

San Francisco-Oakland Bay Bridge Update



THE SAN FRANCISCO-OAKLAND
BAY BRIDGE
SEISMIC SAFETY PROJECT

CALTRANS BAY AREA TOLL AUTHORITY CALIFORNIA TRANSPORTATION COMMISSION

Toll Bridge Program Oversight Committee (TBPOC)

- **Steve Heminger, Chair**
Executive Director, Bay Area Toll Authority
- **Randell H. Iwasaki**
Director, Caltrans
- **Bimla Rhinehart, Vice Chair**
Executive Director, California Transportation Commission





San Francisco-Oakland Bay Bridge East Span Seismic Safety Replacement Project Update



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THE SAN FRANCISCO-OAKLAND
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San Francisco-Oakland Bay Bridge (SFOBB) – October 1989

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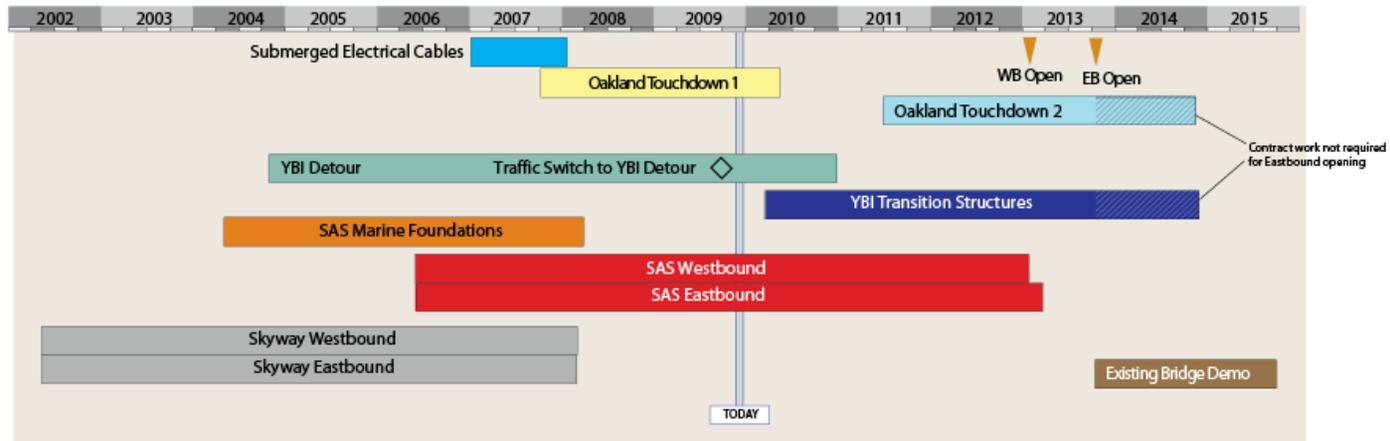
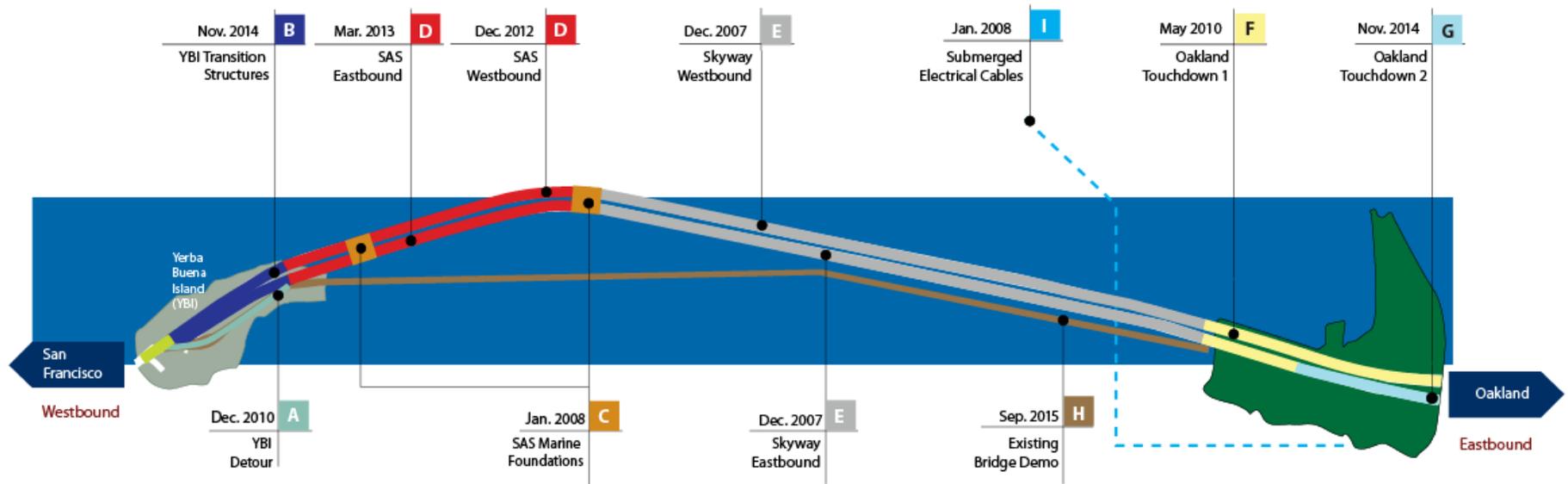


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Bay Bridge Design Task Force – June 1998

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SFOBB East Span Work Sequence



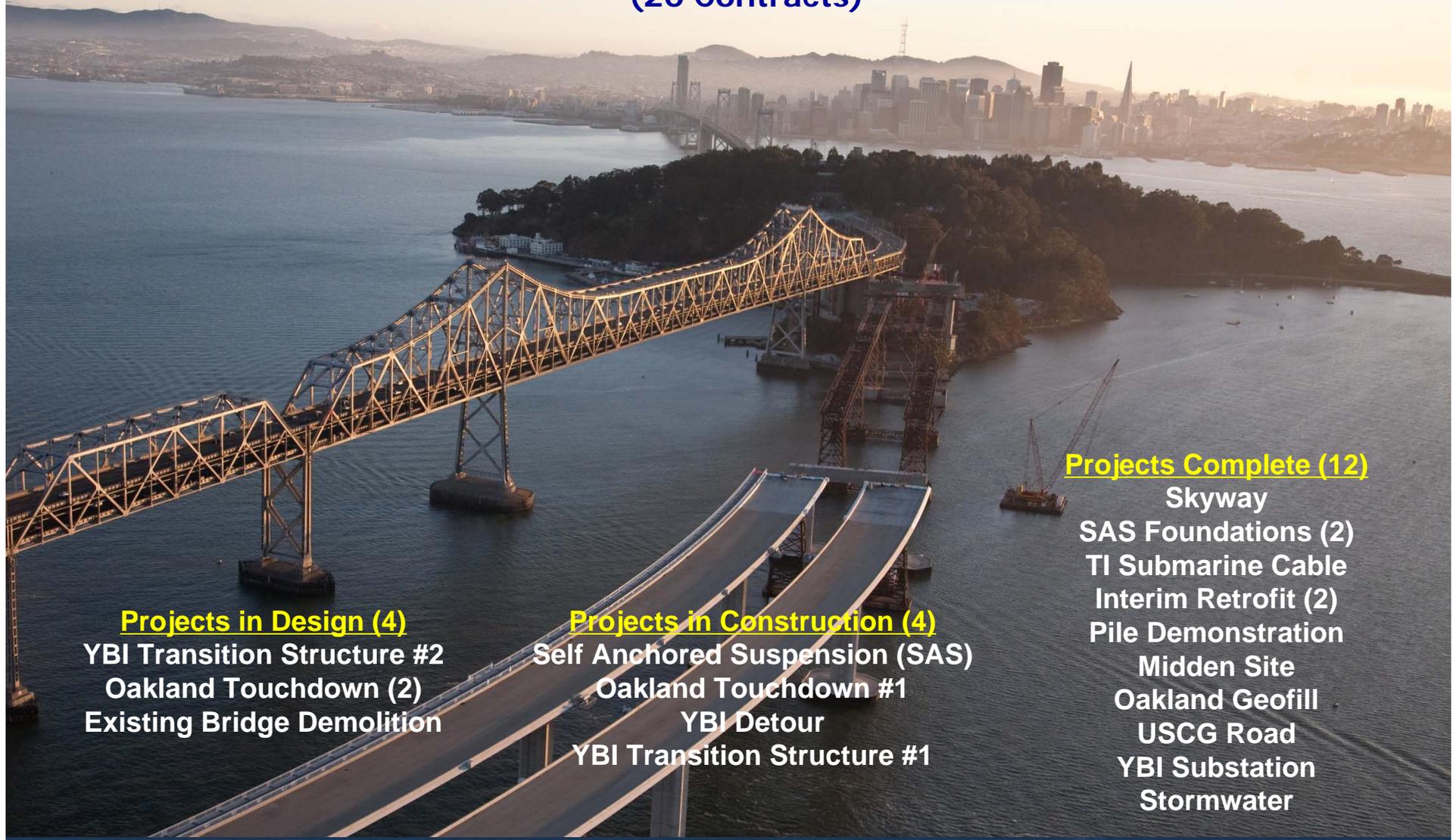
Note: Dates shown above are forecast completion dates.



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SFOBB East Span Work Sequence

SFOBB East Span Seismic Safety Replacement Project (20 Contracts)



Projects in Design (4)

YBI Transition Structure #2
Oakland Touchdown (2)
Existing Bridge Demolition

Projects in Construction (4)

Self Anchored Suspension (SAS)
Oakland Touchdown #1
YBI Detour
YBI Transition Structure #1

Projects Complete (12)

Skyway
SAS Foundations (2)
TI Submarine Cable
Interim Retrofit (2)
Pile Demonstration
Midden Site
Oakland Geofill
USCG Road
YBI Substation
Stormwater



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SFOBB East Span Seismic Safety Replacement Project
(20 Contracts)



**Future Oakland
Touchdown #2
Contract**



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Oakland Touchdown 1 – May 2010

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Skyway – December 2007



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SAS Marine Foundations – January 2008

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Yerba Buena Island Detour – December 2010

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YBI Transition Structures Advance Work and Demolition

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YBI Transition Structures #1 – September 2013

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Self Anchored Suspension Span Contract Update



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Left Coast Lifter Installing Temporary Support Structures

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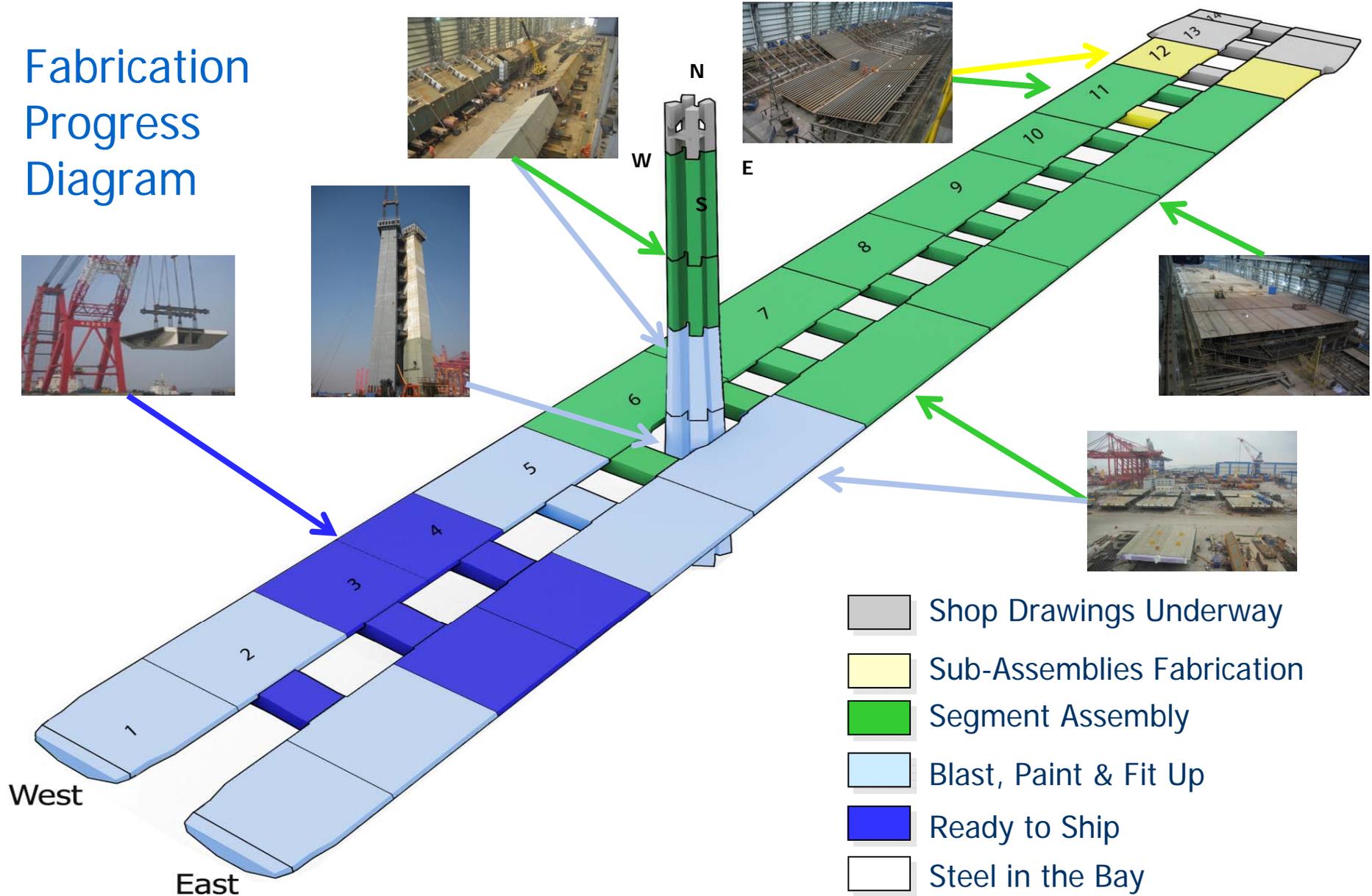


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Temporary Supports Across Main Channel

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Fabrication Progress Diagram



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Roadway Box Girder Loading



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Roadway Box Girder Yard Work

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Roadway Box Girder Fabrication



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Roadway Box Girders Lifts 11 and 12 Assembly

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Tower Fabrication Shop



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Tower Lift 1 Vertical Fit Up



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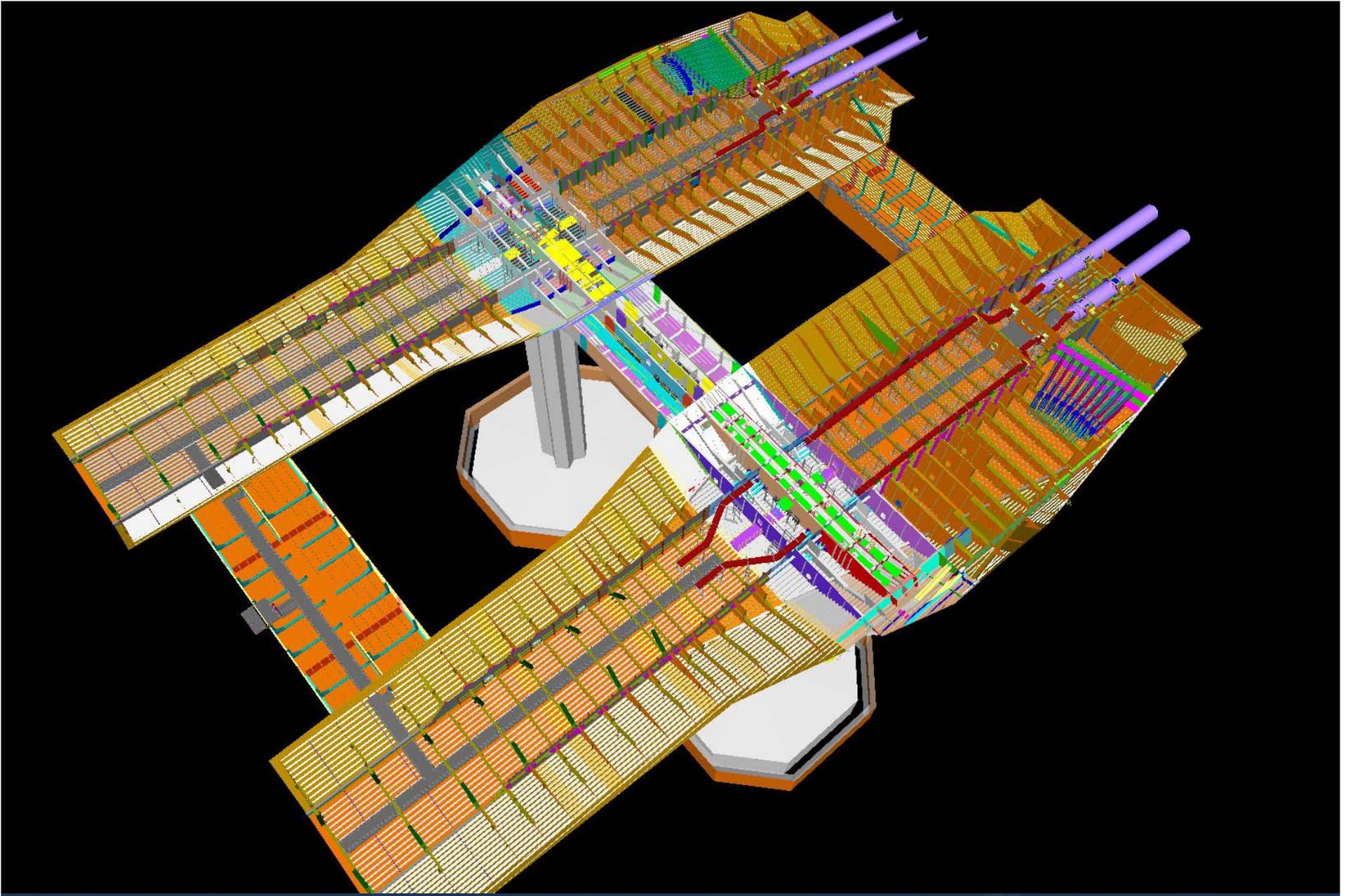
Tower Lift 1 Vertical Fit Up

- Shop drawings expand typical sections shown in contract plans to provide the fabricator with detailed dimensions to cut plate and weld details to build up bridge components.
- ABF has contracted with Candraft of Vancouver, Canada to prepare the SAS East End Shop Drawings (Lifts 12 to 14)



- **East End Roadway Lifts 13 and 14 are more complex than first 11 lifts,**
 - Anchorage for main cable
 - Hinge connection to Skyway
 - On a curve with camber and super-elevation
- **Require considerably more sheets,**
 - First 11 lifts had approximately 8,000 sheets
 - Lift 13 has over 3,300 sheets
 - Lift 14 has an additional 1,600 sheets
- **Behind schedule.**



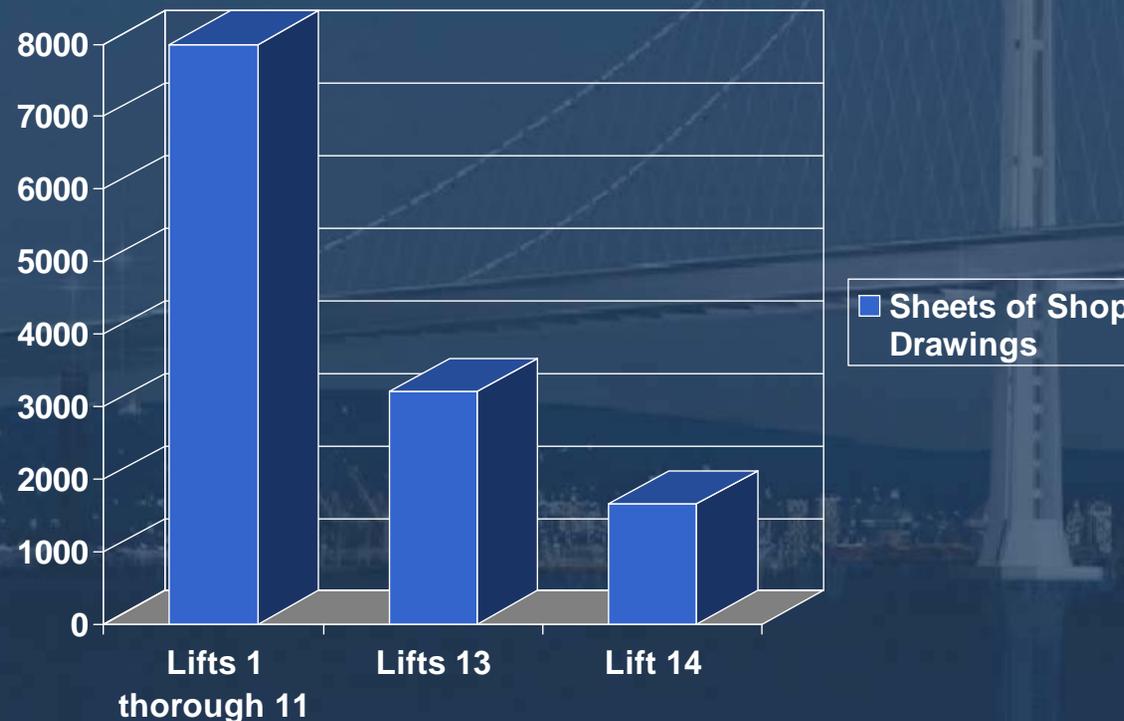


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Model of East End Lifts

- To mitigate the delay, shop drawing for the east end has been incentivized by each sheet delivered with up to \$4 M, if drawings are completed by March 1, 2010



- **Past Delays to Fabrication**
 - Learning Curve
 - Enhanced QA/QC
 - Design Changes and Complexity of Design Impacting Shop Drawings and Fabrication
- **Dispute Resolution**
 - Change Orders to Resolve Owner Responsible Design Changes and Delays
 - Adds Incentives and Disincentives
 - Adjusts Contract Schedule
 - Resolves Direct and Indirect Costs

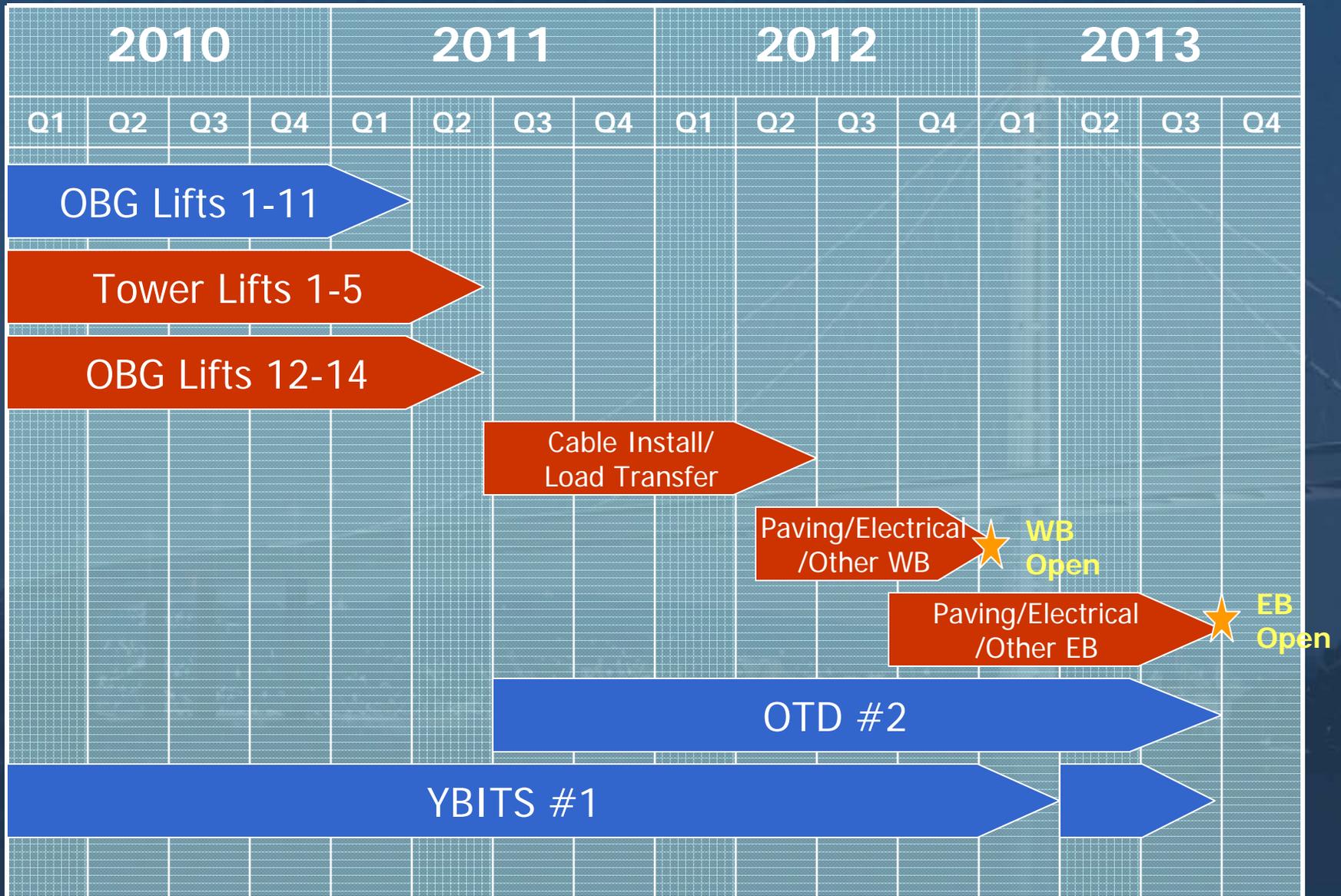


- **Incentives and Disincentives Focused on Near Term Critical Path Activities**
- **Incentives**
 - **Fabrication and Shipment of First Tower Lifts in April 2010**
 - Incentive of \$300,000 per day up to \$12 million for earlier shipment
- **Disincentives**
 - **Fabrication and Shipment of First OBG Shipment, if later than December 31, 2009**
 - Penalty of \$300,000 per day up to \$10 million for late shipment

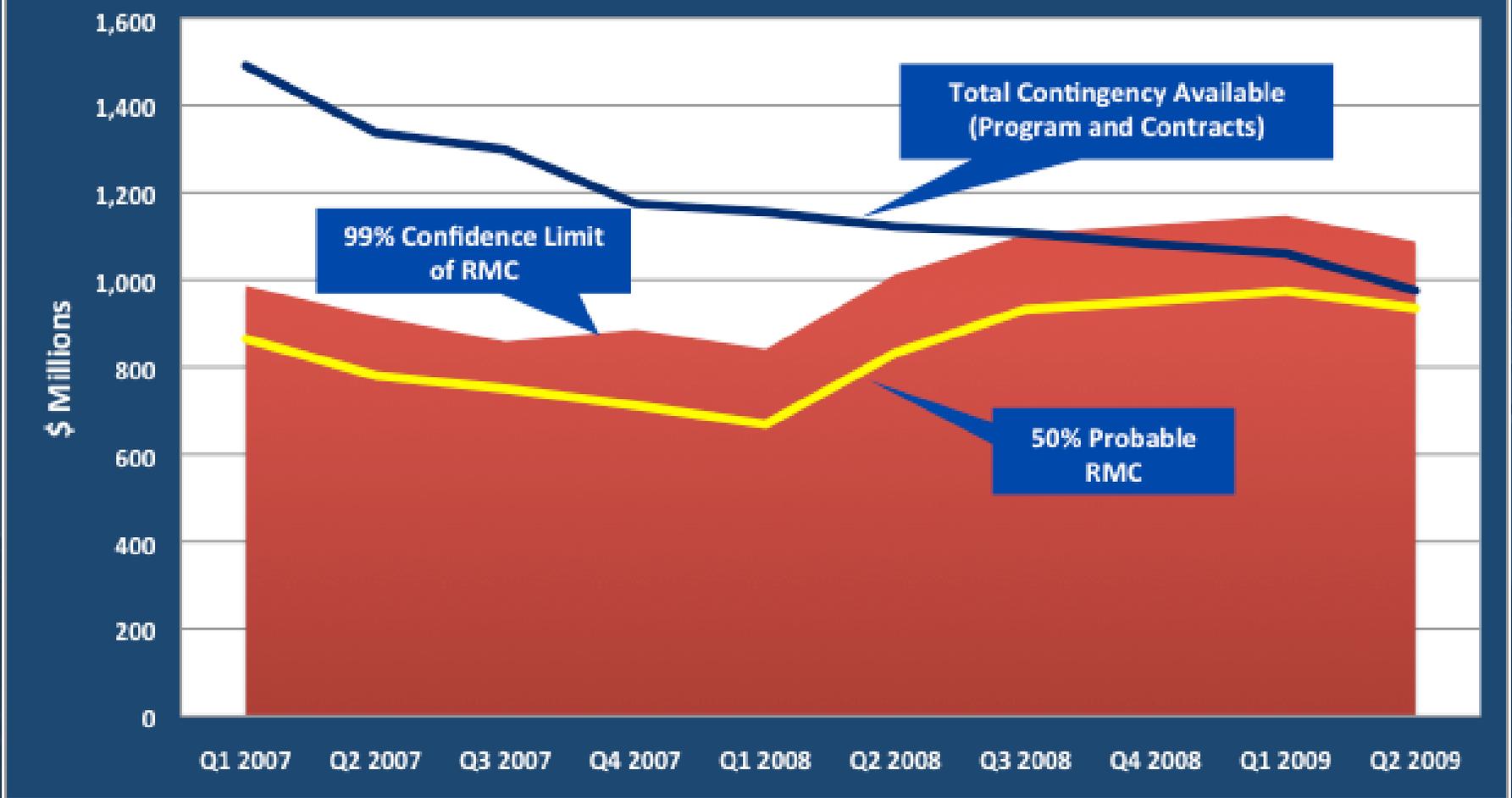


- **Resolution of Owner Responsible Design Changes and Delays**
 - **Direct and Indirect Costs of Changes for \$62 M**
 - **Adjusts Contract Schedule to provide 197 additional contract days – extended duration cost of \$17 M**
- **Cost of the Changes Are Within Current \$1.8 B Contract Budget**
 - **No budget change or additional allocation of toll funds needed at this time**





Trend of RMC and Total Available Contingency





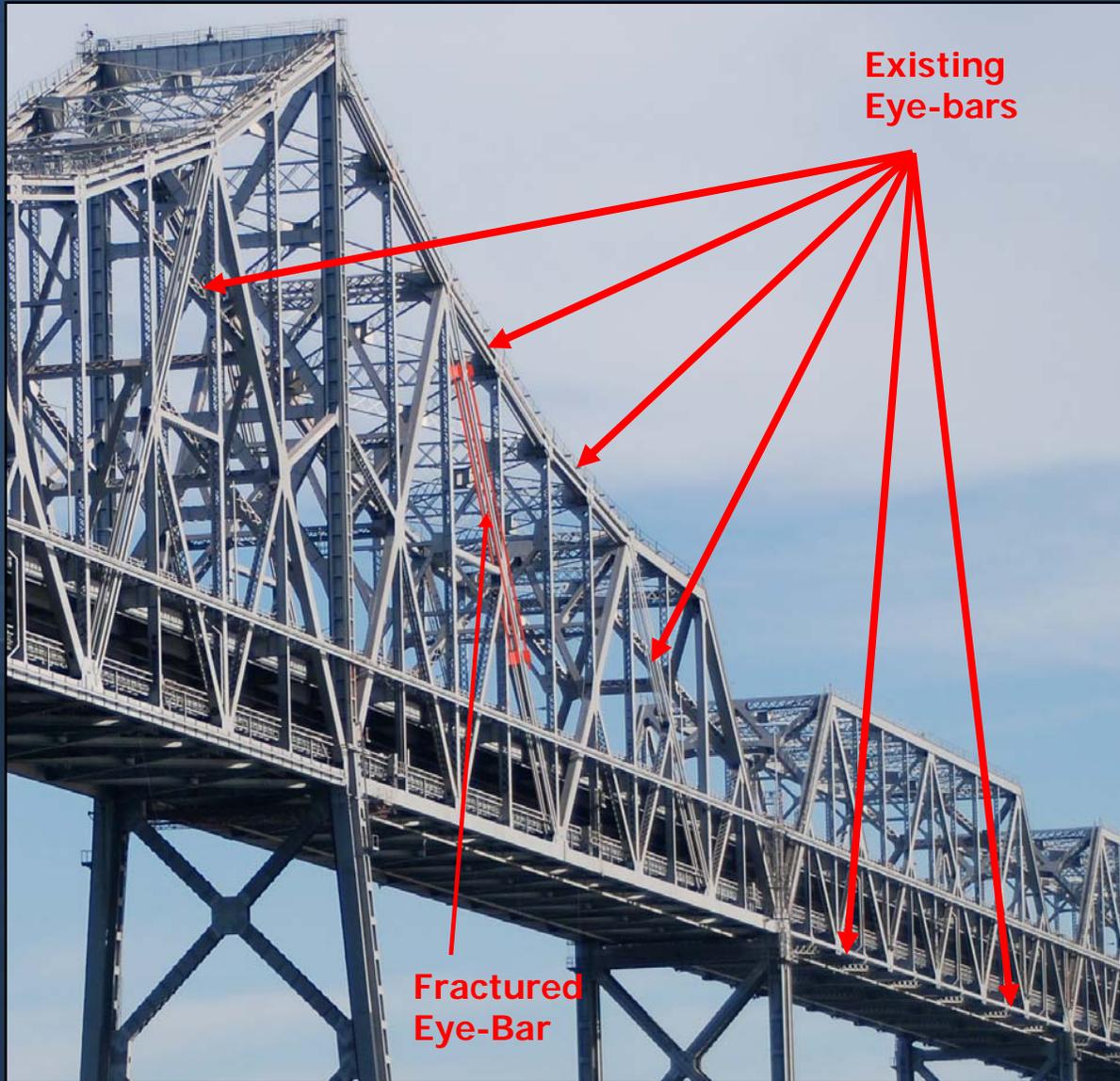


San Francisco-Oakland Bay Bridge East Span Eye-Bar Repair Project



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Eye-Bars

- BATA is requested to budget and allocate \$14 million in Toll Bridge Rehabilitation Program funds for the long-term repair of the fractured eye-bar on the Bay Bridge and \$350,000 for emergency transit service during prior October bridge closure

- **Eye Bar Repair Budget and Allocation as follows:**

➤ Capital Outlay Construction	\$ 7.2 M
➤ Capital Outlay Support	<u>\$ 5.0 M*</u>
Subtotal	<u>\$ 12.2 M</u>
➤ Contingency	<u>\$ 1.8 M</u>
Total	\$ 14.0 M

* Includes \$1.6 million for BATA Independent Review and Public Outreach via BATA on-call contract with TY Lin International



- **Schedule**

- Work scheduled to begin December 11, 2009 pending weather
- Work to last approximately three weeks, with an additional five weeks possibly needed at a later date.
- Work will not require a full bridge closure



UPPER DECK (WESTBOUND)

THREE LEFT LANES WILL BE CLOSED OVERNIGHT

Sunday through Thursday nights: 10 p.m. — 5 a.m.

Friday nights: 11 p.m. — 8 a.m.

Saturday nights: 11:30 p.m. — 9:30 a.m.



LOWER DECK (EASTBOUND)

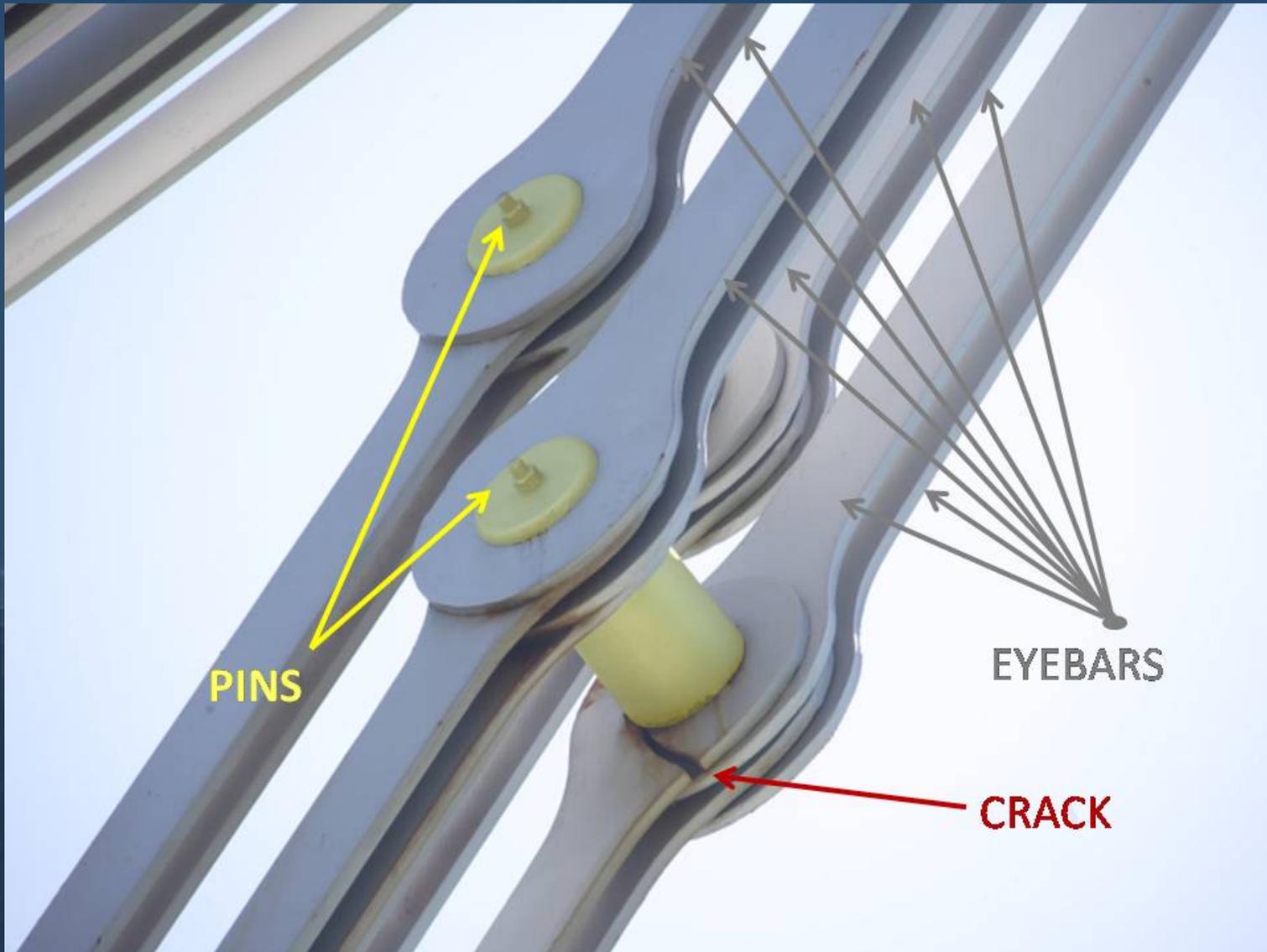
FAR RIGHT LANE WILL BE CLOSED OVERNIGHT

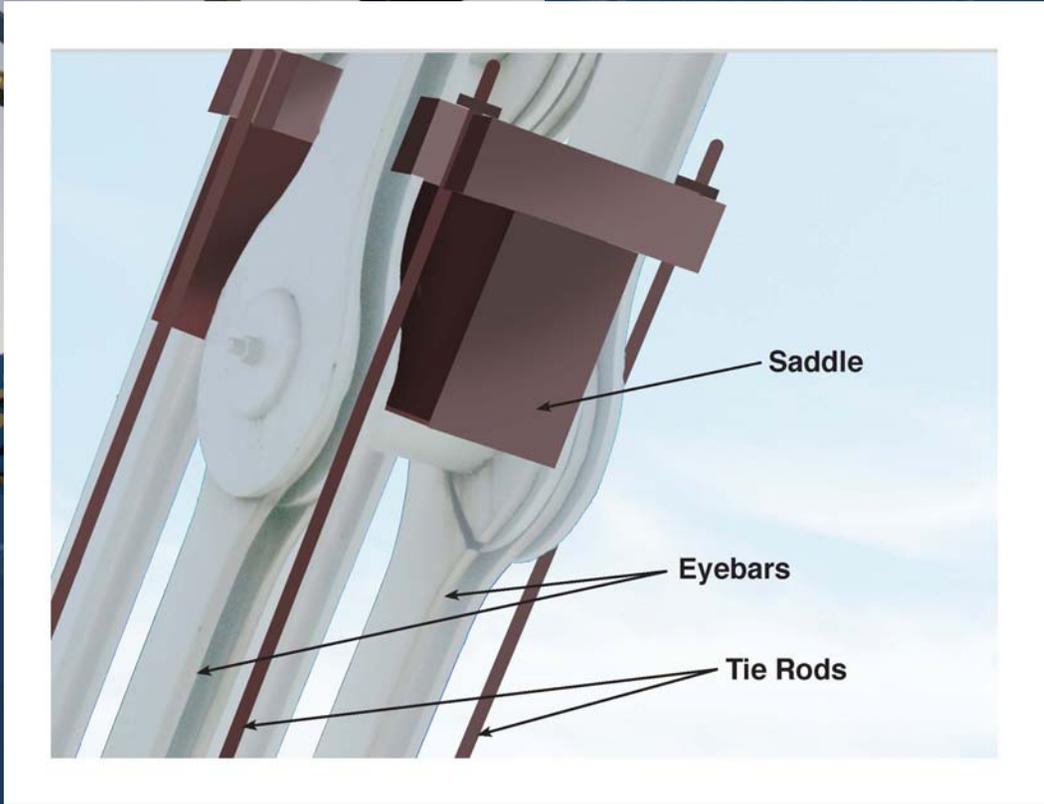
Sunday through Thursday nights: 10 p.m. — 7 a.m.

Friday nights: 11 p.m. — 9 a.m.

Saturday nights: 11:30 p.m. — 10 a.m.



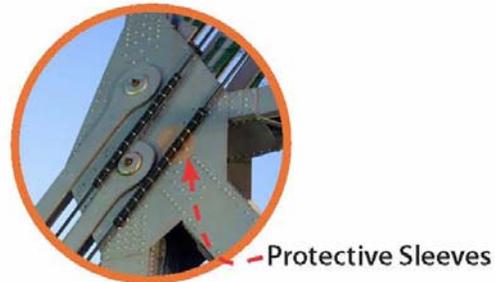
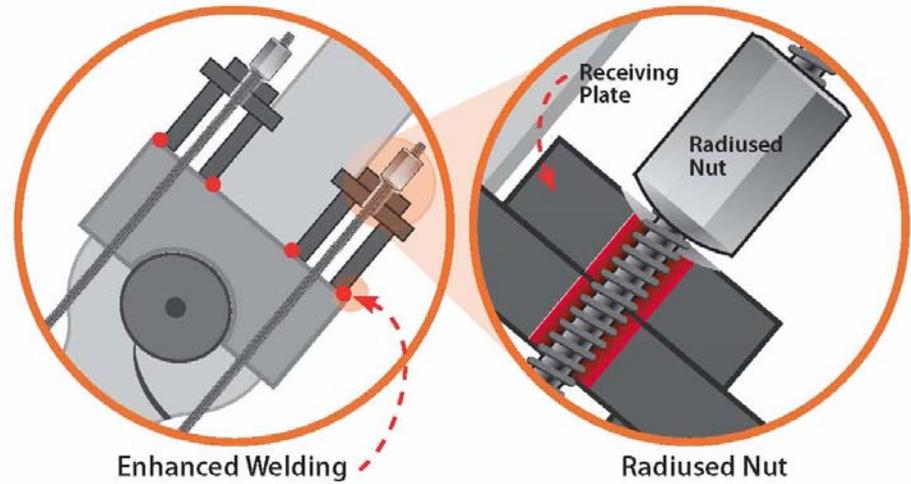
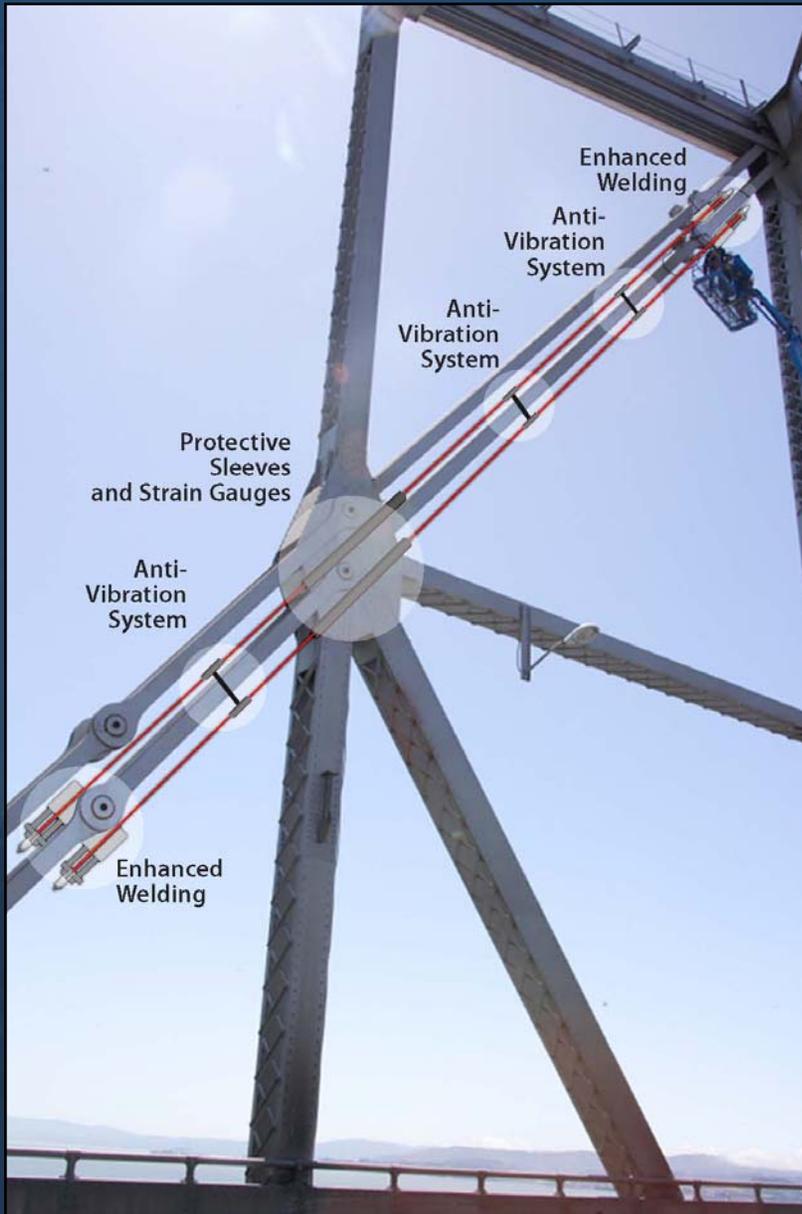




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Labor Day 2009 Weekend Repair

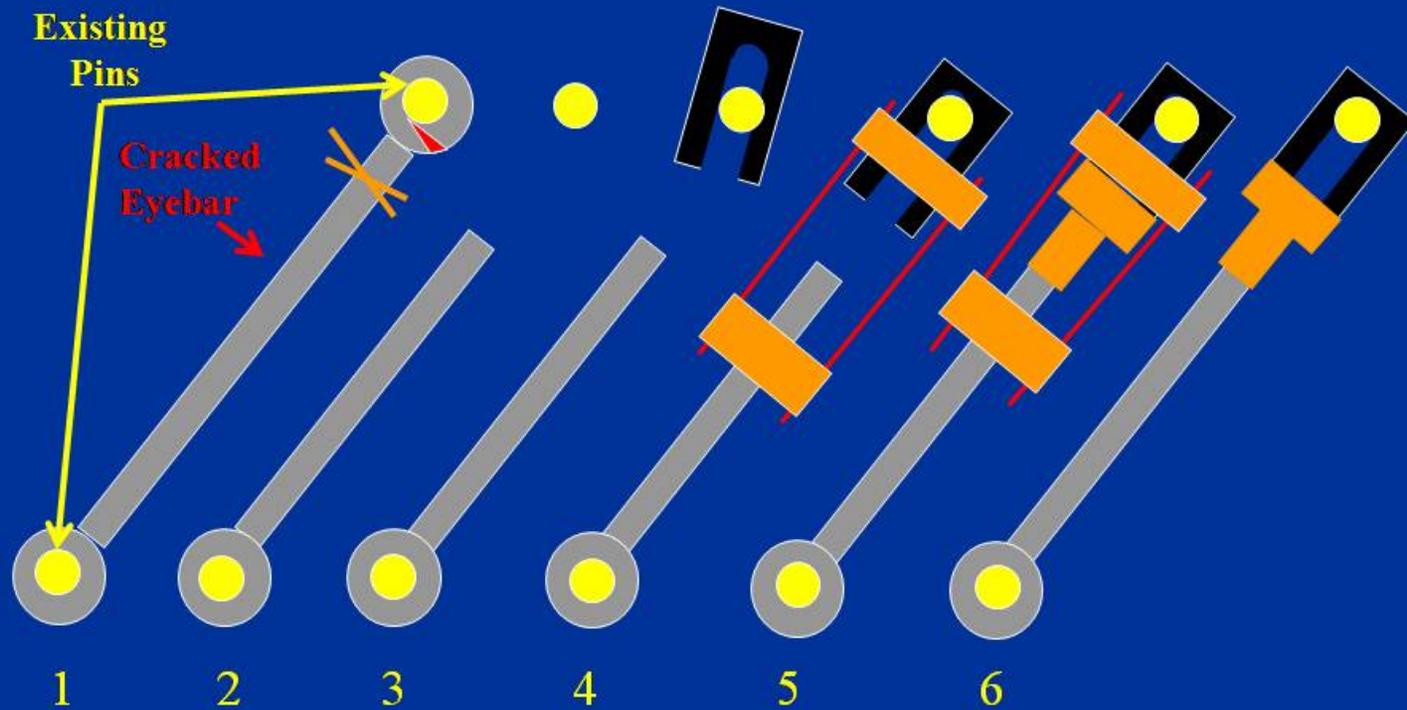


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Current Enhanced Eye-Bar Repair

Internal Repair

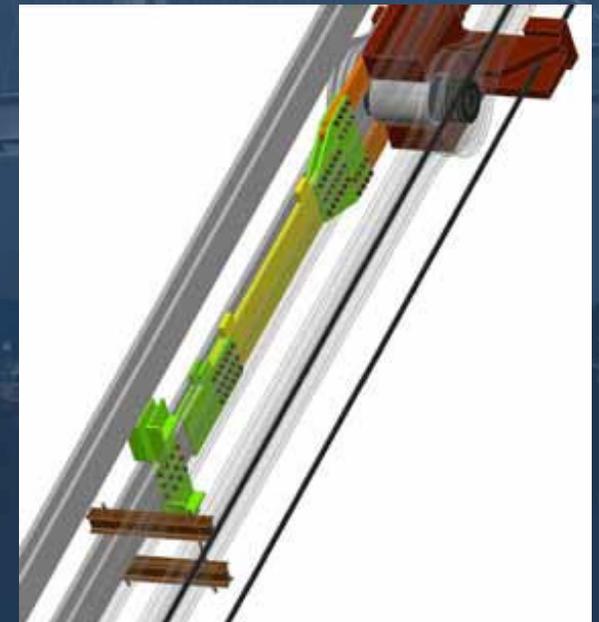
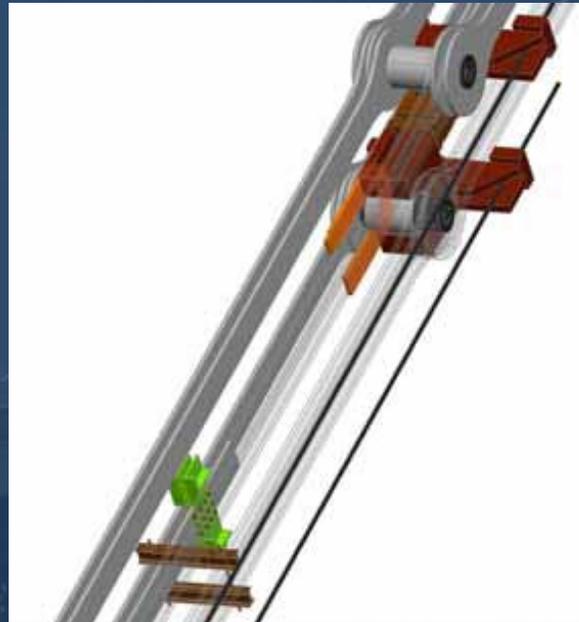


SFOBB Cantilever Eyebar Break



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Proposed Internal Repair Sequence

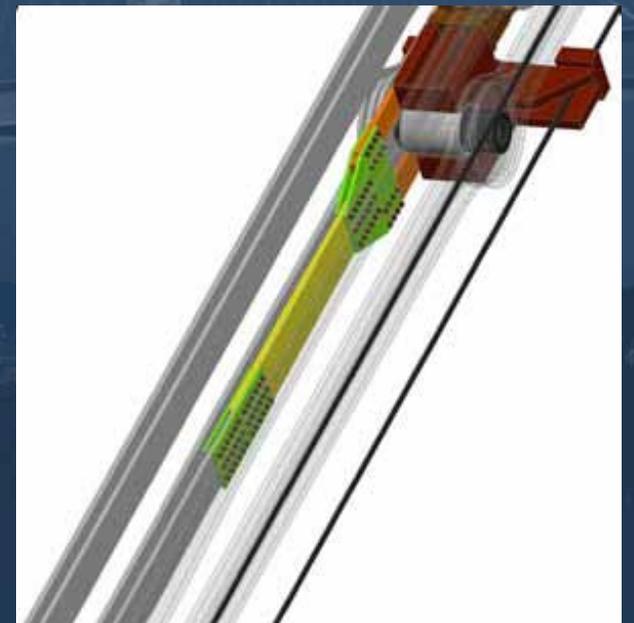
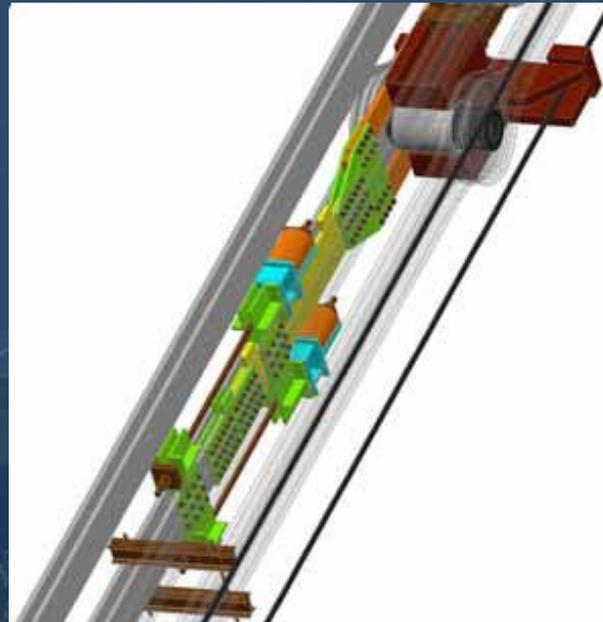
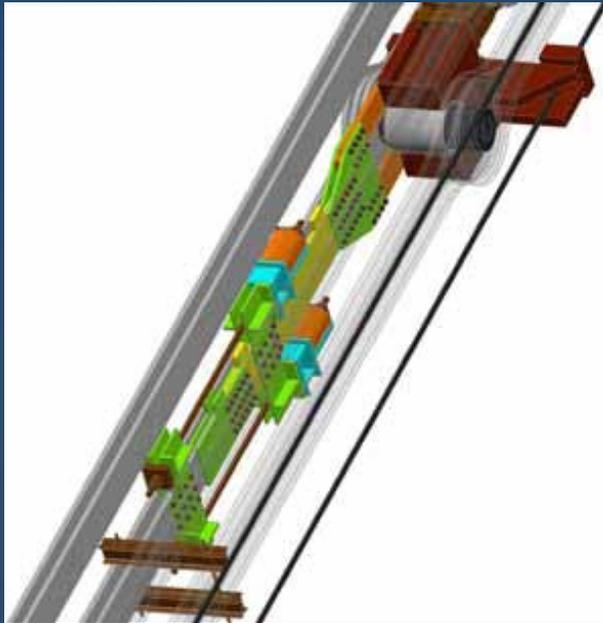


Proposed Internal Repair Sequence



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Proposed Internal Repair Sequence

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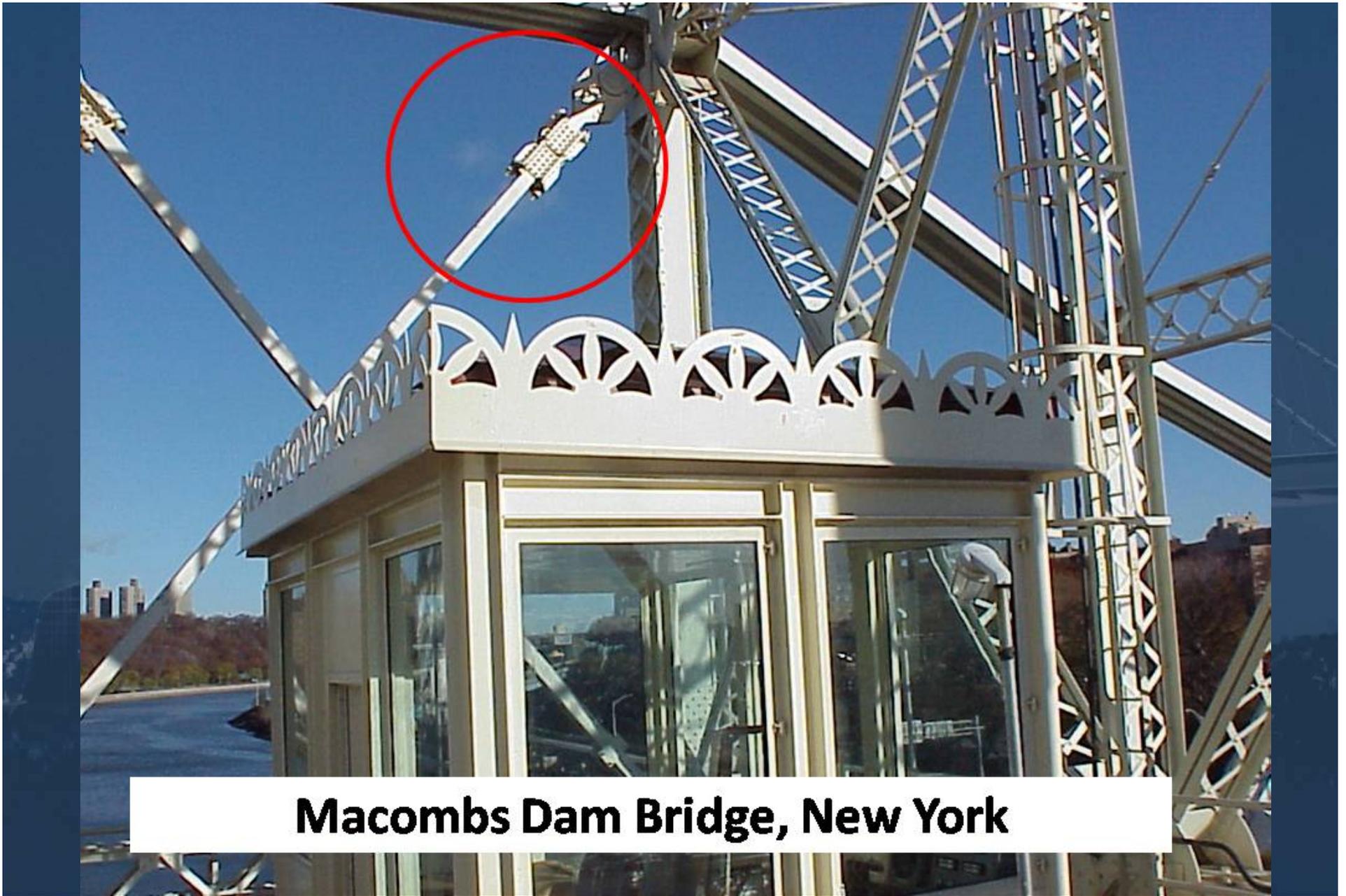
Kate Shelly Boone Bridge, Iowa



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Similar Repair in Iowa



Macombs Dam Bridge, New York



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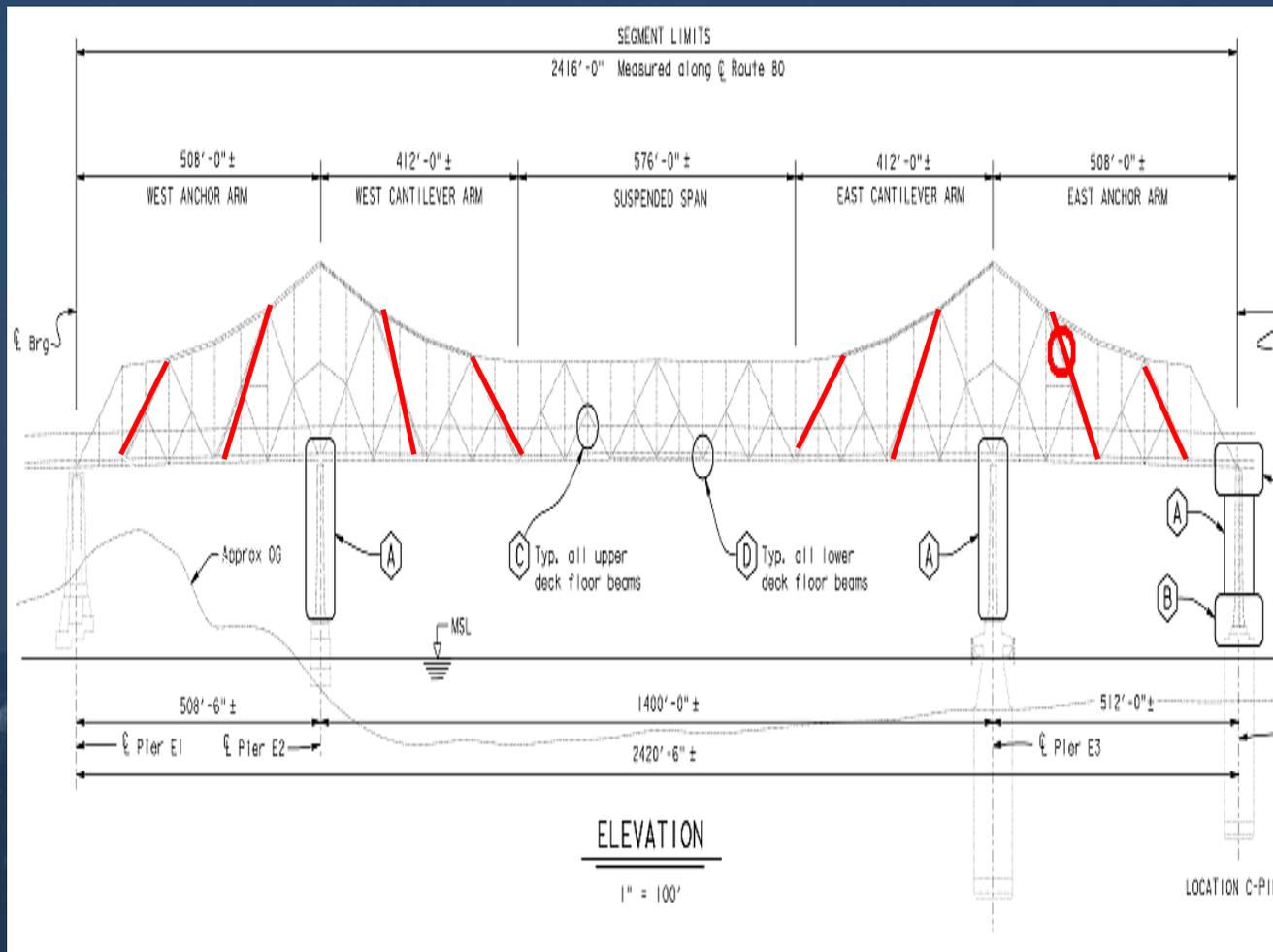
Similar Repair in New York

- **Myint Lwin**
 - **Director, Office of Bridge Technology, Federal Highway Administration**

- **Professor Frieder Seible**
 - **Dean of the Jacobs School of Engineering at the University of California, San Diego**

- **Professor Ahmad Itani**
 - **University of Nevada, Reno**





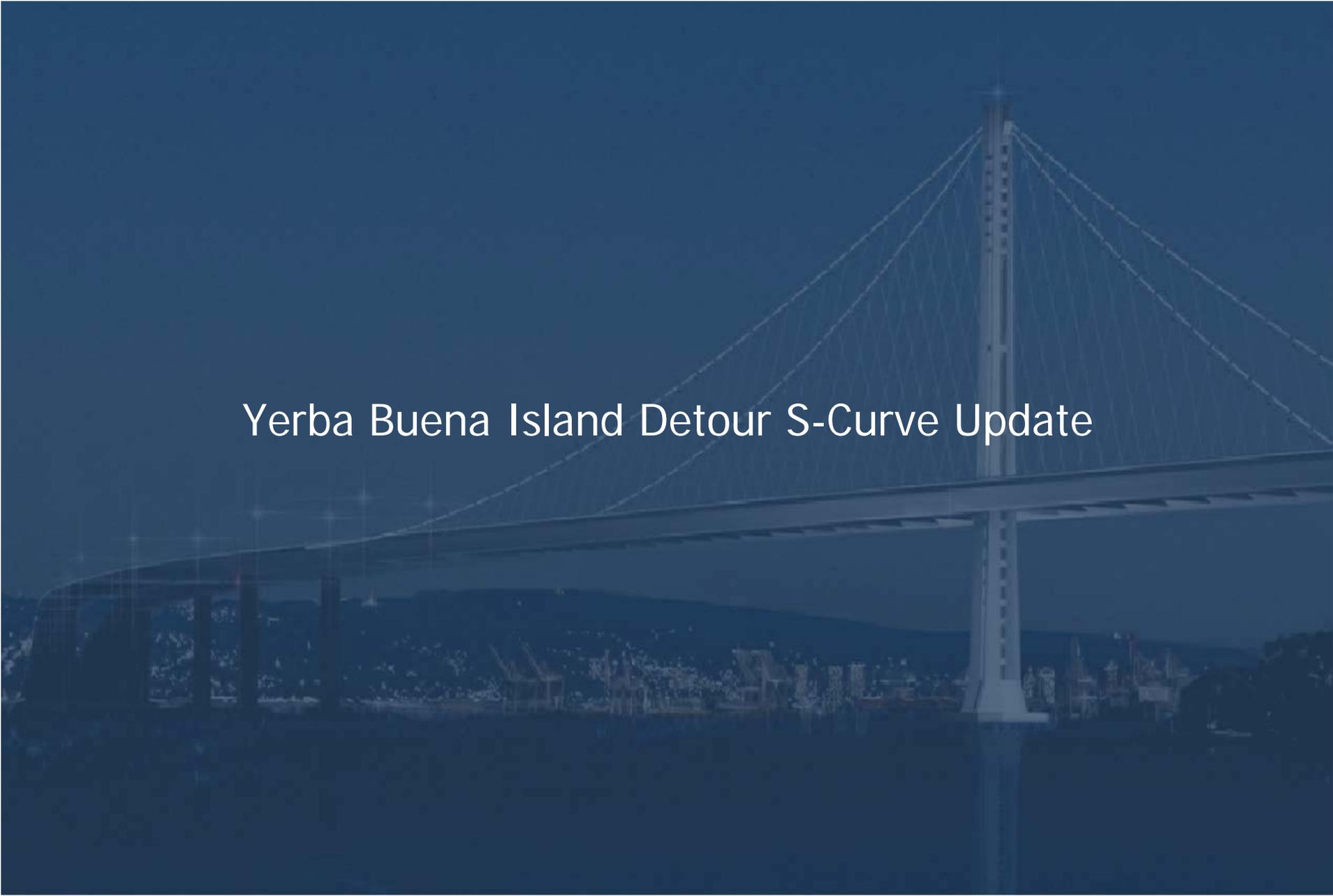
- Eye-bars on both sides of San Francisco-Oakland Bay Bridge and on the Richmond-San Rafael Bridge
- Continued Inspection
- Electronic Monitoring of Critical Locations
- Determination of cause of failure



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Next Steps



Yerba Buena Island Detour S-Curve Update

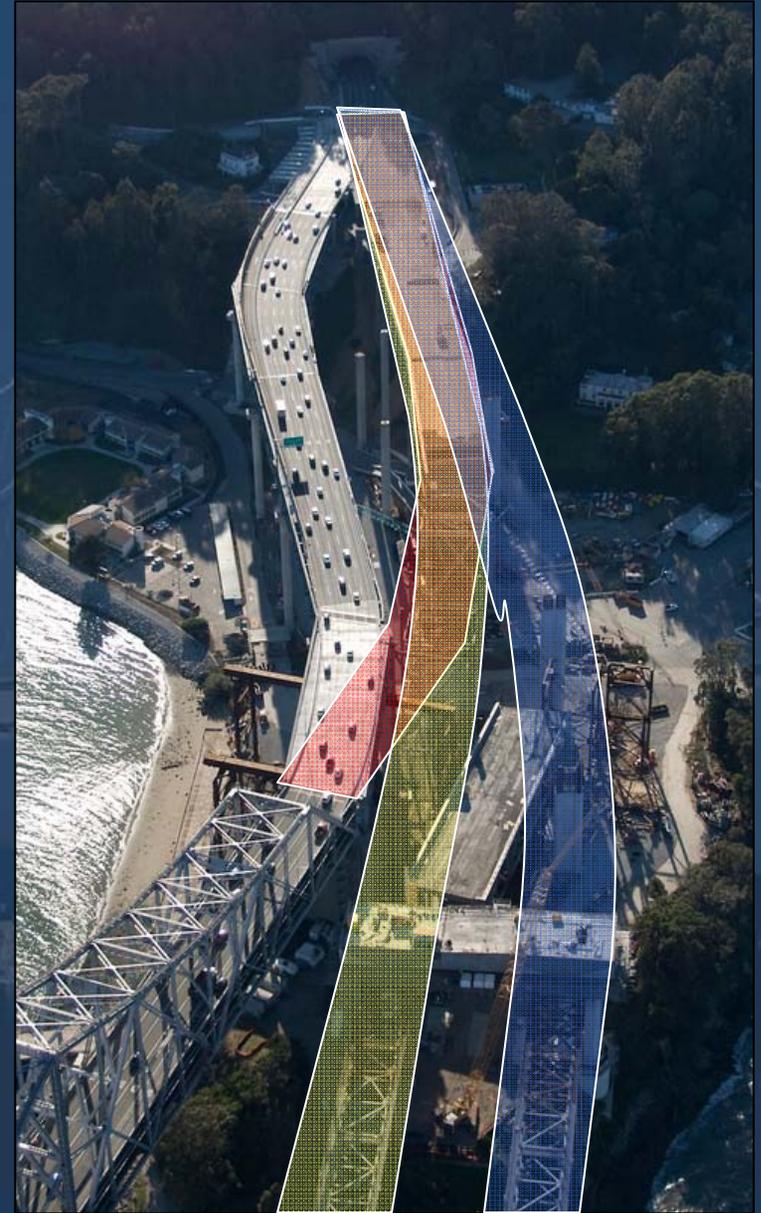


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Yerba Buena Island Detour

- Connects existing bridge to tunnel
- Existing approach structure is in the way of new approaches from SAS bridge north of existing alignment





- **Detour opening included:**
 - new warning lights
 - 40 MPH speed limit signs
 - curve warning & speed advisory signs
 - chevron arrows signs.
- **Enhancements since opening include:**
 - enhanced signage, pavement markings, striping; warning lights
 - radar speed feedback signs
 - Day/Evening off-peak lane closures
 - enhanced enforcement.





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S-Curve Drive-by Video/Simulation

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**Initial
Opening Period**
(9/8/09 to 11/11/09)

- **Traffic Collisions: 56**
(including two major incidents)
- **Primary Collision Factors:**
 - **Unsafe Speed, 46%**
 - **Unsafe Lane Changes, 21%**
 - **DUI's, 16%**

**With Traffic
Safety Enhancements**
(11/11/09 to 12/6/09)

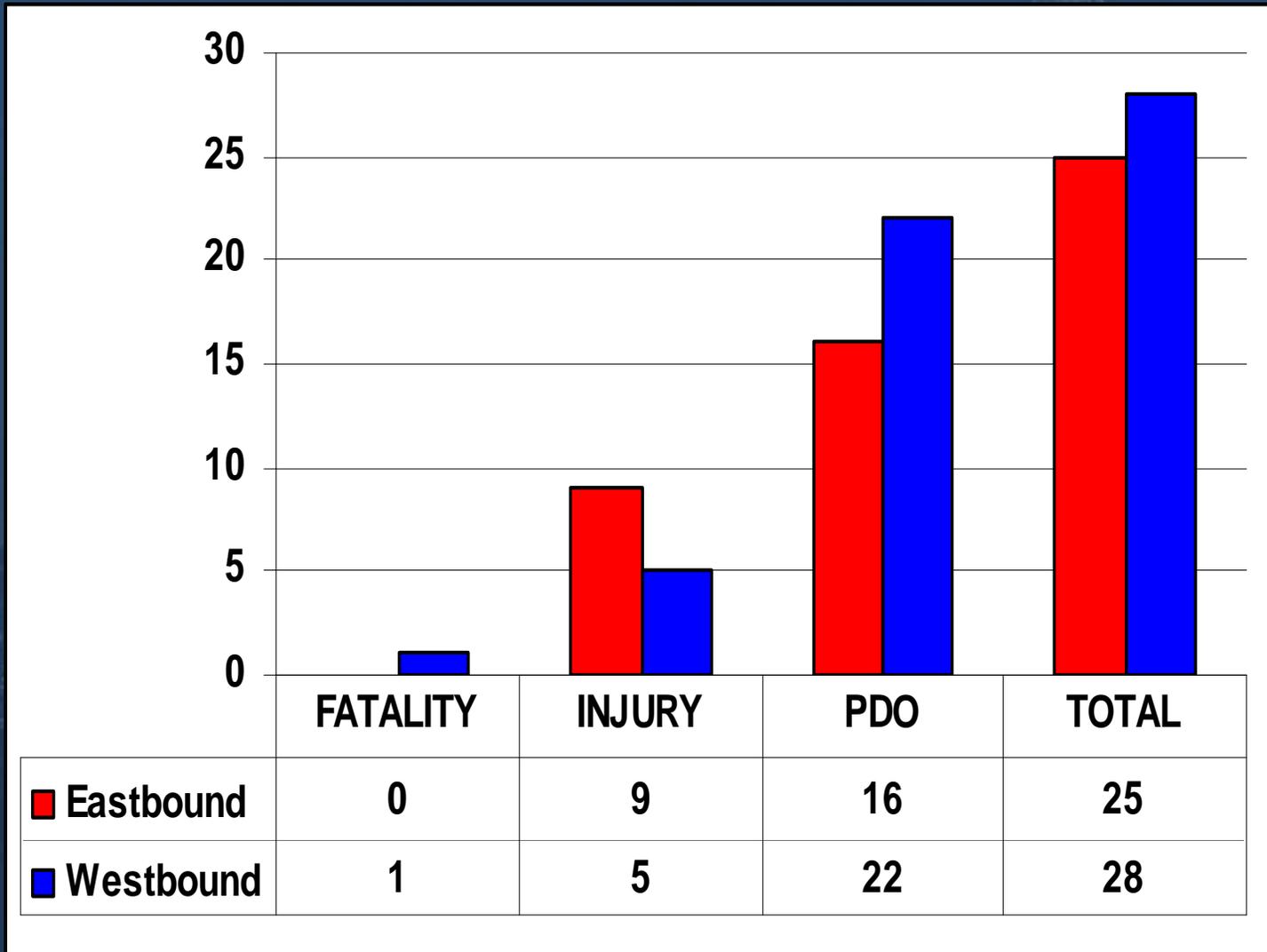
- **Traffic Collisions: 5**
- **Primary Collision Factors:**
 - **Unsafe Speed, 60%**
 - **Following Too Closely, 20%**
 - **Unsafe Lane Change, 20%**
- **Citations:**
 - **728 Speeding**
 - **76 commercial vehicles**
 - **41 DUI's**



SFOBB S-Curve

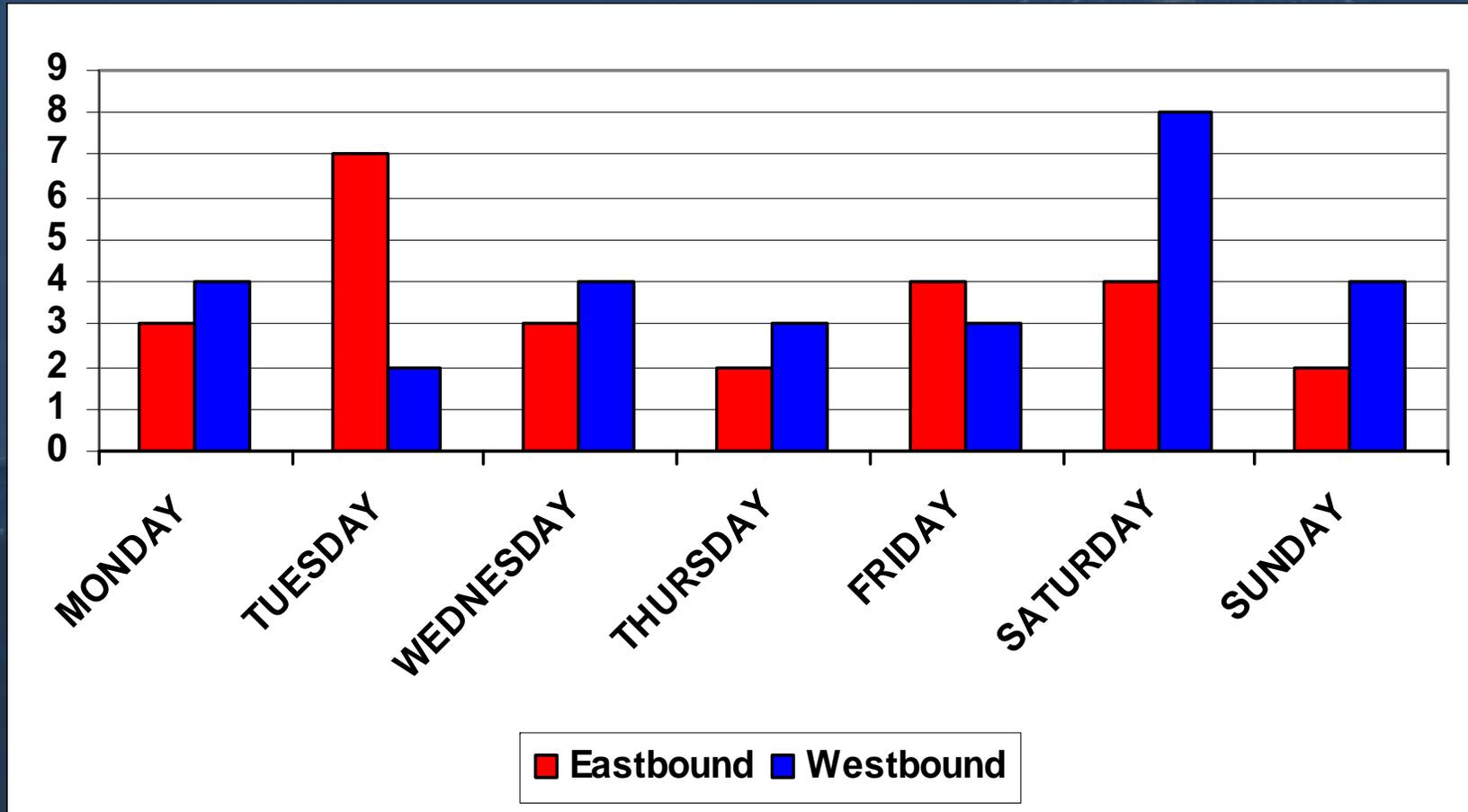
Number of Accidents-Total 53

09/11/09 – 11/16/09

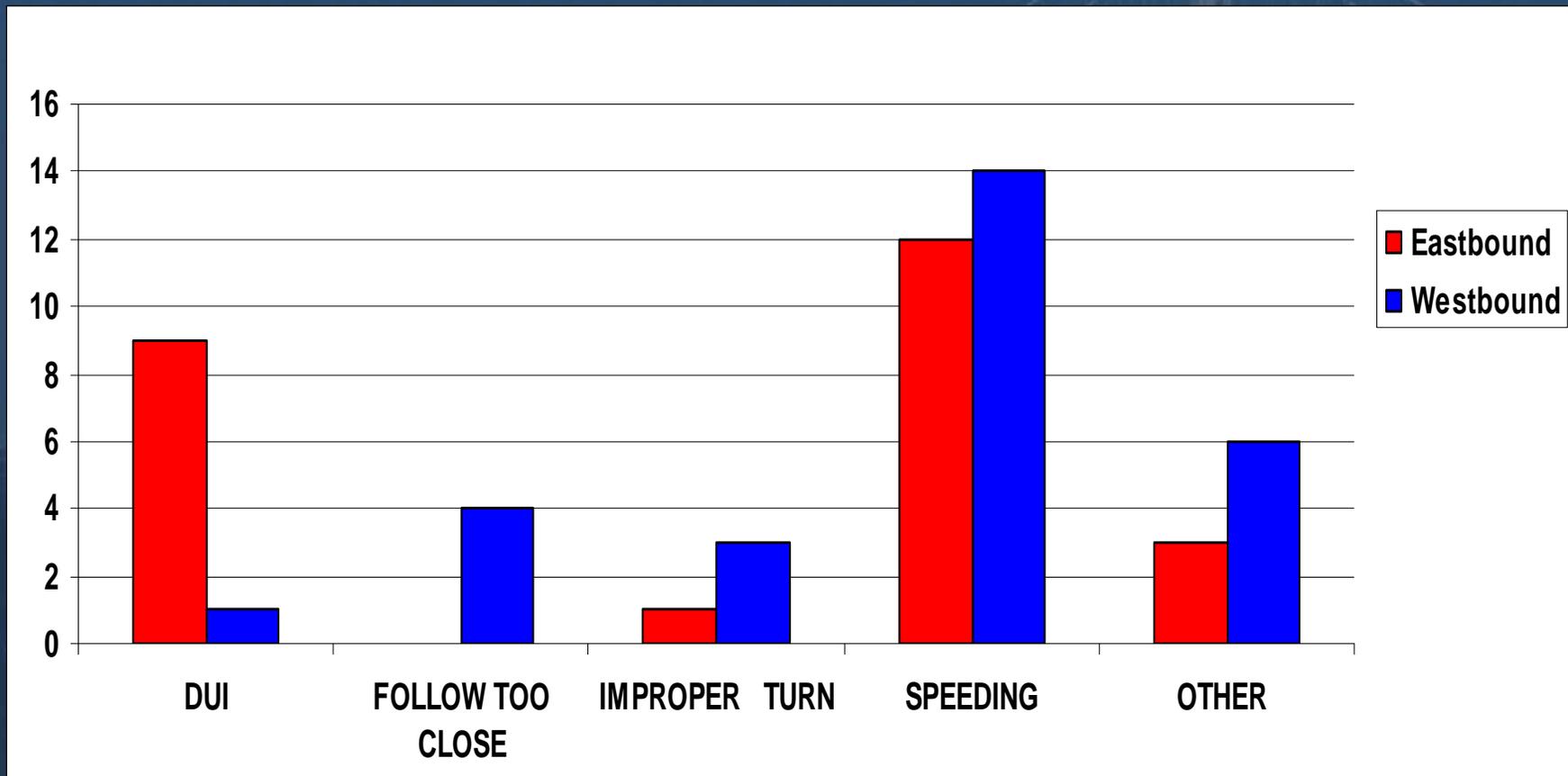


SFOBB S-Curve Number of Accidents by Day of the Week (53 Total)

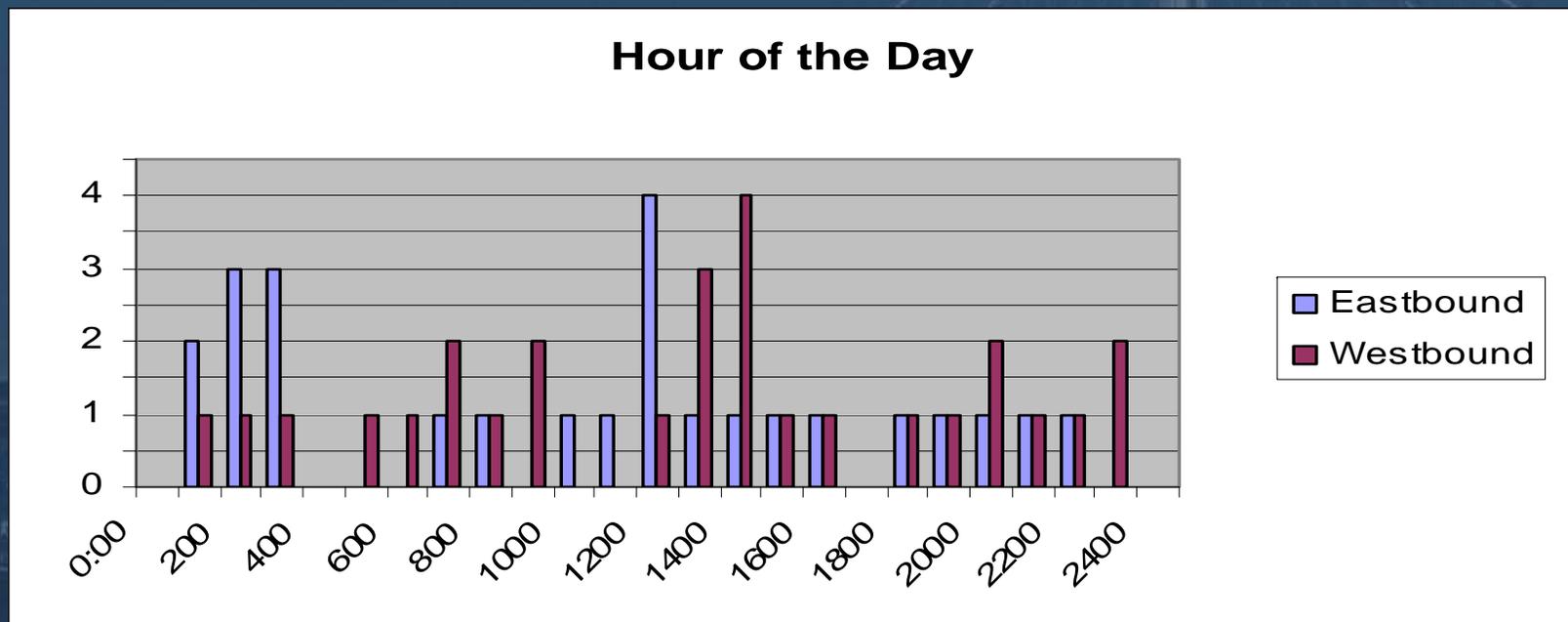
09/11/09 – 11/16/09



SFOBB S-Curve Number of Accidents by Primary Collision Factors (53 Total) 09/11/09 – 11/16/09



SFOBB S-Curve Number of Accidents by Time of Day (53 Total) 09/11/09 – 11/16/09



NEXT

Caltrans and CHP will continue and expand, as needed, their engineering, educational, and enforcement activities to ensure safe and efficient flow of traffic on the bridge:

- additional overhead electronic sign (westbound)
- enhanced traffic monitoring stations & CCTV coverage
- motorist information & outreach via partnerships with:
 - Media and web-sites
 - local agencies and business community
 - sporting events
 - California trucking association
- assertive and in-view enforcement
- DUI Checkpoint in San Francisco and East Bay Cities
- monthly coordination to evaluate effectiveness of actions taken, or to progressively adopt new strategies.

