

# Memorandum

To: CHAIR AND COMMISSIONERS

CTC Meeting: May 28-29, 2008

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Information Item

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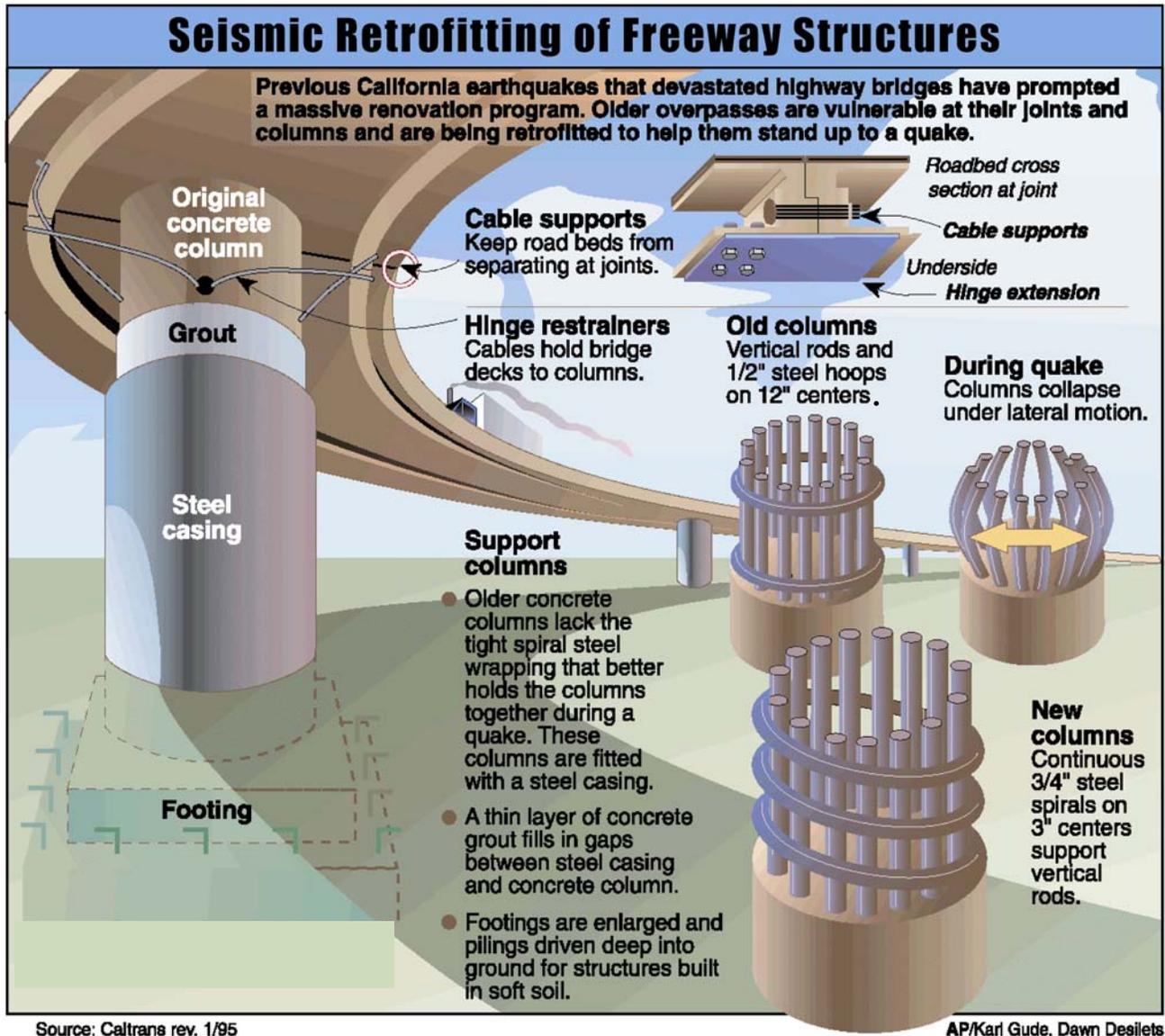
Subject: **QUARTERLY NON-TOLL SEISMIC SAFETY RETROFIT REPORT**

Per Section 188.5(g) of the Streets and Highways Code, attached is the Department of Transportation's Quarterly Non-Toll Seismic Safety Retrofit Report.

Attachment

# CALIFORNIA DEPARTMENT OF TRANSPORTATION

## FIRST QUARTER 2008 NON-TOLL SEISMIC RETROFIT PROGRAM QUARTERLY REPORT



Reporting Period Ending March 31, 2008

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# Executive Summary

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The purpose of this report is to provide information on the status and progress in delivering the California Department of Transportation's (Department) non-toll seismic retrofit programs. The Phase 1 Seismic Retrofit Program is complete and is no longer being reported on. The Toll Bridge Seismic Retrofit Program Report is prepared and submitted separately by the Toll Bridge Program Oversight Committee as outlined in Section 30952.2 (b) (1) of the Streets and Highways Code.

This report fulfills the Department's statutory reporting requirement outlined in Assembly Bill (AB) 144 (Chapter 71, Statutes of 2005), which amended Section 188.5 (g) of the Streets and Highways Code as follows:

*“(1) Commencing on January 1, 2004, and quarterly thereafter until completion of all applicable projects, the Department shall provide quarterly seismic reports to the transportation committees of both houses of the Legislature and to the commission for other seismic retrofit programs.*

*(2) The reports shall include all of the following:*

- (A) A progress report for each program.*
- (B) The program baseline budget for support and capital outlay construction costs.*
- (C) The current or projected program budget for support and capital outlay construction costs.*
- (D) Expenditures to date for support and capital outlay construction costs.*
- (E) A comparison of the current or projected schedule and the baseline schedule.*

*(F) A summary of milestones achieved during the quarterly period and any issues identified and actions taken to address those issues.”*

The Department currently has two active non-toll seismic retrofit programs as outlined below.

## **Phase 2 Seismic Retrofit Program:**

The program consists of additional (beyond Phase 1) State-owned bridges that were determined to need seismic retrofit based on additional screening.

## **Local Bridge Seismic Retrofit Program:**

The program consists of seismic retrofit of locally-owned and Department of Water Resources (DWR) bridges. This program is funded and implemented by the agencies having jurisdiction over the bridges.

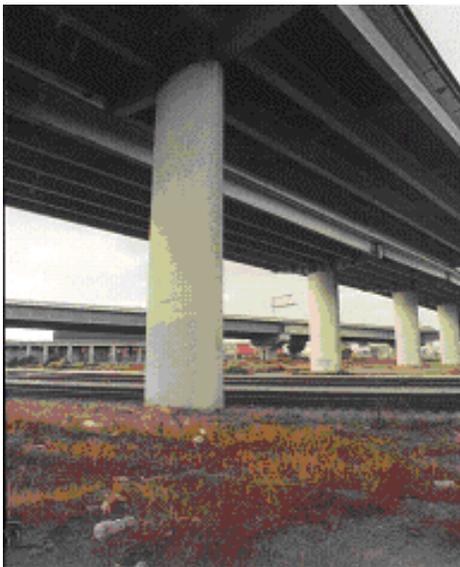
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## Seismic Retrofit Program Overview

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In California, there are more than 12,000 State-owned bridges on the State Highway System, plus an additional 11,500 city and county-owned bridges not on the State Highway System. Each bridge is inspected at least once every two years. Since the 1971 Sylmar earthquake struck the Los Angeles area, the Department has been engaged in an ongoing bridge Seismic Retrofit Program. Following the 1989 Loma Prieta earthquake, the Department's current Seismic Retrofit Program was established to identify and strengthen bridges that needed to be brought up to seismic safety standards.

Using research developed following the 1971 Sylmar earthquake, the Department initially identified 1,039 State-owned bridges in need of being retrofitted to meet seismic safety standards, called Phase 1. The Phase 1 program consisted of mostly single-column bridges that were considered the most vulnerable during an earthquake. The work was funded by State gas taxes.



After the 1994 Northridge earthquake, the Department identified another 1,155 State-owned bridges that became the Phase 2 program consisting of mostly multi-column bridges. Funding for this \$1.35 billion program came from a \$2 billion bond (Proposition 192), which was passed in 1996.



When the Seismic Retrofit Program was established, there were also seven State-owned toll bridges that required retrofit work. The status and progress of the Toll Bridge Seismic Retrofit Program is reported separately in the quarterly Toll Bridge Seismic Retrofit Program Report.

There are a total of 1,235 locally-owned and DWR bridges statewide in the Local Bridge Program. Lead agencies are responsible for assessing the need for seismic retrofit work on locally-owned bridges. The majority of funding comes from gas tax revenues utilizing subvention funds through the Department's Local Assistance Program, \$125 million is available from Proposition 1B Bond program funds, and additional local funds may be used.

## Seismic Evaluation

Based on the 1971 Sylmar earthquake research, the Department implemented new bridge design criteria. From 1986 to 1989, a retrofit program developed by the Department identified single-column bridges as being potentially the most vulnerable to earthquake damage. Research sponsored by the Department at the University of California, San Diego, led to a retrofit procedure that uses steel jackets to increase the strength of columns. Following the 1989 Loma Prieta earthquake, the Department sponsored accelerated retrofit research primarily conducted at the University of California, Berkeley, and the University of California, San Diego.

The Seismic Retrofit Program now involves strengthening the columns of existing bridges by encircling certain columns with a steel casing or, in a few instances, an advanced woven fiber casing. In addition to the column casing, some of the bridge footings are made bigger and given more support by placing additional pilings in the ground, or by using steel tie-down rods to better anchor the footings to the ground. In a few projects, bridge abutments are made larger and the existing restrainer units are made stronger because encasing the columns makes them stiffer and can change the way forces are transmitted within the bridge. Many seismic retrofits involve "hinge seat extensions" which enlarge the size of the hinges that connect sections of bridge decks and help prevent them from separating during severe ground movement. The design of each bridge to be retrofitted is "site specific" based on the

maximum credible earth movement expected at that location. The design details depend on many factors, including the nearest active earthquake fault, type of geology beneath the bridge and the original bridge design.

# Phase 2 Seismic Retrofit Program

## Progress Report

The Phase 2 Seismic Retrofit Program is currently 99 percent complete. To date 1,150 State-owned bridges, out of a total of 1,155 planned bridges, have been retrofitted under the Phase 2 program. Of the remaining five bridges, one is under construction, one is advertised and three bridges are in design.

## Milestones Achieved This Quarter

Seismic retrofit work was completed on the Distribution Structure on Interstate 580 in Oakland on January 4, 2008.

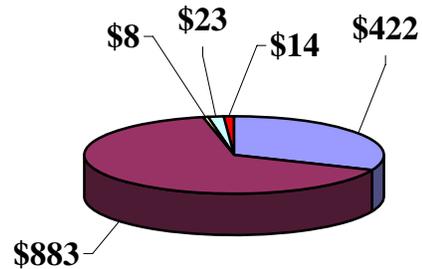
## Program Budget and Expenditures

The total budget for Phase 2 is \$1.35 billion. A total of \$883 million has been allocated for construction and right-of-way, and an additional \$422 million has been expended for support. The total of \$1,305 million committed to date utilizes approximately 97 percent of the available program funds.

Of the remaining balance of \$45 million, \$23 million is to be allocated for construction and right-of-way, and \$8 million is planned for support, leaving a reserve of \$14 million. This reserve is intended to cover cost changes, higher than anticipated bid results, any potential supplemental funds that may be needed, and arbitration settlements.

No program cost overruns are anticipated. All remaining funds will be utilized to complete the Phase 2 program.

**Program Costs  
(millions)**



- Support Expenditures
- Construction and Right of Way
- Planned Support
- Planned Construction and Right of Way
- Reserve

## Program Funds

The funding for the Phase 2 program for seismic retrofit comes from three sources. Proposition 192, which the voters approved in March of 1996, provides bonds for \$1.21 billion. As shown in the table below, an additional \$0.14 billion was expended from a combination of State (\$99.8 million) and Federal (\$40.2 million) funds prior to the passage of Proposition 192. The total budget for Phase 2 is \$1.35 billion.

### Seismic Retrofit Funds

Funds (millions)	Budgeted	Allocated
State	\$99.8	\$99.8
Federal	\$40.2	\$40.2
Bond	\$1,210.0	\$1,165.0
<b>Total</b>	<b>\$1,350.0</b>	<b>\$1,305.0</b>
<b>Available</b>		<b>\$45.0</b>

As bridges were evaluated for seismic retrofit design strategies, it was determined that for some bridges it would be more cost effective to replace the bridge than to retrofit. This is particularly true when the existing bridge needed non-seismic improvements for bridge repair or rehabilitation.

The additional cost for replacement is beyond the scope of funds available for the retrofit program. Consequently, bridge replacement costs were programmed in the State Highway Operations and Protection Program (SHOPP).

## Additional Bridge Replacement Funds Funded from SHOPP

Replacement Bridges	Program Year	Const \$	R/W \$
Ten Mile	2005-06	\$ 22.3	\$ 0.2
5 <sup>th</sup> Avenue Overhead	2006-07	\$ 153.8	19.8
<b>Projects Allocated from SHOPP - \$195.9 million</b>			
High Street Separation	2005-06	\$ 73.2	\$ 20.1
Schuyler Heim	2005-06	\$ 250.0	\$ 5.0
<b>Projects Programmed in SHOPP - \$348.3 million</b>			

### Program Delivery by Region / District

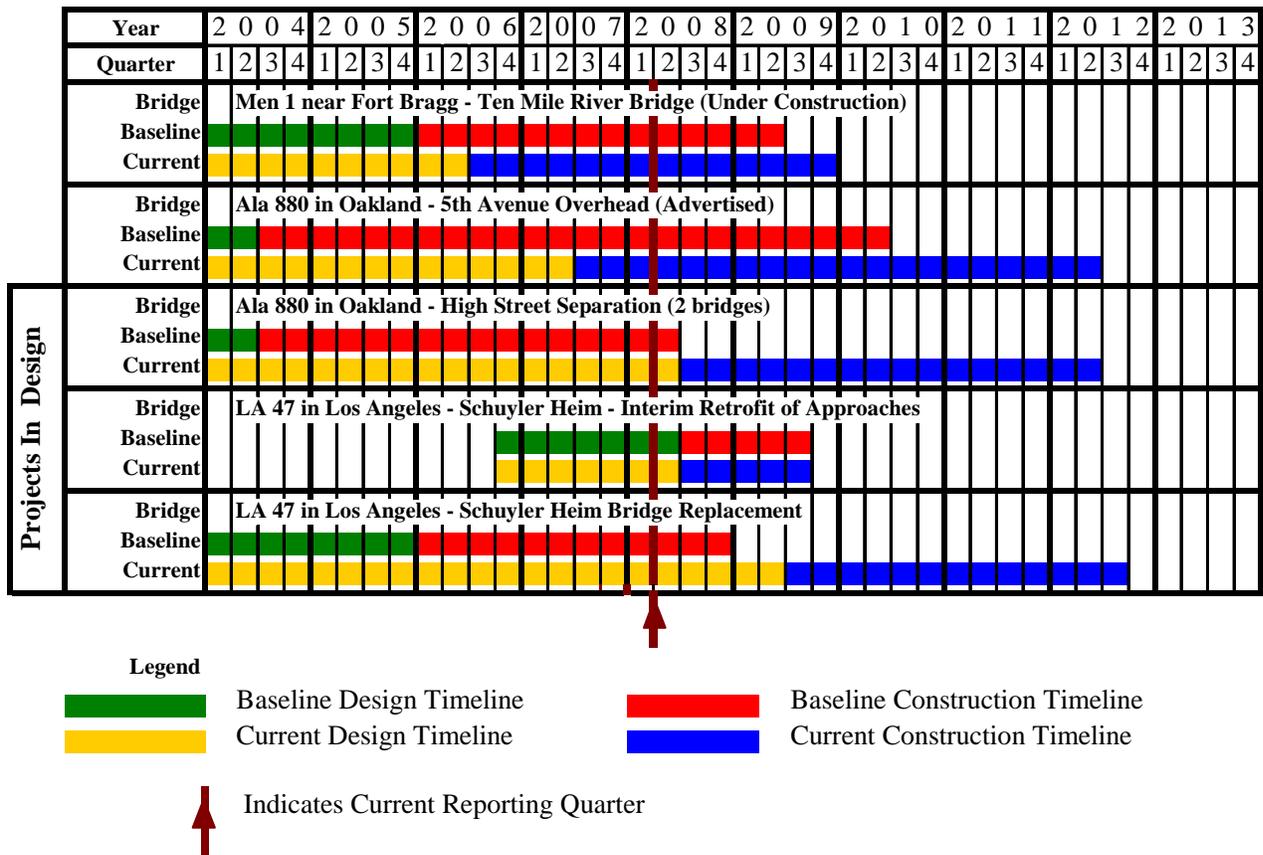
Bridges By Region	#	Percent of Total	\$ million	Percent of Total
North Coast	81	7	\$ 154	11
Bay Area	151	13	\$ 527	39
Central Valley	267	23	\$ 184	14
Southern California	656	57	\$ 485	36
<b>Total</b>	<b>1,155</b>	<b>100</b>	<b>\$ 1,350</b>	<b>100</b>

Bridges By District Office	#	Percent of Total	\$ million	Percent of Total
1 (Redding)	69	6	\$ 139	11
2 (Eureka)	12	1	\$ 15	1
3 (Marysville)	36	3	\$ 40	3
4 (Oakland)	151	13	\$ 527	39
5 (San Luis Obispo)	107	9	\$ 82	6
6 (Fresno)	77	7	\$ 18	1
7 (Los Angeles)	292	25	\$ 301	22
8 (San Bernardino)	131	11	\$ 86	6
9 (Bishop)	7	<1	\$ 2	<1
10 (Stockton)	40	4	\$ 42	3
11 (San Diego)	172	15	\$ 82	6
12 (Irvine)	61	6	\$ 16	1
<b>Total</b>	<b>1,155</b>	<b>100</b>	<b>\$ 1,350</b>	<b>100</b>

### Comparison of Current and Baseline Schedule

While the program is 99 percent complete, the few remaining bridges (1 percent) are taking substantially longer than originally planned because they are either total bridge replacement projects, or are follow-up contracts to earlier

contracts. The bridge replacement contracts face delivery challenges, including environmental protection, construction under heavy traffic conditions, and securing public and external agency input and acceptance for project approval.



Baseline date is planned schedule as of November 2001 (AB1171 approved)

## Projects Under Construction or Advertised

### Ten Mile River Bridge

In Mendocino County on Route 1 North of Fort Bragg and South of Westport.

**Retrofit Strategy:** Replace Bridge.

	Construction		Budget (millions)
	Begins	Ends	
Baseline Schedule	Late 05	Early 09	
Current Schedule	Late 06	Early 10	
<b>Funding:</b>	SHOPP	Seismic	Total
Construction	\$22.3	\$29.9	\$52.2
Right-of-Way	\$ 0.2	\$ 0.0	\$ 0.2
Support	\$10.0	\$10.0	\$20.0
Total	\$32.5	\$39.9	\$72.4

Number of Bridges to be Retrofitted – 1  
10-0161 Ten Mile



The construction contract is currently 52 percent complete.

### Fifth Avenue Overhead

In Alameda County on Interstate 880 in Oakland.

**Retrofit Strategy:** Replace Bridge.

	Construction		Budget (millions)
	Begins	Ends	
Baseline Schedule	Mid 04	Early 10	
Current Schedule	Mid 07	Mid 12	
<b>Funding:</b>	SHOPP	Seismic	Total
Construction	\$122.1	\$ 0.0	\$122.1
Right-of-Way	\$ 19.8	\$17.2	\$ 37.0
Mitigation	\$ 0.0	\$17.0	\$ 17.0
Support	\$ 15.3	\$ 7.0	\$ 22.3
Total	\$157.2	\$41.2	\$198.4

Number of Bridges to be Retrofitted – 1  
33 0027 Fifth Avenue Overhead



This project was advertised on November 26, 2007 and is scheduled for bids to be opened on May 14, 2008. The original bid opening date has been delayed three months to resolve an issue related to the temporary use of railroad tracks located in the middle of a city street.

When the railroad tracks were being prepared for temporary use, the City of Oakland took action to revoke the railroads permit allowing use of the street. High-level discussions are being held in an effort to resolve the dispute. If the dispute is not resolved, the project will likely be delayed a minimum of at least eighteen months to relocate the railroad tracks.

## Projects in Design

### High Street Separation

In Alameda County on Interstate 880 in Oakland.

**Retrofit Strategy:** Replace Bridges.

	Construction		Budget (millions)
	Begins	Ends	
Baseline Schedule	Mid 04	Mid 08	
Current Schedule	Mid 08	Mid 12	
<b>Funding:</b>	SHOPP	Seismic	Total
Construction	\$73.2	\$ 0.0	\$73.2
Right-of-Way	\$20.1	\$22.0	\$42.1
Support	\$32.4	\$15.5	\$47.9
Total	\$125.7	\$37.5	\$163.2

Number of Bridges to be Retrofitted – 2

33 0040L High Street Separation Overhead

33 0040R High Street Separation Overhead

Final contract plans are scheduled for late this year.

Substantial progress has been made in the acquisition of right of way parcels needed for the project. The biggest obstacle to starting construction is time needed to relocate utilities and realign a city street that are part of the conditions in acquiring right of way parcels.

The current schedule to deliver this project is the ready to list milestone in June 2008.



### Schuyler Heim Bridge Interim Retrofit

In Los Angeles County on Route 47 in Long Beach.

**Retrofit Strategy:** Reinforce bridge approaches.

	Construction		Budget (millions)
	Begins	Ends	
Baseline Schedule	Late 08	Late 09	
Current Schedule	Mid 08	Early 09	
<b>Funding:</b>			<b>Total</b>
Construction			\$6.0
Right-of-Way			\$0.3
Support			\$2.0
Total			\$8.3

Number of Bridges to be Retrofitted – 0 – Interim Measure

53 2618 Schuyler Heim Bridge

The Department has initiated an interim retrofit project to enhance safety of the approach slabs to the bridge. This will provide an increased level of safety on an interim basis while the bridge replacement project is implemented.

The project plans are nearly complete and are being finalized for advertisement this spring.

<b>Schuyler Heim Bridge Replacement</b>			
In Los Angeles County on Route 47 in Long Beach.			
<b>Retrofit Strategy:</b> Replace Bridge.			
	<b>Construction</b>		<b>Budget</b>
	<b>Begins</b>	<b>Ends</b>	<b>(millions)</b>
Baseline Schedule	Late 05	Late 08	
Current Schedule	Mid 10	Late 12	
<b>Funding:</b>	<b>SHOPP</b>	<b>Seismic</b>	<b>Total</b>
Construction	\$250.0	\$0.0	\$250.0
Right-of-Way	\$ 5.0	\$0.0	\$ 5.0
Support	\$ 25.1	\$4.0	\$ 29.1
Total	\$280.1	\$4.0	\$284.1
Number of Bridges to be Retrofitted – 1			
53 2618 Schuyler Heim Bridge			

Note: Current schedule tied to local improvements schedule.

The Alameda Corridor Transportation Authority (ACTA) is the lead agency in preparation of the environmental document and has been evaluating an elevated Truck Corridor Expressway to tie into a replacement bridge.

The draft environmental document for the combined project was recently completed by ACTA. The public hearing was held on September 25, 2007.

The environmental document is being finalized for project approval and should be completed this summer.

Because of the scope and magnitude of the combined project, there is a substantial amount of risk in delivering this project on the proposed schedule. Project risks are outlined below:

- Environmental issues (noise, air quality and traffic impacts).
- Property impacts to pier operations.
- Residents may oppose the project.
- Time to address construction issues and complications due to maintaining and reconstructing, as needed, numerous utilities, railroad operations and pier and port operations.
- Hazardous waste studies and remedial action.

The begin construction date has been revised to incorporate the planned date in the TCIF application for the elevated expressway project which will be combined with this project for construction.



## Seismic Retrofit Program Budget, Expenditures and Current Estimates (Phase 2 Funds Only)

Bridges	Projects	Baseline Budget*	Current Budget*	Expenditures To Date*
<b>1,150</b>	<b>Completed Projects</b>			
	Capital Outlay Support		\$ 396.2	\$ 391.2
	Capital Outlay	\$ 840.0	\$ 808.9	\$ 790.6
	Total		\$ 1,205.1	\$ 1,181.8
	<b>Projects Being Advertised or In Construction</b>			
<b>1</b>	<b>5th Avenue Overhead</b>			
	Capital Outlay Support		\$ 7.0	\$ 6.0
	Capital Outlay (R/W Only)	\$ 0.0	\$ 34.2	\$ 16.9
	Total		\$ 41.2	\$ 22.9
<b>1</b>	<b>Ten Mile River Bridge</b>			
	Capital Outlay Support		\$ 10.0	\$ 5.5
	Capital Outlay	\$ 25.0	\$ 29.9	\$ 14.2
	Total		\$ 39.9	\$ 19.7
	<b>Projects in Design</b>			
<b>2</b>	<b>High Street Separations</b>			
	Capital Outlay Support		\$ 15.5	\$ 15.5
	Capital Outlay (R/W Only)	\$ 0.0	\$ 22.0	\$ 9.6
	Total		\$ 37.5	\$ 25.1
<b>Interim</b>	<b>Schuyler Heim Interim Retrofit Approaches</b>			
	Capital Outlay Support		\$ 2.0	\$ 0.1
	Capital Outlay	\$ 0.0	\$ 6.3	\$ 0.0
	Total		\$ 8.3	\$ 0.1
<b>1</b>	<b>Schuyler Heim Bridge replacement</b>			
	Capital Outlay Support		\$ 4.0	\$ 4.0
	Capital Outlay	\$ 66.0	\$ 0.0	\$ 0.0
	Total		\$ 4.0	\$ 4.0
<b>1,155</b>	<b>Program Totals</b>			
	Capital Outlay Support	\$ 419.0	\$ 434.7	\$ 422.3
	Capital Outlay	\$ 931.0	\$ 901.3	\$ 831.3
	Total	\$1,350.0	\$1,336.0	\$1,253.6

\* Note: All costs shown are in millions and include only the seismic retrofit program's portions of costs and expenditures.

# Local Bridge Seismic Retrofit Program

## Progress Report

The Local Bridge Seismic Retrofit Program (LBSRP) is currently 57 percent complete. To date, 709 local bridges, out of a total of 1,235 planned bridges, have been retrofitted under the LBSRP. Currently, there are 66 bridges under construction, 333 bridges under design, and 127 bridges in a pre-strategy phase.

This program was initially mandated by emergency legislation (SB 36X) after the October 17, 1989 Loma Prieta earthquake.

## Milestones Achieved This Quarter

The status as of March 31, 2008 of local bridges by phase is as follows:

	2003	2004	2005*	2006	2007
<b>Complete</b>	559	589	692	699	709
<b>Construction</b>	121	128	46	45	66
<b>Design</b>	266	248	291	295	333
<b>Pre-Strategy</b>	288	269	206	196	127
<b>Total</b>	1,234	1,234	1,235	1,235	1,235

\*One bridge was added to the retrofit list in 2005.

The funding for the LBSRP comes from Federal, State, and local sources. Federal funds are provided through the Department's Local Assistance Program. State funds were provided through the annual budget process as a match for Federal funds until 2002. The recent passage of the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 will provide \$125 million of State matching funds to complete the LBSRP with bond funds. The funds

in this account will be available upon appropriation by the legislature, to provide 11.47 percent required match for the Federal Highway Bridge Program (HBP) funds, for eligible bridges listed in the LBSRP.

## Program Budget and Expenditures

The estimated budget for the LBSRP is \$1.630 billion. A total of \$675.9 million has been encumbered (spent) to date.

Funds (millions)	Spent	Plan	Total
<b>State</b>	\$72.2	\$0.0	\$72.2
<b>Local</b>	n/a	\$7.7	\$7.7
<b>Bond</b>	\$3.8	\$104.3	\$108.1
<b>Federal</b>	\$599.9	\$842.1	\$1,442.0
<b>Total</b>	\$675.9	\$954.1	\$1,630.0

The Department's Division of Local Assistance completed a one on one workshop with all of the local agencies that have bridges identified to receive bond funds. The workshops covered availability of the bond match, programming seismic retrofit projects in the Federal Transportation Improvement Program (FTIP), and the Governor's Executive Order establishing guidelines for spending bond funds and SB 88 requirements on reporting activities and progress toward implementation of projects. Information collected from local agencies will be used to establish baseline schedules and costs for all phases as required by SB 88 which will be posted on the Department's Bond Accountability website and updated every six months.

### Program Delivery by Agency Group

Bridges By Agency Group	Number Of Agencies	Pre Strategy	In Design	In Construction	Complete or No Retrofit	Total # Bridges	Percent Program
All Other Agencies	193	11	143	40	603	797	65%
Los Angeles Region (City and County)	2	1	54	26	105	186	15%
Department of Water Resources	1	0	24	0	1	25	2%
BART	1	115	112	0	0	227	18%
<b>Total</b>	197	127	333	66	709	1,235	100%

Based on the information presented above, the following points are noted:

- One agency, Bay Area Rapid Transit (BART) is responsible for 91 percent of projects in the pre-strategy phase. They are also responsible for 227 bridges (18 percent of the entire program) that are not completed. BART recently completed the strategy phase on 49 projects and has completed strategy reports for 72 of the 115 bridges remaining in the strategy phase.
- BART's Seismic Retrofit Program consists of: Segment 1 - from the Montgomery Station in San Francisco to the Berkeley Hills tunnels, and Outside Segment 1. Right of way phase has begun for segment 1. Construction is anticipated later this year. The environmental document for bridges outside Segment 1 was completed on August 3, 2007. First construction contract is anticipated in Fall 2008 for bridges outside Segment 1.
- Construction of nine Department of Water Resources (DWR) bridges is planned in 2008. The United States Bureau of Reclamation (USBR) owns the remaining 15 DWR bridges and recently completed the strategy phase on all 15 bridges with construction planned in the 2009/10 fiscal year.
- Excluding BART, DWR and Los Angeles region bridges, the other local agencies have completed 603 bridges out of a total of 797 bridges, which represents a 76 percent completion rate.
- Los Angeles area bridges are lagging slightly behind other agencies (excluding BART and DWR) for completion. A significant number are in design and should be in construction soon.