

Briefing: Secretary  
FOR INFORMATION



## Post travel report: Christian Christodoulou, to Zaragoza, Spain

**Purpose:** To report to the Secretary on the recent overseas travel to Zaragoza, Spain, from 14 to 19, December 2022 and the outcomes from the visit to CAF's manufacturing facility.  
**Analysis:** The site visit was informative and gave first-hand insights and assurance on the proposed modifications to be made to the Inner West Light Rail (IWLR) fleet. In addition, during the site visit there was an opportunity to look at 3 of the new Inner West Light Rail vehicles on order which were currently at CAF's manufacturing facility in Spain.

### Summary:

1. Gained technical know-how of the proposed modifications to the R-module bogie boxes and modifications to the waistlines prior to implementation.
2. Opportunity to provide technical comments and feedback directly to CAF's engineers whilst the prototype modifications procedures were being trialled.
3. Opportunity to witness the modifications on a prototype and adjust them based on lessons learnt, prior to implementation.
4. Obtained assurance on the practicality and constructability of the proposed modifications of the R-module bogie boxes and waistlines.
5. Strengthened collaboration with CAF to continue promoting technical and safety assurance of the modifications and modifications to the Inner West Light Rail (IWLR) fleet.
6. Viewed the manufactured door replacement portals prior to their shipment to Sydney.
7. Viewed 3 out of the 4 additional Light Rail Vehicles currently being manufactured by CAF for IWLR.

### Key learnings and outcomes

The Inner West Light Rail fleet of 12 Urbos 3, manufactured by CAF, was withdrawn from service in October 2021 following the discovery of extensive cracking. A comprehensive program of modifications has subsequently been developed to permanently address the issues and return the fleet to service.

The planned modifications to the R-module bogie boxes and the waistline are complex in nature and they have not been materially implemented before on any fleet of Urbos 3. CAF invited Transport to witness the prototype implementation of the modification procedures in a mock-up setting at their factory in Zaragoza, Spain.

Dr. Christodoulou, Director of Engineering in Asset Management Branch travelled to CAF's manufacturing facility in Zaragoza, Spain and witnessed the prototype procedures.

The visit also permitted TfNSW to view three out of the four additional vehicles ordered for Inner West Light Rail at the factory which are in varying stages of either assembly or final testing.

### Technical Observations

CAF has developed a modification solution to address the cracking that has occurred on the IWLR LRV fleet. Undertaking prototype trials in a factory setting provided an opportunity to trial the proposed modification procedures prior to implementation on full-scale light rail vehicles and obtained valuable lessons learnt around implementation constraints such as welding, sequencing of the works, geometric fitment and others.

**Objective Reference:** BN22/00833  
**Contact:** Christian Christodoulou, Director -  
Engineering, Asset Management Branch,  
Safety, Environment & Regulation  
Division

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The technical observations included:

- Steelwork, which provides local stiffening
- Complete replacement of aluminium waistlines, which are pre-fabricated prior to shipment to Sydney
- Modifications aimed at resisting intended load forces and increasing structural resilience
- The benefits obtained by using a prototype process which allows outcomes to be consistently, safely and assuredly reproduced locally in Sydney

### **Factory Visit**

CAF also offered a tour of its manufacturing and production facility. This gave the opportunity to Transport staff to observe the manufacturing process of the new all aluminium modules and how these light rail vehicles are assembled. Several different components could be seen in various stages of the process. The taking of photos was not permitted by CAF.

### **Communication Strategy**

A daily log of activities witnessed, including a photographic record was kept. This was communicated daily to relevant technical and contract management staff involved in the assurance of the rectification works for the IWLR fleet.

### **Alignment with *Future Transport***

Reliable, resilient and fit for purpose public transport systems are critical in the delivery of Future Transport Strategy.

The fleet of 12 No Urbos 3 is crucial in the operation of a consistent and reliable light rail service for Inner West. Without the necessary modifications, the fleet's residual service life will be impacted.

A successful modification program is critical in supporting Customer Focus, Safety & Performance, Accessible Services and Sustainability outcomes with technical assurance, safety, resilience and reliability of outcomes.

### **Disclosure Summary**

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The primary engagement and technical discussions were held with the staff noted in the below table. Additional CAF staff involved in the physical works and supervision were also present.

<b>Date</b>	<b>Organisation/Individual</b>	<b>Purpose of Meeting</b>
14/12/2022 to 19/12/2022	After Sales Engineering, LRV- URBOS Manager	Technical discussions in relation to prototype procedures
15/12/2022	CAF Technical Project Manager	Technical discussions in relation to prototype procedures

15/12/2022	CAF Head of Programs, Tramways	Discussion about overall progress of modifications and also inspections for Newcastle Light Rail fleet
16/12/2022	CAF Technical Project Manager	Technical discussions in relation to prototype procedures
16/12/2022	CAF Head of Programs, Tramways	Technical discussions in relation to prototype procedures
14/12/2022 to 19/12/2022	Senior Consultant – Specialist Engineering, SNC-Lavalin	Technical discussions in relation to prototype procedures

## Next steps

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Lessons learn from the site visit to Zaragoza, Spain will be shared with the technical assurance and contract management teams involved in the remediation of the IWLR fleet.

Technical assurance meetings with CAF will continue to be held on a regular basis until all the modifications have been completed.

## Expense Summary

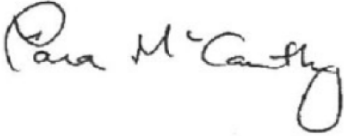

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All overseas travel costs adhered to the Transport for NSW Overseas Guidelines. The below table provides a detailed summary of actual costs.

Breakdown of all costs incurred	Actual Cost
Airfares – GL 534030	\$10360.68
Accommodation – GL 534040	\$1576.92
Official hospitality – GL 534050	nil
Attendance fees for delegates – GL 534050	nil
Ground transport – GL 534050	\$460.14
Meals and refreshments – GL 534050	\$319.05
Other miscellaneous costs – GL 534050	nil
<b>Total</b>	<b>\$12,716.19</b>

**Traveller endorsement**

**Secretary**

<p><b>John Hardwick</b> Executive Director, Asset Management Branch Safety, Environment &amp; Regulation</p> <p><b>Date:</b> <i>J. Hardwick,</i> 24/01/2022</p>	<p><b>Tara McCarthy</b> Deputy Secretary Safety, Environment &amp; Regulation</p>  <p><b>Date: 25/01/2022</b></p>	<p><b>Rob Sharp</b> Secretary</p>  <p><b>Date: 31/01/2023</b></p> <p><b>Noted</b></p>
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**Background**

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