

Beca Infrastructure Ltd report on the Golden Mile Restoration Project - Stage 4 Post Construction Safety Audit and Wellington City Council response



14 July 2011

1 Introduction

This report responds to the findings of a Post Construction Safety Audit (PCSA) carried out by Beca Infrastructure Ltd on the recently constructed Golden Mile improvement project. It should be noted that the works on Cuba Street were not complete at the time of the safety audit and construction of adjacent works was on-going while the audit team was on site.

This report specifically responds to issues identified within the project area as outlined in Section 2 of the Beca report. This is noting that all of the issues identified in that report were considered to be of sufficient importance to be reconsidered by the designers and addressed as appropriate. The report used the following priority ranking system.

Ranking system:

Serious concern	A major safety concern that should be addressed and requires changes to avoid serious safety problems
Significant concern	A significant concern that requires consideration of changes to improve safety
Minor concern	A safety concern of lesser significance, but which should be addressed as it may improve overall safety
Comment	A concern or an action that may be outside the scope of the Road Safety Audit, but which may improve overall design or be of wider significance.

In accordance with the Land Transport New Zealand guideline manual 'NZ Road Safety Audit Procedures for Projects', it should be noted that this audit is not to be regarded as a 'quality/design check' of the project. It is focused essentially on road safety issues that are worthy of further consideration in regard to the scheme.

For completeness and ease of use, the issues raised in the Beca report have been reproduced in the same order as they were raised in their report and WCC's response has been appended below.

2 Audit findings and recommendations

2.1 General

2.1.1 Speed environment

Comment

The posted speed limit changes between 30kmh and 50kmh at several places within the area of interest and the adjoining road network. On Willis Street the change occurred mid-block as shown in photo 1 below. The constantly changing speed limit does not appear to change at a point where there is any physical change in speed environment or that has any clear differentiation. These changes may appear random and unnecessary to drivers leading to unsafe and differential speeds in some areas.

Recommendation:

A clear rationale for posted speed limits for the surrounding environment should be presented as an area-wide strategy and this should be clearly identified to road users through signage and gateway measures.

Response:

The full length of the Golden Mile from Lambton Quay to Courtenay Place has a speed limit of 30kmh. The change from 50kmh to 30kmh was introduced from the Mercer Street/Willis Street intersection to Courtenay Place as part of the Golden Mile improvement project. All thresholds to this restriction have 30kmh signs and red markings on the carriageway. The signs and markings identified in this Willis Street location are the old threshold markings denoting the extent of the previous speed limit restriction. These signs and markings have been kept to reinforce and repeat the new speed restriction introduced as part of the Golden Mile scheme. They will however be removed in time to provide a consistent treatment of cordon signs and markings at speed limit change points.



Photo 1

2.1.2 Angled parking

Comment

The on-street parking using a variety of parallel and angled parking attempts to provide a self-managed speed environment whereby drivers slow down to let other motorists park and enter/exit parking bays as shown in photos 2 and 3. The expectation behind this is that drivers will act in the correct manner. We note that angled parking may lead to nose-to-tail accidents as a result of drivers reversing into the traffic stream.

Recommendation:

Driver behaviour can be unpredictable and the use of angled parking should be monitored to ensure there is no increased incidence of accidents.

Response:

This type of parking is typically used safely in similar situations across the city, where traffic speeds are low.



Photo 2



Photo 3

2.1.3 Environmental conditions – sun reflection

Minor

On the day of the audit the sun reflecting on a wet surface made the road markings very difficult to read and could confuse drivers into making unsafe manoeuvres.

Recommendation:

The road markings need to be finished with thermoplastic reflectorised marking and, where appropriate, alternative measures should be considered, such as raised paint markings.

Response:

Many of the inner-city road markings are marked in thermoplastic. Consistent with current practice other markings will be upgraded to thermoplastic including, in particular, any lane markings that may be subject to sun strike or would be difficult to discern in wet, dark conditions.

2.1.4 Bus lane operation

Minor

Operation of bus lanes normally allow for cyclists and motorcyclists to use them. The signs specifically state 'Buses Only' or 'Except Buses' as shown in photo 4, which excludes other users such as cyclists and motorcyclists. However, this could be open to misinterpretation and some cyclists may use these roads and put themselves in an environment that may be unsafe for them to operate.

Recommendation:

Consider the provision of signage to advise cyclists and motorcyclists where they are not permitted.

Response:

Many of the bus lanes along the Golden Mile are 'Bus Only' and when they are operating exclude cyclists, motor cyclists and other vehicles. This is because of the high number of buses and safety concerns if others were to use these lanes, which are predominantly contra flow. Lanes marked as 'Bus Lane' are available for cyclists, motor cyclists and other special vehicles, such as on Lambton Quay. Signs to inform these users have only been used outside the central city at this stage. The situation will be monitored and, if appropriate in the future, signs will be erected to advise users.



Photo 4

2.1.5 Cycle road markings

Comment

The use of cycle road markings is only provided at one location within the scheme. A general lack of cycle guidance was noted. The limited guidance provided does not give cyclists clear direction through the road network and may lead to inappropriate use. Photo 5 shows cycle markings provided.

Recommendation:

Consider developing guidelines to provide a consistent level of cycle provision within the scheme and on the surrounding road network within the city.

Response:

Provision for cyclists, particularly in the form of cycle stop boxes, is provided on the fringe of the Golden Mile and in the wider road network, eg the location shown in photo 5. Because of the constraint caused by tight road geometry and dispersed nature of cycling on inner city streets, no on-road cycle facilities are provided. As this project is on the core Golden Mile route there are, by design, no special cycle facilities.



Photo 5

2.1.6 Reflective signs

Minor

The night site visit revealed a number of signs that were not clearly visible in the dark, as indicated in photos 6 and 7. This was largely because they were not reflectorised. These included regulatory signs barring vehicles from bus lanes. This could lead to misuse of lanes and conflicts between buses and other vehicles.

Recommendation:

Check signs and, where appropriate, signs and backing should be replaced with approved reflective material.

Response:

All signs installed have been manufactured with approved reflective material. Signs will be checked and, where there is poor ambient light, signs will be upgraded to a higher grade of reflectivity.



Photo 6

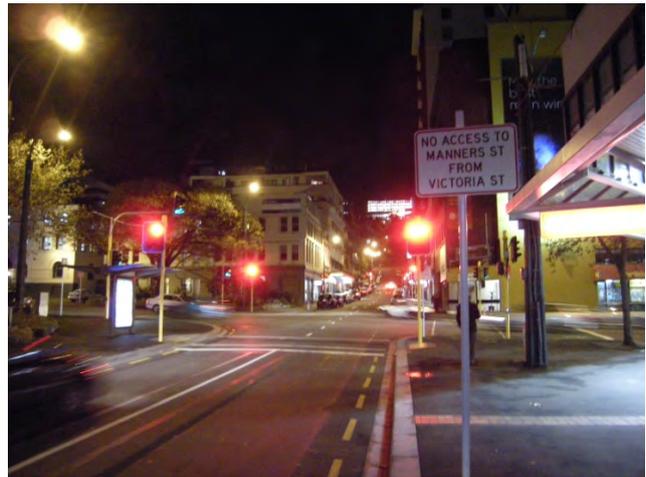


Photo 7

2.1.7 Sign poles

Comment

Part of the scheme has regulatory signs mounted on grey poles that detract from their visibility and could result in drivers not having sufficient time to observe, read and then act appropriately on the sign's message. The use of grey poles is shown in photo 8.

Recommendation:

Regulatory signs could be mounted on appropriately coloured poles consistent with the adjacent road network. Typically regulatory signs are mounted on white poles and traffic signals on yellow poles, ie Dixon Street signs are mounted on yellow poles, which give the appearance of being more visible.

Response:

To reduce visual clutter all poles have been painted blast grey. We see poles as primarily a vehicle to support signs and other traffic infrastructure. Similarly with traffic signals, we believe the lanterns are the primary message for motorists.



Photo 8

2.1.8 Speed limit road markings

Minor

The 30kmh speed limit is reinforced with road markings. In some areas a red surfacing has also been used in conjunction with the speed limit marking. The use of two different marking styles makes it difficult for road users to easily recognise the environment in which they are travelling and may lead to some confusion. 30kmh road marking on Willis Street is shown in photo 9.

Recommendation:

The road markings are a good way to reinforce the speed limit to road users. A consistent use of the style of marking is recommended to make it easier for road users to recognise the environment in which they are travelling and process and adapt to the information being presented.

Response:

Refer to 2.1.1 above.



Photo 9

2.1.9 Pedestrian behaviour

Significant

Observation of pedestrians on the day of the audit suggests that pedestrians in general are not attentive and do not look out for traffic. This may be a result of the complex environment in which they are held as they walk through the area. We note that the pedestrian-friendly environment (wide footpaths, slow-speed environment and bus-only areas) may result in pedestrians being less attentive to traffic and putting themselves in unsafe situations resulting in collisions with vehicles.

Recommendation:

The difference between pedestrian areas and the traffic areas within the scheme could be clearer with greater delineation. Public awareness of the traffic within the city should be heightened with an education campaign.

Response:

An extensive education campaign was undertaken as part of the scheme's introduction. This was in place for the first month with extensive media coverage, temporary signs both at eye level and on the ground and an active street campaign across the area. This was followed by a city-wide pedestrian campaign with special attention on the Golden Mile. Opportunities for additional signs and the strategic placement of street furniture will be taken as appropriate.

2.2 Victoria Street

2.2.1

Significant

Victoria Street has wide traffic lanes which appear to be out of context with a 30kmh speed limit, see photo 10. Traffic was observed to be travelling at higher speeds, which matched the environment but not the speed limit.

Recommendation:

The lanes should be narrowed with visual narrowing measures (such as narrower lane marking or threshold type signs) to provide an environment which matches the posted speed limit.

Response:

While in the past engineering works have been used to lower speed there is an increasing acceptance that speeds can be lowered using regulatory signage. This approach has been adopted by the Council as a more efficient means and, as such, threshold signs have been used on Victoria Street in advance of Manners Street to lower speeds through this intersection. This and other locations will be monitored to gauge the effectiveness of this approach over time.

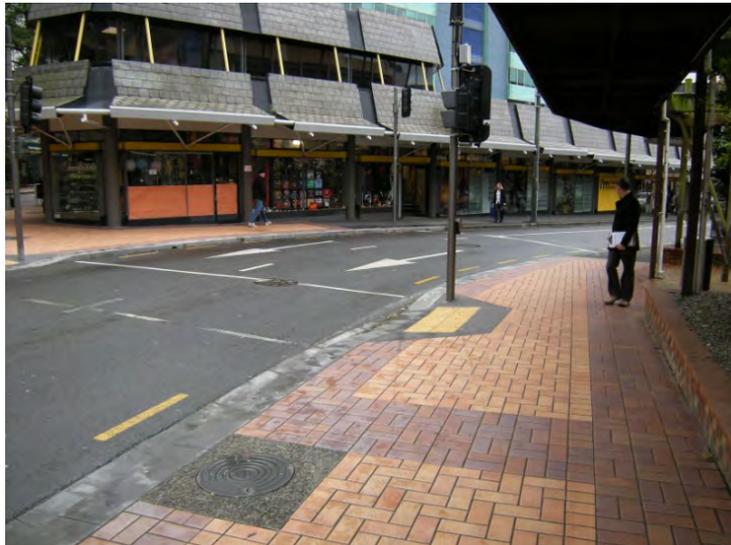


Photo 10

2.2.2

Minor

The exit from Edward Street onto Victoria Street is located adjacent to angle parking, where visibility to the left is obscured by parked vehicles, as shown in photo 11. The right-turn movement into the outside lane of oncoming vehicles is unsafe because of the lack of sight distance. In busy situations this observation would be more than minor, however, because of the low volume of traffic associated with the Edward Street exit. We consider this a minor issue.

Recommendation:

Remove parking adjacent to the exit or convert to motorcycle parking which can be less visually obstructive.

Response:

We are confident the parking arrangement is workable being similar to other situations across the city. The situation will be monitored and, if the concern raised is material, then an alternative parking arrangement will be explored.



Photo 11

2.2.3

Minor

The 'No Entry' sign on Victoria Street is located at a low level and angled such that traffic exiting Edward Street will find it difficult to see and respond to.

Recommendation:

Relocate the sign to a suitable location where it can be clearly visible for traffic on Victoria and Edward streets. Road markings/arrows could also be used to direct traffic to turn right when exiting Edward Street.

Response:

The 'No Entry' sign will be repositioned further out on the island so that it is more visible to northbound Victoria Street traffic. Additional road marking will be installed in Edward Street to reinforce that traffic exiting Edward Street must turn right.

2.2.4

Serious

The northbound lane on Victoria Street, between Dixon Street and Edward Street, is not wide enough for traffic to pass a vehicle parked in the short-term parking spot located in front of the model shop, without traversing into the opposing traffic lane. See photo 12.

Recommendation:

Remove parking area or adjust lane widths to provide minimum 2.8m clear lane width.

Response:

Road markings will be adjusted in this area to provide adequate clearance for all movements.



Photo 12

2.3 Victoria Street / Manners Street intersection

2.3.1

Minor

The no-left and no-right turn signs are not clearly visible because of their size and position as shown in photos 13 and 14.

Recommendation:

The size of the signs should be increased to either 450 or 600mm and the new signs located where they are clearly visible to road users.

Response:

The signs have been positioned on existing poles to minimise clutter and reduced in size to minimise obstruction to pedestrians. The effectiveness of the signs will be monitored and, if necessary, will be repositioned or increased in size as appropriate.

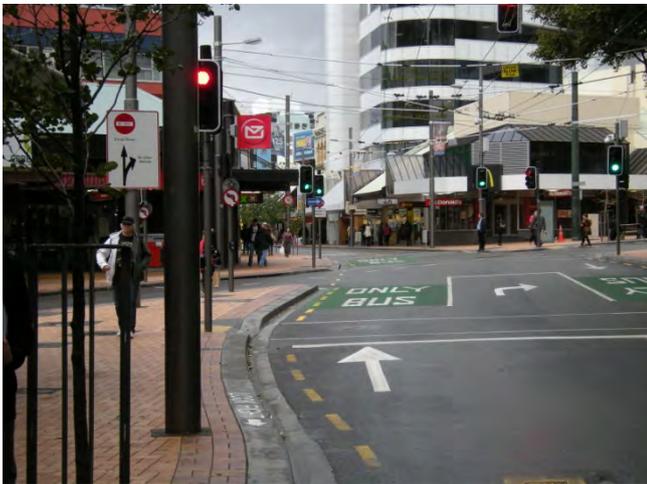


Photo 13



Photo 14

2.3.2

Minor

The 'No Entry' sign to Manners Street, situated west of the Victoria Street entrance, is poorly located and does not provide drivers with sufficient information to avoid entering restricted lane. See photo 15.

Recommendation:

The sign should be relocated to better inform drivers of the entry restriction.

Response:

The sign has been positioned on an existing pole to minimise clutter. The effectiveness of the sign will be monitored and, if necessary, repositioned as appropriate.



Photo 15

2.3.3

Significant

Continuity road marking lines and arrows pass through the pedestrian crosswalk area at the midblock signalised crosswalk adjacent to the intersection of Victoria and Manners streets. The limit line in advance of the pedestrian crossing is located away from the crossing point, see photos 16 and 17. The markings in this area were observed to cause some confusion as to where vehicles should queue and pedestrians cross.

Recommendation:

Remove continuity lines through pedestrian crossing area and consider revising the road markings for the pedestrian crossing and limit line to reduce possible confusion. Any changes will need to be in coordination with the signal pole location.

Response:

Some blacked out continuity lines and walk lines have reappeared through this intersection. These will be permanently removed and existing markings refreshed or marked in thermoplastic to avoid confusion.

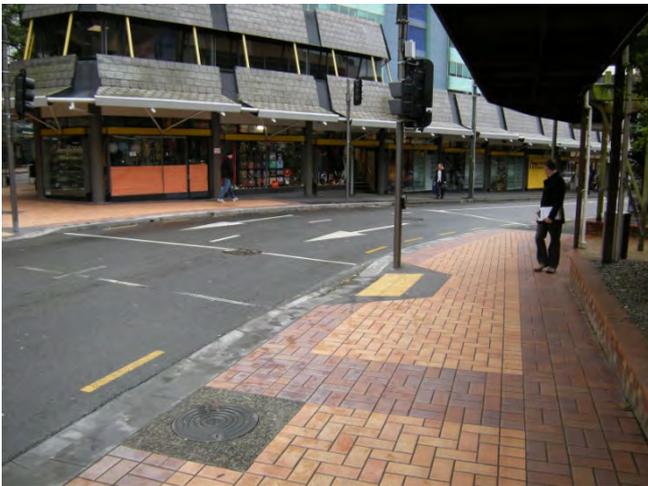


Photo 16

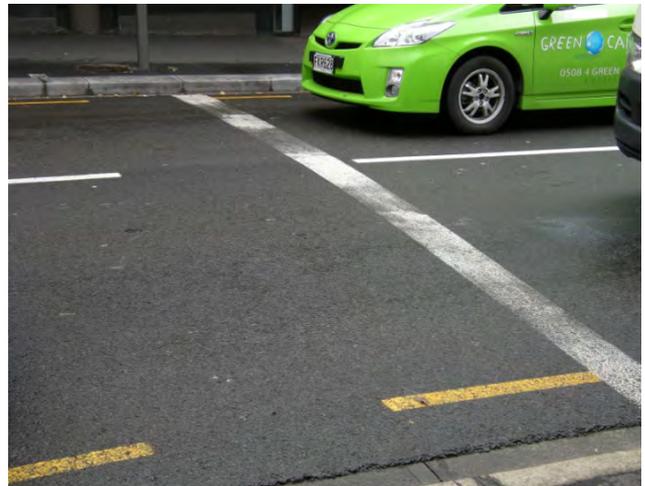


Photo 17

2.3.4

Significant

The Manners Street westbound traffic lane just immediately west of the Victoria Street intersection appears too narrow for buses. Buses were observed to track into the opposite lane as shown in photo 18. This could lead to head-on collisions. The lane width does not appear to match the 3.0m wide design indicated on drawing C116A.

Recommendation:

Check lane widths and correct to provide sufficient width for bus tracking.

Response:

The westbound bus lane is 3m wide through this area. The right-turn lane could be narrowed to achieve a wider westbound lane. This will be monitored and, if necessary, the lanes will be adjusted.



Photo 18

2.3.5

Minor

A number of occurrences were observed where buses on Manners Street, heading westbound from Victoria Street intersection, were found to block the pedestrian crossing on Manners Street on a green signal, making crossing hazardous, see photo 19.

Recommendation:

The amber phase timing on the signals should be sufficient to clear buses from the intersection and where necessary increased to eight seconds.

Response:

Sufficient phase time is given for buses to clear the intersection. There are incidences where upstream buses loading at the bus stop cause queuing back through the intersection thus impeding progress through the intersection.

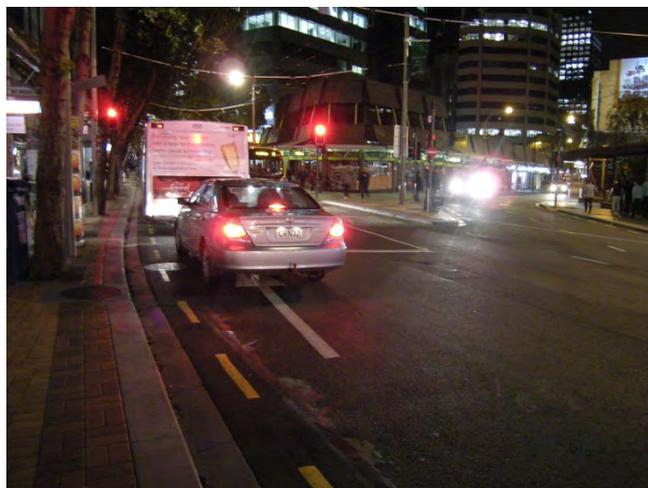


Photo 19

2.3.6

Minor

A dropped kerb crossing, north of Manners Street intersection, as shown on drawing C116A, has not been constructed. The crossing is in a busy area for pedestrians as shown in photos 20 and 21, and would be located on the pedestrian desire line along Manners Street. The lack of a dropped crossing point may result in trip accidents and does not provide for visually impaired users, wheelchairs or pushchairs.

Recommendation:

Consider installing the dropped kerb crossing as shown on the drawings.

Response:

Dropped crossings are provided in safe locations for the mobility impaired and not designed to cater for all pedestrians. In this situation the dropped crossing has been located in an area which provides a safe area to wait and is the shortest direct route across Victoria Street. It is also situated next to the northern stop line to serve the predominant desire line across Victoria Street for pedestrians approaching or departing to the northern end of Victoria Street. A dropped crossing is not necessary in the location identified across Victoria Street as this is merely an extension of the same crosswalk area, which provides a wider opportunity for pedestrians to cross in this area.



Photo 20



Photo 21

2.3.7

Minor

The 50kmh speed limit sign south of the Manners Street intersection, as shown in photo 22, has been rotated and is not clearly visible to motorists.

Recommendation:

Correct sign orientation to suit driver's sightline.

Response:

The sign will be reoriented to its correct position.



Photo 22

2.4 Victoria Street / Dixon Street intersection

2.4.1

Minor

The size and positioning of the no-right turn signs results in the signs not being clearly visible.

Recommendation:

The size of the signs should be increased to either 450 or 600mm and the new signs located where they are clearly visible to road users.

Response:

The positioning and size of the signs will be reassessed as part of 2.4.2 below.

2.4.2

Minor

The no-right turn manoeuvre into Victoria Street, except for access to Edward Street, is not obvious to drivers and the wordy signs add to confusion. See photos 23–25. Some irregular vehicle movements were observed with late lane changes occurring. The situation is made worse in the dark when the signs are less visible, because they are not reflectorised.

Recommendation:

Amend signage to give motorists sufficient warning and direction without being over elaborate. Consider removing the advance sign completely as it is redundant given the wording of the stop line sign, and consider relocating the stop line sign to the advance location.

Response:

The advance sign was designed to advise motorists who previously used the intersection of the change. This had some value during the transition but it is agreed that it can now be removed. This sign will be replaced by a repeat of the stop line sign and consideration given to increasing the reflectivity of it.



Photo 23



Photo 24

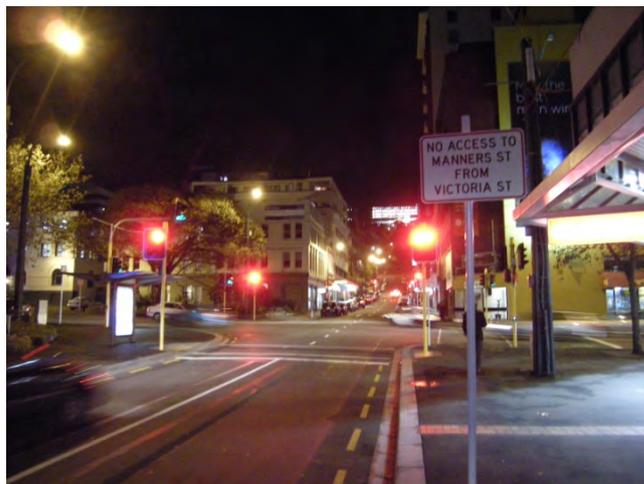


Photo 25

2.4.3

Minor

Advanced cycle boxes, as shown in photo 26, are marked on the Victoria Street approach across multiple lanes for straight-through traffic only. This could lead to cyclists in the outer lane mixing with other traffic, which may lead to cyclists being exposed and hit.

Recommendation:

Remove cycle box from outer lane (adjacent right-turn lane) and provide cycle box for right-turning cyclists.

Response:

A stop box will added to the right-turn pocket and the stop box will be removed from the middle through-lane as recommended.



Photo 26

2.5 Dixon Street

2.5.1

Comment

The 50kmh speed limit appears out of context with the adjacent speed environment. This may confuse other road users with pedestrians not expecting vehicles to be travelling at higher speed than in adjacent areas and may result in pedestrian conflicts.

Comment:

A consistent approach/strategy for setting the speed limits on the road network within Wellington City should be identified and be more recognisable to road users and part of a public education campaign.

Response:

The 50kmh restriction is required to denote the end of the 30kmh restriction that has been introduced along Manners Street as part of the 30kmh restriction along the Golden Mile. Streets that intersect with the Golden Mile need to have the restriction imposed in advance of the crossing point and closed again on the departure side of the intersection.

2.5.2

Comment

A number of street lights were not working at the time of the site visit making the environment less safe.

Comment:

The issue of working street lights is a maintenance issue that impacts on traffic and personal safety and should be addressed as part of Wellington City Council's routine maintenance.

Response:

Noted and the issue will be followed up as part of ongoing maintenance of street lighting.

2.6 Manners Street

2.6.1

Serious

Trees and street furniture (phone boxes/poles/poster bollards), as shown in photo 27, obscure visibility of pedestrians from eastbound traffic. A large number of 'Look Right' markings have been painted on the kerbs to warn pedestrians. However, several accidents have been recorded where pedestrians have been hit by buses. The lack of visibility of pedestrians may result in further pedestrians being struck.

Recommendation:

Ways to improve visibility of pedestrians should be considered. This could include removing selected items of street furniture or where sufficient width is available, relocating kerb edge to provide greater width to the footpath. Alternative measures may include eye-level warning signs or pedestrians being shepherded to crossing at formal crossing point(s) with the use of railings/fences.

Response:

This is recognised as an ongoing issue not only for Manners Street but the length of the Golden Mile. Any unnecessary obstructions that reduce visibility between pedestrians and vehicles will be removed. A more in-depth investigation of pedestrian activity along the Golden Mile is to be undertaken to better understand potential pedestrian conflict and to identify possible remedial measures.

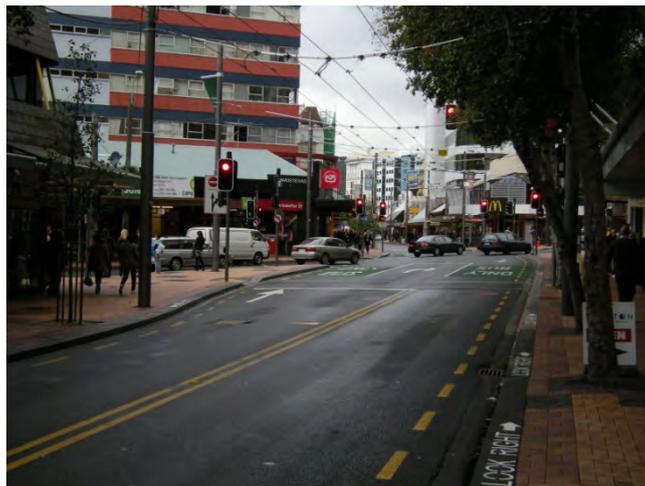


Photo 27

2.6.2

Significant

A number of pedestrian rails are located on the kerb at the east end of Manners Street. The railings are located close to the edge of the carriageway and do not provide sufficient clearance for cyclists who may shy away from the railings and veer into the path of vehicles attempting to overtake.

Recommendation:

Remove railings or provide set back to give 300mm clearance for cyclists.

Response:

These railings were installed as a temporary measure to raise pedestrian awareness on the introduction of the scheme. It is planned for these to be removed and replaced with bollards as appropriate.

2.6.3

Minor

A number of ACO drain covers in the footpath were observed to be loose and a potential trip hazard to pedestrians.

Recommendation:

The drain covers in the footpath should be checked to ensure they are secure and any loose covers repaired.

Response:

Any loose drain covers will be secured as part of ongoing maintenance of the footpath network.

2.6.4

Significant

An uncontrolled drop kerb pedestrian crossing and tactile pavers was observed on north side of Manners Street at the east end with no corresponding crossing point on the opposite side of the road, see photo 28. The opposite side of the road is also located in a bus stop area, which may be blocked by buses. This crossing in this area may misguide some pedestrians and place them in danger, (particularly the visually impaired).

Recommendation:

Consider removing or relocating the crossing point.

Response:

This is a redundant ramp that served mobility parking before the parking was removed as part of the scheme. Use of the ramp will be monitored and removed if it proves to be misleading to road users.



Photo 28

2.6.5

Minor

A service cover was observed to be missing from pit on west end of Manners Street. See photo 29. This situation is dangerous to pedestrians and road users who may trip in the area where there is live traffic.

Recommendation:

Replace missing lid.

Response:

The missing service cover will be replaced as part of ongoing maintenance of the road network.



Photo 29

2.7 Manners Street / Cuba Street intersection

Westbound traffic on Manners Street, excluding buses, is required to turn right into Cuba Street at a signal-controlled intersection. Traffic management for on-going works was in place at the time of the safety audit. The intersection has a number of conflicts that may contribute to unsafe operation as noted below:



Photo 30



Photo 31



Photo 32



Photo 33

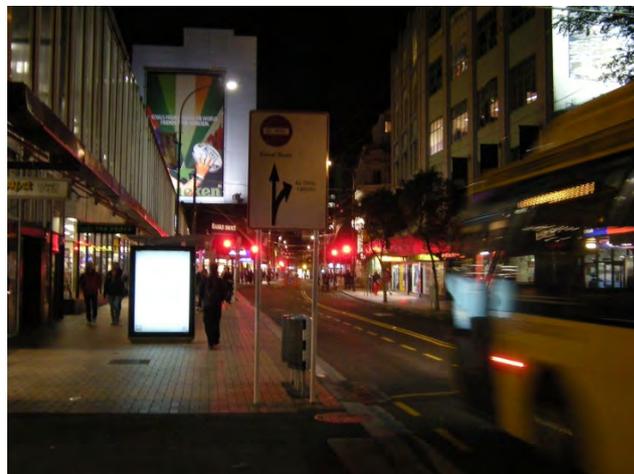


Photo 34

2.7.1

Minor

The road sign directing all traffic, other than buses, into Cuba Street is not clear and the text size makes it difficult to read. In addition, the sign is not reflectorised and is difficult to see at night. Refer to photo 34.

Recommendation:

Replace sign with clear directions, larger text and reflectorised surface material.

Response:

The sign has been positioned and sized to minimise clutter. The effectiveness of the signs will be monitored and, if necessary, will be increased in size and reflectivity increased as appropriate.

2.7.2

Minor

The pedestrian crossing has three call points, with the centre point located in the middle of the intersection, at the dropped kerb vehicle access, see photo 32 and 33. This places pedestrians and vehicles on the same piece of pavement and may lead to pedestrians being struck by motor vehicles.

Recommendation:

Consider using only two crossing signals and call points at the pedestrian crossing to make it simpler to use. The two outer call buttons will also shepherd pedestrians away from possible points of conflict with turning vehicles.

Response:

The crossing facilities at this intersection are seen as an extension of Cuba Mall. The third push button facility was provided to increase pedestrian amenity and reflect the desire for pedestrians to cross the full width of Cuba Street. The vehicle crossings are lightly trafficked with the southern side crossing only allowing service vehicles between 5am and 10am each day. While conflict exists it is well defined and speeds are low. The situation will be monitored and adjustments made as appropriate.

2.7.3

Significant

Pedestrians traversing Cuba Street on the footpath are confronted with vehicles turning right on the green signal from Manners Street as shown in photos 31 and 32. There is no control for pedestrians and it is not clear who has priority, which would greatly increase the possibility for pedestrians being hit.

Recommendation:

Add road/footpath markings clear from the edge of Manners Street to advise pedestrians that they are entering a shared-use zone (including the 'driveway-style' vehicle crossing).

Response:

This entry has been designed as a vehicle access rather than a roadway and the use of materials reflects this. Vehicles are ramped up onto the footpath and together with the change in material both vehicles and pedestrians are alerted to a change in environment. Again while we expect some interaction between pedestrians and vehicles this can be managed within the constraints imposed by the low-speed environment. The intersection will continue to be monitored and if opportunities arise to improve the situation then these will be taken as appropriate.

2.7.4

Minor

The right-turn bay and road markings are located in the middle of the intersection and are only long enough for one small vehicle. See photos 30–32. The purpose of the right-turn bay is to allow buses to pass on the left and avoid congestion while other traffic negotiates pedestrians. There is potential for a vehicle to get trapped in the intersection, obstruct pedestrians and make crossing hazardous.

Recommendation:

The operation of the intersection should be monitored over time to check it operates safely.

Response:

Because of the constraints of the intersection a right-turn bay could not be provided. The turn pocket has been provided and marked as a clear indication of where a vehicle can safely wait to provide unimpeded passage for buses until there is a turning opportunity within the phase. It is expected because of the lower volume of traffic, the facility will be adequate for this purpose. While there will be interaction between pedestrians and vehicles, entry to the street by turning vehicles will be carried out in a controlled environment, at low speeds, where the intention of all users is clear. The intersection will continue to be monitored and if opportunities arise to improve the situation then these will be taken as appropriate.

2.8 Cuba Street

2.8.1

Comment

Cuba Street was under construction at the time of the audit and has not been considered as part of the audit.

However, the intersections of Cuba Street with Manners Street and Cuba Street with Wakefield Street have been substantially completed and are covered under the relevant intersection in this report.

Response:

Noted.

2.9 Dixon Street / Cuba Street intersection

2.9.1

Minor

The pedestrian crossing has three call points, with the centre call point located in the middle of the intersection. This requires 6 poles for signals and adds to clutter at this location. See photo 35 and 36. The crossing furniture would appear excessive and may be hazardous to users.

Recommendation:

Consider using only two crossing signals and call points at the crossing to make simpler to use and avoid possible confusion.

Response:

The crossing facilities at this intersection reflect the fact that they service Cuba Mall. The third push-button facility was provided to increased pedestrian amenity. This reflects the desire and provides the convenience for pedestrian to cross from the full width of Cuba Street.

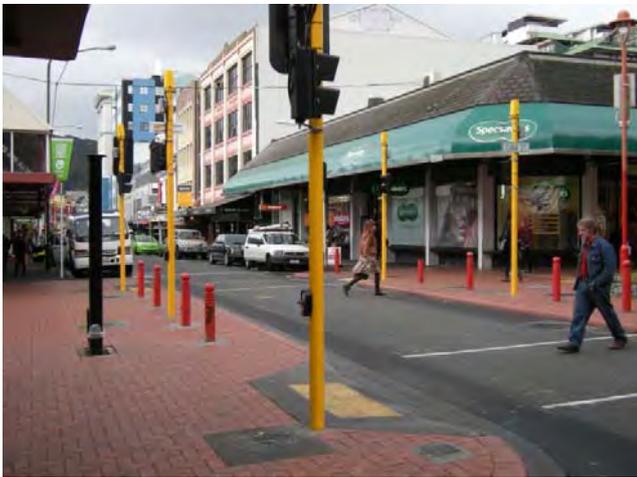


Photo 35



Photo 36

2.10 Willis Street

2.10.1

Minor

The 30kmh speed limit sign on the east side of Willis Street has been rotated and is not clearly visible to motorists. Refer to photo 37.

Recommendation:

Correct sign orientation to suit driver's sightline.

Response:

The 30kmh sign will be reoriented so that it is visible.



Photo 37

2.10.2

Comment

The street lighting on Willis Street is not consistent with the adjacent scheme with some old poles and lanterns still in place. See photo 38. The lighting level differs from the adjacent network and makes it more difficult for drivers to read their environment and make judgements.

Comment:

A future consideration may include removing old street lights and replacing with new furniture.

Response:

Only the east side of Willis Street, between Mercer Street and Manners Street, was upgraded within the scope of this project. It is planned that the rest of Willis Street be similarly upgraded in the near future. At that time the street lighting will be upgraded to provide consistent lighting patterns in the street.



Photo 38

2.11 Willis Street / Manners Street / Boulcott Street intersection

2.11.1

Minor

Traffic from Boulcott Street is confronted with a large number of traffic signal aspects to observe, located at the end of Manners Street. Straight-through traffic to Manners Street is only given a green signal at certain unrestricted times during the day. The road sign detailing the restriction is small and difficult to read and may result in some confusion to road users possibly waiting for the straight-through green signal during bus-only times. The intersection arrangement is shown in photos 39–44.

Recommendation:

The road sign with details of restriction should be larger and more informative. At the time of the audit, traffic was observed to operate safely. This intersection arrangement should be monitored to assess its safety performance.

Response:

The sign observed is positioned at the intersection and complements other information available to the motorist at this intersection. In advance of this sign there is one on Boulcott Street to give motorists advanced warning of the prohibition on general traffic in Manners Street during business hours. As suggested the effect of the signs will be monitored and improvements made as appropriate.



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43



Photo 44

2.12 Willis Street / Mercer Street intersection

2.12.1

Comment

The road markings at the pedestrian crossing were not complete at the time of the audit and have not been included in this report.

Comment:

The road marking for this arrangement should be reviewed on completion of the current works to ensure they are not ambiguous or potentially unsafe.

Response:

The road markings have been checked and are fit for purpose and safe.

2.13 Mercer Street

2.13.1

Minor

Old road-marking lines at the end of Mercer Street, near Willis Street, are still visible and confuse the new arrangement. See photo 45.

Recommendation:

Remove old road markings.

Response:

All redundant road markings will be removed.



Photo 45

2.13.2

Minor

Motorcycle parking is provided at the end of Mercer Street next to the intersection with Willis Street. The proximity of the parking next to the intersection with Willis Street may lead to accidents. Vehicles turning into Mercer Street, may strike motorcycles as they weave to the parking bay. This is a busy intersection where room to manoeuvre is limited and visibility could be obstructed.

Recommendation:

Consider moving parking a safe distance away from the intersection.

Response:

The motorcycle parks will be monitored and if found unsafe they will be removed as suggested.

2.13.3

Minor

A painted ghost island has been marked between the parked cars and the traffic lane as shown in photo 46. The function of this island is not clear and may lead to misunderstanding when entering/existing parking and pedestrians crossing behind the cars.

Recommendation:

Review placement of ghost island after suitable period and remove if found to contribute to unsafe use.

Response:

The ghost island shadowed previous parking in the area and did not cause any problems. However the marking will be monitored and, if unsafe, removed as suggested.



Photo 46

2.14 Wakefield Street

2.14.1

Minor

The hatched area at the east end of Wakefield Street, as shown on drawing C117A, near the intersection with Taranaki Street, was not constructed. Instead, parking has been provided close to the intersection. This parking may interfere with turning traffic.

Recommendation:

Monitor the intersection and, if a problem is identified as a result of the proximity of parking to the intersection, remove the extra parks.

Response:

The car parks will be monitored and if found unsafe they will be removed as suggested.

2.15 Wakefield Street / Cuba Street intersection

2.15.1

Minor

The size and positioning of the no-right turn and no-entry signs results in the signs not being clearly visible to motorists. See photos 47–49.

Recommendation:

The size of the signs should be increased to either 450 or 600mm and the new signs located where they are clearly visible to road users.

Response:

The signs have been positioned on existing poles to minimise clutter. Their size has been reduced to minimise any obstruction to pedestrians. The effectiveness of the signs will be monitored and, if necessary, will be repositioned or increased in size as appropriate.



Photo 47



Photo 48



Photo 49

2.15.2

Minor

The limit line on Cuba Street is located close to the edge of Wakefield Street where vehicles would wait at the traffic signals, as shown in photo 50. The location of vehicles waiting at the traffic signals and the location of landscaping features on Cuba Street may block pedestrians trying to traverse Cuba Street on the footpath. There is no control for pedestrians and it is not clear who has priority. This increases the possibility of a pedestrian being hit, however, the final layout has not yet been constructed and may address these concerns.

Recommendation:

Set back the limit line from the edge of Wakefield Street to provide walking space for pedestrians.

Response:

The limit line has been positioned against the Wakefield Street kerb-line to minimise conflict between motorists and pedestrians. It is accepted that motorists waiting in this position will restrict pedestrian movement but when they move off on a green signal they will not be running against unsuspecting pedestrians. Similarly pedestrians are aware that they are crossing among cars and are less likely to be surprised when vehicles start moving around them. If, as may seem logical, vehicles are held back then pedestrians may feel lured into a false sense of security and will more likely be surprised when vehicles advance toward them on a green vehicle phase. There may also be some tendency for drivers to instinctively move forward assuming right of way when they see the green signal. This may lead to inattentive drivers not being aware of pedestrians, which is seen as more problematic if motorists are held back.



Photo 50

2.15.3

Minor

The exit from Cuba Street is at the narrow section of Wakefield Street where a kerb build-out has been constructed. This is normally associated with traffic calming measures and not with an intersection. See photos 51 and 52. Traffic turning left out of Cuba Street is required to track over the opposite lane to make the turn. This manoeuvre would be more pronounced for larger vehicles which have to negotiate poles placed close to the intersection.

Recommendation:

It is proposed to monitor the intersection performance and consider a more conventional treatment if found to be unsafe.

Response:

Wakefield Street has been narrowed through the intersection to improve pedestrian amenity and to create a stronger pedestrian connection between Cuba Mall and the Civic Centre. Vehicles leaving Cuba Street do so under their own phase. There is therefore no problem if vehicles track wider when turning to leave the street. However the situation will be monitored and changes made if required.

Concern is noted as minor at this stage but this could be raised if monitoring shows the layout to be unsafe.



Photo 51



Photo 52

2.15.4

Minor

Old road markings on Wakefield Street are visible at the intersection with Cuba Street and make lane positioning difficult. See photo 53.

Recommendation:

Remove redundant markings.

Response:

All redundant road markings will be removed.



Photo 53

2.16 Taranaki Street / Dixon Street / Manners Street intersection

2.16.1

Minor

Northbound traffic approaching the intersection wishing to turn left on to Dixon Street and Manners Street is confronted with separate signal/lane markings for the two turns. The traffic signals give two different arrows, which is not normal practice and potentially confusing to motorists and lead to unsafe manoeuvres.

Recommendation:

Review signal arrangement after suitable period and, if found to be unsafe, consider more traditional signals options.

Response:

The arrow displays for both road lanes and traffic signal displays were designed to differentiate between the two left-hand exits to Dixon Street and Manners Street. These displays will be monitored and, if not effective, more conventional markings and displays will be used as suggested.

2.16.2

Minor

Westbound traffic approaching the intersection is confronted with a split arrow for traffic travelling straight to either Dixon Street or Manners Street. The arrows do not easily lead drivers to where they want to go and may direct them to the wrong road and lead to late lane-change decisions.

Recommendation:

Consider further signage to guide motorists onto Dixon Street and Manners Street.

Response:

Signs were considered to complement the lane marking in this area but discarded because it would add unnecessary street clutter when the value of a sign at this location was questionable. Instead it is planned to change the middle through-lane double arrow with a conventional straight-through arrow. This is expected to also minimise the tendency for some drivers to use this middle through-lane as a right-turn lane causing conflict with other users of the lane under the phasing arrangement of the intersection. Again these changes will be monitored and further changes made as appropriate.

2.16.3

Minor

There are a number of continuity lines through the intersection that confuse some turning movements. The exits should be clear to drivers from the line markings in advance of the intersection, traffic signals, direction signs (where present) and road signs. Any added confusion leads to unsafe operation.

Recommendation:

The number of continuity lines should be minimised through the intersection.

Response:

The use of continuity lines through this intersection will be reviewed. Any unnecessary lines will be removed.

Appendix A

Drawings used in audit

220292 - C111 - A

220292 - C112 - A

220292 - C116 - A

220292 - C117 - A