

SUMMARY

Traffic congestion plagues every major urban area in the country, costing millions of dollars annually in lost time from delays and contributing to serious air quality problems. While many approaches to these issues have been tried - including building more roads, creating high occupancy vehicle (HOV) lanes, and promoting car pooling and public transportation - none has achieved more than modest success. Advanced Vehicle/Highway Systems (AVHS), an umbrella term for several interdependent vehicle and road technologies, offer potential for reducing congestion and the air pollution it engenders, and for improving highway safety.

The term AVHS includes technologies for:

- . automatic vehicle identification and billing;
- . weighing vehicles in motion;
- . collision warning and avoidance;
- . driver information and route guidance
- . advanced traffic operations control and optimization; and
- . automatic vehicle control - both steering and headway.

OTA concludes that AVHS technologies now available can increase roadway efficiency and throughput by 10 to 20 percent, make travel time more predictable, improve safety, and cut down harmful emissions, although by themselves they cannot solve our urban traffic problems. If road capacity is increased and road travel made more desirable, more motorists can be expected to take to the roads, counteracting some reductions in congestion. If even moderate success is to be achieved in combating these issues in the near term, other strategies, such as car pooling, HOV lanes, use of alternative fuels, congestion pricing, and other forms of transportation systems management must also be pursued aggressively.

However, emerging AVHS pose no conflicts with other traffic management strategies, can be used in conjunction with them, and indeed, may facilitate certain aspects. These multiple benefits from AVHS argue for the immediate further development of AVHS and greater investment in research, development, and operational testing. More aggressive Federal leadership in organizing and supporting research could assist States and localities in addressing urban transportation infrastructure problems. States (notably California) and some universities have established cooperative public/private programs that provide good models.

OTA finds that substantial short-term national advantages could come from Federal policies and programs to encourage implementation of advanced traffic operations control systems. Through large-scale, high-profile, government supported research programs abroad, such as Prometheus and Drive in Europe and various others in Japan and other countries, foreign transportation research has advanced far beyond that in the United States in many areas. As AVHS technologies are implemented, extensive in-vehicle and roadside instrumentation will be needed. The size of this potential market and the strong priority given AVHS abroad raise concern that the United States will lose out in developing and producing “transportation electronics” products unless steps are taken soon.

Most in-vehicle systems are dependent for successful operation on beacons, detectors, and other components based in the infrastructure and usually supplied by the public sector. Without assurance that local or State governments will equip the transportation network with such beacons and detectors, manufacturers of in-vehicle systems are reluctant to press ahead, despite the threat of foreign competition. Existing limitations on the use of Federal grant money for these systems could be eliminated, and other types of urban transportation assistance could be made contingent on the installation of these systems. Federal policies could encourage and facilitate the necessary interjurisdictional coordination between agencies that manage freeway and arterial traffic.

Federal participation in testing and demonstration programs of vehicle identification, driver information, and collision warning and avoidance technologies could speed advancement of in-vehicle equipment. Government leadership in addressing standardization issues early would also aid development of these technologies. Finally, how drivers interact with AVHS technologies is not fully understood. Attention to safety and human factors is a top priority, and active participation in these areas by Federal agencies responsible for highway safety is warranted.

OTA concludes that Federal effort and dollars invested in assisting State and local governments in moving ahead with AVHS could do double duty. They could support much needed programs to address urban traffic congestion as well as boost industry by helping create the public infrastructure necessary to communicate with advanced products that are almost market ready.