
Barton Street, Barangaroo

Road Safety Audit

Detailed Design Stage

22nd September 2020

JN21019_Report01 Rev02 - JMT Barton

On Behalf of

Infrastructure NSW



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NSW RSA Register Details

Final Signoff Date	22/09/2020
Title of Audit	Barton Street, Barangaroo
Location of Audit	Barangaroo
Project Description	The aim of this project is to allow all vehicles to use Barton Street in Barangaroo, Sydney (as currently approved as a temporary construction road for construction vehicles under the REF determined by INSW)
Purpose of Audit	The aim of this Road Safety Audit (RSA) is to consider the operation of Barton Street for use by all vehicles, taking into account the existing conditions, and the interface between Barton Street and the intersection of Hickson Road and Watermans Quay with priority control.
State of Audit	NSW
Stage of Audit	Detailed Design Stage
Client Company	Infrastructure NSW
Client Contact	Josh Milston
Client Phone	0415 563 177
Client Email	josh.milston@jmtconsulting.com.au
Audit Team Lead	Aaron Walton
Audit Team Member	Jose Villacorta

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1 Project Description

The aim of this project is to allow all vehicles to use Barton Street in Barangaroo, Sydney (as currently approved as a temporary construction road for construction vehicles under the REF determined by INSW).

The aim of this Road Safety Audit (RSA) is to consider the operation of Barton Street for use by all vehicles taking into account the interface between Barton Street and the intersection of Hickson Road and Watermans Quay with priority control.

2 Study Area

The general audit location is shown below.



Source – snazzymaps.com

3 Auditable Data

The following data was referenced during the audit:

- > Hickson Road Interim Alignment Two – Siteworks Plan
 - Rev 03 – 15/09/2020

4 Audit Stage

A Concept Design Stage Audit was carried out during a desktop assessment of the concept design plan on 21st September 2020. A site visit was carried out on 4th September 2020. A previous Concept Design Stage Audit (JN20043_Report01 Rev04 - Lendlease Barton) had been undertaken by the design team on 17th March 2020 including the desktop assessment of the concept design plans and site visit of the proposed works.

The audit was generally undertaken in accordance with 'TNSW Guidelines for Road Safety Audit Practices (2011)' and 'Austroads: Guide to Road Safety Part 6 and Part 6a (2019)'.

5 Exclusions

At the time of the audit no exclusions were presented to the audit team.

6 Audit Team

The audit team and client details are shown below.

Table 6-1 Audit Team & Client Details

Role	Name
Client (Sponsor)	Infrastructure NSW
Client Contact	Chris Courtenay
Client Email	christopher.courtenay@lendlease.com
Lead Auditor	Aaron Walton RSA-02-0501 - Level 3 Auditor
Lead Auditor Email	admin@amwc-rsa.com
Team member	Jose Villacorta RSA-02-0805 - Level 3 Auditor

7 Audit Program

The audit program details are shown below.

Table 7-1 Audit Program

Activity	Date	Notes
Opening Meeting	17/09/2020	Aaron Walton, Josh Milston
Site Inspection	17/03/2020 04/09/2020	Aaron Walton, Jose Villacorta
Completion Meeting	22/09/2020	Aaron Walton, Josh Milston
Final Report	22/09/2020	RSA Report Rev01 – Issue for comment
Final Report	22/09/2020	RSA Report Rev02 – Issue for responses

8 Audit Risk Assessment Technique

For each of the safety issues identified, the level of risk with each has been determined. The tables below are extracted from Austroads: Guide to Road Safety Part 6 and Part 6a (2019) and have been used in the assessment of risk for this audit.

Table 8-1 Incident Frequency

Frequency	Description
Frequent	Once or more per week
Probable	Once or more per year
Occasional	Once every five or ten years
Improbable	Less often than once every ten years

Table 8-2 Incident Severity

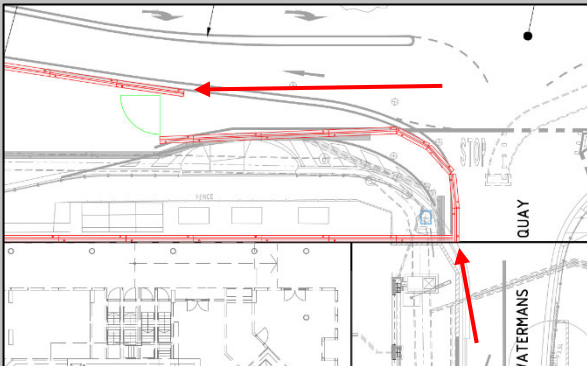
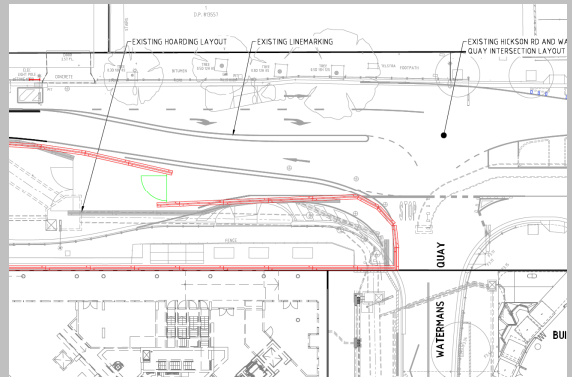
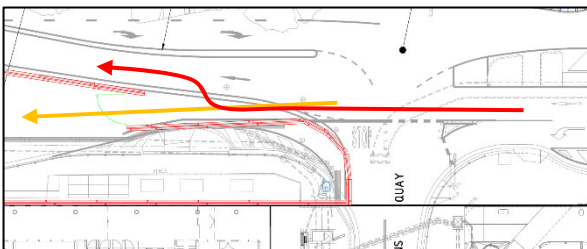
Severity	Description	Examples
Catastrophic	Likely multiple deaths	<ul style="list-style-type: none"> > High-speed, multi-vehicle crash on freeway. > Car runs into crowded bus stop. > Bus and petrol tanker collide. > Collapse of bridge or tunnel.
Serious	Likely death or serious injury	<ul style="list-style-type: none"> > High or medium-speed vehicle/vehicle collision. > High or medium-speed collision with a fixed roadside object. > Pedestrian or cyclist struck by a car.
Minor	Likely minor injury	<ul style="list-style-type: none"> > Some low-speed vehicle collisions. > Cyclist falls from bicycle at low speed. > Left turn rear-end crash in a slip lane.
Limited	Likely trivial injury or property damage only	<ul style="list-style-type: none"> > Some low-speed vehicle collisions. > Pedestrian walks into object (no head injury). > Car reverses into post.

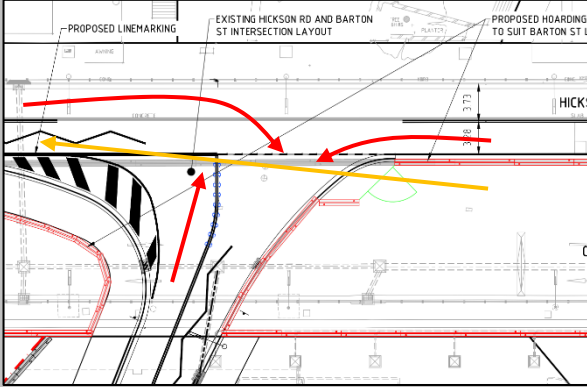
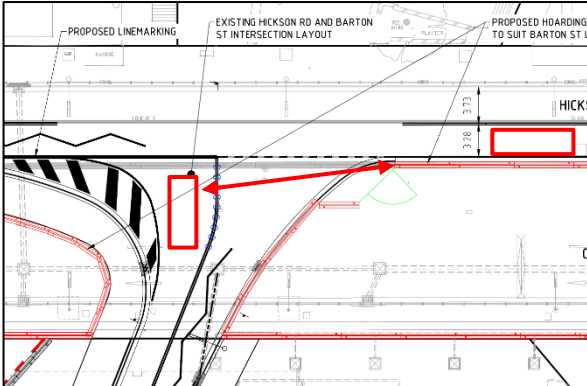
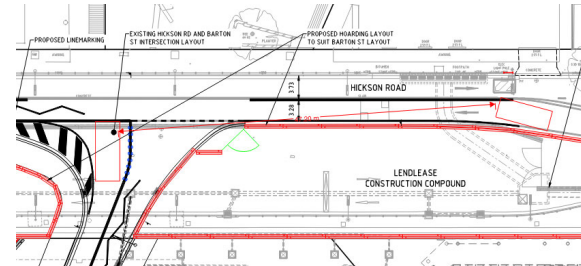
Table 8-3 Resulting Level of Risk Matrix

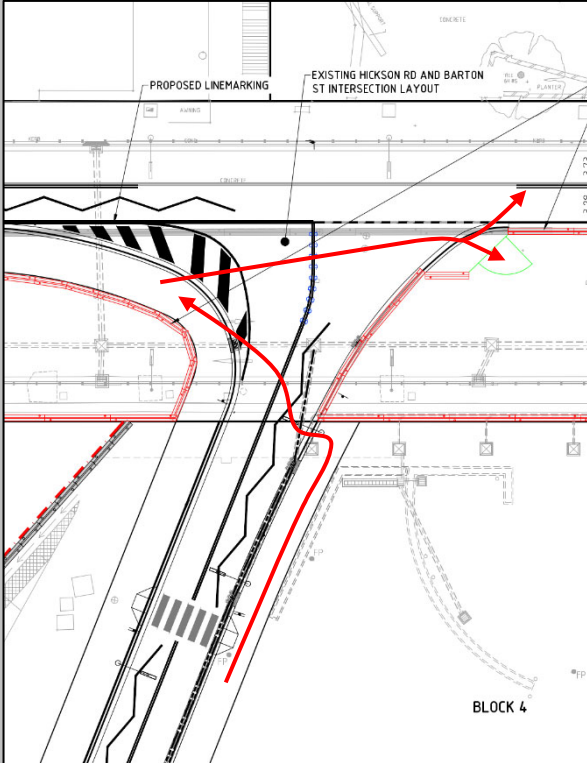
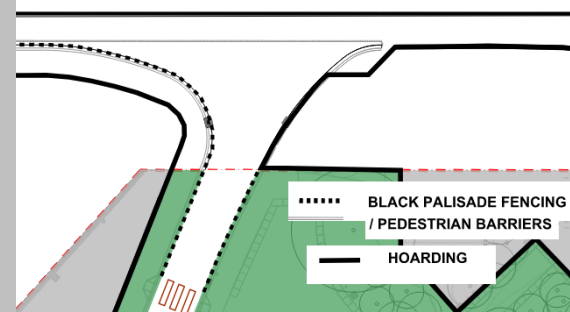
	Frequent	Probable	Occasional	Improbable
Catastrophic	Intolerable	Intolerable	Intolerable	High
Serious	Intolerable	Intolerable	High	Medium
Minor	Intolerable	High	Medium	Low
Limited	High	Medium	Low	Low

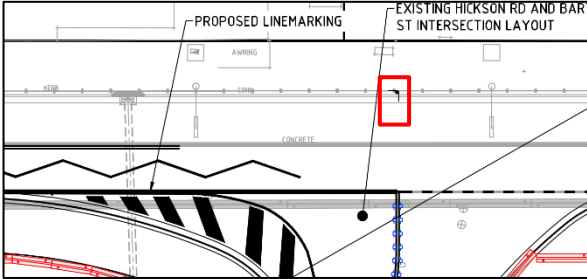
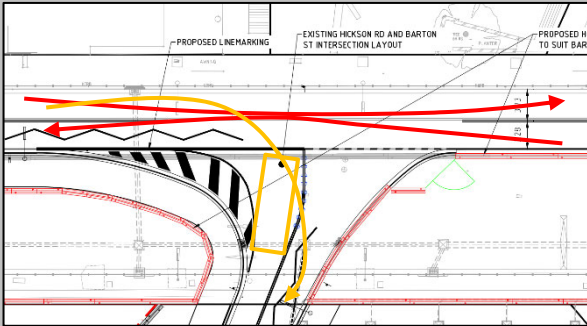
9 Audit Findings

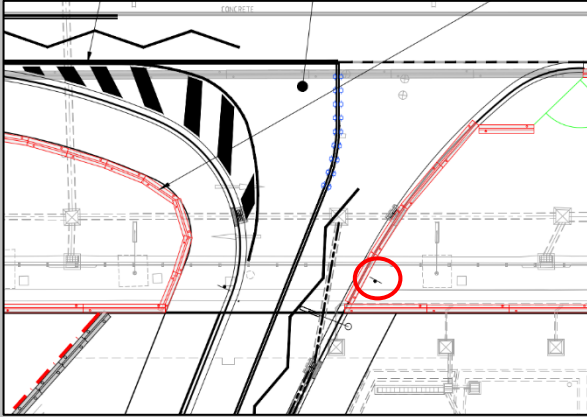
Table 9-1 Audit Findings

Item	Safety Hazard Finding	Frequency	Severity	Level of Risk	Project Manager Response
1. Hoarding/Barrier Terminals	<p>There are hoarding/barrier terminals in the clearzone of the travel lane.</p> <p>There is a risk that an errant vehicle may impact the blunt end of a hoarding/terminal resulting in injury to vehicle occupants.</p> 	Occasional	Serious	High	<p>This has been addressed with adjustment to hording to include taper and separation from Hickson Road travel lane as per the recommendation of the Road Safety Audit, as indicated below</p> 
2. Following Vehicles	<p>There is a construction access in line with the through carriageway.</p> <p>There is a risk that a motorist may follow a construction vehicle into the access point before undertaking sudden manoeuvres to enter back into the travel lane resulting in sideswipe collisions.</p> 	Improbable	Minor	Low	<p>This will be managed through clear signage and traffic control.</p>

Item	Safety Hazard Finding	Frequency	Severity	Level of Risk	Project Manager Response
3. Vehicle Exit	<p>There is a construction exit at the kerb return of an intersection.</p> <p>There is a risk that a motorist (northbound, southbound, eastbound, or turning) may not sight an exiting construction vehicle resulting in side impact or sideswipe collisions.</p> 	Probable	Minor	High	Traffic controller at this location to ensure vehicles exit safely. Construction vehicles will only be instructed to depart the gate by traffic controllers when there is no oncoming traffic on Barton Street and is safe to do so.
4. Sight Distance	<p>There is hoarding restricting the sight distance between a northbound motorist on Hickson Road and a motorist exiting Barton Street.</p> <p>There is a risk that motorists may not have sufficient sight distance to avoid a collision between turning vehicles resulting in side impact or rear end collisions.</p>  	Probable	Minor	High	Driver behaviour will be on high alert with the presence of traffic controller, construction hoarding and signage. Advanced warning signage will be included to address sight line. The sight line to the intersection is beyond the hoarding line and deemed acceptable.

Item	Safety Hazard Finding	Frequency	Severity	Level of Risk	Project Manager Response
5. Pedestrian Access	<p>There is pedestrian access proposed beyond the pedestrian crossing point, with no safe pedestrian route provided.</p> <p>There is a risk that a pedestrian may continue past the pedestrian crossing and enter the travel lanes resulting in a pedestrian-vehicle collision.</p> <p>There is a risk that a pedestrian may continue south along Hickson Road entering the construction access or walking around the proposed hoarding on Hickson Road resulting in a pedestrian-vehicle collision.</p> 	Occasional	Serious	High	<p>Pedestrian barriers to be in-place to prohibit pedestrian movements at this location in line with the recommendation of the Road Safety Audit, as indicated below</p> 

Item	Safety Hazard Finding	Frequency	Severity	Level of Risk	Project Manager Response
6. Street Signage	<p>There is a sign proposed on the eastern extent of the intersection that hangs into the travel lane.</p> <p>There is a risk that a vehicle may impact overhanging signage resulting in vehicle damage.</p> <p>There is a risk that a motorist may swerve to avoid a sign resulting in head on collisions with oncoming vehicles.</p> 	Occasional	Limited	Low	Noted as a low risk. Deemed acceptable.
7. Centre Linemarking	<p>There is a long section on Hickson Road with no centreline provided.</p> <p>There is a risk that insufficient centre line delineation may reduce lane discipline resulting in sideswipe or head on collisions.</p> <p>There is a risk that vehicles turning right onto Barton Street may clash with holding vehicles off Barton Street.</p> 	Improbable	Limited	Low	Noted as a low risk. Deemed acceptable.

Item	Safety Hazard Finding	Frequency	Severity	Level of Risk	Project Manager Response
8. Speed Zones	There are no speed limit signs shown. There is a risk that motorists may travel at a higher speed than the design allows for, including construction setups and the speeds expected by construction workers, increasing the frequency and severity of crashes.	Improbable	Minor	Low	This will be managed through clear signage.
9. Signage	There is no signage provided on the plans. There are signposts shown but it is unclear to the audit team of the proposed sign face. In particular, there is no intersection priority signage shown in close proximity to the intersection hold line, and there is a sign shown inside of the hoarding. No further assessment has been carried out.	Note			This will be managed through clear signage.
					
10. Turn Restrictions	There are no turn restrictions provided for vehicles on Hickson Road entering Barton Street. It is unclear to the audit team of the proposed design vehicle or check vehicle. No further assessment has been carried out.	Note			This will be managed through clear signage and linemarking.

10 Formal Statement

We, the undersigned, declare that we have reviewed the site and data listed in this report and identified the safety and operational deficiencies above.

It should be noted that while every effort has been made to identify potential safety hazards, no guarantee could be made that every deficiency has been identified.

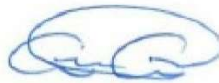
A project sponsor is under no obligation to accept the findings outlined in this audit report. This report simply provides the opportunity to review potential safety issues highlighted by the auditors.

This audit will be recorded on the NSW Register of Road Safety Auditors and the project sponsor should expect email notification from the register to confirm the audit has been carried out.

We recommend that points of concern be investigated, and necessary corrective actions undertaken.



Aaron Walton
Level 3 Road Safety Auditor
Team Leader



Jose Villacorta
Level 3 Road Safety Auditor
Team Member