
Office of Inspector General

Audit Report

Report on the
**OCTOBER 2000 FINANCE PLAN FOR THE
CENTRAL ARTERY/TUNNEL PROJECT
BOSTON, MASSACHUSETTS**

Federal Highway Administration

Report Number: IN-2001-009
Date Issued: November 29, 2000





Memorandum

**U.S. Department of
Transportation**

Office of the Secretary
of Transportation

Office of Inspector General

Subject: ACTION: Report on the October 2000
Finance Plan for the Central Artery/Tunnel Project
Boston, Massachusetts
IN-2001-009

Date: November 29, 2000

Reply to
attn. of: JA-30

From: Kenneth M. Mead
Inspector General

To: Federal Highway Administrator

The Fiscal Year (FY) 2001 appropriation for the Department of Transportation directed the Office of Inspector General (OIG) to review the October 2000 Finance Plan for the Central Artery/Tunnel Project (CA/T) to determine whether it complies with the Federal Highway Administration's (FHWA) finance plan guidance.¹ We reviewed the October 1, 2000 CA/T Finance Plan to determine whether the plan complies with FHWA guidance, including examining whether (1) the estimated completion cost is reasonable, (2) identified funding is sufficient to meet the estimated cost, and (3) the current scheduled completion date is reasonable. (See Exhibit A for the details of our scope and methodology.)

Results in Brief

Our review of the proposed October 1, 2000 CA/T Finance Plan found it is consistent with FHWA guidance and includes reasonable estimates of the projected cost, funding, and schedule for the Project. Given the Central Artery's cost history, the proposed Plan represents a respectable effort to accurately estimate the future cost of this project, the largest infrastructure project in the

¹ Title III, Section 340 (c) of the House Conference Report on the 2001 Transportation Appropriations Report state "Of the funds apportioned to the Commonwealth of Massachusetts under each of subsections (b)(1), (b)(2), (b)(3), and (b)(4) of section 104 and section 105 of title 23, United States Code, the Secretary of Transportation shall withhold obligation of Federal funds and all project approvals for the Central Artery/Tunnel project until the Inspector General of the Department of Transportation finds the annual of the Central Artery/Tunnel project finance plan consistent with Federal Highway Administration financial plan guidance".

Nation. In addition, the Plan demonstrates that the guidance issued by FHWA on May 23, 2000, which guided the preparation of the Plan, provides adequate minimum requirements for financial reporting on this and other large projects. Specifically, we found:

- The CA/T Finance Plan conforms with FHWA guidance by including all essential data elements and following the Sample Financial Plan format.
- The CA/T estimated completion cost of \$14.075 billion (\$13.8 billion, plus a \$258 million contingency) is consistent with independent FHWA and Deloitte & Touche estimates and appears reasonable (see Table 1, page 3). However, in light of the CA/T Project's historical cost increases, the project still faces a risk of further cost exposure if the assumptions upon which the current estimate is predicated (i.e., an assumed market discount rate of 7 percent, a 2.35 percent escalation rate, and a potential change allowance rate of 24 percent) are not realized.
- The Project has committed funding to meet the estimated \$14.075 billion cost, and additional funding of at least \$350 million has been identified in case of further cost growth. The Federal participation level is capped at \$8.549 billion. Nonetheless, funding also faces some risk (such as interest rates on borrowing and investments) and, as with cost assumptions, could change.
- The current Project schedule appears reasonable and attainable. However, the Project faces a potential delay risk of up to 120 days on the Initial Interstate 90 (I-90) opening. This would be a "worst case scenario" for I-90 and the overall CA/T Project completion date of December 31, 2004 could be pushed to April 30, 2005. This delay could cost the CA/T Project up to \$75 million. The project is taking steps to mitigate this delay.
- The State has provided for a balanced statewide transportation program. The Additional Funding Act, signed by the Governor on May 17, 2000, provides at least \$400 million annually for statewide road and bridge programs exclusive of the CA/T Project. The October 2000 CA/T Project Finance Plan assumes a Federal apportionment of about \$524 million per fiscal year for the next 8 years. The CA/T Project would receive 71 percent of the apportionment in FY 2002, and the Statewide Road and Bridge Program would receive 29 percent. After FY 2002, the apportionment of \$524 million would be split 50/50 percent between

the CA/T Project and the Statewide Road and Bridge Program until the CA/T Project's Grant Anticipation Notes are repaid.

We recommend that FHWA closely monitor:

1. the factors underlying the cost assumptions (e.g., discount rate, inflation rate, contract change order rate);
2. the factors underlying the funding assumptions such as interest rates on borrowings and investments; and
3. the progress of work on Initial I-90.

Table 1
Cost and Funding Reported by
Central Artery / Ted Williams Tunnel

Project Location	Boston, Massachusetts
Project Length	7.5 miles total length / 161 lane miles
Completion Date	December 31, 2004

Expenditures from Inception Through June 30, 2000 (Billions):

Expenditures by Cost Category:		Expenditures by Funding Source:		
Construction	\$5.749	Federal Grants	\$5.566	61%
Design	\$0.858	GANs (Future Federal)	\$1.114	12%
Management Consultant	\$1.449	Mass. Turnpike Authority	\$1.289	14%
Right of Way	\$0.538	Mass. Port Authority	\$0.220	2%
Insurance Premium	<u>\$0.528</u>	State	<u>\$0.933</u>	11%
	\$9.122		\$9.122	100%

Estimates of Total Cost and Funding Through Project Completion in 2004 (Billions):

Estimate Date:	<u>October 1998</u>	<u>June 2000</u>	<u>October 2000</u>	
Cost Category:				
Construction	\$8.121	\$9.485	\$9.716	
Design	\$0.875	\$0.969	\$0.996	
Management Consultant	\$1.589	\$1.888	\$1.962	
Right of Way	\$0.506	\$0.595	\$0.572	
Insurance Premium	\$0.575	\$0.575	\$0.572	
Contingency			\$0.258	
Total Project Cost	\$11.667	\$13.512	\$14.075	
Funding Source:				
Federal	\$8.549	\$8.549	\$8.549	60.7%
Mass. Turnpike Authority	\$1.355	\$1.408	\$1.408	10.0%
Mass. Port Authority	\$0.300	\$0.300	\$0.300	2.1%
State	\$1.463	\$1.463	\$1.465	10.4%
Allston Landing Sale	\$0.000	\$0.000	\$0.185	1.3%
Infrastructure Fund	<u>\$0.000</u>	<u>\$1.793</u>	<u>\$2.168</u>	15.4%
Total Project Funding	\$11.667	\$13.512	\$14.075	100%

Sources:

Expenditures from Inception through June 30, 2000:

Cost Category data: October 2000 Finance Plan, page 3

Funding Source data: October 2000 Finance Plan, page 23

Estimates of Total Cost and Funding through Project Completion:

Cost Category data: "October 1998" - June 2000 Finance Plan, page 21; "June 2000" and "October 2000" - October 2000 Finance Plan, page 3

Funding Source data: "October 1998" - June 2000 Finance Plan, page 38; "June 2000" - June 2000 Finance Plan, page 51; "October 2000" - October 2000 Finance Plan, page 36

Background

The 1998 Transportation Equity Act for the 21st Century (TEA-21) requires finance plans for all projects with costs exceeding \$1 billion. Finance Plans are essential tools for identifying project costs and funding sources. The CA/T Project's October 1998 Finance Plan identified total project costs of \$11.7 billion. The CA/T Project submitted its October 1999 update to FHWA on January 7, 2000, and FHWA approved the Plan on February 1, 2000. In its acceptance letter, FHWA noted that Project staff had identified potential cost exposure and asked for additional information by April 15, 2000. However, later that same day, the Massachusetts Turnpike Authority (MTA) unexpectedly announced that CA/T Project costs would increase by an additional \$1.4 billion which was not mentioned in the 1999 Plan.² Consequently, MTA prepared a March 15, 2000 Finance Plan to reflect that increase.

On May 8, 2000, FHWA rejected the March 15, 2000 Plan because a FHWA review revealed that total Project costs would likely exceed even the \$1.4 billion increase by \$300 million to \$480 million. FHWA directed the MTA to update the finance plan to reflect the new estimate and to identify new funding resources to cover the increase. FHWA emphasized the need for the Massachusetts Legislature to pass legislation to make funding resources available to cover the cost of the CA/T Project, including the cost increase and an adequate, budgeted contingency. FHWA also said that Massachusetts would have to enact the new funding legislation before the FHWA would approve the Project's revised finance plan.

On May 17, 2000, The Commonwealth of Massachusetts' legislature provided funding for additional cash requirements of \$1.8 billion and approximately \$130 million in contingencies. On June 16, 2000, the Project submitted another updated Finance Plan reflecting the new funding sources. FHWA declined to act on that plan, but on August 8, 2000 directed the Project to submit its October 2000 plan in conformance with FHWA's new finance plan guidelines issued May 23, 2000.

On June 22, 2000, FHWA entered a Partnership Agreement with MTA and others that, among other things, capped Federal funding at \$8.549 billion. The Federal funding cap was also specified in the House Conference Report on the 2001 Transportation Appropriations. As a result, the MTA and its state and local partners are responsible for all remaining costs above the Federal cap amount.

² The OIG report, Current Cost and Funding of the Central Artery/Ted Williams Tunnel Project Report Number: TR-2000-050 Date Issued: February 10, 2000 reported an expected cost increase of \$942 million over what was reported in the October 1999 CA/T finance plan.

Findings

The CA/T Finance Plan Conforms with FHWA Guidance

On May 23, 2000 FHWA issued revised guidance for the development of initial and annual finance plans for all federally funded transportation Mega Projects (e.g., those projects with an estimated cost of \$1 billion or more). FHWA and CA/T Project agreed that the CA/T Project Financial Plan would conform to the guidance beginning with the October 2000 Plan. The October 2000 CA/T Finance Plan conforms with FHWA guidance by including all essential data elements and following the Sample Financial Plan format. The Plan also incorporates all of the recommendations pertaining to financial plans made by the OIG in its February 10, 2000 report TR-2000-050 Current Cost and Funding of the Central Artery/Ted Williams Tunnel Project.

CA/T Project Cost Forecasts Are Reasonable but Could Change

We found that MTA's estimates of CA/T Project costs in the October 2000 Finance Plan are reasonable because they were developed in compliance with FHWA guidance and are consistent with independent estimates developed by Deloitte & Touche and the FHWA. In addition, MTA's key cost estimating assumptions are supportable and validated by current industry indices. We do have several concerns regarding the potential impact of price escalation (inflation) and schedule delays on project costs, especially in light of the CA/T Project's historical cost increases.

Cost Estimates Conform with FHWA Guidance. MTA's October 2000 Finance Plan meets the basic requirements of FHWA Financial Plan Guidance and the requirements of other specific agreements for the CA/T October 2000 Finance Plan. The other requirements included (1) using the June 16, 2000 Finance Plan Update as the base cost and schedule estimate to which the October 2000 Plan and all future Finance Plans were to be compared, (2) performing a total project forecast of costs in conjunction with the annual finance plan, (3) providing an accurate and complete best estimate of completion costs, and (4) submitting an overall Budget vs. Potential Forecast Variance Report.

MTA followed the May 23, 2000 FHWA guidance. On September 28, 2000, the Secretary of The Commonwealth of Massachusetts, certified that, "The cost data in the Finance Plan [October 2000] provided an accurate accounting of costs incurred to date, and included a realistic estimate of future costs based on engineers estimates and expected cost escalation factors."

MTA's October 1, 2000 Finance Plan estimates total Project costs of \$14.075 billion, which includes a \$258 million contingency fund. As shown in Table 2, the \$14.075 billion represents a net increase of \$433 million over the June 2000 base estimate.

Table 2 Project Costs (in Millions)			
Budget Category	June 2000 Plan Estimate	October 2000 Plan Estimate	October 2000 Plan Net Increase
Construction	\$8,917	\$9,120	\$203
Force Account	568	596	28
Right of Way	595	572	-23
Design	969	996	27
Project Management	1,888	1,962	73
Insurance Premiums	575	572	-3
Subtotal*	\$13,512	\$13,817	\$305
Contingency	130	258	128
Total*	\$13,642	\$14,075	\$433

* Numbers may not add due to rounding.

Source: Central Artery/Tunnel Project Finance Plan October 1, 2000

The \$433 million reflects projected changes in each of the major budget elements and potential budget risks as follows (numbers may not add due to rounding):

- \$132 million on I-90 and I-93 contracts for a budgeted 6 month extension (including additional administrative costs), miscellaneous scope refinements, and an allowance for potential costs from differing site conditions.³
- \$71 million on 22 unawarded contracts for (1) miscellaneous cost refinements and scope items identified since the June 16, 2000 Finance Plan, (2) an allowance for increased cost due to potential changes prior to contract bid openings, and (3) a reassessment of the change order allowance for unawarded contracts.
- \$28 million for force accounts agreements for utilities work.

³ The CA/T Project engineers recognized that the milestones for the June 2000 baseline schedule would not be met and included 4 months of delay in the current schedule for I-90 and I-93. In addition, 2 months more of possible delay was also included in the cost estimate.

- \$73 million for project management⁴ for (1) the one-year extension of management staffing through 2005 to accommodate administrative closeout of the project, (2) increased staffing levels through 2004, and (3) miscellaneous pricing rate changes.
- \$128 million in additional budgeted contingency funds.

Cost Estimates Consistent with Independent Cost Estimates. MTA's cost estimates are generally consistent with independent cost estimates developed by Deloitte & Touche and the FHWA. The Executive Office for Administration and Finance for The Commonwealth of Massachusetts hired the auditing and consulting firm of Deloitte & Touche to conduct an independent assessment of the CA/T budget and schedule through completion of construction. Among other things, the firm was asked to validate the CA/T Project cost estimates and schedule projections that the project had provided in its proposed Finance Plan update dated June 16, 2000.

On August 4, 2000, Deloitte & Touche issued an independent assessment of the potential budget risks and resulting financial exposures using the same budget categories as those used by the MTA and FHWA. The assessment was based on interviews, a review of Project records, and visits to the Project office.

The report identified a need for further budget increases over the June 2000 Finance Plan Update and established a "reasonable budget target" of \$2.14 billion in additional funding. It also explained the need for up to \$280 million in contingency funds for a total of \$2.42 billion. This is consistent with MTA's CA/T Project October 2000 budget estimate, which called for an increase of \$2.4 billion over its October 1998 budget estimate. The CA/T Project budget increases from October 1998 to October 2000 are compared to Deloitte & Touche's estimates of reasonable budget and potential exposure amounts in Table 3.

⁴ Project management responsibilities include conceptual and preliminary design services, design management services for final design, project controls, construction management, and overall project management by both the Management Consultant and the Turnpike Authority.

Table 3 Comparison of Project Cost (In Millions)				
Budget Category	CA/T Project Budget Increases		Total Increase	
	October 1998 to June 2000	June 2000 to October 2000	October 1998 to October 2000	Deloitte & Touche Reasonable Budget Target¹
Awarded Contracts	\$728	\$132	\$860	\$910
I-90 Risk ²				32
I-93 Risk ²				75
Unawarded Contracts	529	71	600	531
Force Account	107	28	135	107
Right of Way	88	-23	65	67
Design	94	27	121	100
Project Management	299	73	372	318
Total	\$1,845	\$305³	\$2,150	\$2,140
Contingency	130	128	258	280
Grand Total	\$1,975	\$433	\$2,408	\$2,420

* Variations due to rounding.

¹ The amount CA/T Project managers should expect and plan for, while preparing for possible negative contingencies which would increase exposure.

² I-90 and I-93 risk includes contractor extended overhead costs, CA/T overhead costs for the field project management staff, and an allowance for additional schedule initiatives that may be required to avoid further Project delay.

³ This amount includes \$3 million reduction for insurance premiums.

Source: MTA's June 16, 2000, Finance Plan Update; the Central Artery Project Assessment by Deloitte & Touche, August 3, 2000, MTA's October 1, 2000 Finance Plan.

MTA's Cost Estimate Depends on Three Critical Budget Assumptions

MTA's October 2000 cost estimates are based on three critical budget assumptions—an assumed market discount rate, low escalation rate, and high potential change allowance rate. These assumptions could significantly influence overall Project costs and need to be closely monitored over the remaining life of the Project.

Assumed Market Discount. The October 2000 Finance Plan assumes that aggressive bidding on 22 unawarded contracts will result in bids that are 7 percent below original contract estimates, resulting in a competitive market discount rate of 7 percent. The 7 percent rate represents a reduction from the Project's previous

13 percent rate, which was set in 1994. MTA reduced its market discount rate to 7 percent based on actual bidding results since 1999, a robust Boston economy, low unemployment rates, and aggressive past bidding on unawarded contracts.

However, the Deloitte & Touche report states that there is a risk that MTA's 7 percent market discount rate will not materialize because it is based on broad generalizations and assumes that MTA's current contract estimates are correct. Deloitte & Touche analyzed actual bid results over the last 5 years for 16 large contracts (more than \$100 million) and 29 small contracts (less than \$100 million). The auditing firm found an average market discount rate of 5 percent rather than 7 percent. They also found that bids awarded for some small contracts ranged up to 52 percent higher than MTA estimates, resulting in a substantial market premium rather than a market discount. Deloitte & Touche recommended that CA/T personnel consider the possibility that some contracts would experience a market premium and include an assumed 0 percent market discount rate in estimating potential exposures (contingencies).

Assumed Lower Escalation Rate. MTA's Project budget assumes an escalation (inflation) rate for unawarded contracts of 2.35 percent annually. In prior years, MTA used a 3.35 percent rate. The escalation rate is the rate of change in the price of construction work over time. MTA reported that its revised 2.35 percent rate was based on the results of an escalation analysis for the 6 year period ending December 31, 1999. In the October 2000 Finance Plan, MTA said its assumed 2.35 percent escalation rate compared favorably with other construction cost indices such as the 3 year Annual Percentage Rate for the combined Engineering News Record (ENR) Building Cost Index and Construction Cost Index for the Boston area of 2.44 percent.

However, the Deloitte & Touche assessment stated that 2.35 percent is a relatively low rate from an historical perspective Deloitte & Touche cited three factors currently impacting construction costs: (1) recent increases in key interest rates that raise the cost of capital for contractors, (2) craft labor shortages in the New England market that raise labor costs, and (3) drastic increases in oil prices that affect many construction costs. Deloitte & Touche supported its assessment by citing several prominent construction cost indices that, in June 2000, reported annual rate increases of between 3.5 percent and 5 percent, including the ENR at 3.5 percent. Consequently, Deloitte & Touche recommended an escalation rate of 3.35 percent and a potential additional exposure range of between 1 percent to 4.35 percent.

Assumed Higher Potential Change Allowance (PCA) Rate. MTA's October 2000 Finance Plan budget assumes a 17 percent PCA rate for unawarded

contracts and an overall blended PCA rate of 24 percent above the fixed-bid price on all contracts.⁵ PCA rates represent an estimated cost value that has been allowed above the fixed-bid price for differing site conditions, schedule maintenance decisions, and design evolution changes. In the past, Project staff assumed a 7 percent PCA rate for contracts awarded after 1994. In December 1999, Project staff raised the PCA rate to 10 percent. Trend studies conducted by FHWA show a PCA rate that ranges from 14 percent to 17 percent. This is consistent with Deloitte & Touche's conclusion that, based on an assessment of currently available information, an assumed PCA rate of 17 percent on unawarded contracts was reasonable. The Deloitte & Touche report cautioned that this is clearly a high-risk area that must be closely monitored.

Potential Impact of Price Escalation (Inflation) and Schedule Pressures on Cost Estimates. Risks remain to the CA/T Project's costs estimates because of recent increases in the annual inflation rate and because much of the inflationary pressure in today's market is not reflected in traditional cost indices. While MTA's assumed lower escalation rate was supported by the ENR cost indices for 1999 (2.6 percent average) and even lower rates in the second quarter of 2000, ENR's Third Quarterly Cost Report shows that inflation is gaining in critical areas such as energy and the labor markets. In the third quarter of this year, oil prices hit a 10-year high and drove increases in the costs of petroleum-based products such as diesel and asphalt. Analyst at McGraw Hill's Data Resources, Incorporated, forecast that crude oil prices will increase another 7 percent next year (2001).

In addition, a significant shortage of craft labor in the Boston area could further increase the cost impact of schedule delays. During a labor shortage, contractors may meet increased schedule demands through overtime, rather than through hiring. Studies have shown that excessive overtime can lead to lower productivity, which can increase construction costs. Cost pressures such as these are not reflected in traditional indices and, as a result, the indices forecasted escalation rates of 2 to 4 percent might understate inflation.

MTA's Cost Estimates Are Reasonable. Schedule changes and higher than anticipated cost escalation could impact CA/T Project cost in the future. However, MTA's estimates include a large budgeted contingency and a potential additional contingency fund that should cover the risks for the CA/T Project as currently described. MTA has also included consideration of Deloitte & Touche's recommendations in its targeted and potential exposure (contingency) estimates. Overall, MTA's cost estimates are consistent with those that we developed by the FHWA and Deloitte & Touche. Although costs will need to be closely scrutinized

⁵ A blended rate is a combination of PCA rates for contracts that are completed or substantially completed, active, and unawarded.

during the coming year, MTA's cost estimates seem reasonable and are supported by current industry indices.

CA/T Funding Is Adequate to Meet Forecasted Costs

The October 1, 2000 Finance Plan identifies funding of \$14.075 billion, including \$258 million in contingency funding. The funding sources are identified in Table 4.

Table 4 CA/T Project Funding (In Millions)			
Source	October 1998	October 2000	Difference
Federal	\$7,049	\$7,049	\$0
Grant Anticipation Notes (GANs) ¹	1,500	1,500	0
Massachusetts Turnpike Authority (MTA)	1,355	1,408	53
Massachusetts Port Authority	300	300	0
State Bonds/Notes	1,463	1,465	2
Allston Landing Sale ²	0	185	185
Transportation Infrastructure Fund ³	0	2,168	2,168
Total	\$11,667	\$14,075	\$2,408

¹ Considered a state obligation until associated Advance Construction is converted to Federal funds

² Proceeds of \$152 million from the disposition have been deposited into a reserve within the Metropolitan Highway System and expected to earn an additional \$33 million.

³ Established by the Additional Funding Act to meet the estimated additional costs associated with the CA/T project and for costs of the statewide road and bridge program.

Source: Central Artery/Tunnel Project Finance Plans June 16, 2000 and October 1, 2000.

We examined the additional funding identified from each source to determine whether it was secure.

- **MTA.** MTA will provide an additional contribution of \$53 million to the CA/T Project to pay for construction of a garage (\$38 million) and a portion of Surface Restoration (\$15 million). The \$53 million is expected to be received in FY 2002 (\$38 million) and in FY 2005 (\$15 million).
- **Allston Landing Sale.** The Allston Landing Sale is expected to provide \$185 million. Proceeds of \$152 million from the Allston Landing sale have been deposited into a reserve within the Metropolitan Highway System (MHS) to be used (Project assumes it will receive \$33 million of the total projected interest earnings of about \$40 million) for the CA/T Project and other MHS contingencies. The \$185 million funding is expected to be available in FY 2004 (\$18.5 million) and in FY 2005 (\$166.4 million).

- **Transportation Infrastructure Fund.** The Transportation Infrastructure Fund is expected to provide \$2.168 billion. The Fund will include \$1.615 billion that is mandated by the Additional Funding Act of 2000 as follows:⁶
 - \$1.35 billion from bonds funded by license and registration fees,
 - \$200 million from the MTA, and
 - \$65 million from Massport.

The Fund is expected to produce the remaining \$1.053 billion from the following funding sources:

- \$230.7 million from “excess” registry and license fees not needed to pay the debt service on the bonds,
- \$663.7 million from debt service savings produced by using \$650 million from the State’s budgetary surpluses to defease (prepay) certain Commonwealth debt, and
- \$159.0 million from investment earnings on balances in the Fund until needed for either the project or the Statewide program.

The total value of the Transportation Infrastructure Fund is projected to be \$2.668 billion, of which the Statewide Program will receive \$500 million over 5 years, leaving \$2.168 billion for the Project.

The CA/T Project Has Identified Additional Contingency Funding Sources

The Finance Plan, dated October 1, 2000, identified four major sources of contingency funds that could be utilized if there is further growth in the current CA/T Project cost estimate. These contingency funding sources of at least \$350 million are in addition to the already budgeted \$258 million in contingency included in the \$14.075 billion budget. These potential sources include the following revenue:

- \$50 million in insurance trust withdrawals,

⁶ An Act providing additional funding for the CA/T Project and the statewide road and bridge program. The Act was passed by the Massachusetts legislature and approved by the Governor May 17, 2000.

- \$33 million from third parties for South Boston surface road construction,
- \$141 million to \$308 million from disposition of real estate air rights and other right of way assets, and
- \$150 million from sale of additional Metropolitan Highway System Bonds.

Seventy One Percent of the Anticipated Funding Obligated as of June 2000

As of June 30, 2000, \$10.008 billion in Project costs had been obligated, leaving a cost-to-go of \$4.068 billion. Table 5 presents the Projects obligations and costs – to-go by funding source.

Table 5			
CA/T Project Obligations by Funding Sources			
(In Millions)			
Funding Source	Obligations as of 6/30/00	Cost-to-go	Total Anticipated Funding
Federal	\$5,950	\$1,099	\$7,049
Grant Anticipation Notes (GANs)	1,284	217	1,500
Massachusetts Port Authority	1,354	54	1,408
Massachusetts Port Authority	289	11	300
State Bonds/Notes	1,131	334	1,465
Transportation Infrastructure Fund	0	2,168	2,168
Allston Landing Sale	0	185	185
Total	\$10,008	\$4,068	\$14,075

Source: Central Artery/Tunnel Project Finance Plan October 1, 2000.

Risks to the Identified Funding Remain

The Finance Plan recognizes that management of the Transportation Infrastructure Fund will entail both borrowing and investment decisions, which depending on the options chosen will produce different amounts for expenditure. In particular:

- the structure and timing of bond issuance will determine interest expenses and thus the amount of excess registry and license fees deposited to the Fund;

- the selection of Commonwealth bonds to be defeased (retired) will determine the “savings” deposited to the Transportation Infrastructure Fund and control the ability to reinvest those balances; and
- the types and structures of investments will determine the level of earnings retained in the Transportation Infrastructure Fund.

The Finance Plan also recognizes that certain variables, such as interest rates on borrowings and investments, are subject to market forces, and the pattern of spending from the Transportation Infrastructure Fund will also affect its ultimate capacity. For example, if Federal funds are delayed or if the proceeds from the Allston Landing are not left in the account for the assumed period of time, principal balances in the Fund could be spent faster resulting in less investment earnings. Deloitte & Touche did not provide an opinion on the funding.

CA/T Project Schedule Is Reasonable but a Delay Is Possible

The current Project schedule appears reasonable and attainable. The current completion date milestone for the CA/T project is December 31, 2004. The CA/T Project engineers recognized that the milestones for the June 2000 baseline schedule would not be met. As a result, the current schedule includes 4 months of delays for I-90 and I-93 (see Table 6).

Table 6 Project Schedule As of October 1, 2000			
Segment	June 2000 Baseline Milestones	Current Milestones	Risk of Additional Future Delay
Ted Williams Tunnel	Completed December 15, 1995	Completed December 15, 1995	
Initial Leverett Circle Connector	Completed October 7, 1999	Completed October 7, 1999	
Initial Interstate 90	Expected completion December 31, 2001	Expected completion May 1, 2002	4 months
Interstate 93 Northbound	Expected completion July 1, 2002	Expected completion November 1, 2002	4 months
Initial Interstate 93 Southbound	Expected completion July 1, 2003	Expected completion November 1, 2003	4 months
Interstate 90 Substantial Completion	Expected completion July 1, 2003	Expected completion July 1, 2003	
Full Interstate 93 Southbound	Expected completion November 15, 2004	Expected completion November 15, 2004	
Project Completion	Expected completion December 31, 2004	Expected completion December 31, 2004	4 months

Source: Project Management Monthly Reports for July 31, 2000 and August 31, 2000.

Risk of Further Delay. As shown in Table 6, there is a risk of an *additional* 4 months delay to the current target for the Initial I-90 opening. The CA/T Project engineers are working to mitigate this delay, but the risk remains because the mitigation strategies are complex, there is a labor shortage, and the renegotiated schedules for critical contracts have not been completed. If the delay materializes, it could affect the opening of both the I-93 and the CA/T Project target completion of December 31, 2004, as described below.

The current schedule calls for I-90 to be completed by May 1, 2002. This date is the “best case scenario” in which all the critical path activities are executed as planned. Under the “worst case scenario” there are two areas along the Initial I-90 section of CA/T that could pose a risk of an additional 120 days of delay (60 days each) pushing the Initial I-90 opening to September 9, 2002. This would add up to \$22 million to the CA/T Project costs. The areas at risk are the Immersed Tube Tunnels at Fort Point Channel and the Cut & Cover Tunnels East of Fort Point Channel.

If the “worst case scenario” occurs for Initial I-90 then I-93 Northbound and I-93 Southbound openings could also experience additional delay. That is because the city of Boston requires that at least one route from Boston to Logan Airport remain open to traffic at all times and there are only two ways to go to Logan Airport from Boston: I-93 through the Sumner or Callahan Tunnels or I-90 through the Ted Williams Tunnel. (See map in Exhibit B). If the delays occur, it

could push the I-93 Northbound opening to February 28, 2003 and the I-93 Southbound opening to February 28, 2004. The cost of the I-93 delay could reach \$53 million. Finally, the overall CA/T Project completion date of December 31, 2004 could be pushed to April 30, 2005 if the “worst case scenarios” for I-90 and I-93 occur.

Impact of CA/T Project on Other Statewide Programs

Massachusetts has committed to maintain a Statewide Road and Bridge Program. Appendix F of the October 2000 Finance Plan contains a Memorandum of Understanding between the Secretary of the Executive Office of Transportation and Construction (EOTC), the Commissioner of the Massachusetts Highway Department (MHD), and representatives of Massachusetts Metropolitan Planning Organizations that the MHD is committed to maintaining a Statewide Road and Bridge Program. The parties agreed that spending \$400 million on statewide programs annually, exclusive of the CA/T Project, would be sufficient for construction activities and specific transportation projects.

To meet that commitment:

- Massachusetts has passed the Additional Funding Act requiring the department of highways to develop and implement a comprehensive plan to ensure the statewide road and bridge program is adequately funded at a minimum amount of \$400 million in each fiscal year, for the years 2001 to 2005. Of that \$400 million, annual amounts of \$100 million must be provided from the Central Artery Statewide Road and Bridge Infrastructure Fund (Transportation Infrastructure Fund). The October 2000 CA/T Project Finance Plan assumes a Federal apportionment of about \$524 million per fiscal year for the next 8 years. The CA/T Project would receive 71 percent of the apportionment in FY 2002, and the Statewide Road and Bridge Program would receive 29 percent. After FY 2002, the apportionment of \$524 million would be split 50/50 percent between the CA/T Project and the Statewide Road and Bridge Program until the CA/T Project’s Grant Anticipation Notes are repaid.
- The Massachusetts Association of Regional Planning requires, through the CA/T Project Partnership Agreement, the EOTC and the MHD to reach agreement and respect the terms of a balanced statewide program. The agreement also requires that the Secretary of the EOTC and the Commissioner of the MHD to certify that each CA/T Project finance plan and update is consistent with the balanced statewide program. MHD provided the required certification in the Finance Plan at Appendix I.

Conclusion

Based on our review, we identified no significant deficiencies to report to FHWA that would prevent approving the proposed CA/T Project October 1, 2000 Finance Plan. Our review determined that the Central Artery/Tunnel Project Finance Plan: (1) complied with FHWA guidance; (2) estimated a reasonable cost for the CA/T Project; (3) identified funding sufficient to meet the estimated cost; and (4) proposed a reasonable implementation schedule.

Recommendations

We recommend that FHWA closely monitor:

1. the factors underlying the cost assumptions (e.g., discount rate, inflation rate, contract change order rate);
2. the factors underlying the funding assumptions such as interest rates on borrowings and investments; and
3. the progress of work on Initial I-90.

Management Comments and Actions Required.

We discussed the contents of this report with FHWA personnel and they concurred with our conclusions on November 22, 2000. In accordance with Department of Transportation's Order 8000.1C, we would appreciate receiving your written comments within 30 days. If you concur with our findings and recommendations, please indicate for each recommendation the specific action taken or planned and the target dates for completion. If you do not concur, please provide your rationale. Furthermore, you may provide alternative courses of action that you believe would resolve the issues.

We appreciate the courtesies and cooperation of FHWA and MTA representatives. If I can answer any questions or be of further assistance, please feel free to contact me at (202) 366-5630 or my Acting Deputy, Todd J. Zinser, at (202) 366-6767.

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OBJECTIVES, SCOPE AND METHODOLOGY

We conducted this review from October 2000 to November 2000. The review objective was to determine whether the CA/T October 1, 2000 Finance Plan complied with FHWA guidance. Specifically, we determined whether (1) the estimated completion cost was reasonable, (2) the identified funding was sufficient to meet the estimated cost, and (3) the current scheduled completion date was reasonable. This review was conducted at the FHWA Massachusetts Division Office in Cambridge, Massachusetts and the CA/T Project Offices in Boston, Massachusetts.

To determine if the Plan complied with May 23, 2000 FHWA guidance, we compared what the FHWA guidance required to be included in a finance plan to what CA/T Project had actually include in its October 1, 2000 plan. We also checked to see if there were significant differences in format or substance between the CA/T Finance Plan and the FHWA Sample Financial Plan.

We evaluated the October 2000 Finance Plan to determine whether the cost estimates were developed in compliance FHWA guidance (i.e. the costs were reasonable). We reviewed the cost estimates in the MTA's October 2000 Finance Plan Update and compared them with the results of the baseline costs in the June 2000 Finance Plan. We reviewed the independent assessment conducted by Deloitte & Touche to validate CA/T Project costs and schedule projections and the FHWA's September 27, 2000 estimate of CA/T Project costs. Furthermore, we evaluated the reasonableness of MTA's cost estimates based on the supportability of the key assumptions on which the estimates were based.

To evaluate the security of the funding, we interviewed officials at the CA/T Project. We reviewed legislation, Project agreements, and memorandums of understanding. We also reviewed the funding methodology contained in the CA/T October 1, 2000 Finance Plan.

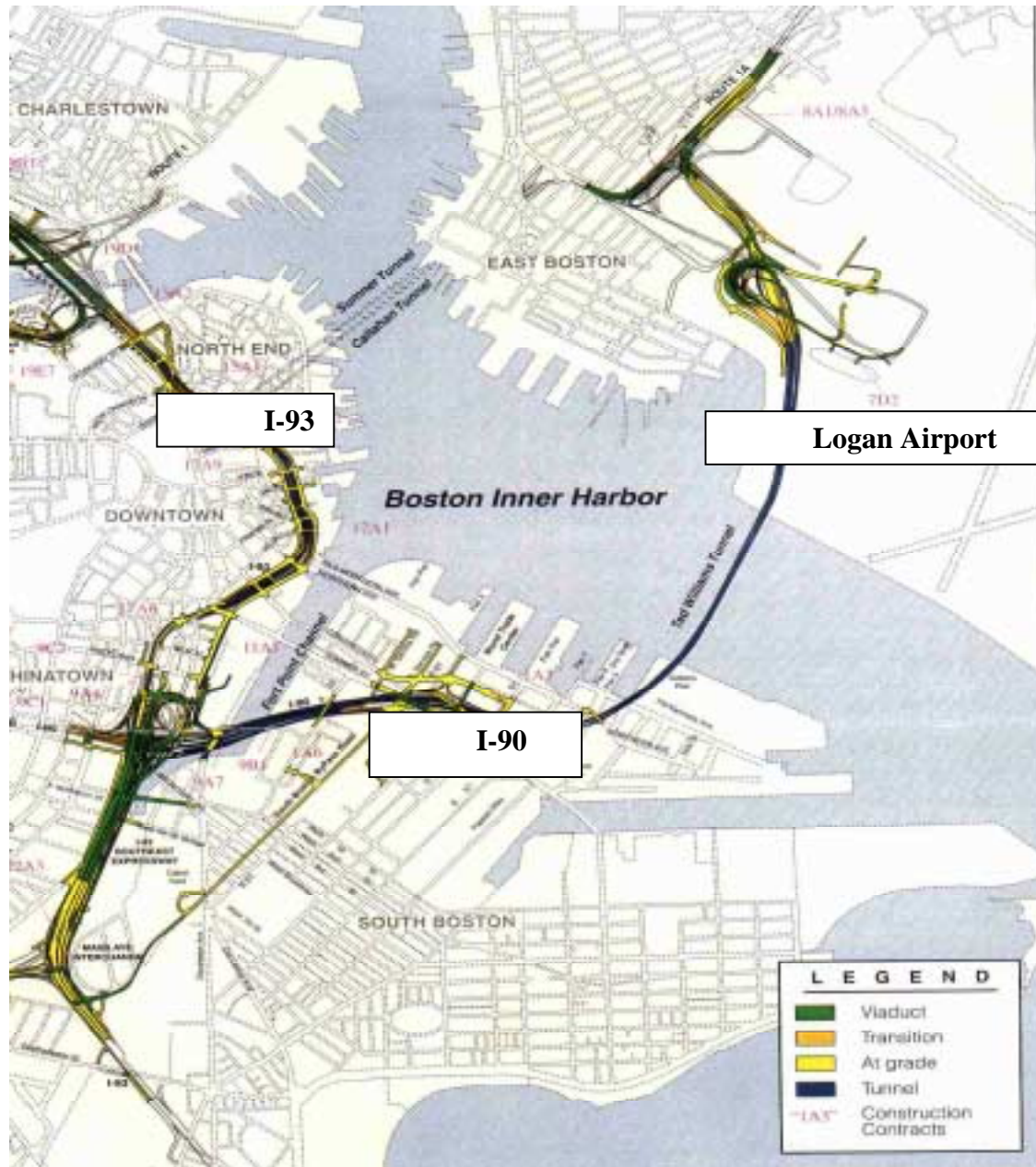
To determine the reasonableness of the current CA/T Project schedule, we reviewed the current implementation schedule found in the October 2000 CA/T Finance Plan, the Deloitte & Touche assessment of the CA/T Project schedule, and the Project Management Monthly Reports. We also talked to the CA/T project

managers' engineers. We then compared the implementation schedule found in the October 2000 Plan with the Deloitte & Touche assessment and what was told us by the project managers' engineers to reach a conclusion.

We did not verify the costs estimates but relied on the estimates provided us by the CA/T Project, FHWA, and Deloitte & Touche. We did verify that sufficient funding had been identified and committed to cover the estimated cost of the CA/T Project as it is described today.

Our review was conducted in accordance with Government Auditing Standards prescribed by the Comptroller General of the United States. However due to time constraints for performing the review, we did not send out a notification letter nor did we have an entrance conference.

CENTRAL ARTERY/TUNNEL PROJECT



Source: Massachusetts Turnpike Authority Central Artery/Tunnel Project

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