

Priority, Market-Ready Technologies and Innovations

Highway Economic Requirements System, State Version (HERS-ST)

Problem: Transportation agencies need planning tools that help contain improvement costs while enhancing system performance

In the past, transportation agencies have had to rely on engineering applications for long-range planning and programming. However, many agencies are beginning to focus on system performance rather than simply on dollars spent or miles improved. This Transportation Asset Management approach has created a demand for planning tools that incorporate economic factors, especially user benefits and costs, in addition to traditional engineering considerations. Because existing engineering software packages were not designed specifically for managing transportation assets, they did not adequately address these agencies' changing needs.

To address this problem, the Federal Highway Administration (FHWA) developed the Highway Economic Requirements System, State Version (HERS-ST) from the national-level HERS program that FHWA has used since the early 1990s.

Solution: HERS-ST uses engineering and economics to improve system performance

The concept of adapting the national-level HERS model for State use began when the State of Oregon recognized that HERS had great potential for statewide planning, and created a version of HERS to meet its needs. FHWA then launched a HERS-ST pilot program to gauge State interest. The response was very positive. As of August 2005, 16 States were using HERS-ST, and 10 States were interested in using the software.

What is HERS-ST?

HERS-ST is a user-friendly Microsoft® Windows® application that helps transportation agencies

plan and schedule highway work and determine future highway system needs. This software uses engineering principles to simulate future highway conditions and performance levels and identify deficiencies. The program then applies economic criteria to select the most cost-effective mix of improvements for systemwide implementation.

How does it work?

HERS-ST accepts highway-section records data in the Highway Performance Monitoring System format. For each highway section, the model predicts future condition and capacity deficiencies, identifies alternative improvements to correct each deficiency, and determines a benefit-cost ratio for each potential improvement. To calculate benefits, the analysis considers the value of travel time, safety, vehicle operating costs, emissions, and highway agency costs. The model identifies the most economically attractive improvement for each section and then determines the improvements to be implemented by comparing the benefit-cost ratios. HERS-ST can optimize highway investment given funding constraints or performance objectives specified by the

Putting It in Perspective

Transportation agencies need resources for:

- Long-range planning.
- "What if" analyses.
- Governmental Accounting Standards Board (GASB) Statement 34 compliance.
- Congestion management.
- Needs assessment.
- Data management.
- Legislative decision support.

analyst. The software enables users to view the analysis output spatially in a built-in geographic information system view. HERS-ST users also can create customized charts, tables, and reports or export the output for use in other software, such as ArcView® or word processing or spreadsheet programs.

Benefits

- Improves system performance.
- Enhances customer satisfaction.
- Combines engineering and economics to maximize return on investment.

Successful Applications: Quantifying the impact of highway investments

HERS-ST can help a State maximize the return on its highway investments. Transportation agencies can use HERS-ST to estimate the impact of investment strategies on future system performance. HERS-ST will provide decisionmakers with information about the impacts of current and future highway improvements on agencies, highway users, and the environment.

In 2003, FHWA provided free onsite briefings and workshops on HERS-ST for nine States. In 2004, this onsite assistance expanded to include implementation support for States that need help to set up and run HERS-ST. FHWA can provide assistance in assembling the program input data, adjusting the software’s various parameters and controls, understanding the output generated, and creating customized reports.

Deployment Statement

HERS-ST is a highway investment and performance model that enables users to consider engineering and economic concepts and principles when reviewing the impacts of alternative highway investment levels and program structures on highway conditions, performance, and user impacts.

Deployment Goal

By 2009, 35 State departments of transportation will be implementing comprehensive asset management strategies, a component of which is the use of HERS-ST, when making decisions concerning their transportation infrastructure.

Deployment Status

Comprehensive application of asset management economic principles has occurred so far in nine States, including California, Florida, Indiana, Michigan, Minnesota, Oregon, Washington, and Wisconsin.

Additional Resources

FHWA will release a new version of the software in April 2006, along with a new user’s guide and technical report.



HERS-ST logo

To learn more about HERS-ST, visit <http://www.fhwa.dot.gov/infrastructure/asstmgmt/hersindex.htm>. The Web site hosts a HERS-ST community of practice, where visitors can post questions and comments. The new software and user’s guide also will be posted on the Web site.

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