route solutions. In this regard, the following is noted.

- It is not possible to avoid needing to reroute the buses, as it will not be safe to maintain public transport access on Lower Hobson Street and Fanshawe Street while the overhead structures are being demolished
- Given the layout of the road network in this area of the City Centre, there are limited options for where buses can be rerouted

- Solutions 1 and 2 address the Stage 1 closure, while Solutions 3 to 5 address the Stage 5 closure. These closures largely rely on buses using Commerce Street as an alternative route. We have also indicated that Tangihua Street could be used if Commerce Street is not appropriate, but this would result in a longer detour route
- Alternative bus routes generally rely on using the same bus stops as the existing ones and being able to access them in the same direction. As identified for solution 2 during Stage 1, it may be necessary to find an alternative for Stop 1006 Stop E Lower Albert
- For the vehicle tracking for alternative bus routes.
    - The majority of our alternative bus route solutions utilise areas which already accommodate buses, which does not need additional vehicle tracking
    - Solution 1 as part of Stage 1 proposes that buses undertake turning movements at Commerce Street and Quay Street which are not part of existing bus routes.
        - Vehicle tracking for these intersections is shown in Appendix E. This shows vehicle tracking for a 12.6 m bus, which has a tighter turning radius compared to a 13.5 m bus. We note that as-built surveys of kerblines are not currently available, but the tracking shows aerials with the current road layout
        - At the Commerce Street / Customs Street East intersection, buses can turn left into Commerce Street without issues
        - At the Commerce Street / Quay Street intersection, buses may need to use both lanes to turn left into Quay Street
        - If Commerce Street is not suitable then another option is utilising Tangihua Street, although this would require a longer detour
        - At the Quay Street / Lower Albert Street intersection, buses are able to turn left into Quay Street while staying in their lane, but the clearance envelope has some overlap with the northbound lane on Quay Street. We note that these movements will not occur at the same time due to the signal phasing
        - We note that Solution 1 will only be required for Stage 1 which will likely occur for 48 hours during a weekend
        - We also note that there will be opportunity to agree the final bus routes with Auckland Transport when the final CTMP is prepared, should a more suitable solution be identified.

The final alternative bus routes for Stages 1 and 5 will be agreed with Auckland Transport as part of the final CTMP if more suitable routes are potentially identified.

9 LOCAL ACCESS ASSESSMENT

As outlined in Section 6, the proposed demolition works will affect the operation of local access points during Stages 1 to 5.

We summarise the impacts on the local accesses below.

- M Social servicing access on Lower Hobson Street.
  - M Social have a servicing access on Lower Hobson Street, which is located along the north boundary of the Downtown Carpark site
  - During Stage 1, Lower Hobson Street will be fully closed to remove the pedestrian overbridge. The M Social servicing access will need to be closed during this time. We note that Stage 1 is anticipated to occur for only 48 hours, and should be scheduled to occur during a weekend
  - During Stages 2 to 5, the east side of Lower Hobson Street, and the traffic lane adjacent to the Downtown Carpark site, will be closed to the public. This is to provide a construction vehicle access, and to remove members of the public away from a work zone. The M Social servicing access is in this zone. To maintain access for servicing vehicles for M Social, the access will need to be maintained via a managed access arrangement, which will require coordination between M Social and the appointed contractors.
- Customs Street West service lane access
  - The service lane has vehicle crossings on Quay Street and Customs Street West and serves the AON and HSBC buildings
  - During Stage 5, while Customs Street West is fully closed, the service lane access on Customs Street West will need to be closed. Vehicles using the service lane can use the Quay Street vehicle access. We note that Stage 5 is anticipated to occur for a relatively short period of time of 1 week
  - During Stages 1 to 4, the Customs Street West footpath along the Site frontage will be closed to prevent the public from walking near a work zone. Local pedestrian access to the service lane can be provided for people accessing the service lane and HSBC / AON buildings. For vehicles, the service lane crossing on Customs Street West can be maintained.

10 CONTRACTOR PARKING ASSESSMENT AND MITIGATION

The Site is located in the Auckland City Centre, where on-street parking on the surrounding streets is limited and in high demand.

Workers and sub-contractors will be encouraged to use public transport to travel to and from the work site where possible. The Site is located very close to the Britomart Transport Centre, the main public transport interchange in Auckland. Many public transport bus and train services to all parts of the city arrive and depart from the Britomart Transport Centre, and ferry services can be accessed directly across Quay Street.

Where construction staff must travel by private vehicle, they will be directed to park off-site in one of the surrounding parking building facilities. Existing facilities include (but are not exclusive to) the Fanshawe Street Carpark and various Wilson Parking areas (Princes Wharf, Federal Street, Hobson Street, Swanson Street, Queen Street, Fort Street, Durham Lane). It may prove practical for some companies with a small number of staff to shuttle staff to the Site via mini-vans or similar.

Workers and sub-contractors will be advised that if they need to park off-site, they will be required to park in accordance with normal traffic regulations. It should be made clear to all workers and sub-contractors that the use of any nearby, time-limited parking spaces for all-day parking is not permitted.

11 CONSTRUCTION TRAFFIC GENERATION

11.1 Truck generation

The demolition works will generate truck movements for the transportation of building materials off-site.

For our assessment, we have considered a 12.6 m rigid truck. The size of trucks will be restricted due to the construction vehicle access underneath the Lower Hobson Street flyover, which will require some modifications to accommodate a 12.6 m rigid truck.

To estimate the number of heavy vehicle movements during the demolition, we have used the following information:

- Building weight of 33,888 tonnes (33,888,000 kg) based on the structural engineers assessing the existing building plans and estimating the amount of material to be transported off-site
- Crushed stone density (loose) of 1,600 kg/m^3
- 21,180 m^3 of material, considering the building weight and crushed stone density (loose)
- 12-month programme (312 working days, assuming a 6-day working week).

Table 1 summarises the estimated number of heavy vehicle movements during the demolition.

Table 1: Assessment of heavy vehicle generation during demolition

Truck type	Carry capacity (m^3)	Total no. of trucks	Average trucks per day	Average truck movements per day
12.6m large rigid truck	10	2,118	7	14

We note the following about truck volumes for demolition

- On average, 7 trucks per day (14 truck movements) will be generated during the demolition for the removal of material
- This equates to an average of less than 1 truck per hour, or less than 2 truck movements per hour (assuming daily construction periods of 10.5 hours during weekdays and 9 hours on Saturdays)
- The truck movements will be spread throughout the demolition process. There will be some days that are higher and lower than the average volumes provided in Table 1, although it is unlikely to vary substantially. We understand that the duration of the demolition programme is determined by the amount of time required to demolish the building, instead of how many truck movements can be processed. Therefore, the demolition truck movements are unlikely to vary significantly
- We note that the contractor will be able to schedule truck movements to minimise the impacts of too many trucks arriving at the same time
- Nevertheless, we note that these truck volumes are very low when considered on a daily and hourly basis. Therefore, we do not consider it necessary to impose any peak hour time restrictions on truck movements.

11.2 Light vehicle generation

The demolition will also generate light vehicle movements.

- While contractors will be encouraged to use public transport or park in other areas in the City Centre, there may still be some staff who need to drive directly to the Site on some occasions
- This could involve light vehicles driving in and out of the construction zone on the Lower Hobson Street lane adjacent to the building
- We note that on-site parking will likely not be possible during the early stages of the project before parts of the building have been fully demolished
- Noting that a contractor has not been appointed and there is limited information available about staff numbers, we have assumed that there could be up to 50 light vehicles generated per hour during weekday peak hour periods.

12 TRANSPORT NETWORK EFFECTS OF ROAD AND LANE CLOSURES

12.1 Assessment methodology

We have used the City Centre SATURN model to assess the transport network effect of each stage of the demolition.

The City Centre SATURN model has been prepared by the Auckland Forecasting Centre ("**AFC**") and assesses the morning ("AM") and ("**PM**") peak hours during a weekday. To assess the effects of the demolition, we have prepared models for the 'existing environment' and Stages 1 to 5 of the demolition for both AM and PM peak periods. The 'existing environment' will be compared against each stage to assess the effects of the proposed road closures.

For the 'existing environment model',

- The Auckland Forecasting Centre's ("**AFC**") 2031 City Centre SATURN model has been used.
    - This accounts for the City Rail Link ("**CRL**") being completed. All current road closures associated with the CRL have, therefore, been removed. The model also accounts for future bus routes that will apply to the City Centre once the CRL is completed
    - The model only includes committed and funded road projects in the City Centre, which can be considered as part of the existing legal environment. One of these included projects is the Wellesley Street bus improvements
    - No unfunded or uncertain projects are included in the model, such as the removal of the Lower Hobson Street flyover.

For the Stages 1 to 5 models, we have used the 'existing environment model' as a baseline and made the following further changes.

<u>All Stages</u>

- Removed all trips from the Downtown Carpark
- Closed the Lower Hobson Street southbound lane adjacent to the Site
- Added construction truck trips. Construction truck trips have been modelled as 7 trucks per hour. This represents the anticipated 7 trucks per day based on using 12.6 m rigid trucks to transport material, as outlined in Section 11. We note that this is a very conservative assumption, it is estimated that there will be 7 trucks on average per day, and we have applied this in the model to occur within 1 hour in the modelled peak hours.
- Added light vehicle construction trips. In this regard, we assumed 50 vehicles per hour as per Section 11. These were added to the AON/HSBC service lane to simulate travelling to and from the Site
- Downtown Carpark trip redistribution. We have allowed for a 'worse case' traffic effects scenario, assuming that 100% of the existing Downtown Carpark trips will be redistributed to other parking areas within the City Centre. The methodology for redistributing these trips was provided and developed by AFC based on carpark occupancy data originally provided by Auckland Transport Parking for privately owned parking sites in the City Centre

- Existing M Social trips have been reassigned from the Downtown Carpark to the AON / HSBC service lane
- Reconfigure the Lower Hobson Street / Customs Street West signalised intersection to provide construction vehicle access, as outlined in Section 5.3.

Stage 1

- Fully close all links on Lower Hobson Street between Quay Street and Customs Street West
- Adjust signal phasing to Quay Street / Lower Hobson Street, Quay Street / Commerce Street and Lower Hobson Street / Fanshawe Street, accounting for rerouted traffic
- Buses have been rerouted for Stage 1, as outlined in Section 8 and Appendix D. We note that the 2031 model includes up to date bus routes for the post-CRL road network, compared to the previous version of the City Centre model. As such, the updated modelling allows for proposed changes to the bus routes once the CRL is operational.

Stage 2

- Close lanes on the Lower Hobson Street flyover to reduce to one approach lane
- Close one westbound lane on Quay Street approaching the Quay Street / Lower Hobson Street intersection
- Adjust signal phasing to Quay Street / Lower Hobson Street in the AM and PM peak, accounting for lane closures.

Stage 3

- No additional changes compared to 'All Stages'.

Stage 4

- Close lane on Customs Street West in front of the Site.

Stage 5

- Fully close Customs Street West between Lower Hobson Street and Lower Albert Street
- Close one westbound lane on Fanshawe Street on approach to the Fanshawe Street / Hobson Street intersection
- Redirect all service lane trips (between Customs Street West and Quay Street) to the Quay Street access
- Adjust signal phasing to Lower Albert Street / Customs Street, accounting for rerouted traffic
- Buses have been rerouted for Stage 5, as outlined in Section 8 and Appendix D. We note that the 2031 model includes up to date bus routes for the post-CRL road network, compared to the previous version of the City Centre model. As such, the updated modelling allows for proposed changes to the bus routes once the CRL is operational.

12.2 Modelling results

SATURN model outputs are provided in Appendix B. The following outputs are provided.

- SATURN network volume and delay difference diagrams.
  - Actual volume differences between the 'existing environment' scenario and each of the Stages 1 to 5. The differences are shown in 'PCUs' per hour, where a standard vehicle is 1 PCU and a heavy vehicle is 2 PCUs. Only differences of over 10 PCUs are shown
  - Delay differences between the 'existing environment' scenario and each of the Stages 1 to 5, in seconds. Only differences of over 10 seconds are shown
  - Diagrams are provided for each Stage for the AM and PM weekday peak period
  - The blue lines represent a decrease in volume/delay when compared to the 'existing environment', whereas the green line represents an increase
- Average travel time per vehicle per modelled scenario, showing differences compared to the baseline
- Bus route travel times per modelled scenario, showing differences compared to the baseline.

12.2.1 Network volume and delay differences

We summarise the results for each Stage and peak period below.

Stage 1

- AM peak
  - Vehicles reroute away from Quay Street and Lower Hobson Street towards Customs Street East and Fanshawe Street
  - The delay decreases along Quay Street, but increases on Customs Street West and Fanshawe Street by 20 – 60 seconds at the approaches to some intersections along the corridor. This increase corresponds to less than one traffic signal cycle
  - There are increases in delays to Commerce Street and Gore Street
  - Delay increases are predicted at the SH16 / Alten Street intersection of up to 45 seconds. This intersection is signalised, and there are already some delays in the base scenario. In the City Centre model, the intersection operates with a 150 second cycle time, so a delay of 45 seconds is 30% of a single cycle
  - There are no increases in delays in the area surrounding the Site.
  - We note that Stage 1 is anticipated to occur over 48 hours, which should be scheduled during a weekend. As the model is for a weekday peak period, the impacts will likely be less during a weekend, when there is likely to be lower traffic demands on the network.
- PM peak
  - Vehicles reroute away from Quay Street and Lower Hobson Street towards Customs Street East and Fanshawe Street

- The delay decreases along Quay Street but increases on Customs Street West by 10 – 90 seconds between Lower Albert Street and Commerce Street. This increase corresponds to less than one traffic signal cycle
- There is an increase in delays to Commerce Street, Queen Street and Wyndham Street
- There is an increase in delays to on SH16 of around 30 seconds. This applies to southbound traffic at the merging point of the Wellesley Street on-ramp. We note that the base model already has delays of around 110 seconds at this location in the PM peak, so there is already some delay and queueing at this location
- Delay increases are predicted at the SH16 / Alten Street intersection of up to 45 seconds. This intersection is signalised, and there are already some delays in the base scenario. In the City Centre model, the intersection operates with a 150 second cycle time, so a delay of 45 seconds is 30% of a single cycle
- There are no noticeable increases in delays in the area surrounding the Site
- We note that Stage 1 is anticipated to occur over 48 hours, which should be scheduled during a weekend. As the model is for a weekday peak period, the impacts will likely be less during a weekend, when there is likely to be lower traffic volumes on the network.

Stage 2

- AM peak
  - Vehicles reroute away from Lower Hobson Street and Customs Street West (in the Viaduct area) and towards Fanshawe Street
  - Increased delays are predicted at the Quay Street / Lower Hobson Street intersection of 20 to 70 seconds due to lane closures. Although some rerouting away from the intersection will occur, not all delays can be avoided
  - The delay changes are localised to these areas, and do not affect the wider network.
- PM peak
  - Vehicles reroute away from Lower Hobson Street and Customs Street West (in the Viaduct area) and towards Fanshawe Street
  - Increased delays are predicted at the Quay Street / Lower Hobson Street intersection of around 40 seconds due to lane closures. While some rerouting away from the intersection, not all delays can be avoided
  - The delay changes are localised to these areas, and do not affect the wider network.

Stage 3

- AM peak
  - Vehicles reroute away from Lower Hobson Street lane adjacent to the building and Customs Street West (in the Viaduct area) and towards Fanshawe Street and the Lower Hobson Street flyover
  - No noticeable changes in delays are predicted.

- PM peak
  - Vehicles reroute away from Lower Hobson Street lane adjacent to the building and Customs Street West (in the Viaduct area) and towards Fanshawe Street and the Lower Hobson Street flyover.
  - No noticeable changes in delays are predicted.

Stage 4

- AM
  - Vehicles reroute away from Lower Hobson Street lane adjacent to the building and Customs Street West (in the Viaduct area) and towards Fanshawe Street and the Lower Hobson Street flyover
  - No noticeable changes in delays are predicted.
- PM peak
  - Vehicles reroute away from Lower Hobson Street lane adjacent to the building and Customs Street West (in the Viaduct area) and towards Fanshawe Street and the Lower Hobson Street flyover
  - No noticeable changes in delays are predicted.

Stage 5

- AM peak
  - Vehicles reroute away from Customs Street West, and towards Lower Hobson Street (northbound). In the wider network, vehicles approach the City Centre from Stanley Street instead of through Nelson Street. Southbound vehicles on Lower Hobson Street reroute to the Lower Hobson Street flyover and Fanshawe Street
  - Delays are predicted to increase on Lower Hobson Street (northbound) by 110 seconds. This is due to Customs Street West being closed
  - Other delay increases are predicted, including on Fanshawe Street, Quay Street and Queen Street.
- PM peak
  - Vehicles reroute away from Lower Hobson Street lane adjacent to the building and Customs Street West (in the Viaduct area) and towards Fanshawe Street and the Lower Hobson Street flyover
  - Delays are predicted to cumulatively increase on Lower Hobson Street (northbound) by 140 seconds. This is due to Customs Street West being closed
  - Other delay increases are predicted, including on Fanshawe Street, Quay Street and Queen Street.

In summary, we highlight the following key findings.

- The demolition models for the various Stages generally predict that traffic will be rerouted from Lower Hobson Street onto Fanshawe Street
- Stages 1 and 5 see different rerouting patterns, given they involve full closures of Lower Hobson Street and Customs Street West respectively
- Moderate delay increases are predicted for Stages 1 and 5 due to these full road closures. In some cases, the delay increases are in the range of 2 minutes at some intersections. We note that these stages are anticipated to occur over 48 hours and 1 week respectively, which means they will be of a shorter duration
- Low delay increases are predicted during Stages 2, 3 and 4, which will occur over a longer duration
- While the demolition works will generate construction traffic and result in road closures, this will be offset by the significant reduction in local traffic demand due to the closure of the Downtown Carpark.

12.2.2 Average travel times

Please refer to Appendix B, which provides the average journey times for all vehicles for each Demolition stage. A comparison is provided for each Demolition stage against the 'without demolition' base case. We highlight the following key findings.

- During Stages 1 and 5, which will involve temporary road closures on Lower Hobson Street and Customs Street West, when compared to the "without demolition" base case, the results predict an average travel time increase of 2 – 4%. Both of these stages will be of short duration
- For Stages 2 to 4, average delay increases are predicted to increase by up to 1%
- These are small increases in average travel times.

12.2.3 Bus route travel times

Please refer to Appendix B which provides the modelled bus route travel times.

- A comparison is provided for each Demolition stage against the base case 'without demolition'
- Each route is included as per the City Centre SATURN model. Each route typically has an inbound and outbound route
- We note that the travel times for each route are limited to the area of the City Centre model. Some bus routes extend beyond the modelled area, which means the total travel time will be greater. However, any impacts to buses due to the Demolition are unlikely to extend to the wider network, as our modelling assessment has shown that any impacts to vehicle delays will be contained within the City Centre area
- The results predict an increase in bus delays for multiple routes during Stages 1 and 5, where buses need to change routes due to temporary road closures. We note that these stages will be of relatively short duration, and works will be scheduled during weekends where possible to minimise impacts during weekdays

- Small delay increases in bus travel times are predicted during Stage 2, where a bus lane on Quay Street may need to be partially closed. An option to keep one of these lanes open to provide bus priority could be explored with Auckland Transport when the final CTMP is prepared. This could involve reconfiguring the traffic signals to provide one lane with advance bus priority. For the purpose of our preliminary assessment, we have assumed the worst-case scenario where one of the Quay Street bus lanes will need to be closed
- No notable bus delay changes are predicted for Stages 3 and 4. While Stage 4 consists of a partial bus lane closure on Customs Street West, the CTMP will include measures to keep this bus lane open where it is safe and practical to do so.

13 VEHICLE TRACKING

The vehicle tracking for each Stage is provided in Appendix C.

- As outlined in Section 5.3, we have assessed that all construction vehicle access will be through the Lower Hobson Street slip lane adjacent to the Site. As mentioned, modifications to the access point will be required to accommodate a 12.6 m rigid truck
- While trucks will be able to enter and exit the construction zone in a forward direction, reversing will be required within the construction zone. There is space available at the south end of the Lower Hobson Street slip lane for 2 trucks to pass each other, although the width at the north end will be limited to one truck at a time. During Stages 1 to 4, trucks will need to reverse up the slip lane to be in reach of the crane. The contractors will be required to implement management measures to safely control these truck reversing manoeuvres
- For Stage 5, we note that construction access can be provided directly through Sturdee Street, which will provide additional space for truck manouevring
- The Stage 2 diagram shows that a double decker bus can safely pass the crane location at the Lower Hobson Street / Quay Street intersection.

A final vehicle tracking assessment should be provided by the contractor when the CTMP is prepared.

14 MAKE GOOD WORKS

During and after the demolition, there will be 'make good' works. These ‘make good’ works will ensure that the work areas are left to an acceptable standard following the demolition and are suitable for use by the public.

We note that once the Downtown Carpark ramp onto Fanshawe Street is removed, the signalised intersection exit onto Fanshawe Street will no longer be required.

- We recommend that this intersection be removed and reinstated as a road for through traffic. The works will involve removing the signal posts, and the associated road markings
- The footpath on the north side of Fanshawe Street will also require modification or removal. As the footpath on the northern side does not have sufficient width to provide a proper pedestrian facility near Lower Albert Street, we recommend that it is not required once the Downtown Carpark is demolished
- We recommend that the future design of this intersection is addressed at a later Engineering Plan Approval stage.

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15 AUCKLAND UNITARY PLAN ASSESSMENT

The Site is located in the Business – City Centre Zone in the Unitary Plan. Demolition of buildings is a controlled activity in the City Centre zone.

We understand that the resource consent application for the demolition will have an overall Restricted Discretionary activity status.

Standard H8.7.1(1) specifies the following matters of control for demolition of buildings. Standards (a) and (d) are applicable to this construction traffic assessment.

- **(a) pedestrian amenity and safety**
- (b) reuse of building materials
- (c) site condition post-demolition
- **(d) traffic generation.**

The applicable assessment criteria are provided in Standard H8.7.2(1). We have provided our assessment against these criteria in Table 2.

In summary, we believe that the demolition proposal adequately addresses the assessment criteria.

Table 2: Unitary Plan H8.7.2(1) assessment criteria for demolition of buildings

Assessment Criteria	Assessment
(a) pedestrian amenity and safety: (i) whether sites containing buildings that are proposed to be demolished have significant adverse effects on the quality and amenity of the public realm and the safety and efficiency of the surrounding transport network. In particular: 1 whether a high-quality and safe temporary hard or landscaped edge is provided along the site boundaries so that a defined boundary to streets and public open spaces is maintained. Including the provision and maintenance of continuous pedestrian cover within areas subject to the verandah standard; and 2 whether an edge treatment designed to reduce its vulnerability to graffiti and vandalism is maintained.	As outlined in Section 7, it is necessary to close pedestrian access to some footpaths near the demolition site. In particular, it is necessary to divert pedestrian access away from the footpaths fronting the site on Lower Hobson Street and Customs Street West. This is to remove conflicts between pedestrians and an active demolition work zone, where there will be overhead works and large construction vehicles. Alternative pedestrian routes are available and will be signposted as part of the final CTMP. The CTMP will include a potential option to include a temporary pedestrian crossing on Customs Street West to retain some pedestrian access, if this is safe and practical to achieve.
(d) traffic generation: (i) with regard to the effects of building demolition on the transport network: 1. proposed hours of operation; 2. the frequency and timing of truck movements to and from the site; and	1. Standard construction hours are proposed, as outlined in Section 5.1 2. As outlined in Section 11, an average of 14 truck movements per day are predicted to and from the site, or an average of 1-2 truck movements per hour. The timing of these movements will occur during the proposed hours

3. the location of vehicle access.	of operation, and can be scheduled by the contractor. These volumes are very low. 3. As outlined in Section 5.3, vehicle access for construction traffic will be provided underneath the flyover on Lower Hobson Street. This option allows construction vehicles to avoid Quay Street and means no additional lane closures on Customs Street West are required.

16 CONCLUSIONS

Our assessment of the proposed preliminary CTMP to enable the demolition of the Downtown Carpark building to take place, concludes that subject to a final CTMP being prepared and implemented by a contractor once appointed, the transport effects resulting from the demolition can be safely and efficiently managed and mitigated.

- Construction vehicle loading can be safely provided on Lower Hobson Street, with the closure to general traffic of the existing southbound slip lane located adjacent to the Site. Construction vehicles will enter from Nelson Street or Fanshawe Street from the west, enter the Site from underneath the flyover, and exit through the Customs Street West end
- As requested by Auckland Transport, construction vehicle routes have been developed to avoid Quay Street
- Additional lane closures on Lower Hobson Street and Customs Street West will be required at different stages throughout the demolition. Where possible, these lane closures will be minimised and aim to keep bus lanes open where safe and practical to do so
- Full road closures on Lower Hobson Street and Customs Street West will be required to remove the pedestrian overbridge and carpark ramp. These closures are unavoidable and will occur for approximately 48 hours and 1 week, respectively. This will require some bus routes to be temporarily diverted
- Footpath closures and pedestrian diversion routes will be required in the immediate surrounding area to protect the public from live work zones, overhead works, and construction vehicles. Alternative pedestrian paths are available for diversion routes. The CTMP will include an option to provide a temporary pedestrian crossing on Customs Street West
- The volume of construction traffic will be relatively low on a daily and hourly basis, as they will be spread across the 1-year demolition period
- We have assessed the traffic effects of these stages, including the proposed road closures that are required to be implemented in association with each stage of the demolition. This traffic modelling assessment shows that the demolition and associated road closures will increase delays on some roads but decrease on others. The largest delays are predicted to occur during Stage 1 and Stage 5, where full closures on Lower Hobson Street and Customs Street West are required to remove overhead structures. These stages will also have temporary impacts on buses, and some rerouting will be required. We note that these stages will be for 48 hours and 1 week, respectively. The other stages that occur for a longer duration will have small delays and impacts on the surrounding road network. On average, vehicle journey times are predicted to increase by 1 to 4% for all of the stages
- The demolition adequately addresses the assessment criteria of the Unitary Plan.

APPENDIX A Section 92 and post meeting minute responses

A1 DOWNTOWN CARPARK DEMOLITION CONSENT, LUC60435285: TRANSPORT SECTION 92 RESPONSES

We have reviewed the transport related Section 92 requests received from Auckland Council (Council), dated 27 August 2024, regarding the resource consent application for the proposed demolition of the Downtown Carpark building located at 2 Lower Hobson Street in the Auckland City Centre (Demolition).

We attended several meetings with Council and Auckland Transport to discuss these requests and discussed parts of the transport related items. The following outlines the additional work that we have completed to address these requests and provides our response to each of the transport related items.

A2 UPDATE OF THE TRAFFIC MODELLING ASSESSMENT

As part of our response to the Section 92 requests, we have updated our traffic modelling for each stage of the Demolition.

Compared to the modelling assessments in our previous Transport Assessment and Preliminary Construction Traffic Management Plan (CTMP), prepared as part of the Demolition application documents, the updates to the modelling include the following.

- The Auckland Forecasting Centre's (AFC) 2031 City Centre SATURN model has been used for the updated assessment.
    - The modelling assessments contained in our Transport Assessment and Preliminary CTMP used an older version of the City Centre SATURN model. As that model in its original state reflected 2018 pre-Covid conditions, we made several updates to the model, in agreement with the AFC, to provide an 'existing environment model'. Some of these changes included applying a 10% traffic demand reduction to reflect post-Covid City Centre demands
    - The 2031 City Centre SATURN model was used as part of our Integrated Transport Assessment to assess the transport effects of the proposed Downtown Carpark redevelopment. We note that this model was not originally available at the time of preparing the previous Preliminary CTMP and Transport Assessment supporting the Demolition resource consent application
    - The model is based on the future 2031 year.
        - This accounts for the City Rail Link (CRL) being completed. All current road closures associated with the CRL have, therefore, been removed. The model also accounts for future bus routes that will apply to the City Centre once the CRL is completed
        - The model only includes committed and funded road projects in the City Centre, which can be considered as part of the existing legal environment. One of these included projects is the Wellesley Street bus improvements
        - No unfunded or uncertain projects are included in the model, such as the removal of the Lower Hobson Street flyover.
- Downtown Carpark trip redistribution

- We have allowed for a 'worse case' traffic effects scenario, assuming that 100% of the existing Downtown Carpark trips will be redistributed to other parking areas within the City Centre
- The methodology for redistributing these trips was provided and developed by AFC based on carpark occupancy data originally provided by Auckland Transport Parking for privately owned parking sites in the City Centre
- This methodology was also applied as a sensitivity test in our Integrated Transport Assessment of the Downtown Carpark redevelopment.

- Construction traffic volumes
  - Construction truck trips were increased from 5 to 7 trucks per hour. This represents the anticipated 7 trucks per day based on using 12.6 m rigid trucks to transport material, as outlined in Section 8 of our Preliminary CTMP and Transport Assessment. We note that this is a very conservative assumption, it is estimated that there will be 7 trucks on average per day and we have applied this in the model to occur within 1 hour in the modelled peak hours
  - The same light vehicle trip generation assumption of 50 trips per hour during the Demolition has been applied.
- Bus rerouting
  - Buses have been rerouted for Stages 1 and 5 where temporary full road closures of Lower Hobson Street and Customs Street West respectively are necessary
  - We note that the 2031 model includes up to date bus routes for the post-CRL road network, compared to the previous version of the City Centre model. As such the updated modelling allows for proposed changes to the bus routes once the CRL is operational.

Apart from the changes above, the updated modelling includes the same road and lane closures for each of the Stages 1 to 5 as outlined in our previous Preliminary CTMP and Transport Assessment.

We have provided responses to each Section 92 request related to the traffic modelling within this letter. Appendix B provides the modelling outputs.

A3 INFORMATION REQUESTS AND FLOW RESPONSES

We have copied Council's and Auckland Transport's Section 92 requests in italics, and provide our responses under each item related to transport.

Auckland Transport's comment

AT have identified that the approach identified within the draft Construction Traffic Management Plan ("CTMP") is largely inconsistent with the principles identified within AT's Temporary Traffic Management Guidelines ("TTMG") 2022 to 2025, which is a document that sets the key directions and measures to ensure the safe and effective operation of the City Centre's transport network. That document is attached as an Appendix to this letter.

As proposed, the overall management of the demolition of the existing Downtown Car Park ("DTC") may result in significant adverse effects upon the operation of the City Centre, particularly in terms of delays to bus journey times.

A revised approach to the management of construction related effects, including any rerouting of buses and other general vehicles, is regarded as necessary to align with the principles and criteria of the TTMG in order to suitably avoid and/or mitigate significant adverse effects on the surrounding and wider transport network.

Item #11

All trips from the existing DTC appear to be removed from the applicant's traffic model. Auckland Transport are concerned that the condition of the receiving environment has been understated, as there are a couple of factors in play that may skew the results of the assessment undertaken. In particular:

(a) There are a number of leased car parks within the DTC, which belong to the HSBC and/or Aon buildings nearby. It is understood that there may be existing lease agreements in place that require the applicant to find alternatives to service the two buildings.

(b) Whilst it is recognised that the DTC is proposed to be closed, it does not necessarily mean that the current movements associated with the use of the DTC will no longer travel to the city. More appropriately, it is likely that they will be simply displaced to another car park within the City Centre.

As such, please provide an updated assessment, inclusive of revised modelling, that takes into consideration the aforementioned points in order to characterise what will happen to the existing trips to the DTC.

Advice Note:

For the avoidance of doubt, this request is made in the context of establishing a more accurate depiction of the receiving environment. The purpose of this request is to help inform a better understanding of how the resulting construction traffic may be accommodated within the wider transport environment, alongside any subsequent delays that will result from the proposed demolition. It is understood that AT's Auckland Forecasting Centre ("AFC") previously requested that existing trips from the DTC be factored into the applicant's model. Further liaison with AFC may be necessary in order to prepare a response to this matter.

AFC will be asked to check and advise on the acceptability of the inputs when this updated modelling is requested / provided.

Flow's response

As outlined in Section A2, the modelling has been updated to account for 100% of the existing Downtown Carpark trips to be redistributed to other parking facilities within the City Centre.

In addition, this modelling includes the proposed changes to the bus routes once the CRL is operational and therefore assesses the effects of the proposed Demolition on bus movements. The methodology for this modelling was provided and developed by AFC.

The updated modelling has not resulted in significant changes to traffic rerouting or delay changes when compared to our Transport Assessment and Preliminary Construction Traffic Management Plan. The localised traffic impacts around the site are similar to before, as the redistributed trips will not necessarily need to use the roads around the permitter of the site to access alternative parking areas. For effects on buses and total journey times, we have provided comments on these in the applicable Section 92 request within this letter.

Item #12

The modelling report states that each bus route has been coded separately. Subsequently, please undertake an assessment of the journey times associated with each bus route pre / post each demolition stage in order to understand the anticipated delays that will result from the proposed demolition.

Flow's response

Please refer to Section 12.2.3

Item #13

Please undertake additional assessment on the total effects on journey times for all vehicles in each identified scenario. Auckland Transport is of the view that the assessment should not solely focus on specific intersection delay(s) as it is also about total journey times.

Flow's response

Please refer to Section 12.2.2.

Item #14

The diagrams included within the TAR shows that in Stages (2), (3), & (4) in the PM peak traffic rerouting from northbound Albert Street to Swanson Street and onto Federal Street and then onto Fanshawe Street with increases in volumes on the northern end of Federal Street of 200 vehicles. This could be traffic avoiding the Albert Street / Fanshawe Street intersection. Please clarify whether this rerouting is realistic. Auckland Transport is concerned as to whether this could affect the reported delays if traffic remains on Albert Street rather than taking the route indicated in the model. Sensitivity testing of this within the updated modelling is requested in support of this.

Flow's response

This rerouting pattern no longer occurs in the updated modelling outputs.

- This rerouting previously occurred due to different coding of intersections in the previous City Centre SATURN model, where the Downtown Carpark signalised ramp intersection onto Fanshawe Street was combined with Federal Street

- As the signalised intersection was changed to a priority intersection in the Demolition stage models, more vehicles were attracted to use Federal Street
- The updated City Centre SATURN model codes these as two separate intersections, which means this change in rerouting does not occur in the updated modelling.

Item #15

Modelling shows that for Stage (5) there is wider rerouting effects with vehicles using State Highway 16 ("SH16") to travel to the city rather than Fanshawe Street. Please undertake further assessment to characterise the effects on delays for these routes.

Advice note: The applicant is encouraged to engage with Waka Kotahi given the concerns raised by AT and Auckland Council's Traffic Engineer with respect of queuing the traffic effects onto the State Highway network.

Flow's response

The updated Stage 5 modelling outputs predict the following impacts near State Highway 16 during the AM peak hour.

- There is predicted to be an increase in up to 80 vehicles per hour (during the AM peak) using SH16 to access the City Centre due to the closure of Customs Street West
- Delay increases of up to 30 seconds are predicted on the Wellesley Street off-ramp and the Grafton Road / Stanley Street intersection. There are minimal changes to queuing in these areas, which will not impact the operation of the State Highway 16

The PM peak hour for Stage 5 shows minimal changes to the operation of SH16.

In summary, while there is predicted to be an increase of vehicles using SH16, we consider it will not have a noticeable impact on the operation of SH16.

We also note that for the updated Stage 1 model

- In the PM peak, there is a predicted increase in delays to on SH16 of around 30 seconds. This applies to southbound traffic at the merging point of the Wellesley Street on-ramp. We note that the base model already has delays of around 110 seconds at this location in the PM peak, so there is already some delay and queueing at this location.
- For both peak periods, delay increases are predicted at the SH16 / Alten Street intersection of up to 45 seconds. This intersection is signalised and already has some delays in the base scenario. In the City Centre model, the intersection operates with a 150 second cycle time, so a delay of 45 seconds 30% of a single cycle.
- However, we note that Stage 1 will likely occur during a weekend, whereas the modelling is undertaken during a weekday peak hour period. Therefore, these effects will likely not be realised during Stage 1.

Accordingly, we do not consider it is necessary to engage with NZTA at this stage, although this could be undertaken while preparing the final CTMP alongside Auckland Transport.

Item #16

Please provide details of proposed alternative routes for buses, including how they would access their current bus stops, or where alternative bus stops are to be located. This information is required to understand the degree of adverse effects on bus services and to ensure that there is an acceptable solution.

Specific Traffic Management measures may be required. For instance, during Stage (1) buses that normally turn left out of Lower Albert Street would not be able to do so. Vehicles are only permitted to turn left onto Quay Street. It is not clear how those buses will then be able to travel west. Similar consideration needs to be given to buses arriving from the west that turn right into Lower Albert Street. Stage (5) will also affect the routing of buses.

Flow's response

Refer to Section 8.

Item #17

Please provide further details on the proposed rerouting of buses, including any temporary relocations of existing bus infrastructure

Flow's response

Please refer to our response for Item #16 above.

Item #18a

Further to Matters (12 and 13), there are a number of other specific clarifications required surrounding the various stages. Further details, inclusive of supporting additional assessment, is required in relation to the following:

a. Stage (1):

i. Please clarify how larger vehicles and any other vehicles (including taxis) that end up in the local access area (labelled as 1A on the enabling plans) would be able to be turned around in the event of manoeuvring into this restricted area;

ii. One of the diversion routes for pedestrians appears to include stairs, where it does not appear that the applicant has provided consideration towards mobility or visual impaired users, particularly during night-time periods. Please clarify what measure(s) are proposed to ensure that mobility impaired users are provided with advanced warning of alternative routes to manoeuvre through the proposed routes in a safe manner.

iii. The footpath along Customs Street West is proposed to be closed. It is not clear why this is necessary in this stage (or for Stage (2)) as there are no works in this area. Please can further clarification / justification for this be provided?

Non-s92: It is noted that keeping the signalised crossing open would provide an alternative for pedestrians.

Flow's response

Item i

- The local access area on Quay Street should be extended to Commerce Street, given Lower Albert Street allows for buses and authorised vehicles only
- The Commerce Street / Quay Street intersection should have signage to direct general traffic away from the local access area
- These measures will minimise the number of vehicles entering the local access area during Stage 1
- Should an unauthorised vehicle enter this area, then a traffic controller could guide a vehicle to turn around. Without relying on undertaking a u-turn within the road reserve, there are several locations to turn around, including the ferry terminal access or Princes Wharf. Lower Albert Street could also be used for any vehicles that need to exit the limited access area, although this would require an exemption to the authorised vehicles restrictions during the 48 hour period of Stage 1.

Item ii

- The CTMP will provide detailed measures of how to cater for mobility or visually impaired users, which could include providing advance warnings highlighting safe and accessible alternative routes
- Acknowledging that mobility or visually impaired users may find it challenging to use the pedestrian diversion route with stairs, the pedestrian diversion route around Lower Albert Street and Quay Street should be indicated as the primary diversion route. Refer to Section 7.

Item iii

- The Stage 1 diagrams indicated the closure of the pedestrian footpath along Custom Street West to keep pedestrians away from the Lower Hobson Street area, which will need to be cordoned off from the public while the pedestrian overbridge is being removed. There may also be trucks turning out of Lower Hobson Street
- The closures were shown as a worst-case scenario, but we acknowledge there may be opportunities to retain some pedestrian access if it is considered safe to do so by the contractor and Auckland Transport. This will minimise any unnecessary footpath closures
- The CTMP will include a provision to maintain public pedestrian footpath access where safe and practical to do so.

Item #18b

b. Stage (2):

The single left turn lane from Quay Street to Fanshawe Street would impact buses as they would need to merge into a single lane.

i Please provide tracking diagrams for buses from Quay Street onto the Lower Hobson Street flyover past the proposed crane location. Tracking must demonstrate that movements can be undertaken safely and that there is sufficient width for larger vehicles to complete the movement past the crane.

ii Please provide details of the diversion route for vehicles owing to the proposed closure of southbound Lower Hobson Street slip lane. No details have been provided at this stage.

iii As above, the footpath along Customs Street West is proposed to be closed, however it is not clear why this is necessary. Construction during Stage (2), at this stage, is located within the north-western corner of the building. Please can further clarification / justification for this closure be provided.

Non-s92 Matter: The applicant is encouraged to consider whether closure from Customs Street West / Sturdee Street West intersection, where the signalised pedestrian crossing is located, could be achieved. Keeping the signalised crossing would provide an alternative for pedestrians.

Flow's response

Please refer to the updated Stage 2 diagram in Figure 11.

This shows a 300T mobile crane (specifically a Grove GMK6300L model), which is anticipated to be needed for Stage 2 of the Demolition. Stage 2 requires that the crane is located within the road reserve, as there will not be space within the site during the early Demolition works

We note the following about the crane position.

- The crane sits partially within the carriageway and partially within the footpath
- Due to the size of the crane and stabilisers, the previous position at the base of the flyover was not feasible without blocking all traffic lanes on the flyover
- The current drawing shows that one lane on the Lower Hobson Street flyover can be retained, as per the previous plans
- The crane stabilisers will overlap with a tree pit within the footpath. We understand that these trees will be temporarily relocated during the demolition works. To protect the tree pit and footpath, a temporary base will need to be placed in this area to support the stabilisers
- Construction access will no longer be provided at the north end of Lower Hobson Street via Quay Street. We note that M Social Hotel servicing vehicles could potentially access their loading area from the north end of Lower Hobson Street as part of the managed access arrangement
- The size of the crane means there are limited positions where a crane can be located during Stage 2.

For the lane closure on Quay Street.

- As per the previous Stage 2 plan, we have indicated that one westbound lane may need to be closed on Quay Street
- As the Lower Hobson Street flyover can only have one lane open due to the crane position, it is necessary to direct the two Quay Street westbound lanes into one lane before the Lower Hobson Street intersection, to avoid merging happening within the intersection
- An option to keep one of these lanes open to provide bus priority could be explored with Auckland Transport when the final CTMP is prepared. This could involve reconfiguring the traffic signals to provide one lane with advance bus priority. For the purpose of our preliminary assessment, we have assumed one of the Quay Street lanes will need to be closed.

We provide our specific responses to points (i) to (iii) below.

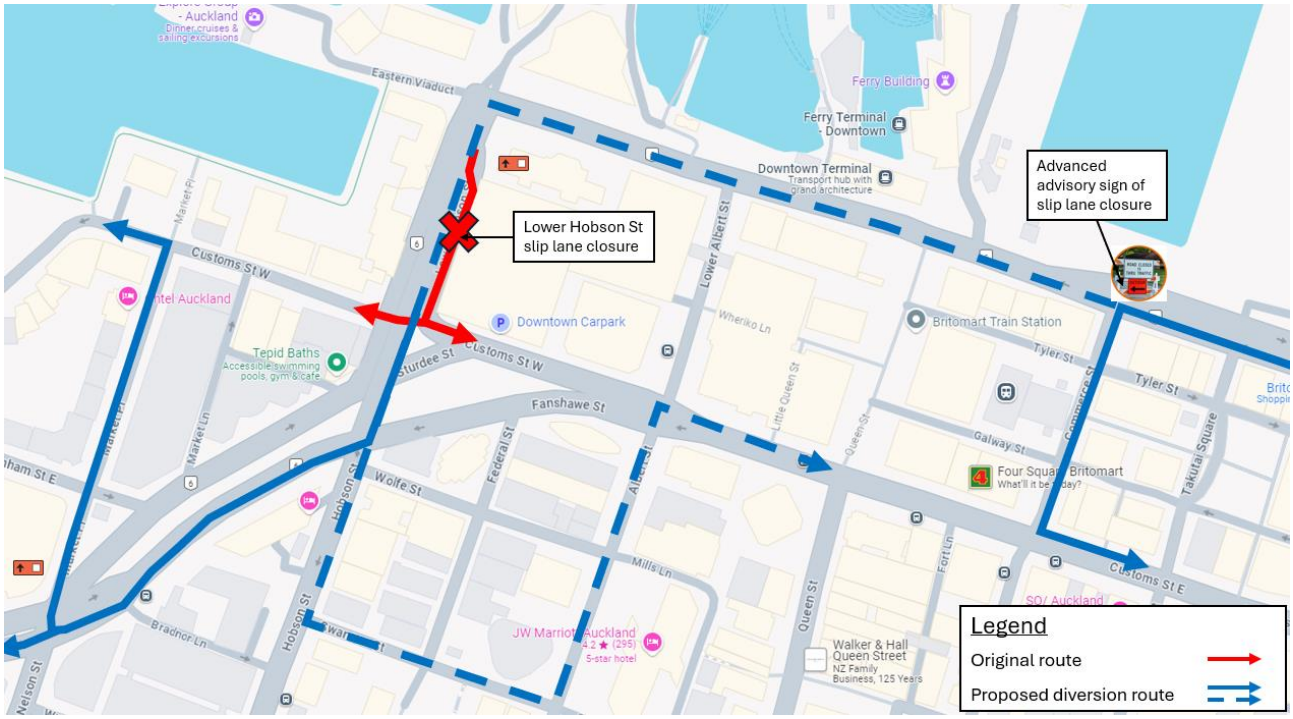
Item i

- Please refer to sheet 2 of Appendix C, which shows that there is sufficient space for buses to pass the crane on Lower Hobson Street and Quay Street
- There will be some flexibility to adjust the area of the road closure to accommodate vehicle tracking, while also providing separation from the crane.

Item ii

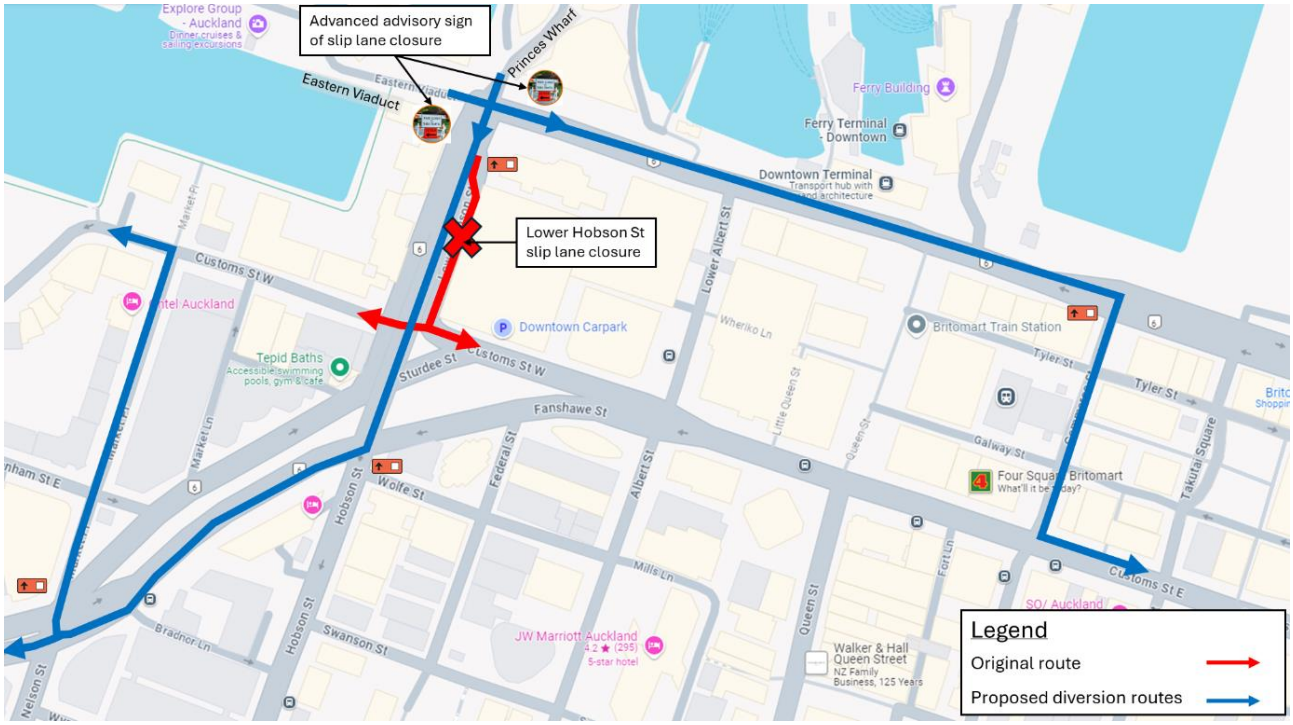
- The Lower Hobson Street slip lane is primarily used as a route to access the Downtown Carpark or access the Viaduct / Wynyard Quarter to the west. It may also be used by vehicles on Quay Street effectively undertaking a u-turn around the Quay Street / Customs Street block. These diversion routes are shown in Figure A1

Figure A1: Lower Hobson Street slip lane diversion routes for general traffic



- It can also be used by vehicles exiting Princes Wharf or Eastern Viaduct. These diversion routes are shown in Figure A2.

Figure A2: Lower Hobson Street slip lane diversion routes for Princes Wharf and Eastern Viaduct



Item iii

- As per our comments for Stage 1 under Item #18a(iii), the CTMP will include a provision to maintain public pedestrian footpath access where safe and practical to do so, to minimise any unnecessary footpath closures.

Item #18c

c. Stage (3):

i. Please clarify whether any lane closures and/or reductions in lane width(s) are proposed along Customs Street West.

ii. Please clarify whether Stage (3) can be extended to include most of the eastern portion of the car park, enabling the duration of Stage (4) controls / management measures (including but not limited to: lane closures, partial lane closures (and the removal of the bus priority), temporary relocation of the existing bus stop at the corner of Customs Street West / Lower Albert due to lane closure) to be reduced.

Flow's response

Item i

- No lane closures or lane width reductions on the three eastbound Customs Street West lanes are anticipated for Stage 3. The Stage 3 plans only show a closure along the southwest corner of the

site, to provide an exit point for construction vehicles coming out of the Lower Hobson Street slip lane.

Item ii

- The areas of Stage 3 and Stage 4 are based on the methodology of demolishing different sections of buildings at the same time using a top-down approach
- We agree that the extent of Stage 4 traffic management controls (which require the partial closure of the bus lane) should be minimised
- The Stage 4 traffic management controls will need to be implemented when the demolishing works are close to the Customs Street West road frontage. During these times, it will likely be necessary to close the footpath and a lane on Customs Street West to provide a safety zone from live demolition works
- There may be times during Stage 4 when Stage 3 traffic control measures could be implemented, which would not need the partial bus lane closure
- The partial bus lane closures on Stage 4 were shown as a worst-case scenario, but we acknowledge there may be opportunities to keep the bus lane open if it is considered safe to do so by the contractor and Auckland Transport. This will minimise any unnecessary bus lane closures
- The CTMP will include provisions to keep bus lanes open where safe and practical to do so.

Item #18d

d. Stage (4):

i. The construction of a (4P) temporary steel support structure beneath the overpass ramp is proposed. Please can additional information be provided as to when within Stage 4 construction is to take place and how long construction is anticipated. Can it be clarified if this is the main / sole reason for the partial lane closure to Custom Street West.

Flow's response

Please refer to our response for Item #18c which addresses both Stage 3 and Stage 4.

Item #18e

e. Stage (5):

i. Please provide further assessment (including but not limited to: modelling and supporting assessment around delays – with reference to point 13 of this letter) to quantify the adverse effects on Fanshawe Street through the removal of a single lane.

ii. Further to i), please clarify whether the existing bus lanes will be closed for the period of works required for Stage (5);

iii. Please provide further information of the proposed traffic diversion route for eastbound traffic from Nelson Street and Fanshawe Street. Specifically, Auckland Transport is wanting clarity around whether this is to be directed down the single lane on Lower Hobson Street and onto Quay Street.

During the removal of the carpark ramp over Customs Street West the CTMP currently proposes that all bus services be redirected to travel north on Lower Hobson Street. This arrangement will work for the North-Western bus services, as they start their services on the eastern side of Lower Hobson Street. However, this will not appropriately provide for the Northern services as they will start their services on the western side of Lower Albert Street.

iv. Please provide further assessment to demonstrate whether alternative routes can be secured in order to maintain suitable service of any nearby bus routes, including the Northern and North-Western services.

Note: proposed diversion route(s) must take into account the spatial requirements of larger vehicles. Please note, there are restrictions surrounding the use of heavy vehicles along Quay Street, although this does not appear to have been considered as part of the proposed construction vehicle route that has been specified within the CTMP

Flow's response

Item i

- The updated Stage 5 modelling results do not predict any noticeable delay increases on Fanshawe Street
- While a lane may need to be closed to provide a safety buffer from the Demolition works area, the impacts to westbound through traffic on Fanshawe Street will be offset by the removal of the signalised intersection of the Downtown Carpark ramp onto Fanshawe Street. This signalised intersection operates in the base model scenario but is not anticipated to be required during Stage 5, which will reduce some delays to westbound traffic

Item ii

- No bus lane closures on Fanshawe Street are anticipated
- Only 1 general traffic lane is anticipated to be closed, in order to provide a safety zone around the Downtown Carpark ramp intersection onto Fanshawe Street

Item iii

Refer to Section 6.5 for our assessment of heavy vehicle diversion.

Item iv.

- Please refer to our response for Item #16 for rerouting of buses.
- Solutions 3 to 5 in Appendix D specifically address Stage 5. As noted in this response, the final alternative bus routes should be agreed with Auckland Transport in the final CTMP.

Item #19

For alternative diversion routes including departure routes, please provide an assessment of vehicle tracking for buses and heavy vehicles (as a minimum) inclusive of supporting tracking plans. As part of this response, As-built surveys of kerblines should be used to inform the tracking diagrams.

Flow's response

For heavy vehicles,

- please refer to our response for Item #18(e)(iii) for the proposed heavy vehicle diversion route, which will be necessary for Stage 5
- As this route utilises an existing over dimension truck route, it is not necessary to provide additional vehicle tracking.

For bus routes

- Please refer to our response for Item #16
- The majority of our alternative bus route solutions utilise areas which already accommodate buses, which does not need additional vehicle tracking
- Solution 1 as part of Stage 1 proposes that buses undertake turning movements at Commerce Street and Quay Street which are not part of existing bus routes.
    - Vehicle tracking for these intersections is shown in Appendix E. This shows vehicle tracking for a 12.6 m bus, which has a tighter turning radius compared to a 13.5 m bus. We note that as-built surveys of kerblines are not currently available, but the tracking shows aerials with the current road layout
    - At the Commerce Street / Customs Street East intersection, buses can turn left into Commerce Street without issues
    - At the Commerce Street / Quay Street intersection, buses may need to use both lanes to turn left into Quay Street
    - If Commerce Street is not suitable then another option is utilising Tangihua Street, although this would require a longer detour
    - At the Quay Street / Lower Albert Street intersection, buses are able to turn left into Quay Street while staying in their lane, but the clearance envelope has some overlap with the northbound lane on Quay Street. We note that these movements will not occur at the same time due to the signal phasing
    - We note that Solution 1 will only be required for Stage 1 which will likely occur for 48 hours during a weekend
    - We also note that there will be opportunity to agree the final bus routes with Auckland Transport when the final CTMP is prepared, should a more suitable solution be identified.

Item #20

Please provide maximum dimensions for crane set-down footprint, including stabilisers and kentledge as required.

Flow's response

Please refer to our response for Item #18b.

Item #21

Service and delivery requirements for all affected properties must be identified and provided for, particularly those properties along the western side of Lower Hobson Street. Please provide further supporting information on how any existing servicing / delivery arrangements are to be maintained for any nearby properties.

Flow's response

During Stage 1, Lower Hobson Street will be fully closed to remove the pedestrian overbridge. This is anticipated to occur over 48 hours, which should be scheduled during a weekend.

There are existing on-street loading bays on the west side of Lower Hobson Street. These loading spaces will need to be temporarily closed during the Stage 1 works, as it will not be possible for loading vehicles to continue northbound underneath the pedestrian overbridge, or undertake a u-turn near the loading spaces. We therefore consider it is unavoidable to temporarily close these loading spaces.

The CTMP will need to consider alternative loading locations through agreement with Auckland Transport. We note that there is existing P5 loading bays on Customs Street West (west of Lower Hobson Street).

Given that the Stage 1 works are anticipated to occur for 48 hours and should be undertaken during a weekend, the impacts on existing loading arrangements can be minimised.

Item #22

The CTMP indicates the location of a parked crane for the various stages of demolition. Please provide details of arrangements for other large construction (demolition) vehicles (trucks and others) to be parked and manoeuvred within and adjacent to the site.

Flow's response

In our previous Preliminary CTMP and Transport Assessment, we had assessed truck movements based on 3 truck sizes (12.6 m large rigid truck, 19.45 m semi-trailer truck, 23 m truck and trailer).

As outlined in Sections 5.3 and 11, a 12.6 m rigid truck will be used due to the limitations of turning in underneath the Lower Hobson Street flyover. These trucks will transport demolition material off-site, which will consist of crushed material from the building.

We note that the mobile crane will need to arrive at the site, which will likely be a one-off occasion and can be scheduled to occur outside of busy periods.

No other larger vehicles are anticipated as part of the Demolition.

Item #23

With reference to pages 26 and 27 of the Preliminary CTMP and Transport Assessment, please can it be clarified if the average truck (heavy vehicle) and light vehicle numbers are expected to be consistent for all stages, or will specific stages generate higher volumes? Please provide greater clarity regarding these heavy and light vehicle numbers for each demolition stage.

Flow's response

A high-level estimate of truck movements was provided in the previous Preliminary CTMP and Transport Assessment. This was based on the duration of the programme and the amount of building material to demolished. This material will be crushed within the site and then transported off-site.

Given a contractor has not yet been appointed, it is not possible to provide precise numbers. Assuming that the building is demolished at a consistent rate, it is likely that truck volumes will not vary. We also understand that the duration of the Demolition is mostly driven by the time needed to demolish the building and crush the material, rather than limitations due to truck movements. Therefore, we do not anticipate large fluctuations of truck movements for different stages.

For light vehicle movements, we assumed 50 light vehicles per hour for the purposes of modelling. This number will be dependent on the number of construction workers, which is subject to a contractor being appointed and the methodology being developed in further detail.

We note that the estimated vehicle movements will be much lower than the existing Downtown Carpark vehicle trips (300 – 380 vehicles per hour during weekday peak hours), which will be removed during the demolition. While there may be some displacement of existing Downtown Carpark trips to other parking areas in the City Centre, there will generally be a reduction of traffic volumes for the roads immediately surrounding the site during the Demolition. The operational effects of construction are more related to temporary road and lane closures, rather than the volume of construction traffic.

Item #23A

If the numbers (referenced in 23 above) will differ according to demolition stage, please provide sensitivity testing for the higher volume stage(s) to provide greater clarity of the worst case traffic effects. In particular, this should consider the peak periods and details as to how any identified adverse network effects might be managed, mitigated or avoided. This links to the following suggestion (non-s92 matter):

Non s92 matter:

Notwithstanding, and depending on the responses to concerns raised by AT regarding Custom Street West and Quay Street, there are traffic congestion concerns during the weekday peak periods on Custom Street and Quay Street. It is requested that depending on the responses to AT, the applicant give consideration to staggering of construction hours to prevent traffic movements during peak periods.

Flow's response

Please refer to our response to Item #23 which provides clarity about the construction vehicle volumes.

- As noted in this response, the construction vehicle volumes are relatively low when compared to the existing Downtown Carpark trips that will be removed (and potentially redistributed away)

from the local area during the Demolition. The modelling results generally show a reduction in traffic volumes on the roads surrounding the site during the demolition stages

- We consider that it is not necessary to stagger construction movements during peak periods, given these are anticipated to be relatively low
- We also note that restricting truck movements during peak periods has implication of extending the overall duration of the demolition, and therefore the associated effects of temporary road and footpath closures.

Item #24

The Traffic Engineer has concerns with the assessment methodology for the 'existing environment model' (page 33 of the Preliminary CTMP and Transport Assessment) that reduces the overall traffic demand by 10% due to pre/post covid situation. Please can further information be provided in support of the 10% reduction in traffic demand. Please also provide sensitivity modelling of the higher traffic demand to test the difference in effects.

Flow's response

As summarised in Section A2, this assumption was used as the previous City Centre SATURN model reflected pre-Covid 2018 traffic conditions, and a demand reduction was applied.

We have now used the most recent City Centre model (2031) which does not require a demand reduction to be applied.

Item #25

The SATURN Traffic model currently uses construction vehicle numbers that reflect an average. With reference to request 23 and 23A above, please provide sensitivity testing that reflects the worst-case scenario of construction vehicle numbers relating to both light and heavy vehicles.

Flow's response

Given our responses to Items #23 and #23a, we do not consider it is necessary to provide a sensitivity test.

For the heavy construction vehicles, we have modelled 7 trucks per hour (7 inbound and 7 outbound) in each peak hour. This is already highly conservative as our estimated truck volumes were up to 7 trucks per day, so have been compressed to occur within 1 hour for the modelling assessment.

We also consider that the 50 light vehicle estimate is at the higher scale of an estimate that may access the site.

Item #27

Can it be clarified that these alternative Laneway access arrangements for stage 5 have been included within the SATURN modelling, including confirming the number of car parking spaces and service trips that are accommodated and will be redirected from the Laneway onto Quay Street.

Flow's response

For the Stage 5 model, the service lane access onto Customs Street was closed, and all vehicle trips were redirected to the Quay Street access.

Item #29

Please can it be clarified what consideration has been given to mobility-impaired and visually impaired users for the pedestrian diversion route for Stages 1-4. Noting that the stairwell at Fanshawe Street is diverted and unlikely to be the desired line mobility-impaired users.

Flow's response

Please refer to our response for Item 18(a)(ii).

Item #30

Please can it be clarified what consideration has been given to mobility-impaired and visually impaired users for the pedestrian diversion route for Stage 5 from Fanshawe Street to Custom Street West. This does not appear to be user-friendly for mobility-impaired people, with the stairwell reroutes via multiple intersections.

Flow's response

Please refer to our response for Item18(a)(ii).

A4 SUGGESTED CHANGES / RECOMMENDATIONS

Auckland Transport's comment

Approach to managing construction effects / proposed staging

Auckland Transport holds significant concerns relating to the overall approach in managing any construction related adverse effects, such as the resulting delay to bus journey times, and the manner in which construction vehicles will enter / exit from the subject site. AT has identified a number of principles for work being undertaken with Auckland's City Centre, which is used to inform the preparation of CTMPs as a means of avoiding and/or mitigating effects upon the wider transport network. These can be found within AT's Temporary Traffic Management Guidelines ("TTMG") 2022 to 2025, dated 7th September 2022. This document has been attached to the end of this s92 Request for ease of reference.

AT finds that the draft CTMP has not been prepared in accordance with the principles, including any supporting specifications, set out within the aforementioned document and otherwise does not suitably avoid and/or mitigate adverse construction related effects upon the City Centre's transport network.

Suggested changes / recommendation #1

Consequently, AT consider that an updated draft CTMP is required to be prepared for AT's review and input, that better provides for the adoption and implementation of the principles of the TTMG and other specific matters outlined within this memorandum.

Flow's response

We have reviewed the TTMG and have provided responses to the principles applicable to the proposed Demolition.

- We agree with the Auckland Network Operation Plan's key principles to enable good accessibility to the City Centre during the Demolition, and we have attempted to take this into account where safe to do so. Any road, footpath, cycle lane or bus lane closure was considered necessary to protect the public from live demolition works
- We provide the following comments on the key points specific and applicable to the Demolition. We have copied these points in italics and then presented our comments.
- Where possible, the CTMP should be prepared to adopt the TTMG. As outlined in our assessment below, some compromises to the TTMG may be required due to constraints of the site, and the need to undertake the demolition in a safe and efficient manner.

1 - No bus lanes are to be compromised.

- *However, if unavoidable and agreed by AT Metro, appropriate mitigation is required to ensure bus operations are unaffected. This could typically necessitate the provision of a bus lane on the temporary route, and relocated bus shelters, with ample pre-warning to enable*
- *Close liaison and agreement with AT Metro is necessary*

Refer to Section 8 for our assessment of impacts to buses.

Some bus lane closures may be necessary throughout the demolition. However, the CTMP will include measures to keep these bus lanes open where it is safe and practical to do so. As noted in the principles, this will require close liaison and agreement with AT Metro.

2 – No pedestrian access is to be compromised

- *In general, available unobstructed footpath widths must be maintained at 2.2m at all times, or at the width of the existing footpath if less than 2.2m.*
- *The Albert Street, Victoria Street, Wellesley Street, Mayoral Drive, Wyndham Street, Shortland Street and Customs Street footpath width must be maintained at 3m*
- *Crossing points at intersections and across streets are to be provided, and of similar widths to footpaths no less than 3m wide.*
- *Footpath surfaces provided are to be devoid of any trip hazards, and with minimal clutter albeit signage and/or construction-related equipment*

Refer to Section 7 for our assessment of impacts to pedestrians.

We have identified that some pedestrian closures on Lower Hobson Street and Customs Street West may be required, as it may not be safe for the public to walk alongside the site frontages while demolition works are taking place. This could potentially contradict with the TTMG to maintain a 3 m footpath.

The CTMP will include measures to maintain footpath access where it is safe and practical to do so. It may be possible to provide a temporary pedestrian crossing on Customs Street West during some parts of the demolition.

3 – No cycle lanes/facilities are to be compromised

- *Existing facilities are to be retained and provided for*
- *A minimum lane width of 1.5m is required for any temporary cycle lane.*

Refer to Section 7 for our assessment of impacts to cyclists.

During Stage 1, it will not be safe to keep the cycle facilities on Lower Hobson Street open while the pedestrian overbridge is being demolished. We note that this is expected to occur for 48 hours over a weekend.

4 – The number of lanes available to general access and traffic movements is to be closely considered, in particular for east-west movements across the Queen Street valley

- *Downtown: The number of lanes on Quay Street and Customs Street are to be considered as a subsystem comprising 3 lanes per direction, one of which is shared by buses on Customs Street.*
    - *i. This effectively represents 1 lane for buses and 2 lanes for general access and traffic movements per direction. This is to be retained as such. A reduction thereof may be considered during interpeak periods, if deemed necessary and under close monitoring.*
    - *ii. Between Lower Albert Street and Lower Hobson Street, there is an additional lane per direction provided for bus movements, which is to remain.*
    - *iii. Bus stop requirements are to be agreed with AT Metro.*

As assessed throughout this report, we note that some lane closures on Quay Street and Customs Street West may be required at some stages of the Demolition.

Where safe and practical to do so, these lane closures should be minimised in agreement with Auckland Transport. The CTMP will explore options to retain bus lanes on these roads.

5 –Close monitoring is undertaken by AT. Adherence to the above requirements is expected to enable the city centre to operate to an acceptable level despite construction disruption.

This can be undertaken during the CTMP.

6 - Temporary Traffic Management Plans (TTMPs) are required to be approved as per standard AT requirements and outlined below. Within the city centre this is actively managed through the City Centre Network Operations (CCNO) team

AM/PM peak periods must not be affected by TTM/works on weekdays.

We note that AM and PM peak periods will be affected on weekdays. There may be adverse traffic effects of restricting works during weekday peak periods, as this would extend the overall duration of the Demolition and therefore require closures of roads and footpaths over a longer time period. As the demolition traffic volumes are very low (1-2 trucks per hour), we do not consider it is necessary to restrict movements during peak periods.

The lane closures of the demolition may be required for extended periods at a time, for example when the crane needs to be located in the road reserve. This means it will not always be feasible for TTM to have no impacts on weekday peak periods.

TTMP must ensure mobility parking spaces and loading bays are provided and approved by AT parking prior to submitting for Road Corridor Access (RCA) approval.

Any changes to parking will need to be agreed with AT Parking.

NO night works are to take place from Thursday to Saturday night

For the short term demolition activities of Stage 1 and Stage 5, it may be necessary to undertake night works to minimise the full road closures of Customs Street West and Lower Hobson Street.

Any proposed road closures will be subject to the availability of identified detour routes, and to be discussed and pre-approved by CCNO

This will need to be accounted for in Stage 1 and Stage 5.

7 –Early engagement with AT Works Coordination is strongly encouraged to facilitate appropriate coordination of construction activity and avoid delays in obtaining TTMP approvals.

This can be undertaken during the preparation of the CTMP.

8 – Construction vehicle movements are to be deliberately managed upon accessing and travel within the city centre

No construction vehicles are to use Queen Street

Construction vehicles are not to cross Queen Street. Construction sites to the east of Queen Street are to be accessed from and to the east, and similar those sites to the west are to be accessed from the west and to the west, via the traffic network as per Future Connect and the ANOP.

Construction vehicles are to keep to higher order streets and avoid shared spaces and local streets.

Construction vehicles must enter the construction site on arrival. There is to be no idling on side streets nor in close proximity to the site.

A construction vehicle travel plan must be provided for approval by CCNO. All project-related construction vehicle movements must adhere to the approved construction vehicle routes identified in the construction vehicle travel plan.

Refer to Section 5.2 for the heavy vehicle route.

This route avoids Quay Street, and allows construction vehicles to enter from the West. However, we note that with this route construction vehicles must exit via the west and cross Queen Street.

9 – Parking and Loading is an important element of the city centre.

Any changes or impact on parking and loading must be discussed and agreed by AT Parking.

TTMP drawing must ensure mobility parking spaces and loading bays are shown and approved by AT.

Any changes to parking will need to be discussed and agreed with AT Parking while the final CTMP is being prepared. This will include the parking underneath the Lower Hobson Street flyover for all stages, and the Lower Hobson Street loading bays during Stage 1.

Suggested changes / recommendation #2

Stage (1):

a. The location on Quay Street where vehicles are prevented to travel towards Lower Hobson Street needs to be further east than Lower Albert Street as Lower Albert Street is limited to bus and authorised vehicles only. As identified above, the restriction may need to apply from Commerce Street. Buses from Lower Albert Street are to be diverted to Customs Street West, however there is left turn only from Lower Albert Street to Quay Street. Subsequently, signal phasing may have to be amended and/or traffic controls at the intersection. This should be taken into account through the revised modelling;

b. It is unclear whether the footpath on the corner of Lower Hobson Street / Quay Street can accommodate heavy vehicles, as it is currently shown that the tracking of construction vehicles is intended to mount the kerb / footpath. This could damage the upgrade works in this location, which is not a supportable outcome.

c. Cycle facilities on Customs Street West would be closed to cyclists. As a result, cyclists would need to dismount and travel through Wynyard Quarter.

Flow's response

Item a.

- We agree that the limited access area should be extended further east to Commerce Street
- We have updated the model to account for the changes to bus routes outlined as part of the Section 92 Reponses
- We note that Stage 1 is anticipated to occur for 48 hours during a weekend. The City Centre SATURN model reflects AM and PM weekday peak hours, so does not reflect a weekend. Therefore, the signal timing may be slightly different during a weekend. However, traffic volumes in the City Centre are higher during weekday peak hours when compared to a weekend, so we consider the model assesses a worst case scenario for Stage 1

Item b.

- We assume this is referring to Stage 2, where our previous vehicle tracking diagrams showed a truck mounting the kerb
- Given the crane position has now been updated for Stage 2, no construction vehicles trucks mount the footpath when manouevring into the construction loading area.

Item c.

- Cycle lanes will need to be closed temporarily during Stage 1 as it will not be safe or possible to maintain cycle access on Lower Hobson Street while the pedestrian overbridge is being demolished
- We note that this will be of a relatively short duration for Stage 1, and diversions can be sign posted as part of the CTMP.

Suggested changes / recommendation #3

Stage (3): The response to Matter (8)(c) raises a potential concern in terms of any potential lane closures / reduced lane widths due to the operation of the adjacent bus network.

Flow's response

As per our response to Item #18c, no lane closures on reduced lane widths on Customs Street West are anticipated for Stage 3.

Suggested changes / recommendation #4

Stage (4): Closure of the bus lane on Customs Street West will further impact buses as the applicant's intention is to remove bus priority.

Flow response

Please refer to our responses for Items #18c(ii) and #18(d).

As outlined in these responses, the CTMP will include measures to keep the Customs Street West bus lane open when it is safe and practical to do so during Stage 4.

Suggested changes / recommendation #5

Stage (5): With regards to Matter (8)(d)(ii), there are significant concerns relating to the use of Quay Street as a diversion route for heavy vehicles, given the functionality of the existing road coupled with the streetscape improvements that have been completed for the locality. By diverting construction vehicles through this space, there is a high risk of causing damage to nearby streetscape amenities and other key infrastructure.

Flow's response

Refer to Section 5.2 for the heavy vehicle route. This route has been updated to avoid Quay Street.

Suggested changes / recommendation #6

The stage numbering indicates a chronological staging of the demolition of the DTC. Stages (1) and (5) are anticipated to have the most significant impact upon the operation of the network. As these are short duration activities, if these could be timed to occur during school holidays (e.g. over the summer break (January)), then this would significantly reduce the effects of these closures due to the much lower traffic volumes at this time.

Flow's response

We understand that it is proposed that reasonable endeavours will be undertaken, in collaboration with Auckland Transport for Stage 5 to remove the vehicle ramp on a weekend to minimise impacts. Stage 1 is already anticipated to fully occur during a weekend.

Suggested changes / recommendation #7

There are concerns regarding the proposed crane location described as (2K) for Stage (2), which will restrict access to the Hobson Street flyover. Auckland Transport cannot see that a crane can be safely stabilised and operate with a live traffic lane onto the flyover, which is shown as a single lane southbound, as the only traffic route from Quay Street. Tracking shown for Stage (2) is not good as it currently shows trucks arriving and tracking over the footpath. An alternative crane location may be feasible on the Lower Hobson Street low level, should trucks be able to reverse into the site to load.

Flow response

Please refer to our response for Item #18(b).

Suggested changes / recommendation #8

Notwithstanding, and depending on the responses to concerns raised by AT regarding Custom Street West and Quay Street, there are traffic congestion concerns10 during the weekday peak periods on Custom Street and Quay Street. There are also congestion concerns affecting the wider network including from SH16. It is requested that depending on the responses above, the applicant give consideration to staggering of construction hours to prevent traffic movements during peak periods.

Flow's response

As per our response for Item #23A, we consider that it is not necessary to stagger construction vehicle movements given the construction vehicle volumes are relatively low when compared to the existing Downtown Carpark trips that will be removed from the local area during demolition.

We also note that restricting truck movements during peak periods has implication of extending the overall duration of the demolition, and therefore the associated effects of temporary road and footpath closures.

Please refer to our response for item #15 for impacts on SH16.

A5 POST MEETING MINUTE RESPONSES

We have held several meetings with Auckland Transport since the report was originally lodged. Several post meeting minute comments were received from Auckland Transport, dated 15 October 2024. We have copied the Auckland Transport comments in italics below, and our responses underneath each comment.

The use of Quay Street to facilitate the movement of any construction vehicles (whether it be vehicles under or over 14m in length) will not be supported. The applicant must come in via the west and then exit out to the west. When entering into the city centre construction vehicles must come in via either Nelson Street or Fanshawe Street. An updated TMP is necessary to take into account a revised approach for any construction vehicles entering / exiting the City Centre to take this into account.

Flow's response

The construction vehicle route has been updated to avoid Quay Street. The proposed route now accesses the construction loading area from underneath the Hobson Street flyover. Construction vehicles can enter from Nelson Street and Fanshawe Street from the west, and will exit through Customs Street West via the east. We note that it is not possible for construction vehicles to both enter and exit from the west, as the Customs Street West / Lower Albert Street intersection directs vehicle to continue straight through in the east direction.

At a minimum, the updated TMP must have no impact on bus operations; not impede bus lanes during peak periods; maintain an east – west pedestrian connection along Customs Street West, which may involve crossing onto the southern extent of Customs Street West and forming a new pedestrian footpath; and ensure that the vehicle overpass removal occurs during a weekend, preferably a long-weekend to minimise the disruption to the network.

Flow's response

We provide our comments as below on the various aspects of this statement.

"have no impact on bus operation; not impede bus lanes during peak periods"

It is not feasible to have no impact on bus operations. While all measures should be taken to avoid unnecessary bus lane closures, it will not be possible to avoid all impacts. We also note that imposing peak hour restrictions will likely extend the overall duration of the demolition, and therefore the total amount of time that pedestrian and road closures may be required. The following are required.

- Stage 1 and Stage 5 will have full road closures, which will affect bus operations continuously for 48 hours and 1 week respectively
- Stage 2 may result in a bus lane closure on Quay Street for 3 months, although one potential mitigation could include providing buses with priority on Quay Street prior two lanes merging into one on approach to Lower Hobson Street
- Stage 4 will also result in some bus lane closures when the demolition works are occurring along the Customs Stret West frontage, but may not be necessary during other periods of Stage 4

"maintain an east – west pedestrian connection along Customs Street West, which may involve crossing onto the southern extent of Customs Street West and forming a new pedestrian footpath"

As assessed in Section 7, a temporary pedestrian crossing could be provided on Customs Street West to maintain east-west pedestrian connections.

The following note has been included in the Stage 1 to 4 diagrams: "NOTE - A TEMPORARY PEDESTRIAN CROSSING ON CUSTOMS ST WEST IS TO BE CONSIDERED AS PART OF THE FINAL CTMP COLLABORATION WITH AUCKLAND TRANSPORT". This path will not be feasible during Stage 5 while the Downtown Carpark ramp onto Fanshawe Street is being demolished. There may also be some periods during Stage 4 where this may not be safe to provide, if demolition works are occurring near the Customs Street West frontage. Should it not be safe or feasible to provide this crossing point, then pedestrians will need to be diverted towards Quay Street.

"ensure that the vehicle overpass removal occurs during a weekend, preferably a long-weekend to minimise the disruption to the network"

The Stage 1 works for the removal of the Lower Hobson Street pedestrian overbridge is anticipated to occur for 48 hours so will be scheduled during a weekend. The Stage 5 works for the removal of the Downtown Carpark ramp onto Fanshawe Street is anticipated to occur for 1 week. Weekends will be utilised, but some works on weekdays will be required. As Stage 5 is expected to occur near the end of the demolition programme, it is difficult to provide certainty about scheduling this during a long weekend. The Stage 5 diagram includes the following comments: "REASONABLE ENDEAVOURS SHALL BE UNDERTAKEN, IN COLLABORATION WITH AUCKLAND TRANSPORT, AS IT RELATES TO STAGE 5 TO REMOVE THE VEHICLE RAMP ON A WEEKEND TO MINIMISE IMPACTS."

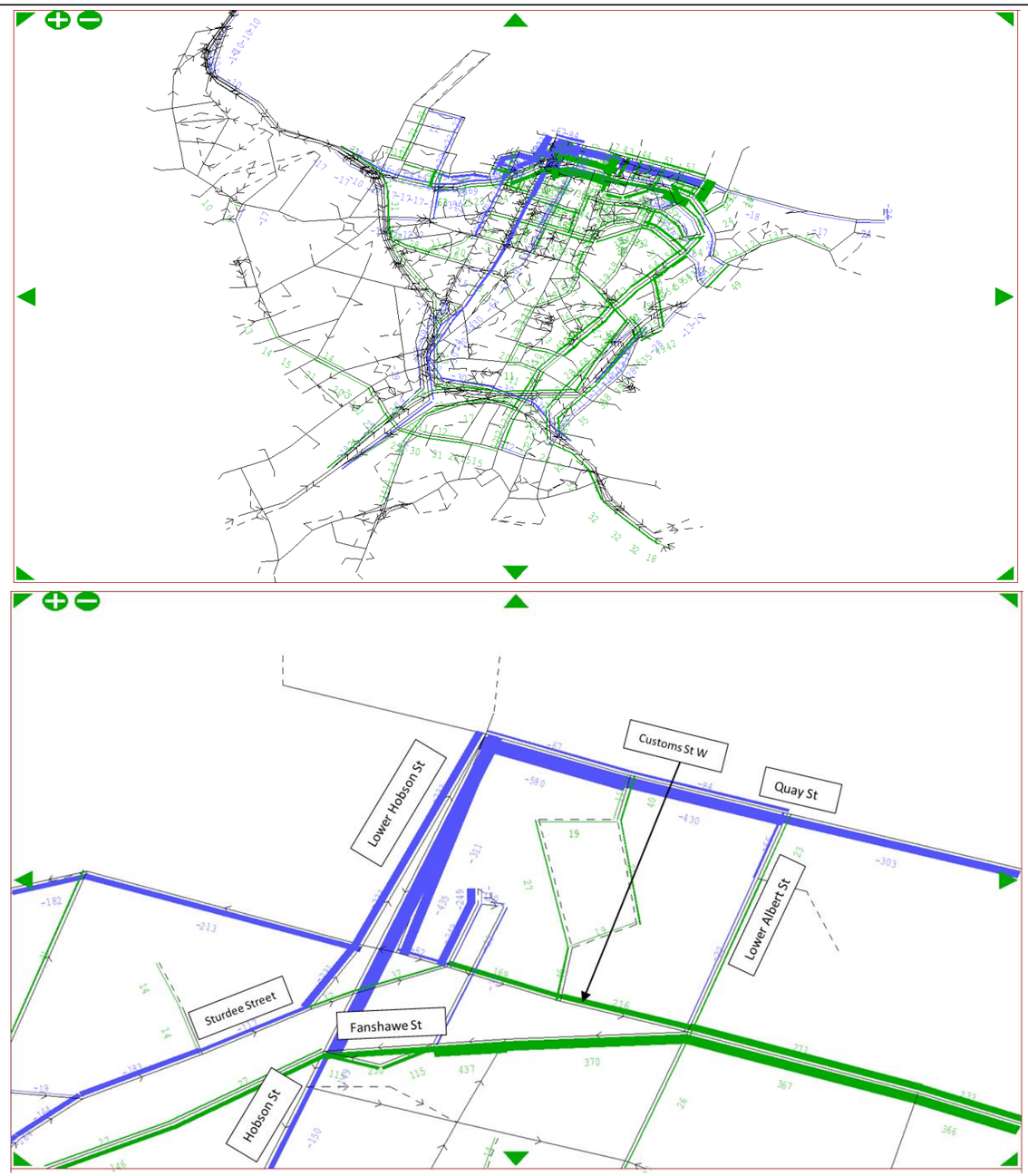
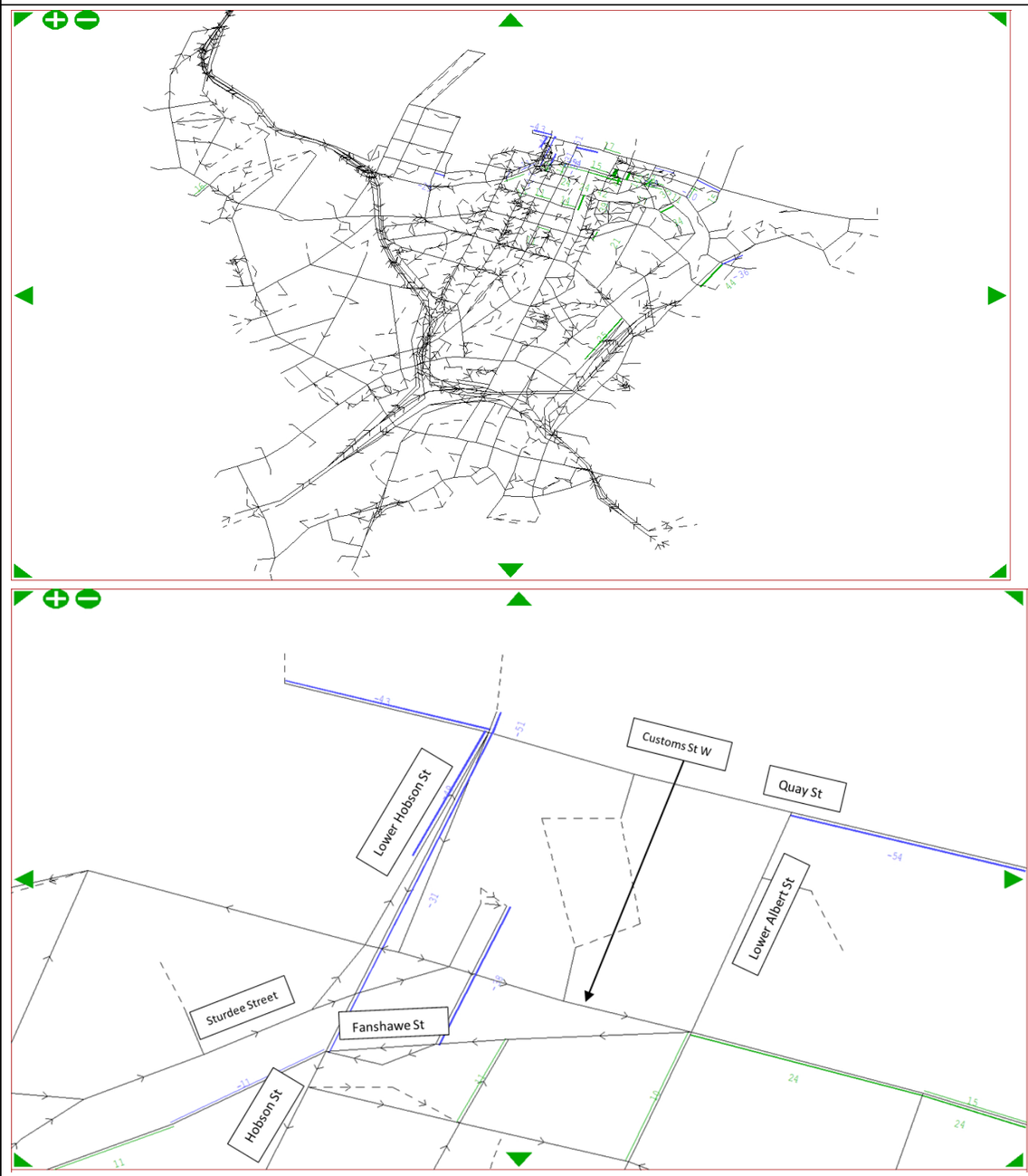
"A stage 4a is requested to demonstrate opening of the bus lane on Custom Street West as soon as practicable. Note comments elsewhere regarding pedestrian east-west connection during demolition and construction being maintained and provided for"

The Stage 4 diagrams show a bus lane closure on Customs Street West, as this may be required to provide a safety buffer between the demolition works within the site and vehicles using the bus lane.

We note that this bus lane closure will only be required when demolition works are occurring along the Customs Street West site boundary. This means the bus lane closure won't be required for the anticipated 6-month duration of Stage 4. To account for this, the updated Stage 4 diagrams include the following comment: "BUS LANE CLOSURE TO PART STURDEE STREET AND CUSTOMS STREET WEST WITH 2 LANES TO REMAIN OPEN. SHOULD DEMOLITION PROGRESS IN A MANNER THAT PRACTICALLY AND COST EFFICIENTLY ENABLES OPTIONS TO BE EXPLORED TO ENABLE RE-OPENING OF THE BUS LANE IN A SAFE MANNER, THEN WE WILL WORK WITH AUCKLAND TRANSPORT TO DO SO". This provides flexibility for the bus lanes to be reopened when safe to do so and avoid any unnecessary bus lane closures.

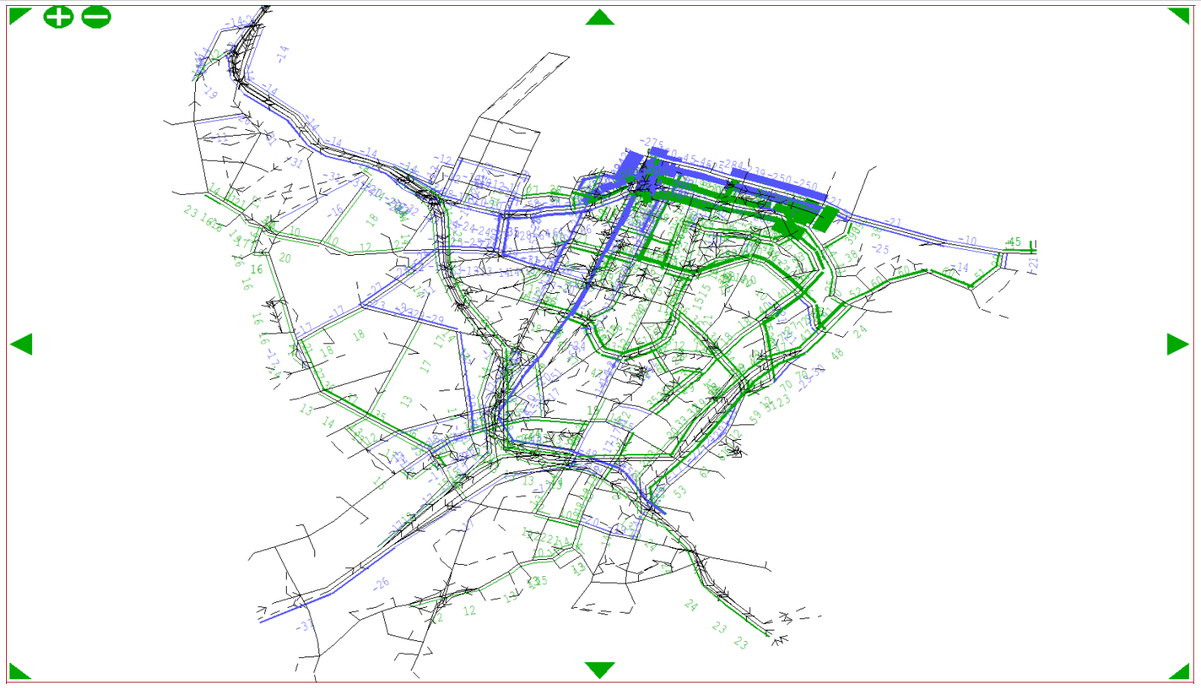
APPENDIX B SATURN model results

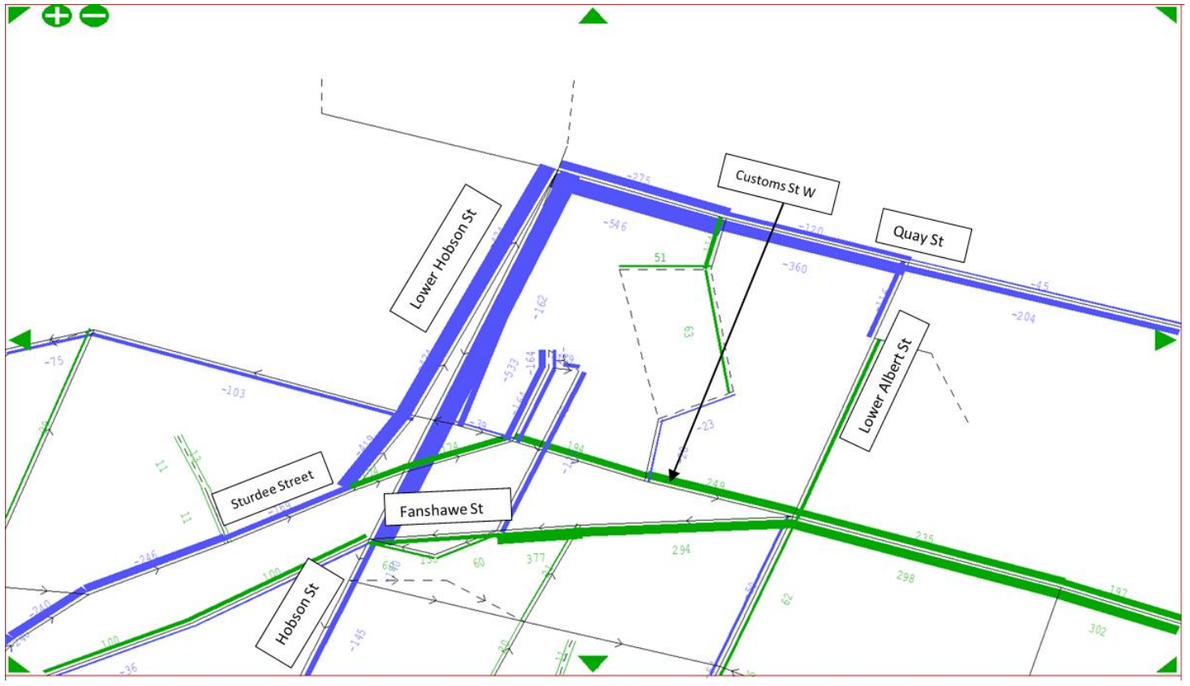
SATURN model volume and delay difference diagrams between the baseline scenario and demolition scenarios

Stage 1 vs Baseline AM	
Volume difference diagram (PCUs per hour)	**Delay difference diagram (seconds)**
	

Stage 1 vs Baseline PM

Volume difference diagram (PCUs per hour)





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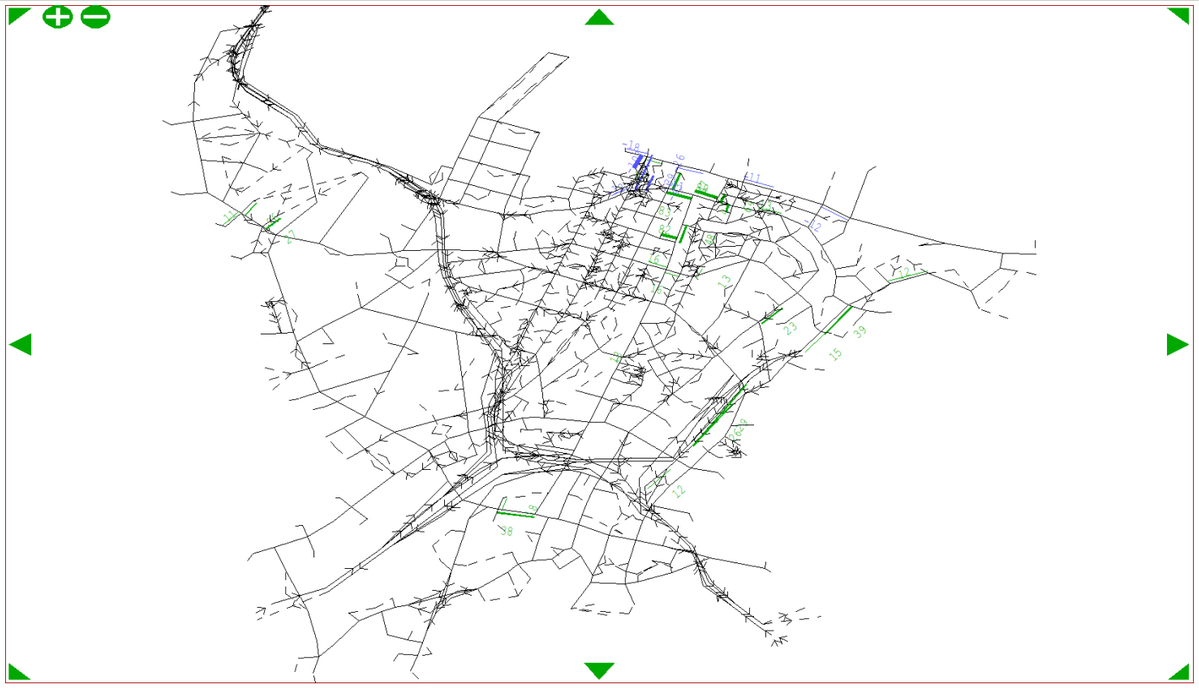
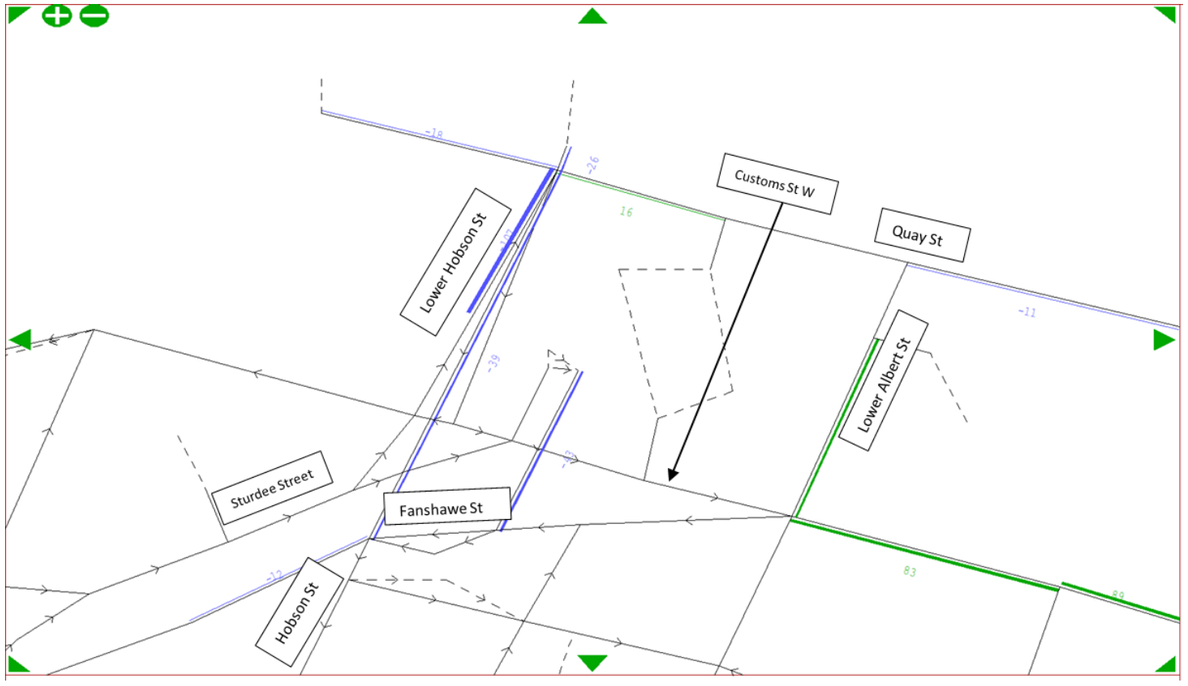
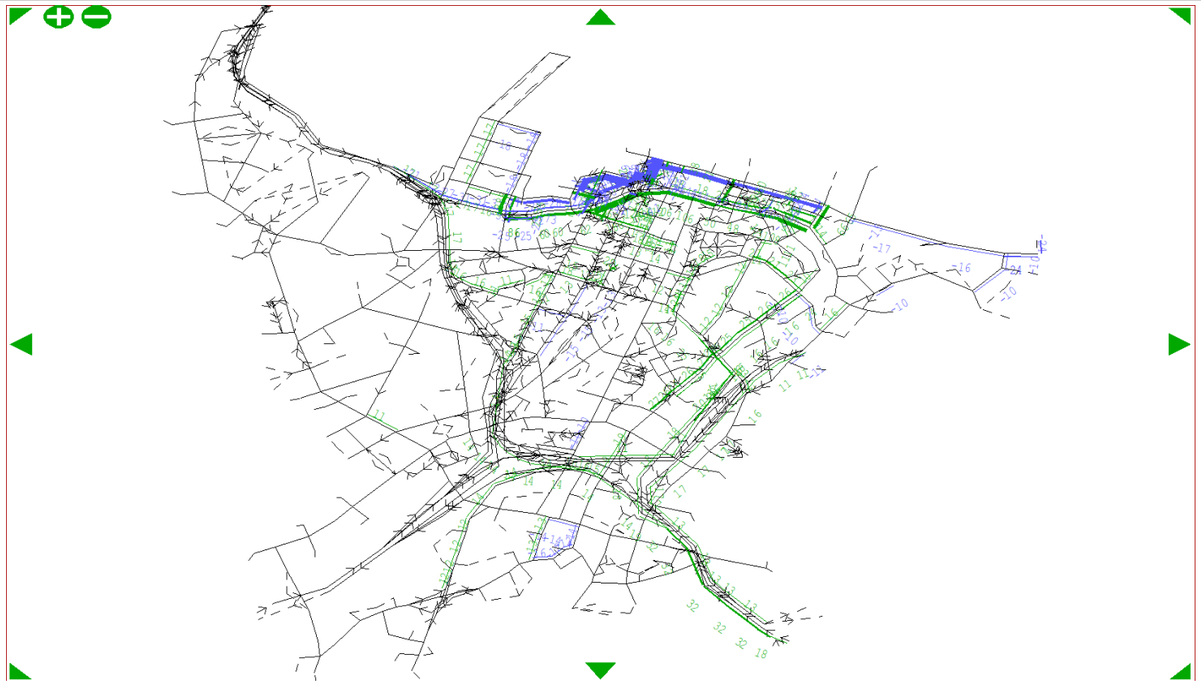




Stage 2 vs Baseline AM

Volume difference diagram (PCUs per hour)



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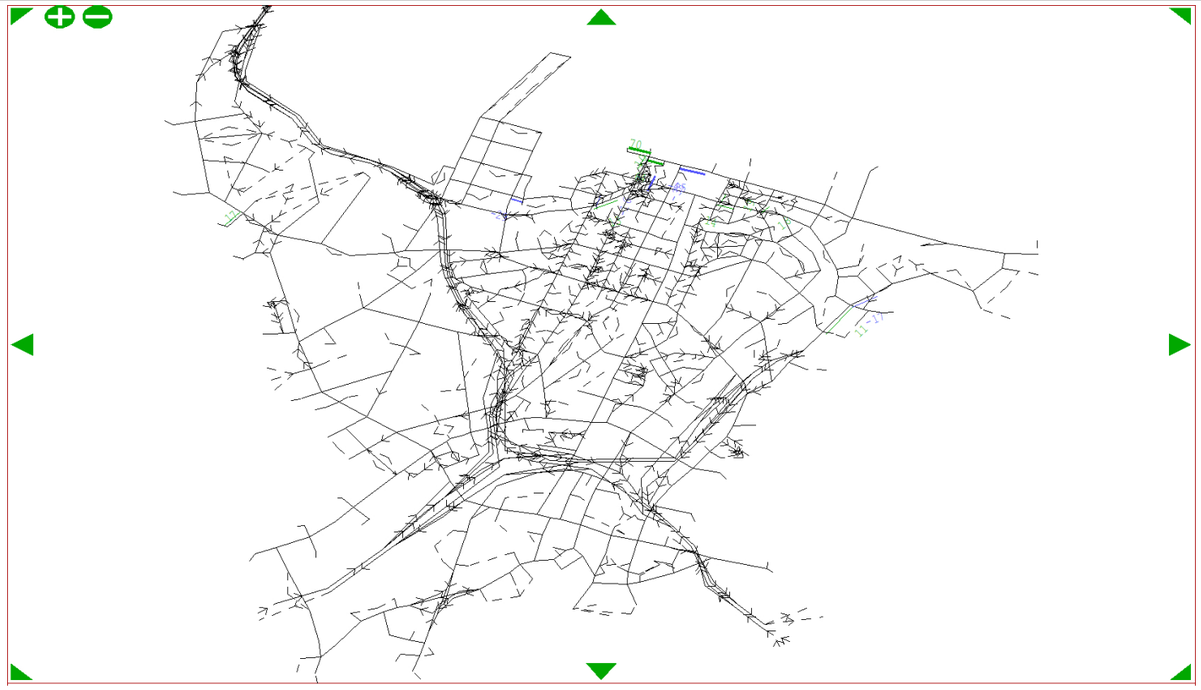
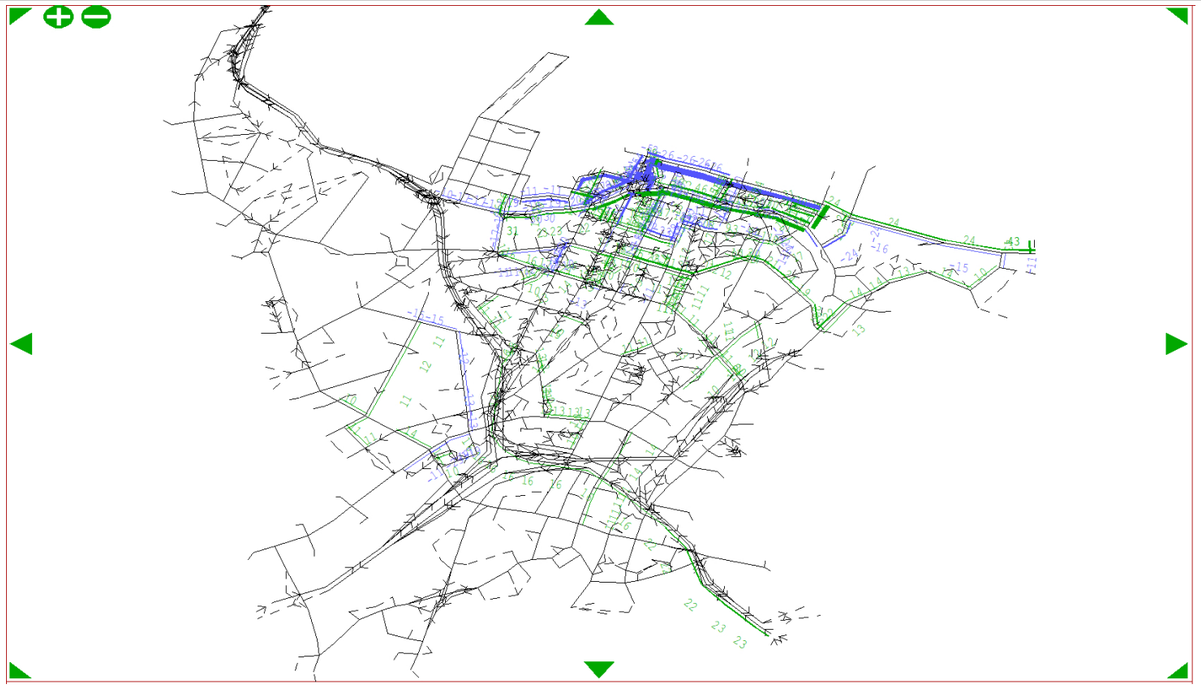


Stage 2 vs Baseline PM

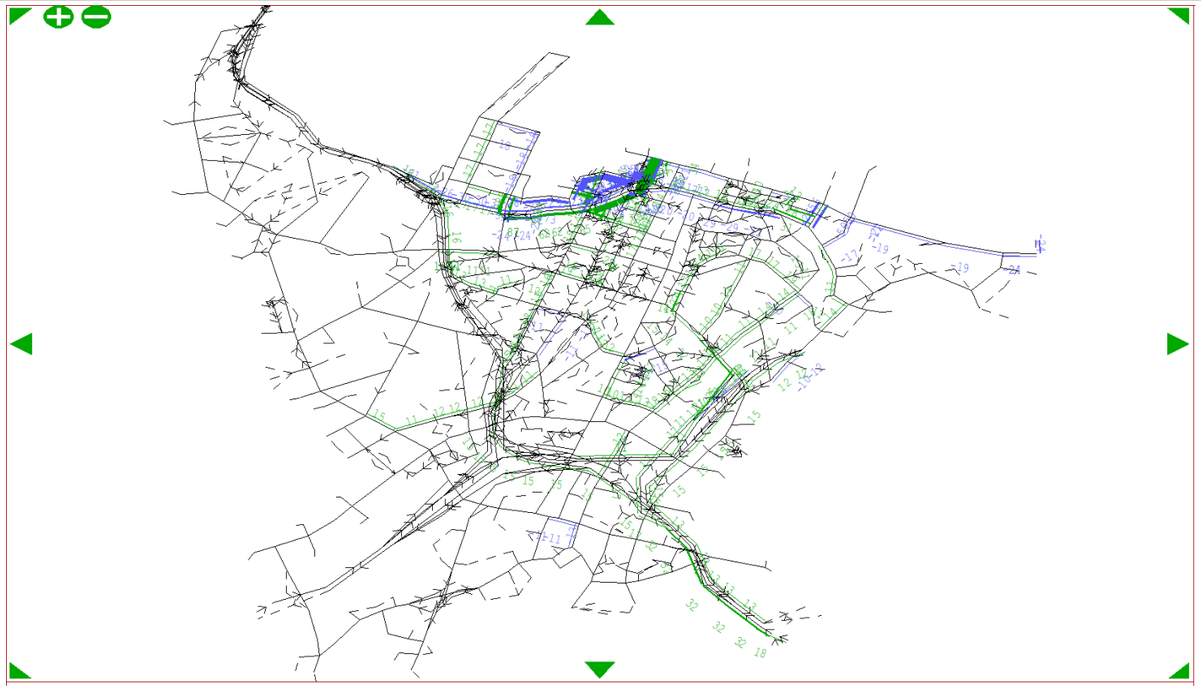
Volume difference diagram (PCUs per hour)

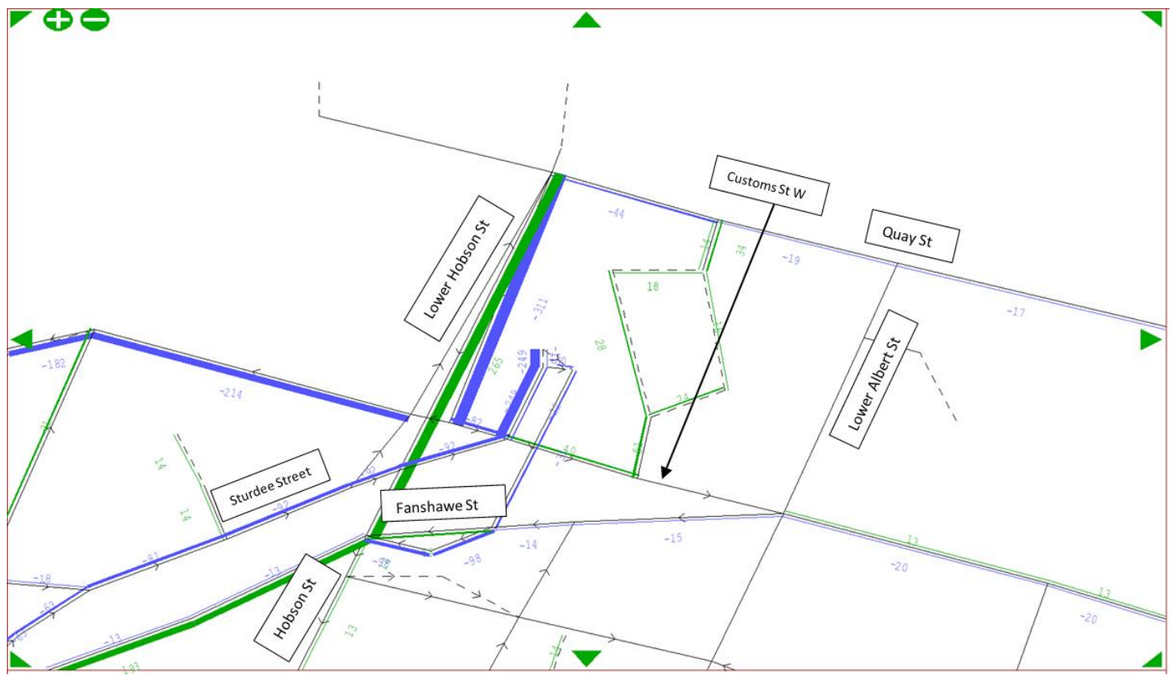


Delay difference diagram (seconds)

Stage 3 vs Baseline AM

Volume difference diagram (PCUs per hour)





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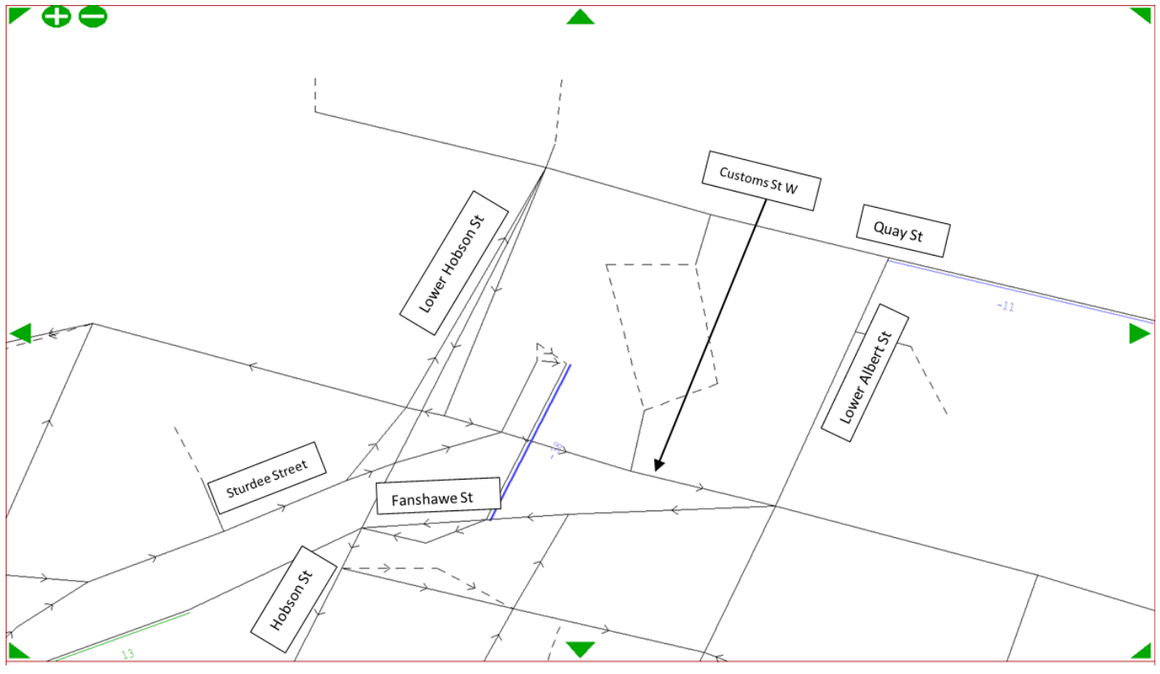
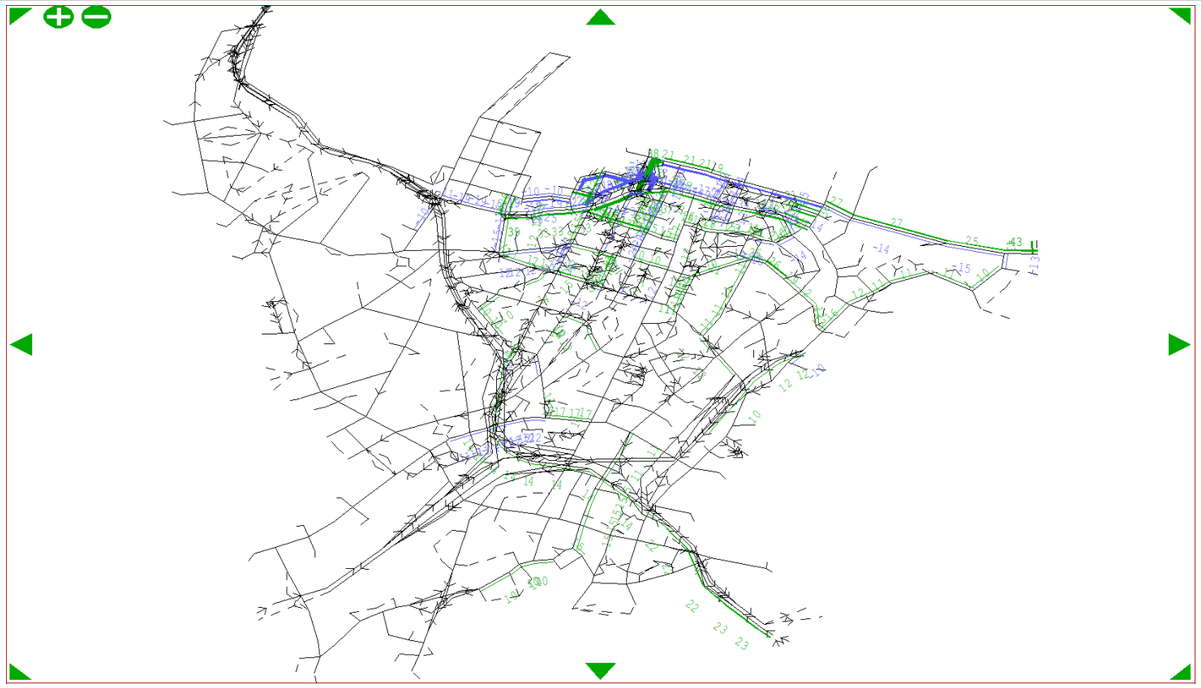


Stage 3 vs Baseline PM

Volume difference diagram (PCUs per hour)



Delay difference diagram (seconds)