TravTek

Robert Rupert
Federal Highway Administration

Mr. Rupert provided an overview of the basic elements of the TravTek project in Orlando, Florida. He noted that many of the presentations at the symposium have mentioned the use of in-vehicle information and guidance systems. TravTek represents the most advanced in-vehicle information and guidance system under operational testing today. Mr. Rupert covered the following topics relating to the TravTek project.

- TravTek is a public-private partnership among General Motors (GM), the American Automobile Association (AAA), the Florida Department of Transportation (FDOT), the city of Orlando, and the Federal Highway Administration (FHWA). Other major participants include: Avis Rent-a-Car, who is working with the AAA and renting the TravTek cars at the Orlando International Airport; Motorola, Inc., who is supplying the radio system used to transmit data between the Traffic Management Center (TMC) and the TravTek cars; and Magnavox, who is supplying the global positioning system (GPS) devices in the cars.

- There are three major subsystems included in TravTek. The first is the TravTek cars, which are 1992 Oldsmobile Toronados supplied by GM. Second is the TravTek information and services center (TISC), which is operated by the AAA. The third element is the TMC, which was designed under a FHWA contract and is operated by the city. The TISC serves as the "help desk" for TravTek users, with free cellular calls provided from TravTek cars. The TMC collects traffic information concerning the TravTek network, processes it to produce travel times, and transmits these times to the TravTek cars.

- The in-vehicle TravTek subsystem includes two 386-based microprocessors, each with a removable 20-megabyte hard disk. A radio system operating in the 800 megahertz range provides communication between the cars and the TMC. The cars use a system of dead-reckoning and map-matching to keep track of their location. GPS receivers are added to provide a means of correcting the cars' locations. A cellular telephone is built into each Toronado and integrated with the TravTek equipment. Buttons on the steering wheel and the visual information center (VIC) in the dashboard are the chief ways that the TravTek system interfaces with the driver. The VIC is an available option on the Toronado and houses the radio and climate controls.

- A variety of screens can be displayed on the VIC by the TravTek system. The first screen provides a "Main Menu." Options are available for viewing a map of the car's vicinity, calling for emergency services, specifying a destination, or viewing a listing of services and attractions. The user may also choose to make one of the services or attractions a destination.

- Once a destination has been selected, the user has a choice of three routing methods. The user may ask for the fastest route, regardless of road type; a route may be determined that avoids expressways; or a routing avoiding tollways may be selected. When the TravTek computers determine the routing, it is displayed to the user as a purple line overlaid on a map of the local area.

- A computer-synthesized voice also informs the driver of what the next maneuver is. All of these selections are only available while the car's transmission is in park. Once the car is taken out of park, simple screens with arrows indicating the next turn are displayed. Mileage and travel time estimates to the destination are shown, as are the distance to the turning street and its name.

- The only functions available to the driver while the car is in motion are those selectable from the steering wheel. These func-

tions include "Traffic Report," "Where am I," and "Swap Map," the last of which lets the driver switch between guidance arrow displays and a map display of the car's vicinity. If the driver misses a turn or travels off the designated route, a voice informs the driver that the car appears to be off the route and asks if a new route should be calculated. If a new route is desired, the driver would press the "OK New Route" button, and the TravTek computers will determine a new route to the destination. The "OK New Route" button would also be used if something were to occur along the planned route to significantly affect the travel time. The voice would suggest that a better route may be available, and the driver would press the "OK New Route" to see the new route.

- In addition to receiving data, the cars transmit their locations and travel times to the TMC every minute. This information is combined with information from the city's traffic signal system, FDOT's freeway system along I-4, and sources such as media traffic reporters, police and emergency agencies, and delivery companies. Travel times for segments of the roadway network, called traffic links, are processed from this information. These real-time travel times are transmitted to the TravTek cars every minute and are used by the TravTek computers in the vehicles to determine the fastest routes, locations of congestion, and major incidents. At the TMC, the TravTek operator workstation can display maps of the TravTek area. Sections of the roadways are displayed in different colors, depending upon their calculated travel times and congestion levels. The TMC operator can also display the locations of the TravTek cars and enter accidents or other incidents that impact the traffic network on the operator workstation.

In closing, Mr. Rupert noted that a fleet of 100 cars driven primarily by out-of-town visitors may not result in a great deal of quantifiable information from a traffic management point of view. However, the establishment of a TMC as a central information collection point is an invaluable resource for areawide traffic management. The city of Orlando and the metropolitan planning organization for eastern central Florida view TravTek as an element in an overall traffic management plan. Regardless of whether there are "smart" cars with which to communicate, the TMC is planned to continue operations as a cornerstone for integrated traffic management.

Transit Applications of ITMS

Ronald J. Fisher
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Mr. Fisher discussed the need to take a broad view of ITMS development. He believes that the development should not just be limited to traffic concerns, but also should include transit and other modes. During his presentation, Mr. Fisher made the following points.

- Transportation professionals face the challenge of providing good choices for improved mobility to a broad group of travelers or users of transportation services. While by far the greatest number of these travelers are behind the wheel of an automobile, the policy directions contained in ISTEA, clean air, and energy legislation strongly support developing alternatives to single-occupant vehicle travel.

- Taking a broader view of the responsibilities of transportation professionals is not new. In the 1970s the Highway Research Board became the Transportation Research Board, and in the 1980s the Institute of Traffic Engineers changed to the Institute of Transportation Engineers. Although actual practice in the field often lags behind these surface changes, transportation will continue to evolve in the 1990s to meet increasing demands and responsibilities.

- Traffic management and ITMS should encompass a broad focus. The term transportation management, rather than traffic man-