bined decisions made by the various agencies in real-time. They will include: a combined information data base, shared data among agencies (including video images), decision support mechanisms, strategies to influence route choice, and adaption of the network to conditions in real-time.

- Despite its apparent size and complexity, the Smart Corridor system configuration is rather simple. Basically, it is a network of workstations and high-end PCs; there is no large single computer at the center of the Smart Corridor project. One important aspect to operating this distributed system effectively will be to have established standard operating procedures and agreements among the participants.

Mr. Kay concluded his presentation by discussing the use of expert systems for decision support in the Smart Corridor. Some examples of potential expert system uses include arterial incident detection, incident correlation, and incident response support.

Project Development

S. Edwin Rowe
Los Angeles Department of Transportation

Following the general introduction to the Smart Corridor project, Mr. Rowe focused on the evolution of the project concept and the implementation process. He described the following major steps in the process.

- The process began in 1987 with the development of a vision for the Smart Corridor concept. At that time, the traffic conditions were getting noticeably worse in Los Angeles County and continued growth in the demand was expected. With very little new capacity being constructed, it became obvious that the existing facilities would need to be used much more efficiently. That situation led to the vision of a network of corridor integrated traffic management systems in the county. That concept, which came to be known as the Smart Corridor, drew heavily from the experiences of the 1984 Summer Olympic Games. The idea received initial approval from the Los Angeles County Transportation Commission (LACTC).

- After obtaining initial approval and preliminary funding, the project moved forward into a concept design study during 1989. That process involved detailed studies of over 40 separate functional elements that were being considered for the project. The results of those studies were summarized in a concept report that was essentially a recommendation for the system. It had a system definition, an idea of the costs, and a project plan. The report also contained the results of some parallel research conducted by several universities. The LACTC approved the project, which then went into detailed design.

- A systems manager approach was used during the detailed design of the overall program, which began in mid-1990. Much of the work and detailed design was done by the operating agencies, like Caltrans and the Los Angeles DOT. JHK & Associates, the project consultant, was responsible for the development of the computer systems and software. They were also responsible for the integration and advising of the various agencies. It was very important that all of the elements being developed worked together as an organized system.

- The project is now being implemented, and should be completely in place by the summer of 1993. At that point, the Smart Corridor will go into full operation and a year of intense evaluation. Some topics for evaluation will include the various motorist information elements, the expert systems, and the relationships and coordination among the operating agencies. In addition, there will be an overall performance evaluation of the impact on the corridor in terms of moving traffic, increasing throughput, and increasing travel time reliability. Based on the results of that evaluation, a decision will be made

to move forward with an expansion of the Smart Corridor concept into other parts of the county.

Mr. Rowe ended his discussion by describing how the coordination of traffic signals operated by different cities in the Smart Corridor was being handled. The number of participating agencies has been kept as low as possible, but there are several municipalities involved. The city of Los Angeles has a majority of the intersections in the project, but Beverly Hills and Culver City each have a string of intersections that are included in the Smart Corridor.

After looking at how to coordinate the signals operated by the different cities, it was decided that Beverly Hills and Culver City would upgrade their systems to an ATSAC-type of system. Rather than having each city develop their own control center, the actual control of the signals will take place in the Los Angeles ATSAC control center. This situation required the negotiation of operating protocols and agreements with the other cities that may provide a model for future use in other areas.

Implementation Issues

David Roper
Roper & Associates

The final panelist was Dave Roper. Mr. Roper discussed Caltrans' role in the area of traffic management, the capabilities it could contribute, and its attitude toward participating in a joint project like the Smart Corridor. The key elements of his discussion are outlined below.

- Many traffic management ideas have been tested on the Santa Monica Freeway over the years. It provides an ideal laboratory because it has the severe problems and necessary facilities for testing traffic management systems. Some of those previous Caltrans efforts on the Santa Monica Freeway included: ramp metering, changeable message signs, closed-circuit television, a traffic operations center, standard operating procedures, and incident management teams. In general, a good traffic management system existed for the freeway before the Smart Corridor project was initiated, but it was not as effective as it could have been.

- Diversion is a very sensitive issue in integrated traffic management. Caltrans and other agencies have almost always relied upon voluntary diversion, but it does not seem to work as planned. Some motorist surveys have been conducted to help understand why voluntary diversion is not very effective, and the results are very revealing. Many reasons were given for not diverting, including getting lost, concerns about personal security off the freeway, and the whole issue of credibility. As an agency, Caltrans was also hesitant about the idea of forcing diversion because there was very little information about the conditions on the surface streets, or even about its own freeways.

- It is imperative to develop staff expertise within the operating agencies for traffic management systems. Over a period of time, particularly during and since the 1984 Olympics, both Caltrans and the Los Angeles DOT developed the necessary staff for operating and maintaining the systems. In addition, a very important factor is the strong commitments made by both state and local agencies to these systems. Too often, systems are implemented without enough commitment given to their operation.

- One of the most important aspects of a system like the Smart Corridor is interagency trust. There was a history of trust between key staff members from Caltrans and the city of Los Angeles, but it had to be taken a step further. Each organization had to be willing to trust the other, because they were being asked to share information to effectively operate the corridor. Essentially, Caltrans had to give up something in the interest of the surface streets, and the city had to give up something in the operation of