

**Briefing: Secretary**  
**FOR INFORMATION**

**Post travel report: Gabriel Gonzalez and Ali Nematzadeh, Spain.**



**Transport  
for NSW**

**Purpose:** To report to the Secretary on the recent overseas travel for Gabriel Gonzalez, Parramatta Light Rail (PLR) Delivery Director and Alireza Nematzadeh, Engineering Manager Fleet to inspect the PLR and Inner West Light Rail (IWLR) expansion fleets at the Construcciones y Auxiliar de Ferrocarriles (CAF) facilities in Spain.

**Analysis:** The core objectives of the trip have been achieved with the significant outcomes being:

- Inspections of the entire PLR light rail vehicle (LRV) fleet were conducted in person by Transport for NSW (TfNSW) staff; to undertake assurance activities including identifying and rectifying any questions/concerns on site and enable proactive and direct engagement on solutions.
- Inspection and approval of LRV12, the first of the 13 PLR LRVs to be shipped to Sydney, Australia.
- Witnessing the dynamic testing (traction and braking to 40km/h) of the first IWLR expansion vehicle.
- Closure of numerous Critical Design Review (CDR) matters, via physical demonstration and workshopping of resolution, whilst on-board the first IWLR vehicle.
- In-depth discussions were held with key CAF engineering personnel on-site about the development of car-body validation reports. These future reports will help inform car-body assurance initiatives for both the PLR and IWLR expansion fleets.

## Summary

1. The IWLR expansion fleet are in various states of production / testing in Zaragoza:
  - a. LRV01 is undergoing dynamic testing and nearing its readiness state for shipping to Australia. LRV01 will depart Spain in December 2022 and will arrive in Australia in January 2023.
  - b. LRV02 remains at the final stage of the fit-out assembly line and is expected to be transferred to the testing facility in November 2022.
  - c. LRV03 is under production at the assembly line and is expected to be transferred to the testing facility in January 2023.
  - d. LRV04 is under production and will be transferred to the fit-out assembly line in November 2022 and testing is expected to begin in February 2023.
2. IWLR expansion CDR closeout: the following design matters were reviewed in detail and progressed to closure:
  - a. A large number of open CDR comments, departure/concession requests and variations were discussed and progressed through on-board demonstration

and in-depth workshops in the factory. In-person interactions allowed for this design phase of the project to be closed off sooner.

- b. Notably, the driver's desk modification was physically reviewed on-board LRV01 and progressed towards acceptance of the new design. This addressed comments raised by the IWLR Operator and Maintainer (ALTRAC).
3. The PLR fleet (in Trenasa, Ziordia and Irun) have all completed their core production works:
  - a. A final inspection was conducted on LRV12 before approval was given to ship the vehicle to Australia.
  - b. All other LRVs are in various stages of final fit-out works requiring application of production changes to align to the fleet configuration baseline and apply final cosmetic elements such as decals and interior finishes in preparation for shipment.

## Key learnings and outcomes

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### Factory Visit (Zaragoza Facilities) – IWLR Expansion Fleet

During the factory visit, the TfNSW team visited the CAF production and assembly facilities and performed a series of inspections to ensure the acceptable quality of the production. Based on these inspections, a large number of quality issues that were raised previously during the design review were addressed and closed out. The openness and unrestricted access granted to all facilities and LRVs, allowed for clear visibility of issues and supported the discussions.

Furthermore, TfNSW team attended various static and dynamic LRV tests including car-body, bogie, traction, and braking tests. A number of observations were made by TfNSW during these tests, that were subsequently addressed by the CAF team on-site. Additionally, testing and commissioning activities planned in Australia were discussed to finalise the list of requirements for the upcoming testing phase in Sydney.

### Car-body Finite Element Model

During the Zaragoza visit, a series of discussions and meetings were held to discuss the approach for future 'Car-body Validation' reports, the applicable standards, relevant fatigue load cases and required validation test procedures. These discussions were relevant to both the PLR and IWLR expansion fleets, which share the same car-body type (its design has evolved to incorporate lessons from previous URBOS car-body versions, as used on the original IWLR and Newcastle Light Rail fleets). The development of these reports and the execution of the related test procedures remains the subject of on-going discussion between the parties. TfNSW will continue future assurance activities to conclude these reports.

### PLR Fleet Inspections

#### Irun Facility:

The Irun facility is utilised for final fit-out elements on the PLR vehicles, in preparation for shipping. LRV12 and LRV13 were in Irun undergoing final inspections and fit-out. LRV12, the most complete LRV, was undergoing the final application of decals (wayfinding, opal, emergency signage). Some cosmetic issues were identified concerning the decals and bike hooks, however, these were considered minor and will be addressed by the contractor in Australia upon arrival of the vehicle. LRV12 was approved for shipment.

#### Ziordia Facility (storage facility):

The bulk of the PLR LRVs (LRV03 to LRV11) are currently held at the Ziordia facility. These vehicles are awaiting the application of all remaining production changes by the contractor, to align to the same configuration baseline as LRV12.

TfNSW team witnessed the wheel-turn maintenance procedure applied to these stored vehicles, which prevents flat spot issues on the wheels that may occur when stored for prolonged periods.

**Trenasa Facility:**

PLR LRV01 and LRV02 were held at Trenasa facility where they were undergoing wheel-unloading testing. These vehicles are the least advanced with the most residual work remaining prior to shipment. Various configuration issues concerning the coupling mechanisms and gangway finishes were identified by the TfNSW team. This will be followed up formally and corrective actions will be monitored. The openness and unrestricted access to all vehicles (at all facilities) allowed for clear visibility of these issues.

**General TfNSW/CAF Relationship**

The Spain visit has allowed for direct lines of communication between the TfNSW team and key CAF Spain representatives. This direct engagement has greatly facilitated the progress of the next steps for car-body assurance initiatives and future interactions between the entities on this topic. Similarly, the on-site collaboration led to the closure of a number of IWLR expansion critical design matters.

**Communications Strategy**

A briefing to the Transport Minister’s office (Minister or Ministerial staff) is currently being arranged.

**Alignment with Future Transport 2056**

In keeping with the principles of the vision for ‘Future Transport 2056’, Mr Gonzalez and Mr Nematzadeh progressed a number of customer focused, safety and performance and accessibility matters during the visit.

- Disability standard compliance approaches were discussed with CAF and will continue to be progressed throughout the testing and commissioning phases
- Customer information (on-board screens imagery) was reviewed and strategies to close ongoing issues were agreed to during the visit
- Safety and performance are the underlying focus of the ongoing assurance initiatives and is the driver behind the mitigation measures being undertaken in validating the new car-bodies

**Disclosure Summary**

Date	Organisation/Individual	Purpose of Meeting/Activity
19-27 Sept 2022 (Zaragoza)	<p><b>Inspections and Testing</b></p> <ul style="list-style-type: none"> <li>- Sergio Cocera Martin (CAF)</li> <li>- Carlos Vazquez (SNC-L)</li> <li>- Antonio Sancho Lizaga (CAF)</li> <li>- Jara Agudo Tabuenca (CAF)</li> <li>- Beatriz Lafuente (CAF)</li> </ul> <p><b>Quality</b></p>	Review and perform testing and commissioning activities

	<ul style="list-style-type: none"> <li>- Sergio Cocera Martin (CAF)</li> <li>- Beatriz Lafuente (CAF)</li> <li>- Carlos Vazquez (SNC-L)</li> </ul> <p><b>Design review</b></p> <ul style="list-style-type: none"> <li>- Beatriz Lafuente (CAF)</li> <li>- Carmelo Latorre (CAF)</li> <li>- Jara Agudo Tabuenca (CAF)</li> </ul> <p><b>Car-body 'Finite Element (FE) Model'</b></p> <ul style="list-style-type: none"> <li>- Jara Agudo Tabuenca (CAF)</li> <li>- Sofia Gumiel (CAF)</li> <li>- Vanessa Gomez Igual (CAF)</li> <li>- Beatriz Lafuente (CAF)</li> <li>- Carlos Vazquez (SNC-L)</li> </ul>	<p>Discuss quality and perform audits</p> <p>Discuss design matters and review TfNSW CDR comments</p> <p>Obtain visibility of the FE Model and consider risks on the IWLR expansion and PLR fleets</p>
28 Sept 2022 (Corella/Trenasa)	<p><b>Inspection of PLR LRV01 and LRV02</b></p> <ul style="list-style-type: none"> <li>- César Moneo (CAF)</li> <li>- Alan Brittain (GRCLR)</li> <li>- Carlos Vazquez (SNC-L)</li> </ul> <p><b>Inspection of PLR LRV01 and LRV02</b></p> <ul style="list-style-type: none"> <li>- Luis Fernández (CAF)</li> <li>- Alan Brittain (GRCLR)</li> <li>- Carlos Vazquez (SNC-L)</li> </ul>	<p>Inspection of CAF capability at Corella test track</p> <p>Observe the status of wheel-unloading tests on LRV01 and LRV02</p>
29 Sept 2022 (Ziordia / Besain)	<p><b>Inspection of remaining PLR LRV fleet in storage</b></p> <ul style="list-style-type: none"> <li>- Jesus Angel Escudero (CAF)</li> <li>- Alan Brittain (GRCLR)</li> <li>- Elias Mekki (GRCLR)</li> <li>- Carlos Vazquez (SNC-L)</li> </ul> <p><b>Visit of Besain facility (CAF head office)</b></p> <ul style="list-style-type: none"> <li>- Jesus Angel Escudero (CAF)</li> <li>- Jara Agudo Tabuenca (CAF)</li> <li>- Alan Brittain (GRCLR)</li> <li>- Elias Mekki (GRCLR)</li> <li>- Carlos Vazquez (SNC-L)</li> </ul>	<p>Inspect stored fleet and witness wheel-turn maintenance procedures</p> <p>Discuss options for shipping LRV12</p>
30 Sept 2022 (Irun)	<p><b>Inspection of PLR LRV12</b></p> <ul style="list-style-type: none"> <li>- Jesus Angel Escudero (CAF)</li> <li>- Alan Brittain (GRCLR)</li> <li>- Elias Mekki (GRCLR)</li> <li>- Carlos Vazquez (SNC-L)</li> </ul>	<p>Final inspection of LRV12 prior to shipment to Australia</p>

Note: Great River City Light Rail (GRCLR) is the consortium delivering the supply, operate and maintain contact for the Parramatta Light Rail.

## Next Steps/Actions

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Below are critical follow-up actions required as an outcome of the trip to CAF facilities in Spain:

1. Confirm the provision by CAF of the 'Car-body Validation Plan' for the IWLR expansion fleet (containing the required finite element model data)
2. Confirm the provision by CAF of the 'Car-body Validation Plan' for the PLR fleet (containing the required finite element model data)
- 3.** Request a corrective action plan from CAF concerning the configuration and gangway finishes issues identified on PLR LRV01 and LRV02

## Expense Summary

### Gabriel Gonzalez – 1 week visit

Breakdown of all costs incurred	Actual Cost	Budget Cost BN
Airfares	\$5,667.87	\$4,657.40
Accommodation – six nights in Pamplona/Irun/Zaragoza/Madrid	\$1,859.39	\$2,280.00
Hire Car - <i>Not required due to local transport being provided by contractor</i>	\$0	\$0
Attendance fees for delegates <i>Not applicable</i>	\$0	\$0
Taxis, meals and other incidental costs for six nights	\$472.10	\$2,030.00
<b>Totals:</b>	<b>\$7,999.36</b>	<b>\$8,967.40</b>

### Ali Nematzadeh – 2 week visit

Breakdown of all costs incurred	Actual Cost	Budget Cost BN
Airfares	\$6,598.39	\$5,247.00
Accommodation – Fifteen nights in Pamplona/Irun/Zaragoza/Madrid	\$2,892.59	\$4,940.00
Hire Car – <i>Not required due to local transport being provided by contractor</i>	\$0	\$1,293.60
Attendance fees for delegates <i>Not applicable</i>	\$0	\$0
Taxis, meals and other incidental costs for fifteen nights	\$2003.00	\$4,060.00
<b>Totals:</b>	<b>\$11,493.98</b>	<b>\$15,540.60</b>

\*Note 1 - Variances: airfares increased significantly at the time of ticketing (increased demand and fuel prices in airfare market) from when approvals were sought.

**Traveller endorsement**

**Secretary**

<p><b>Gabriel Gonzalez</b>  <b>Delivery Director - SOM</b>  <b>Infrastructure and Place</b></p> <p><b>Ali Nematzadeh</b>  <b>Engineering Manager - Fleet</b>  <b>Infrastructure and Place</b></p>	<p><b>Camilla Drover</b>  <b>Deputy Secretary</b>  <b>Infrastructure and Place</b></p> <p><b>Date: 05/09/2022</b></p>	<p><b>Trudi Mares</b>  <b>Deputy Secretary</b>  <b>Greater Sydney</b></p> <p><b>Date: 02/09/2022</b></p>	<p><b>Rob Sharp</b>  <b>Secretary</b></p> <p><b>Date: 06/09/2022</b></p>
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## Background

The PLR fleet (13 vehicles) and IWLR Expansion fleet (4 vehicles) share the same 'Urbos 3 - 100' LRV product. This is the next generation of the LRV product, with an evolved design compared to the existing IWLR fleet.

This visit enabled the TfNSW team to witness the progress of the vehicles, identify any concerns, and engage with the CAF team to proactively discuss and resolve any matters promptly. The timing of the visit to the CAF facilities was necessary prior to shipping the first PLR vehicle from Spain, as well as to observe the critical dynamic testing of the new IWLR expansion fleet.

## Attachments

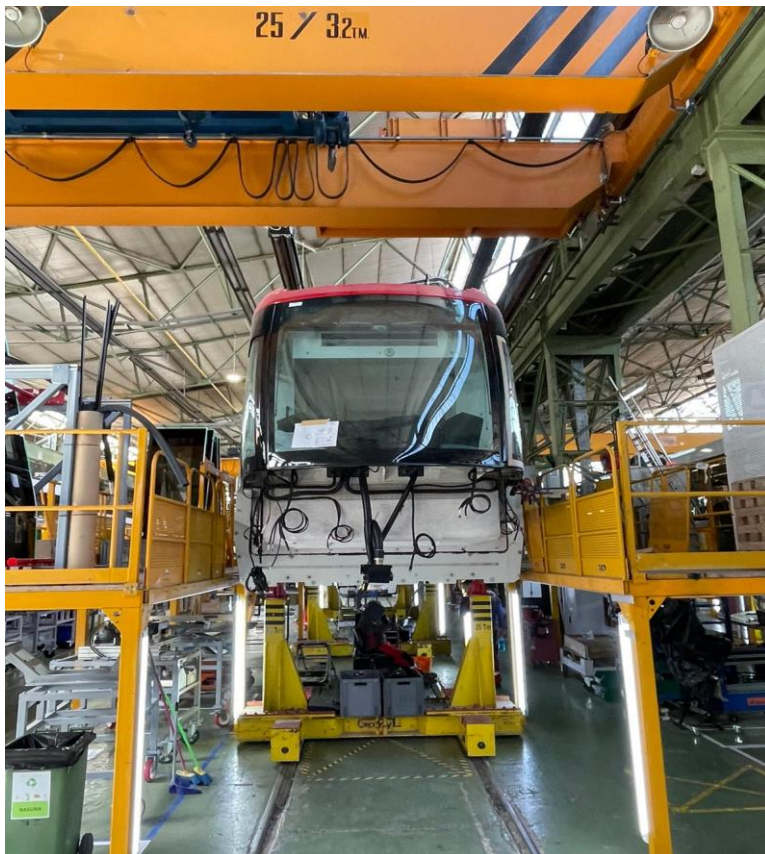
Attachment	Title
A	Photographs taken at the CAF factory

## Attachment A: Photographs taken at the CAF Facilities

### 1. CAF Zaragoza



*IWLR Expansion LRV01 on Test Track*

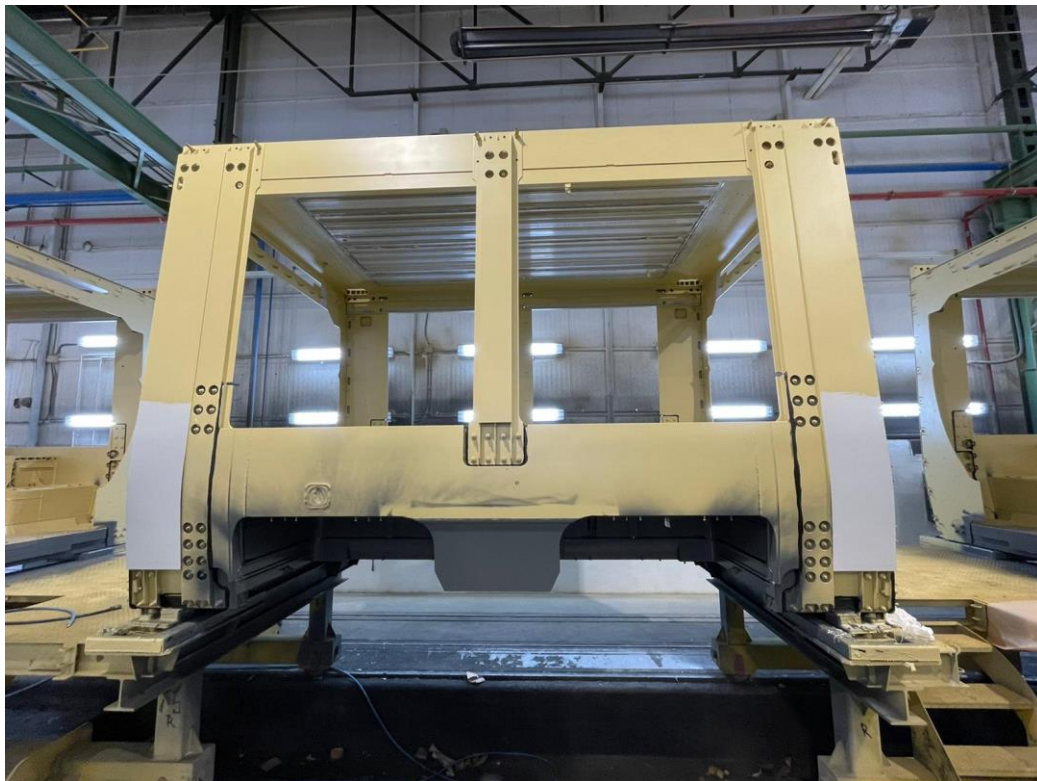


*IWLR Expansion LRV02 in final fit-out*





***IWLR Expansion LRV03 in Production***



***IWLR Expansion LRV04 in Production***

**2. Renasa Test Facility**



***PLR LRV01 at Trenasa (Wheel un-loading testing)Ziordia Storage Facility***

### **3. Ziordia Storage Facility**



***PLR fleet in storage at Ziordia***

### **4. Irun Facility**



***PLR LRV01 – Final inspection and fit-out prior to shipment***

**5. Besain – CAF Headquarters**



***IWL Expansion Bogie article inspection***