

receive as much priority as other internal activities at each agency. Unfortunately, that is difficult because no single agency is responsible for the success of a cooperative project.

Mr. Tarnoff concluded by discussing a very common problem for traffic management systems: the lack of adequate internal staff to operate and maintain them. If internal staff is not available, the possibility of contracting out for support staff should be considered. It simply does not make sense to spend millions of dollars on systems that are not going to be properly operated and maintained.

Traffic Management Lessons

Colin A. Rayman

National Engineering Technology Corporation

Mr. Rayman has been involved with traffic management projects in several capacities. In his presentation he shared some perspectives on traffic management from personal experiences in the industry, as a client, and as a consultant. His comments are summarized below.

- One of the most important lessons in traffic management is that we never seem to learn. There are many valuable experiences out there, but we have failed to educate ourselves. That failure may be due to a competitive attitude among agencies, a lack of traffic management education at our universities, or some other reason. Whatever the reason, every time a system is implemented there is a struggle to justify its existence. There is a long history of experiences out there indicating that these systems do work.
- Integration represents a new era in traffic management systems. Because of this, there is a need for constant education and reeducation in traffic management. The program at Texas A&M University is a noteworthy effort to educate our young engineers in traffic management. The reeducation effort must also extend to our decision makers.
- While there are a lot of knowledgeable people in the field, there are also a lot of naive people. That includes agencies who think they want to implement a traffic management system, but don't really know what it involves. It also includes consultants who want to provide services, but are not capable of doing so. And finally, there are suppliers who don't know how their products can be applied effectively in traffic management systems.
- There are also some unrealistic expectations for traffic management systems. This problem exists in expectations about project costs and the implementation schedule. It is important to be very clear about what the expectations are, given the industry's capabilities.
- There is a growing assortment of exotic traffic management products. The potential exists to focus too much on the technology and lose sight of the true objectives of a traffic management system. This is a danger that we need to be aware of.
- As clients, agencies also need to be aware of exactly what they are purchasing, whether it is from an equipment vendor or a consultant. It really is common sense, but the concept of "buyer beware" needs to be emphasized.
- These systems require a champion within the agency for them to succeed. Knowledge of these systems and what they are capable of is not necessarily widespread. In order to implement and operate a system successfully, it takes someone who is willing to defend it continuously.
- It is necessary to think beyond implementation. That stage is often difficult, but one also must think about what is necessary to operate and maintain the system. In addition, there will be advances in the technology, which means continuous upgrades and changes. These projects do not end once they are operational, and that requires a long-term vision for the project.

Mr. Rayman concluded by emphasizing an important point about integrated traffic management systems. He noted that it isn't just systems working together, it is the people who must work together.

Houston ITMS

Alfred H. Kosik

Texas Department of Transportation

Mr. Kosik provided a brief case history of a traffic management project on I-10 West in Houston. He used the project as an example to discuss some of the lessons that have been learned in Texas. The highlights of his presentation are summarized below.

- The project involved the instrumentation of a 6-mile stretch of HOV lane for surveillance, communications, and control. Design work for the system began in 1982. In 1984, the project was let and computer equipment was purchased. Construction was substantially complete in 1985, but the system was not put into operation until 1988.
- The system has an assortment of surveillance and control devices, including closed-circuit television cameras, inductive loop detectors, changeable message signs, lane control signals, and an on-site control center. The system uses a distributed computer architecture, and the communications are by standard coaxial cable.
- One of the biggest problems with the project was the fact that it was designed by a committee. It was a large group that included TxDOT, Houston METRO, the city of Houston, Harris County, the Texas Transportation Institute, the Houston-Galveston Area Council, and consultants and suppliers. Because of the size and diverse nature of that group, resolving detailed design issues was very difficult.
- The project was initiated because TxDOT was planning to reconstruct I-10. However,

there was a funding shortage in the department at that time. Houston METRO had funds, and they agreed to help finance the reconstruction, an HOV lane, and the instrumentation.

- A good working relationship was developed between TxDOT, METRO, and the other participants. This was built on the previous relationships between METRO and TxDOT, which were formed during the joint implementation of the HOV lanes in the Houston area.
- Many of the problems that had to be overcome were design differences. Some specific issues that the design committee struggled with were the control system architecture, the joint chairmanship of the committee, and a proposed fast-track construction schedule that had to be coordinated with other construction activities. Developing the specifications was also a major issue.
- Some other problems were more typical of traffic management projects. For example, there was not enough consideration given to the operation and maintenance of the system during its design, the project inspectors were not familiar with either the technology or the contractors, and there were weather-related delays. Also, the contractors should have been given some flexibility to improve some of the designs if possible.