# Session Three
# National ITMS Case Studies

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### Houston Traffic Management System

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Implementing, operating, maintaining, and funding traffic management systems in the Houston area—with 560 square miles, 5 transportation agencies, and 13 municipalities—represents a real challenge from the standpoint of communication, cooperation, and coordination. Although the Houston area may not present as great a challenge as that described by Matt Edelman, it is a significant challenge. I would like to provide a brief history of the development of the traffic management systems in Houston, and the lessons that have been learned.

Traffic management systems really began back in the 1960s on the Gulf Freeway (I-45 South) with the implementation of a variety of traffic management elements, including closed-circuit television and isolated ramp metering devices along a 6 mile stretch. These systems were supplemented with call boxes, which were located along sections that were not covered by closed-circuit television cameras.

Although many of these projects may have been conceptually successful, operationally they were unsuccessful. The call boxes in the Houston area implemented in the 1960s were unsuccessful because at that time a police officer had to be present when you removed your vehicle from the freeway after an incident. If you tried to get a tow truck with one of the call boxes, a police officer had to come out first and confirm that there was a need for a tow truck before they would dispatch one. The call boxes were not located where the closed-circuit television cameras could be used to verify the need.

Accident investigation sites were also implemented along the Gulf Freeway. The accident investigation sites were located under freeway overpasses, at shopping centers, and at other similar locations. They were well lighted, signed, and provided motorists with public pay telephones from which tow trucks, police, or family assistance could be obtained. The accident investigation sites were well-utilized initially because the Houston Police Department provided good public information and education on their use. As the public information effort diminished, however, utilization of the accident investigation sites declined.

Most of these projects were removed as part of the freeway reconstruction efforts, and were not relocated until some years later. Work is still underway on the Gulf Freeway today.

In the 1970s, as travel demand started to exceed the capacity of the roadway system, congestion became a major concern for local officials. In 1979, an experiment with an HOV contraflow lane on I-45 North was implemented. This system proved so successful—it moved more people in fewer vehicles, thereby increasing the person movement capacity of the corridor and stabilizing the congestion—that an extensive system of HOV lanes has been planned, designed, and implemented. Right now approximately 47 miles of the planned 100 mile system have been completed.

Although the recession in the mid-1980s slowed growth somewhat, the demand is starting to exceed the capacity of the roadway system once again. Average daily traffic is increasing at about 3 percent a year. This has forced all agencies in the Houston area to continue looking at a variety of strategies for managing traffic. Traffic management systems represent one of those approaches.

In Houston, a regionwide approach is being taken to implement the traffic management system. This involves coordinating the activities of the Metropolitan Transit Authority of Harris County (METRO), the Texas Department of Transportation (TxDOT), the city of Houston, and Harris County. Each of these agencies have different concerns, and therefore different interests in traffic management elements. Traffic management teams have been used successfully in Houston to help coordinate the efforts of these different agencies and ensure a coordinated traffic management system. You will hear more about the use of these teams in one of the workshops tomorrow.

The first element of the system to be implemented is the freeway traffic management system. This is primarily a TxDOT and METRO project focusing on freeway corridors. A freeway corridor is defined as the freeway, HOV lane, frontage roads, and selected arterial streets. These systems are planned to include traditional surveillance, communication, and control techniques using inductive loops that detect traffic, closed-circuit television cameras to verify any problems, and changeable message signs that inform the public of travel conditions or incidents ahead.

One question that has been addressed in the development of these systems is the appropriate use of changeable message signs. Recently the use of changeable message signs for general messages and ridesharing information was discontinued in Houston. Now they are being used only to provide information about incidents, thereby increasing their target value. Ramp metering devices are also in use on selected freeways, as are lane control signals for the HOV lanes. These confirm the proper direction of travel by advising motorists with a red "X" if they are going in the wrong direction. This is important because the Houston transitways are barrier-separated reversible facilities.

METRO, in cooperation with the city of Houston, is implementing an approximately $120 million regional computerized traffic signal system that will update and modernize the region's current system. One might ask why METRO, a transit agency, is actively involved in traffic management systems. METRO is a very atypical transit authority. In addition to the traditional bus and ridesharing responsibilities, METRO has a general mobility program that provides approximately $1.4 billion per year for repaving streets, adding capacity to streets, TSM measures, modernizing traffic signals, and other similar projects. These are not the typical activities performed by a transit agency. METRO is viewed more as a transportation agency that is concerned about mobility in general.

The selection of an A&E consultant to design the central control center is currently underway. The center, which will be operated by all the agencies, is being designed by METRO and will be constructed by TxDOT. The design includes a large video display like the one at Caltrans, as well as the applications for controlling intersections like the Anaheim system.

These elements all focus on the future of the traffic management system in Houston. Current-

ly, only a computerized traffic management system on about 6 miles of the Katy Freeway HOV lane is operational. Thus, it was decided a few years ago that short-term strategies for reducing congestion needed to be developed and implemented.

Non-recurrent congestion caused by both major and minor incidents was one area targeted for these strategies. The first element implemented to address this problem was a motorist assistance program or service patrol. This program costs approximately $1.2 million per year, of which METRO contributes about $750,000. The program consists of nine vans operated 16 hours a day by the sheriff's department. The vehicles, which are provided by the Houston Automobile Dealers Association and dispatched by TxDOT, assist motorists along the most congested freeway corridors.

Non-recurrent congestion caused by traffic to and from special events was the second area addressed. By pre-planning for the events, it was believed that the resulting congestion could be reduced. Strategies such as motorist information systems, detouring traffic to utilize the available capacity of arterial streets, and operating special park-and-ride service from shopping centers have all been used successfully to help manage traffic during special events.

It also was realized that a good deal of information already exists that could be used to better manage recurrent and non-recurrent congestion. Cooperative efforts with other government agencies and their dispatch centers were explored. Essentially, this involved the collection and dissemination of information through TxDOT's interim communications center. That effort did not prove to be very successful, however, because each of the participants had their own objectives, which were primarily to manage their own fleets.

An InfoBank system, which provides information about reconstruction efforts on a major freeway facility, has been implemented in Greenway Plaza, a major suburban employment center. Monitors were installed to provide current information on incidents and recurrent congestion on the freeway. This program has been quite successful, and there are plans to expand it to the central business district and other major activity centers.

Another project underway in the Houston area focuses on the use of traffic probes on the freeways to collect information. This demonstration project, which is being conducted by TxDOT and the Texas Transportation Institute (TTI), uses motorists with cellular telephones as traffic probes. When these motorists pass specified roadside markers they enter a code into their phones, which is used by a central computer to provide real-time traffic information. This has provided valuable information prior to the completion of the computerized traffic management system. Currently, 200–300 probe vehicles are operating in the test corridor, primarily during the peak periods.

These short-term strategies for reducing congestion are viewed as the initial stages of a fully developed IVHS program in Houston. To focus those efforts, an overall program called the Houston Intelligent Transportation System (HITS) is being developed with the assistance of TTI. This will help in coordinating the IVHS efforts in the region. The result will be a single document that represents a master plan for moving forward and applying for the necessary funding.

The Houston *Smart Commuter* IVHS demonstration project also represents a major IVHS program in the Houston area. The *Smart Commuter* project has two parts. The first focuses on encouraging the use of the HOV lane for suburb to downtown trips on the north side of town, by providing real-time traffic and transit information to approximately 700 homes. The goal of this element is to encourage commuters to use the park-and-ride lots, bus service, and the HOV lane for their trip downtown. The second part of the *Smart Commuter* project concentrates on the use of HOV lanes for suburb-to-suburb trips. This will involve a computerized, single-trip carpool matching system to assist motorists in taking advantage of the HOV lane.

These efforts will represent the initial stages of a comprehensive IVHS program in Houston. A plan for the Congested Corridors Program has been submitted to FHWA. This program encompasses a large area and includes a number of transportation improvements. These include advanced traffic management systems, advanced public transportation systems, and the use of advanced traveler information systems.

TxDOT is also examining the use of automatic vehicle identification (AVI) to supplement the computerized transportation management system that is being developed. The technology could be used on both the freeways and the HOV lanes to collect current traffic information.

These IVHS efforts are not just targeted at motorists. Commercial users will also benefit through the improved movement of goods and services in the Houston area.

One of the lessons we have learned in the Houston area is that communication, coordination, and cooperation are very important. Yet, in my opinion there also needs to be a master plan that identifies what the goals are, what is trying to be achieved, what funding is available, and what the responsibilities of each agency are. Although each agency has their own goals, it is important that a cooperative approach be taken that involves all agencies and organizations. Developing an overall plan will help in this effort.

In conclusion, the complete implementation and operation of these traffic management systems is still well in the future for the Houston area. It takes a long time to design and implement these systems. Thus it is important to start using the resources currently available to initiate elements of the program, such as the provision of real-time traffic information. This will provide the public with early benefits from the system and help build public support.

## INFORM

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INFORM is a traffic information system for Long Island drivers. You may be wondering what a Long Island driver is. Although we don't tell them, anyone that drives on Long Island is a Long Island driver. INFORM grew out of an earlier public information effort known as IMIS (Integrated Motorist Information System). Because it took so long to implement the project, IMIS had developed a tarnished image. A public relations firm was hired and, working with some local people, developed the name INFORM. It is a nice name and has gotten very good press.

The INFORM corridor on Long Island is 40 miles long and about 5 miles wide. It goes from Queens in New York City, through Nassau County, and out into Suffolk County. At the far end is Hauppauge, where the control center is located. One of the things we have learned from the project is that the best location for the control center is not at the end of the corridor. In