August 14, 2015

Mr. Gregory Schmidt  
Secretary of the Senate  
State Capitol, Room 3044  
Sacramento, CA 95814

Mr. E. Dotson Wilson  
Chief Clerk of the Assembly  
State Capitol, Room 3196  
Sacramento, CA 95814

Dear Messrs. Schmidt and Wilson:

The Toll Bridge Program Oversight Committee (TBPOC) is pleased to submit the 2015 Second Quarter Project Progress and Financial Update for the San Francisco Bay Area Toll Bridge Seismic Retrofit and Regional Measure 1 Programs (TBSRP and RM1), prepared pursuant to California Streets and Highways Code Section 30952.

The TBPOC was established by Assembly Bill 144 in 2005 to oversee the delivery of the TBSRP and consists of the Executive Director of BATA, the Director of Caltrans, and the Executive Director of the California Transportation Commission. With the opening of the new East Span of the San Francisco-Oakland Bay Bridge to traffic on September 2, 2013, all seven state-owned toll bridges in the Bay Area have now achieved seismic safety, either via retrofit or replacement of existing structures.

On the Self-Anchored Suspension Span, contract acceptance is pending resolution of the discovery of water within the tower anchor rod sleeves. Caltrans is performing tests on the tower anchor rods, both laboratory testing and an in-situ seismic load proof testing. Of the 424 tower anchor rods, 408 were readily accessible for testing. Only two of the 408 tested rods did not hold their seismic proof load due to stripped threads at the base of the rods. As reported last quarter, the TBPOC directed Caltrans to develop a comprehensive testing plan and protocol for the tower foundation rods, in cooperation with the independent bolt review team, the Seismic Safety Peer Review Panel, and steel fastener and marine foundation experts from the Federal Highway Administration. The TBPOC has authorized more than $4 million for these testing activities and additional investigations. We will provide reports on this investigation at our regular public meetings, and will provide a detailed update in our quarterly reporting.

On dismantling of the old span, Caltrans is proceeding on a number of contracts to remove the old bridge. The main cantilever truss and Yerba Buena Island detour structures are almost completely removed and construction of the new eastbound on-ramp and bicycle/pedestrian path from the island is on-going. Caltrans recently awarded a $69.5 million low-
Caltrans has been in discussions with environmental regulatory agencies to remove the Pier E3 footing by implosion versus conventional means (i.e. jack hammers). We believe the implosion process will have the least amount of impact on the environment and to be less costly. The implosion process will be demonstrated on Pier E3 and, if successful, repeated on the remainder of the bridge foundations. While work has commenced on the above water work with a goal to perform the implosion in November 2015, Caltrans is still awaiting permits and approvals from regulatory agencies. A significant cost increase is expected should the implosion process not be approved by regulatory agencies or is not successful in the removal of the foundation.

The program contingency is currently $135 million in accordance with the TBPOC approved budget. As of the end of the second quarter of 2015, the 50 percent probable draw on program contingency is $241 million. The 50 percent probable draw is $9 million higher than last quarter. This reflects two principal factors: (1) increased risk that capital outlay support (COS) costs will grow due to the tower foundation rod investigation and (2) increased risk that even the lower capital outlay (CO) cost of the implosion demolition alternative will be more expensive than what was assumed in prior estimates of the marine foundation work.

We are mindful that this is the largest gap between the risk forecast and the program contingency balance that we have reported in the nearly 10 years that the TBPOC has existed. We are actively exploring various strategies to reduce both the COS and CO cost for the remaining work on both the new and old east spans, in order to bring the risk forecast and contingency balance back into better alignment. Recently, we have reevaluated our COS staffing levels and have dramatically reduced staffing for the upcoming fiscal years. The reduction will put downward pressure on future COS costs. However, there continues to be construction risks that are identified in the risk management plan.

The TBPOC is committed to providing the Legislature with comprehensive and timely reporting on the TBSRP. If there are any questions, or if any additional information is required, please do not hesitate to contact the members of the TBPOC.

Sincerely,

STEVE HEMINGER  MALCOLM DOUGHERTY  WILL KEMPTON
TBPOC Chair  Director  Executive Director
Executive Director  California Department of  California Transportation Commission
Bay Area Toll Authority  Transportation
August 14, 2015

Ms. Lucetta Dunn, Chair
California Transportation Commission
1120 N Street, Room 2221
Sacramento, CA 95814

Mr. Robert Alvarado, Vice-Chair
California Transportation Commission
1120 N Street, Room 2221
Sacramento, CA 95814

Dear Ms. Dunn and Mr. Alvarado:

The Toll Bridge Program Oversight Committee (TBPOC) is pleased to submit the 2015 Second Quarter Project Progress and Financial Update for the San Francisco Bay Area Toll Bridge Seismic Retrofit and Regional Measure 1 Programs (TBSRP and RM1), prepared pursuant to California Streets and Highways Code Section 30952.

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Caltrans has been in discussions with environmental regulatory agencies to remove the Pier E3 footing by implosion versus conventional means (i.e. jack hammers). We believe the implosion process will have the least amount of impact on the environment and to be less costly. The implosion process will be demonstrated on Pier E3 and, if successful, repeated on the remainder of the bridge foundations. While work has commenced on the above water work with a goal to perform the implosion in November 2015, Caltrans is still awaiting permits and approvals from regulatory agencies. A significant cost increase is expected should the implosion process not be approved by regulatory agencies or is not successful in the removal of the foundation.

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The TBPOC is committed to providing the Legislature with comprehensive and timely reporting on the TBSRP. If there are any questions, or if any additional information is required, please do not hesitate to contact the members of the TBPOC.

Sincerely,

STEVE HEMINGER
TBPOC Chair
Executive Director
Bay Area Toll Authority

MALCOLM DOUGHERTY
Director
California Department of Transportation

WILL KEMPTON
Executive Director
California Transportation Commission
The Program Management Team (PMT):
Andrew Fremier
Bay Area Toll Authority
Metropolitan Transportation Commission

Stephen Maller
California Transportation Commission

Dan McElhinney
Caltrans District 4 - Bay Area

Caltrans, SFOBB Chief Engineer:
Brian Maroney
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Cover photos, inside cover photos, table of contents photo and photos on pages 2-3, 5, 8, 15, 17-19, 22, 32, 38, 48-58
Map of Bay Area Toll Bridges

* The Golden Gate Bridge is owned and operated by the Golden Gate Bridge, Highway and Transportation District.
Introduction

In July 2005, Assembly Bill (AB) 144 (Hancock) created the Toll Bridge Program Oversight Committee (TBPOC) to implement a project oversight and project control process for the new Benicia-Martinez Bridge and State Toll Bridge Seismic Retrofit Program (TBSRP) projects. The TBPOC consists of the Director of the California Department of Transportation (Caltrans), the Executive Director of the Bay Area Toll Authority (BATA) and the Executive Director of the California Transportation Commission (CTC). The TBPOC’s project oversight and control processes include, but are not limited to, reviewing bid specifications and documents, reviewing and approving significant change orders and claims in excess of $1 million (as defined by the TBPOC), and keeping the Legislature and others apprised of current project progress and status. In January 2010, Assembly Bill (AB) 1175 (Torlakson) amended the TBSRP to include the Antioch and Dumbarton Bridges seismic retrofit projects. The current TBSRP is as follows:

<table>
<thead>
<tr>
<th>Toll Bridge Seismic Retrofit Projects</th>
<th>Seismic Safety Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dumbarton Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>Antioch Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>San Francisco-Oakland Bay Bridge East Span Replacement</td>
<td>Construction*</td>
</tr>
<tr>
<td>San Francisco-Oakland Bay Bridge West Approach Replacement</td>
<td>Complete</td>
</tr>
<tr>
<td>San Francisco-Oakland Bay Bridge West Span Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>San Mateo-Hayward Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>Richmond-San Rafael Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>1958 Carquinez Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>1962 Benicia-Martinez Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>San Diego-Coronado Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
<tr>
<td>Vincent Thomas Bridge Seismic Retrofit</td>
<td>Complete</td>
</tr>
</tbody>
</table>

*The seismic safety opening of the bridge occurred in September 2013. The project will be fully opened when the permanent Yerba Buena Island on ramp and bicycle/pedestrian path are completed.

The New Benicia-Martinez Bridge was part of a larger program of toll-funded projects called the Regional Measure 1 (RM1) Toll Bridge Program under the responsibility of BATA and Caltrans. The RM1 program included:

<table>
<thead>
<tr>
<th>Regional Measure 1 Projects</th>
<th>Open to Traffic Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate 880/State Route 92 Interchange Reconstruction</td>
<td>Open</td>
</tr>
<tr>
<td>1962 Benicia-Martinez Bridge Reconstruction</td>
<td>Open</td>
</tr>
<tr>
<td>New Benicia-Martinez Bridge</td>
<td>Open</td>
</tr>
<tr>
<td>Richmond-San Rafael Bridge Deck Overlay Rehabilitation</td>
<td>Open</td>
</tr>
<tr>
<td>Richmond-San Rafael Bridge Trestle, Fender &amp; Deck Joint Rehabilitation</td>
<td>Open</td>
</tr>
<tr>
<td>Westbound Carquinez Bridge Replacement</td>
<td>Open</td>
</tr>
<tr>
<td>San Mateo-Hayward Bridge Widening</td>
<td>Open</td>
</tr>
<tr>
<td>State Route 84 Bayfront Expressway Widening</td>
<td>Open</td>
</tr>
<tr>
<td>Richmond Parkway</td>
<td>Open</td>
</tr>
</tbody>
</table>
SUMMARY OF MAJOR PROJECT HIGHLIGHTS, ISSUES, AND ACTIONS

Toll Bridge Seismic Retrofit Program Risk Management

A major element of the 2005 AB 144, the law creating the TBPOC, was legislative direction to implement a more aggressive risk management program. Such a program has been implemented in stages over time to ensure development of a robust and comprehensive approach to risk management. A comprehensive risk assessment is performed for each project in the program on a quarterly basis.

Based upon those assessments, a forecast is developed using the average cost of risk. These forecasts can increase or decrease as risks are identified, resolved or retired. The program contingency is currently $135.2 million in accordance with the TBPOC approved budget. As of the end of the second quarter of 2015, the 50 percent probable draw on program contingency is $240.9 million. The potential draw ranges from about $160 million to $300 million (refer to Figure 3 on page 29).

Although the current program contingency forecast balance is lower than the cost of currently identified forecast risks, it is important to understand that the risks identified in each of the contracts are not yet mitigated. Various teams will be working to further define these risks and potential mitigations to reduce the probability of these risks occurring and preparing responses to minimize their impact should they occur. In accordance with the approved TBSRP Risk Management Plan, risk mitigation actions are to be developed and implemented to reduce the potential draw on the program contingency (see further details on page 28).

San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Replacement Project Self-Anchored Suspension (SAS) Bridge Superstructures Contract

The seismically safe replacement eastern span of the San Francisco-Oakland Bay Bridge opened to traffic on the morning of September 2, 2013. On the Self-Anchored Suspension Span, contract acceptance is pending resolution of several issues.

To date, Caltrans has been performing tests on the tower anchor rods, both in-situ and in the laboratory.
Of the 424 tower anchor rods, 408 rods that were readily accessible were recently put through a seismic load proof test. The vast majority of the rods held at the seismic proof load. Only two of the rods tested did not hold their seismic proof loads. Both of these rods were later extracted and determined that both had threads stripped at the bottom of the rods and one of these two rods also had a bottom end fracture. Two other rods had been extracted prior to the seismic proof test for laboratory testing. One rod that had not held the initial jacking load (stripped threads at bottom found) and one rod that had held the design load, but had been found with water in its rod duct sleeve instead of grout. The later rod had met all design load requirements and was pulled to test for any adverse impacts that might have been caused by the exposure of the rod to the water. Further, some micro-cracking was observed during inspection on one of the previously extracted rods by a scanning electron microscope. Testing has not yet been completed to determine the significance of these microscopic results. Finally, testing of water found in the tower anchor rod sleeves have shown elevated levels of chloride suggesting potential salt water intrusion at some rod locations.

To review, in early 2013, within days after tensioning was performed, the anchor bolts in the shear keys directly below the eastbound and westbound orthotropic box girder (OBG) structures (known as shear keys S1 and S2) began to fail. The function of the broken rods were replaced by the steel saddle retrofit that was completed in December 2013.

As far as the remaining A354 Grade BD high strength steel rods used on the bridge, the TBPOC completed a comprehensive testing program. On September 30, 2014, a bolt review committee of nine experts in the areas of fasteners, corrosion, and metallurgy presented the TBPOC with the findings of the test results. Those results found that the 2008 bolts broke from hydrogen embrittlement due to specific combination of susceptible material properties and challenges during fabrication and installation. The remaining A354 grade BD high strength steel bolts used on the bridge were fabricated and installed in a definitively different manner than the broken 2008 bolts. The bolt review committee has determined that the remaining bolts are safe, meet the design requirements of the bridge, and will not be a long term problem as long as the corrosion protection of the bolts is maintained in accordance with maintenance requirements. Their report and test results can be found at www.baybridgeinfo.org.
San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Replacement Project

**Oakland Touchdown #2 Contract**
Flatiron West, Inc. is the prime contractor that is constructing the Oakland Touchdown #2 project, which completes the remaining portions of the Oakland Touchdown approach structures from the existing toll plaza to the new span. This work included the entire westbound structure and portions of the eastbound structure (not in conflict with the existing span) which were constructed under the Oakland Touchdown #1 contract. The OTD #2 construction contract started on June 25, 2012, and was substantially completed in September 2014. Plant establishment work is ongoing. Maintenance and SWPPP will continue on the OTD #2 project until the end of September 2015.

**Yerba Buena Island Transition Structure (YBITS) #2 and Cantilever Dismantling Contract**
The YBITS #2 and Cantilever Dismantling contract is dismantling the main cantilever truss and detour viaduct and will construct the new eastbound on-ramp and bicycle/pedestrian pathway to the bridge in its place. The contract was awarded to California Engineering Contractors Inc./Silverado Contractors Inc. Joint Venture on November 28, 2012. Initial startup activities and submittals began in March 2013. The main cantilever truss was cut into two independent east and west structures on April 2, 2014 and has been removed. Work is now focused on completing work onto the island, including new east bound on-ramp and the bicycle/pedestrian path. There is now a potential 6-month delay for completion of the bike path to the landing and eastbound on-ramp, due to delays in column demolition of the YBI detour structure, delays to the pile driving for the removal of the cantilever temporary supports, and potential re-sequencing of the on-ramp construction due to Coast Guard access restrictions to the work area.

**504/288 Superstructure Dismantling Contract**
Caltrans has finalized plans for the dismantling of the 504 and 288 trusses and supports. The 504 and 288 trusses make up the approach structures from the toll plaza to the main cantilever. Bids for the 504/288 contract opened in March 2015, and the contract was awarded to California Engineering Contractors, Inc./Silverado Contractors Inc., JV.
Dismantling of the Former San Francisco-Oakland Bay Bridge with the New Self-Anchored Suspension Bridge on right
## Toll Bridge Seismic Retrofit Program Cost Summary (Millions)

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><em>a</em></td>
<td><em>b</em></td>
<td><em>c</em> = <em>a</em> + <em>b</em></td>
<td><em>d</em></td>
<td><em>e</em></td>
<td><em>f</em> = <em>e</em> - <em>c</em></td>
<td></td>
</tr>
</tbody>
</table>

### SFOBB East Span Seismic Replacement

**Capital Outlay Construction**

- **Skyway**
  - Completed
  - $1,293.0 (55.8)
  - $1,237.2
  - $1,235.6
  - $1,237.2
  - -

- **SAS Marine Foundations**
  - Completed
  - $313.5 (38.7)
  - $274.8
  - $274.8
  - $274.8
  - -

- **SAS Superstructure**
  - Construction
  - $1,753.7
  - $293.1
  - $2,046.8
  - $1,980.7
  - $2,047.5
  - 0.7

- **YBI Detour**
  - Completed
  - $131.9
  - $341.4
  - $473.3
  - $473.3
  - -

- **YBI Transition Structures (YBITS)**
  - Completed
  - $299.3
  - 0.1
  - $299.4
  - $274.8
  - $274.8
  - -

- **YBITS 1**
  - Completed
  - $203.7
  - $201.8
  - $203.0
  - (0.7)

- **YBITS 2 Cantilever Dismantling**
  - Construction
  - $92.4
  - $77.2
  - $123.4
  - 31.0

- **YBITS Landscaping**
  - Design
  - $3.3
  - -
  - $3.3
  - -

- **Oakland Touchdown (OTD)(1)**
  - $283.8
  - 46.8
  - $330.6
  - $324.1
  - $331.6
  - 1.0

- **OTD 1**
  - Completed
  - $205.3
  - $202.8
  - $203.0
  - -

- **OTD 2**
  - Construction
  - $72.6
  - $68.9
  - $73.7
  - 1.1

- **Detour**
  - Completed
  - $47.0
  - $46.7
  - $46.9
  - (0.1)

- **OTD Electrical Systems**
  - Construction
  - -
  - -
  - -
  - -

- **Submerged Electric Cable**
  - Completed
  - $5.7
  - $5.7
  - $5.7
  - -

- **Existing Bridge Dismantling**
  - $239.2
  - 7.3
  - $246.5
  - $36.1
  - $361.3
  - 114.8

- **Cantilever Section (2)**
  - Construction
  - $69.0
  - $23.6
  - $65.0

- **504/288 Sections**
  - Construction
  - -
  - 9.6
  - 112.4

- **Marine Foundations**
  - Construction
  - -
  - 2.9
  - 183.9

- **Pier E3 Demonstration Project**
  - -
  - 2.9
  - 24.2

- **Remaining Marine Foundations**
  - -
  - -
  - -
  - -
  - -

- **Stormwater Treatment Measures**
  - Completed
  - $15.0
  - 3.3
  - $18.3
  - $16.9
  - $17.3
  - (1.0)

- **Other Completed Contracts**
  - Completed
  - $90.4
  - (0.5)
  - $89.9
  - $89.9
  - $90.5
  - 0.6

- **Capital Outlay Support**
  - $959.3
  - 346.2
  - $1,305.5
  - $1,274.5
  - $1,376.7
  - 71.2

- **Right-of-Way and Environmental Mitigation**
  - $72.4
  - -
  - $72.4
  - $60.0
  - $69.0
  - (3.4)

### Antioch Bridge Seismic Retrofit

- **Capital Outlay Construction and Mitigation**
  - Completed
  - $47.0
  - $47.0
  - $47.0
  - $47.0
  - -

- **Capital Outlay Support**
  - $23.8
  - $23.8
  - $23.8
  - $23.8
  - -

- **Total Antioch Bridge Seismic Retrofit**
  - -
  - $70.8
  - $70.8
  - $70.6
  - $70.8
  - -

### Dumbarton Bridge Seismic Retrofit

- **Capital Outlay Construction and Mitigation**
  - Completed
  - $68.2
  - $68.2
  - $63.8
  - $68.2
  - -

- **Capital Outlay Support**
  - $46.0
  - $46.0
  - $45.1
  - $45.4
  - (0.6)

- **Total Dumbarton Bridge Seismic Retrofit**
  - -
  - $114.2
  - $114.2
  - $108.9
  - $113.6
  - (0.6)

- **Other Program Projects**
  - $2,268.4
  - (63.6)
  - $2,204.8
  - $2,169.7
  - $2,170.5
  - (34.3)

- **Miscellaneous Program Costs**
  - $30.0
  - -
  - $30.0
  - $26.0
  - $30.0
  - -

- **Net Programmatic Risks**
  - -
  - -
  - -
  - -
  - -

- **Program Contingency**
  - $900.0
  - (76.4)
  - $135.2
  - -
  - (105.7)
  - (240.9)

- **Total Toll Bridge Seismic Retrofit Program (3)**
  - $8,685.0
  - 267.0
  - $8,952.0
  - $8,420.5
  - $8,952.0
  - -

---

1. Construction administration of the OTD Detour was under the YBITS#1 contract.
2. Construction administration of the cantilever segment is under the YBITS#2 contract.
3. Figures may not sum up to totals due to rounding effects.
4. Forecast for the removal of the remaining marine foundations with the conventional method is estimated to be $254.3 million. (Due to the rounding of numbers, the totals above are shown within $0.02).
## Toll Bridge Seismic Retrofit Program Schedule Summary

<table>
<thead>
<tr>
<th>AB 144/SB 66 Project Completion Schedule Baseline (July 2005)</th>
<th>TBPOC Approved Changes (Months)</th>
<th>Current TBPOC Approved Completion Schedule (June 2015)</th>
<th>Current Completion Forecast (June 2015)</th>
<th>Schedule Variance (Months)</th>
<th>Schedule Status</th>
<th>Remarks/Notes</th>
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</thead>
<tbody>
<tr>
<td>SFOBB East Span Seismic Replacement</td>
<td>g</td>
<td>h</td>
<td>i = g + h</td>
<td>j</td>
<td>k = j - i</td>
<td>l</td>
</tr>
<tr>
<td>Contract Completion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skyway</td>
<td>Apr 2007</td>
<td>8</td>
<td>Dec 2007</td>
<td>Dec 2007</td>
<td>-</td>
<td>●</td>
</tr>
<tr>
<td>YBI Transition Structures (YBITs)</td>
<td>Nov 2013</td>
<td>36</td>
<td>Nov 2016</td>
<td>Nov 2016</td>
<td>-</td>
<td>●</td>
</tr>
<tr>
<td>YBITS 1</td>
<td>Feb 2014</td>
<td></td>
<td>Feb 2014</td>
<td>Feb 2014</td>
<td>-</td>
<td>●</td>
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<td>May 2017</td>
<td>(6)</td>
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<td>(12)</td>
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### SFOBB East Span Bridge Opening and Other Milestones

- **Westbound Seismic Safety Open**
  - Sep 2011 24 Sep 2013 Sep 2013 - ● See Page 14
- **Eastbound Seismic Safety Open**
  - Sep 2012 12 Sep 2013 Sep 2013 - ● See Page 14
- **Eastbound On Ramp / Bike/Ped Pathway Open to Traffic**
  - Jun 2015 Dec 2015 (6) ● See Page 14
- **Antioch Bridge Seismic Retrofit**
  - Contract Completion Jul 2012 Jul 2012 - ● See Page 25
  - Seismic Safety Completion Apr 2012 Apr 2012 -

### Dumbarton Bridge Seismic Retrofit

- **Contract Completion**
  - Mar 2013 Mar 2013 - ●
- **Seismic Safety Completion**
  - Mar 2013 Jan 2013 - ●

*Within approved schedule and budget*
*Identified potential project risks that could significantly impact approved schedules and budgets if not mitigated*
*Known project impacts with forthcoming changes to approved schedules and budgets*
Looking West toward Yerba Buena Island with the Demolition of the Former San Francisco-Oakland Bay Bridge in the foreground and the New Bridge in the Background
When a 250-ton section of the upper deck of the East Span collapsed during the 7.1-magnitude Loma Prieta Earthquake in 1989, it was a wake-up call for the entire Bay Area. While the East Span quickly reopened within a month, a critical question lingered: How could the Bay Bridge - a vital regional lifeline structure - be strengthened to withstand the next major earthquake? Seismic experts from around the world determined that to make each separate element seismically safe on a bridge of this size, the work must be divided into numerous projects. Each project presents unique challenges. Yet there is one common challenge - the need to accommodate the more than 280,000 vehicles that cross the bridge each day.

**West Approach Seismic Replacement Project**

*Project Status: Completed 2009*

Seismic safety retrofit work on the West Approach in San Francisco, bounded on the west by Fifth Street and on the east by the anchorage of the west span at Beale Street, involved completely removing and replacing this one-mile stretch of Interstate 80, as well as six on-and off-ramps within the confines of the West Approach’s original footprint.

**West Span Seismic Retrofit Project**

*Project Status: Completed 2004*

The West Span lies between Yerba Buena Island and San Francisco and is made up of two complete suspension spans connected at a center anchorage. Retrofit work included adding massive amounts of steel and concrete to strengthen the entire West Span, along with new seismic shock absorbers and bracing.
East Span Seismic Replacement Project

Rather than a seismic retrofit, the two-mile long East Span has been completely rebuilt. The new East Span consists of several different sections, yet appears as a single streamlined span. The eastbound and westbound lanes of the East Span no longer include upper and lower decks. The lanes are side-by-side, providing motorists with expansive views of the bay. These views are also enjoyed by bicyclists and pedestrians, thanks to a new bicycle/pedestrian path on the south side of the bridge that will extend all the way to Yerba Buena Island. The new span features the world’s longest Self-Anchored Suspension (SAS) bridge that connects to an elegant roadway supported by piers (Skyway), which gradually slopes down toward the Oakland shoreline (Oakland Touchdown).
TOLL BRIDGE SEISMIC RETROFIT PROGRAM
San Francisco-Oakland Bay Bridge East Span Replacement Project Summary

The new East Span bridge is split into four major components - the Skyway, the Self-Anchored Suspension bridge in the middle, the Yerba Buena Island Transition Structures and Oakland Touchdown approaches. Each component has been constructed by one to three separate contracts that were sequenced together to reduce schedule risk.

Highlighted below are the major East Span contracts and their schedules. The letter designation before each contract corresponds to contract descriptions in the report.

The New San Francisco-Oakland Bay Bridge East Span Bicycle/Pedestrian Path Construction in Progress

SFOBB East Span Work Sequence

Note: Dates shown above are project completion dates.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM
San Francisco-Oakland Bay Bridge East Span Replacement Project
Yerba Buena Island Detour (YBID)

As with all of the Toll Bridge Seismic Retrofit Program’s projects, crews built the Yerba Buena Island Detour (YBID) structure without disrupting traffic. To accomplish this task, YBID eastbound and westbound traffic was shifted off the existing roadway and onto a temporary detour over Labor Day weekend 2009. Drivers used this detour, just south of the original roadway, until traffic was moved onto the new East Span.

A YBID Contract

Contractor: C.C. Myers, Inc.
Approved Capital Outlay Budget: $473.3 M
Status: Completed October 2010

This contract was originally awarded in early 2004 to construct the detour structure for the planned 2006 opening of the new East Span. Because of a lack of funding, the SAS Superstructure contract was re-advertised in 2005 and the opening was rescheduled to 2013. To better integrate the contract into the current East Span schedule and to improve seismic safety and mitigate future construction risks, the TBPOC approved a number of changes to the contract, including adding the deck replacement work near the tunnel that was rolled into place over the Labor Day 2007 weekend advancing future transition structure foundation work and making design enhancements to the temporary detour structure. These changes increased the budget and forecast for the contract to cover the revised project scope and to reduce project risks.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM
San Francisco-Oakland Bay Bridge East Span Replacement Project
Yerba Buena Island Transition Structures (YBITS)

The new Yerba Buena Island Transition Structures contract (YBITS) connects the new SAS bridge span to the existing Yerba Buena Island Tunnel, transitioning the new side-by-side roadway decks to the upper and lower decks of the tunnel. The new structures are cast-in-place reinforced concrete structures that look very similar to the already constructed Skyway structures. While some YBITS foundations and columns were advanced by the YBID contract, the remaining work was completed under three separate YBITS contracts.

YBITS #1 Contract
Contractor: MCM Construction, Inc.
Approved Capital Outlay Budget: $203.7M
Status: 100% Complete as of December 2014

MCM Construction, Inc. is the prime contractor that constructed the Yerba Buena Island Transition Structure #1 (YBITS #1) contract. Their work included completing the remaining foundations and the bridge deck structure from the existing double deck Yerba Buena Island Tunnel to the SAS bridge.

Status: Completed.

YBITS Landscaping Contract
Contractor: TBD
Approved Capital Outlay Budget $3.3 M
Status: In Design

Upon completion of the YBITS #2 work, a follow-on landscaping contract will be executed to replant and landscape the area.

YBITS #2 YBI Eastbound On-Ramp Cantilever Dismantling Contract
Contractor: CEC & Silverado (JV)
Approved Capital Outlay Budget: $92.4 M
Status: 60% Complete as of June 2015

Now that the traffic has been switched to the new bridge, The YBITS #2 contract involves dismantling the detour viaduct, constructing a new eastbound on-ramp to the bridge, completing the bicycle/pedestrian path to Yerba Buena Island, and dismantling of the cantilever.

The contract was awarded to California Engineering Contractors Inc/Silverado Contractors Inc. Joint Venture on November 28, 2012. Initial startup activities and submittals began in March 2013, with actual dismantling starting after the seismic safety opening on Labor Day weekend 2013.

Status: Cantilever removal is on-going. There is now a potential 6-month delay for completion of the bicycle/pedestrian path to the landing and eastbound on-ramp, due to delays in column demolition of the YBI detour structure, delays to the pile driving for the removal of the cantilever temporary supports, and potential re-sequencing of the on-ramp construction due to Coast Guard access restrictions to the work area.
Aerial View of the Old Bridge and Demolition and the Transition Structure
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge East Span Replacement Project
Self-Anchored Suspension (SAS) Bridge

If one single element bestows world class status on the new Bay Bridge East Span, it is the Self-Anchored Suspension (SAS) section of the bridge. This engineering marvel is the world’s largest SAS span at 2,047 feet in length, as well as the first bridge of its kind built with a single tower.

The SAS was separated into three separate contracts - construction of the land-based foundations and columns at pier W2, construction of the marine-based foundations and columns at piers T1 and E2, and construction of the SAS steel superstructure, including the tower, roadway and cabling. Construction of the foundations at pier W2 and at piers T1 and E2 was completed in 2004 and 2007, respectively.

SAS Land Foundation Contract
Contractor: West Bay Builders, Inc.
Approved Capital Outlay Budget: $26.5 M
Status: Completed October 2004

The twin W2 columns on Yerba Buena Island provide essential support for the western end of the SAS bridge, where the single main cable for the suspension span will extend down from the tower and wrap around and under the western end of the roadway deck. Each of these huge columns required massive amounts of concrete and steel and are anchored 80 feet into the island’s solid bedrock.

SAS Marine Foundations Contract
Contractor: Kiewit/FCI/Manson, Joint Venture
Approved Capital Outlay Budget: $274.8 M
Status: Completed January 2008

Construction of the piers at E2 and T1 required significant on-water resources to drive the foundation support piles down, not only to bedrock, but also through the bay water and mud.

The T1 foundation piles extend 196 feet below the waterline and are anchored into bedrock with heavily reinforced concrete rock sockets that are drilled into the rock. Driven nearly 340 feet deep, the steel and concrete E2 foundation piles were driven 100 feet deeper than the deepest timber piles of the existing east span in order to get through the bay mud and reach solid bedrock.
SAS Superstructure Contract

Contractor: American Bridge/Fluor Enterprises, Joint Venture
Approved Capital Outlay Budget: $2.05 B
Status: 99% Complete as of June 2015

The self-anchored suspension span of the bridge is not just another suspension bridge. Rising 525 feet above mean sea level and embedded in bedrock, the single-tower SAS span is designed to withstand a massive earthquake. Traditional main cable suspension bridges have twin cables with smaller suspender cables connected to them. While there appears to be two main cables on the SAS, it is actually a single continuous cable. This single cable is anchored within the eastern end of the roadway, carried over the tower and then wrapped around the two side-by-side decks at the western end.

The single-steel tower is made up of four separate legs connected by shear link beams, which function much like a fuse in an electrical circuit. These beams will absorb most of the impact from an earthquake, preventing damage to the tower legs.

Status: To date, Caltrans has been performing tests on the tower anchor rods, both in-situ and in the laboratory. Of the 424 tower anchor rods, 408 rods that were readily accessible were recently put through a seismic load proof test. The vast majority of the rods held at the seismic proof load. Only two of the rods tested did not hold their seismic proof loads. Both of these rods were later extracted and determined that both had threads stripped at the bottom of the rods and one of these two rods also had a bottom end fracture. Two other rods had been extracted prior to the seismic proof test for laboratory testing. One rod that had not held the initial jacking load (stripped threads at bottom found) and one rod that had held the design load, but had been found with water in its rod duct sleeve instead of grout. The later rod had met all design load requirements and was pulled to test for any adverse impacts that might have been caused by the exposure of the rod to the water. Further, some micro-cracking was observed during inspection on one of the previously extracted rods by a scanning electron microscope. Testing has not yet been completed to determine the significance of these microscopic results. Finally, testing of water found in the tower anchor rod sleeves have shown elevated levels of chloride suggesting salt water intrusion at some rod locations.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM
San Francisco-Oakland Bay Bridge East Span Replacement Project
Skyway

The Skyway, which comprises much of the new East Span, drastically changes the appearance of the Bay Bridge. Replacing the gray steel that used to cage the drivers on the old bridge, a graceful, elevated roadway supported by piers is now providing sweeping views of the bay.

Skyway Contract
Contractor: Kiewit/FCI/Manson, Joint Venture
Approved Capital Outlay Budget: $1.24 B
Status: Completed April 2008

Extending for more than a mile across Oakland mudflats, the Skyway is the longest section of the East Span. It sits between the new Self-Anchored Suspension (SAS) span and the Oakland Touchdown (OTD). In addition to incorporating the latest seismic-safety technology, the side-by-side roadway decks of the Skyway feature shoulders and lane widths built to modern standards.

The Skyway’s decks are composed of 452 pre-cast concrete segments (standing three stories high), containing approximately 200 million pounds of structural steel, 120 million pounds of reinforcing steel, 200 thousand linear feet of piling and about 450 thousand cubic yards of concrete. These are the largest segments of their kind ever cast and were lifted into place by custom-made winches.

The Skyway marine foundation consists of 160 hollow steel pipe piles measuring eight feet in diameter and dispersed among 14 sets of piers. The 365-ton piles were driven more than 300 feet into the deep bay mud. The new East Span piles were battered or driven in at an angle, rather than vertically, to obtain maximum strength and resistance.

Designed specifically to move during a major earthquake, the Skyway features several state-of-the-art seismic safety innovations, including 60-foot-long hinge pipe beams. These beams allow deck segments on the Skyway to move, enabling the deck to withstand greater motion and to absorb more earthquake energy.

Status: Opened to traffic on September 2, 2013.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge East Span Replacement Project
Oakland Touchdown

The Oakland Touchdown (OTD) structures connects Interstate 80 in Oakland to the side-by-side decks of the new East Span. For westbound drivers, the OTD is their introduction to the graceful new East Span. For eastbound drivers from San Francisco, this section of the bridge carries them from the Skyway to the East Bay, offering unobstructed views of the Oakland hills.

The OTD approach structures to the Skyway was constructed in three phases. The first phase, constructed under the OTD #1 contract, built the new westbound approach structure. Due to physical constraints with the existing bridge, the OTD #1 contract was only able to construct a portion of the eastbound approach. To facilitate opening the bridge in both directions at the same time, the second phase of work, performed by the Oakland Detour contractor, included widening the upper deck of the Oakland end of the existing bridge to allow for a traffic shift to the north that removes the physical constraint to completing the eastbound structure. This phase was completed in April 2012. The third phase, constructed by an OTD #2 contract, completed the eastbound lanes and provided the traffic switch to the new structure in both directions and allowed for the bridge to open simultaneously in both directions.

Oakland Touchdown #1 Contract
Contractor: MCM Construction, Inc.
Approved Capital Outlay Budget: $205.3 M
Status: Completed June 2010

The OTD #1 contract constructed the entire 1,000-foot-long westbound approach from the toll plaza to the Skyway. The westbound approach structure provides direct access to the westbound Skyway. In the eastbound direction, the contract constructed a portion of the eastbound structure and all of the eastbound foundations that are not in conflict with the existing bridge.

Oakland Touchdown #2 Contract
Contractor: Flatiron West, Inc.
Approved Capital Outlay Budget: $72.6 M
Status: Completed September 2014

Flatiron West, Inc. is the prime contractor constructing the Oakland Touchdown #2 contract that completed the remaining portions of the Oakland Touchdown approach structures from the existing toll plaza to the new span. The contractor is also responsible for the construction of the bicycle/pedestrian path and final landscaping of the area.

Status: Landscaping and installation of the irrigation system continues with plant establishment beginning in October 2014 and forecasting to be completed in October of 2015.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM
San Francisco-Oakland Bay Bridge East Span Replacement Project
Former East Span Bridge Dismantling

1 Cantilever Removal
Approved Capital Outlay Budget: $69 M
Contractor: CEC and Silverado JV

To expedite the opening of a new eastbound on ramp and the bike/pedestrian pathway from Yerba Buena Island to the SAS and to maximize contractor efficiencies, the TBPOC split the dismantling of the existing bridge into multiple contracts. The dismantling of the superstructure of the main cantilever section of the existing bridge has been incorporated into the YBITS #2 contract.

Status: The cantilever portion of the dismantling contract was awarded to CEC and Silverado (JV) on November 28, 2012. Construction start-up activities began in March 2013. Cantilever and YBI detour dismantling continues.

504/288 Superstructure Dismantling

The project was awarded to CEC and Silverado JV in March 2015. The scope of the work is to remove the 504/288 superstructure section of the former bridge.

Marine Foundations Removal


The marine foundation removal is a CMGC (Construction Manager / General Contractor)contract and the selected CMGC contractor is a Kiewit Manson team. Work is currently under design.

Demolition Diagrams
1. Remove Upper Deck from Pier E3 to Pier E2

2. Remove Lower Deck from Suspended Span Replace with Timber Mat

3. Disconnect Bridge at Midspan

4. Remove West Suspended Span

5. Install West Falsework Supports

6. Remove Remaining West Cantilever Arm

7. Remove West Anchor Arm - Remove Falsework Supports

8. Remove East Spans Similarly
TOLL BRIDGE SEISMIC RETROFIT PROGRAM
San Francisco-Oakland Bay Bridge East Span Replacement Project
Former East Span Bridge Dismantling

Marine Foundations
E3 Foundation Removal Demonstration Project

Approved Capital Outlay Budget: $18.5M
Contractor:

The original east span of the San Francisco-Oakland Bay Bridge was supported by 21 in-water bridge piers, Piers E2 through E22, along with land based piers at Yerba Buena Island and Oakland. Part of this project is the demolition of Pier E3, which is located 1,535 feet east of Yerba Buena Island and on the east side of a 50-foot deep navigation channel.

As shown in the illustration on the facing page, Pier E3 is a cellular concrete caisson approximately 268 feet tall containing 28 total chambers. Fourteen of the chambers occur only below an elevation of approximately -51 feet and occur in two separate rows of seven chambers on each length side. Exterior walls of the caisson are four feet wide, while the interior walls comprising the chamber are three feet wide.

The structure has 12 angled buttress walls, six on each side, that are approximately 51 feet tall that begin at -51 feet and run up the caisson to 0 feet. Weep holes in the foundation located at an approximate elevation of -5 feet have allowed the caisson chambers to fill with water. Nearly 175 feet of the pier is buried in bay mud.

Pier E3 also contains a pier cap, which is 80 feet by 167 feet, excluding the fender apron. The pier cap, fender apron, and upper most portion of the caisson extend above the water line and support the steel superstructure of the bridge and are visible from the Bay.

Pier E3 is a pilot/demonstration project for the effective use of controlled charges to remove the marine foundations of the original SFOBB. The original authorization covered the dismantling of the piers via mechanical means such as saw cutting, flame cutting, mechanical splitting or pulverizing, and hydro-cutting, but did not cover the use of controlled implosion.

Dismantling of Pier E3 using controlled charges would be completed in four phases: 1) mechanical dismantling of pier cap and fender system, 2) drilling of bore holes into caisson and buttress walls and installing a blast attenuation system (BAS), 3) installing charges, activating the BAS and imploding the pier, and 4) management and removal of remaining dismantling pier debris. When completed, the pier would be removed to -51 feet.

Mechanical dismantling would have required the installation of a cofferdam around Pier E3, which would have required 394 piles of various types. Pile driving alone would take approximately four years, while the four phases of the demonstration project would occur within six months.

For more detailed information on the phases of the project, and compliance with state, local and federal laws, please see the US Army Corps of Engineers San Francisco District Public Notice: PUBLIC NOTICE NUMBER: SPN-1997-230130

Status: Completed the fender removal & work is underway with above water concrete pier removal projected to be completed the first week of August 2015. Pier E3 Implosion is scheduled for November, 2015, pending getting environmental permit in September, 2015. Successfully competed the first test of the bubble curtain mock-up on July 25th, 2015.
Schematic of the East Span of the SFOBB Showing the Cantilever Truss Span and the Location of Pier E3 (circled) Relative to Other Piers on the Former Bridge

E3 Foundation Removal
A number of contracts needed to relocate utilities, clear areas of archeological artifacts and prepare areas for future work have already been completed. The last major contract is in progress, which is the dismantling and removal of the existing bridge, which has served the Bay Area for nearly 80 years. Following is a status of some the other East Span contracts.

### Electrical Cable Relocation

**Contractor:** Manson Construction  
**Approved Capital Outlay Budget:** $5.7 M  
**Status:** Completed January 2008

A submerged cable from Oakland that is close to where the new bridge touches down supplies electrical power to Treasure Island. To avoid any possible damage to the cable during construction, two new replacement cables were run from Oakland to Treasure Island. The extra cable was funded by the Treasure Island Development Authority.

### Yerba Buena Island Substation

**Contractor:** West Bay Builders  
**Approved Capital Outlay Budget:** $11.3 M  
**Status:** Completed May 2005

This contract relocated an electrical substation just east of the Yerba Buena Island Tunnel in preparation for the new East Span.
Stormwater Treatment Measures  
Contractor: Diablo Construction, Inc.  
Approved Capital Outlay Budget: $18.3 M  
Status: Completed December 2008

The Stormwater Treatment Measures contract implemented a number of best practices for the management and treatment of stormwater runoff. Focused on the areas around and approaching the toll plaza, the contract added new drainage and built new bio-retention swales and other related constructs.

East Span Interim Seismic Retrofit  
Contractors: 1) California Engineering  
2) Balfour Beatty  
Approved Capital Outlay Budget: $30.8 M  
Status: Completed October 2000

After the 1989 Loma Prieta Earthquake, and before the final retrofit strategy was determined for the East Span, Caltrans completed an interim retrofit of the existing bridge to prevent a catastrophic collapse of the bridge should a similar earthquake occur before the East Span was completely replaced. The interim retrofit was performed under two separate contracts that lengthened pier seats, added some structural members, and strengthened areas of the bridge so they would be more resilient during an earthquake.

Pile Installation Demonstration  
Contractor: Manson and Dutra, Joint Venture  
Approved Capital Outlay Budget: $9.2 M  
Status: Completed December 2000

While large-diameter battered piles are common in offshore drilling, the new East Span is one of the first bridges to use them in its foundations. To minimize project risks and build industry knowledge, a pile installation demonstration project was initiated to prove the efficacy of the proposed technology and methodology. The demonstration was highly successful and helped result in zero contract change orders or claims for pile driving on the project.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

Other Completed Projects

In the 1990s, the State Legislature identified seven of the nine state-owned toll bridges for seismic retrofit. In addition to the San Francisco-Oakland Bay Bridge, these included the Benicia-Martinez, Carquinez, Richmond-San Rafael and San Mateo-Hayward bridges in the Bay Area, and the Vincent Thomas and Coronado bridges in Southern California. Other than the East Span of the Bay Bridge, the retrofits of all of the bridges have been completed as planned.

San Mateo-Hayward Bridge Seismic Retrofit Project

Project Status: Completed 2000
The San Mateo-Hayward Bridge seismic retrofit project focused on strengthening the high-rise portion of the span. The foundations of the bridge were significantly upgraded with additional piles.

1958 Carquinez Bridge Seismic Retrofit Project

Project Status: Completed 2002
The eastbound 1958 Carquinez Bridge was retrofitted in 2002 with additional reinforcement of the cantilever thru-truss structure.

1962 Benicia-Martinez Bridge Seismic Retrofit Project

Project Status: Completed 2003
The southbound 1962 Benicia-Martinez Bridge was retrofitted to “Lifeline” status with the strengthening of the foundations and columns and the addition of seismic bearings that allow the bridge to move during a major seismic event. The Lifeline status means the bridge is designed to sustain minor to moderate damage after a seismic event and to reopen quickly to emergency response traffic.

Richmond-San Rafael Bridge Seismic Retrofit Project

Project Status: Completed 2005
The Richmond-San Rafael Bridge was retrofitted to a “No Collapse” classification to avoid catastrophic failure during a major seismic event. The foundations, columns, and truss of the bridge were strengthened, and the entire low-rise approach viaduct from Marin County was replaced.
Los Angeles-Vincent Thomas Bridge Seismic Retrofit Project
Project Status: Completed 2000
The Vincent Thomas Bridge is a 1,500-foot long suspension bridge crossing the Los Angeles Harbor in Los Angeles that links San Pedro with Terminal Island. The bridge was one of two state-owned toll bridges in Southern California (the other being the San Diego-Coronado Bridge). Opened in 1963, the bridge was seismically retrofitted as part of the TBSRP in 2000.

San Diego-Coronado Bridge Seismic Retrofit Project
Project Status: Completed 2002
The San Diego-Coronado Bridge crosses over San Diego Bay and links the cities of San Diego and Coronado. Opened in 1969, the 2.1-mile long bridge was seismically retrofitted as part of the TBSRP in 2002.

Antioch Bridge Seismic Retrofit Project
Project Status: Completed 2012
Serving the Delta region of the Bay Area, the Antioch Bridge takes State Route 160 traffic over the San Joaquin River, linking eastern Contra Costa County with Sacramento County. The current 1.8-mile-long steel plate girder bridge was opened in 1978 with one lane in each direction. The major retrofit measure for the bridge includes installing seismic isolation bearings at each of the 41 piers, strengthening piers 12 through 31 with steel cross-bracing between column bents, and installing steel casings at all columns located at the Sherman Island approach slab bridge.

Dumbarton Bridge Seismic Retrofit Project
Project Status: Completed 2013
The current Dumbarton Bridge was opened to traffic in 1982 linking the cities of Newark in Alameda County and East Palo Alto in San Mateo County. The 1.6-mile long bridge has six lanes (three in each direction) and an eight-foot-wide bike/pedestrian pathway. The bridge is a combination of three bridge types; reinforced concrete slab approaches supported on multiple pile extension columns, precast-prestressed concrete delta girders and steel box girders supported on reinforced concrete piers. The current retrofit strategy for the bridge included superstructure and deck modifications and installation of isolation bearings.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM
Risk Management Program Update

Potential Draw on Program Reserve (Program Contingency)

The program contingency is currently $135.2 million in accordance with the TBPOC approved budget. As of the end of the second quarter of 2015, the 50 percent probable draw on program contingency is $240.9 million. The potential draw ranges from about $160 million to $300 million (refer to Figure 1).

The potential draw curve includes all currently identified risks in the risk registers. It does not include costs that may result from possible future decisions to alter the projects from their current scope and construction methods. Possible material changes to a project are not placed in a risk register according to best practices. A materially changed project differs substantially from its predecessor and requires a new risk register.

The removal of marine foundations is a project that may undergo material changes later this year. The project assumes that the implosion method of removal will be used. However, depending on the results of the Pier E3 Demonstration Project later this year, the project may have to revert to conventional methods of removal, which could increase the project cost by up to $94 million. This possibility is not in the risk register for the reasons given above, and its cost is not reflected in the draw curve. This potential increase in cost may be considered as an amount reserved from the program contingency or an amount that may need to be added to the program contingency if sufficient reserves are not available.

Over half of the $240.9 million 50% probable draw is on account of two major risks: Additional Capital Outlay Support (COS) and Capital Outlay (CO) may be needed in case the implosion method of dismantling the marine structures has to be replaced by more expensive conventional dismantling methods.

Among the other risks, 19 are 100% probable to have a cost impact having a most likely total of $140 million. These risks include known issues, future contract change orders (CCOs), cost uncertainty in pending CCOs, and uncertainty in the capital cost estimates of unawarded contracts.

In view of the above, the $135.2 million current program contingency balance is insufficient to cover the cost of currently identified risks. Risk mitigation actions are continuously developed and implemented to reduce the potential draw on the program contingency.

RISK MANAGEMENT DEVELOPMENTS

Self-Anchored Suspension Span Contract
The project team continues to perform tests on rods extracted from the tower base. The scope of the testing is still under discussion and is likely to change as new information is obtained. The cost of the testing is primarily a COS effort. However, there could be some capital costs for ongoing or new construction contracts to ensure that there is sufficient information to close this issue.

Oakland Touchdown #2 Contract
The cost of risks reduced three percent this quarter, primarily due to the reduction in risk to change orders. The landscaping is approximately three quarters of the way through a one year plant-establishment period.

Yerba Buena Island Transition Structure #2 Contract
The contractor removed the cantilever portion of the existing bridge along with the superstructure of temporary detour structure. Removal of temporary supports is scheduled to be completed in the fourth quarter of 2015. Construction of the new eastbound on-ramp is on-going.

The team continues to cooperate and coordinate with the adjacent project. This contract builds on and off ramps on the north side of the new bridge and is administered by the City of San Francisco.
504/288 (Superstructure Removal)
Removal of the upper deck roadway has begun and major construction is expected to begin in the third quarter. Planning operations have begun.

Pier E3 Demonstration (Superstructure Removal)
Caltrans intends to validate the feasibility of controlled implosion as a removal method. This contract was awarded early in the second quarter. Convention construction operations began in June 1, 2015. Implosion of the pier would take place in November provided a permit to do so is obtained. Permit information submitted to agencies and an answer is expected in September 2015.

The removal of all of the foundations is procured using the Contract Manager/General Contractor (CM/GC) delivery method. This scope of work will be the first delivered to the construction phase.

Foundation Removal
The team is awaiting the results of the Pier E3 demonstration to confirm the means and methods to remove the remaining piers. Cost estimates have been revised and updated to reflect the current understanding of the removal effort. Preliminary design efforts will begin next quarter.

RISK MANAGEMENT LOOK AHEAD

Self-Anchored Suspension Span Contract
The contractor is expected to complete all required filed work early next quarter. Contract acceptance may be delayed as the team awaits test results from the tower base rod investigation. The contract delivery method to design and install this system is uncertain.

Oakland Touchdown #2 Contract
The project team will continue closing out the contract.

Yerba Buena Island Transition Structure #2 Contract
The resolution of time issues related to on-ramp and bike path opening is underway. This could delay the opening until April 2016, although December 2015 remains a possibility.

Dismantling Contracts
Award of the 504/288 and Pier E3 demonstration will transition the projects from the design phase to the construction phase.

![Figure 3 – Potential Draw on Program Contingency](image)

*Figure 3 Notes:
1. Proposed architectural enhancements and project improvements are excluded unless approved by the TBPOC.
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

Program Funding Status

AB 144 established a funding level of $8.685 billion for the TBSRP. As of December 31, 2010, seismic retrofitting of Antioch and Dumbarton Bridges became part of the Toll Bridge Seismic Retrofit Program with the passage of AB 1175, which provided another $750 million bringing the total funding to $9.435 billion. The program funding sources are shown in Table 1—Program Budget.

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<th>Table 1—Program Budget as of June 30, 2015 ($ Millions)</th>
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<tr>
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<td>Seismic Surcharge Revenue AB 1175 (2)</td>
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<td>BATA Consolidation</td>
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<table>
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<tr>
<th>Contributions</th>
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<td>Proposition 192</td>
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<tr>
<td>San Diego Coronado Toll Bridge Revenue Fund</td>
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<tr>
<td>Vincent Thomas Bridge</td>
</tr>
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<td>State Highway Account (1)</td>
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<td>Public Transportation Account (1)</td>
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<td>ITIP/SHOPP/Federal Contingency (1)</td>
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<td>SHA - East Span Dismantling</td>
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<td>SHA - “Efficiency Savings”</td>
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<td>Redirect Spillover</td>
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<td>Motor Vehicle Account</td>
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<td>Subtotal - Contribution</td>
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| Total Funding                                           | 9435.0 | 9425.9 |

| Encumbered to Date                                      | 8581.5 |

| Remaining Unallocated                                    | 844.4  |

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<th>Expenditures</th>
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<td>State Operations</td>
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<tr>
<td>Antioch and Dumbarton Expenditures by BATA</td>
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<td>Total Expenditures</td>
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<table>
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<th>Encumbrances</th>
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<td>State Operations</td>
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<tr>
<td>Total Encumbrances</td>
</tr>
</tbody>
</table>

| Total Expenditures and Encumbrances                      | 8581.5 |

(1) The California Transportation Commission adopted a new schedule and changed the PTA/SHA split on December 15, 2005.
(2) As of January 1, 2010, seismic retrofitting of Antioch and Dumbarton Bridges became part of the Toll Bridge Seismic Retrofit Program with the passage of AB 1175.
(3) The Skyway contract is the only contract in the San Francisco-Oakland Bay Bridge East Span Seismic Safety Project with federal funds. The Federal Aid Project No. is 0801(090) for the amount of $321,645,209.22.
Summary of the Toll Bridge Oversight Committee (TBPOC) Expenses

Pursuant to Streets and Highways Code Section 30952.1 (d), expenses incurred by Caltrans, BATA, and the California Transportation Commission (CTC) for costs directly related to the duties associated with the TBPOC are to be reimbursed by toll revenues. Table 3 - Toll Bridge Program Oversight Committee Estimated Expenses: July 1, 2005, through June 30, 2015, shows expenses through June 30, 2015, for TBPOC functioning, support, and monthly and quarterly reporting.

Table 2—CTC Toll Bridge Seismic Retrofit Program Contributions Adopted December 2005
Schedule of Contributions to the Toll Bridge Seismic Retrofit Program ($ Millions)

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<td>99</td>
<td>100</td>
<td>100</td>
<td>148</td>
<td>448</td>
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* Caltrans Efficiency Savings
** SFOBB East Span Dismantling Cost. The last contribution of $300 million from SHA was made in October 2013 as scheduled.

Table 3—Toll Bridge Program Oversight Committee
Estimated Expenses: July 1, 2005 through June 30, 2015 ($ Millions)

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<tr>
<th>Agency/Program Activity</th>
<th>Expenses</th>
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<td>BATA</td>
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<td>CTC</td>
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<tr>
<td>Reporting</td>
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<tr>
<td>Total Program</td>
<td>15.4</td>
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</table>
Overall environmental compliance for the San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Safety Project (SFOBB Project) has been a success during the second quarter of 2015. The tasks for the current quarter are focused on monitoring and environmental permitting. Key successes in this quarter are as follows:

Marine-based bird monitoring was conducted weekly from a consultant boat. The goal of this monitoring is to document potential impacts to birds from construction activities. Monitors did not observe any indication that birds were disturbed due to the east span construction activities. Nesting bird surveys continue to be performed daily in the active construction areas and month for vegetation removal activities at stormwater basins that are located around the San Francisco-Oakland Bay Bridge toll plaza. No nests were impacted by construction activities during the second quarter.

Peregrine falcon monitoring occurred throughout the second quarter of 2015. The resident peregrine falcon pair nested again this year at the Pier E8 nest site. Eggs were laid at the Pier E8 nest site on April 17, 19, 21, and 23, 2015 for a total of 4 eggs. Three of the eggs hatched the week of May 25, 2015. One egg was not viable. Fledging is expected in early July.

Turbidity monitoring was conducted in June when H-piles were removed on Yerba Buena Island under the YBITS2 Construction Contract. Monitoring was also conducted daily during the removal of the pier cap and fender system at Pier E3. No exceedances occurred that would require action to be taken.

On June 22, 2015, the Pier E3 demolition contractor began removing the pier cap using a hoe ram. Marine mammal monitoring occurred daily and no marine mammals came into the exclusion zone. On June 25 and 29, 2015, hydroacoustic monitoring occurred to document sounds levels during hoe ram work at Pier E3. The hydroacoustic monitoring results allowed the marine mammal exclusion zone to be reduced from 100 meters to 50 meters.

SFOBB environmental compliance and stormwater pollution prevention plan (SWPPP) inspections were conducted weekly at all active project sites. The project team continues to work closely with construction to ensure compliance with environmental permits and regulations and to improve best management practices. During dismantling activities of the original east span, the contractor uses debris containment structures to capture and collect debris. Structures are installed on the traveler system under the lower deck of the original east span and are used to collect demolition debris.

The environmental team now prepares a weekly Look Ahead and SFOBB Environmental Status Report for dissemination to district management as well as other interested parties. These reports detail environmental events and future action items.

Work continues with regulatory agencies to gain approval for the Pier E3 Controlled Blasting Demonstration Project. A strategy meeting was held with the regulatory agencies on June 18, 2015 where the agency gave a status update of where they were in their permitting process and the group as a whole identified a schedule that would result in the issuance of the permits in time for a November 7, 2015 implosion event. There was also a follow-up meeting on June 9, 2015 with the Regional Water Quality Control Board and Bay Keeper related to water quality questions that came up at the March 25, 2015 stakeholders meeting.
REGIONAL MEASURE 1 PROGRAM
Completed Projects
In November 1988, Bay Area voters approved Regional Measure 1 (RM 1), which authorized a standard auto toll of $1 for all seven state-owned Bay Area toll bridges to be used to reduce congestion in the bridge corridor.

Richmond Parkway Construction Project
Project Status: Completed 2001
The final connections to the Richmond Parkway from Interstate 580 near the Richmond-San Rafael Bridge were completed in May 2001.

San Mateo-Hayward Bridge Widening Project
Project Status: Completed 2003
This project expanded the low-rise concrete trestle section of the San Mateo-Hayward Bridge to allow for three lanes in each direction to match the existing configuration of the high-rise steel section of the bridge.

New Alfred Zampa Memorial (Carquinez) Bridge Project
Project Status: Completed 2003
The new western span of the Carquinez Bridge, which replaced the original 1927 span, is a twin-towered suspension bridge with three mixed-flow lanes, a new carpool lane, shoulders and a bicycle/pedestrian pathway.

Bayfront Expressway (State Route 84) Widening Project
Project Status: Completed 2004
This project expanded and improved the roadway from the Dumbarton Bridge touchdown to the US 101/ Marsh Road interchange by adding additional lanes and turn pockets and improving bicycle/pedestrian access in the area.

Richmond-San Rafael Bridge Rehabilitation Projects
Project Status: Completed 2006
Three major rehabilitation projects for the Richmond-San Rafael Bridge were completed. In 2001, the final connections to the Richmond Parkway were completed. In 2005, seismic retrofit, trestle and fender system replacement work was completed. In 2006, the bridge was resurfaced along with deck joint repairs.
Benicia-Martinez Bridge Project

Project Status: **Completed 2007**

The new Congressman George Miller Bridge opened to traffic in August 2007, taking its place alongside the existing 1962 Benicia-Martinez Bridge, which is named for Congressman Miller’s father, the late George Miller, Jr. The new bridge carries five lanes of northbound Interstate 680 traffic, while the existing bridge was upgraded to carry four lanes of southbound traffic and a new bicycle/pedestrian pathway.

Benicia-Martinez Bridge Rehabilitation Project

Project Status: **Completed 2009**

A two-year project to rehabilitate and reconfigure the original Benicia-Martinez Bridge began shortly after the opening of the new Congressman George Miller Bridge. The existing 1.2-mile roadway surface on the steel deck truss bridge was modified to carry four lanes of southbound traffic (one more than before) - with shoulders on both sides - plus a bicycle/pedestrian path on the west side of the span that connects to Park Road in Benicia and to Marina Vista Boulevard in Martinez. Reconstruction of the east side of the bridge and approaches was completed in August 2008. Reconstruction of the west side of the bridge and its approaches and construction of the bicycle/pedestrian pathway were completed in August 2009.

Interstate 880/State Route 92

Project Status: **Completed 2011**

This corridor was consistently one of the Bay Area’s most congested during the evening commute. This was due in part to the lane merging and weaving that was required by the then-existing cloverleaf interchange. The new interchange features direct freeway-to-freeway connector ramps that now increase traffic capacity and improve overall safety and traffic operations in the area. With the new direct-connector ramps, drivers coming off of the San Mateo-Hayward Bridge can access Interstate 880 without having to compete with traffic headed onto east Route 92 from south Interstate 880.
APPENDICES

A. TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 (A-1 and A-2) .............................40

TBSRP (SFOBB East Span Only)
AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015..........................................................44

B. Project Photos...................................................50

C. Glossary of Terms.............................................56
Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 ($ Millions)

<table>
<thead>
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### Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 ($ Millions) Cont.

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*Figures may not sum up to totals due to rounding effects.

\(^{2}\) Total program cost forecast assumes mitigation of risks.
Toll Bridge Program Oversight Committee

Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 ($ Millions)

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1 Figures may not sum up to totals due to rounding effects.

---

(1) Total Capital Outlay Support includes program indirect costs.
(2) BTA provided a distribution of program contingency in December 2004 based on Bechtel Infrastructure Corporation input.
(3) This column is subject to revision upon completion of Caltran’s risk assessment update.
(4) Construction administration of the OTD Detour is under the YBITS1 contract. Encumbrance is included in YBITS1 contract.
(5) Construction administration of the cantilever segment is under the YBITS2 contract. Encumbrance is included in YBITS2 contract.

(1) Total Capital Outlay Support includes program indirect costs.
(2) BTA provided a distribution of program contingency in December 2004 based on Bechtel Infrastructure Corporation input.
(3) This column is subject to revision upon completion of Caltran’s risk assessment update.
(4) Construction administration of the OTD Detour is under the YBITS1 contract. Encumbrance is included in YBITS1 contract.
(5) Construction administration of the cantilever segment is under the YBITS2 contract. Encumbrance is included in YBITS2 contract.

(1) Total Capital Outlay Support includes program indirect costs.
### Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 ($ Millions)

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Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 ($ Millions) Cont.

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### Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 ($ Millions) Cont.

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*Marine Foundations*
- Capital Outlay Support: 20.0, 4.0, 39.5
- Capital Outlay Construction: -2.9, 183.9
  - Total: 20.0, 6.9, 223.4

Sunk Cost for Marine Foundation: -2.8, 2.8

Pier-3 Demonstration Project
- Capital Outlay Support: -0.3, 4.5
- Capital Outlay Construction: 18.5, 2.9, 24.2
  - Total: 18.5, 3.2, 28.7

Remaining Marine Foundations:
- Capital Outlay Support: -2.8, 2.8
- Capital Outlay Construction: -159.7
  - Total: -191.9

YBI/SAS Archeology
- Capital Outlay Support: 1.1, 1.1, 1.1
- Capital Outlay Construction: 1.1, 1.1, 1.1
  - Total: 2.2, 2.2, 2.2

YBI - USCG Road Relocation
- Capital Outlay Support: 3.0, 2.7, 3.0
  - (0.3)
- Capital Outlay Construction: 3.0, 2.8, 3.0
  - (0.2)
  - Total: 6.0, 5.5, 6.0
  - (0.5)

YBI - Substation and Viaduct
- Capital Outlay Support: 6.5, 6.4, 6.5
  - (0.1)
- Capital Outlay Construction: 11.6, 11.3, 11.6
  - (0.3)
  - Total: 18.1, 17.7, 18.1
  - (0.4)

Oakland Geofill
- Capital Outlay Support: 2.5, 2.5
- Capital Outlay Construction: 8.2, 8.2
  - Total: 10.7, 10.7

Pile Installation Demonstration Project
- Capital Outlay Support: 1.8, 1.8
- Capital Outlay Construction: 9.3, 9.3
  - Total: 11.1, 11.0
  - (0.1)

Stormwater Treatment Measures
- Capital Outlay Support: 6.0, 8.2
- Capital Outlay Construction: 15.0, 18.3
  - Total: 21.0, 26.5
  - (3.4)

Right-of-Way and Environmental Mitigation
- Capital Outlay Support: -72.4, 60.0
- Capital Outlay & Right-of-Way: 72.4, 69.0
  - Total: 72.4, 69.0
  - (3.4)
# Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through June 30, 2015 ($ Millions) Cont.

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**Sunk Cost - Existing East Span Retrofit**
- Capital Outlay Support: 39.5 - 39.5
- Capital Outlay Construction: 30.8 - 30.8
- Total: 70.3 - 70.3

**Other Capital Outlay Support**
- Environmental Phase: 97.7 0.1 97.8 97.8 97.7 (0.1)
- Pre-Split Project Expenditures: 44.9 - 44.9 44.9 44.9 -
- Non-Project Specific Costs: 20.0 (16.8) 3.2 3.2 3.2 -
- Total: 162.6 (16.7) 145.9 145.9 145.8 (0.1)

**Subtotal Capital Outlay Support**
- Total: 959.3 346.2 1,305.5 1,274.3 1,376.7 71.2

**Subtotal Capital Outlay Construction**
- Total: 4,492.2 597.0 5,089.2 4,770.4 5,232.2 143.0

**Other Budgeted Capital**
- Total: 35.1 (32.8) 2.3 0.7 2.3 -

**Total SFOBB East Span Replacement Project**
- Total: 5,486.6 910.4 6,397.0 6,045.4 6,611.2 214.2

---

1. Figures may not sum up to totals due to rounding effects.
2. The forecast shown for the remaining marine foundation contract is the implosion alternative. For the conventional alternative, the forecast is $254.3 million.
Demolition Workers on a Section of the East Span of the Former Oakland-San Francisco Bay Bridge
Project Photos
Appendix E: Project Progress Photographs
Self-Anchored Suspension Bridge (SAS)
Appendix E: Project Progress Photographs

Oakland Touchdown (OTD)

Aerial View of Oakland Touchdown Construction
Yerba Buena Island Transition Structures Demolition Progress on right with the New Self-Anchored Suspension Span of the San Francisco-Oakland Bay Bridge on Left Looking east toward Oakland
Glossary of Terms

**AB 144/SB 66 BUDGET**: The planned allocation of resources for the Toll Bridge Seismic Retrofit Program, or subordinate projects or contracts, as provided in Assembly Bill 144 and Senate Bill 66, signed into law by Governor Schwarzenegger on July 18, 2005, and September 29, 2005, respectively.

**AB 144/SB 66 PROJECT COMPLETE BASELINE**: The planned completion date for the Toll Bridge Seismic Retrofit Program or subordinate projects or contracts.

**APPROVED CHANGES**: For cost, changes to the AB 144/SB 66 Budget or BATA Budget as approved by the Bay Area Toll Authority Commission. For schedule, changes to the AB 144/SB 66 Project Complete Baseline approved by the Toll Bridge Program Oversight Committee, or changes to the BATA Project Complete Baseline approved by the Bay Area Toll Authority Commission.

**AT COMPLETION VARIANCE or VARIANCE (cost)**: The mathematical difference between the Cost Forecast and the Current Approved Budget.

**BATA BUDGET**: The planned allocation of resources for the Regional Measure 1 Program, or subordinate projects or contracts as authorized by the Bay Area Toll Authority as of June 2005.

**BATA PROJECT COMPLETE BASELINE**: The planned completion date for the Regional Measure 1 Program or subordinate projects or contracts.

**COST FORECAST**: The current forecast of all of the costs that are projected to be expended so as to complete the given scope of the program, project, or contract.

**COST TO DATE**: The actual expenditures incurred by the program, project or contract as of the month and year shown.

**CURRENT APPROVED BUDGET**: The sum of the AB 144/SB 66 Budget or BATA Budget and Approved Changes.

**HINGE PIPE BEAMS**: Pipes between roadway sections designed to move within their sleeves during expansion or contraction of the decks during minor events, such as changes in temperature. The beams are designed to absorb the energy of an earthquake by deforming in their middle or “fuse” section. Hinge pipe beams are also found at the western piers where the SAS connects to the YBITS (Hinge “K” pipe beams).

**PROJECT COMPLETE CURRENT APPROVED SCHEDULE**: The sum of the AB 144/SB 66 Project Complete Baseline or BATA Project Complete Baseline and Approved Changes.

**PROJECT COMPLETE SCHEDULE FORECAST**: The current projected date for the completion of the program, project, or contract.

**SCHEDULE VARIANCE or VARIANCE (schedule)**: The mathematical difference expressed in months between the Project Complete Schedule Forecast and the Project Complete Current Approved Schedule.

**% COMPLETE**: % Complete is based on an evaluation of progress on the project, expenditures to date, and schedule.
This document, including the coil binding, is 100% recyclable.

The information in this report is provided in accordance with California Government code Section 755. This document is one of a series of reports prepared for the Bay Area Toll Authority (BATA)/Metropolitan Transportation Commission (MTC) on the Toll Bridge Seismic Retrofit and Regional Measure 1 Programs. The contract value for the monitoring efforts, technical analysis, and field site works that contribute to these reports, as well as the report preparation and production is $1,574,873.73.

Bay Area Management Consultants
An Association of URS Corporation and Hatch Mott MacDonald
Old San Francisco-Oakland Bay Bridge and the New Self-Anchored Suspension Bridge (on far left)