



# **CPUC Public Agenda 3300**

**Thursday, September 13, 2012, 9:00 a.m.**  
**San Francisco, CA**



**Commissioners:**  
**Michael R. Peevey**  
**Timothy Alan Simon**  
**Michel Peter Florio**  
**Catherine J.K. Sandoval**  
**Mark J. Ferron**

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# LA Metro Safety Issues at the Blue Line-Expo Line Rail Junction



**Daren Gilbert**

***Program Manager, Rail Transit and Crossings Branch***

**California Public Utilities Commission**

September 13, 2012





# Overview:

## Washington / Flower Junction Issues

- Los Angeles County Metropolitan Transportation Authority (“LA Metro” or LACMTA) light-rail vehicles (LRV) lines involved:
  - Blue Line
  - Expo Line (aka “Expo Phase 1”)
- Summary of Issues
- Interim Safety Measures
- Path Forward





# Washington / Flower Junction Issues

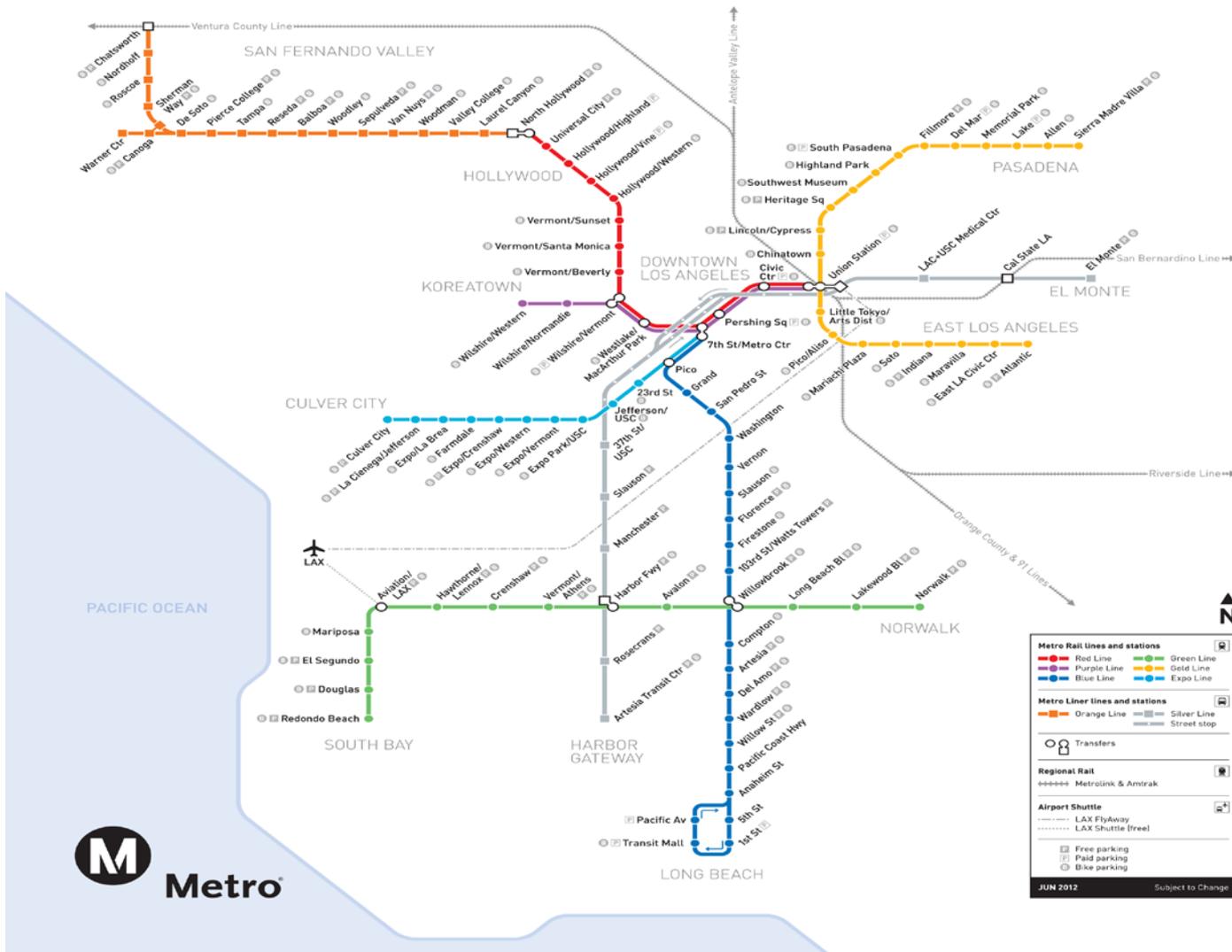
- The Expo line extends from a track junction off of the Blue line, just south of downtown Los Angeles.
- Both lines are street-running lines in the vicinity of the junction.
- The track junction is within the intersection of Washington Street and Flower street.





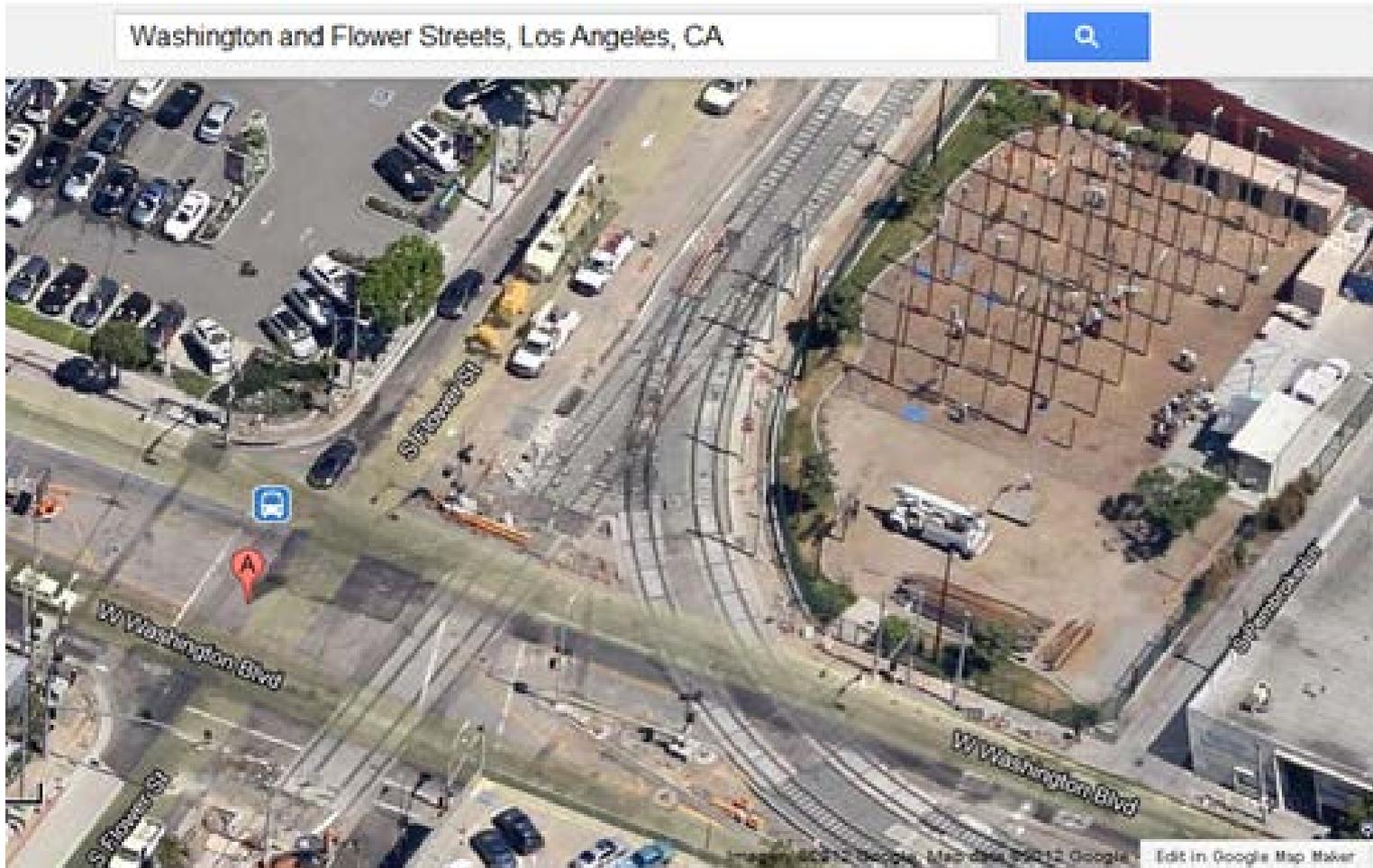
# Go Metro

metro.net





# Washington & Flower Streets





# Washington / Flower Junction Issues

- The junction was added as part of the Expo construction approximately two years ago.
- The junction was designed to allow two Blue Line tracks and two Expo Line tracks to intersect.
- The junction provides for Expo service without interruptions to Blue Line service.

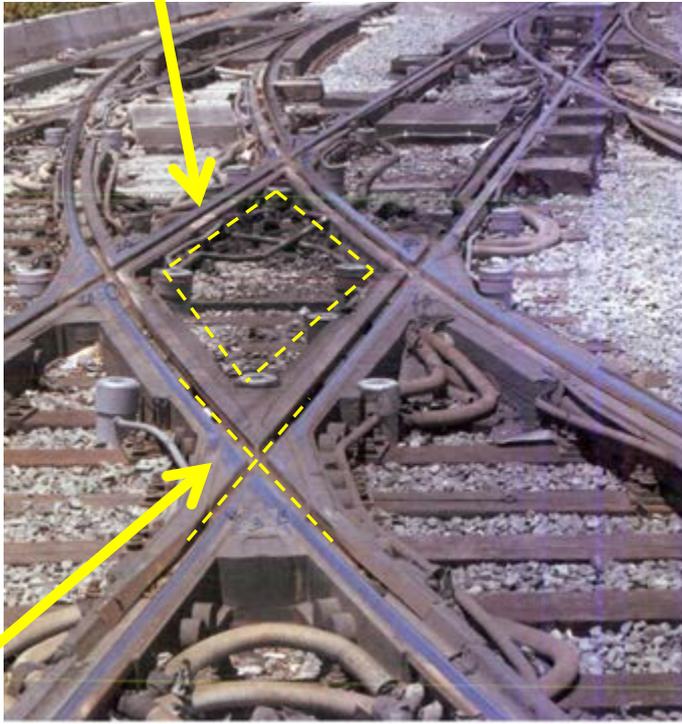




# Washington / Flower Junction Issues

- The junction is also known as the “diamond” due to the resulting shape of the intersecting tracks.
- The support structure where the rails intersect is called a “frog,” and provides a gap for a wheel flange to cross through an intersecting rail.
- There are four frogs in the diamond, and two more in the distance.

diamond



frog





## Washington / Flower Junction Issues

- Alignment issues revealed during the construction of this project.
- Unclear whether the alignment issues originated in the original design or its layout and construction.
- Alignment issues caused LRV wheels to strike the rail frog intersection point in the diamond.





# Washington / Flower Junction Issues

- Frog point close-up.
- Evidence of wheel-flange contact.





# Washington / Flower Junction Issues

- LRVs' eastside wheels strike and damage the eastside frog point.
- Uncorrected continuing damage would increase the potential for derailment through:
  - Wheels climbing over the frog.
  - LRV wheel and brake gear damage.
- Expo's modification pushes the eastside wheels over far enough to avoid hitting the frog point.





# Washington / Flower Junction Issues

- The modification was a large build-up of metal (welded) on the inside of the rail within the frog's flange-way.
- The build-up shifts the LRV trucks laterally to avoid hitting the opposite frog point.





# Washington / Flower Junction Issues

- The modification was developed by the EXPO Authority.
- The modification is not supported by any standard practice in the U.S.
- The manufacturer of the frog opposed this modification.





# Washington / Flower Junction Issues

- Staff is aware of two occasions when the frog weld build-up chipped and fractured.
- On March 23, 2012, and June 29, 2012, ultra sonic testing identified weld fractures.
- The internal fractures became exposed.
- The fractures caused chipping and cracking within the first layers of the weld, resulting in visible defects.
- These fractures resulted in the modification being re-welded.





# Washington / Flower Junction Issues

CPUC Staff Concerns include:

- Non-standard modification.
- Ongoing inspection and maintenance.
- Undetected failure compromising safety.
- Long-term harm to LRV fleet.
- Failure or maintenance disrupting service.
- Derailment of LRV at frog point.





# Washington / Flower Junction Issues

- Interim Safety Measures
  - 5 mph speed restriction for LRVs traversing the diamond.
  - Two additional visual inspections per week of the frog and modifications, plus other already-required inspections.
  - Monthly ultrasonic inspections of the welds.
  - Detailed maintenance procedures for the modification, including wear and condemning limits.
  - Immediate notification of CPUC staff of any defect or anomaly detected, or any incident at the location.
  - Advance notice to CPUC staff of inspections and ultrasonic testing.





# Washington / Flower Junction Issues

- Path Forward
  - CPSD staff has recommended that LACMTA/EXPO replace this diamond.
  - CPSD Director, General Hagan, issued a directive to replace the diamond in a July 13, 2012, letter.
  - LA Metro, Expo, and CPSD staff subsequently met and agreed to have an independent track expert evaluate and recommend correction.
  - CPSD staff, LA Metro, and EXPO interviewed and selected track experts who could assess the junction and provide corrective actions.
  - The track experts reviewed the site last week.
  - Staff awaits a report of the findings and recommendations.





# Regular Agenda – Management Reports and Resolutions

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## **Item #46 [11537]**

**Report and Discussion by Consumer Protection and Safety Division on Recent Safety Program Activities**

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# Management Reports





# **The CPUC Thanks You For Attending Today's Meeting**

**The Public Meeting is adjourned.**

**The next Public Meeting will be:**

**September 27, 2012, at 9:00 a.m.  
in San Francisco, CA**

