ITS Texas/TexITE
Architecture Feedback Forum
May 11, 1995
Dallas, Texas

(Summary Prepared by Jerry Werner and Herman Haenel)

Introduction and Goal of the Forum. This meeting was a follow-up to ITS Texas'/TexITE's Architecture Stakeholder Workshop that was held in Richardson, TX on March 30. At that Workshop, the architecture teams (Rockwell and Loral) had indicated that they were facing major deliverables on the architecture project this fall, and would appreciate additional stakeholder guidance and input on several key issues. Immediately following the Workshop, Richard Barber of Rockwell sent a list of issues to ITS Texas. The ITS Texas Development Task Force then met and decided to focus on two issues that directly impact state/local stakeholders: standards and deployment priorities. In addition, we distributed a concise survey to stakeholders, both prior to and during the Forum. This report summarizes the Forum discussion. Survey responses, mapped to the Rockwell issues, are included in Appendix A. Additional comments by Forum participants are included in Appendix B.

Issues Submitted by Rockwell. Below are the issues that were submitted by Mr. Barber. Those issues shown in bold print involve either standards or deployment priority issues that were the focus of the May 11 Forum. Our goal was to provide additional state/local stakeholder input to assist the architecture teams in the development of a standards requirement document that is to be completed in draft form by June, 1995.

* What is a suitable vision for ITS?
* How do you sell the ITS concept to the public sector? The private sector? To private citizens?
* To what level should the architecture design go (i.e., the TMC, the roadside, or _____)?
* **To what level should standards be defined?**
* **To what level should standards requirements be defined?**
* **What should the priority of standards development be?**
* **What should the short-term versus long-term ITS goals be?**
* **What ITS infrastructure/services/products should the public sector provide funding for? The private sector?**
* Who should own/operate/maintain ITS infrastructure/services? Under what circumstances?
* What are the institutional issues that affect public/private partnerships?
* What are the requirements for commercial vehicle operations/international border crossings? What are the institutional issues involved? How should the architecture address the tracking of HAZMAT?

- What should be included in basic (basically free) ITS services?
- **What are the differences between local/regional/national priorities?**
- What are the institutional issues of intermodalism? What elements should be included in the national architecture?
- **From your perspective, how do you envision the evolutionary deployment of ITS infrastructure/services/products over time?**
- How should the architecture affect tort liability?
- What specific issues should the architecture address relative to MAYDAY/E911 ?

Summary of the May 11 Forum Discussion

Traffic data is needed by both the public and private sectors and may serve as a good collaborative starting point. There is a need for a public/private-sector partnership to assure that the traffic data needed by both will be obtained at a reasonable cost. This need must be determined up front before the rest of the architecture is put in place. The architecture effort, working hand-in-hand with state/local stakeholders, should help determine who will gather the data and how it will be shared. For example, probe vehicles could help provide data for both the public and private sectors. However, fundamental issues must be addressed, such as:
- what part of public and private data requirements can probe vehicles provide?
- where and by whom is the probe vehicle information gathered and analyzed?
- how will that collected information be shared, and at what cost?

Early answers to this type of questions could simplify the overall architecture, help provide a "win-win" for both public and private sectors, and ensure that the architecture is deployed. If these types of issues are not addressed, architecture deployment may miss its potential and never -- or barely -- get off of the ground.

The architecture does not provide for the data needs of cities (related to city streets and arterials). One participant observed that cities have specific needs for traffic information, but that the architecture seems to be focused almost entirely on freeway data requirements. In addition, information provided to motorists will need to take city issues and constraints (neighborhood traffic, concerns about increases in crime and vandalism due to in-vehicle guidance systems, etc.) into account.

The architecture must provide leverage to state/local stakeholders. The architecture effort must provide leverage for state/local stakeholders in their current responsibilities for transportation planning, design, implementation, operation, and maintenance, by:
- providing a framework that everyone can understand and build on for all areas of ITS
- providing guidance for easy system expansion in the future
- supporting the insertion of more advanced technologies in the future
- supporting both upward and downward compatibility of components

- permitting development of standards to a level that they will make the job easier for implementation, operations, and maintenance

The architecture will need to provide specific guidelines. The architecture effort needs to provide guidelines much in the same manner as the Interstate Highway effort developed design guidelines and the MUTCD provides guidelines for the implementation of traffic control devices. Forum participants suggested that those architecture guidelines must take into account :
- what state/local stakeholder needs those guidelines must address
- the integration of the various components of the architecture
- how new parts of the architecture can be added in an efficient and low-cost manner

Vehicle-to-roadway communication is key. Several Forum participants suggested that vehicle to roadway communication is the key aspect of the national ITS system architecture.

Need better process for determining standards. One participant suggested a three-step process involving stakeholders could better identify needed standards. Those steps would be:
- Determine what the stakeholder information needs are.
- Determine where that information should come from (vehicle/infrastructure, etc.)
- Determine how that information could best be communicated.

The federal government should take the lead in developing standards needed to ensure nationwide interoperability of a core but limited set of functions (e.g., vehicle-to-infrastructure communication. This discussion was an extension of the recommendation made by state/local stakeholders at the ATMS Support Systems meeting held in Dallas on March 3 1. It may be necessary for the federal agency to make decisions that all are not in agreement. In areas not critical to national interoperability, the "marketplace" should determine if new hardware/software standards need to be implemented. This approach would support a phase-in period for new standards.

The federal government should lead this standards effort by coordinating a standards development team consisting of state/county/city agencies, hardware manufacturers and software (firmware) houses. A primary goal of this effort would be the rapid development of critical new standards, say within two years. Many state/local stakeholders were frustrated by the glacial pace of traditional standards efforts, which often drag on for 10 years or more.

Need to inventory "where we are." Several participants suggested that it is difficult to determine short-term priorities without gaining a better understanding of where various regions are in their current deployment of ITS technologies. This issue is important because it may be necessary to retrofit some/many systems to ensure that they are compatible with the national architecture.

Need public/private collaboration, not separation. One participant suggested that we are taking the wrong tack in trying to identify public-and-private-sector roles in the ITS architecture effort. He suggested first defining what we're trying to accomplish and to assume that the effort would be a joint effort. A brainstorming session between interested public and private-sector entities could then be held to help develop a "win-win" strategy for both sectors.

Everything for Everybody. Some Forum participants felt that the architecture, as it is being defined, attempts to appease every single constituent group, and thus is not creating a specific national transportation framework. The FHWA and teams seem to be going out of their way not to step on toes. For example, at the March workshop the issue of "where's the intelligence" elicited a response that the architecture would accommodate having the intelligence either in the infrastructure or in the vehicle. Forum participants felt that the lack of specific direction in this topic (and others) could make the system architecture definition irrelevant.

First must define a "Local Sphere." One participant suggested that the architecture needs to be defined in terms of a "local sphere" of functions that can be decided locally, and a set of "national communication interfaces" that the local/regional system must provide for nationally interoperable services. This conceptual description of the architecture would make it easier for state/local stakeholders to assess:
- what impact the architecture would have on their current plans, and
- what additional capability/services they must provide for national interoperability

The ITS Architecture has little impact on ATMS systems. A theme, repeated from the March 30 workshop, was that the architecture as presented by the architecture teams seems to have little impact on a regional ATMS system currently in the planning stage in the Dallas area. Prior to the March 30 workshop, one participant had been concerned that the architecture effort might adversely impact the local ATMS system deployment, but that it was clear that the national architecture is focusing on ATIS issues. Most state/local stakeholders at this Forum again repeated that the ATMS support systems effort, out of the FHWA Turner Fairbank research center, seems to address local concerns better than the national architecture effort.

The architecture must do a better job of integrating ATIS with ATMS and APTS.
The Architecture needs to consider these three as one integrated environment since they are closely interrelated today and will become inseparable in the near future. For example, the Architecture must consider vehicle guidance (ATIS) within the context of public-sector agencies' ATMS and APTS goals and capabilities, and not provide motorist information that is not safe and/or practical from ATMS or APTS viewpoints. The architecture should consider such elements as:

· system limitations and constraints (e.g., pre-timed signal systems and non-interconnected systems)
· unsafe neighborhoods (e.g., crime and vandalism)
· impact of driver route guidance on bus route adherence
· increased vehicle emissions in an area due to indiscriminate information to the motorist.

One participant suggested that the architecture needs to be relevant to both ATMS and ATIS efforts, especially since the ATMS component serves as the "framework" for many of the ATIS services.

The U.S. national ITS system architecture must be compatible with that of other countries. One participant noted that VCR tapes recorded in the U.S. cannot be played in European VCRs. Interchangeability is needed on an international basis where possible.

Sustained funding will be required for a regional, multi-agency commitment to the Architecture. Participants see the implementation of the architecture as an evolutionary process, starting out with those components that address immediate needs with new components added as they are proven and available. A "traffic management fund" needs to be established to ensure continued resources for installation, operations, and maintenance as the architecture evolves, especially if it is to reach the long-term goal of national interoperability.

Appendix B
Additional Comments by Forum Participants

From Don Cranford (Dallas County):

ITS encompasses ATMS, ATIS, APTS, CVO, etc. ITS is expected to provide over 25 "user services" in its full implementation. ITS must include private sector providers, all levels of government, transportation providers, regulatory agencies, emergency services, individual system users and others.

All of these systems, services, providers, and users require and expect to receive <u>useful information</u> and benefits from ITS.   All elements of ITS expect and deserve to have their information needs satisfied and their benefits provided efficiently, cost effectively, clearly, and simply. ITS must be flexible, open, upwardly expandable and geographically compatible.

A National Architecture must answer the following questions if it is to be the framework for implementing ITS that provides for and meets the above needs and expectations:
1. What information is needed by each system, service, operator, provider and ITS user?
2. What information/data can each system, service, operator, provider, and user provide to ITS?
3. What is the most economical, efficient and cost effective <u>source</u> for each piece of needed information, to minimize duplication and redundancy?
4. What is the most economical, efficient and cost effective way of assuring that each piece of information is delivered from its source to the system(s), service(s), operator(s), provider(s), and/or user(s) that need the information?
5. What pieces of this puzzle are necessarily public sector responsibility? What pieces have the greatest potential for private sector investment and implementation? What pieces are most cost effectively implemented through joint public/private investment and information sharing?
6. What standards are needed?
7. How can ITS be "grown" from:

> easily and immediately deployable elements that maximize the use of existing infrastructure(s) to provide some basic level of information and benefit to at least some of the systems, services, operators, providers and users.

> to:

> successively more extensive, more complete and more beneficial ITS?

Clearly, the Architecture must address these issues:

- standards development can be prioritized and initiated.
- public/private partnerships can be established.
- private sector market opportunities can be developed into products.
- public sector investment can be justified, planned and guided.
- early deployment can commence.
- risk, duplication and redundancy can be minimized.
- ITS implementation can proceed in phases and stages, over varying time frames, as appropriate to the economic, market, political and transportation priorities of different communities and regions.

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From John Blain (TxDOT Dallas District)

Let's look at the architecture as if you are responsible for the design of a new facility. In other areas of transportation planning and design, we have standards, guidelines, and criteria -- why not with ITS? The architecture needs specifics.

John Blain
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