Baseline Review of the Woodrow Wilson Bridge Project

Federal Highway Administration

Report Number: TR-1999-133
Date Issued: September 27, 1999

Memorandum

U.S. Department of Transportation
Office of the Secretary of Transportation
Office of Inspector General

Subject: ACTION: Report on Baseline Review of Woodrow Wilson Bridge Project TR-1999-133

Date: September 27, 1999

From: Raymond J. DeCarli
Deputy Inspector General

Reply to Attn of: JA-30

To: Federal Highway Administrator

This report provides the results of our review of the Woodrow Wilson Bridge Project. Your September 22, 1999 comments were considered in preparing this final report. An executive summary of the report follows this memorandum.

In your comments on our draft report, you concurred with our recommendations. We consider your comments to be responsive to the recommendations. The recommendations are considered resolved, subject to the follow-up provisions of the Department of Transportation Order 8000.1C.

We noted your concern with our representation of the project's estimated cost of $2.1 billion and your position that the $1.9 billion estimate is reasonably accurate for this stage of project development. However, we maintain that the best available cost estimate at this time is the $2.1 billion estimate, as it contains updated information and estimates. We made several changes to our draft report based on the Federal Highway Administration's (FHWA) requests for clarifications and technical comments. However, we did not revise our recommendation to stipulate, as FHWA suggested, that the cap should be set at the $1.5 billion level. We maintain that Congress could determine that the cap should be set at either a higher or a lower level. We did amend the recommendation to add the clarification that the cap is not to restrict the states' use of their Federal-aid highway apportionments.

We conducted this review from November 1998 through July 1999. Our review covered all project costs incurred and estimated through July 1999, and all legal and environmental issues related to the project. The review was conducted at the

FHWA offices in Washington, DC, and Alexandria, VA. We conducted this review in accordance with Government Auditing Standards prescribed by the Comptroller General of the United States.

If you have questions, or require additional information, please contact me at x66767 or Patricia J. Thompson, Deputy Assistant Inspector General for Highways and Highway Safety, at x60687.

Attachment

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Baseline Review of the Woodrow Wilson Bridge Project

Federal Highway Administration

This report represents a baseline assessment of the Woodrow Wilson Bridge Project in the Washington (District of Columbia) Metropolitan Area. The purpose of our baseline reviews is to track the progress of highway projects having an estimated cost of $1 billion or more, which will enable us to perform timely audits of those projects experiencing cost, financing, or scheduling problems. The specific objective of this review of the Woodrow Wilson Bridge Project was to provide information on the current status, estimated costs, funding sources, and completion schedule, as well as to identify outstanding issues that may affect the project.

RESULTS OF REVIEW

Project Status

The Woodrow Wilson Bridge Project currently includes construction of 2, side-by-side drawbridges with 12 traffic lanes (6 in each direction); major improvements to 4 interchanges -- 2 in Maryland and 2 in Virginia; and related parkland work on each end of the new bridge spans (see area maps on pages ii and iii). The Federal Highway Administration's (FHWA) latest estimate indicates that one of the new bridge spans must be opened by 2004 to avoid the possibility of costly rehabilitation to the existing bridge. To meet the 2004 deadline, the project's current schedule calls for construction to begin by mid-October 2000. When the first bridge is completed, all vehicles will be rerouted to the new span, and the existing bridge will be demolished. The total project is scheduled to be completed in 2006.

The existing bridge was designed to carry 75,000 vehicles per day and has 6 general purpose traffic lanes, 3 in each direction. Although the sections of the Beltway that feed onto the bridge were widened from 2 to 4 lanes in each direction in the 1970s, structural limitations prevented widening of the bridge. Presently, 190,000 vehicles cross the bridge each day. Because of the traffic volume, the bridge currently rates an "F," or worst, level-of-service during peak periods (see Exhibit A on page 14). Furthermore, the Metropolitan Washington Council of

Governments[1] has projected the daily traffic volume will grow to 235,000 by the time the project is completed in 2006, and increase to 300,000 vehicles per day in 2020. FHWA officials expect the 12-lane bridge design to rate a D level-of-service during peak periods when the project is completed in 2006, and an E or F level-of-service during peak periods in 2020. FHWA projected that a 16- to 18-lane bridge would be necessary to rate a C level-of-service during peak periods in 2020. However, local public resistance made a structure of that magnitude unacceptable. In addition to creating congestion, the current condition also affects travel safety. The accident rate on the Woodrow Wilson Bridge is 153.5 accidents per 100 million vehicle miles of travel -- nearly double the accident rate on the Beltway in Maryland (87.8) and Virginia (75.0).

Figure 1

[1] The Metropolitan Washington Council of Governments is the metropolitan planning organization for the Washington metropolitan area, including DC and seven nearby counties in Maryland and Virginia.

Figure 2

Estimated Costs Not Finalized; Sufficient Funding Not Committed. Our review disclosed that the total estimated cost of the Woodrow Wilson Bridge Project has not been finalized and that sufficient funding to meet all identified costs has not been committed. The identified costs are those of the major components -- the replacement bridge spans and interchanges -- which are currently estimated at $1.9 billion. Since that estimate was prepared in 1995, the Office of Inspector General (OIG) calculates a $227 million net increase to the cost as a result of updated information, raising the estimated cost as of July 31, 1999, to $2.1 billion.

FIGURE 3 – COST UPDATES	
Updates Since the 1995 Estimates Were Prepared (also see Exhibit B on page 15)	**Estimated Cost** (in millions)
Change Orders	$ 99
Labor Premium for Over-Time Work on Critical Path	59
Adjustment for Poor/Wet Soil Conditions	48
Wetland and Reforestation Mitigation	27
Increased Dredge Disposal	26
Congestion Management Systems	25
Refurbishment of Existing Draw Span	4
Other Items	50
Decreases – Bridge Size and Inflation Factors	-111
Changes to Cost Since 1995	**$ 227 ***

* For details, see Exhibit B.

We note that FHWA and the project's partner agencies -- the Virginia Department of Transportation, the Maryland State Highway Administration, and the District of Columbia Department of Public Works -- stated that it is not appropriate to increase (or decrease) the original $1.9 billion estimate at this time because:

1) The original estimate contained sufficient flexibility (adjustment factors) to offset the $227 million net increase.
2) The preliminary design process, which will be completed in the fall of 1999, will provide opportunities to refine project design concepts and reduce costs. For example, FHWA expects to reduce the cost of the project by eliminating $100 million of aesthetic items for the bridge and for the Route 1 interchange that may not be needed.
3) Detailed design data will be available by December 1999, from which a more accurate cost estimate will be developed.

Although FHWA claimed that there was "sufficient flexibility" in the original estimate to offset the $227 million increase, we found no conclusive data that would allow us to quantify this offset. While we acknowledge that some costs may decrease based on the final design of the project, we also recognize that costs may increase.[2] For example, an additional ramp may be built on the Route 1 interchange; the scope of the project may increase to lengthen the distance to taper the lanes connecting Interstate 295 and the Beltway; and additional work is being planned for the southern connections on the Telegraph Road interchange. We realize that more accurate cost estimates will be developed by the end of this year; however, we maintain our position that the best available cost estimate at this time is $2.1 billion, as it contains the $227 million update to the original cost estimate.

To date, Federal funding of $149 million has been appropriated for the project and an additional $800 million in appropriations through fiscal year (FY) 2003 was authorized by the Transportation Equity Act for the 21st Century (TEA-21). In July 1999, legislation was introduced in the U. S. Senate and House of Representatives to authorize an additional $600 million for the project over 4 years, beginning in FY 2004. If this legislation passes, the total Federal funding for the project will be $1.5 billion. To ensure that there is no expectation that additional Federal funds will be provided if costs increase, we are recommending that FHWA request Congress to establish a statutory cap limiting Federal funding for the project to either the amount currently requested or some other amount established by Congress. Such a cap is not to prohibit Maryland, Virginia, or the District of

[2] All references in this report to the design, cost, and schedule of the project are based on the plans as of July 31, 1999. The project is in jeopardy of being pushed back 1 year or more, and the design may be changed, depending on the Federal Court decision on a June 1999 appeal. If the schedule is pushed back or if the design changes, the cost and schedule would be affected.

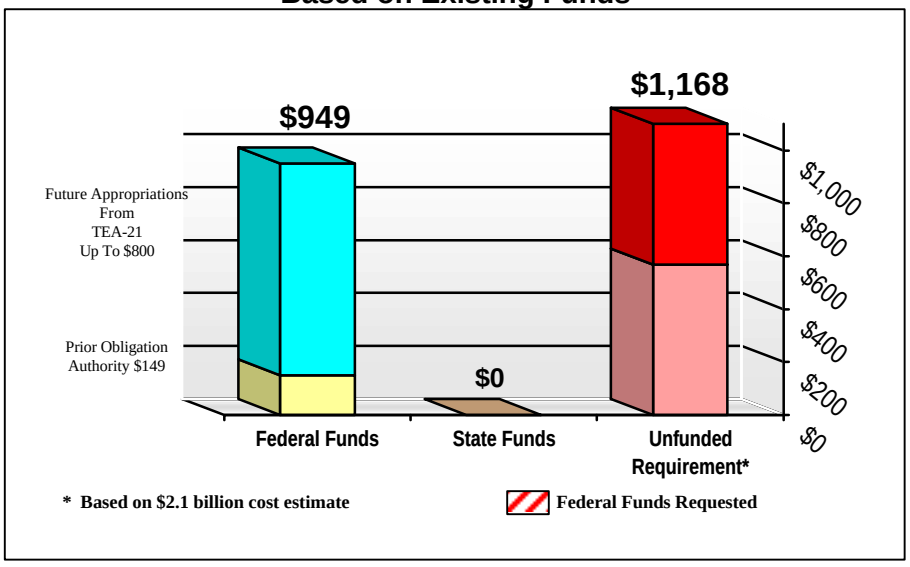
Columbia from applying their respective Federal-aid highway apportionments to the project.

The involved jurisdictions (Maryland, Virginia, and the District of Columbia) have not yet committed any state or local funds to the project. Officials from the Maryland and Virginia Departments of Transportation stated that they intend to provide reasonable funding amounts to the project, but that specific dollar amounts have not yet been identified or proposed. The District of Columbia, due to a limited budget, does not plan to provide any funds for the project at this time.

As a result of the funding status, there is a shortfall of as much as $1.2 billion in identified funding -- $2.1 billion in possible costs, less the $949 million in committed funding (Figure 4). If the additional $600 million is authorized by Congress, the shortfall would be reduced to about $568 million.

We found that the current Transportation Improvement Plan (TIP) for the Washington metropolitan area identifies the Woodrow Wilson Bridge Project as toll-financed. However, the highway agencies and local elected officials do not plan to include tolls in the project. FHWA has notified the states that they must commit their share of the funding for the project by the fall of 1999, so that the "finance strategies" required for the TIP and the states' transportation plans can be updated to remove the stipulation for tolls.

Figure 4 - Funding Sources (in millions)
Based on Existing Funds



TEA-21 Requires New Bridge Owner and Finance Plan. TEA-21 specifically prohibits the use of any Federal funds for construction on the Woodrow Wilson Bridge Project until the jurisdictions agree on a new owner for the bridge. TEA-21 also requires an approved Finance Plan (before construction can begin) as a necessary provision of the new ownership agreement. Identification of costs and funding sources is required so that the Finance Plan, and then ownership of the new bridge, can be established.

Court Decision May Delay or Change the Project. On April 15, 1999, a Federal judge issued a decision against FHWA. The court found that FHWA did not: (1) comply with all requirements of the National Environmental Policy Act (e.g., did not adequately analyze the 10-lane bridge option); (2) identify protected properties under the National Historic Preservation Act; and (3) comply with all requirements of the Clean Air Act. On June 14, 1999, the Department appealed the court decisions regarding the National Environmental Policy Act and the National Historic Preservation Act. The Department did not appeal the court decision regarding the Clean Air Act, indicating it would provide the necessary analyses (including demonstration of adequate financing for the project) to comply with the Act's requirements. If the appeal is not successful, FHWA estimates the project will be delayed 1 year or more, and the design could change, which would affect the cost and schedule of the project.

Conclusion

If the issues regarding the court decision and appeal, project costs, and the funding shortfall are not resolved to allow construction to begin in October 2000, the scheduled completion of the first bridge span in 2004 is at risk. Missing that deadline most likely will cause the Federal Government to have to spend additional funds to keep the old bridge in operation, and result in an increase in the cost of the new bridge.

Recommendations

To minimize costs, delays to the traveling public, and potential safety problems, we recommend that FHWA establish timeframes and a resolution process to ensure the following items are completed in a timely fashion in order to keep the project on schedule:

- bring the project into compliance with the Clean Air Act,
- develop an all-inclusive cost estimate for the project,
- finalize the Finance Plan,
- determine a new owner for the bridge, and
- complete all of the necessary environmental reviews.

We further recommend that FHWA request Congress to establish a statutory cap limiting Federal funding for the Woodrow Wilson Bridge Project to either the amount currently requested or some other amount established by Congress. Such a cap is not to prohibit Maryland, Virginia, or the District of Columbia from applying their respective Federal-aid highway apportionments to the project.

FHWA Comments and OIG Response

In its September 22, 1999 comments to the draft of this report, FHWA concurred with our recommendations. We consider FHWA's comments responsive to our recommendations. Therefore, the recommendations are resolved, subject to the follow-up provisions of the Department of Transportation Order 8000.1C.

While basically concurring with our recommendation to establish a cap on Federal funding, FHWA commented that the cap should be at the $1.5 billion level and that it should be made clear that such a cap does not apply to the states' use of their respective Federal-aid apportionments.

We did not revise our recommendation to stipulate that the cap should be set at the $1.5 billion level. We maintain that Congress could determine that the cap should be set at either a higher or a lower level. We did amend the recommendation to clarify that the cap is not to restrict the states' use of their Federal-aid highway apportionments.

FHWA noted its concern with our representation of the project's estimated cost of $2.1 billion. FHWA stated that its $1.9 billion cost estimate is a reasonably accurate estimate for this early stage of project development. By the end of 1999, the design will be about 30 percent complete, and a more detailed estimate will be prepared.

We acknowledge that more accurate cost estimates will be developed by the end of 1999. However, we maintain our position that the best available cost estimate at this time is the $2.1 billion figure, as it contains updated information and estimates.

Baseline Review of the Woodrow Wilson Bridge Project

Federal Highway Administration

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I. PROJECT HISTORY

Opened in 1961, the 1.1-mile long Woodrow Wilson Bridge serves as the southern crossing of the Potomac River for the Beltway (Interstate 495) that encircles the Washington Metropolitan Area (see maps on pages ii and iii). This bridge is also a critical component of Interstate 95, the major North/South Interstate on the East Coast, and it is the only federally owned bridge on the Interstate System. It is jointly controlled and operated by three jurisdictions: Virginia provides electric power for lighting and operation of the drawbridge; the District of Columbia's (DC) employees operate the drawbridge, which is within DC; and Maryland maintains the bridge.

According to FHWA, the existing bridge was designed to carry 75,000 vehicles per day and has 6 general purpose traffic lanes, 3 in each direction. Although the sections of the Beltway that feed onto the bridge were widened from 2 to 4 lanes in each direction in the 1970s, structural limitations prevented widening of the bridge. Presently, 190,000 vehicles cross the bridge each day. Because of the traffic volume, the bridge currently rates an "F," or worst, level-of-service during peak periods (see Exhibit A) -- peak periods run from 6:00AM to 9:00AM and 4:00PM to 7:00PM. Furthermore, the Metropolitan Washington Council of Governments[4] has projected the daily traffic volume will grow to 235,000 by the time the project is completed in 2006, and increase to 300,000 vehicles per day in 2020.

In addition to creating congestion, these conditions also affect travel safety. The accident rate on the Woodrow Wilson Bridge is 153.5 accidents per 100 million vehicle miles of travel -- nearly double the accident rate on the Beltway in Maryland (87.8) and Virginia (75.0).

In 1994, a 3-year comprehensive study[5] concluded that, even with repairs, the useful life of the bridge could only be extended to approximately 2004. The 1994 study report advised that, as early as 2004, major rehabilitation of the bridge (requiring closing half of the bridge at a time) could be required. A May 1999 update to that report concluded:

> "… it is reasonable to expect that the service life of the bridge should extend beyond [2004], without the need for truck weight restrictions. However, continuing efforts to repair and rehabilitate the bridge to further extend its life will become increasing expensive. … any long-term rehabilitation measures would be increasingly likely to require that

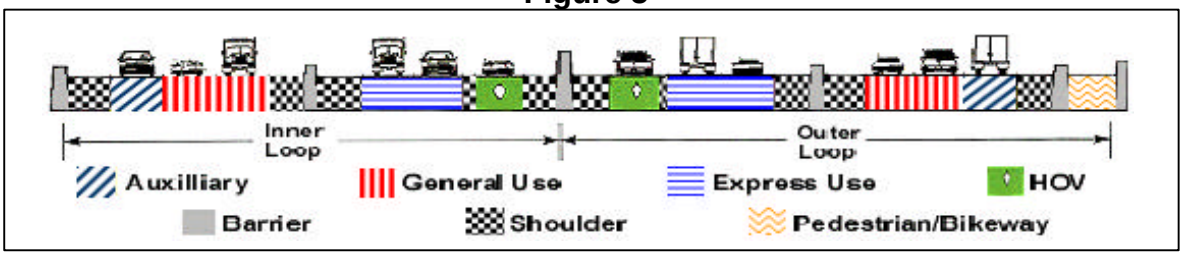
[4] The Metropolitan Washington Council of Governments is the metropolitan planning organization for the Washington metropolitan area, including DC and seven nearby counties in Maryland and Virginia.

[5] Hardesty and Hanover, a New York bridge inspection firm, performed this study for FHWA.

portions of the bridge be closed to all traffic for periods of 3 to 6 months at a time or more."

In 1997, based on a Coordination Committee's[6] recommendation, FHWA selected a 12-lane bridge design. The design includes 2, side-by-side drawbridges that will ultimately provide 12 travel lanes[7] (Figure 5). It was agreed that the new bridge would operate with just 10 lanes until connecting systems for high occupancy vehicles (HOV), express bus, or transit operations are in place.

Figure 5



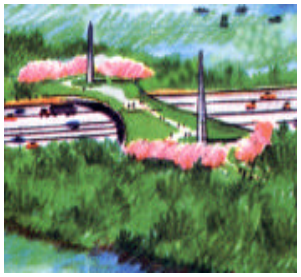
The Current Woodrow Wilson Bridge

The Proposed Woodrow Wilson Bridge

FHWA officials expect the bridge design to rate a D level-of-service during peak periods when the project is completed in 2006, and an E or F level-of-service during peak periods in 2020. FHWA projected that a 16- to 18-lane bridge would be necessary to rate a C level-of-service during peak periods in 2020. However, local public resistance made a structure of that magnitude unacceptable. Therefore, the design was limited to the currently proposed 12 lanes.

Figure 6 - Proposed Parkland Work

Washington St. area in Alexandria



Rosalie Island in Prince George's County

[6] This is a 14-member coordination committee comprised of Federal, state, and local officials representing the affected jurisdictions.

[7] The 12-lane bridge layout would include 4 express lanes; 4 general-purpose lanes; 2 auxiliary lanes; and 2 high occupancy vehicle, express bus, or transit lanes. The new bridge will also include a pedestrian/bicycle facility and eight shoulders.

In addition to replacing the bridge, the project will include parkland work (Figure 6 on page 2) and reconstruction of four major interchanges between the Beltway and Interstate 295, Route 210, U.S. Route 1, and Telegraph Road. The bridge and interchanges are treated as functionally interrelated because 70 percent of all traffic using the bridge enters or exits the Beltway through these interchanges. Funds to refurbish the existing draw span -- and to perform any other necessary rehabilitation -- will come from the Federal funds available for the project, and will, therefore, draw funds away from the project.

II. PROJECT STATUS

Costs

The total costs of the Woodrow Wilson Bridge Project have not been finalized. FHWA currently estimates the cost of the major components -- the replacement bridge spans and interchanges -- to be $1.9 billion.[8] The Office of Inspector General identified some changes to the cost that have occurred since the $1.9 billion estimate was prepared in 1995, bringing the total estimated cost to $2.1 billion (Figure 7).

FIGURE 7 – ESTIMATED PROJECT COSTS a/

Project Component (1995 estimates, escalated to year-of-expenditure dollars)	**Estimated Cost** (in millions)
1. Side-by-Side Drawbridges	$694
2. US Route 1 Interchange	500
3. Interstate 295 Interchange	336
4. Maryland Route 210 Interchange	178
5. Telegraph Road Interchange	182
Drawbridges and Interchanges	**1,890**
Updates Since the 1995 Estimates Were Prepared (Exhibit B on page 15)	
Change Orders	99
Labor Premium for Over-Time Work on Critical Path	59
Adjustment for Poor/Wet Soil Conditions	48
Wetland and Reforestation Mitigation	27
Increased Dredge Disposal	26
Congestion Management Systems	25
Refurbishment of Existing Draw Span b/	4
Other Items	50
Decreases – Bridge Size and Inflation Factors	-111
Changes to Cost Since 1995	**227**
Total Identified Project Costs	**$2,117**

a/ These costs include the design work, right-of-way acquisition, and construction costs. Also, the cost figure for the side-by-side drawbridges includes the cost to remove the existing bridge.

b/ Costs to repair the existing bridge are included in the project cost because these costs are to be funded from existing appropriations for the bridge replacement project.

[8] $1.9 billion is the original 1995 estimate, which was escalated to year-of-expenditure dollars to account for the time value of money.

$227 Million Net Increase to 1995 Estimate. FHWA does not agree that it is appropriate to add these costs in at this time; however, we found no conclusive information to warrant excluding the cost of these items. As designs are refined, the cost of the project changes. As Figure 7 shows, we have identified more specific cost data for some project elements included in the $1.9 billion. The net increase to the cost as a result of updated information is $227 million. The major cost increases were associated with contract change orders, overtime, soil stabilization, replacement wetland and reforestation mitigation, disposal of additional dredge materials, provisions for congestion management systems, and various other items (see Exhibit B on page 15):

- Change orders are an inherent part of large construction projects, but specific allowances for change orders were not included in the original project estimate. According to FHWA, approximately $99 million may be needed for change orders after the various construction contracts are awarded.
- To meet the tight timeframes to get the first new span built by 2004, overtime and nighttime work costing about $59 million will be needed. The 1995 estimate did not include any specific amounts for this work.
- A geotechnical report issued after the 1995 estimate was prepared identified the soil in and around the Route 1 Interchange as a problem. Approximately $48 million may be needed for special treatment of this soil before and during construction.
- FHWA estimates that an additional $27 million will be needed to pay for wetland and reforestation mitigation measures that were committed to in the Record of Decision, but had not been included in the Final Environmental Impact Statement.
- FHWA did account for some dredging in the original estimate. However, because of an increase in the size of piers that will be used on the new bridge, they need to dredge the entire width of the Potomac -- 490,000 cubic yards vs. the original estimate of 20,000 cubic yards must be removed from the river bottom. Disposal of additional dredge materials will cost approximately $26 million.
- Congestion management systems were not accounted for in the original estimate, yet approximately $25 million will be needed for incident management teams and equipment in the project area throughout the construction period.

The net increase also includes $111 million in decreases due to a reduction in the size of the bridge and lower inflation than FHWA anticipated. We added the net cost increase to the original estimate, bringing the total to $2.1 billion (see Figure 7 on page 3 and Exhibit B on page 15).

Highway Agencies Are Not Increasing Original Cost Estimate Yet. We note that FHWA and the project's partner agencies -- the Virginia Department of Transportation, the Maryland State Highway Administration, and the District of Columbia Department of Public Works -- stated that, although other project costs have been identified, they believe that it is not appropriate to increase (or decrease) the overall project estimate from the original $1.9 billion at this time because:

1) The original estimate contained sufficient flexibility (adjustment factors) to offset the $227 million net increase.
2) The preliminary design process, which will be completed in the fall of 1999, will provide opportunities to refine project design concepts and reduce costs. For example, FHWA expects to reduce the cost of the project by eliminating $100 million of aesthetic items for the bridge and for the Route 1 interchange that may not be needed.
3) Detailed design data will be available by December 1999, from which a more accurate cost estimate will be developed.

While we acknowledge that some costs may decrease, we also recognize that costs may increase based on the final designs of the project. The designs are not yet 30 percent complete, and some changes that will increase costs are being planned. For example:

- An additional ramp may be built on the Route 1 interchange.
- The scope of the project may increase to lengthen the distance to taper the lanes connecting I-295 and the Beltway.
- The southern connections on the Telegraph Road interchange may require additional work.

Although FHWA claimed that there was "sufficient flexibility" in the original estimate to offset the $227 million increase, we found no conclusive data that would allow us to quantify these offsets. By December 1999, FHWA expects to have more detailed cost estimates, as the designs will be 30 percent complete. At that time, FHWA plans to adjust the estimated cost figure. The jurisdictions (Maryland, Virginia, and the District of Columbia) plan to select techniques and designs that minimize costs. Furthermore, the project may employ other management techniques, which could affect the final cost of the project, including cost containment procedures or value engineering. Each jurisdiction will make the final decisions regarding contracts for the portions of the project which fall in their boundaries, with Maryland being responsible for the bridge contracts.

Funding

A major challenge currently facing FHWA and the jurisdictions is a lack of committed funding for the full cost of the Woodrow Wilson Bridge Project. TEA-21

specified that "the Federal share of the cost of the Bridge component of the Project shall not exceed 100 percent; and … the Federal share of the cost of any other component of the Project shall not exceed 80 percent." This funding split applies to all funds authorized under the Woodrow Wilson Memorial Bridge Act of 1995. The parkland work is considered part of the necessary approach work for the bridge component and is to be 100 percent federally funded.

As of July 31, 1999, the total level of Federal funding for the project was $949 million -- $149 million in appropriations through fiscal year (FY) 1999 plus $800 million authorized (but not yet appropriated) under TEA-21[9] (Figure 8). In July 1999, legislation was introduced in the U. S. Senate and House of Representatives to authorize an additional $600 million for the project over 4 years, beginning in FY 2004. This authorization, if it passes, will bring the Federal funding for the project to $1.5 billion. To ensure that everyone involved understands the extent of the Federal funding commitment for the bridge, and to ensure that there is no expectation that additional Federal funds will be provided if costs increase, we are recommending that FHWA request Congress to establish a statutory cap limiting Federal funding for the project to either the amount currently requested or some other amount established by Congress. Such a cap is not to prohibit Maryland, Virginia, or the District of Columbia from applying their respective Federal-aid highway apportionments to the project.

Figure 8 – Federal Funds Currently Available and/or Proposed for the Woodrow Wilson Bridge Project

Federal Funds	Source of Funds
$23,112	Federal Highway Act of 1981
$134,189	Intermodal Surface Transportation Efficiency Act of 1991
$60,000,000	National Highway System Designation Act of 1995
$22,275,000	TEA-21, FY 1998 appropriation
$66,225,000	TEA-21, FY 1999 appropriation
$148,657,301	**Federal Funds Provided as of July 31, 1999**
$800,000,000	TEA-21, FYs 2000 – 2003 Authorizations
$948,657,301	**Total Identified Federal Funding As of July 31, 1999**
$600,000,000	Proposed authorization
$1,548,657,301	**Total Proposed Federal Funding As of July 31, 1999**

The states of Maryland and Virginia, and the District of Columbia have not committed any funds to the project as of July 31, 1999. As a result, there is a $1.2 billion shortfall in identified funding -- $2.1 billion in costs, less $949 million in

[9] Although TEA-21 authorized $900 million, the actual amount available for the project will be less, as Congress did not give the full appropriation in FYs 1998 and 1999. TEA-21 authorized $100 million for FYs 1998 and 1999, but the appropriations totaled only $88.5 million. The remaining TEA-21 authorizations ($800 million) are $150 million for FY 2000, $200 million for FY 2001, $225 million for FY 2002, and $225 million for FY 2003.

committed funding (see Figure 4 on page v). If the additional $600 million is authorized by Congress, the shortfall will be reduced from $1.2 billion to $568 million.

We found that the current Washington Metropolitan Council of Governments' Transportation Improvement Plan (TIP) for the Washington metropolitan area, a document that integrates the applicable portions of the jurisdictions' transportation plans, identifies the Woodrow Wilson Bridge Project as toll-financed. However, the highway agencies and local elected officials do not plan to include tolls in the project. FHWA has notified the states that they must commit their share of the funding for the project by the fall of 1999, so that the "finance strategies" required for the TIP and the states' transportation plans can be updated to remove the stipulation for tolls.

Furthermore, the project's Finance Plan (which is more detailed than the finance strategy required for the TIP) has not been finalized, and sufficient funding has not been committed to cover all identified costs. TEA-21 specifically requires a Finance Plan for the Woodrow Wilson Bridge Project. In general, Finance Plans are to be prepared and submitted to the Secretary of Transportation for all projects with an estimated total cost over $1 billion. Those Finance Plans should identify the current financial status of the project; contingency or alternative plans to address funding shortfalls or cost increases; project completion milestones; and cost containment goals. TEA-21 requires that the project's Finance Plan be completed before actual construction can begin. FHWA estimates the Finance Plan will be finalized in May 2000. FHWA expects the Maryland State Highway Administration to initiate the contracting process for construction of the new bridge in May 2000, with construction to begin in October 2000.

In March 1999, FHWA announced plans to spend approximately $4 million to refurbish the draw spans and make other miscellaneous repairs on the existing bridge. These and any other funds required for major repairs or rehabilitation of the existing bridge will be taken from the funds available for the bridge replacement project. If construction delays make major rehabilitation of the existing bridge necessary, the shortfall in funding for the replacement project would increase. The extent of any rehabilitation will depend on the status of the project and the expected condition of the existing bridge in 2004. In 1997 the cost of a complete rehabilitation of the existing bridge was estimated at $324 million.[10] Any funding shortfall would have to be offset through increased Federal, state, or local funding, or the project scope would have to be decreased.

Funds Spent on the Project. As of June 30, 1999, $33 million had been spent on preliminary design, oversight, and environmental studies for the project. In addition,

[10] Complete rehabilitation would require closing half of the bridge at a time for up to 4 years to perform necessary work on the piling, reconstruct some piers, replace floor beams, replace the steel girders (which support the deck) and replace the deck.

Maryland and Virginia have awarded five preliminary design contracts and one oversight contract, with a total cost of approximately $109 million. About half of the funding for these contracts will be provided from the National Highway System Designation Act of 1995, with the remaining funding to be provided from TEA-21 funds.

Schedule

The entire project schedule depends on the appeal the Department filed in response to an April 1999 Federal Court decision against FHWA. The dates discussed below reflect the schedule of the project if the appeal is successful. If the appeal is not successful, FHWA estimates the schedule will be pushed back 1 year or more.

The project is now in preliminary design.[11] A different consultant is designing each of the five major components, with an additional consultant, the Potomac Crossing Consultants, overseeing the design work on behalf of FHWA and the jurisdictions. If the Department wins the appeal, the states plan to initiate the contracting process for construction in May 2000. The construction contracts are to be awarded and construction is scheduled to begin in October 2000.

The estimated completion date for the first (eastbound) bridge is 2004. When the first bridge is completed, the existing bridge will be closed to traffic, and all vehicles will be rerouted to the new span. FHWA will begin demolishing the existing bridge in 2005. Construction on the second (westbound) span will begin in the fall of 2004, and that bridge will be completed when the total project is finished in the fall of 2006. (See Figure 9 and the Design and Construction Schedule in Exhibit C on page 17.) However, as noted above, the Finance Plan must be finalized before construction can begin. In addition, there are outstanding issues related to a court decision, ownership, and environmental concerns that may delay construction.

Figure 9 – Upcoming Milestones to Meet Critical Completion Schedule

Milestone	Requirement
Resolution of the Appealed Court Decision	December 1999
Determine Total Cost and Source of Funds, and Finalize Finance Plan	May 2000
Determine Owner for New Bridge	May 2000
Advertise for Bids for Bridge Construction	May 2000
Environmental Assessments (In addition to Court-ordered reviews)	June 2000
Award Contract and Begin Bridge Construction	October 2000
Open First Bridge (Eastbound)	**By December 2004**
Completion of Project	2006

[11] This project is a traditional Design-Bid-Build project. Therefore, the design and construction contracts will go to different contractors.

Other Issues

Legal Action Against the Project. In January 1998, the City of Alexandria filed a lawsuit against FHWA. Three organizations (the Coalition for a Sensible Bridge, the Historic Alexandria Foundation, and the Alexandria Historic Restoration and Preservation Commission) joined Alexandria in this lawsuit. The lawsuit alleged FHWA did not comply with applicable environmental and historic laws and regulations in selecting the bridge design. The City had contended that a 10-lane structure would meet the traffic needs, and a smaller structure and approach roadways would reduce the impact on the community and the local environment.

On March 1, 1999, FHWA settled the suit with the City of Alexandria;[12] however, the other three organizations involved in the lawsuit did not agree with the settlement terms. Therefore, the lawsuit remained unsettled even though Alexandria withdrew from the case.

On April 15, 1999, a Federal judge issued a decision against FHWA. The Court found that FHWA did not: (1) comply with all requirements of the National Environmental Policy Act (e.g., did not adequately analyze the 10-lane bridge option); (2) identify protected properties under the National Historic Preservation Act and the Department of Transportation Act, Section 4(f)[13]; and (3) comply with all requirements of the Clean Air Act. On June 14, 1999, the Department appealed the Court decisions regarding the National Environmental Policy Act and the National Historic Preservation Act. The Department did not appeal the Court decision regarding the Clean Air Act, indicating it would provide the necessary analyses to comply with the Act's requirements.

Compliance with the Clean Air Act requires that the transportation plan "conform" to the air quality implementation plan for the Washington DC metropolitan area. The transportation plan must reflect the most current concept of the projects in the plan, and must be "financially constrained." This means that the conformity analysis must include the Woodrow Wilson Bridge Project as currently proposed -- 10 general-purpose lanes, 2 lanes reserved for future HOV or transit use, without tolls. In addition, "financial constraint" means the plan must identify the sources of funding for the bridge that are reasonably available (i.e., the mix of state and Federal funds, which will be used to pay for the project). The Transportation Planning Board will do the conformity analysis, upon which the Council of Governments and the Department of Transportation will base their conformity determinations.

[12] The negotiated settlement included changes to the planned access ramps, agreements on studies of other planned ramp alterations and a southern river crossing, additional mitigation and enhancement measures, and limitations on the bridge width.

[13] Section 4(f) is that part of the Act containing policies on preserving lands, wildlife, refuges, and historical sites now codified at 49 U.S. Code, Section 303.

The Secretary of Transportation stated that the Department will now prepare a supplemental environmental impact statement that will evaluate both the 10- and 12-lane alternatives. This is a contingency plan, so that if the Department loses the appeal, the project will not be set back as much as it would if the review is not done until after the appellate Court decision. The project's general engineering consultant will be performing the review of 10-lane alternatives. This work is within the scope of the current general engineering consultant's contract; however, FHWA may have to pay more on this contract at a later date.

The Secretary of Transportation stated that, if the appeal is successful, the project would stay on schedule. If the Department loses the appeal, they will be required to complete the supplemental environmental review of the 10-lane alternatives (to comply with the Court decision regarding the National Environmental Policy Act), and project officials expect the entire project schedule will be delayed 1 year or more. Until the Department receives a Court decision on the appeal, the entire project is at risk of delays, changes, and cost increases.

Ownership is Undetermined. TEA-21 specifically prohibits the use of any Federal funds for construction until the jurisdictions agree on a new owner for the bridge. (Preliminary work, such as design and right-of-way, can proceed; however, actual construction cannot begin until the new owner is defined.) The owner may be one of the jurisdictions or a joint authority similar to the Washington Metropolitan Area Transportation Authority, which operates the region's subway system. The jurisdictions and the Department of Transportation met and developed an issue paper on ownership, but the ownership question cannot be resolved until the finance plan is finalized – the finance plan is a necessary component of the ownership agreement.

Environmental Concerns (Regardless of the Court's Final Decision) Must be Resolved. Before the states can begin construction in October 2000, the following environmental issues also must be resolved:

- Project officials must identify replacement wetlands, and the U.S. Army Corps of Engineers must approve a conceptual mitigation plan; the Corps will then hold a public hearing on the permit application as required by the Federal Water Pollution Control Act. This permit is required before the Notice to Proceed on the bridge foundation contract can be issued.
- There is a pair of Bald Eagles nesting near the Interstate 295 interchange. Because these eagles are a threatened species, the Endangered Species Act required that FHWA complete a biological assessment to evaluate the project's impacts on eagles. This study concluded that the project would not pose a threat to the species; however, there will be an impact on the eagles. Due to this impact, the United States Fish and Wildlife Service has requested that FHWA formally consult with them to determine whether any mitigation measures will be required.

- Depending on the type of dredging technique to be used on the project, the National Marine Fisheries Service may require FHWA to prepare a biological assessment of the potential effect on the short-nosed sturgeon. Dredging techniques will be determined as the project gets closer to construction.
- The environmental impacts of the already agreed to changes to the design must be evaluated in the Supplemental Environmental Impact Statement. Examples of these changes are the alterations for tapering lanes on interchanges and adding new ramps.

FHWA expects to have all of these concerns resolved by or before June 2000, so that construction can proceed, as scheduled, in October 2000.

Conclusion

In addition to the recent adverse Court decision, the project has several hurdles to surpass before it can proceed. First, the cost estimate for the project must be finalized and funding sources identified to eliminate the current $1.2 billion funding shortage (a $568 million shortage, if Congress authorizes the additional $600 million). Second, once the total cost and funding sources are determined, a Finance Plan must be prepared and approved by the Secretary of Transportation. Third, FHWA and the jurisdictions must identify a new owner for the bridge before construction can begin. Finally, FHWA and the Department of Transportation must complete the necessary environmental studies and comply with the Federal Court decision before construction can begin.

Any of the above issues could delay construction, resulting in a failure to complete the first (eastbound) bridge by 2004. Around that time, the existing bridge may need extensive rehabilitation work requiring lane closures for extended periods of time. Although the jurisdictions pay for routine maintenance on the existing structure, the Federal government is required to pay reconstruction costs because the bridge remains federally owned until the new bridge is in place.

Recommendations

To minimize costs, delays to the traveling public, and potential safety problems, we recommend that FHWA establish timeframes and a resolution process to ensure the following items are completed in a timely fashion in order to keep the project on schedule:

- bring the project into compliance with the Clean Air Act,
- develop an all-inclusive cost estimate for the project,
- finalize the Finance Plan,
- determine a new owner for the bridge, and

- complete all of the necessary environmental reviews.

To ensure that everyone involved understands the extent of the Federal funding commitment for the bridge, and that there is no expectation that additional Federal funds will be provided if costs increase, we recommend that FHWA request Congress to establish a statutory cap limiting Federal funding for the project to either the amount currently requested or some other amount established by Congress. Such a cap is not to prohibit Maryland, Virginia, or the District of Columbia from applying their respective Federal-aid highway apportionments to the project.

FHWA Comments

In its September 22, 1999 response to the draft of this report (see Appendix A on page 17), FHWA concurred with our recommendations. FHWA stated that the five prescribed activities are underway and agreed that a cap on Federal funding is appropriate.

While basically concurring with our recommendation to establish a cap on Federal funding, FHWA commented that the cap should be at the $1.5 billion level and that it should be made clear that such a cap does not apply to the states' use of their respective Federal-aid apportionments.

FHWA expressed its concern with our representation of the project's estimated cost of $2.1 billion. FHWA stated that its $1.9 billion cost estimate is a reasonably accurate estimate for this early stage of project development. FHWA also noted that the $1.9 billion estimate was developed using a method based on bid prices of past projects, and that the methodology included adjustment factors to account for increases and decreases in costs that may occur as the project design progresses.

FHWA stated that, by the end of this year, the design will be about 30 percent complete, and a more detailed estimate will be prepared. FHWA also noted that revising the estimate at this time would increase the difficulty of finalizing the Finance Plan and negotiating with Congress on additional Federal funding for the project. In addition, FHWA's Office of Bridge Technology made suggestions to clarify certain areas of the report. We reviewed those suggestions and made changes to the final report as we deemed appropriate.

OIG Response

We consider FHWA's comments responsive to our recommendations. Therefore, the recommendations are resolved, subject to the follow-up provisions of the Department of Transportation Order 8000.1C.

We made several changes to our draft report to address FHWA's requests for clarifications. However, we did not revise our recommendation to stipulate that the cap should be set at the $1.5 billion level. We maintain that Congress could determine that the cap should be set at either a higher or a lower level. We did amend the recommendation to add the clarification that the cap is not to restrict the states' use of their Federal-aid highway apportionments.

Regarding the estimated cost of the project, we did not change our calculation of the $2.1 billion figure. Although FHWA does not support changing the original $1.9 billion cost estimate until December 1999, we consider the $2.1 billion estimate to be more appropriate, as it contains updated information and estimates that have been identified since the 1995 estimate was developed. FHWA further claimed that there was "sufficient flexibility" in the original estimate to offset the $0.2 billion increase, however we found no conclusive data that would allow us to quantify this offset.

Exhibit A

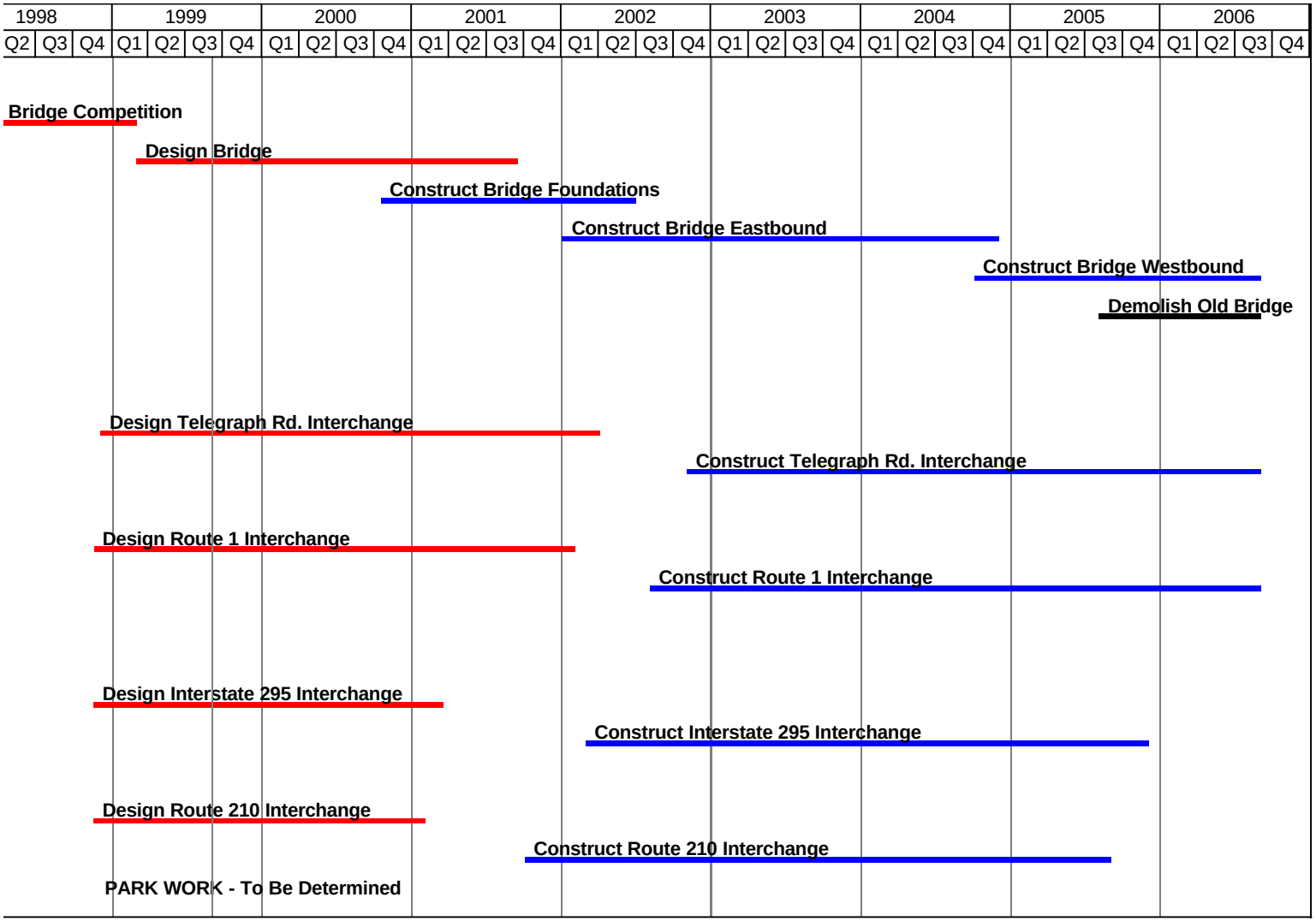
Transportation Research Board
Levels of Service

Operating Conditions	Level of Service	Description
Best	A	A free flow of traffic with generally higher speeds, and good maneuverability. Minor disruptions to flow are easily absorbed without changing travel speed.
↓	B	Stable flow of traffic. Average speeds are still high, but maneuverability decreases slightly. The presence of others in the traffic stream begins to affect individual behavior.
↓	C	Stable flow of traffic, but operation of individuals becomes significantly affected by others in the traffic stream. Average speeds are lower. Minor disruptions could cause serious local deterioration in service, with queues forming behind any significant traffic disruption.
↓	D	High-density, but stable, flow of traffic. Ability to maneuver is severely restricted because of traffic congestion. Travel speed begins to be reduced by increasing volumes. Only minor disruptions can be absorbed without the formation of extensive queues and the deterioration of service to levels-of-service E and F.
↓	E	Operations are at or near capacity and are unstable. Average speeds are lower, but highly variable and unpredictable. Most disruptions will cause queues to form and service to deteriorate to level-of-service F.
Worst	F	Forced or breakdown flow of traffic. This occurs either at a point where vehicles arrive at a rate greater than they are discharged or demand for a facility exceeds capacity. Queues will form behind these breakdown points. Average speeds in queues are slow and operations are highly unstable, with brief periods of movement followed by stoppages.
Source: Highway Capacity Manual (Transportation Research Board, Special Report 209, 1992).		

Updates Since the 1995 Estimates Were Prepared (Dollars in Millions)		
Change Orders	$99	1. Estimated at 7% of construction costs. 2. Not included in the original estimate, because the original is based on bid prices, and, in the history of these projects, change orders are an additional 6 to 8% of construction costs.
Labor Premium for Over-Time Work on Critical Path	59	Assumptions: 1. More than 220 workdays per year will result in premium time charges. Schedule assumes 260 workdays per year. 2. More than 8 hours per shift per day will result in premium time charges. Schedule assumes 2, 10-hour shifts per day. 3. 40% of construction cost is a labor charge. 4. Only work prior to the opening of the first bridge span will be considered critical to the schedule. 5. 50% of activities will be eligible for premium time on the critical path.
Adjustment for Poor/Wet Soil Conditions	48	1. Cost is based on a draft geotechnical report. 2. Cost is based on assumed loads and foundation types/sizes. Actual costs may vary depending on the selected foundation type and size.
Additional wetland and reforestation mitigation measures	27	For Wetland and Reforestation Mitigation Measures over and above the quantified price for them in the FEIS (9/97), but potentially committed to or implied in the Record of Decision (11/97). Cost assumes that mitigation must be done to meet both Federal and State requirements independent of each other.
Increased Dredge Disposal	26	1. Original assumption required 20,000 cubic yards of dredging. Updated information shows that an additional 472,000 cubic yards of dredging will be required for the bridge at $40 per cubic yard (472,000 * $40 = $18.9 million increased dredging cost). 2. Add in $6.6 million for unquantifiable or contingency items associated with dredging (35% contingency * $18.9 million). 3. Total increased costs for dredge disposal is approximately $26 million ($18.9 million + $6.6 million = $25.5 million).
Provision of Congestion Management Systems	25	Cost shown assumes the use of incident management teams/equipment and other communication methods within the project area throughout the construction period.
Adjustment of the mainline roadway cost for modifications due to the addition of the Rosalie Island Deck	19	1. This additional cost shown account for approximately 500 feet of new roadway in the I-295 Interchange that was originally part of the proposed River Crossing Structure. 2. Major quantity items include retaining walls (>20 feet high), embankment/fill, roadway pavement, and traffic barrier.

Provision of Intelligent Transportation System	17	Cost shown assumes the installation of permanent communications equipment.
Property for construction staging	12	Assumes: 1. That VDOT will be able to purchase staging area land near the Eisenhower Valley Connector for approximately $8 million. 2. That contractors should be able to purchase vacant land south of the Beltway in Maryland for a staging area at reasonable cost. 3. That they will be able to dredge a channel and build a loading area with a bulkhead for $1.3 million.
Refurbishment of Existing Draw Span	4	In February 1999, FHWA committed to do the following repairs to the existing bridge: 1. Replace the draw span grating and stringer for $3.6 million. 2. Other items include repairing stone facing anchorage at the tower, installing a balance measurement system, and miscellaneous steel repairs. These are estimated at $265,000. ($3.6 million + $0.265 million = $3.865 million or approximately $4 million)
Other environmental mitigation	2	1. Other Environmental Mitigation committed to or implied by the Record of Decision (11/98), but not included in the FEIS (9/97). 2. Cost shown includes assumed archaeological cost and mitigation at the Flintstone Elementary School near Interstate 210 in Maryland.
Decrease in the size of the bridge	-49	The original estimate for the bridge was based on a deck width of 242' and a length of 6660'. The current design is for 234' wide bridge deck that will be 6061' long. Unit Bridge cost = $253 per square foot (242 * 6660) – (234 *6061) = 193,446 sq. ft. reduction * $253 per sq. ft. = $48.9 million reduction.
Decrease in inflation factors	-62	1. The 1995 estimate was based on actual 1995 bid costs. These costs were escalated at a 3% per year inflation rate to develop the current $1.9 billion estimate. 2. The actual price trend from 1995 to 1999 has averaged 1.9% inflation per year. (Note: that is 1.9% inflation in construction costs) 3. Applying this reduced inflation factor reduced the current cost base by 4.17% or $62 million.
Changes to Cost Since 1995	**$227**	

Woodrow Wilson Bridge Project
Design and Construction Schedule in Calendar Years*
As of July 31, 1999



* This is the current schedule, which assumes that the appeal is successful. If the appeal is not successful, the entire schedule could be pushed back 1 year or more.

WOODROW WILSON BRIDGE PROJECT

Major Contributors to this Report

The following is a list of the major contributors to the Baseline Review of the Woodrow Wilson Bridge Project.

Glenn Griser	Program Director
Lori Hood	Evaluator

U.S. Department of Transportation
Federal Highway Administration

Memorandum

Subject: **INFORMATION:** FHWA's Comments on the Draft Baseline Review of the Woodrow Wilson Bridge

Date: September 22, 1999

From: Anthony R. Kane
Executive Director

Reply to Attn. of: HIBT

To: Mr. Raymond J. DeCarli
Deputy Inspector General (J-2)

Thank you for providing us the draft baseline review of the Woodrow Wilson Bridge project for comment. We agree with the five bulleted recommendations as these are prescribed activities for this type of major project to be accomplished before construction begins. We also agree partially to your sixth recommendation to request Congress to establish a cap for special Federal funding under the Woodrow Wilson Memorial Bridge Act. We would suggest the special funding cap be $1.5 billion and not an indeterminate amount. Also, the cap is with regard to special Federal funding, not inclusive of regular Federal-aid.

We are concerned with the report's representation of the project cost estimate. Our position remains that the $1.9 billion cost estimate is a reasonably accurate estimate for this current early stage of the project. As we have discussed with your representatives, the $1.9 billion estimate was developed using a method based on bid prices of past projects. The method also includes adjustment (contingency) factors to account for increases and decreases in costs that may occur as the design of the project progresses. Also, by the end of the year, 1999, design will be about 30 percent complete and a more detailed estimate will be prepared. For these reasons, it may be without purpose to show a higher cost estimate at this time.

There are other issues to consider, too. A revised estimate at this time will increase the difficulty of arriving at a fiscally constrained transportation plan, the project's financial plan, and in negotiations with congress on additional Federal funding for the project.