flow
TRANSPORTATION SPECIALISTS

technical note

PROJECT	**DOWNTOWN CARPARK SITE DEVELOPMENT**
SUBJECT	**SECTION 53 RESPONSES AND SUMMARY OF TRANSPORT MATTERS**
TO	**THE FTAA PANEL**
FROM	HARRY SHEPHERD, GERHARD VAN DER WESTHUIZEN
REVIEWED BY	PHIL HARRISON
DATE	21 MAY 2026

1 INTRODUCTION AND PURPOSE OF THIS TECHNICAL NOTE

Precinct Properties New Zealand Limited ("**Precinct**") has commissioned Flow Transportation Specialists Ltd to identify and assess the transport planning and traffic engineering matters relating to the proposed development of the Downtown Carpark site into a mixed-use precinct ("**Project**"), located at 2 Lower Hobson Street in the Auckland City Centre ("**Site**").

Section 53 comments have been provided by affected parties. From these comments, there are several transport matters where there are points of disagreement.

The purpose of this technical note is to assist the FTAA panel by summarising the transport matters that are in contention (key transport matters) and stating our position on each of these matters.

2 SUMMARY OF TRANSPORT MATTERS

2.1 Auckland Transport

The key transport matters are primarily from Auckland Transport (**"AT"**). The overarching memo is provided by Elevate Planning Ltd (**"AT Memo"**), which references a memo prepared by Mr Peake of Progressive Transport Solutions. These matters are summarised below

- For construction traffic management matters
  - Areas of whole and/or partial agreement are summarised in Section 7.13 of the AT Memo
  - Areas of disagreement are summarised in Section 7.14 of the AT Memo. There are various matters, including the operation of heavy construction vehicles, light construction vehicles, and the closure of the Customs Street West end of the service lane
- For operational impacts on the transport network
  - Areas of whole and/or partial agreement are summarised in Section 7.17 of the AT Memo 53 response
  - Areas of disagreement are summarised in Section 7.19 of the AT Memo. The primary matter of disagreement is the operation of the Hotel Pick-Up and Drop-Off (**"Hotel PUDO"**)

AT have provided a set of proposed updated conditions in its comments, which reflect AT's outstanding concerns. Many of AT's suggested conditions and changes to conditions have been accepted by the applicant and this is reflected in the updated condition set provided by the applicant.

We address the key matters (i.e., where there is disagreement) in further detail in this report.

2.2 Auckland Council

Auckland Council's (**"Council"**) Section 53 response includes a traffic engineering memo prepared by Stantec (on behalf of Council)

- This review contains the following note:

  "My review, as instructed by Auckland Council, has focused on the internal traffic arrangements and operation. It is understood that a review of external traffic effects, including those associated with construction, will be undertaken separately by Auckland Transport."

  We note that the memo provides specific consideration to the proposed Hotel PUDO area and associated vehicle crossings, which considers these acceptable
- Section 8.0 of the memo concludes:

  "In summary, apart from clarification regarding EV charging provisions, I support the application based on the information available."
- Section 9.0 of the memo recommends two additional conditions of consent to address Stantec's concerns, relating to providing detailed plans for electric vehicle supply equipment and providing specific identification of the proposed four small parking spaces in the basement.

Council has provided a planning memo. The outstanding transport matters are as per the AT Memo.

2.3 Other affected parties

Expert transport input has been provided by several parties

- The parties are
  - MCK
  - Quattro RE Ltd
  - Body Corporate
  - Viaduct Harbour Holdings Ltd
- From a transport perspective, there are no notable areas of disagreement. These parties have primarily requested additional conditions of consent (or modifications to the consent conditions) relating to construction traffic effects. These are addressed in the planning and legal response.

Various other affected parties have raised concerns about construction traffic impacts, particularly the closure of the Lower Hobson Street slip lane during the construction period. We have assessed this matter comprehensively throughout our various assessments, and AT have also accepted our assessments on this matter (AT Memo, paragraph 7.13(e)).

3 CONSTRUCTION TRAFFIC MANAGEMENT MATTERS

3.1 Construction heavy vehicle access via Sturdee Street

Auckland Transport's Position

AT opposes the proposed left-turn manoeuvre from Sturdee Street into the Lower Hobson Street slip lane. Their concerns relate to the following

- The turn is against the primary flow of outbound construction vehicles, potentially impacting eastbound traffic and bus lane reliability
- Pedestrians at the relocated crossing may not expect heavy vehicles approaching from that direction
- Potential conflicts between inbound and outbound trucks could cause spillback onto the wider network.

Issue Overview

The concern is whether allowing flexible inbound access from Sturdee Street creates a safety risk that outweighs its logistical benefit. AT seeks a total prohibition of this specific movement in the documentation.

Our Position

We have reviewed AT's concerns and agree that the inbound left-turn movement from Sturdee Street is not required for standard operations. To simplify the management of the intersection and prioritise pedestrian safety, this inbound movement has been removed from the proposal (and the CTMP updated accordingly) and a condition preventing inbound left-turn manoeuvres from Sturdee Street is proposed.

However, we wish to clarify the following points to ensure site efficiency is maintained

- While we agree with AT's preference to prohibit trucks from entering the site via this left turn, outbound movements (trucks exiting the site and turning onto the established truck routes) must remain permitted
- By removing the against the flow inbound manoeuvre, the specific pedestrian and traffic conflict points raised by Mr Peake are eliminated. This provides a cleaner, more predictable traffic pattern that aligns with AT's safety objectives
- We are confident that the primary access route under the flyover, supported by our conservative modelling (as explained below in Section 3.2), provides more than enough capacity to handle all inbound Heavy Commercial Vehicles (HCVs) without needing the Sturdee Street left-turn
- While the inbound turn has been removed, the construction zone boundary still interacts with the relocated pedestrian crossing. In specific instances where a HCV must reverse within the designated construction zone to reach a loading bay, this will be an actively managed event.

3.2 Construction staging and truck capacity

Auckland Transport's Position

As outlined in Section 7.14 of the AT Memo, AT's concerns focus on the practicalities of site access and the sensitivity of the modelling. In summary

- Mr Peake remains of the opinion that the modelling is not sensitive enough to take into account the complexities and constraints of the existing road layout. He considers that the introduction of 24 HCVs in conjunction with other movements would increase the complexity of this arrangement (weaving between Sturdee Street and Lower Hobson Street). The maximum number of heavy vehicles forecast per hour presents a realistic risk of this situation occurring, even with the management measures proposed
- There are periods throughout the draft construction programme where unloading/loading is to occur solely within the Lower Hobson St service lane. The arrival, unloading and/or loading, and ultimate departure is anticipated to occur on average for a period of 2.5 minutes. This figure appears to be optimistic, and no specialist(s), such as a Buildability Consultant or Main Contractor, has been engaged to confirm if this is realistic or feasible.
- AT have recommended additional monitoring conditions for heavy construction vehicles.

Issue Overview

The core issue is a disconnect between the theoretical traffic modelling (which AT acknowledges shows no adverse effects on bus reliability) and the operational reality of managing the proposed truck volumes within a constrained urban site. AT is concerned that if trucks cannot be processed within 2.5 minutes, they will spill back into the bus lanes, causing network delays. Consequently, they are requesting monitoring conditions and peak-period restrictions.

Our Position

We consider that Mr Peake's concerns appear to assume a simultaneous arrival of all peak-hour vehicles, which does not reflect actual site operations. While certain project phases involve large material deliveries requiring longer dwell times, these will primarily be scheduled during later stages of the Project when significant on-site space (within the towers and podiums) is available to accommodate such activities without impacting the road network.

Flow has specifically assessed the most constrained operational phase, that being the excavation period. This stage involves three dedicated loading bays, no internal site access, and requires manoeuvring within the construction zone. It is important to note that construction logistics movements are distributed across the peak periods through active management. Our position remains that HCV movements can be safely managed within peak periods through these operational controls, meaning there is no need for additional monitoring conditions or volume restrictions. Further comment on AT's proposed monitoring condition is provided below.

1. <u>Response to Modelling Sensitivity</u>

While AT suggests the modelling does not capture "weaving" complexities, we highlight that AT has already acknowledged that our assessment shows buses are not adversely affected at peak times. The construction traffic volumes proposed are significantly lower than the existing Downtown Carpark (DTC) trip generation during peak periods; therefore, the "effect" on the network is a net reduction in overall vehicle movements compared to the baseline.

2. <u>Accuracy of Staging and Truck Volumes</u>

AT's concern regarding the "2.5-minute turnover" is based on a conservative "worst-case" peak that does not reflect the majority of the Project timeline

- As detailed in Section 12.1 of the Construction and Demolition Transport Assessment, only the final phase reaches the 48 movements (24 in / 24 out) per hour
- Initial phases (Demolition and Enabling) carry significantly lower volumes
- Our peak hour modelling assumes 20 % of daily movements occur in a single hour. In a standard 12-hour shift, a flat distribution would be 8.3 %. Our model is therefore 2.4 times more conservative than a standard arrival profile.

3. <u>Site Capacity and "Sense-Check" of Critical Phases</u>

The most constrained phase of the Project involves excavation and basement construction. During this period, HCVs cannot enter the site directly and must utilise the Lower Hobson Street slip lane for loading. In all other phases, truck volumes are either lower or can be accommodated on-site. These stages are therefore not subject to the same constraints as the excavation phase, which we illustrate below, is not an issue to begin with

- The proposed staging plans provide three dedicated loading zones within the slip lane. A technical "sense-check" of the operational requirements demonstrates that the site can comfortably accommodate the forecast volumes
  - The predicted maximum for this phase is 18 trucks (36 movements) per hour
  - With three concurrent loading bays, the requirement is reduced to 6 trucks per bay, per hour
  - This equates to a 10-minute total dwell time available for each truck
- We have assessed these dwell times against New Zealand industry standards for a standard 12.6 m rigid tip truck. A 10-minute window is considered both realistic and conservative, allowing for a complete loading cycle
  - Active Loading (4–6 minutes): This allows for 10–12 bucket cycles (at 25–30 seconds each) from a 20–30 tonne excavator, considered the typical plant used for basement works of this scale
  - Positioning and Auxiliary Tasks (4 minutes): This provides a 100 % buffer over the active loading time to account for manoeuvring into the bay, tarping/securing the load, and managed entry/exit via traffic marshals
- In their recent memo, Auckland Transport expressed concern that a 2.5-minute turnover would be required and that this was "optimistic". We clarify that the 2.5-minute figure assumes a single

point of contact for all 24 trucks. By providing three concurrent loading bays, the required turnover per bay is extended to 10 minutes. This duration

- o Enables a continuous, staggered flow of arrivals
- o Does not consider the proposed holding bay areas provided within the construction zone, which provides further redundancy

- Through active management, including radio-controlled arrivals and GPS sequencing, the contractor will ensure bays are cleared before the next scheduled arrival, preventing any spillback or queuing into the Lower Hobson Street bus lane.

4. <u>On-site manoeuvring within the construction zone</u>

Section 6 to 7 and Appendix B and C of our Demolition and Construction Transport Assessment report show in detail how trucks can manoeuvre on site during various stages. During the critical stage (the excavation stage where no on-site manouevring will be available), we have shown that 3 loading bays can be accessed without being blocked.

5. <u>Contractor Management Obligations</u>

The management of these movements is not a "passive" situation. The draft Construction Traffic Management Plan (CTMP) already includes a number of measures, objectives and contractor obligations for the final CTMP. We highlight the following

- Radio communication and GPS tracking to ensure trucks are sequenced and do not arrive simultaneously
- Contractors will hold pedestrian movements specifically when trucks are entering or exiting, to prevent conflicts. It is in the contractor's financial and safety interest to avoid idling and congestion, as site bottlenecks lead to wasted labour and equipment costs.

6. <u>Monitoring condition</u>

AT have requested additional monitoring conditions for heavy construction vehicles, as set out in Section 10.4 of the AT Memo. The AT memo states the following:

- *In lieu of any assessment to substantiate or demonstrate whether this is practical, feasible, or realistic, it is considered necessary that monitoring of the performance of the management of the Applicant's controlled accesses and staging area is implemented during the periods where this situation is to occur*

We do not consider a monitoring condition necessary based on the responses above and the fact that there will not be any adverse effects to justify monitoring. AT also considered these monitoring conditions would only be considered necessary "in lieu of any assessment to substantiate or demonstrate" the practicality of this arrangement, which we have now provided.

With respect to wider construction traffic monitoring, we also note the following

- Network performance is influenced by numerous variables outside the Applicant's control, such as third-party construction, signal timing changes, and network-wide incidents. Monitoring cannot accurately isolate project-related impacts from these variables

- AT frequently modifies lane configurations and bus frequencies in the City Centre. It is unreasonable to hold a single project accountable for performance metrics that can be altered by AT's own independent network adjustments
- Monitoring creates a "moving target" and significant delivery risk. If the network underperforms due to external factors, the Project could be unfairly penalised or forced to adjust its programme without cause
- The CTMP is the appropriate tool for control. Regulation should focus on process compliance (e.g., managing arrivals and ensuring no site spillback) rather than broad network outcomes, which are impacted by city-wide trends
- Given that AT has acknowledged modelling results showing no material impact on bus reliability, there is no technical "residual uncertainty" that would justify ongoing monitoring.

Summary

Our assessment has shown that the proposed construction vehicle volumes can be managed within the Site. We do not agree with a monitoring condition. As illustrated above, the

- Network performance is influenced by many factors outside the applicant's control, including AT's own network changes
- The operational concerns raised by AT are addressed through the capacity of the three-bay loading zone and the professional obligations within the CTMP. Given the 10-minute dwell time availability during the critical excavation phase, which is double the required active loading time, the risk of "spill back" into the bus lane is effectively mitigated.

3.3 Light construction vehicle access

Auckland Transport's Position

- AT notes that while we believe Lower Hobson light vehicle access under the flyover is "reasonable," we have not quantified the resulting traffic queues or proven that the transport network can absorb the extra pressure
- AT remains concerned that there are no "appropriate management measures" to address the specific needs of contractors dropping off tools and materials, leaving the impact on the network unmitigated
- Due to the complexity of managing the flyover access, AT considers that the Consent Conditions and CTMP must strictly prohibit light construction vehicles from using the Lower Hobson Street entrance.
- AT is of view that the service lane boundary is the only appropriate location for light vehicle access and should be utilised instead of the flyover route.

Issue Overview

The main issue is that the current management plans do not show how light vehicles will be managed, leading to concerns that they will disrupt traffic and public transport unless they are restricted to the service lane.

Our Position

It is our position that using both the service lane and the Lower Hobson Street entrance is the most practical way to keep traffic moving. Rather than a total ban on one entrance, a balanced approach is better for the following reasons

- While the service lane is a viable access point, it should not be relied on exclusively. Putting every single trade van, courier, and delivery truck into one narrow lane risks creating a "bottleneck" effect. By using both entrances, the load can be spread and the site managed more effectively, which reduces the risk of vehicles backing up or competing for space with pedestrians and other users
- The service lane is not always the right fit for every vehicle. Some larger trade vans or flatbed trucks may struggle with the tight layout or height restrictions there, particularly if there is ongoing construction activity along this boundary of the site. If these drivers are prohibited from using the Lower Hobson Street entrance, there is a risk that they will try to park informally on Customs Street West to offload tools. Providing a managed entry via Lower Hobson Street prevents this potential overflow and keeps the main roads clear
- Construction happens on both sides of the site. Forcing tools, etc., for the Hobson-facing side to be unloaded in the Service Lane and then carried through the entire site is inefficient. It increases the amount of manual handling for workers and slows down the Project. Being able to deliver closer to the point of use means a faster, smoother construction process and less overall time spent on-site
- We are not proposing an "open gate" policy. All light vehicle arrivals will be controlled through the CTMP. This means
    - Scheduling vans so that we minimise them arriving at the same time as heavy trucks
    - Having staff on hand to guide vehicles in and out safely
    - As outlined previously, the traffic modelling already reviewed by AT is intentionally conservative. It assumes that 20 % of the daily heavy vehicle movements occur within a single peak hour, which is roughly 2.4 times higher than a standard, even (and more likely) distribution. Because we have modelled such a high-intensity "worst-case" scenario, the occasional arrival of light vehicles (vans or couriers) is already effectively accounted for within these robust figures. In short, the network has already been tested against a much higher pressure than what will actually occur on a typical day
    - The CTMP has numerous ‘contractor obligations for the final CTMP’. We highlight the following obligations in *italics*:
        - *Hours of operation and any restrictions on site access at certain times, including measures to manage access*
        - *Measures to ensure that loading zones for construction traffic will be managed to minimise congestion on the surrounding road network*
        - *Measures to ensure truck travel to and from the site are staged and sequenced as much as possible. These measures will include (but not limited to) detailed planning and preconstruction coordination, radio communication devices and GPS tracking of trucks requirements. This will ensure that the designated truck*

holding areas will be unlikely to overflow and potentially result in conflicts with the general traffic and bus lanes.

  - While the third obligation above refers to trucks, it will work in conjunction with the first two obligations. Overall, the obligations will form part of a cohesive final CTMP, where all construction vehicles (light or heavy) are coordinated to manage external vehicle access and internal loading areas, to minimise congestion on the surrounding road network.

- As detailed further in Section 3.4, the southern section of the service lane will need to be closed for some parts of the construction period. If light vehicles are restricted to the service lane only, then all of these vehicles would be forced to use the Quay Street access. We understand that AT are keen to minimise access to Quay Street in principle, given they have requested a condition to include signage that discourages drivers from using the Quay Street service lane vehicle access (for the operational phase of the Project).
- We note that light vehicles may not be subject to the same internal manouevring constraints within the construction zone compared to larger heavy construction vehicles. We have assessed 24 construction vehicles per hour (48 movements) in and out of the construction zone via the Lower Hobson Street entrance, assuming these are all heavy vehicles. However, if the contractor elects to operate more light vehicles instead of heavy vehicles (or if a particular stage does not require as many heavy vehicles), we consider there should be a provision which allows the 24 construction vehicles per hour limit to be revisited. This would be subject to approval as part of the CTMP certification process (which includes provision for amendments to management plans under Conditions 16-18), to demonstrate the effects of inbound movements on Lower Hobson Street bus lane are of a similar or acceptable nature. We also note that some construction stages will be less constrained, for example when construction vehicles are able to manoeuvre within the site internally.

Prohibiting access at Lower Hobson Street makes the logistics much harder and can potentially put too much pressure on the service lane (and thus wider network). By allowing the use of both access points, we have the flexibility to choose the safest and most efficient route for every delivery of tools, etc, keeping the surrounding streets moving as intended.

3.4 Customs Street West service lane closure during construction

Auckland Transport's position

AT's position is provided in Section 7.14(e) of the AT memo

- AT considers that the closure of the service lane access at Customs Street West during the construction period has not been appropriately assessed, and the closure duration has not been identified
- AT states that the level of impact, in terms of any increased servicing and loading requirements along Quay Street as a consequence of this closure, has not been assessed. The applicant has rather focused their consideration on establishing any adverse impact to Quay Street solely within the context of any post-construction / operational impacts.

Issue overview

In short, AT is concerned about potential operational impacts during construction, on the Quay Street vehicle crossing, which carries high volume bus movements and has right turning movements. A closure of the Customs Street West end of the service lane would result in vehicle trips needing to divert to the Quay Street end of the service lane.

Our position

The duration of the closure of the Customs Street West service lane crossing is subject to the final contractor's methodology. However, an extended closure may be required, as the methodology will involve constructing a podium level above the south end of the service lane, which is currently uncovered.

We provide further assessment on this closure below, to demonstrate that the traffic effects are acceptable

- We have undertaken an additional SIDRA modelling scenario of the construction period, where the Customs Street West end of the service lane would be closed and diverted to Quay Street
- Table 1 and Table 2 below show SIDRA results of the Quay Street service lane access during the AM and PM weekday peak hours
    - Scenario 1 and Scenario 2 are the same results as presented in Section 9.4.2 of the Operational Integrated Transport Assessment report
    - We have now included 'Scenario 3' to address the closure of the service lane at the Customs Street West end
- The results (in terms of average vehicle delay and queue lengths) are largely consistent with what was assessed (and broadly accepted by AT) for the operation of the Project compared to the future baseline (ie the existing environment)
- The only notable difference for this additional modelling is the following for the AM peak period:
    - The delay and 95th percentile queue lengths on the northbound Lower Hobson Street approach is predicted to increase by 20 seconds 75 m respectively. This affects general traffic, not the bus lanes which are separated from general traffic
    - As a result of the northbound approach change, the model automatically adjusting signal phase timing. This results in the increased 95th percentile queue lengths on the Quay Street east approach. However, there is no change to the average delay of vehicles for vehicles on this approach.
- We note that this additional modelling is based on the conservative assumption that there will be 50 additional light vehicle trips during peak periods into the service lane
    - As set out in Section 13.1 of our Construction and Demolition Transport Assessment report, this assumption was made for modelling purposes only. In reality, the number of light vehicle movements will not be this high, as there will be no dedicated contractor parking provided within the site.

- Our response in Section 3.3 also noted that these light vehicle movements will be managed by contractors, such that there will not be an 'open gate' policy
- If a lower volume of light vehicles was assumed, then the differences at the northbound Lower Hobson Street approach for general traffic will not be as noticeable

- We also emphasise that allowing some light vehicles to use the Lower Hobson Street slip lane during construction will also allow traffic volumes to be reduced at the Quay Street access, during periods when it is necessary to close the Customs Street West end of the service lane
- Therefore, we consider that no mitigation is required, and the effect of this closure is acceptable.

Table 1: Quay Street service lane access: SIDRA results AM peak hour

Approach	Scenario 1 Future Baseline with Downtown Carpark			Scenario 2 With Development Operational			Scenario 3 Construction period with Customs St W service lane closure		
	LOS	Ave delay (s)	95th %tile Queue (m)	LOS	Ave delay (s)	95th %tile Queue (m)	LOS	Ave delay (s)	95th %tile Queue (m)
Service Lane left turn	A	5	2	A	5	71	A	5	76
Service lane right turn	B	15	2	B	15	71	C	16	76
Quay Street east left turn	A	4	0	A	4	28	A	4	55
Quay Street east through	A	0	0	A	0	28	A	0	55
Quay Street west through	A	0	0	A	0	0	A	0	5
Quay Street west right turn	A	5	0	A	5	0	A	5	5
All vehicles	NA	1	2	NA	1	71	NA	2	76

Table 2: Quay Street service lane access: SIDRA results PM peak hour

Approach	Scenario 1 Future Baseline with Downtown Carpark			Scenario 2 With Development Operational			Scenario 3 Construction period with Customs St W service lane closure		
	LOS	Ave delay (s)	95th %tile Queue (m)	LOS	Ave delay (s)	95th %tile Queue (m)	LOS	Ave delay (s)	95th %tile Queue (m)
Service Lane left turn	A	5	25	A	9	36	A	10	39
Service lane right turn	C	21	25	D	31	36	D	32	39

Quay Street east left turn	A	4	14	A	4	9	A	4	9
Quay Street east through	A	0	14	A	0	9	A	0	9
Quay Street west through	A	0	8	A	0	8	A	0	8
Quay Street west right turn	A	4	0	A	4	0	A	4	0
All vehicles	NA	1	25	NA	3	36	NA	3	39

We have attached the movement summary result outputs from Sidra to this memo.

Summary

The Customs Street West end of the service lane will require closures as part of the construction methodology to cover the (currently exposed) service lane with a podium level. The exact duration is to be confirmed in the final construction methodology.

We have undertaken an additional modelling test, which shows that the operation of the Quay Street service lane access is consistent with what we modelled for other scenarios as part of the development. No mitigation measures are required and we consider that the traffic effects associated with such a closure to be acceptable.

3.5 Concurrent Fanshawe Street / Customs Street West retaining wall works

Auckland Transport's position

AT's position is provided in Section 7.14(f) of the AT memo

- AT notes that there should be HCV restrictions during a time when retaining wall relocation works are being undertaken, where a single lane is in place eastbound along Customs Street West without an alternative or additional eastbound lane being established on Fanshawe Street. At the time of writing this response, it is understood that AT's resource consent for these retaining wall works is still being processed. The period of AT's intended work is not known at this stage; the potential cumulative impacts of enabling HCVs to mix with buses and other local access vehicles may reasonably delay bus operations.

Issue overview

As stated in AT's position above, the concern is about impacts on bus operations from the Project during the most constrained period of the retaining wall construction period.

Our position

We do not agree with AT's position based on the following reasons

- We provided a modelling sensitivity assessment of this period in Section 3.2 of our Transport Addendum Report. As concluded in our report:
    - *The sensitivity test shows there is no noticeable difference to the operation of the network as a result of the construction period of the Project while assuming the worst-case road closures during the retaining wall realignment works. Any delay changes shown in this sensitivity test can be addressed by optimising signal timing*
- AT's current position is not reasonable, as it does not take into account the effects of taking away vehicle trips from the local network by closing the Downtown Carpark. The number of trips removed from Fanshawe Street by closing the Downtown Carpark will be a much greater number than the volumes generated by heavy construction traffic. When assessing this on an effects basis, we have shown that there will not be cumulative impacts or increased delays on bus movements
- If the consent application for the retaining wall works is approved, it is likely that this work will be scheduled to coincide with earlier periods of the Project demolition / construction period. The volume of HCVs will be lower during these earlier periods, as outlined in Section 12.1 of our Demolition and Construction Transport Assessment
- The HCV restrictions would be tied to an undefined period (for when the additional lane on Fanshawe Street has not yet been established) of a consent that has not currently been granted. If such a restriction was to be imposed, the demolition / construction period of the Project would be on hold for an indefinite period, as the works (and any construction project of this nature) are dependent on having continuous HCV access.

Summary

In summary, we do not agree with AT's position to impose HCV restrictions during some periods of the retaining wall works. AT have not considered this on an effects basis, where construction traffic volumes will be lower than existing trips generated by the Downtown Carpark. Imposing these restrictions will cause an indefinite delay on all construction activity of the Project.

3.6 Lower Hobson Street barrier during construction to prevent driver distraction

Auckland Transport's position

AT's position is provided in Section 7.13(g) of the AT memo

- AT agree with our previous assessment that the potentially high severity of a crash, directly associated with the operation and distraction that could be attributed to adjacent crane use, would be reduced based on the common operation of cranes within a City Centre environment, low speeds on the flyover (30 km/h) and that traffic is unidirectional
- Notwithstanding, Mr Peake considers that the risk of distraction will still exist to an extent and that some means of managing those impacts would be required, such as screening along the whole eastern edge of the Flyover to a height of 1 m from the top of the existing concrete edge barrier. A condition to this effect has been recommended by AT.

Issue overview

The concern is that general traffic driving on the Lower Hobson Street flyover will become distracted looking into the construction site, which could result in a crash.

Our position and summary

We do not agree that a specific barrier or any other mitigation is warranted. AT have already agreed with our assessment that the severity of a crash in this area is not significant. The likelihood of such a crash is also very low. As outlined in Section 4.1.2 of our Transport Addendum Report, construction activity in the City Centre is very common. These are not unique situations for City Centre drivers to encounter, such that an additional screening barrier is required. We emphasise the following

- AT has agreed that the low speeds and one-way traffic mitigate crash severity, yet they are still requesting extensive screening
- We note that if visual screening were required every time a crane operated near a City Centre road, the entire City Centre would be walled off. This is not how AT manages its own works across the City Centre
- Given the lack of pedestrians and the simple road geometry, the existing barrier is sufficient. The proposed condition is an unnecessary "no-risk" mandate that lacks a technical basis.
- Furthermore, we also note that a 1 m barrier would not be fully effective as intended by AT, as it would not fully screen a driver's potential view of a crane.

4 OPERATIONAL TRANSPORT MATTERS

4.1 Hotel PUDO

Auckland Transport's position

As outlined in Section 7.19 of the AT Memo, AT are not supportive of the Hotel PUDO. In summary, the AT concerns are

- The constrained nature of the facility with two PUDO spaces, and the ability to move vehicles on
- Location of the west vehicle crossing having poor legibility for inbound vehicles from Sturdee Street, with the risk of creating vehicle to vehicle conflicts
- Exceeding the maximum vehicle crossing width standards of the Unitary Plan to accommodate minivans, increasing the exposure of conflicts between vehicles and pedestrians
- The vehicle crossings are aligned at an angle instead of 90-degrees to the footpath, creating potential conflicts between pedestrians and vehicles
- Lack of clear delineation between the PUDO area and the footpath on Customs Street West, causing inbound vehicles to drive over the footpath
- Constraints of the vehicle tracking, which could cause vehicles to pull out onto the footpath in order to reverse into the PUDO spaces, which could increase conflicts with pedestrians
- The lack of capacity of the hotel PUDO compared to other hotels in the City Centre, citing examples in Wynyard Quarter.

Auckland Council's traffic engineering position

The Traffic Engineering memo prepared by Stantec on behalf of Council had no concerns about the Hotel PUDO. We underline the following specific comments in the memo, which support the design of the Hotel PUDO vehicle crossings (emphasis added)

- *6.9. Vehicle Crossings – three vehicle crossings are proposed off Customs Street West which is a technical infringement against the Unitary Plan requirement of no more than two. However, two of the crossings cater for the inbound and outbound traffic streams for the hotel porte cochere (one-way circulation) <u>and this is considered acceptable. Vehicle crossing locations are also considered acceptable.</u>*
- *6.10. Vehicle crossing widths – infringements identified for the hotel porte cochere crossings and the Quay Street access. These are required to be wider than the Unitary Plan standards permit. However, additional width is required to accommodate the tracking of the largest vehicles anticipated to use these crossings. <u>Proposed widths are accepted.</u>*

No operational concerns about the Hotel PUDO were raised in this memo.

Issue overview

In short, the AT concern is that the limited capacity and size of the Hotel PUDO could result in vehicles spilling back onto the road or footpath, adversely affecting pedestrian and bus movements.

Our position

We are supportive of the proposed Hotel PUDO design, as put forward in our Transport Addendum report (refer to Section 3.3 and Appendix A)

- In this report, minor updates to the vehicle crossing design were proposed to better allow a van with a trailer to use the bypass lane
- We also accepted some of AT's suggestions to strengthen the draft Hotel PUDO Management Plan.

We emphasise that the proposed Hotel PUDO has the following features

- There is a bypass lane, which allows vehicles to continue circulating if the two spaces are occupied. It is also possible that this bypass lane could temporarily accommodate space for a vehicle to wait without causing queueing back onto the road (subject to management by staff, and achieving the measures outlined in the management plan)
- It is subject to a robust management plan, which means the operation will not be comparable to other hotel PUDO areas, which are passively managed
- It is fully within the property boundary of the Site and not located within the public road reserve, meaning the applicant has full control over the facility
- The management plan includes the following commitments
    - Objectives to prevent queueing onto Customs Street West, and ensure the area operates safely

- Maximum time restrictions of 3 minutes for taxis and 5 minutes for hotel guests. These time restrictions were confirmed with specialist input from THSA Hotel Advisors
- To provide a driveway manager (doorman) on a 24/7 basis, and a minimum of one porter during a 'core hour' period
- Measures to encourage high turnover of the spaces, including turning away vehicles, targets to turn over vehicles within a certain period, and staff training
- A monitoring and review programme to allow the plan to be updated on an ongoing basis.

We do not agree with AT's position

- AT has not considered the provision of the vehicle crossings and PUDO facility on an effects basis. This will replace the existing Downtown Carpark vehicle crossings. We note the following features of the Hotel PUDO crossings compared to the existing Downtown Carpark crossings
  - The existing crossings occupy much more space on the Customs Street West frontage. While the proposed vehicle crossings exceed the maximum Auckland Unitary Plan widths, they are overall much narrower than the total width of the existing vehicle crossings
  - The existing crossings do not provide a good amenity for pedestrians due to the speed at which vehicles currently enter. There is often ambiguity over whether vehicles or pedestrians have priority at these existing crossings due to the design of the footpath
  - Inbound movements into the existing crossings regularly queue back directly into the bus lane on Customs Street West. By comparison, the proposed hotel inbound crossing provides a buffer of around two car lengths between the footpath and the bus lane, which therefore provides a better outcome with less potential for queueing onto the bus lane
  - The Hotel PUDO crossings are predicted to generate up to 28 vehicles per hour in the AM peak (14 in and 14 out) and 22 vehicles per hour during the PM peak (11 in and 11 out). This is significantly less than following peak hour volumes (vph) reported in Section 5.4.7 of our Operational Transport Assessment report
    - During the AM peak, 380 vph consisting of 366 inbound vph and 14 outbound vph. This is 14 times more than the proposed Hotel PUDO trips in the AM peak
    - During the PM peak, 197 vph consisting of 105 inbound vph and 92 outbound vph. This is 9 times more than the proposed Hotel PUDO trips in the PM peak
    - Therefore, the existing crossings have 9 to 14 times higher vehicle volumes than the proposed crossings are expected to generate
- The orientation of the vehicle crossings and the proposed surface treatments means that vehicles will be travelling in and out of the vehicle crossings at safe speeds, and not pose safety risks to pedestrians walking on the Customs Street West frontage
- There will be staff actively on-site to assist with vehicle manoeuvring and move vehicles on

- To provide further demonstration of why the capacity of the PUDO area is not an issue, we have undertaken an additional assessment to determine the probability of multiple vehicles arriving within the same time period
    - We have undertaken a Poisson Distribution assessment, which determines the probability of multiple vehicles arriving within a fixed time period. This can be used to determine the potential of the PUDO area operating over capacity and generating excess vehicle queuing
    - We have assumed an average dwell time of 3 minutes, which is based on our review of a full day of video footage of M Social's porte-cochere. We note that the proposed management plan has time restrictions of 3 minutes for taxis or ride share vehicles, and 5 minutes for hotel guests, which means the actual average dwell time will likely be lower than M Social (which is not subject to the same level of active management)
    - We have assessed the arrival patterns of multiple vehicles arriving within a 3-minute dwell time period, of the AM peak hour (with 14 inbound movements)
        - The probability of more than 2 cars arriving (i.e. 3+) within a 3 minute period is 0.58 %. This accounts for a scenario of both spaces being occupied, and another vehicle arriving. To put it in other terms, this event would happen only once over around 9 peak hour periods
        - The probability of more than 3 cars (i.e. 4+) arriving within a 3 minute period is 0.08 %. This accounts for a scenario of both spaces being occupied, a third vehicle temporarily waiting in the bypass lane, and another vehicle arriving. To put it in other terms, this event would happen only once over around 64 peak hour periods
        - The probability of more than 4 cars (i.e. 5+) arriving within a 3 minute period is 0.01 %. This accounts for a scenario of both spaces being occupied, a third and fourth vehicle temporarily waiting in the bypass lane, and another vehicle arriving. To put it in other terms, this event would happen only once over around 555 peak hour periods
    - Simply put, the probability of multiple vehicles arriving at the same time and the area being over capacity is very low
    - In the scenario that multiple vehicles do arrive at the same time, the management plan has been designed to address this exact scenario. Excess vehicles will be directed away by staff to ensure the objectives of the management plan are achieved
    - A PUDO with active management is also better than no PUDO at all, as that scenario could result in unlawful or informal parking in the road reserve.

Response to independent peer review

An independent peer review of the Hotel PUDO has been undertaken by Hughes Traffic & Transportation.

In summary, the peer review is supportive of the Hotel PUDO, subject to the Hotel PUDO management plan including clear procedures. The peer review raises several points in support of the Hotel PUDO that we have also noted in our response, including the comparison to the existing Downtown Carpark vehicle crossings, and the low likelihood of several vehicles arriving at the same time.

As a result of this peer review, we have made several updates to the draft Hotel PUDO Management Plan. These updates include

- Providing a clearly defined route for vehicles to "circulate around the block". This will involve vehicles turning out of the PUDO area, turning left into the service lane, and then circulating via Quay Street and the Lower Hobson Street slip lane in an anticlockwise direction
- Include wayfinding measures for the approved route. This could include booking confirmation maps, rideshare pin placement, taxi instructions, concierge scripts and any driveway signage
- Treat the bypass lane as a managed short-term stacking / circulation area only, not as a loading, luggage handling or taxi / rideshare waiting area. This will provide short term capacity if needed, but ensure the bypass lane is not used as a formal loading area
- Systems for implementation of the following, where practicable
    - Valet users and pre-arranged transfers to book, or at least nominate, an arrival window
    - Vans, shuttles and any vehicle with a trailer to book, or at least nominate, an arrival window

    Note: These systems could be implemented when guests are pre-booking online. While it may not be possible to capture all of these trips via booking (as there may be some ad-hoc, early or late arrivals, these measures will still assist hotel staff by identifying potential busy periods in advance, and direct guests to arrive outside of busy periods if already fully booked by other guests.
- Add a specific "all 4 internal positions occupied" procedure
- Include a larger vehicle protocol. These vehicles should be called forward only when sufficient internal space is available, otherwise they will be directed to the defined recirculation route
- Include a clear "no informal drop-off" rule within the road reserve
- Include an additional review period at 6 months, in addition to the current 3 months, 12 months after commencement of operation, and annually thereafter. Also include an additional review period, should the external road network layout along the Customs Street West or Lower Hobson Street site frontages fundamentally change
- Include the following metrics as part of the monitoring surveys
    - Record each occasion when the bypass lane is used for stacking, a vehicle waits at the Customs Street West entrance, a vehicle is redirected, or any informal vehicle stopping outside the PUDO
    - The vehicle types
    - The peak arrival periods over a day
    - Any complaints or near misses.

We consider these recommendations further strengthen what is already a robust draft Hotel PUDO Management Plan.

The only notable point of difference between our position and the peer review is that they consider a fifth vehicle could be held at the Customs Street West entrance, if all four internal spaces are occupied

- In principle, we agree that there is space for a vehicle to temporarily wait at the Customs Street West entrance. There is space between the footpath and bus lane, which would not block pedestrian or bus movements
- However, this would conflict with the proposed management plan objective of preventing queueing onto Customs Street West
- Therefore, the peer review has a more 'permissive' position about how many vehicles could be accommodated at once, and the acceptable allowance for queueing onto the road network
- As we have noted earlier, the probability of 4+ and 5+ vehicles arriving at any one time is extremely low, which means the scenario of needing to hold vehicles at the entrance is extremely unlikely. The management plan includes sufficient measures to ensure that vehicle turnover is high, to prevent the buildup of too many vehicles using the PUDO at once

For the reason above, we have not fully adopted the recommendations of the peer review which relate to this scenario.

We also note the other following differences between the peer review recommendations and the updated draft management plan. Overall, we consider these are minor differences (not fundamental differences), and these recommendations have been captured by other provisions in the management plan

- The peer review has recommended including "adaptive management triggers". We consider this can be captured in the monitoring review periods at 3, 6, 12 months and annually thereafter. Any initial operational issues will be captured in these periods. We also consider it will be impractical to define and measure these adaptive management triggers, and that relying on defined and ongoing monitoring periods is an appropriate mechanism. The hotel operator may still choose to elect to undertake monitoring earlier if warranted
- The peer review has recommended that "that "private driveway / authorised entry only" signage will not confuse or deter drivers for the service lane detour route. We consider this is already addressed by the mechanism to include wayfinding measures for the approved route.

In response to the conclusion in section 4.5 of the peer review, we confirm that the single give way layout on the external road network is part of the proposal, albeit that:

- It will only be required if the flyover has not been removed before the Project is completed and hotel operations commence.
- If it is required (which is assumed for the purposes of the assessment of the PUDO), the give way layout change involves the road environment and will require approval under the AT Traffic Resolution process, which will be carried out separately.

Summary

The proposed Hotel PUDO represents a substantial net improvement to the existing Customs Street West frontage, replacing high-volume, unmanaged car park access with a low-volume, professionally managed facility. While Auckland Transport expresses concern over capacity, our Poisson Distribution assessment proves that the risk of over-capacity is statistically very low, with a third vehicle arriving only once every nine peak-hour periods (and more than three vehicles once every 64 peak periods). Unlike the "passive" hotel examples cited by AT, this facility will be governed by a robust 24/7 Management Plan, including a dedicated driveway manager and strict turnover targets, ensuring that any rare surges are handled internally without impacting the public road, bus lanes or footpaths.

Crucially, this proposal delivers a significant safety benefit by reducing vehicle volumes by 9 to 14 times compared to the existing Downtown Carpark crossings. By replacing wide, high-speed entries with narrower, speed-calmed crossings, we are actively reducing pedestrian conflict and removing the current ambiguity regarding right-of-way into the Downtown Carpark. This assessment is supported by Auckland Council's traffic experts (Stantec), who confirmed that the crossing widths and locations are technically acceptable to accommodate the necessary tracking of larger vehicles.

Ultimately, AT's position fails to account for the current effects of the Site and the very low probability of more than three vehicles entering at one time. The Project involves moving from a high-impact, unmonitored traffic environment to a high-amenity, private-property solution that clears the public road reserve and prioritises pedestrian safety. The design is a pragmatic, well-engineered response to a City Centre context that far exceeds the safety and operational performance of the current infrastructure.

We have also strengthened the draft Hotel PUDO Management Plan to include recommendations as set out in the independent peer review undertaken by Hughes Traffic & Transportation.

5 UPDATES TO PLANS

The following updates have been made to the architecture plans

- Conversion of 3 accessible parking spaces to residential parking spaces. The justification for this was provided in our Transport Addendum report, and was accepted in the Council traffic engineering memo
- Update to the Hotel PUDO layout, which reflects the changes set out in our Transport Addendum report. These are minor changes relating to the vehicle crossing splays, and the planter area along the road frontage.

The following changes have been made to the management plans

- Hotel PUDO management plan
  - Several updates as set out previously in Section 3.3 of our Transport Addendum report
  - Adopted several recommendations as set out in the Hughes Traffic & Transportation peer review. Refer to Section 4.1.
- CTMP
  - Inclusion of the revised pedestrian route for the east-west connection, as set out previously in Section 3.4.3 of our Transport Addendum report
  - Introduce restrictions for inbound left turning movements from Sturdee Street into the Lower Hobson Street slip lane. Refer to Section 3.1.

- Servicing and loading management plan
  - A couple of updates as set out previously in Section 3.4 of our Transport Addendum report.

Reference: P:\PREP\002 Downtown Carpark redevleopment\ITA and reporting\Technotes\Fast Track Response\T12D260521 FTAA Panel Transport Response Final.docx

APPENDIX A SIDRA results

MOVEMENT SUMMARY

Site: 101 [Quay Street Service lane Access - AM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: Future Development Model)]

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	52	1.9	52	1.9	0.228	4.8	LOS A	10.7	76.1	0.32	0.48	0.32	39.9
9	R2	All MCs	37	2.7	37	2.7	0.228	15.9	LOS C	10.7	76.1	0.32	0.48	0.32	39.9
Approach			89	2.2	89	2.2	0.228	9.4	LOS A	10.7	76.1	0.32	0.48	0.32	39.9
East: Quay Street															
10	L2	All MCs	87	2.3	87	2.3	0.074	4.1	LOS A	6.4	55.2	0.00	0.39	0.00	44.7
11	T1	All MCs	545	11.6	545	11.6	0.274	0.0	LOS A	6.4	55.2	0.00	0.02	0.00	48.1
Approach			632	10.3	632	10.3	0.274	0.6	NA	6.4	55.2	0.00	0.07	0.00	46.1
West: Quay Street															
5	T1	All MCs	217	46.5	217	46.5	0.130	0.2	LOS A	0.6	5.1	0.04	0.05	0.04	37.4
6	R2	All MCs	102	2.0	102	2.0	0.130	4.8	LOS A	0.6	5.1	0.56	0.64	0.56	42.5
Approach			319	32.3	319	32.3	0.130	1.7	NA	0.6	5.1	0.21	0.24	0.21	42.2
All Vehicles			1040	16.3	1040	16.3	0.274	1.7	NA	10.7	76.1	0.09	0.16	0.09	43.2

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 [M - Social East - AM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: Future Development Model)]

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: M Social															
1	L2	All MCs	1	0.0	1	0.0	0.006	5.5	LOS A	0.1	0.4	0.57	0.61	0.57	19.4
3	R2	All MCs	1	0.0	1	0.0	0.006	13.2	LOS B	0.1	0.4	0.57	0.61	0.57	19.4
Approach			2	0.0	2	0.0	0.006	9.3	LOS A	0.1	0.4	0.57	0.61	0.57	19.4
East: Quay Street															
4	L2	All MCs	5	0.0	5	0.0	0.164	2.1	LOS A	1.6	12.4	0.00	0.01	0.00	38.4
5	T1	All MCs	593	10.8	593	10.8	0.164	0.0	LOS A	1.6	12.4	0.00	0.00	0.00	58.7
Approach			598	10.7	598	10.7	0.164	0.0	NA	1.6	12.4	0.00	0.00	0.00	57.4
West: Quay Street															
11	T1	All MCs	319	32.3	319	32.3	0.166	0.1	LOS A	0.1	0.6	0.02	0.02	0.02	56.8
12	R2	All MCs	5	0.0	5	0.0	0.039	5.8	LOS A	0.1	0.6	0.13	0.17	0.13	37.0
Approach			324	31.8	324	31.8	0.166	0.1	NA	0.1	0.6	0.02	0.02	0.02	55.7
All Vehicles			924	18.1	924	18.1	0.166	0.1	NA	1.6	12.4	0.01	0.01	0.01	55.7

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 [M - Social West - AM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: Future Development Model)]

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: M Social															
1	L2	All MCs	7	0.0	7	0.0	0.033	4.7	LOS A	0.5	3.7	0.55	0.68	0.55	15.9
3	R2	All MCs	5	0.0	5	0.0	0.033	10.9	LOS B	0.5	3.7	0.55	0.68	0.55	15.9
Approach			12	0.0	12	0.0	0.033	7.3	LOS A	0.5	3.7	0.55	0.68	0.55	15.9
East: Quay Street															
5	T1	All MCs	593	10.8	593	10.8	0.204	0.0	LOS A	6.4	49.0	0.00	0.00	0.00	59.9
Approach			593	10.8	593	10.8	0.204	0.0	NA	6.4	49.0	0.00	0.00	0.00	59.9
West: Quay Street															
11	T1	All MCs	320	32.2	320	32.2	0.166	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			320	32.2	320	32.2	0.166	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			925	18.1	925	18.1	0.204	0.1	NA	6.4	49.0	0.01	0.01	0.01	57.5

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 - AM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: Future Development Model)]

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	HV]	Arrival Flows [Total	HV]	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh.	Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Lower Albert St																
1	L2	All MCs	59	57.6	59	57.6	* 0.361	40.5	LOS D	2.3	24.1	0.92	0.76	0.92	10.4
Approach			59	57.6	59	57.6	0.361	40.5	LOS D	2.3	24.1	0.92	0.76	0.92	10.4
East: Quay St																
4	L2	All MCs	23	26.1	23	26.1	0.903	47.6	LOS D	29.9	220.4	1.00	1.15	1.31	17.9
5	T1	All MCs	573	5.2	573	5.2	* 0.903	42.8	LOS D	29.9	220.4	1.00	1.15	1.31	14.1
Approach			596	6.0	596	6.0	0.903	43.0	LOS D	29.9	220.4	1.00	1.15	1.31	14.2
West: Quay St																
11	T1	All MCs	217	29.5	217	29.5	0.225	8.9	LOS A	4.2	37.2	0.51	0.43	0.51	35.0
12	R2	All MCs	38	100.0	38	100.0	0.199	37.9	LOS D	1.4	18.4	0.89	0.73	0.89	13.0
Approach			255	40.0	255	40.0	0.225	13.2	LOS B	4.2	37.2	0.56	0.47	0.56	29.6
All Vehicles			910	18.9	910	18.9	0.903	34.5	LOS C	29.9	220.4	0.87	0.93	1.08	16.8

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	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE [Ped	Dist]	Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		ped	m			sec	m	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: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street AM (Network Folder: Future Development Model)]

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	0.942	72.8	LOS E	25.1	211.2	1.00	1.21	1.55	18.3
2	T1	All MCs	94	23.4	94	23.4	* 0.942	68.0	LOS E	25.1	211.2	1.00	1.21	1.55	19.1
3	R2	All MCs	300	33.3	300	33.3	0.942	68.4	LOS E	25.1	211.2	0.98	1.15	1.46	17.8
Approach			414	30.7	414	30.7	0.942	68.5	LOS E	25.1	211.2	0.98	1.17	1.48	18.2
East: Quay St															
4	L2	All MCs	525	8.2	525	8.2	0.795	36.1	LOS D	5.4	40.8	0.96	0.90	1.02	25.3
5	T1	All MCs	1	0.0	1	0.0	* 0.824	59.7	LOS E	4.3	37.0	1.00	0.98	1.44	6.1
6	R2	All MCs	75	28.0	75	28.0	0.824	62.4	LOS E	4.3	37.0	1.00	0.98	1.44	6.7
Approach			601	10.6	601	10.6	0.824	39.4	LOS D	5.4	40.8	0.96	0.91	1.08	23.0
North: Princes Wharf															
7	L2	All MCs	18	16.7	18	16.7	0.058	41.3	LOS D	0.7	5.9	0.85	0.69	0.85	8.4
8	T1	All MCs	67	13.4	67	13.4	* 0.766	58.1	LOS E	3.7	29.1	1.00	0.90	1.31	21.6
9	R2	All MCs	1	0.0	1	0.0	0.766	62.7	LOS E	3.7	29.1	1.00	0.90	1.31	9.5
Approach			86	14.0	86	14.0	0.766	54.6	LOS D	3.7	29.1	0.97	0.86	1.21	20.0
West: Quay St															
10	L2	All MCs	1	0.0	1	0.0	0.514	61.5	LOS E	1.9	14.5	1.00	0.75	1.05	9.0
11	T1	All MCs	1	0.0	1	0.0	* 0.514	57.0	LOS E	1.9	14.5	1.00	0.75	1.05	4.9
12	R2	All MCs	33	12.1	33	12.1	0.514	61.6	LOS E	1.9	14.5	1.00	0.75	1.05	20.1
Approach			35	11.4	35	11.4	0.514	61.5	LOS E	1.9	14.5	1.00	0.75	1.05	19.6
All Vehicles			1136	18.2	1136	18.2	0.942	51.9	LOS D	25.1	211.2	0.97	0.99	1.23	20.5

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 Hobson St											
P1	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	200	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 [Quay Street Service lane Access - PM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: Future Development Model)]

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	102	1.0	102	1.0	0.603	10.4	LOS B	5.5	38.8	0.59	0.55	0.85	32.6
9	R2	All MCs	79	0.0	79	0.0	0.603	31.8	LOS D	5.5	38.8	0.59	0.55	0.85	32.6
Approach			181	0.6	181	0.6	0.603	19.8	LOS C	5.5	38.8	0.59	0.55	0.85	32.6
East: Quay Street															
10	L2	All MCs	49	2.0	49	2.0	0.053	4.1	LOS A	0.9	8.6	0.00	0.33	0.00	45.2
11	T1	All MCs	426	16.0	426	16.0	0.215	0.0	LOS A	0.9	8.6	0.00	0.02	0.00	48.1
Approach			475	14.5	475	14.5	0.215	0.4	NA	0.9	8.6	0.00	0.05	0.00	46.6
West: Quay Street															
5	T1	All MCs	465	20.2	465	20.2	0.238	0.1	LOS A	1.0	8.2	0.03	0.04	0.03	41.1
6	R2	All MCs	44	2.3	44	2.3	0.072	3.9	LOS A	0.3	3.4	0.43	0.45	0.43	44.2
Approach			509	18.7	509	18.7	0.238	0.5	NA	1.0	8.2	0.07	0.07	0.07	43.5
All Vehicles			1165	14.2	1165	14.2	0.603	3.4	NA	5.5	38.8	0.12	0.14	0.16	37.7

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 [M - Social East - PM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: Future Development Model)]

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: M Social															
1	L2	All MCs	6	0.0	6	0.0	0.037	5.4	LOS A	0.1	0.9	0.60	0.67	0.60	18.1
3	R2	All MCs	5	0.0	5	0.0	0.037	16.3	LOS C	0.1	0.9	0.60	0.67	0.60	18.1
Approach			11	0.0	11	0.0	0.037	10.3	LOS B	0.1	0.9	0.60	0.67	0.60	18.1
East: Quay Street															
4	L2	All MCs	4	0.0	4	0.0	0.147	2.1	LOS A	1.6	12.4	0.00	0.01	0.00	38.4
5	T1	All MCs	524	13.2	524	13.2	0.147	0.0	LOS A	1.6	12.4	0.00	0.00	0.00	58.8
Approach			528	13.1	528	13.1	0.147	0.0	NA	1.6	12.4	0.00	0.00	0.00	57.6
West: Quay Street															
11	T1	All MCs	504	18.8	504	18.8	0.258	0.0	LOS A	0.0	0.5	0.01	0.01	0.01	58.4
12	R2	All MCs	4	0.0	4	0.0	0.036	5.4	LOS A	0.0	0.5	0.10	0.13	0.10	38.2
Approach			508	18.7	508	18.7	0.258	0.1	NA	0.0	0.5	0.01	0.01	0.01	57.8
All Vehicles			1047	15.7	1047	15.7	0.258	0.2	NA	1.6	12.4	0.01	0.01	0.01	54.5

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.

Organisation: FLOW TRANSPORTATION SPECIALIST LIMITED | Licence: NETWORK / 1PC | Processed: Tuesday, 12 May 2026 6:07:10 pm
Project: P:\PREP\002 Downtown Carpark redevleopment\Modelling\SIDRA\Development FTA\Downtown Carpark model_FTA 260512_Construction_Stage_0.sip9

MOVEMENT SUMMARY

Site: 101 [M - Social West - PM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: Future Development Model)]

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: M Social															
1	L2	All MCs	5	0.0	5	0.0	0.022	4.1	LOS A	0.3	2.0	0.52	0.61	0.52	16.3
3	R2	All MCs	3	0.0	3	0.0	0.022	12.0	LOS B	0.3	2.0	0.52	0.61	0.52	16.3
Approach			8	0.0	8	0.0	0.022	7.1	LOS A	0.3	2.0	0.52	0.61	0.52	16.3
East: Quay Street															
5	T1	All MCs	530	13.0	530	13.0	0.147	0.0	LOS A	6.3	49.0	0.00	0.00	0.00	59.9
Approach			530	13.0	530	13.0	0.147	0.0	NA	6.3	49.0	0.00	0.00	0.00	59.9
West: Quay Street															
11	T1	All MCs	504	18.8	504	18.8	0.335	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			504	18.8	504	18.8	0.335	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles			1042	15.7	1042	15.7	0.335	0.1	NA	6.3	49.0	0.00	0.00	0.00	58.4

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.
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: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: Future Development Model)]

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	109	37.6	109	37.6	* 0.424	39.1	LOS D	4.2	38.6	0.93	0.78	0.93	10.6
Approach			109	37.6	109	37.6	0.424	39.1	LOS D	4.2	38.6	0.93	0.78	0.93	10.6
East: Quay St															
4	L2	All MCs	5	20.0	5	20.0	0.654	32.7	LOS C	13.6	101.3	0.92	0.80	0.92	22.7
5	T1	All MCs	366	7.7	366	7.7	* 0.654	28.0	LOS C	13.6	101.3	0.92	0.80	0.92	18.7
Approach			371	7.8	371	7.8	0.654	28.0	LOS C	13.6	101.3	0.92	0.80	0.92	18.8
West: Quay St															
11	T1	All MCs	506	11.1	506	11.1	0.503	12.6	LOS B	11.7	89.8	0.67	0.59	0.67	31.1
12	R2	All MCs	38	100.0	38	100.0	0.186	36.8	LOS D	1.4	18.1	0.88	0.73	0.88	13.2
Approach			544	17.3	544	17.3	0.503	14.3	LOS B	11.7	89.8	0.68	0.60	0.68	29.2
All Vehicles			1024	16.0	1024	16.0	0.654	21.9	LOS C	13.6	101.3	0.80	0.69	0.80	22.5

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: 101 [Quay St / Lower Hobson St - PM (Site Folder: Future Development Model)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Quay Street PM (Network Folder: Future Development Model)]

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	0.898	59.3	LOS E	25.6	199.7	1.00	1.05	1.31	20.6
2	T1	All MCs	49	16.3	49	16.3	* 0.898	54.5	LOS D	25.6	199.7	1.00	1.05	1.31	21.5
3	R2	All MCs	404	21.0	404	21.0	0.898	57.0	LOS E	25.6	199.7	0.98	1.02	1.26	19.8
Approach			461	20.6	461	20.6	0.898	56.8	LOS E	25.6	199.7	0.98	1.03	1.27	20.0
East: Quay St															
4	L2	All MCs	508	12.6	508	12.6	0.569	31.6	LOS C	5.3	40.8	0.87	0.81	0.87	26.0
5	T1	All MCs	1	0.0	1	0.0	* 0.569	90.7	LOS F	5.2	40.8	0.98	0.80	0.98	7.6
6	R2	All MCs	24	16.7	24	16.7	0.569	93.5	LOS F	5.2	40.8	0.98	0.80	0.98	8.2
Approach			533	12.8	533	12.8	0.569	34.5	LOS C	5.3	40.8	0.87	0.81	0.87	25.4
North: Princes Wharf															
7	L2	All MCs	98	9.2	98	9.2	0.295	44.6	LOS D	4.4	33.1	0.90	0.77	0.90	7.9
8	T1	All MCs	69	13.0	69	13.0	* 0.681	57.6	LOS E	3.9	30.1	1.00	0.84	1.16	21.7
9	R2	All MCs	1	0.0	1	0.0	0.681	62.2	LOS E	3.9	30.1	1.00	0.84	1.16	9.5
Approach			168	10.7	168	10.7	0.681	50.1	LOS D	4.4	33.1	0.94	0.80	1.01	15.8
West: Quay St															
10	L2	All MCs	1	0.0	1	0.0	0.454	65.7	LOS E	1.3	9.8	1.00	0.72	1.02	8.6
11	T1	All MCs	1	0.0	1	0.0	* 0.454	61.2	LOS E	1.3	9.8	1.00	0.72	1.02	4.7
12	R2	All MCs	20	15.0	20	15.0	0.454	65.8	LOS E	1.3	9.8	1.00	0.72	1.02	19.3
Approach			22	13.6	22	13.6	0.454	65.6	LOS E	1.3	9.8	1.00	0.72	1.02	18.5
All Vehicles			1184	15.5	1184	15.5	0.898	46.0	LOS D	25.6	199.7	0.93	0.89	1.05	21.6

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 Hobson St											
P1	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		200	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.