TRAFFIC, which stands for Traffic Reduction and Free Flow Interagency Committee, is comprised of individuals from many different jurisdictions and agencies. It includes not only engineers, but also representatives from enforcement agencies, trucking associations, and automobile clubs. TRAFFIC was formed in 1988, and was organized around the three "Es:" Enforcement, Engineering, and Education. The initial focus of the committee was on coordinating low cost approaches to traffic management.

Much of TRAFFIC's work is carried out through the use of subcommittees. For example, the Engineering Subcommittee was responsible for the countywide traffic signal synchronization, operations, and maintenance program. The goal of this project was to establish the system and institutional arrangements for operating and maintaining a coordinated traffic signal system within the county. The first two elements of the program focused on consensus building and developing an implementation program. The third phase, which includes a pilot program, is just being initiated.

During the consensus building it became clear that one central approach for all 88 cities would probably not work. Therefore, the county was divided into smaller sub-regions that provide the focus for the project. There are currently 11 sub-regions in the county. A Signal Support Group was established to help with coordination and implementation. The emphasis was placed on the peak-period operation of the system. Several focus groups were held in the sub-regions as one technique for identifying and discussing issues and solutions.

One of the main issues in the second phase was determining where the Signal Support Group should be housed. The alternatives considered included both using an existing agency or creating a new agency. Other issues were the definition of the Signal Support Group and development of model interagency agreements for timing, operations, and maintenance of signal systems. Informational brochures, special meetings, and presentations were used during this phase to reconfirm the consensus. The final decision on the Signal Support Group was that it should be a permanent staff located at the LACTC offices. LACTC was perceived as a neutral location for the Signal Support Group and the commission represents all of the agencies. The staff for this group will be hired soon.

The pilot project for phase three, which focuses on nine cities in the San Gabriel Valley, has been initiated. $1 million in "fast start" ISTEA funding has been earmarked for this project. Now the task of the Signal Support Group is to finalize the needed interagency agreements. This pilot project is expected to provide a model for future programs.

IVHS Test Bed in Orange County

Dr. Wil Recker
University of California-Irvine

I would like to focus most of my comments on the institutional issues associated with the Orange County project. To do this, however, I would like to first provide a brief overview of the major elements of the Orange County IVHS Test Bed. This project has evolved over a 2-year period from a relatively well-defined, specific, and compact project to a larger, more diverse effort.

The program can be traced back to a Caltrans ATMS and ATIS initiative started a few years ago. The mission of this initiative was to expedite deployment of full-function advanced transportation management systems, including advanced traveler information systems, in California. A number of more specific goals were outlined in the initiative. It is important to briefly discuss these, as they influence the institutional issues associated with the Orange County project.

The first goal was to provide Traffic Operation Center (TOC) and Traffic Operations System (TOS) designers and operators with state-of-the-possible ATMS evaluations based on actual field trials. The two key parts of this goals are the use of state-of-the-possible technology and

the evaluation of these based on actual field trials. The use of the term state-of-the-possible clearly made it a research, rather than an operations, mission. However, the field trial portion of the goal identified the need to not only conduct the research, but also to actually implement a test.

The second goal was to enlist technological capabilities of private industries in California, especially those associated with aerospace and communications. This charge clearly established the need to bring high technology private businesses into the demonstration. The third goal related to forwarding the California IVHS agenda. The fourth goal was to help satisfy the implementation of the district's TOC. The fifth goal was to foster cooperation among private and public practitioners and researchers. This supported the second goal and clearly identified the need to involve both public and private sector groups in the demonstration. The final goal, which was to test new ways of doing business with the private sector, especially the aerospace industry, further encouraged this cooperation.

These goals were identified by Caltrans at the outset of the process. The California Test Bed, which is basically a research and development program, was designed in response to these. The partners in the Test Bed currently include academic institutions—primarily the University of California-Irvine, Cal Poly San Luis Obispo, and the whole University of California System through the PATH Program, Caltrans districts, local cities, and private sector businesses. The scope of the program is really two-fold. The first is to develop a very aggressive integrated research and development program. The aim of this program is to provide the capability for real-time computer assisted traffic management and communication. The second element of the program, which has evolved over time, is the development of a statewide facility to support IVHS research and development applications. This focuses on building and equipping a laboratory for IVHS research and testing.

The physical boundaries of the Test Bed currently focus on the area around Disneyland in the city of Anaheim. We anticipate implementing research addressing network-wide application within this area first. A second Test Bed focuses on the Golden Triangle area in the city of Irvine. Research in this Test Bed will focus more on corridor type applications.

There are three basic dimensions to the Test Bed. The first addresses TOC decision support. This includes developing real-time computer assisted capability to help operators make traffic operations decisions. The second is to develop strategies or venues from which operators will be able to choose appropriate treatments for the different problems. The last addresses the development of management and integration capabilities for all forms of data that will be needed to help solve these problems.

Specific research components focus on further refining each of these dimensions. The development of real-time knowledge-based expert systems represents a major focus of the TOC decision support component. Other elements include AI-type applications for incident detection. Strategies being examined include research to develop real-time capabilities on ramps and arterials, real-time provision of traveler information, prediction of individual responses to real-time traveler information, and on-line response authorization. Strategies relating to data base management and communication focus on data fusion needs, real-time acquisition and transmission capabilities, and risk, reliability, and security.

The best way to highlight the institutional issues and opportunities associated with the California Test Bed is to review the major elements in chronological order. Caltrans initiated the first discussions on the project almost 2 years ago. These informal discussions included representatives from the district offices, academic institutions, and private industry. Given these early meetings, it is difficult to separate the roles of the various participants, particularly in advancing the original initiative. However, Caltrans had been working with the University of

California on a regular basis since 1947, and decided to use the academic institutions as the lead organizations in this effort.

In September 1990, Caltrans issued a formal RFP for ATMS conceptual research proposals. Prior to issuing the RFP, Caltrans significantly increased their advanced technology budget. This may have been done in anticipation of the ISTEA programs and funding for IVHS. The RFP indicated that two to seven test packages would be funded for the fiscal year, ranging from simple TOCs to more complex integrated system elements. It was anticipated that there would be between $18 and $30 million available for these projects over a 3-year period.

In response to the RFP, the initial Advanced Test Bed Partnership was formed. This included UC-Irvine, Caltrans District 12, the city of Anaheim, and two private sector businesses—a transportation consulting firm and a major aerospace firm. This represents a real mixture of groups, with different approaches and working styles. A number of steps were taken to make this group a full functioning consortium. The first step was to establish a partnership between the universities and the operating agencies. This was done by building on existing agreements. The city of Anaheim and UC-Irvine were working on an FHWA-funded demonstration project that had already addressed many of the legal and administrative issues. Further, a master agreement exists between Caltrans and the University of California System. Under the agreement, Caltrans can quickly and easily contract with universities. This agreement was used to make UC-Irvine the lead agency. The burden of subcontracting was then with UC-Irvine rather than Caltrans.

Coordinating operations between Caltrans and local jurisdictions was also a significant issue. Again, historical cooperation, coordinated relationships, and existing agreements were used to develop the new arrangements. The final issue concerned bringing in the private sector and establishing the link between research and the technology providers. Again, existing agreements were used to develop this link. The city of Anaheim had a longstanding agreement with a particular transportation consulting firm. This firm, in turn, had an existing agreement with a major aerospace firm. Thus, a basic research program was established, tied to a research implementation program that built on the strengths of the private sector partners. This provides for an interconnected and coordinated program.

This approach provided a number of benefits for Caltrans. These included the ease of contracting, a rich history of a good working relationship with the university, the ability to sole-source subconsulting contracts, and enhanced credibility for the program. The city of Anaheim brought a state-of-the-art TMC, the start of a Test Bed, and aggressive leadership. Caltrans District 12 was a new district and the project represented a first for them. In addition, the district had aggressive young leadership who were interested in developing new and innovative projects. The private sector groups brought unique skills and the needed advanced technologies. The city of Irvine was added later as a partner using the same approach.

This group developed a conceptual proposal for Caltrans' consideration. The proposal was for a 3-year, $12.5 million program with the Institute of Transportation Studies at UC-Irvine as the lead agency. The basic research element was focused at the university and the research implementation program was delegated to the agencies and private sector partners. A formal link connected the two elements. In April 1991, a revised 3-year proposal for $9 million was resubmitted to Caltrans. This included $5.5 million worth of subcontracts to the private sector firms and the operating agencies. At the same time, Cal Poly San Luis Obispo was brought into the group.

Caltrans later split the basic research element and the research implementation program into two contracts. The basic research element moved forward first. Negotiation of this agreement occurred from June to December of 1991. At the same time, a new master agreement was being developed between Caltrans and the University

of California System. This created some delay in finalizing the agreement for the Test Bed.

The final contract for the basic research element was signed in December of 1991, however. This 3-year, $2.8 million contract established the basic research program in ATMS for Caltrans at UC-Irvine, and established a statewide Test Bed facility. From January to June of this year we have been establishing the Test Bed and negotiating the research implementation program contract. Different approaches for private sector involvement are being examined and the consortium has been expanded to include Caltrans District 7 and the city of Los Angeles.