

**GAO**

Testimony

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**TRAFFIC CONGESTION:**

**THE NEED AND OPPORTUNITY  
FOR FEDERAL INVOLVEMENT**

*Statement of*  
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*Before the*  
Committee on the Budget  
U.S. House of Representatives



Good Morning, Mr. Chairman:

GAO is very pleased to respond to your invitation to testify on our work in the area of traffic congestion and federal approaches for dealing with it. To date, we have published three reports on the subject, and we are about to publish a fourth. Based on this work, I would like concentrate today on those areas where we believe federal policy could contribute to improving surface transportation mobility. My message to you this morning has five basic points:

1. traffic congestion is a worsening problem,
2. the federal government has a role in improving mobility,
3. intelligent vehicle and highway systems (IVHS) are promising but need further testing,
4. there are other low-cost approaches that need to be considered, and
5. the reauthorization of the Surface Transportation Act should contain mobility-enhancing provisions.

#### BACKGROUND

With the expected completion of the interstate system, increasing attention is being paid to maintaining the quality of the surface transportation infrastructure that we have built. The growth in traffic congestion represents an increasing threat to

that infrastructure, and especially to the efficient conduct of the nation's commercial, commuter, and leisure travel. Therefore, it is important to ensure that transportation policy--as represented in the 1991 Surface Transportation Act reauthorization--incorporates needed strategies to improve mobility.

#### TRAFFIC CONGESTION IS WORSENING

In our first study on traffic congestion, we noted that a variety of interrelated trends have combined to create widespread traffic congestion problems in many of the nation's metropolitan areas.<sup>1</sup> These trends--such as the intensification of suburban development and the corresponding growth in automobile use--have made congestion a regionwide problem and not simply a problem limited to downtown areas.

The result of these changes is that traffic congestion is now widespread in many of the major and medium-sized metropolitan areas; for example, 65 percent of urban freeways are congested during peak periods. Moreover, the economic cost of this congestion is considerable. A recent study by the Federal Highway Administration (FHWA) estimated that commuters are wasting over 2 billion vehicle-hours annually because of freeway delays, which translates into \$15.9 billion in user costs. Declining mobility

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<sup>1</sup> U.S. General Accounting Office, Traffic Congestion: Trends, Measures, and Effects, GAO/PEMD-90-1 (Washington, D.C.: November 1989).

also has concurrent effects on energy usage and environmental quality. Congestion alone results in over 2 billion gallons of fuel being wasted each year, and mobile emissions continue to be a major source of air pollution.

Our study found that traffic congestion shows no signs of abating; rather, FHWA estimates of future growth suggest possible congestion increases of at least 400 percent by 2005. While our analysis of their model suggests that the magnitude of possible congestion increase is probably closer to 300 percent, this still represents a considerable barrier to mobility, and one that must be monitored closely and addressed accordingly.

#### NEED FOR FEDERAL ROLE IN ADDRESSING THE PROBLEM

As traffic congestion continues to spread across entire regions and to threaten our current infrastructure, the need for a federal presence becomes inescapable. But it is also true that there is a pressing need to determine the appropriate federal response. The reauthorization of the Surface Transportation Act provides a unique opportunity for the Congress to consider steps that can be taken to develop an effective congestion-reduction strategy. In our second study, we found that while the Department of Transportation (DOT) has conducted a number of mobility-related activities, these activities are somewhat fragmented and, therefore, the need exists to develop a more comprehensive

congestion-reduction strategy.<sup>2</sup> We further identified low-cost transportation systems management efforts and the development of advanced technologies as attractive key areas for federal involvement.

#### IVHS TECHNOLOGIES ARE PROMISING

Earlier this month, we released a report which took a closer look at the potential of IVHS to reduce congestion.<sup>3</sup> These technologies represent a range of configurations, from centralized computer systems for controlling traffic signals, to information systems that provide commuters with congestion and other travel information, to fully automated freeways that could greatly increase highway capacity.

Federal interest and support for IVHS has been increasing dramatically over the last few years. For example, in fiscal year 1990, DOT spent less than \$3 million on IVHS research, Funding in this area grew to \$20 million for fiscal year 1991. Now the Congress is considering a substantially enhanced federal IVHS program as part of the 1991 Surface Transportation Act reauthorization, which could total over \$100 million annually by

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<sup>2</sup> U.S. General Accounting Office, Traffic Congestion: Federal Efforts to Improve Mobility, GAO/PEMD-90-2 (Washington, D.C.: December 1989).

<sup>3</sup> U.S. General Accounting Office, Smart Hiahways: An Assessment of Their Potential to Improve Travel, GAO/PEMD-91-18 (Washington, D.C.: **May** 1991).

fiscal year 1994. Our study was aimed to provide the Congress with evaluative information that could be used when deciding the appropriate legislative support for IVHS over the course of the 1992-96 Surface Transportation Act reauthorization.

#### Encouraging But Limited Data on IVHS Effects

Our analysis of major IVHS research suggests that these technologies can be effective in contributing not only to improved mobility but, under certain configurations, also to safety, air-quality, and energy conservation goals. In terms of the magnitude of potential benefits, our review documented a wide range of possible effects. In general, moderately successful outcomes--ranging from 2-percent to 50-percent improvement in travel time savings--were estimated for nearer-term IVHS technologies, while more dramatic gains--such as a 100-percent improvement in freeway capacity--were predicted for highly advanced IVHS technologies.

Unfortunately, the confidence that can be placed in these estimates is limited by the lack of sound performance data, particularly for the more advanced technologies. While several field tests--such as the Pathfinder project in Los Angeles--are under way to obtain additional empirical data, our review found a need for systematic testing of a range of IVHS issues before major deployment decisions are made.

## Potential Obstacles to IVHS Success

Finally, we identified three types of barriers--cost, institutional, and technological--that need to be overcome to ensure full realization of IVHS benefits. The first of these obstacles refers to the ability of the various parties to IVHS (federal, local, and private) to financially support the development, and especially the deployment, of IVHS technologies. This barrier encompasses not only the cost burdens associated with the anticipated federal involvement but also possible resource limitations at the state and local level, as well as an uncertain consumer market. While initial funding for research and testing has been forthcoming, it is clear that a more detailed analysis is needed of the costs and benefits of IVHS before each party can be expected to commit to the \$34 billion investment that has been estimated for IVHS over the next 20 years.

Even if cost barriers were overcome, a variety of institutional issues would still need to be confronted. For this reason, the difficulty of integrating and coordinating the myriad systems, resources, and initiatives needed to plan and implement IVHS is another likely barrier. Indeed, the ability of the various institutions to work together is crucial to the success of a domestic IVHS program. For example, DOT will have to execute the complex and sensitive work of technically guiding an integrated national program while encouraging decentralized private sector

research. Further, both the government (federal, state, and local) and the private sector will have to develop arrangements that allow for cooperation in areas such as field testing.

The third obstacle to an effective IVHS program is the arduousness of setting technological standards. Since there is general agreement in the field that progress with IVHS does not depend on any major technological breakthroughs, the critical technological impediment is that of standard-setting. As with institutional barriers, resolving a lack of consensus related to standards will require cooperation and coordination among participants.

#### Federal Research and Testing Are Warranted

Because of both the promise and the uncertainty of the eventual success of a domestic IVHS program, we believe that an aggressive research and testing period is warranted in order to gain a firmer understanding of IVHS before major deployment decisions are made. In our latest report, we make three legislative recommendations aimed at ensuring that important IVHS considerations are addressed in Surface Transportation Act reauthorization or related IVHS legislation.

First, we recommend that the reauthorization legislation--including any related IVHS legislation--explicitly note the policy

goals of improvement in the areas of congestion, safety, the economy, energy, and the environment and that, within this legislative guidance, DOT be required to develop and execute research aimed at determining the role of IVHS technologies in achieving these concurrent goals. In making this recommendation, we are particularly concerned that the IVHS program more closely examine how these technologies can best be developed to maximize their congestion-reduction promise while simultaneously contributing to other policy goals such as safety and environmental quality.

Second, we recommend that the reauthorization--and any related IVHS legislation--contain guidance requiring DOT to select, design, and evaluate operational field tests in accordance with a strategic IVHS research plan. Our main interest in this regard is ensuring that operational field tests do in fact provide needed information on IVHS performance. In the face of what will be strong local pressure to use proven IVHS technologies, the role of DOT in ensuring that the newest IVHS developments be tested cannot be overstated and, consequently, needs to be recognized in the legislation.

Third, we recommend that the reauthorization--and any related IVHS--legislation include a requirement for an analysis of optimal funding options for achieving desired IVHS benefits and that such analysis include consideration of alternative federal, local, and

private partnership arrangements. The IVHS program should be designed to maximize the resource capabilities of both public and private participants and should not disproportionately distribute the cost burdens of IVHS to any participating party, be it the federal government, local governments, or the consumer.

OTHER LOW-COST STRATEGIES ARE AVAILABLE

While IVHS represents a promising area for developing a technologically based approach to congestion reduction, there are other "low-tech" approaches that have immediate application to improving mobility. Known as transportation systems management, these techniques aim at better managing existing freeway capacity (for example, by quickly clearing accidents) and at lowering traffic demand (for example, by carpooling or vanpooling).

Our preliminary analysis suggests that while federal-aid highway funds have supported these types of activities, greater attention--particularly to implementing demand management--is required to ensure sufficient use of these techniques. Nonetheless, we have found that several communities are experimenting with innovative demand management practices, such as parking management policies aimed at encouraging ridesharing and transit use. We will soon be publishing a report covering our major findings on this subject.

FEDERAL TRANSPORTATION POLICY SHOULD  
INCLUDE MOBILITY PROVISIONS

In summary, our work has highlighted both the nature and the magnitude of traffic congestion in this country and the various approaches that could be taken to alleviate the problem. The pending highway legislation represents a key opportunity to develop a comprehensive federal approach to congestion mitigation. We believe the following are elements that should be included in federal surface transportation policy:

- congestion monitoring and planning requirements, conducted as part of the metropolitan planning process;
- an aggressive IVHS testing program, conducted as part of DOT's research and technology program; and
- incentives for implementing low-cost transportation systems management techniques, such as metropolitan bonus programs or related congestion-mitigation apportionments.

While the overall effectiveness of the federal policy that is eventually developed will depend on the strength of the final combination of mechanisms chosen, we believe those mentioned above do represent the appropriate elements of a more comprehensive federal congestion-mitigation strategy.

This concludes my remarks, Mr. Chairman. I would be pleased to answer any questions that you may have.