

Summary of Three Highway and Improvement Cost Reports

Prepared for
John Conrad, Assistant Secretary for Engineering &
Regional Operations

Prepared by
Kathy Lindquist, WSDOT Research Office

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Summary of Reports

This document is a summary of three reports, *Highway Economic Requirements System Improvement Cost and Pavement Life*, November 2003; *Improvement Cost Data Methodology*, April 2005; and *High Cost Transportation Capacity Investments – The Megaproject*, June 2006. These reports build on one another and expand on the topic of national averages for highway construction costs.

Stephen Sissel, of the Federal Highway Administration (FHWA) Office of Legislative & Governmental Affairs, was contacted and provided clarification on the background, purpose and findings of the reports.

According to Mr. Sissel, FHWA began a study in 2002 to review the costs per mile of highway construction projects used in the Highway Economic Requirements System (HERS). FHWA maintains the HERS model to enable the estimation of highway agency costs for building specific types of highway improvements. It is the primary tool used by FHWA to develop estimates of highway investment requirements for the biennial *Status of the Nation's Highways, Bridges and Transit: Conditions and Performance Report to Congress (C&P Report)*. This report simulates the cost and impacts of making improvements to the nation's highways to provide estimates of national investment requirements.

The first study, *Highway Economic Requirements System Improvement Cost and Pavement Life*, completed for the FHWA by Battelle Corporation in November 2003, provided estimates of highway construction costs per lane-mile. These results were based on information from several states in light of their current design procedures and the cost factors. This study provided estimated construction costs on a per mile basis calculated in 2002 dollars.

Mr. Sissel clarified that after completion of the first study several questions remained and additional detail was needed. Further work was commissioned with Battelle Corporation to address construction costs in 1) communities of greater than one million population, 2) mountainous areas, and 3) megaprojects such as the Boston "Big Dig" and the Woodrow Wilson Bridge project in Washington, DC.

According to Mr. Sissel, the first study did not provide a separate category for work done in communities of greater than one million population. The costs of these projects originally were included with projects in communities with a population greater than 200,000. A question remained if there were factors existing in larger communities of greater than one million population that would significantly impact construction costs.

A second concern was expressed that a representative cross-section of projects may have been included in the category of construction in mountainous areas and therefore the costs may not be representative.

Lastly, the costs to construct large projects in areas with extreme conditions such as a large number of bridges, complicated interchanges, major environmental issues, and other extreme engineering and environmental issues were not considered.

Two studies were commissioned to provide additional information and respond to these concerns. The studies, *Improvement Cost Data Methodology*, April 2005, and *High Cost Transportation*

Capacity Investments – The Megaproject, June 2006, were completed and built on the information developed in the first study and responded to the questions raised.

The two additional studies found construction costs for projects were higher in areas with populations greater than one million, in areas with mountainous terrain, and for megaprojects. These revised costs were then incorporated into the updated HERS software. All estimated construction costs on a per mile basis were calculated in 2002 dollars.

According to Mr. Sissel, it must be noted that these costs represent an average that is used for a **national** level analysis of needs for the Nation's highway system. It is strongly recommended these costs NOT be used in the analysis of individual projects or for projects at any level other than the **national** level. *[Mr. Sissel's emphasis added]*

For example, in urban areas with restrictions (high cost of additional right-of-way, major utility relocation, high volume traffic control, evening work restrictions, etc.), the cost to construct one lane-mile of a 4-lane divided highway can range from \$23.8 million to \$105.4 million depending on the urban population size.

The cost of \$105.4 million per-lane-mile may not represent the maximum cost per-lane-mile and should be used as general guideline only. Individual projects may include extreme conditions warranting a much higher cost.

Summary technical highlights of the three reports are available in a separate document.