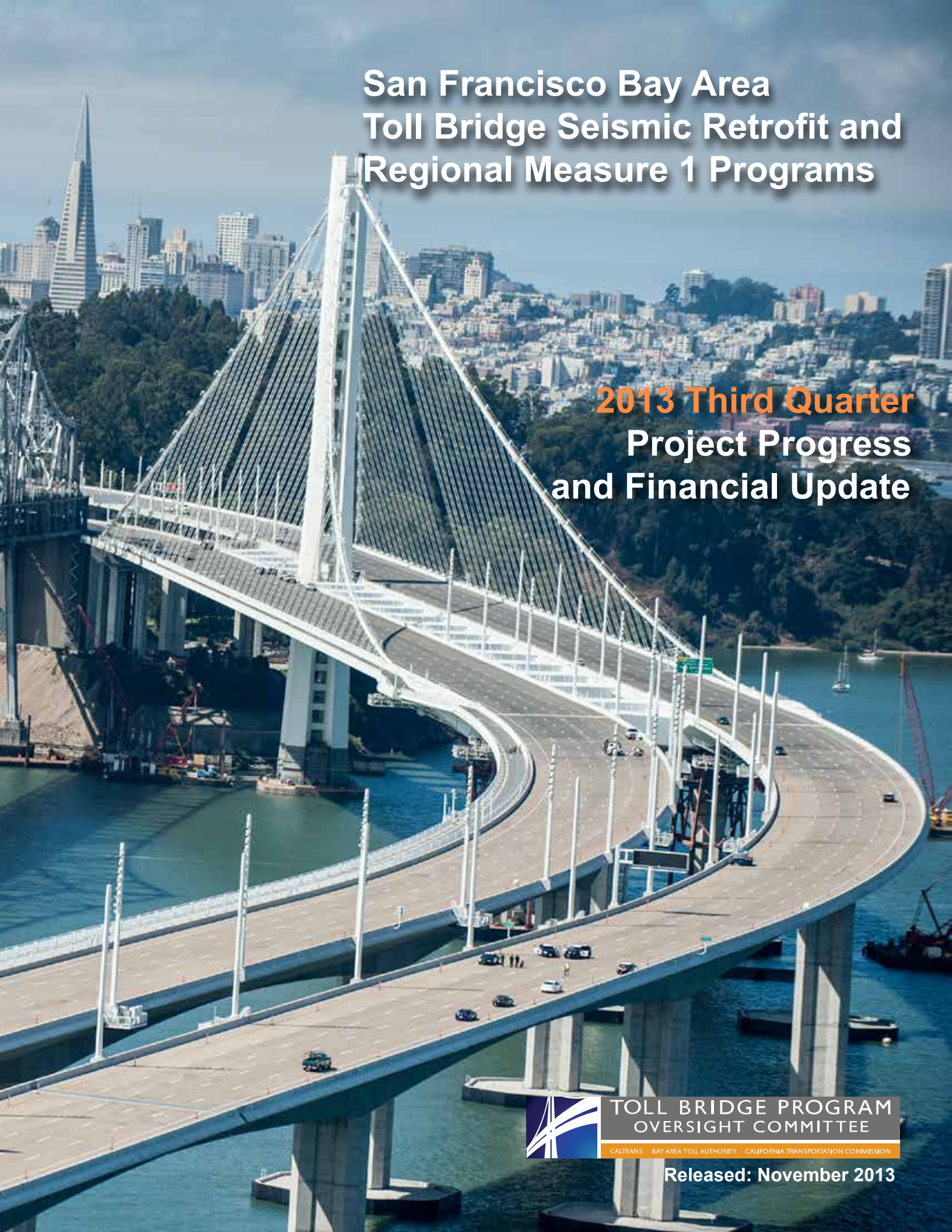

San Francisco Bay Area Toll Bridge Seismic Retrofit and Regional Measure 1 Programs

2013 Third Quarter Project Progress and Financial Update

TOLL BRIDGE PROGRAM OVERSIGHT COMMITTEE

CALTRANS BAY AREA TOLL AUTHORITY CALIFORNIA TRANSPORTATION COMMISSION

Released: November 2013

The San Francisco-Oakland Bay Bridge Self-Anchored Suspension Span and Skyway after Opening

TOLL BRIDGE PROGRAM
OVERSIGHT COMMITTEE
CALTRANS · BAY AREA TOLL AUTHORITY · CALIFORNIA TRANSPORTATION COMMISSION

Toll Bridge Program Oversight Committee
Department of Transportation
Office of the Director
1120 N Street
P.O. Box 942873
Sacramento, CA 94273-0001

November 14, 2013

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 2013 Third 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 is tasked to perform project oversight and control over the TBSRP and comprises 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). This third quarter report includes project progress and activities for the TBSRP through September 30, 2013, with more recent progress and actions addressed in this letter.

On September 2, 2013, the new east span of the San Francisco-Oakland Bay Bridge opened to traffic and seismic safety was achieved on the most important bridge crossing in California. The new span also provides motorists a panoramic view of the San Francisco Bay and East Bay hills. The bike and pedestrian path opened to the public on September 3rd and for the first time in history, pedestrians and bicyclists have the chance to travel on the San Francisco - Oakland Bay Bridge. Now that traffic has been safely rerouted on to the new east span, the original east span will be dismantled. The work will be performed in sections and the demolition process will take approximately three years. Other remaining work will be completing the bike path and the permanent eastbound on ramp at Yerba Buena Island.

Recently, much focus has been placed on the failed anchor rods on the new self-anchored suspension (SAS) span of the San Francisco-Oakland Bay Bridge. Because of the superior strength of the new east span design compared to the old east span, the TBPOC installed an interim fix for the failed rods at Pier E2 prior to completion of the steel saddle retrofit. The retrofit is scheduled to be functionally completed in January 2014. The TBPOC has performed an extensive review of the remaining rods of similar type to the failed rods on the bridge and has determined that risk of failure by near-term hydrogen embrittlement has passed for these rods. However, there is a potential for longer-term (years and decades) stress corrosion cracking on certain rods. This potential risk can be managed safely and effectively while the bridge is in service, and an ongoing testing program will provide the needed data to aid the decision making on the remaining rods.

The program contingency is currently $329 million in accordance with the TBPOC approved budget. As of the end of the third quarter of 2013, the 50 percent probable draw on program contingency is $159 million. The potential draw ranges from about $75 million to $250 million. The current program contingency balance is sufficient to cover the cost of currently identified risks. In accordance with the approved TBSRP risk management plan, risk mitigation actions are continuously developed and implemented to reduce the potential draw on the program contingency.

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

Susan Bransen for
ANDRE BOUTROS
Executive Director
California Transportation Commission

MALCOLM DOUGHERTY
Director
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MALCOLM DOUGHERTY
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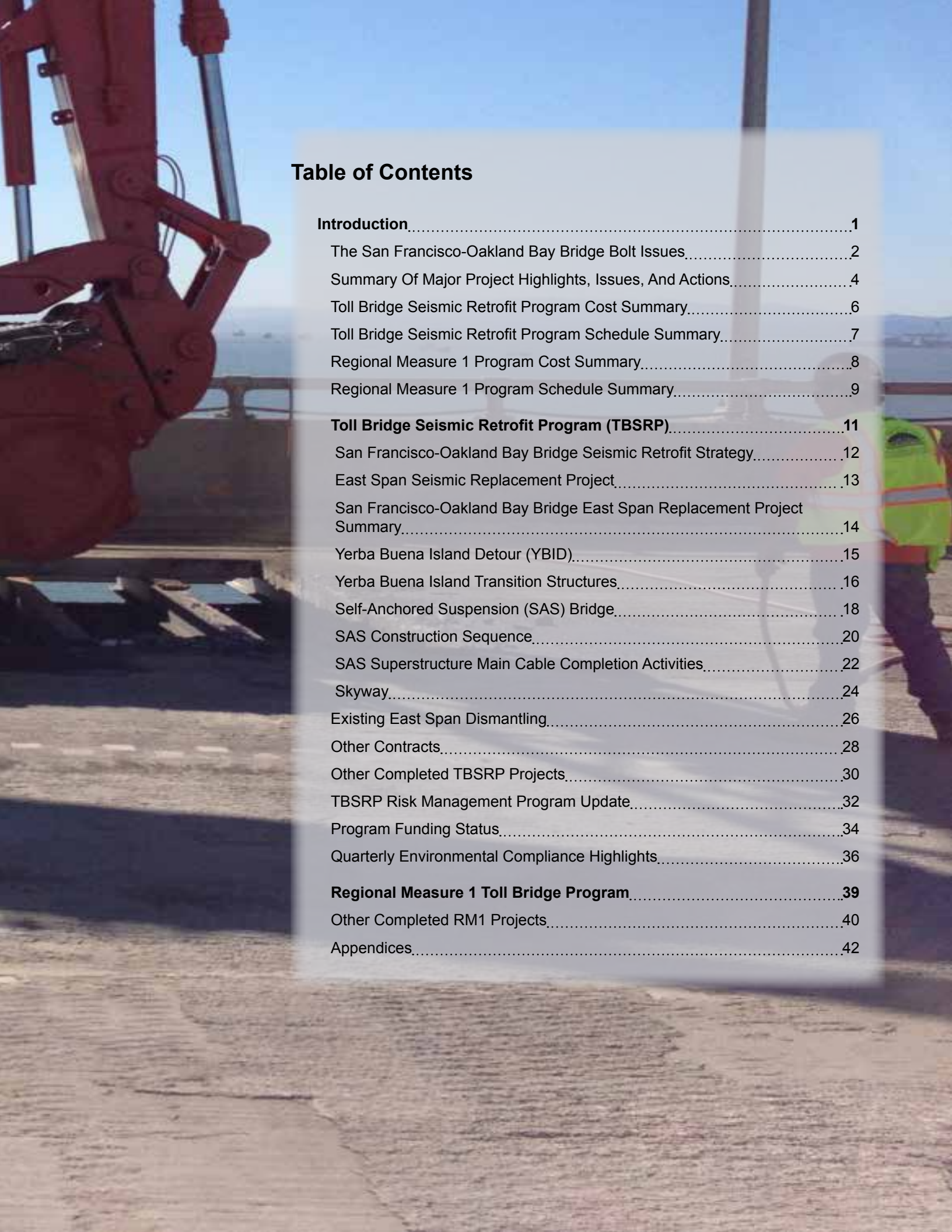
California Department of Transportation

The Old San Francisco-Oakland Bay Bridge Upper Deck
Awaiting Dismantling



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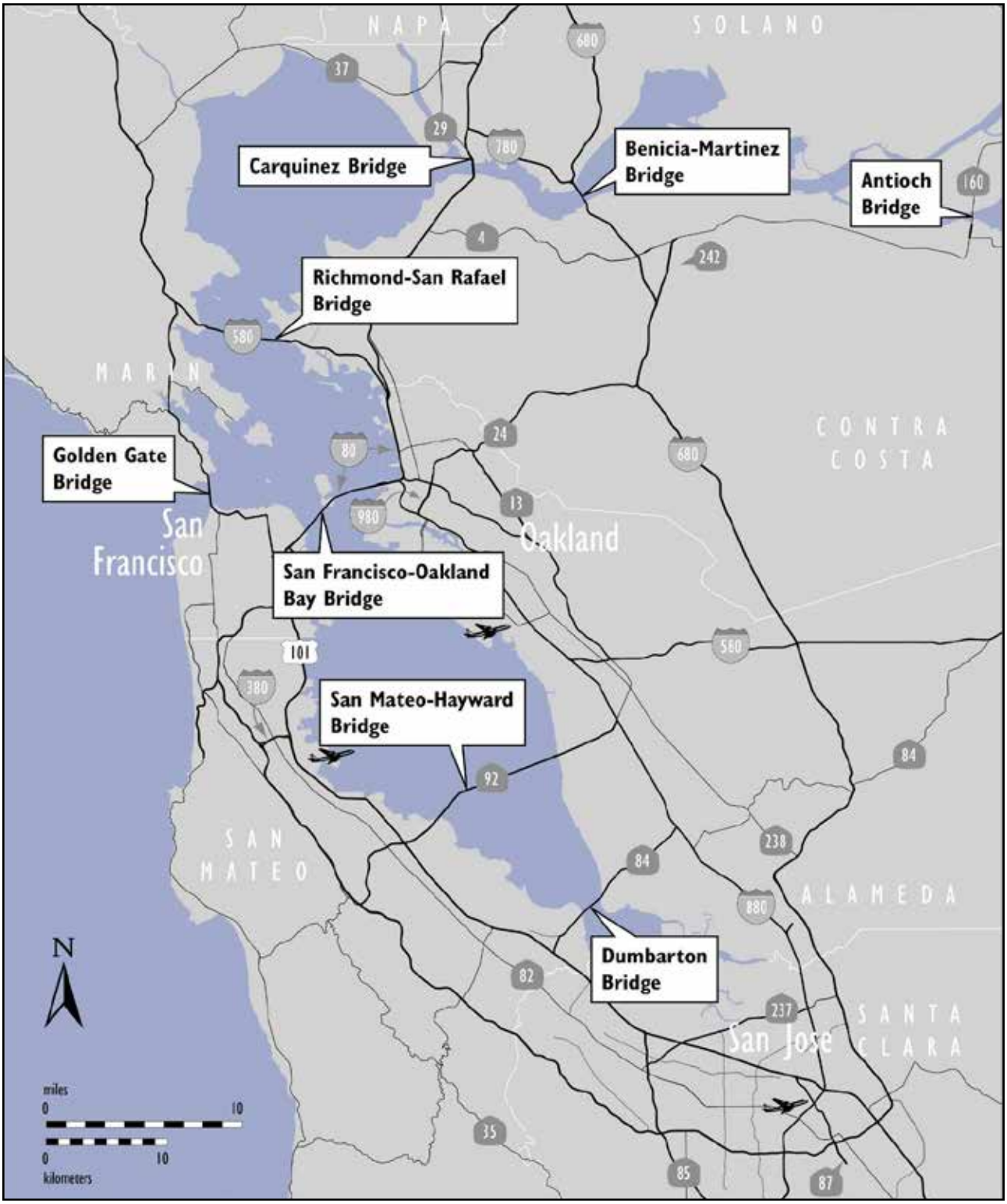


* The Golden Gate Bridge is owned and operated by the Golden Gate Bridge, Highway and Transportation District.

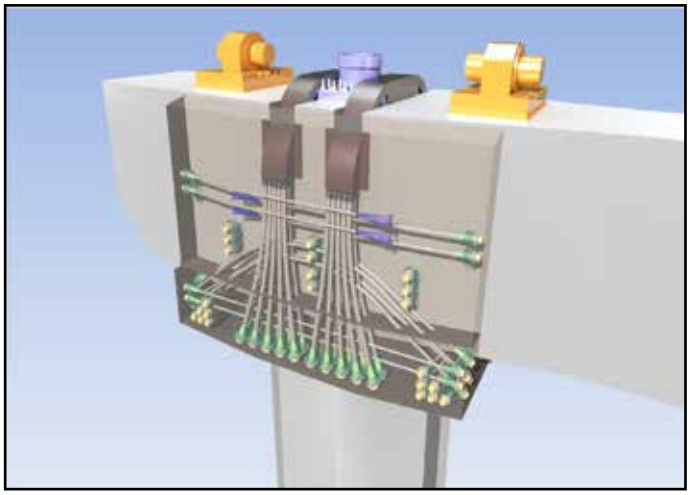
Introduction

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:

Toll Bridge Seismic Retrofit Projects	Seismic Safety Status
Dumbarton Bridge Seismic Retrofit	Complete
Antioch Bridge Seismic Retrofit	Complete
San Francisco-Oakland Bay Bridge East Span Replacement	Construction
San Francisco-Oakland Bay Bridge West Approach Replacement	Complete
San Francisco-Oakland Bay Bridge West Span Seismic Retrofit	Complete
San Mateo-Hayward Bridge Seismic Retrofit	Complete
Richmond-San Rafael Bridge Seismic Retrofit	Complete
1958 Carquinez Bridge Seismic Retrofit	Complete
1962 Benicia-Martinez Bridge Seismic Retrofit	Complete
San Diego-Coronado Bridge Seismic Retrofit	Complete
Vincent Thomas Bridge Seismic Retrofit	Complete

The New Benicia-Martinez Bridge is 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. While the rest of the projects in the RM1 program are not directly under the responsibility of the TBPOC, BATA and Caltrans will continue to report on their progress as an informational item. The RM1 program includes:

Regional Measure 1 Projects	Open to Traffic Status
Interstate 880/State Route 92 Interchange Reconstruction	Open
1962 Benicia-Martinez Bridge Reconstruction	Open
New Benicia-Martinez Bridge	Open
Richmond-San Rafael Bridge Deck Overlay Rehabilitation	Open
Richmond-San Rafael Bridge Trestle, Fender & Deck Joint Rehabilitation	Open
Westbound Carquinez Bridge Replacement	Open
San Mateo-Hayward Bridge Widening	Open
State Route 84 Bayfront Expressway Widening	Open
Richmond Parkway	Open



Rendering of E2 Saddle Retrofit Strategy

Cross Section of an E2 Shear Key Broken Bolt

Cutting Rebar on the upper Saddle

The San Francisco-Oakland Bay Bridge Bolt Issues

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. A total of 32 out of the 96 anchor bolts broke before Caltrans directed the contractor to reduce the anchor bolt tension to prevent further failures.

A forensic metallurgic examination was jointly performed with both the contractor's and Caltrans' Materials Engineering and Testing Services' (METS) metallurgical experts. It was determined that while the failed bolts' material properties did meet the contract specifications, the hardness properties were at the upper limit and the ductility and toughness properties were at the lower limit. Taking this high-end hardness and low-end ductility into account and combining it with a high tensile stress (0.70 Fu) makes this material more susceptible to the effects of hydrogen cracking (also known as hydrogen embrittlement). The metallurgical examination indicated that the bolts were susceptible to hydrogen embrittlement due to a lack of uniformity in the microstructure of the rods.

The anchor bolts at shear keys S1 and S2 are uniquely different from the anchor bolts at the remaining shear keys and bearings (known as shear keys S3 and S4 and bearings B1, B2, B3, and B4) in that they were manufactured in 2008 as opposed to the remaining ones in 2010. In addition, the anchor bolts at shear keys S1 and S2 have their anchors fully cast into the pier E2 cap and are not replaceable. The remaining shear keys and bearings which are through bolted and thus replaceable. As such, shear keys S1 and S2 will require an alternate anchorage solution.

On July 8, 2013, the TBPOC released its investigative report that laid out the chronology of events and assigned proper responsibility as warranted for the rod failures. The report made the following determinations:

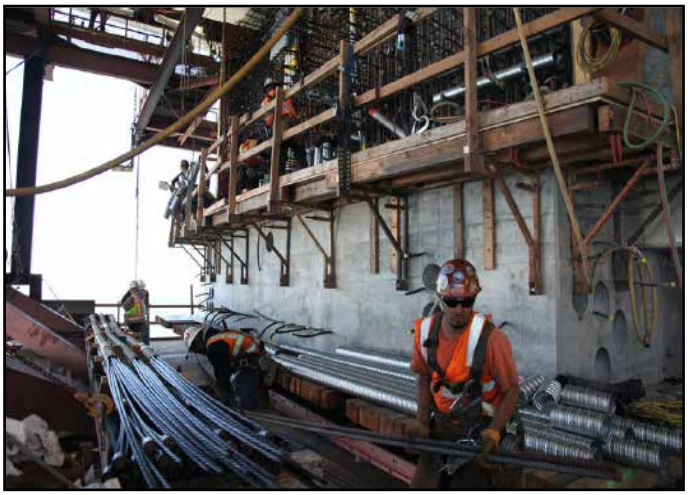
- The rods failed due to near-term hydrogen embrittlement. The failed rods were fabricated in 2008, separate from other similar rods used on the project. The 2008 rods exhibited a material susceptible to hydrogen embrittlement with a heterogeneous structure and high surface hardness.

- It is safe to open the new East Span after replacing the clamping capacity lost by the failed 2008 rods with a steel saddle retrofit. The retrofit is currently being fabricated with completion forecast for early December 2013.
- Caltrans has performed an extensive review of the remaining rods of similar type to the failed rods on the bridge and has determined that risk of failure by near-term hydrogen embrittlement has passed for these rods. However, there is a potential for longer-term (years and decades) stress corrosion cracking on certain rods, though this potential risk can be managed safely and effectively after the bridge is placed into service.

Because of the superior strength of the new East Span design compared to the old East Span, the Toll Bridge Seismic Safety Peer Review Panel (TBSSPRP) supported a proposal for an interim fix at Pier E2 that could be installed prior to completion of the steel saddle retrofit. The TBPOC asked the Federal Highway Administration (FHWA) and two preeminent bridge engineers from the firms of Buckland & Taylor, Ltd., and Modjeski and Masters to review this recommendation. All reviews have reached the same unequivocal conclusion that the interim retrofit will adequately protect and allow for the opening of the new East Span while the permanent retrofit is under construction.

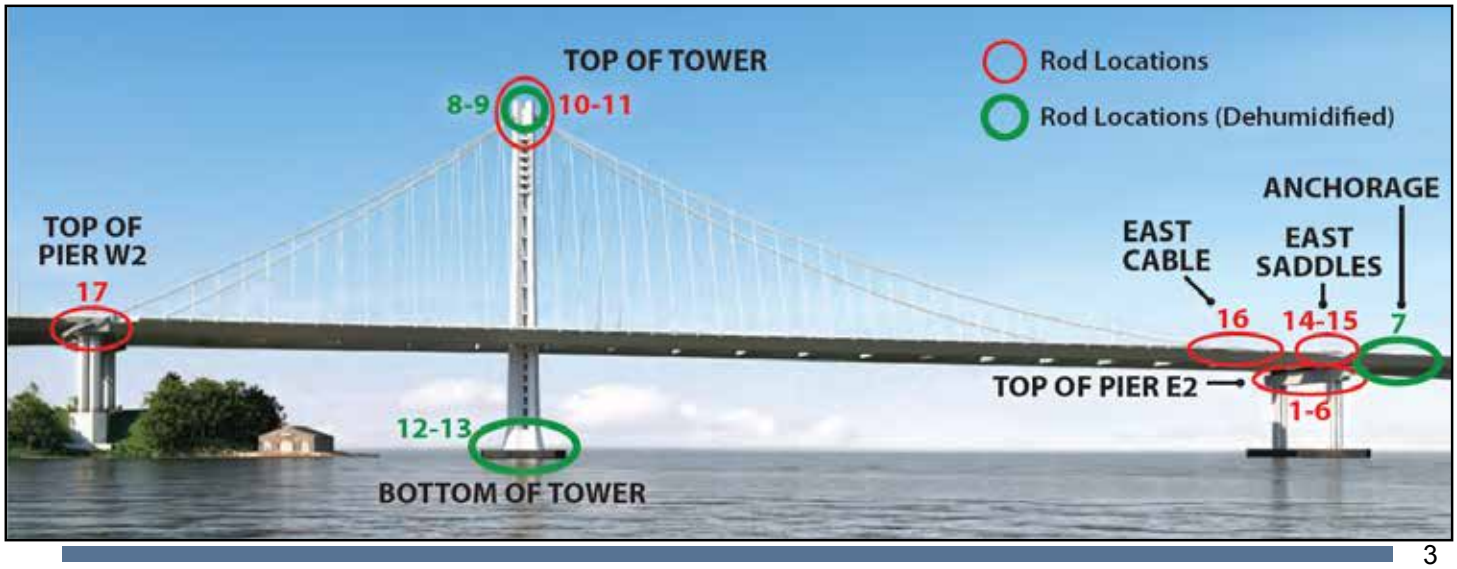
As a result, on August 15th, the TBPOC met in public session to approve the five-day closure over the Labor Day weekend from the evening of August 28, 2013, through the morning of September 3, 2013, to move traffic onto the new East Span.

Detensioning E2E Shear Key Bolts



Rebar Installation at the west Face of E2 Cap Beam

A354 Grade BD Rod Locations on the SAS Bridge



SUMMARY OF MAJOR PROJECT HIGHLIGHTS, ISSUES, AND ACTIONS

Self-Anchored Suspension Bridge Lower Saddle Installation at E2 Shear Key Anchorage

Deck Removal in Progress on the Old San Francisco-Oakland Bay Bridge

Oakland Touchdown #2 Permanent Bike Path Progress Looking west

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 $329 million in accordance with the TBPOC approved budget. As of the end of the third quarter of 2013, the 50 percent probable draw on program contingency is $159 million. The potential draw ranges from about $75 million to $250 million (refer to Risk Management on page 32).

The current program contingency balance is sufficient to cover the cost of currently identified risks. In accordance with the approved TBSRP Risk Management Plan, risk mitigation actions are continuously being developed and implemented to reduce the potential draw on the program contingency.

San Francisco-Oakland Bay Bridge (SFOBB) East Span Seismic Replacement Project

Self-Anchored Suspension (SAS) Bridge Superstructures Contract

A joint venture of American Bridge/Fluor (ABF) has constructed the signature Self-Anchored Suspension (SAS) section of the new east span of the San Francisco-Oakland Bay Bridge. The SAS is a self anchoring suspension span with one main cable that anchors to the eastern end of the roadway deck, rather than to the ground anchorages. All major bridge components are now in place and the bridge opened to traffic over the Labor Day weekend of 2013. Remaining work to be completed includes some field, electrical and mechanical work.

Yerba Buena Island Transition Structure (YBITS) #1 Contract

MCM Construction, Inc. was 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.

MCM has completed both the eastbound and westbound transition structures from the tunnel to Hinge K.

Yerba Buena Island Transition Structure (YBITS) #2 and Cantilever Dismantling Contract

The YBITS #2 contract is dismantling the detour viaduct and will construct a new eastbound on-ramp to the bridge in its place. The contract also includes the cantilever truss dismantling, eastbound on ramp and bike/pedestrian path construction. 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, and work has begun on removing cantilever from the upper deck.

Oakland Touchdown #2 Contract

Flatiron West, Inc. is the prime contractor that constructed the Oakland Touchdown #2 project, which completed the remaining portions of the Oakland Touchdown approach structures from the existing toll plaza to the new span. The westbound structure and portions of the eastbound structure (not in conflict with the existing span) were constructed under the Oakland Touchdown #1 contract. The OTD #2 construction contract started on June 25, 2012. The contractor is in the process of landscaping the area and will construct the remaining portion of the permanent bike/pedestrian pathway that is in conflict with the existing bridge by the first quarter of 2015.

The New San Francisco-Oakland Bay Bridge Self-Anchored Suspension Span with Old Cantilever Bridge on right

Toll Bridge Seismic Retrofit Program Cost Summary (Millions)

	Contract Status	AB 144/SB 66 Budget (September 2005)	TBPOC Approved Changes	Current TBPOC Approved Budget (September 2013)	Cost to Date (September 2013)	Current Cost Forecast (September 2013)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
SFOBB East Span Seismic Replacement								
Capital Outlay Construction								
Skyway	Completed	1,293.0	(55.8)	1,237.2	1,237.3	1,237.2	-	●
SAS Marine Foundations	Completed	313.5	(38.7)	274.8	274.8	278.6	3.8	●
SAS Superstructure	Construction	1,753.7	293.1	2,046.8	1,864.0	2,082.8	36.0	●
YBI Detour	Completed	131.9	334.2	466.1	466.1	473.3	7.2	●
YBI Transition Structures (YBITS)		299.3	0.1	299.4	212.1	323.7	24.3	●
YBITS 1	Completed			203.7	200.1	210.6	6.9	●
YBITS 2 Cantilever Dismantling	Awarded			92.4	12.0	109.8	17.4	●
YBITS Landscaping	Design			3.3	-	3.3	-	●
Oakland Touchdown (OTD)		283.8	35.9	319.7	267.6	331.4	11.7	●
OTD 1	Completed			205.0	204.8	203.3	(1.7)	●
OTD 2	Construction			62.0	29.4	73.6	11.6	●
Detour	Completed			47.0	27.7	44.9	(2.1)	●
OTD Electrical Systems	Construction			-	-	-	-	●
Submerged Electric Cable	Completed			5.7	5.7	9.6	3.9	●
Existing Bridge Dismantling	Design	239.2	(0.1)	239.1	-	241.0	1.9	●
*Cantilever Section	Awarded			61.6	-	60.6		●
*504/288 Sections	Design			-	-	88.4		●
*Marine Foundations	Design			-	-	92.0		●
Stormwater Treatment Measures	Completed	15.0	3.3	18.3	16.9	17.0	(1.3)	●
Other Completed Contracts	Completed	90.4	(0.5)	89.9	90.0	90.5	0.6	●
Capital Outlay Support		959.3	262.3	1,221.6	1,172.3	1,301.7	80.1	●
Right-of-Way and Environmental Mitigation		72.4	-	72.4	51.7	80.4	8.0	●
Other Budgeted Capital		35.1	(32.8)	2.3	0.7	7.7	5.4	●
Total SFOBB East Span Replacement		5,486.6	801.0	6,287.6	5,653.5	6,465.3	177.7	
Antioch Bridge Seismic Retrofit								
Capital Outlay Construction and Mitigation	Completed		51.0	51.0	47.0	50.3	(0.7)	●
Capital Outlay Support			31.0	31.0	23.6	23.8	(7.2)	●
Total Antioch Bridge Seismic Retrofit		-	82.0	82.0	70.6	74.1	(7.9)	●
Dumbarton Bridge Seismic Retrofit								
Capital Outlay Construction and Mitigation	Completed		92.7	92.7	63.6	68.2	(24.5)	●
Capital Outlay Support			56.0	56.0	43.8	46.0	(10.0)	●
Total Dumbarton Bridge Seismic Retrofit		-	148.7	148.7	107.4	114.2	(34.5)	●
Other Program Projects		2,268.4	(63.6)	2,204.8	2,164.3	2,192.5	(12.3)	
Miscellaneous Program Costs		30.0	-	30.0	25.5	30.0	-	●
Net Programmatic Risks		**-**	**-**	**-**	**-**	**36.4**	**36.4**	●
Program Contingency		**900.0**	**(571.1)**	**328.9**	**-**	**169.5**	**(159.4)**	●
Total Toll Bridge Seismic Retrofit Program [2]		**8,685.0**	**397.0**	**9,082.0**	**8,021.3**	**9,082.0**	**-**	

Toll Bridge Seismic Retrofit Program Schedule Summary

	AB 144/SB 66 Project Completion Schedule Baseline (July 2005)	TBPOC Approved Changes (Months)	Current TBPOC Approved Completion Schedule (September 2013)	Current Completion Forecast (September 2013)	Schedule Variance (Months)	Schedule Status	Remarks/ Notes
	g	h	i = g + h	j	k = j - i	l	
SFOBB East Span Seismic Replacement							
Contract Completion							
Skyway	Apr 2007	8	Dec 2007	Dec 2007	-	●	See Page 24
SAS Marine Foundations	Jun 2008	(5)	Jan 2008	Jan 2008	-	●	See Page 20
SAS Superstructure	Mar 2012	29	Aug 2014	Aug 2014	-	●	See Page 21
YBI Detour	Jul 2007	39	Oct 2010	Oct 2010	-	●	See Page 17
YBI Transition Structures (YBITS)	Nov 2013	27	Feb 2016	Feb 2016	-		See Page 18
YBITS 1			Dec 2013	Dec 2013	-		
YBITS 2			Feb 2016	Feb 2016	-	●	
Oakland Touchdown	Nov 2013	10	Sep 2014	Sep 2014	-	●	See Page 25
OTD 1			Jun 2010	Jun 2010	-	●	
OTD 2			Sep 2014	Sep 2014	-	●	
Submerged Electric Cable			Jan 2008	Jan 2008	-	●	
Existing Bridge Dismantling	Sep 2014	18	Dec 2015	March 2017	15	●	
Stormwater Treatment Measures	Mar 2008		Mar 2008	Mar 2008	-	●	
SFOBB East Span Bridge Opening and Other Milestones							
Westbound Seismic Safety Open	Sep 2011	27	Dec 2013	Sep 2013	(3)	●	
Eastbound Seismic Safety Open	Sep 2012	15	Dec 2013	Sep 2013	(3)	●	
Bike/Ped Pathway Open to YBI			Sep 2015	Sep 2015	-	●	
Permanent Eastbound On Ramp Open			Sep 2015	Sep 2015	-	●	
Oakland Detour Eastbound Open			May 2011	May 2011	-	●	
Oakland Detour Westbound Open			Feb 2012	Feb 2012	-	●	
OTD Westbound Access			Aug 2009	Aug 2009	-	●	
YBI Detour Open			Sep 2009	Sep 2009	-		See Page 17
Antioch Bridge Seismic Retrofit							See Page 31
Contract Completion			Jul 2012	Jul 2012	-	●	
Seismic Safety Completion			Apr 2012	Apr 2012	-	●	
Dumbarton Bridge Seismic Retrofit							See Page 31
Contract Completion			Sep 2013	Mar 2013	(6)	●	
Seismic Safety Completion			Sep 2013	Jan 2013	(6)	●	

● 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

(1) Figures may not sum up to totals due to rounding effects.
(2) Construction administration of the OTD Detour is under the YBITS#1 contract.
(3) Construction administration of the Cantilever segment will be under the YBITS#2 contract.

Regional Measure 1 Program Cost Summary (Millions)

	Contract Status	BATA Baseline Budget (July 2005)	BATA Approved Changes	Current BATA Approved Budget (September 2013)	Cost to Date (September 2013)	Current Cost Forecast (September 2013)	Cost Variance	Cost Status
		a	b	c = a + b	d	e	f = e - c	
Interstate 880/Route 92 Interchange Reconstruction								
Capital Outlay Construction	Complete	94.8	68.4	163.2	150.2	163.2	-	●
Capital Outlay Support		28.8	35.8	64.6	62.2	64.6	-	●
Capital Outlay Right-of-Way		9.9	7.3	17.2	15.4	17.2	-	●
Project Reserve		0.3	(0.3)	-	-	-	-	
Total I-880/SR-92 Interchange Reconstruction		133.8	111.2	245.0	227.8	245.0	-	
Other Completed Program Projects		1,978.8	182.6	2,161.4	2,089.4	2,161.4	-	
Total Regional Measure 1 Toll Bridge Program [1]		**2,112.6**	**293.8**	**2,406.4**	**2,317.2**	**2,406.4**	-	

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

Regional Measure 1 Program Schedule Summary

	BATA Baseline Completion Schedule (September 2005)	BATA Approved Changes (Months)	Current BATA Approved Completion Schedule (September 2013)	Current Completion Forecast (September 2013)	Schedule Variance (Months)	Schedule Status	Remarks/Notes
	g	h	i=g+h	j	k=j-i	l	
Interstate 880/Route 92 Interchange Reconstruction							
Contract Completion							
Interchange Reconstruction	Dec 2010	9	Sep 2011	Sep 2011	-	●	See Page 41

The Self-Anchored Suspension Bridge Cutting Rebar at the E2 Cap Beam in Preparation for Setting upper Saddle

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge Seismic Retrofit Strategy

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.

The San Francisco-Oakland Bay Bridge West Approach Overview

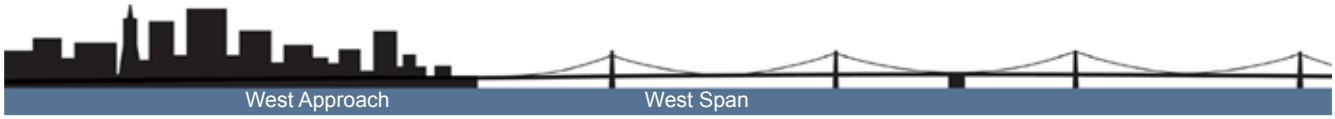
West Approach Seismic Replacement Project Project Status: Completed 2009

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

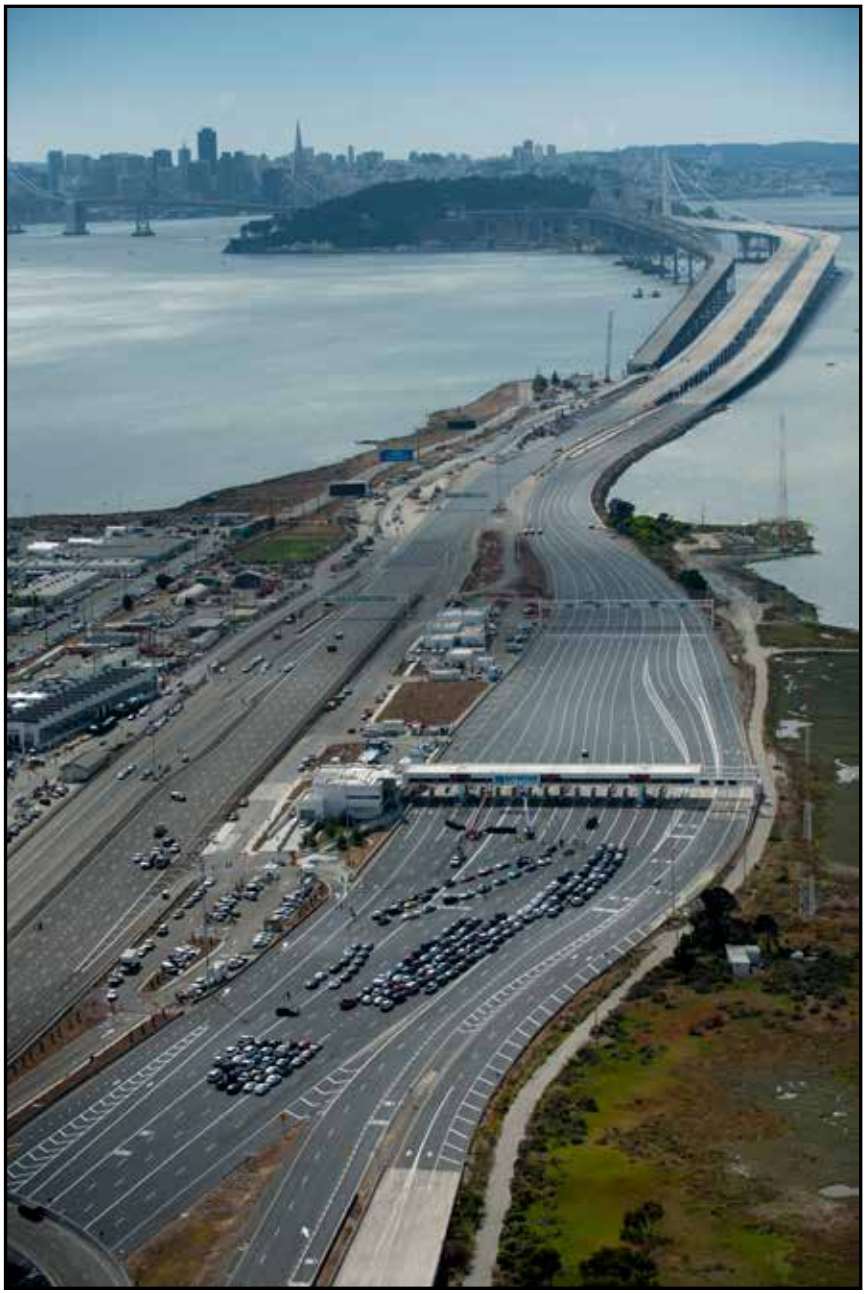
The West Span lies between Yerba Buena Island and San Francisco and is made up of two complete suspension spans connected at a center anchorage. Retrofit work included adding massive amounts of steel and concrete to strengthen the entire West Span, along with new seismic shock absorbers and bracing.

San Francisco-Oakland Bay Bridge West Span



East Span Seismic Replacement Project
Project Status: 95% Complete as of September 2013

Rather than a seismic retrofit, the two-mile long East Span has been completely rebuilt. The new East Span consists of several different sections, 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 bike/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).



Eastern Span of the San Francisco-Oakland Bay Bridge and Oakland Toll Plaza Area at Seismic Safety Opening

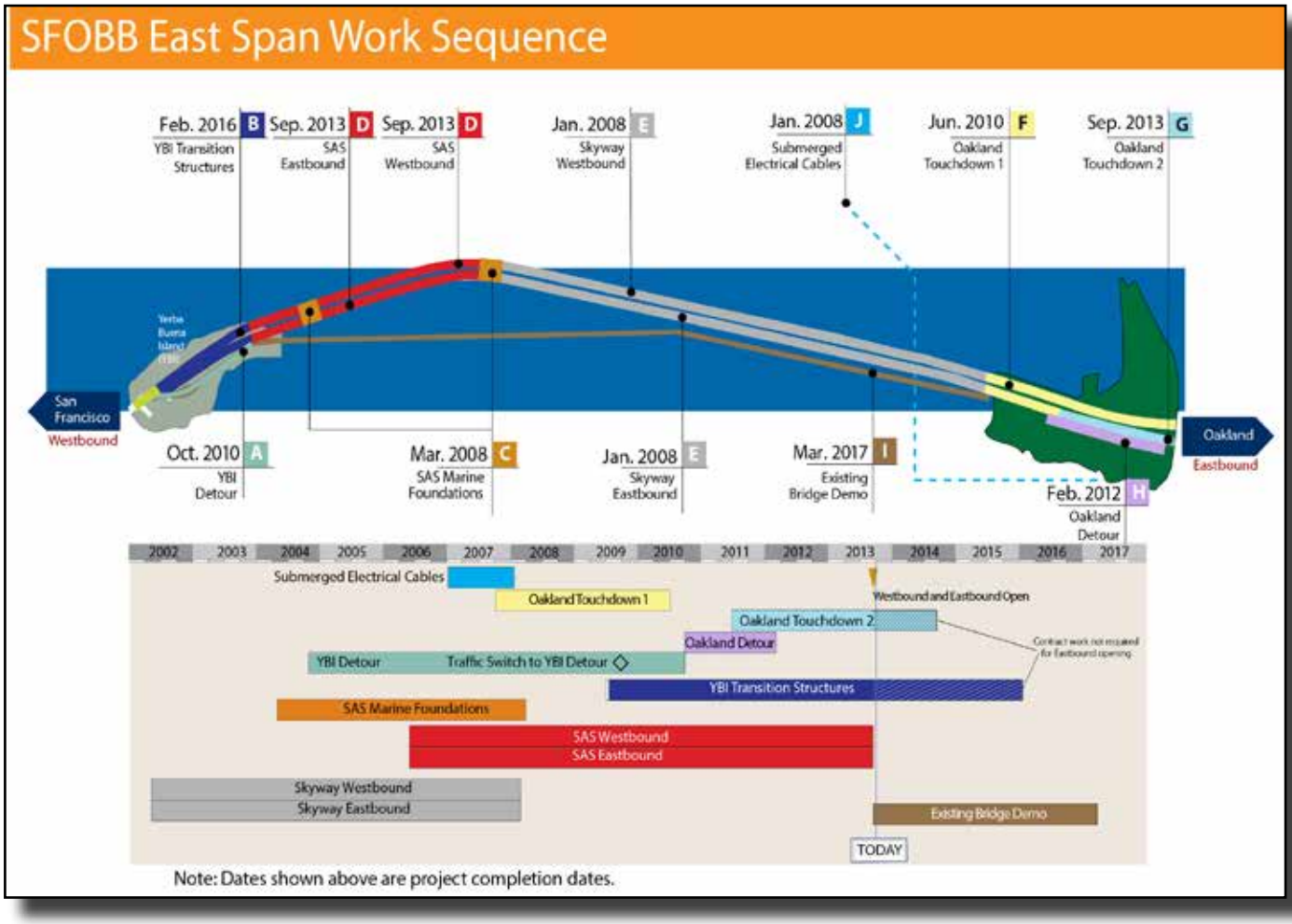
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

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.

Overview of the New San Francisco-Oakland Bay Bridge East Span Construction Progress



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: $466.1 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 reduce project risks.

YBID East Tie-In Rolled in on Labor Day 2009 Weekend

West Tie-In Phase # 1 Rolled in on Labor Day Weekend 2007

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.

B YBITS #1 Contract

Contractor: MCM Construction, Inc.
Approved Capital Outlay Budget: $199.7 M
Status: 90% Complete as of September 2013

MCM Construction, Inc. was the prime contractor constructing 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: Punchlist work and cleanup is ongoing.

YBITS #2 and Cantilever Dismantling Contract

Contractor: CEC & Silverado (JV)
Approved Capital Outlay Budget: $92.4 M
Status: Contract Awarded

The YBITS #2 contract will dismantle the detour viaduct now that the traffic has been switched to the new bridge and will construct a new eastbound on-ramp to the bridge in its place. The contract also includes the cantilever truss dismantling, and bike path construction.

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 to start after the seismic safety opening on Labor Day weekend 2013.

Status: The contractor is in the process of preparing RFIs, CCOs, SWPPP and a bird nesting monitoring program in preparation for the cantilever dismantling after the Labor Day 2013 opening of the new span.

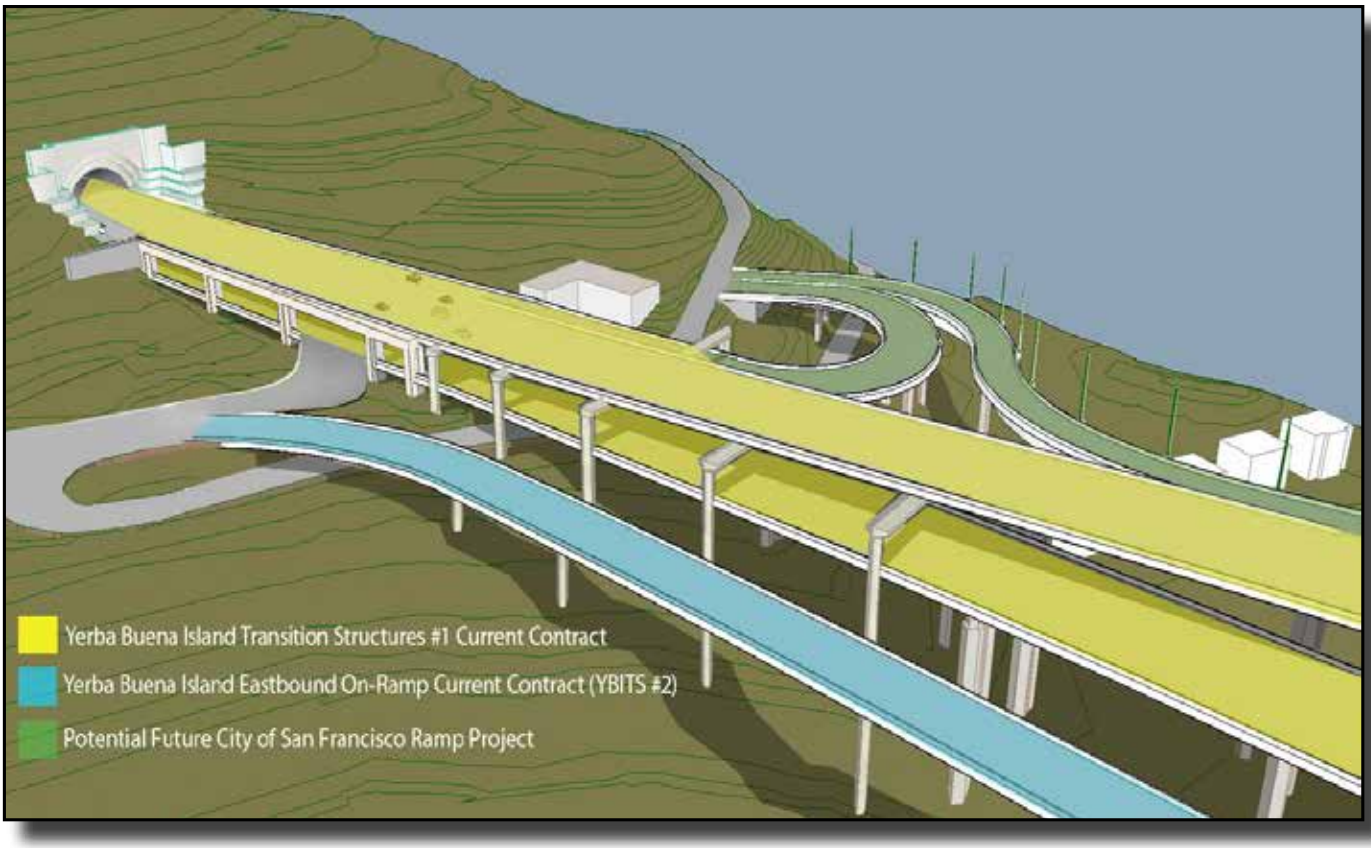
YBITS Landscaping Contract

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.

Birds-Eye View Simulation of the Yerba Buena Island Transition Structures and the New San Francisco-Oakland Bay Bridge Eastbound On Ramp and Bike Path after Dismantling of the Existing Structure

Aerial View of the Self-Anchored Suspension Bridge Tower and Transition Structures on Seismic Opening Day September 2, 2013



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) 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 E2 and the Skyway Westbound Foundation and Columns

C 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 (see rendering on facing page) 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.

D SAS Superstructure Contract

Contractor: American Bridge/Fluor Enterprises, Joint Venture
Approved Capital Outlay Budget: $2.05 B
Status: 95% Complete as of September 2013

The SAS 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.

Two hundred steel wire suspender ropes attached to 100 cable bands along the single main cable did the heavy lifting during load transfer. Sets of suspender ropes were gradually tensioned using hydraulic jacks. As each cable band carries two ropes, there are four hydraulic jacks (each exerting as much as 400 tons of force) at each corresponding location along the outside of the road decks tensioning and pulling the ropes into position.

Status: Painting of the wind vortex plates and traveler testing is ongoing. Preparation work for the removal of the temporary foundations continues. Installation of navigation lights and fog horns continues and other electrical and mechanical work is ongoing.

New Self-Anchored Suspension Span

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

Self-Anchored Suspension (SAS) Construction Sequence

STEP 1 - CONSTRUCT TEMPORARY SUPPORT STRUCTURES

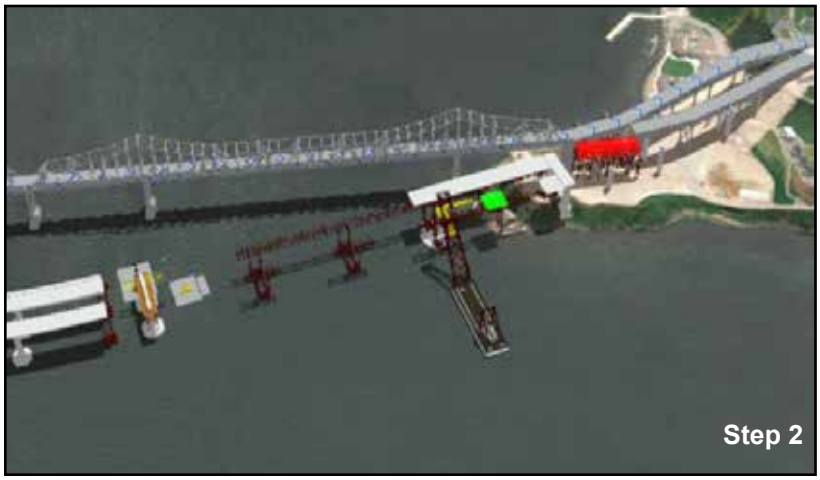
All temporary support foundations and structures were completed between the Skyway and Yerba Buena Island by September 2010 to support the westbound and eastbound roadway box erections.

Status: Removal of the westbound and eastbound temporary support structures and foundations is complete. Hinge A eastbound and westbound support were removed in August 2013.

STEP 2 - INSTALL ROADWAYS

All of the 28 steel roadway boxes and 17 crossbeams have been erected as of the end of October 2011.

Status: Complete.



STEP 3 - INSTALL TOWER

All tower legs, tower grillage, tower saddle and tower head were erected using the self-rising crane as of mid-August 2012.

Status: Complete.

STEP 4 - MAIN CABLE AND SUSPENDER INSTALLATION

The main cable haul started from the east end of the westbound roadway deck moving over the tower saddle, wrapping around pier W2 west deviation saddles and returning to the tower saddle to the east end of eastbound roadway deck where it is anchored. The cable band and suspender cables were then installed to lift the roadway deck off the temporary support structure.

Status: Complete.

STEP 5 - WESTBOUND AND EASTBOUND SEISMIC SAFETY OPENING

The new bridge opened simultaneously in both westbound and eastbound directions.

Status: Complete.

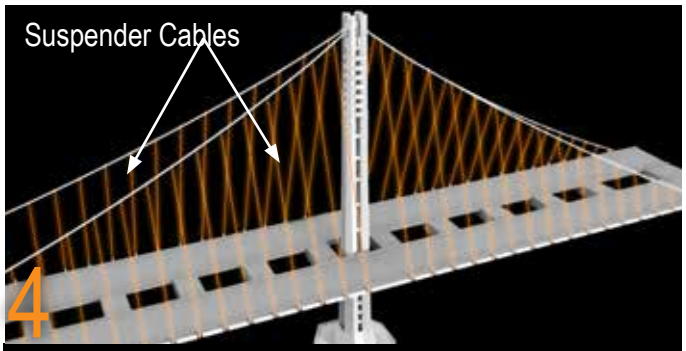
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

Self-Anchored Suspension (SAS) Superstructure Main Cable Completion Activities

CABLE STRAND HAULING

Crews haul the 137 individual steel wire strands that comprise the nearly 1-mile long single main cable. The strands are adjusted and then anchored into the east end of the SAS.

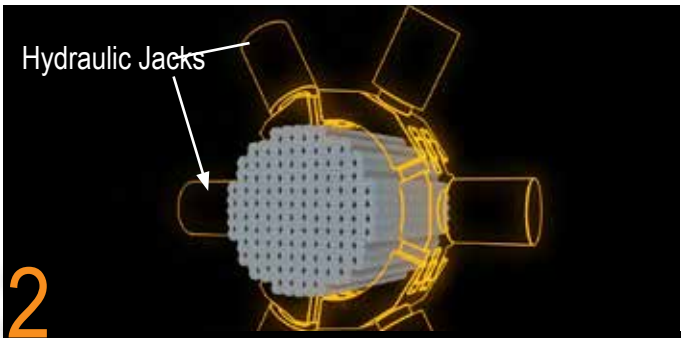
Status: Complete



SUSPENDER CABLES INSTALLATION

Workers begin placing the suspender cables that connect the main cable to the road-decks. Not all of the suspender cables need to be attached before load transfer begins.

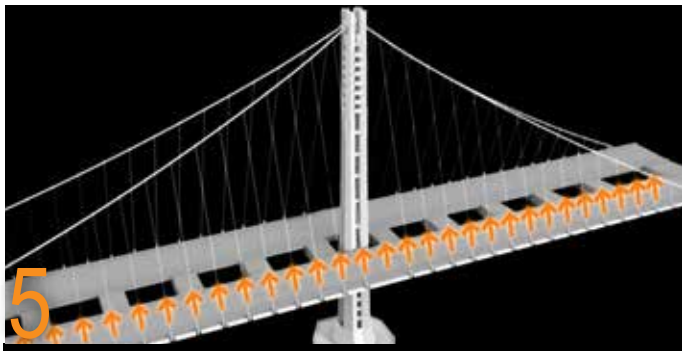
Status: Complete



CABLE STRAND COMPACTING

Four compacting machines containing hydraulic jacks are used to compress the 137 steel wire strands into the shape of the main cable. Temporary bands are placed to maintain the shape.

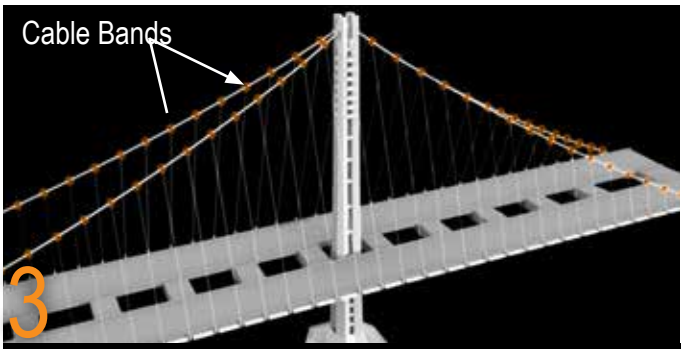
Status: Complete



LOAD TRANSFER (see facing page)

Using the attached suspender cables, crews begin the process of transferring the weight of the span from the temporary supports under the bridge to the main cable.

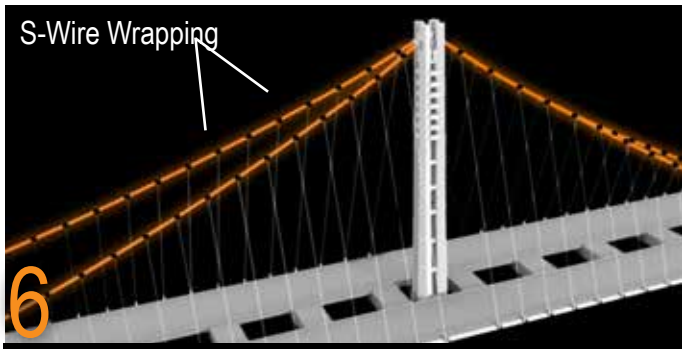
Status: Complete



CABLE BANDS INSTALLATION

Crews installed 114 permanent steel cable bands along the main cable. These bands maintain the shape of the cable, and serve as anchor points for the suspender cables.

Status: Complete

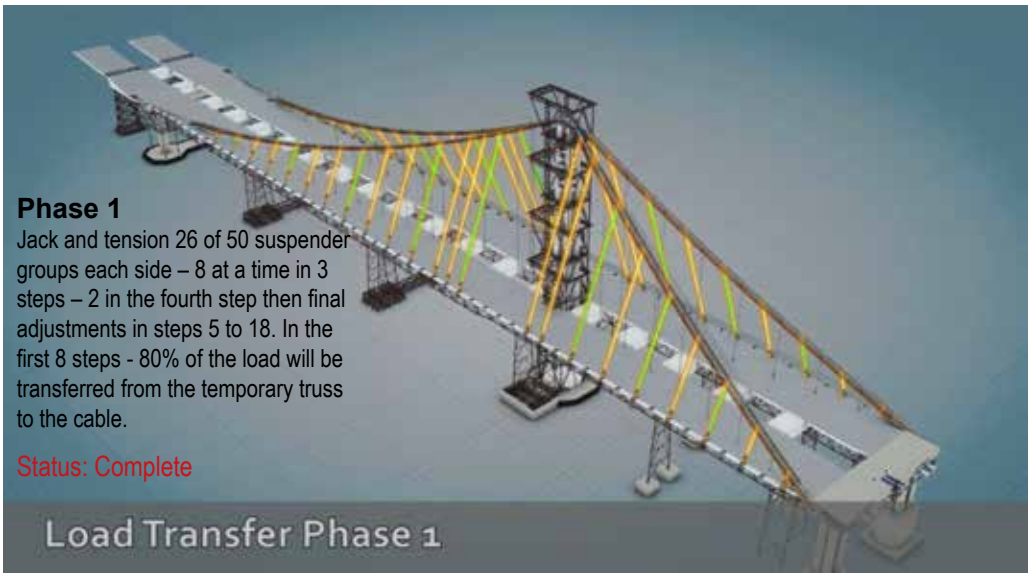


S-WIRE WRAP

After load transfer, the main cable is wrapped in S-wire to protect the cable against corrosion. After the cable is wrapped, it is painted.

Status: Complete

Load Transfer Sequence



Phase 1
Jack and tension 26 of 50 suspender groups each side – 8 at a time in 3 steps – 2 in the fourth step then final adjustments in steps 5 to 18. In the first 8 steps - 80% of the load will be transferred from the temporary truss to the cable.

Status: Complete

Phase 2
Jack and tension 3 more suspender groups out of 50 from each side to bring to a total of 29 of 50 each side.
Status: Complete

Phase 3
Jack and tension final 21 of 50 suspender groups each side to bring total suspenders tensioned to 50 out of 50 each side.
Status: Complete.

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 currently cages drivers, a graceful, elevated roadway supported by piers is now providing sweeping views of the bay.

E 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. 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.

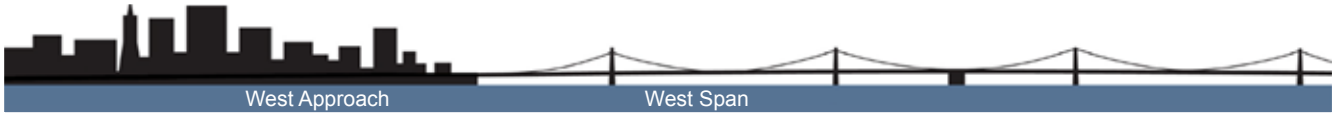
The Skyway's decks are composed of 452 pre-cast concrete segments (standing three stories high), containing approximately 200 million pounds of structural steel, 120 million pounds of reinforcing steel, 200 thousand linear feet of piling and about 450 thousand cubic yards of concrete. These are the largest 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, September 2, 2013.

The New San Francisco-Oakland Bridge Skyway and Self-Anchored Suspension Bridge



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, to be constructed by a future OTD #2 contract, completes 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.

F Oakland Touchdown #1 Contract

Contractor: MCM Construction, Inc.
Approved Capital Outlay Budget: $205.0 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.

G Oakland Touchdown #2 Contract

Contractor: Flatiron West, Inc.
Approved Capital Outlay Budget: $62.0 M
Status: 60% Complete as of September 2013

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 bike path and final landscaping of the area.

Status: Review of RFIs, submittals, and preparation of CCOs is ongoing. Placing of falsework for the bike path has begun.

Aerial View of the Eastbound Oakland Touchdown #2 Construction Progress

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge East Span Replacement Project
Existing East Span Bridge Dismantling

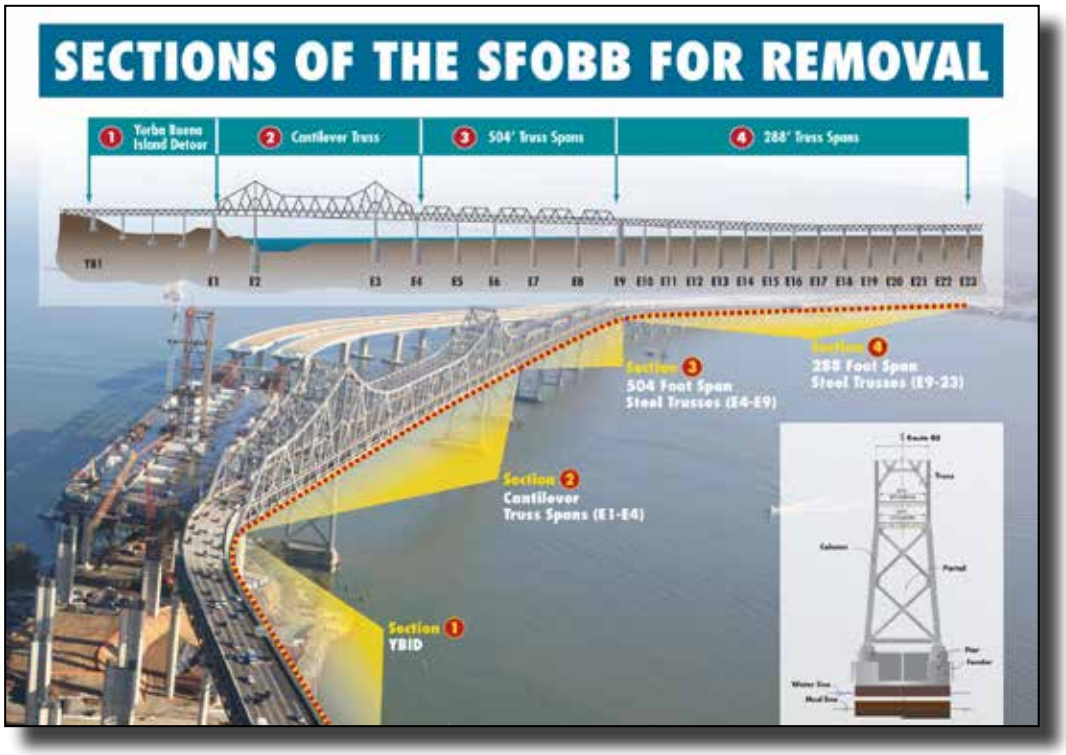
I Existing SFOBB Dismantling Contracts

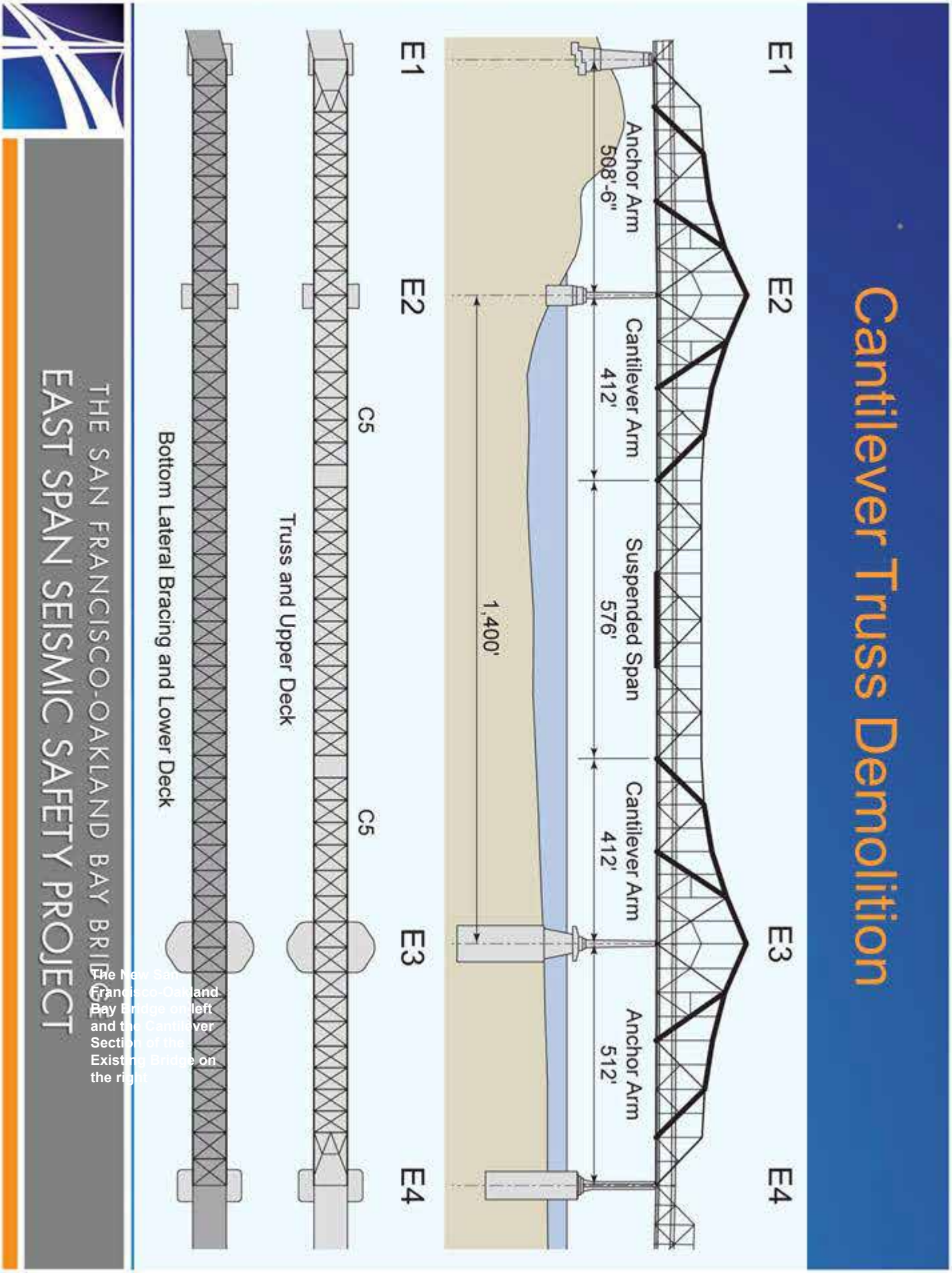
Approved Capital Outlay Budget: $239.1 M

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. The dismantling of the remaining portions of the bridge will likely be performed under separate superstructure (above water) removal and marine foundation (below water) contracts. These contracts are still in design and may change in scope over time.

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. The contractor is continuing the process of preparing RFIs and submittals and monitoring and installing bird deterrence measures on the cantilever bridge. Removal of the cantilever from the upper deck will begin on Monday, the 21st of October.

Cantilever section of the Old eastbound Bridge Section Included in the YBITS #2 Contract for Removal next to the New Bridge





The New San Francisco-Oakland Bay Bridge on left and the Cantilever Section of the Existing Bridge on the right

TOLL BRIDGE SEISMIC RETROFIT PROGRAM

San Francisco-Oakland Bay Bridge East Span Replacement Project
Other Contracts

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 will be the eventual dismantling and removal of the existing bridge, which by that time will have served the Bay Area for nearly 80 years. Following is a status of some the other East Span contracts.

Archeological Investigations

J Electrical Cable Relocation

Contractor: Manson Construction
Approved Capital Outlay Budget: $9.6 M
Status: Completed January 2008

A submerged cable from Oakland that is close to where the new bridge will touch 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.

New YBI Electrical Substation

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.

Stormwater Retention Basin

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.

The existing East Span Cantilever Section of the San Francisco-Oakland Bay Bridge to be Dismantled after Seismic Safety Opening of the New Bridge

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.

Battered Pile Installation Demonstration

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.

High-Rise Section of San Mateo-Hayward Bridge

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.

1958 Carquinez Bridge (foreground) with the 1927 Span (middle) under Demolition and the New Alfred Zampa Memorial Bridge (background)

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.

1962 Benicia-Martinez Bridge (right)

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.

Los Angeles-Vincent Thomas Bridge

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.

Antioch 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.

Dumbarton Bridge

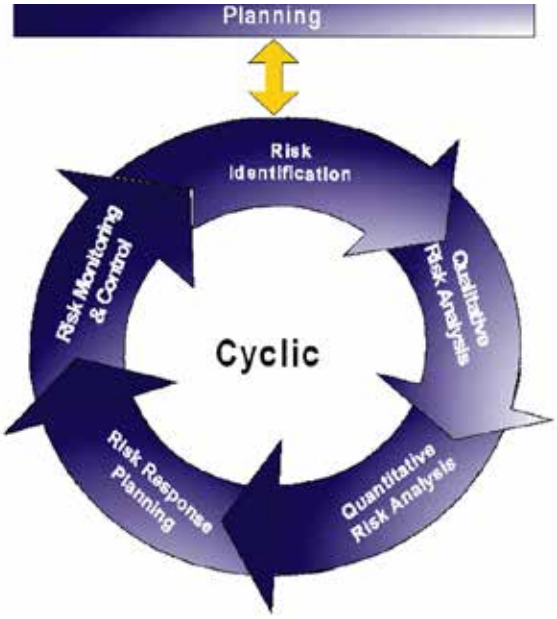
TOLL BRIDGE SEISMIC RETROFIT PROGRAM

Risk Management Program Update

Potential Draw On Program Reserve (Program Contingency)

The program contingency is currently $329 million in accordance with the TBPOC approved budget. As of the end of the third quarter of 2013, the 50 percent probable draw on program contingency is $159 million. The potential draw ranges from about $75 million to $250 million (refer to Figure 1).

The current program contingency balance is sufficient to cover the cost of currently identified risks. In accordance with the approved TBSRP risk management plan, risk mitigation actions are continuously developed and implemented to reduce the potential draw on the program contingency.



RISK MANAGEMENT DEVELOPMENTS

The risk team developed an hourly schedule for the seismic safety opening weekend work and continued to update it as information became available. Planning for the weekend work included coordination of the work zones, access/egress to the work sites and obtaining commitments from suppliers and sub-contractors. The weekend work was performed successfully and the bridge opened to traffic seven hours before the deadline.

RISK MANAGEMENT LOOK AHEAD

The risk analysis of the SSO weekend schedule included duration uncertainties of planned activities, as well as whether risks affected certain activities. The team used the schedule risk model to mitigate risks and recommended the number of days to close the bridge so that there was a high probability of completing on time.

OTD #2 Contract

When the OTD #2 contract was advertised, the plans for the temporary bike/pedestrian path were being developed. Now that plans for the temporary bike/pedestrian path have been finalized, the project team recognizes that there are conflicts, impacts and added risks to the OTD #2 contract completion. Discussions about the impacts continue, and alternate staging plans are being developed to address contract completion.

SAS Contract

The SAS contractor has work to complete, some of which will be performed using lane closures. This may create inefficiencies in the work, with a potential delay risk beyond the contractor's planned completion. Changes to the tower fender pile driving requirements and cleaning of fender embeds may also extend the contract completion time. The SAS risk team will continue to work to minimize and/or mitigate these delays.

Dismantling Projects

Aggressive planning continues for dismantling the marine foundations and trusses of the East Span. Obtaining permits for the marine structures removal will be the most challenging portion of this contract because it involves underwater work in the San Francisco Bay. Caltrans has engaged various environmental, hydro-acoustic, and water quality experts to prepare the permitting documents, and assist in mitigating the identified risks.

The presence of lead paint on the steel superstructure poses potential risks to worker safety and air quality. Caltrans is consulting with Cal-OSHA and the Bay Area Air Quality Management board to determine whether the Caltrans standard engineering controls, used on other Bay Area projects in the past, will provide sufficient risk mitigation.

For all dismantling projects, environmental issues have the potential to lengthen the time to project completion. These risks include: bird nesting, hazardous materials, accidental discharge into the Bay, marine environment work windows, and air quality management. They are being closely monitored and mitigated to the extent possible.

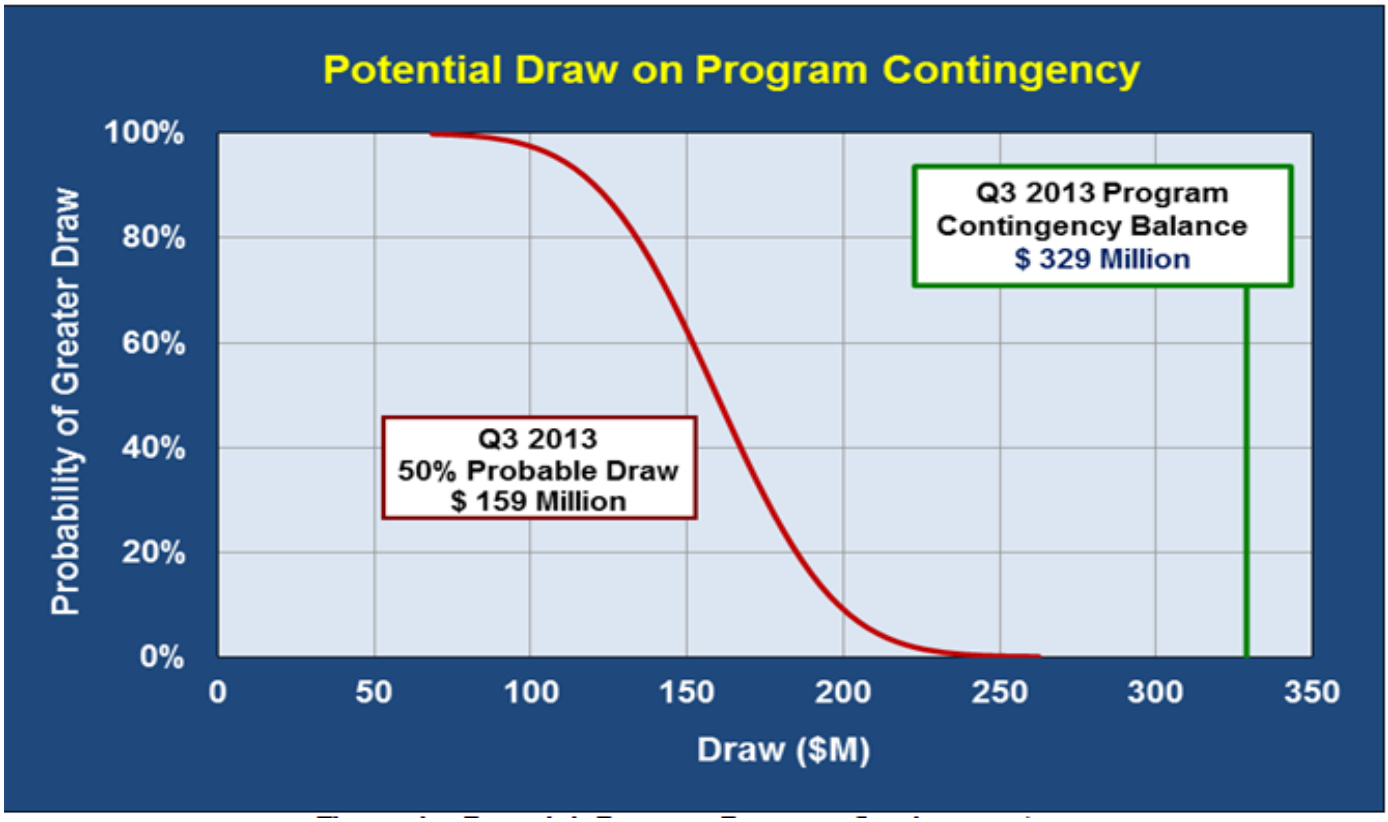


Figure 1 – Potential Draw on Program Contingency*

*Figure 1 Notes:
1. Proposed architectural enhancements and project improvements are excluded unless approved by the TBPOC.
2. Program Contingency may be used for other beneficial purposes than to cover risks. Therefore, the potential draw chart may not necessarily represent a forecast of the future balance of program contingency funds.

The Former San Francisco-Oakland Bay Bridge Being Prepared for Dismantling

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.

Table 1—Program Budget as of September 30, 2013 ($ Millions)

	Budgeted	Funding Available & Contribution
Financing		
Seismic Surcharge Revenue AB 1171	2,282.0	2,282.0
Seismic Surcharge Revenue AB 144	2,150.0	2,150.0
Seismic Surcharge Revenue AB 1175	750.0	750.0
BATA Consolidation	820.0	820.0
Subtotal - Financing	6,002.0	6,002.0
Contributions		
Proposition 192	790.0	789.0
San Diego Coronado Toll Bridge Revenue Fund	33.0	33.0
Vincent Thomas Bridge	15.0	6.9
State Highway Account(1)(2)	745.0	745.0
Public Transportation Account(1)(3)	130.0	130.0
ITIP/SHOPP/Federal Contingency (4)	448.0	448.0
Federal Highway Bridge Replacement and Rehabilitation (HBRR)	642.0	642.0
SHA - East Span Dismantling	300.0	-
SHA - "Efficiency Savings"(5)	130.0	130.0
Redirect Spillover	125.0	125.0
Motor Vehicle Account	75.0	75.0
Subtotal - Contribution	3,433.0	3,123.9
Total Funding	9,435.0	9,125.9
Encumbered to Date		8,268.2
Remaining Unallocated		857.8
Expenditures :		
Capital Outlay		6,290.5
State Operations		1,718.6
Antioch and Dumbarton Expenditures by BATA		12.2
Total Expenditures		**8,021.3**
Encumbrances :		
Capital Outlay		230.6
State Operations		16.3
Total Encumbrances		246.9
Total Expenditures and Encumbrances		**8,268.2**

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.

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 September 30, 2013, shows expenses through September 30, 2013, 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)

Source	Description	2005-06 (Actual)	2006-07 (Actual)	2007-08 (Actual)	2008-09 (Actual)	2009-10 (Actual)	2010-11 (Actual)	2011-12 (Actual)	2012-13 (Actual)	2013-14	Total
AB 1171	SHA	290									290
	PTA	80	40								120
	Highway Bridge Replacement and Rehabilitation (HBRR)	100	100	100	42						342
	Contingency				1	99	100	100	148		448
AB 144	SHA*	2	8				53	50	17		130
	Motor Vehicle Account (MVA)	75									75
	Spillover		125								125
	SHA**									300	300
	Total	547	273	100	43	99	153	150	165	300	1830

* Caltrans Efficiency Savings
** SFOBB East Span Dismantling Cost

Table 3—Toll Bridge Program Oversight Committee Estimated Expenses: July 1, 2005 through September 30, 2013 ($ Millions)

Agency/Program Activity	Expenses
BATA	**2.8**
Caltrans	**2.9**
CTC	**2.9**
Reporting	**5.5**
Total Program	**14.1**

Quarterly Environmental Compliance Highlights

Overall environmental compliance for the San Francisco-Oakland Bay Bridge East Span Seismic Safety Project (SFOBBESSSP) has been a success during the third quarter of 2013. The tasks for the 3rd quarter are focused on mitigation, monitoring, and environmental permitting. Key successes in this quarter were as follows:

The Standard Tracking and Exchange Vehicle for Environmental System (STEVE) was updated regularly with permitting and compliance information for the SFOBB project. 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.

During the bird nesting season (February – August) the Skyway, Self-Anchored Suspension Span, Oakland Touchdown 2 and Yerba Buena Island Transition Structure 1 (YBITS1) and YBITS 2 project areas were surveyed five days a week for nesting birds. The goal of this monitoring is to prevent both impacts to nesting birds and delays to construction. Based on the observations of birds within the project areas adaptive nesting deterrence measures are recommended.

During the double-crested cormorant nesting season (March – August) monitoring was conducted twice a week to evaluate the effectiveness of enticements installed on the new bridge. Bird monitors have observed cormorants loafing amongst the decoys installed on the marine foundations of the new east span.

During the double-crested cormorant nesting season surveys of cormorant nesting activity on the original bridge were performed twice a month. This consists of one survey from the Skyway and one survey from a boat. The goal of this monitoring is to expand our understanding of the timing and location of cormorant nesting. Results of this monitoring will help us develop effective strategies for managing these birds during bridge dismantling. Monitoring results support the assumption that early nesting is centered around Pier E9 and that the colony expands from the center as the season progresses.

In early July, the SFOBB project's bird biologists observed a pair of house finches exhibiting nesting behavior at the Acrow Bridge prior to its scheduled removal. Following this observation the environmental team worked closely with the contractor to undertake an intensive effort to deter house finches from nesting on the Acrow Bridge prior to its removal on July 13, 2013.

On August 8, 2013, Caltrans biologists climbed down the E3, E4, and E9 tower legs of the original east span to conduct a cormorant nesting survey.

Throughout the third quarter of 2013, the environmental team coordinated weekly focus meetings to establish a nesting bird deterrence strategy for upcoming bridge dismantling work.

SFOBB environmental compliance and storm water 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.

The environmental team worked closely with design and construction to prepare environmental Special Provisions for the 504/288 bridge dismantling contract, met with Caltrans engineers to discuss comments on the SFOBB Project Pier E3 demonstration program advanced planning study and attended quarterly risk management meetings for the SFOBB corridor, YBITS 1 contract, OTD2 contract, YBITS 2 contract, and 504/288 contract.

The environmental team began work to amend project permits to allow the YBITS 2 contractor to utilize 42-inch pipe piles in the construction of their temporary falsework being used to support cantilever span dismantling.

Environmental Oyster Survey at YBITS 2

On July 1, 2013, Caltrans completed the transfer of $1.5 million (plus accrued interest) to the National Marine Fisheries Service (NMFS) for a comprehensive off-site eelgrass mitigation program and on July 1 & 2, 2013, a project wide eelgrass survey was performed.

On July 8, 2013, Caltrans submitted an addendum to the miscellaneous permit application submitted to USFWS on May 22, 2013. In the May 2013 application, Caltrans requested authorization to remove occupied nests and nestlings of bird species that nest, or have the potential to nest, in the SFOBB project area during bridge dismantling activities. The purpose of this addendum was to provide supplemental information requested by USFWS following their preliminary review of the May 2013 application.

On July 26, 2013, Caltrans submitted a plan review letter to BCDC requesting approval of the the proposed temporary bicycle and pedestrian trail at the Oakland Touchdown, which establishes a connection from the pathway on the new bridge to the trail leading to Emeryville and Oakland. BCDC submitted a letter on August 28, 2013, that conditionally approved the temporary trail plans.

On August 20 and 21, 2013, the environmental team monitored the installation of five indicator piles as part of the YBITS 2 project. The team performed hydro-acoustic, marine mammal, and water quality monitoring for installation activities. Memorandums detailing monitoring results were delivered to the appropriate agencies.

On September 9 and 10, 2013, the environmental team monitored the proof testing of indicator piles as part of the YBITS 2 project. The team performed hydro-acoustic, water quality, and bird predation monitoring for proof testing activities. Memoranda detailing monitoring results were delivered to the appropriate agencies.

On September 20, 2013, the environmental team performed a native oyster survey along the YBI shoreline in preparation for dismantling of the temporary foundations along the shoreline and during the week of August 26th, the environmental team met with NMFS, San Francisco Bay Conservation and Development Commission (BCDC), Army Corp of Engineers (ACOE), and California Department of Fish and Wildlife (CDFW) to discuss minimization measures and authorizations required for the removal of temporary foundations at the YBI Shoreline.

From August 28, 2013, to September 2, 2013, the environmental team monitored all construction activities associated with the Labor Day traffic switch to ensure compliance with environmental permits and regulations.

On September 13, 2013, the environmental team submitted letter to BCDC requesting review and approval of plans for the removal or four temporary foundations and a trestle abutment at the YBI shoreline and also submitted a letter to BCDC for demolition of the temporary foundation on a steep slope at YBI and construction of a gabion wall system to restore and stabilize the slope, all of which were approved.

Coronado Bridge, San Diego

REGIONAL MEASURE 1 TOLL BRIDGE PROGRAM

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.

Widening of the San Mateo-Hayward Bridge Trestle on left

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.

New Alfred Zampa Memorial (Carquinez) Bridge Soon after Opening to Traffic, with Crockett Interchange Still under Construction

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.

New Richmond-San Rafael Bridge West Approach Trestle under Construction

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 is being upgraded to carry four lanes of southbound traffic and a new bicycle/pedestrian pathway.

The New Congressman George Miller Bridge (New Benicia-Martinez Bridge

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.

Benicia-Martinez Bridge Bicycle/Pedestrian Path

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.

Aerial View of Completed 880/92 Interchange Project

San Francisco-Oakland Bay Bridge Self-Anchored Suspension Span Cutting Rebar for lower Saddle Installation at Shearkey S1

APPENDICES

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Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through September 30, 2013 ($ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
SFOBB East Span Replacement Project						
Capital Outlay Support	959.3	262.3	1,221.6	1,172.3	1,301.7	80.1
Capital Outlay Construction	4,492.2	571.5	5,063.7	4,480.5	5,155.9	92.2
Other Budgeted Capital	35.1	(32.8)	2.3	0.7	7.7	5.4
Total	5,486.6	801.0	6,287.6	5,653.5	6,465.3	177.7
SFOBB West Approach Replacement						
Capital Outlay Support	120.0	(1.0)	119.0	119.3	119.3	0.3
Capital Outlay Construction	309.0	41.7	350.7	332.0	338.1	(12.6)
Total	429.0	40.7	469.7	451.3	457.4	(12.3)
SFOBB West Span Retrofit						-
Capital Outlay Support	75.0	(0.2)	74.8	74.9	74.8	-
Capital Outlay Construction	232.9	(5.5)	227.4	227.4	227.4	-
Total	307.9	(5.7)	302.2	302.3	302.2	-
Richmond-San Rafael Bridge Retrofit						
Capital Outlay Support	134.0	(7.0)	127.0	126.8	127.0	-
Capital Outlay Construction	780.0	(90.5)	689.5	667.5	689.5	-
Total	914.0	(97.5)	816.5	794.3	816.5	-
Benicia-Martinez Bridge Retrofit						-
Capital Outlay Support	38.1	-	38.1	38.1	38.1	-
Capital Outlay Construction	139.7	-	139.7	139.7	139.7	-
Total	177.8	-	177.8	177.8	177.8	-
Carquinez Bridge Retrofit						
Capital Outlay Support	28.7	0.1	28.8	28.8	28.8	-
Capital Outlay Construction	85.5	(0.1)	85.4	85.4	85.4	-
Total	114.2	-	114.2	114.2	114.2	-
San Mateo-Hayward Retrofit						-
Capital Outlay Support	28.1	-	28.1	28.1	28.1	-
Capital Outlay Construction	135.4	(0.1)	135.3	135.3	135.3	-
Total	163.5	(0.1)	163.4	163.4	163.4	-
Vincent Thomas Bridge Retrofit (Los Angeles)						
Capital Outlay Support	16.4	-	16.4	16.4	16.4	-
Capital Outlay Construction	42.1	(0.1)	42.0	42.0	42.0	-
Total	58.5	(0.1)	58.4	58.4	58.4	-
San Diego-Coronado Bridge Retrofit						
Capital Outlay Support	33.5	(0.3)	33.2	33.2	33.2	-
Capital Outlay Construction	70.0	(0.6)	69.4	69.4	69.4	-
Total	103.5	(0.9)	102.6	102.6	102.6	-

Appendix A-1: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through September 30, 2013 ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
Antioch Bridge						
Capital Outlay Support	-	31.0	31.0	17.4	23.8	(7.2)
Capital Outlay Support by BATA				6.2		
Capital Outlay Construction	-	51.0	51.0	47.0	50.3	(0.7)
Total	-	82.0	82.0	70.6	74.1	(7.9)
Dumbarton Bridge						
Capital Outlay Support	-	56.0	56.0	37.8	46.0	(10.0)
Capital Outlay Support by BATA				6.0		
Capital Outlay Construction	-	92.7	92.7	63.6	68.2	(24.5)
Total	-	148.7	148.7	107.4	114.2	(34.5)
Subtotal Capital Outlay Support	1,433.1	340.9	1,774.0	1,705.3	1,837.2	63.2
Subtotal Capital Outlay	6,286.8	660.0	6,946.8	6,289.8	7,001.2	54.4
Subtotal Other Budgeted Capital	35.1	(32.8)	2.3	0.7	7.7	5.4
Miscellaneous Program Costs	30.0	-	30.0	25.5	30.0	-
Subtotal Toll Bridge Seismic Retrofit Program	7,785.0	968.1	8,753.1	8,021.3	8,876.1	123.0
Net Programmatic Risks*	-	-	-	-	36.4	36.4
Program Contingency	900.0	(571.1)	328.9	-	169.5	(159.4)
Total Toll Bridge Seismic Retrofit Program [1]	8,685.0	397.0	9,082.0	8,021.3	9,082.0	-

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

Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through September 30, 2013($ Millions)

Bridge	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of 09/2013 see Note (1)	Estimated costs not yet spent or encumbered as of 09/2013	Total Forecast as of 09/2013
a	b	c	d	e	f = d + e
Other Completed Projects					
Capital Outlay Support	144.9	144.6	144.6	-	144.6
Capital Outlay	472.6	471.9	472.3	(0.5)	471.8
Total	617.5	616.5	616.9	(0.5)	616.4
Richmond-San Rafael					
Capital Outlay Support	134.0	127.0	126.8	0.2	127.0
Capital Outlay	698.0	689.5	667.5	22.0	689.5
Project Reserves	82.0	-	-	-	-
Total	914.0	816.5	794.3	22.2	816.5
West Span Retrofit					
Capital Outlay Support	75.0	74.8	74.9	(0.1)	74.8
Capital Outlay	232.9	227.4	227.4	-	227.4
Total	307.9	302.2	302.3	(0.1)	302.2
West Approach					
Capital Outlay Support	120.0	119.0	119.3	-	119.3
Capital Outlay	309.0	350.7	332.6	5.5	338.1
Total	429.0	469.7	451.9	5.5	457.4
SFOBB East Span - Skyway					
Capital Outlay Support	197.0	181.2	181.2	-	181.2
Capital Outlay	1,293.0	1,237.2	1,237.3	(0.1)	1,237.2
Total	1,490.0	1,418.4	1,418.5	(0.1)	1,418.4
SFOBB East Span - SAS - Superstructure					
Capital Outlay Support	214.6	419.0	448.5	30.9	479.4
Capital Outlay	1,753.7	2,046.8	1,963.7	119.1	2,082.8
Total	1,968.3	2,465.8	2,412.2	150.0	2,562.2
SFOBB East Span - SAS - Foundations					
Capital Outlay Support	62.5	37.6	37.6	-	37.6
Capital Outlay	339.9	301.3	301.3	3.8	305.1
Total	402.4	338.9	338.9	3.8	342.7
Small YBI Projects					
Capital Outlay Support	10.6	10.2	10.2	0.4	10.6
Capital Outlay	15.6	15.2	15.2	0.5	15.7
Total	26.2	25.4	25.4	0.9	26.3
YBI Detour					
Capital Outlay Support	29.5	87.7	88.7	(1.0)	87.7
Capital Outlay	131.9	466.1	466.2	7.1	473.3
Total	161.4	553.8	554.9	6.1	561.0
YBI- Transition Structures					
Capital Outlay Support	78.7	106.4	106.6	13.0	119.6
Capital Outlay	299.4	299.4	333.0	(9.3)	323.7
Total	378.1	405.8	439.6	3.7	443.3

Appendix A-2: TBSRP AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through September 30, 2013 ($ Millions) Cont.

Contract	AB 144 Baseline Budget	TBPOC Current Approved Budget	Expenditures to date and encumbrances as of 09/2013 see Note (1)	Estimated costs not yet spent or encumbered as of 09/2013	Total Forecast as of 09/2013
a	b	c	d	e	f = d + e
Oakland Touchdown					
Capital Outlay Support	74.4	112.9	111.5	15.1	126.6
Capital Outlay	283.8	319.7	272.2	59.2	331.4
Total	358.2	432.6	383.7	74.3	458.0
East Span Other Small Projects					
Capital Outlay Support	212.3	206.6	197.9	8.7	206.6
Capital Outlay	170.8	141.3	117.1	36.3	153.4
Total	383.1	347.9	315.0	45.0	360.0
Existing Bridge Dismantling					
Capital Outlay Support	79.7	59.9	6.2	46.2	52.4
Capital Outlay	239.2	239.1	-	241.0	241.0
Total	318.9	299.0	6.2	287.2	293.4
Antioch Bridge					
Capital Outlay Support	-	31.0	17.4	0.3	17.7
Capital Outlay Support by BATA			6.1	-	6.1
Capital Outlay	-	51.0	47.0	3.3	50.3
Total	-	82.0	70.5	3.6	74.1
Dumbarton Bridge					
Capital Outlay Support	-	56.0	38.0	2.0	40.0
Capital Outlay Support by BATA			6.0	-	6.0
Capital Outlay	-	92.7	68.4	(0.2)	68.2
Total	-	148.7	112.4	1.8	114.2
Miscellaneous Program Costs	30.0	30.0	25.5	4.5	30.0
Total Capital Outlay Support	1,463.2	1,803.9	1,747.0	120.2	1,867.2
Total Capital Outlay	6,321.8	6,949.2	6,521.2	487.7	7,008.9
Program Total [1]	7,785.0	8,753.1	8,268.2	607.9	8,876.1

(1). Funds allocated to project or contract for Capital Outlay and Support needs includes Capital Outlay Support total allocation for FY 06/07.
(2). BSA provided a distribution of program contingency in December 2004 based in Bechtel Infrastructure Corporation input.
This Column is subject to revision upon completion of Department's risk assessment update.

(3) Total Capital Outlay Support includes program indirect costs.

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

Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through September 30, 2013 ($ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
San Francisco-Oakland Bay Bridge East Span Replacement Project						
East Span - SAS Superstructure						
Capital Outlay Support	214.6	204.4	419.0	442.8	479.4	60.4
Capital Outlay Construction	1,753.7	293.1	2,046.8	1,864.0	2,082.8	36.0
Total	1,968.3	497.5	2,465.8	2,306.8	2,562.2	96.4
SAS W2 Foundations						
Capital Outlay Support	10.0	(0.8)	9.2	9.2	9.2	-
Capital Outlay Construction	26.4	0.1	26.5	26.5	26.5	-
Total	36.4	(0.7)	35.7	35.7	35.7	-
YBI South/South Detour						
Capital Outlay Support	29.4	58.3	87.7	87.9	87.7	-
Capital Outlay Construction	131.9	334.2	466.1	466.1	473.3	7.2
Total	161.3	392.5	553.8	554.0	561.0	7.2
East Span - Skyway						
Capital Outlay Support	197.0	(15.8)	181.2	181.2	181.2	-
Capital Outlay Construction	1,293.0	(55.8)	1,237.2	1,237.3	1,237.2	-
Total	1,490.0	(71.6)	1,418.4	1,418.5	1,418.4	-
East Span - SAS E2/T1 Foundations						-
Capital Outlay Support	52.5	(24.1)	28.4	28.4	28.4	-
Capital Outlay Construction	313.5	(38.7)	274.8	274.8	278.6	3.8
Total	366.0	(62.8)	303.2	303.2	307.0	3.8
YBI Transition Structures (see notes below)						
Capital Outlay Support	78.7	27.7	106.4	101.6	119.6	13.2
Capital Outlay Construction	299.3	0.1	299.4	212.1	323.7	24.3
Total	378.0	27.8	405.8	313.7	443.3	37.5
* YBI- Transition Structures						
Capital Outlay Support			16.4	16.4	16.4	-
Capital Outlay Construction			-	-	-	-
Total			16.4	16.4	16.4	-
* YBI- Transition Structures Contract No. 1						
Capital Outlay Support			57.0	65.5	65.3	8.3
Capital Outlay Construction			203.7	200.1	210.6	6.9
Total			260.7	265.6	275.9	15.2
* YBI- Transition Structures Contract No. 2						
Capital Outlay Support			32.0	19.7	36.9	4.9
Capital Outlay Construction			92.4	12.0	109.8	17.4
Total			124.4	31.8	146.7	22.3
* YBI- Transition Structures Contract No. 3 Landscape						
Capital Outlay Support			1.0	-	1.0	-
Capital Outlay Construction			3.3	-	3.3	-
Total			4.3	-	4.3	-

Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through September 30, 2013 ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
Oakland Touchdown (see notes below)						
Capital Outlay Support	74.4	38.5	112.9	107.4	126.6	13.7
Capital Outlay Construction	283.8	35.9	319.7	267.6	331.4	11.7
Total	358.2	74.4	432.6	375.0	458.0	25.4
* OTD Prior-to-Split Costs						
Capital Outlay Support			21.7	20.0	21.7	-
Capital Outlay Construction			-	-	-	-
Total			21.7	20.0	21.7	-
* OTD Submarine Cable(1)						
Capital Outlay Support			0.9	0.9	0.9	-
Capital Outlay Construction			5.7	5.7	9.6	3.9
Total			6.6	6.6	10.5	3.9
* OTD No. 1 (Westbound)						
Capital Outlay Support			51.3	51.2	51.3	-
Capital Outlay Construction			205.0	204.8	203.3	(1.7)
Total			256.3	256.0	254.6	(1.7)
* OTD No. 2 (Eastbound)						
Capital Outlay Support			22.5	27.1	44.0	21.5
Capital Outlay Construction			62.0	29.4	73.6	11.6
Total			84.5	56.5	117.6	33.1
* OTD Touchdown 2 Detour(2)						
Capital Outlay Support			15.0	7.4	7.2	(7.8)
Capital Outlay Construction			47.0	27.7	44.9	(2.1)
Total			62.0	35.1	52.1	(9.9)
* OTD Electrical Systems						
Capital Outlay Support			1.5	0.8	1.5	-
Capital Outlay Construction			-	-	-	-
Total			1.5	0.8	1.5	-
Existing Bridge Dismantling						
Capital Outlay Support	79.7	(19.8)	59.9	5.7	52.4	(7.5)
Capital Outlay Construction	239.2	(0.1)	239.1	-	241.0	1.9
Total	318.9	(19.9)	299.0	5.7	293.4	(5.6)
* Bridge Dismantling Prior-to-Split Cost						
Capital Outlay Support			-	3.9	-	
Capital Outlay Construction			-	-	-	
Total			-	3.9	-	
* Cantilever Section						
Capital Outlay Support			-	0.2	18.0	
Capital Outlay Construction			-	-	60.6	
Total			-	0.2	78.6	
* 504/288 Sections						
Capital Outlay Support			-	1.3	16.6	
Capital Outlay Construction			-	-	88.4	
Total			-	1.3	105.0	
*Marine foundations						
Capital Outlay Support			-	0.3	17.8	
Capital Outlay Construction			-	-	92.0	
Total			-	0.3	109.8	

Appendix B: TBSRP (SFOBB East Span Only) AB 144/SB 66 Baseline Budget, Forecasts and Expenditures through September 30, 2013 ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
YBI/SAS Archeology						
Capital Outlay Support	1.1	-	1.1	1.1	1.1	-
Capital Outlay Construction	1.1	-	1.1	1.1	1.1	-
Total	2.2	-	2.2	2.2	2.2	-
YBI - USCG Road Relocation						
Capital Outlay Support	3.0	(0.3)	2.7	2.7	3.0	0.3
Capital Outlay Construction	3.0	(0.2)	2.8	2.8	3.0	0.2
Total	6.0	(0.5)	5.5	5.5	6.0	0.5
YBI - Substation and Viaduct						
Capital Outlay Support	6.5	(0.1)	6.4	6.4	6.5	0.1
Capital Outlay Construction	11.6	(0.3)	11.3	11.3	11.6	0.3
Total	18.1	(0.4)	17.7	17.7	18.1	0.4
Oakland Geofill						-
Capital Outlay Support	2.5	0.1	2.6	2.5	2.5	(0.1)
Capital Outlay Construction	8.2	-	8.2	8.2	8.2	-
Total	10.7	0.1	10.8	10.7	10.7	(0.1)
Pile Installation Demonstration Project						
Capital Outlay Support	1.8	-	1.8	1.8	1.8	-
Capital Outlay Construction	9.3	(0.1)	9.2	9.3	9.3	-
Total	11.1	(0.1)	11.0	11.1	11.1	-
Stormwater Treatment Measures						
Capital Outlay Support	6.0	2.2	8.2	8.2	8.2	-
Capital Outlay Construction	15.0	3.3	18.3	16.9	17.0	(1.3)
Total	21.0	5.5	26.5	25.1	25.2	(1.3)
Right-of-Way and Environmental Mitigation						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay & Right-of-Way	72.4	-	72.4	51.7	80.4	8.0
Total	72.4	-	72.4	51.7	80.4	8.0
Sunk Cost - Existing East Span Retrofit						
Capital Outlay Support	39.5	-	39.5	39.5	39.5	-
Capital Outlay Construction	30.8	-	30.8	30.8	30.8	-
Total	70.3	-	70.3	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	(8.0)	12.0	3.2	12.0	-
Total	162.6	(7.9)	154.7	145.9	154.6	(0.1)
Subtotal Capital Outlay Support	959.3	262.3	1,221.6	1,172.3	1,301.7	80.1
Subtotal Capital Outlay Construction	4,492.2	571.5	5,063.7	4,480.5	5,155.9	92.2
Other Budgeted Capital	35.1	(32.8)	2.3	0.7	7.7	5.4
						-
Total SFOBB East Span Replacement Project	5,486.6	801.0	6,287.6	5,653.5	6,465.3	177.7

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

Appendix C: Regional Measure 1 Program Cost Detail ($ Millions)

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
New Benicia-Martinez Bridge Project						
New Bridge						
Capital Outlay Support						
BATA Funding	84.9	7.2	92.1	92.0	92.1	-
Non-BATA Funding	-	0.1	0.1	0.1	0.1	-
Subtotal	84.9	7.3	92.2	92.1	92.2	-
Capital Outlay Construction			-			-
BATA Funding	661.9	94.6	756.5	753.7	756.5	-
Non-BATA Funding	10.1	-	10.1	10.1	10.1	-
Subtotal	672.0	94.6	766.6	763.8	766.6	-
Total	756.9	101.9	858.8	855.9	858.8	-
I-680/I-780 Interchange Reconstruction						
Capital Outlay Support						
BATA Funding	24.9	5.2	30.1	30.1	30.1	-
Non-BATA Funding	1.4	5.2	6.6	6.3	6.6	-
Subtotal	26.3	10.4	36.7	36.4	36.7	-
Capital Outlay Construction						
BATA Funding	54.7	26.9	81.6	77.1	81.6	-
Non-BATA Funding	21.6	-	21.6	21.7	21.7	0.1
Subtotal	76.3	26.9	103.2	98.8	103.3	0.1
Total	102.6	37.3	139.9	135.2	140.0	0.1
I-680/Marina Vista Interchange Reconstruction						
Capital Outlay Support	18.3	1.9	20.2	20.2	20.2	-
Capital Outlay Construction	51.5	4.9	56.4	56.1	56.4	-
Total	69.8	6.8	76.6	76.3	76.6	-
New Toll Plaza and Administration Building						
Capital Outlay Support	11.9	3.8	15.7	15.7	15.7	-
Capital Outlay Construction	24.3	2.0	26.3	25.1	26.3	-
Total	36.2	5.8	42.0	40.8	42.0	-
Existing Bridge & Interchange Modifications						
Capital Outlay Support						
BATA Funding	4.3	13.7	18.0	18.0	18.0	-
Non-BATA Funding	-	0.9	0.9	0.8	0.9	-
Subtotal	4.3	14.6	18.9	18.8	18.9	-
Capital Outlay Construction						
BATA Funding	17.2	32.8	50.0	37.2	50.0	-
Non-BATA Funding	-	9.5	9.5	-	9.5	-
Subtotal	17.2	42.3	59.5	37.2	59.5	-
Total	21.5	56.9	78.4	56.0	78.4	-
Other Contracts						
Capital Outlay Support	11.4	(0.9)	10.5	9.7	10.5	-
Capital Outlay Construction	20.3	3.3	23.6	18.6	23.6	-
Capital Outlay Right-of-Way	20.4	(0.1)	20.3	17.0	20.3	-
Total	52.1	2.3	54.4	45.3	54.4	-

Appendix C: Regional Measure 1 Program Cost Detail ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
New Benicia-Martinez Bridge Project continued...						
Subtotal BATA Capital Outlay Support	155.7	30.9	186.6	185.7	186.6	-
Subtotal BATA Capital Outlay Construction	97.5	16.4	113.9	107.0	113.9	-
Subtotal Capital Outlay Right-of-Way	158.1	22.0	180.1	165.9	180.2	0.1
Subtotal Non-BATA Capital Outlay Support	52.1	2.3	54.4	45.3	54.4	-
Subtotal Non-BATA Capital Outlay Construction	115.5	32.3	147.8	147.3	147.8	-
Project Reserves	765.5	163.8	929.3	899.8	929.4	0.1
Total New Benicia-Martinez Bridge Project	1,059.9	212.6	1,272.5	1,209.5	1,272.5	-
Notes:	Includes EAs 00601_,00603_,00605_,00606_,00608_,00609_,0060A_,0060C_,0060E_,0060F_,0060G_,0060H_, and all Project Right-of-Way					
Carquinez Bridge Replacement Project						
New Bridge						
Capital Outlay Support	60.5	(0.3)	60.2	60.2	60.2	-
Capital Outlay Construction	253.3	2.7	256.0	255.9	256.0	-
Total	313.8	2.4	316.2	316.1	316.2	-
Crockett Interchange Reconstruction						
Capital Outlay Support	32.0	(0.1)	31.9	31.9	31.9	-
Capital Outlay Construction	73.9	(1.9)	72.0	71.9	72.0	-
Total	105.9	(2.0)	103.9	103.8	103.9	-
Existing 1927 Bridge Demolition						
Capital Outlay Support	16.1	(0.3)	15.8	15.8	15.8	-
Capital Outlay Construction	35.2	-	35.2	35.1	35.2	-
Total	51.3	(0.3)	51.0	50.9	51.0	-
Other Contracts						
Capital Outlay Support	15.8	0.9	16.7	16.5	16.7	-
Capital Outlay Construction	18.8	(1.2)	17.6	16.5	17.6	-
Capital Outlay Right-of-Way	10.5	(0.1)	10.4	9.9	10.4	-
Total	45.1	(0.4)	44.7	42.9	44.7	-
Subtotal BATA Capital Outlay Support	124.4	0.2	124.6	124.4	124.6	-
Subtotal BATA Capital Outlay Construction	381.2	(0.4)	380.8	379.4	380.8	-
Subtotal Capital Outlay Right-of-Way	10.5	(0.1)	10.4	9.9	10.4	-
Project Reserves	12.1	(9.7)	2.4	-	2.4	-
Total Carquinez Bridge Replacement Project [1]	528.2	(10.0)	518.2	513.7	518.2	-
Notes	Other Contracts include EAs 01301_,01302_,01303_,01304_,01305_,01306_,01307_,01308_,01309_,0130A_,0130C_,0130D_,0130F_,0130G_,0130H_,0130J_,00453_,00493_,04700_,00607_,2A270_,and 29920_ and all Project Right-of-Way					

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

Appendix C: Regional Measure 1 Program Cost Detail ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
Richmond-San Rafael Bridge Trestle. Fender, and Deck Joint Rehabilitation						
Capital Outlay Support						
BATA Funding	2.2	(0.8)	1.4	1.4	1.4	-
Non-BATA Funding	8.6	1.8	10.4	10.4	10.4	-
Subtotal	10.8	1.0	11.8	11.8	11.8	-
Capital Outlay Construction						
BATA Funding	40.2	(6.8)	33.4	33.3	33.4	-
Non-BATA Funding	51.1	-	51.1	51.1	51.1	-
Subtotal	91.3	(6.8)	84.5	84.4	84.5	-
Project Reserves	-	0.8	0.8	-	0.8	-
Total	102.1	(5.0)	97.1	96.2	97.1	-
Richmond-San Rafael Bridge Deck Overlay Rehabilitation						
Capital Outlay Support						
BATA Funding	4.0	(0.7)	3.3	3.3	3.3	-
Non-BATA Funding	4.0	(4.0)	-	-	-	-
Subtotal	8.0	(4.7)	3.3	3.3	3.3	-
Capital Outlay Construction	16.9	(0.6)	16.3	16.4	16.3	-
Project Reserves	0.1	0.3	0.4	-	0.4	-
Total	25.0	(5.0)	20.0	19.7	20.0	-
Richmond Parkway Project (RM 1 Share Only)						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay Construction	5.9	-	5.9	4.3	5.9	-
Total	5.9	-	5.9	4.3	5.9	-
San Mateo-Hayward Bridge Widening						
Capital Outlay Support	34.6	(0.5)	34.1	34.1	34.1	-
Capital Outlay Construction	180.2	(6.1)	174.1	174.1	174.1	-
Capital Outlay Right-of-Way	1.5	(0.9)	0.6	0.6	0.6	-
Project Reserves	1.5	(0.5)	1.0	-	1.0	-
Total	217.8	(8.0)	209.8	208.8	209.8	-
I-880/SR-92 Interchange Reconstruction						
Capital Outlay Support	28.8	35.8	64.6	62.2	64.6	-
Capital Outlay Construction						
BATA Funding	85.2	68.4	153.6	150.2	153.6	-
Non-BATA Funding	9.6	-	9.6	-	9.6	-
Subtotal	94.8	68.4	163.2	150.2	163.2	-
Capital Outlay Right-of-Way	9.9	7.3	17.2	15.4	17.2	-
Project Reserves	0.3	(0.3)	-	-	-	-
Total	133.8	111.2	245.0	227.8	245.0	-
Bayfront Expressway Widening						
Capital Outlay Support	8.6	(0.2)	8.4	8.4	8.4	-
Capital Outlay Construction	26.5	(1.5)	25.0	24.9	25.0	-
Capital Outlay Right-of-Way	0.2	-	0.2	0.2	0.2	-
Project Reserves	0.8	(0.3)	0.5	-	0.5	-
Total	36.1	(2.0)	34.1	33.5	34.1	-

Appendix C: Regional Measure 1 Program Cost Detail ($ Millions) Cont.

Contract	AB 144 / SB 66 Budget (07/2005)	Approved Changes	Current Approved Budget (09/2013)	Cost to Date (09/2013)	Cost Forecast (09/2013)	At-Completion Variance
a	c	d	e = c + d	f	g	h = g - e
US 101/University Avenue Interchange Modification						
Capital Outlay Support	-	-	-	-	-	-
Capital Outlay Construction	3.8	-	3.8	3.7	3.8	-
Total	3.8	-	3.8	3.7	3.8	-
Subtotal BATA Capital Outlay Support	358.3	64.7	423.0	419.5	423.0	-
Subtotal BATA Capital Outlay Construction	1,569.8	217.5	1,787.3	1,754.1	1,787.3	-
Subtotal Capital Outlay Right-of-Way	42.5	6.2	48.7	43.1	48.7	-
Subtotal Non-BATA Capital Outlay Support	14.0	4.0	18.0	17.6	18.0	-
Subtotal Non-BATA Capital Outlay Construction	92.4	9.5	101.9	82.9	102.0	0.1
Project Reserves	35.6	(8.1)	27.5	-	27.4	(0.1)
Total RM1 Program	2,112.6	293.8	2,406.4	2,317.2	2,406.4	-
Notes:	1 Richmond-San Rafael Bridge Trestle, Fender, and Deck Joint Rehabilitation Includes Non-TBSRP Expenses for EA 0438U_ and 04157_					
	2 San Mateo-Hayward Bridge Widening includes EAs 00305_,04501_,04503_,04504_,04504_,04505_,04506_,04507_,04508_,04509_,27740_,27790_,04860_					

The San Francisco-Oakland Bay Bridge a Few Minutes before the Seismic Safety Opening

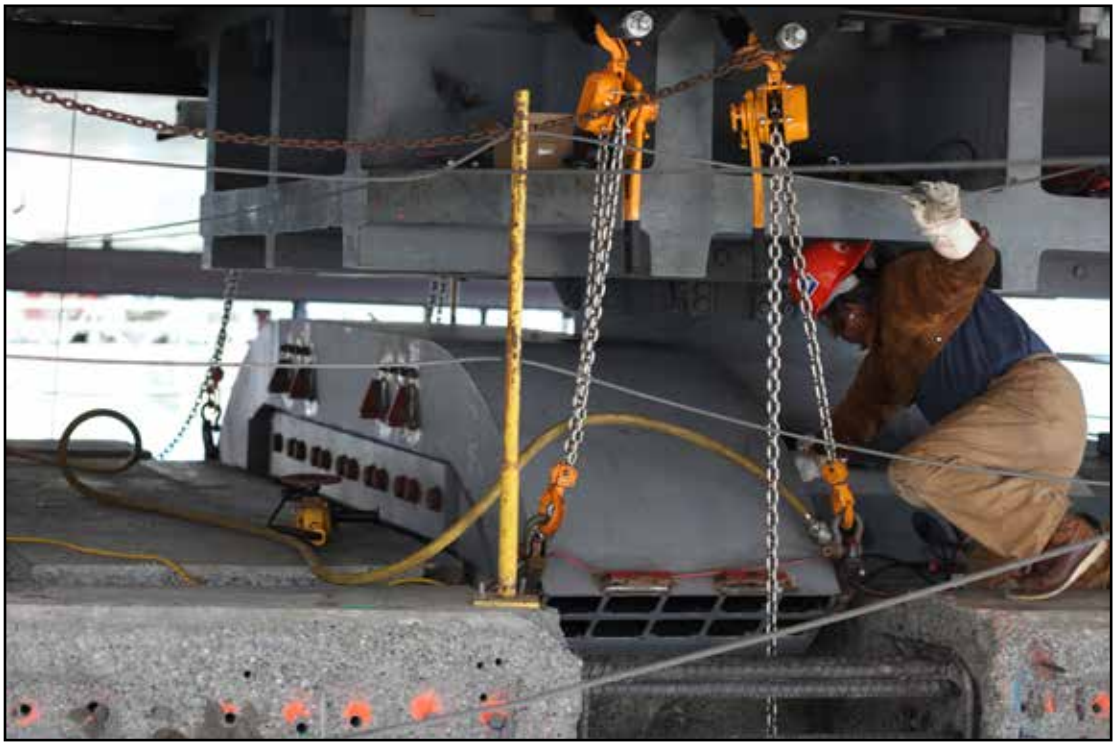
The New San Francisco-Oakland Bay Bridge Self-Anchored Suspension Bridge on right and Old Bridge on left

Project Photos

Appendix E: Project Progress Photographs

Self-Anchored Suspension (SAS) Bridge Field Work

Demolition of the Temporary Truss Foundation



Upper Saddle at the north side of Shear Key S2

Welding and Grinding Elevator Base Support to Tower Skin

Trimmed E2 Shear Key Anchor Rods

Self Anchored Suspension Bridge Looking West to San Francisco with the New Yerba Buena Transition Structure on the right and the Existing Bay Bridge on the left and the Toll Plaza in the forefront

Appendix E: Project Progress Photographs

Oakland Touchdown (OTD)

First Permanent Palm Tree Placement in Progress at OTD #2 between the New Bridge eastbound and westbound OTD Structures

OTD #2 Permanent Bike Path Progress Looking east

OTD Permanent Bike Path in Progress Looking east toward Oakland and Temporary Bike Path in Use at right

Appendix E: Project Progress Photographs

Yerba Buena Island Transition Structure (YBITS)

Cantilever Deck Removal in Progress westbound

Cantilever Deck Removal in Progress eastbound

Permanent Structure at right and Cantilever of Old San Francisco-Oakland Bay Bridge Dismantling Underway at left

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.

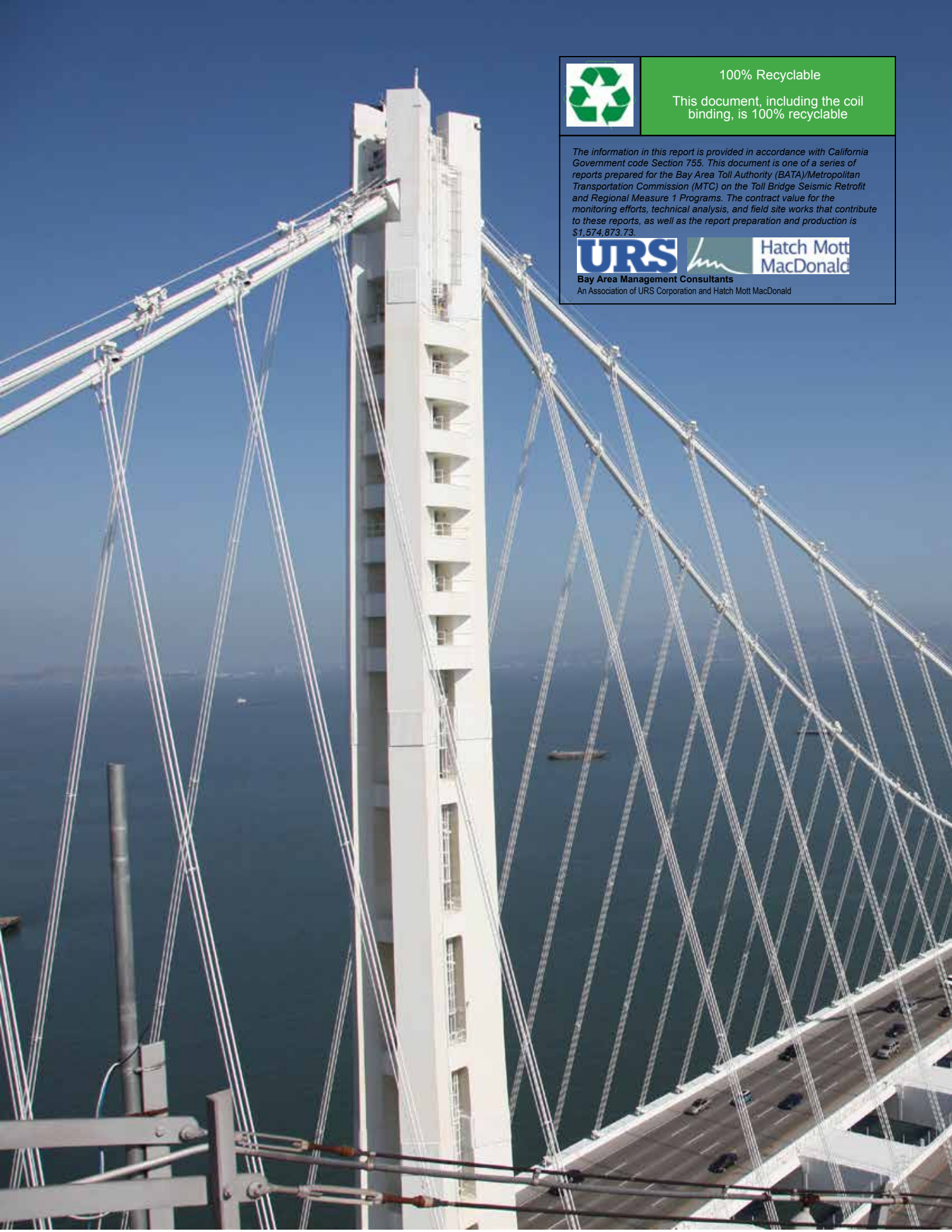
HINGE PIPE BEAMS: Pipes between roadway sections designed to move within their sleeves during expansion or contraction of the decks during minor events, such as changes in temperature. The beams are designed to absorb the energy of an earthquake by deforming in their middle or “fuse” section. Hinge pipe 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.



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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.

URS Hatch Mott MacDonald

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The New San Francisco-Oakland Bridge Seismic Safety Opening