

Pedestrian and Cyclist Network and Facilities Strategy: Addendum

Supply, Operate, Maintain (SOM) Package

Parramatta Light Rail – Stage 1

May 2021

PLR1SOM-GLR-ALL-PE-PLN-001003 Rev 0



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Document control

Version status

Revision	Date	Description	Reviewer / Approver
A	16/11/2020	Draft for TfNSW and ER Review	
B	19/01/2020	Updated to address TfNSW comments	
0	11/05/2021	Updated to reflect consultation	

Glossary / Abbreviations

Abbreviations	Expanded text
CoA	Conditions of Approval
CoPC	City of Parramatta Council
DPIE	Department of Planning, Industry and Environment
GRCLR	Great River City Light Rail
LRV	Light Rail Vehicle
PCPLR	Parramatta Connect Parramatta Light Rail
PLR	Parramatta Light Rail
RMS	NSW Roads and Maritime Services
SOM	Supply, Operate and Maintain
TfNSW	Transport for NSW

1 Introduction

1.1 Context and Scope

This Addendum has been prepared to complete the Pedestrian and Cyclist Network and Facilities Strategy (PLR1INF-BECA-ALL-EN-RPT-000001) prepared by Parramatta Connect Parramatta Light Rail (PCPLR) to address the requirements of Condition of Approval (CoA) E14 of Planning Approval SSI 8285.

Condition E14 states:

E14. *A Pedestrian and Cyclist Network and Facilities Strategy must be prepared in consultation with Relevant Council(s), RMS, Pedestrian Council of Australia and Bicycle NSW. The Strategy must identify safe and accessible pedestrian and cycle paths, during construction and operation, including facilitation of future cycle paths and dedicated cycleways as identified in the documents listed in Condition A1, state and local government plans, with the objective of providing seamless, coherent, visible, and safe pedestrian and cycle access throughout and adjacent to the CSSI corridor. The Strategy must consider:*

- a) existing and proposed local and regional pedestrian and cycle facilities and strategies;*
- b) safety for pedestrians in pedestrianised zones;*
- c) alternative cycle routes during construction, based on safety and efficiency, and contingencies in the event that relocated routes are found to be inadequate;*
- d) pedestrian and cycle access, including local and regional pedestrian and bicycle connections;*
- e) demand for pedestrian and cycle facilities with consideration of measures to encourage an increased pedestrian and cycle mode share;*
- f) signage and way finding;**
- g) cycle storage facilities on light rail vehicles; and**
- h) the requirements of relevant design standards, including Austroads and NSW bicycle guidelines.*

The Pedestrian and Cyclist Network and Facilities Strategy must be submitted to the Secretary before construction of pedestrian/cyclist permanent built works (including the Active Transport Link) commences and implemented to ensure that all works are operational no later than the commencement of CSSI operations.

This Addendum provides information to address item (g) cycle storage on light rail vehicles and to supplement the information provided in the existing strategy relating to (f) signage and wayfinding as it relates to the Light Rail Stops. A cross reference of where the requirements of the CoA E14 have been addressed is provided in [Table 1](#).

Table 1 CoA E14 requirements and where they have been addressed

CoA	Requirement	Where addressed
E14	A Pedestrian and Cyclist Network and Facilities Strategy must be prepared in consultation with Relevant Council(s), RMS, Pedestrian Council of Australia and Bicycle NSW. The Strategy must identify safe and accessible pedestrian and cycle paths, during construction and operation, including facilitation of future cycle paths and dedicated cycleways as identified in the documents listed in Condition A1, state and local government plans, with the objective of providing seamless, coherent, visible, and safe pedestrian and cycle access throughout and adjacent to the CSSI corridor. The Strategy must consider:	Pedestrian and Cyclist Network and Facilities Strategy (PLR1INF-BECA-ALL-EN-RPT-000001) and this Addendum (PLR1SOM-GLR-ALL-PE-PLN-001003). Consultation on this Addendum will be undertaken (refer Section 4)
(a)	existing and proposed local and regional pedestrian and cycle facilities and strategies;	PLR1INF-BECA-ALL-EN-RPT-000001
(b)	safety for pedestrians in pedestrianised zones;	PLR1INF-BECA-ALL-EN-RPT-000001
(c)	alternative cycle routes during construction, based on safety and efficiency, and contingencies in the event that relocated routes are found to be inadequate;	PLR1INF-BECA-ALL-EN-RPT-000001
(d)	pedestrian and cycle access, including local and regional pedestrian and bicycle connections	PLR1INF-BECA-ALL-EN-RPT-000001
(e)	demand for pedestrian and cycle facilities with consideration of measures to encourage an increased pedestrian and cycle mode share;	PLR1INF-BECA-ALL-EN-RPT-000001
(f)	signage and way finding	PLR1INF-BECA-ALL-EN-RPT-000001 and Section 3 of this Addendum
(g)	cycle storage facilities on light rail vehicles; and	Section 2 of this Addendum
(h)	the requirements of relevant design standards, including Austroads and NSW bicycle guidelines	PLR1INF-BECA-ALL-EN-RPT-000001
	The Pedestrian and Cyclist Network and Facilities Strategy must be submitted to the Secretary before construction of pedestrian/cyclist permanent built works (including the Active Transport Link) commences and implemented to ensure that all works are operational no later than the commencement of CSSI operations.	This Addendum will be submitted to the Secretary before commencement of construction of SOM works.

2 Cycle Storage Facilities on LRVs

In order to comply with the requirement of CoA E14 g) and to meet SOM contract requirements, Light Rail Vehicles (LRVs) have been designed to provide bicycle storage facilities. The process of designing the bicycle storage facility involved the following steps:

- Selection of location of bicycle storage areas;
- Selection of bicycle storage options for assessment;
- Undertaking an ergonomic and usability assessment of options;
- Incorporating feedback from the Saloon Mock-Up user evaluation; and
- Final design of bicycle storage areas.

2.1 Location of Bicycle Storage areas

The LRVs have been designed to accommodate bicycle storage for two bicycles within LRV car S1 and two within car S2 (**Figure 1**).



Figure 1 Parramatta LRV composition

These locations were selected for the following reasons:

- S1 and S2 cars are symmetrically located on the Parramatta LRV.
- S1 and S2 cars are accessible by passengers carrying bicycles through the access doors (M and R cars do not have access doors).
- S1 and S2 cars are suspended cars, therefore there are no space restrictions in the interior of the saloon due to the bogie assembly (C1 and C2 cars are symmetrically located on the LRV with access doors, but there are space restriction for the bicycle storage area allocation due to the bogie assembly under the carbody).
- Bicycle storage areas on the S1 and S2 cars are separate to the dedicated wheelchair allocated area, which is at the opposite side of the same cars, as shown in **Figure 2**.
- S1 and S2 cars provide at least one priority seating adjacent to allocated spaces and doorways, as per SOM's contract requirements. The alternative of including two bicycle storage area at both sides of the S3 car (which also has access doors) was considered however this would not meet SOM's contract requirement for priority seating adjacent to the doors.

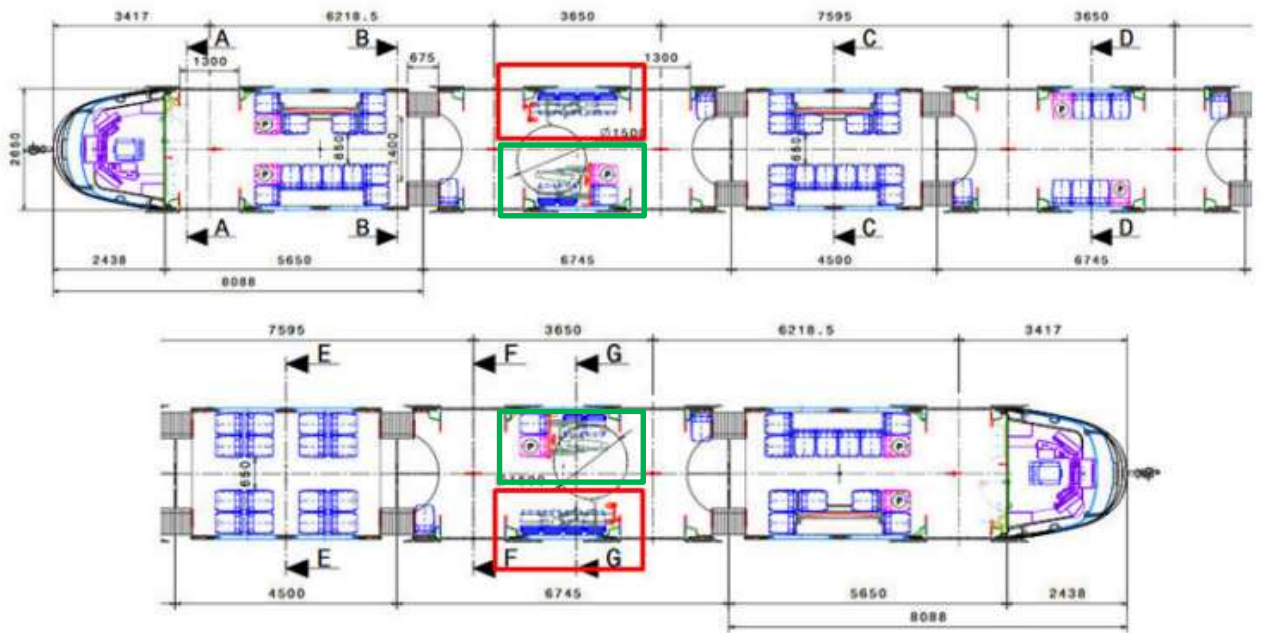


Figure 2 Parramatta LRV layout (red box for bicycle storage area and green box for wheelchair area)

2.2 Bicycle Storage Options analysis

During the design process four options were considered. Two options accommodating three bicycles (Figure 3) and two options accommodating two bicycles (Figure 4).

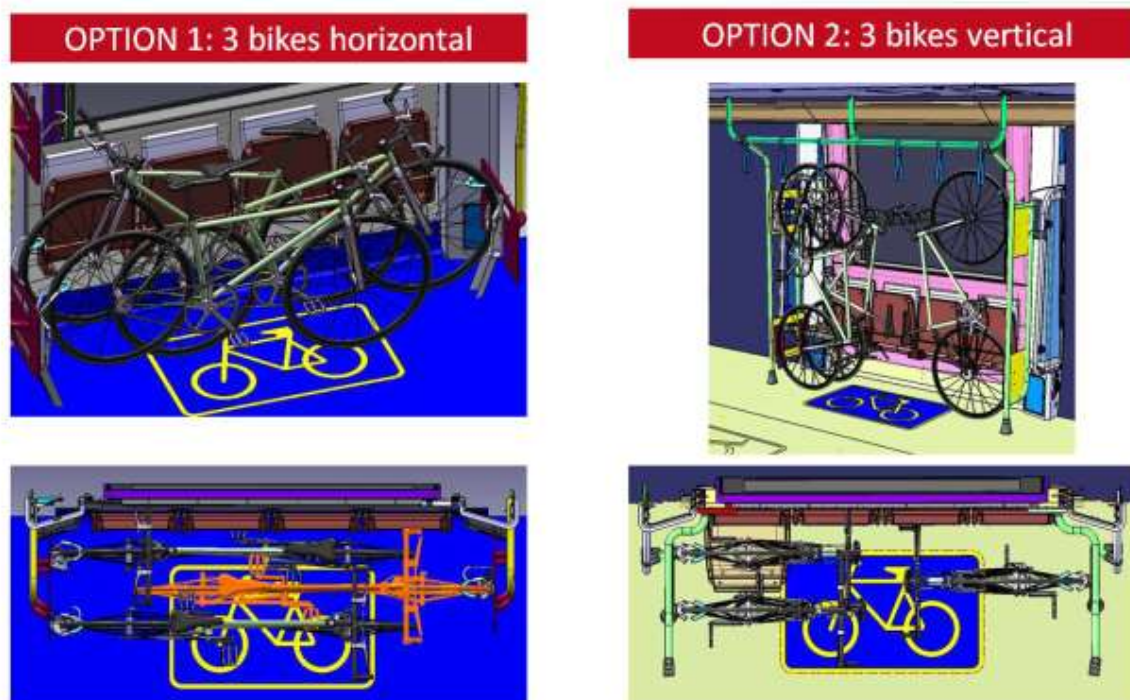


Figure 3 Three bicycle arrangement options

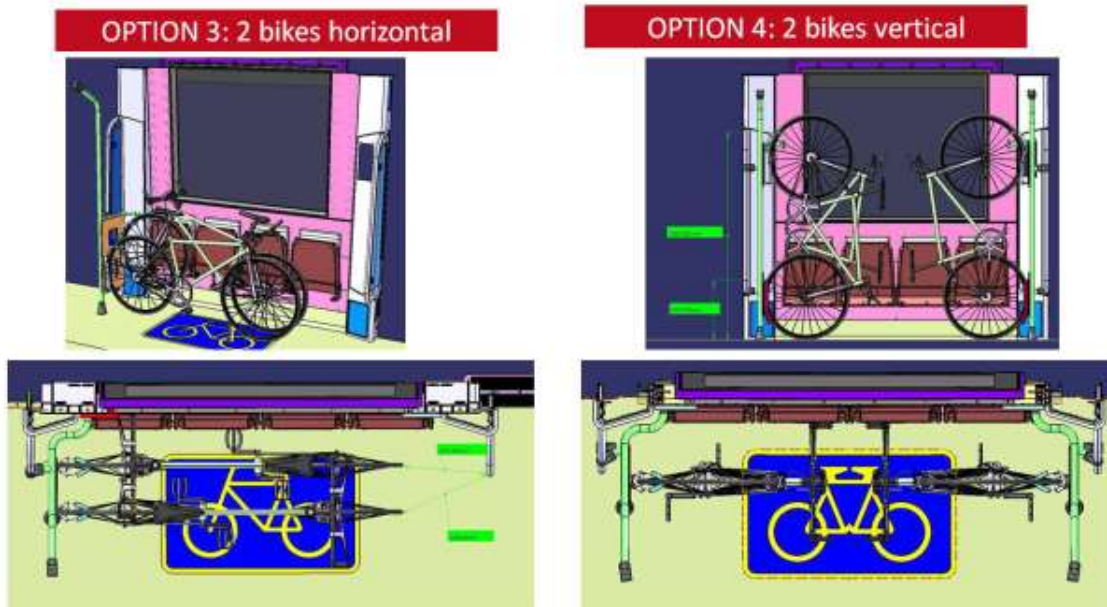


Figure 4 Two bicycle arrangement options

The analysis of the four options considered the following elements:

- Solutions commonly used in LRVs;
- Elements required for bicycle attachment and impact on weight and capacity on standing areas;
- Accessibility to the bicycles when the others are fixed;
- Effort to stow the bicycles;
- Passengers hitting hazard.

2.3 Ergonomic and Usability assessment - conclusions

The ergonomic and usability assessment presented the following conclusions:

- Horizontal positioning of attached bicycles (options 1 and 3) is better than vertical positioning from an ergonomic standpoint for the following reasons:
 - The clearance needed to handle the bicycles is greater for vertical solutions (users would have to lift the front wheel and maneuver the bicycle in a less stable position).
 - The height of the vertical attachments is too high for the child bicycles, forcing the users to lift and operate a considerable weight to attach them.
 - The high attachments for the vertical options are a disadvantage for shorter adults who would have to lift the bicycle using a unrecommended posture, according to postural analysis.
- The attachment of two bicycles (options 3 and 4) is preferred over three bicycles from an ergonomic and usability standpoint for the following reasons:
 - The usability and feasibility of the three bicycles options is highly dependent on whether all attachments are being used and the order of attachment or release of the bicycles.

The final conclusion was that **Option 3 – horizontal attachment for 2 bicycles** – is the best in terms of ergonomics and usability, as it requires a smaller amount of force, does not require lifting

and offers enough clearance between bike stowage and LRV passengers to be able to be used independently of the order of attachment / release of the stowed bicycles.

Based on the above, Option 3 was chosen as the configuration included in the Saloon Mock-Up for user evaluation (**Figure 5**).



Figure 5 Photo from Saloon Mock-Up showing bicycle stowage area accommodating two bicycles in horizontal arrangement

2.4 Saloon Mock-Up for user evaluation

The Saloon Mock-Up User Evaluation allowed the end user population to engage with the design in order to support the optimisation of the saloon elements. It involved an online user evaluation component and a physical user evaluation component. A total of 10 people participated in each of the physical and online evaluations which considered the following saloon elements:

- External appearance
- Wheelchair / accessibility access
- Navigation
- Passage width
- Windows
- Floor surfaces
- Surface textures
- Lighting
- Look and feel
- Draught screens at door
- Emergency help points / Info
- Emergency egress devices
- Passenger Information Displays / sight lines
- **Bike Stowage areas**

- Handrails
- Hanging strips
- Seating.

A summary of the quantitative responses relevant to the bicycle stowage area is presented below. These results are a combination of the physical user and online user evaluations. Note only 18 responses were provided by participants to Question 3c.

Question ID	Question	TOTAL YES	TOTAL NO	TOTAL MIXED	TOTAL #
<i>Bike Handling (if applicable)</i>					
3a	Was it easy to find the bike stowage area?	19	1	0	20
3b	Was it easy to navigate to and from the bike stowage area?	15	5	0	20
3c	Was it easy to use the bike rack?	16	1	1	18

Participants expressed a strong desire for additional bike rack signage on the exterior and interior of the Saloon relating to both navigation to and from, and usage of the bike rack.

It was agreed that decals for both the bike rack and wheelchair users' area would be included on the external doors of the appropriate LRV cars (refer [Figure 6](#)).

2.5 Final Design

Based on the analysis and the Saloon Mock-Up User Evaluation, the LRVs have been designed to contain two bicycle stowage areas (in Cars S1 and S2). These cars will have exterior signage to identifying them. Each bicycle stowage area will accommodate two bicycles in a horizontal arrangement.



Figure 6 Example of decals that can be included on external doors of LRV cars for bike racks and wheelchair users

3 Wayfinding and Signage

PCPLR has included discussion of wayfinding and signage associated with the broader alignment within Section 6.12 of the Pedestrian and Cyclist Network and Facilities Strategy.

This section describes the strategy for wayfinding and signage related to the 16 stops along the PLR infrastructure corridor. It includes the signage and wayfinding on the stop platform (known as on-stop) and the signage and wayfinding to a defined boundary (known as off-stop).

The design objectives of the Stops, relating to Signage and Wayfinding, are as follows:

- Ensure each stop provides intuitive wayfinding to guide passengers through a precinct
- Develop a clear architectural and aesthetic design and components that create a unique experience for the customers.
- Develop a design that responds to the customers' needs first and ensures they have a seamless journey.
- Utilise consistent materials and detailing to provide a seamless experience for customers.
- High-quality, durable materials will facilitate a safe and pleasant journey experience for customers.
- Ensure the design integrates into urban environment, while having a distinctive stop character, consistent with the Urban Design and Landscaping principles adopted by PCPLR.
- Meet Disability Discrimination Act and Disability Standards for Accessible Public Transport requirements.

3.1 On-Stop signage and wayfinding

The on-stop signage and wayfinding includes the following elements:

- Totem / column mounted Stop Name signs.
- Stop Name signs integrated with cabinets or stops as required.
- Stop exit wayfinding.
- Poster cases integrated with cabinets and / or freestanding as required.
- Help Point signage integrated with cabinets and stop infrastructure.
- Mode ID signage integrated with stop infrastructure / design (on street stops).
- Hearing Loop signage as required.
- Please Remember (regulatory) signage.

3.2 Off-Stop signage and wayfinding

The off-stop signage and wayfinding includes the following elements:

- Freestanding Mode ID signage (illuminated during hours of operation).
- Directional finger sign (pole mounted).
- Blade signage (postercase with local contextual information).
- Off-stop Passenger Information Displays (PID) – freestanding digital screen.
- Kiss and ride signage.

4 Consultation

The Pedestrian and Cyclist Network and Facilities Strategy is required to be developed in consultation with relevant stakeholders as identified in Condition E14 and listed below:

- City of Paramatta Council;
- Cumberland Council;
- Roads and Maritime Services (RMS);,
- Pedestrian Council of Australia; and
- Bicycle NSW.

Consultation on the Strategy was undertaken by PCPLR as documented in Section 8 of the Pedestrian and Cyclist Network and Facilities Strategy (PLR1INF-BECA-ALL-EN-RPT-000001). Consultation on this Addendum has been undertaken with the stakeholders listed above as documented in the CoA A5 Consultation Report (PLR1SOM-GLR-ALL-PE-RPT-001003).



2 June 2021

Transport for NSW

Attention to: [Redacted]
Senior Manager Environment
Parramatta Light Rail
[Redacted]

**Review of Pedestrian and Cyclist Network and Facilities Strategy: Addendum
Supply, Operate, Maintain (SOM) Works
Parramatta Light Rail – Stage 1 (SSI-8285)
(PLR1SOM-GLR-ALL-PE-PLN-001003)**

Pursuant to SSI8285 Condition of Approval A23 (d) i), as the approved Environmental Representative, I confirm that I have reviewed the Pedestrian and Cyclist Network and Facilities Strategy: Addendum, Supply, Operate, Maintain (SOM) Works, Parramatta Light Rail – Stage 1 (PLR1SOM-GLR-ALL-PE-PLN-001003), Revision 0, dated 11/05/2021, prepared by Great River City Light Rail, for consistency with the relevant requirements, as per the Staging Report, of the Condition of Approval E14, specifically clauses f) signage and way finding and g) cycle storage facilities on light rail vehicles.

In my opinion the aforementioned document is consistent with the requirements included in or required under the terms of the Conditions of Approval for the Parramatta Light Rail (Stage 1) development.

Yours sincerely,

Australian Quality Assurance & Superintendence Pty Ltd (AQUAS)



[Redacted]
Environmental Representative
[Redacted]
[Redacted]

Filename : AQ1148.05 PLR GLR PCNFS endorsement 210602

