

RESEARCH REVIEW

Congestion evaluation research produces new ways to understand freeway congestion

So in demand are results from TRAC's latest research on freeway congestion that agency researchers have been besieged with requests to present briefings before a final report has even left the presses.

The reason that interest is so high in the FLOW Evaluation project is that it has devised new ways to answer questions that everyone is asking: How well does the freeway system work? How often and how long is the system congested? How often does the system break down? How does HOV lane traffic compare?

People are already finding beneficial operational, policy, and planning uses for the project's results. The Washington State Department of Transportation's Traffic Systems Management Center (TSMC) has determined from the data whether loop detectors in the pavement are working correctly. The Washington State legislature and the Puget Sound Regional Council have found the results useful in their considerations of HOV lane policy. And WSDOT's Translake Study, which is researching ways to address the near-full capacity of the SR 520 bridge over Lake Washington, has used the results to describe freeway performance on I-5 and thus the potential impacts of cross-lake proposals.

The reason the project is so successful and beneficial is that it has created both new means for analyzing freeway performance data and innovative ways to present analysis results.

Routine, complex analyses

Mark E. Hallenbeck, director of TRAC, and John Ishimaru, TRAC research engineer, have been working for two years to create and test a system to monitor the performance of the freeway management system.

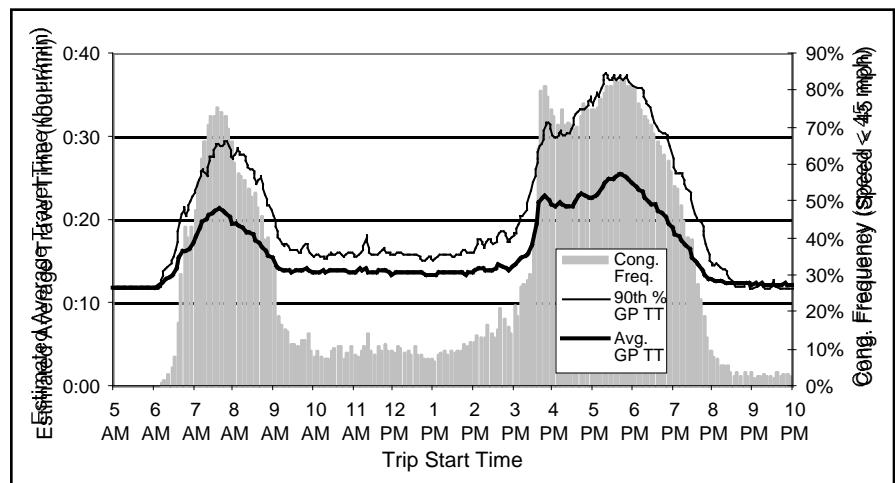
To produce a realistic portrait of the area's freeway systems, the project team has developed new software, called CD-Analysis, that performs routine, complex analyses of how

well the freeway systems are working. The program manipulates volume and speed data that the TSMC already collects through its network of highway surveillance equipment (FLOW system) and stores on CD-ROM.

Les Jacobson, Northwest Region's traffic systems manager, is enthusiastic about the project's products. "We have been evaluating freeway performance on and off for some time," he said. "What this program does is give us the ability to do it more comprehensively and quickly."

Understandable results

The researchers have also devised meaningful ways to present the information to help transportation officials and the public more easily understand area congestion. Jacobson says that this will allow WSDOT to



Estimated average weekday travel time (1997), westbound SR 520 general purpose lanes, Redmond Way to I-5 (12.3 miles)

more easily explain to the public and decision makers *why* certain actions are necessary in particular corridors or sites. Shown is an example of one of the new graphs, a profile of average weekday travel times on the major freeway corridors and the reliability of those trips.

The example is of westbound SR 520 general purpose lanes, Redmond Way to I-5 (based on 1997 data). The lower line shows the average travel time, which varies from about 12 to 15 minutes for a person leaving Redmond at midday to over 20 minutes during the traditional morning commute and about 25 minutes

during the evening commute.

The upper line shows the 90th percentile travel time, which can reach 30 minutes in the morning peak and about 38 minutes in the evening peak, meaning that nine times out of ten the trip's travel time will be 30 minutes or less in the morning and 38 minutes or less in the evening. Importantly, these numbers show that the evening "reverse" commute from Redmond to Seattle is actually more congested than the traditional morning commute in the same direction.

Superimposed on the travel time lines is a column graph that illus-

trates the likelihood that the average trip speed will be less than 45 mph. This example shows that someone leaving Redmond at 6:00 PM can count on traffic moving at less than 45 mph over 80 percent of the time.

Other analyses look at the geographic extent and severity of routine congestion along extensive freeway corridors and at average traffic volumes and speed, as well as the percentage of time the road is congested, for selected freeway sites.

For more information, contact Mark Hallenbeck (206) 543-6261, or visit the report's Web site at <<http://weber.u.washington.edu/~trac/>>.

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