TASK I

AUSTIN ITS ORGANIZATION AND PROCEDURES

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DEFINING PROBLEMS

This task will define transportation system problems and develop a user service plan to address them. Obtaining a wide variety of viewpoints may yield a large coalition to address common problems. Building a coalition based on the most common problems will be the basis of the initial organizational structure.

Experience of Others

The U.S. Department of Transportation (USDOT) complied a report describing USDOT sponsored activities supporting the development and deployment of IVHS. The Austin study contacted nine other cities granted early deployment studies which were named in the report. These contacts revealed the opportunities and problems they encountered. A series of questions were posed to representatives of each study. A summary of the most useful information is included as Appendix IA. A frequently used tactic to get interest in the these studies was to identify a common problem and offer a quick ITS solution. However, it was disappointing to note that many coalitions seemed to disband after the problem was solved and the study completed. It appeared that many of the studies did not address very broad issues or transportation systems. Several dealt with only one roadway or corridor. Freeway corridors were typically targeted. This appeared to limit the involvement of agencies. On the other hand, some studies developed broad plans but the agency involvement was so large, diligent churning was necessary to keep interest peaked. The consensus was that building the coalition was the most

important, time consuming and challenging task in the study. Often, it was felt that this task determined the degree of success achieved by the study.

Local ITS Stakeholders

Seventy-seven agencies agencies in the Austin area were initially identified as potential stakeholders in IVHS user services. These agencies included transportation infrastructure providers, public safety and emergency service agencies, information services, freight carriers, traffic generators, municipalities, special interest, and political representatives. A matrix was developed listing each agency and user service. Agencies were matched with user services estimated to be of interest. This matrix has been included as Appendix IB. Twenty-four agencies were initially identified for further contact. A survey was developed to identify general transportation problems and interest. Conversations among these agencies resulted in some additional agencies being contacted. Eventually, thirty-one surveys were sent out and twenty-two agencies responded. The results of the survey responses are included in Appendix IC. As a result of the responses, interviews were arranged with fourteen of the agencies. A synopsis of the interviews is included in Appendix ID.

Local Survey

The local survey identified what transportation related information agencies used an how they currently received it. The survey also asked how they would like to receive information. The survey also identified corridors and the problems on them.

Information Needs

Currently, nearly all agencies responding to the survey indicated they use transportation related information to improve performance. Accident location was indicated as the most widely used piece of information followed by congestion, construction, weather, and travel time. Most agencies get the information from radio sources followed closely by the telephone. This information is considered reliable and timely only some of the time.

Desirably, responding agencies would receive information concerning traffic related conditions including accidents and congestion. The location of the accident was most important followed by alternate routes, type of accident, location of construction, and anticipated delay. Most agencies indicated they would like to have access to this information through a computer at work. Other highly desired forms of access included radio, computer in vehicle, and changeable message signs on the side of the roadway. They desire this information continuously, 24 hours a day, every day of the week, or at least Monday-Friday. Additionally, agencies operating a fleet of vehicles feel it is beneficial to automatically locate them on the roadway.

Corridor Problems

Three corridors were highly rated as influencing performance of the responding agencies. The highest rated was IH 35 followed by Loop 1/MoPac and US 183. Other significantly rated corridors included US 290/SH 71/Ben White Boulevard, Lamar Boulevard, and Loop 360. The highest rated problems on these corridors include congestion followed closely by accidents. Construction delay, signal delay, and speeding were also indicated as regular problems. Widening the roadway, re-timing the signals, and restricting certain vehicles were selected as methods for solving these problems. Finally, the survey indicated that the state, city, and federal governments should be responsible for making the improvements.

Local Interviews

Interviews reinforced responses indicated on the survey, emphasizing the IH 35 corridor and the accidents and congestion that occur on it. Transportation infrastructure providers interviewed were concerned with upgrading the existing transportation network and the relation of ITS to the local planning and selection process. Agencies not involved in roadway transportation seemed unsure of how ITS related to their agency.

Texas Department of Transportation

TxDOT is currently upgrading US 183 and US 290 from signalized arterials to freeways. These construction improvements are expected to last for several more years. A proposed project on a section of IH 35 through downtown would upgrade lanes to current standards and construct high

occupancy vehicle (HOV) lanes and a collector-distributor street system. One proposal for improving IH 35 would drastically change the terrain within the existing right of way. Additionally, TxDOT has installed two variable message signs (VMS) on the IH 35 corridor. However, insufficient staff and lack of an operations plan results in the signs being utilized. TxDOT also has a radio license, issued by the Federal Communications Commission, to operate a county wide transmitter at 0.530 MHz on the AM band. Unfortunately, this frequency has remained idle since its acquisition in January of 1991 due to concerns over its operation. Currently, TxDOT depends on other enforcement agencies to notify them of an incident on the freeway. Enforcement agencies will usually notify TxDOT only if damage has occurred to the highway facility. This usually limits notification to major incidents.

City of Austin

The City of Austin is struggling to maintain an ever expanding roadway network. Recent Traffic Light Synchronization (TLS) grants, sponsored by the governor have resulted in many signalized corridors being retimed. Not enough grant money is available to retime a large number of corridors. One TLS grant developed incident signal timings for the frontage roads along the downtown IH 35 corridor. These plans have never been implemented primarily because no procedures were developed for implementing the timings. A more modern and responsive system for controlling the signals is also needed.

Capital Metropolitan Transportation Authority (Capital Metro)

Capital Metro is aggressively pursuing technologies to improve the transit system. Automatic vehicle location (AVL) and signal priority are top concerns. Capital Metro is partnering with public safety agencies to improve radio communications.

Public Safety and Emergency Response

Public safety and emergency response agencies are concerned with communicating with their fleet. They are also concerned with communication at the incident scene. Each responding agency operates on their own radio frequency. Communication between agencies is not usually possible unless they get out of their cars and talk to one another. Coordination cannot take place until all agencies have arrived on the scene. Police dispatchers are usually responsible for notifying other agencies. Maintenance and operations agencies do not always get notified. Many times notification occurs only after initial responders are about to leave the scene. Recently, a coalition was formed among public safety agencies and Capital Metro in order to finance a radio network backbone. A new radio network will permit units from different agencies to communicate directly with one another. Each user communicates with its own units and does not hear other users unless there is a need to link them electronically. This system will require significant capital investment.

Public safety and emergency response agencies are also concerned with locating fleet vehicles on the roadway. No agency contacted utilized a true automatic vehicle location (AVL) system. Public safety agencies are concerned over security issues of AVL. They are concerned with who will have access to the AVL information.

Additionally, emergency response providers are concerned with accidents and training personnel on proper procedures at incidents. Policing agencies are particularly concerned with response to accidents involving trucks along the downtown IH 35 corridor. Many times cargo is spilled and additional equipment is needed to clear the roadway. The four freeway lanes in each direction in this area are physically divided into two pairs. A truck accident in either pair of freeway lanes will close that section of freeway. Since one pair is an express section, with no exits or entrances, traffic can be trapped. The local police agency has recently deployed a weights and measures enforcement unit in order to reduce the number of accidents caused by trucks that are overweight or have loads that are not safely secured.

Commercial Vehicles

Freight carriers in the Austin area would benefit from improved traveler information on the transportation system in the Austin area. Freight circulates both in and through Austin. Although rail lines pass through Austin, there is no facility for unloading trailers or increasingly popular double stacked containers. Commodities may be flown into the airport, but once in Austin it must be trucked. Local businesses depend on an efficient trucking system to remain economically competitive. Local freight and commodity carriers must have real time, accurate information on the transportation system in order to deliver goods efficiently.

Truck traffic passing through the Austin area, especially originating from Laredo, is expected increase on IH 35 through Austin due to the North American Free Trade Agreement (NAFTA).

NAFTA will relax trade restrictions between Canada, Mexico, and the United States. This is expected to have significant effects on congestion, pavement, and air quality in Austin. These impacts could be mitigated through improved communications with the freight industry. Information on congestion and incidents could be communicated to freight carriers allowing them reroute and avoid delays in the Austin area.

Local Workshops

Two workshops were held in the Austin area during the study period to stimulate interest and provide input for the Austin ITS deployment plan. The first workshop was held on October 13, 1995 at the Joe C. Thompson Conference Center on the campus of the University of Texas at Austin. This all day workshop provided attendees with an overview of some ITS initiatives around the country, while the afternoon focused on ITS activities closer to the Austin area. While general support for ITS activities was expressed in the afternoon open forum, there was a fear that the institutional environment in Austin was so diverse that no decision or implementation would ever take place. Austin has witnessed the development of several good plans, few of which have ever been implemented.

The second workshop was held on January 31, 1996 and was more focused on incident management. A few agencies, including TxDOT, are trying to implement a freeway courtesy patrol. The workshop was designed to garner support from additional agencies. Although this

workshop was not specifically designed to support this study, the opinions and concerns expressed at this workshop has been considered by the investigators.

Common Concerns

Roadway incidents appear to be a concern held by nearly all agencies. Improving the response to the incident, both enroute and on the scene, could calm this concern. Training is seen by some agencies as a way of improving incident response. Many agencies have experienced turnover. Personnel are not always trained to determine which agencies require notice during an incident. Thick books with long lists of names and complicated maps of who to call have not been entirely successful in the past. Inexperienced personnel have also been blamed for closing lanes, or in some cases, entire roadways when it was not desirable. A comprehensive, up to date training program, applicable to all agencies, could improve response.

Transportation information providers have long been challenged with accurately identifying the location, severity, and duration of incidents and congestion. These characteristics are desired by nearly every agency contacted. Reports from drivers are often inaccurate and must be verified by a reliable source before the information is disseminated to others. Monitoring police frequencies is not always considered reliable. In the past, an officer on the scene has stated that all lanes are closed. However, other sources verify that traffic continues to pass around the scene on the shoulder. The officer's statement is often misunderstood that traffic is at a standstill. Telephoning the enforcement communications dispatcher during an incident is not always well received. A

stressful situation is not improved when another agency is pestering you for information. Closed circuit television (CCTV) capabilities, accessible by all agencies, could improve information dissemination. Radio stations broadcast traffic reports at regular intervals during peak periods. Most stations, however, appear reluctant to break normal programming for all but the most severe incidents. More numerous, day to day, and off peak incidents are never disseminated to the public.

USER SERVICE PLAN

Based on the information provided in the survey and follow up interviews, a user service plan has been developed. Services have been selected that will address the problems identified by the various agencies contacted. A user service plan utilizes the ITS user services identified in **Table i-1** for deployment in the Austin area. This plan indicates which ITS services are most important to the Austin area based on the information gathered in this task. The user service plan is designed to indicate services that will provide a level of satisfaction from a broad range of viewpoints. The user service plan does not necessarily list, or even recommend, specific projects. The plan provides general guidance for the types of projects to deploy. Agencies are encouraged to develop their own specific projects to meet stated objectives. The plan has broad objectives which will meet the expectations of many agencies, as well as, the traveling public. In addition, the plan prioritizes the user services into short, medium, and long term deployment.

User Service Objectives

Information provided from the survey responses and interviews identified several common problems in the transportation system. These problems can be addressed by the objectives listed below:

- improve incident traffic control,
- improve incident communication between agencies,
- improve training for incident responders,
- improve automatic vehicle location,
- improve driver information, and
- improve communications with other modes of travel.

These broad objectives can be addressed with a variety of specific projects. No single project or lump sum will fully satisfy these objectives. However, these objectives can be used by agencies as criteria for implementing projects. These objectives can be met by deploying projects providing specific user services in the short, medium, and long term.

Short Term Plan

The short term plan recommends user services that should be included in projects deployed in 1-2 years. These services are critical for future success of ITS and provide the most cost effective benefits. Short term deployment should include:

- pre-trip and en-route driver information system,
- a roadway incident management plan for the IH 35 corridor, and
- develop a roadway incident management training curriculum.

Medium Term Plan

The medium term plan recommends user services which will require significant investment. However, these services will benefit broad array of users. The following user services should be included in integrated deployment in 2-5 years:

- advanced traffic control system,
- advanced public transportation management system,
- advanced commercial fleet management system,
- advanced emergency management system

Long Term Plan

The long term plan recommends a reevaluation of the user service plan in 5-10 years. This implies that the plan will change from time to time as user needs and the technology to satisfy them changes. Long term recommendations include:

- evaluate user service objectives and plan and
- deploy additional services as technology becomes available.

INSTITUTIONAL FRAMEWORK

ITS service objectives can not be met unless ITS services can be integrated into projects through the local project planning process. Some type of institutional framework or comprehensive, multi-agency process for integrating ITS services into the local planning process is necessary. Somehow ITS must fit into the existing project planning and selection process.

Project Planning and Selection Process

The existing project planning and selection process is a complicated task involving technical and non-technical concerns of coalitions. Coalitions consist of both public and private entities. Local transportation infrastructure providers, such as TxDOT, Travis County, City of Austin Department of Public Works and Transportation, and Capital Metropolitan Transportation

Authority (Capital Metro), currently provide funding for projects through a network of planning and selection processes. Federal assistance is usually filtered through TxDOT to the local agencies, including the MPO, Austin Transportation Study (ATS). A variety of federal, state, and local taxes provide the capital necessary for most transportation projects. Projects seeking Federal assistance are generally ranked according to established technical criteria. Projects funded solely by a single entity are not always selected according to technical criteria. Coalitions lobby these agencies to address their transportation concerns. Many times a project making good technical sense is thwarted due to a successful lobby by a coalition. On the other hand, coalitions are successful influencing projects for selection apparently having little technical merit.

Existing Coalitions

There are several existing planning coalitions in the Austin area which could provide an institutional framework through which ITS user services could be integrated into the existing project planning and selection process. In addition to coalitions among public transportation infrastructure providers, such as the local traffic management team (TMT), many more coalitions exist in the private sector.

Downtown Coalitions

Coalitions among downtown Austin businesses have existed for quite some time. Most businesses realize the importance of an efficient, reliable transportation system to deliver goods and services. The downtown central business district (CBD) is one of the most heavily congested

areas in Austin. These coalitions are usually concerned with mobility, the ability to get from point A to point B. CBD coalitions are often influential in the project planning and selection process since so much of the area's economy is located in the CBD.

Neighborhood Coalitions

Neighborhood and community coalitions are also popular in the Austin area. These coalitions are most influential in the project planning and selection process when there is a question of safety. Safety of children and the effects of transportation improvements on schools always get the attention of planning and selection officials.

Environmental Coalitions

Environmental coalitions are also active in the local project planning and selection process. These coalitions have been successful influencing projects even after they are already under construction. Roadway projects have been stalled in the planning process or in some cases halted in the middle of construction until their concerns have been addressed. These coalitions are concerned with the effects of transportation projects on air and water quality, as well as, wildlife habitat.

These are certainly not representative of all the coalitions in the Austin area. There are many more. A few have been discussed to illustrate a point. An ITS coalition will have plenty of stiff and organized competition. ITS services can not be successfully integrated into the planning and selection process on a large scale by merely forming another coalition lobbying its agenda. ITS

services can be integrated easily into the existing planning and selection process by using these services to support the efforts of existing coalitions. An example of this can be illustrated using an existing framework for project planning and selection used by the transportation infrastructure providers mentioned before.

Planning and Selection Framework

ISTEA, in addition to providing grants for ITS, mandated that states shall develop, establish, and implement six management systems. These systems included pavement, bridge, safety, congestion, public transportation, and intermodal management. The Metropolitan Planning Organization (MPO) in Traffic Management Areas (TMA), areas with population in excess of 200,000, were required to develop the congestion management system (CMS). Additionally, States were required to develop traffic monitoring systems. Congress has since suspended these mandates, however, the planning organizations in the Austin area have found these systems can provide a framework for planning and selecting projects. These management systems provide a process for collecting and organizing transportation related data. This data is used in the local planning process to evaluate projects.

Four of these systems can be easily supported by ITS user services. Travel and Traffic Management services can be used to support the objectives of the Congestion Management System (CMS). Public Transportation Management services obviously support the Public Transportation Management System (PTMS). Electronic Payment Services and Commercial

Vehicle Operations can support the objectives of the Intermodal Management System (IMS). Emergency Management and Advanced Vehicle Safety Systems can support the objectives of the Safety Management System (SMS).

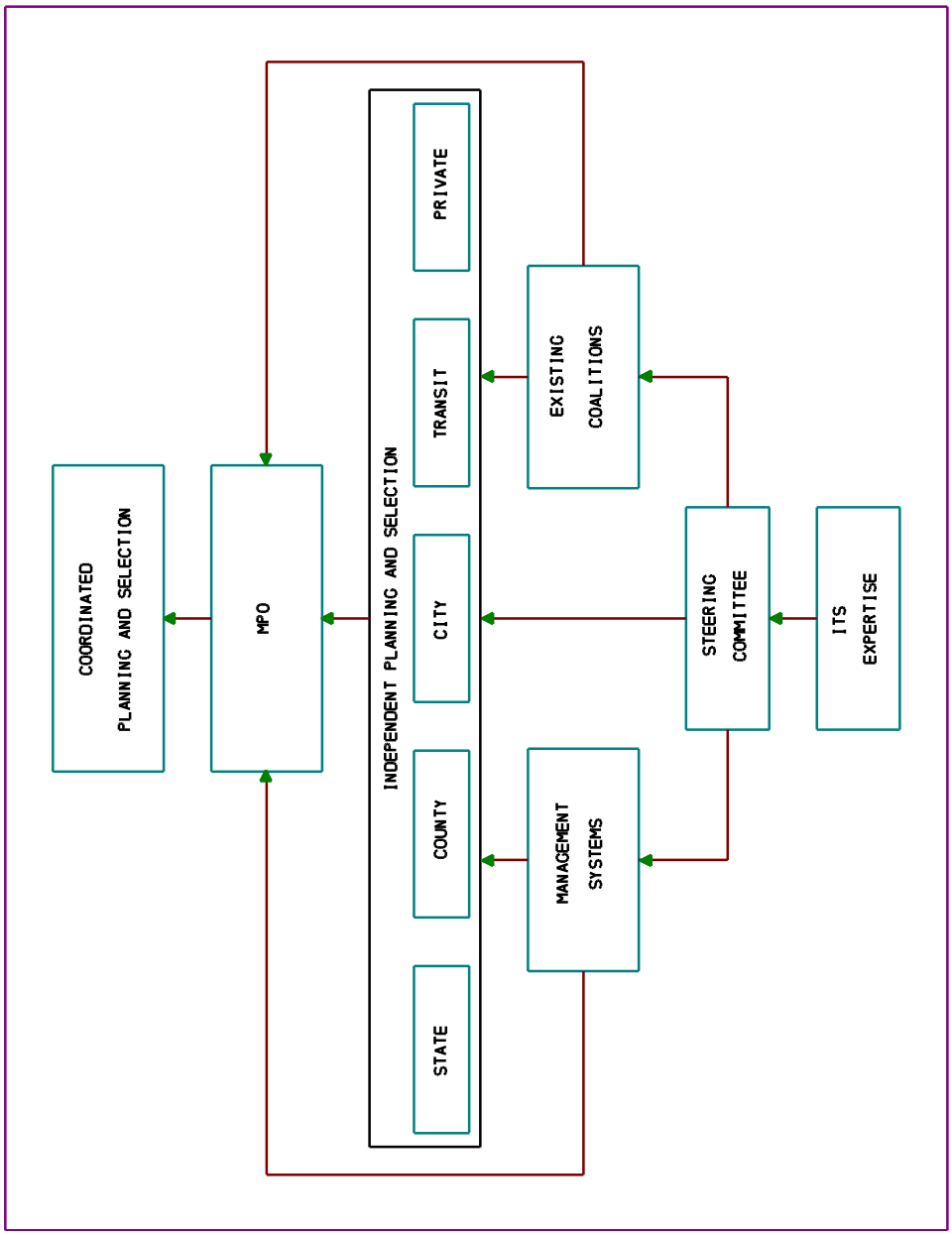
ITS services should not be used to replace existing frameworks for project planning and selection. ITS can be best integrated into existing project planning and selection processes by supporting already established institutional frameworks. This process can be illustrated as shown in **Figure I-1**.

Although public and private coalitions, operating under existing frameworks, exist in the Austin area, ITS is not well understood by them. A broad based steering group will be needed to facilitate the existing institutional framework.

Local IVHS Steering Committee

The Texas legislature enacted Senate Bill 383 in 1993. This legislation requires a state agency that is advised by an advisory committee to adopt rules that state the purpose of the committee, describe its task, and the manner in which it reports to the agency. The Texas Transportation Commission identified advisory committees established in accordance with this legislation through Minute Order 103067. Local IVHS Steering Committees are identified in this minute order. Portions of this minute order relating to the local IVHS Steering Committee are included in Appendix IE. The rules stated in the minute order are minimum requirements. Advisory

committees are free to adopt additional governing rules that do not conflict with those established in Minute Order 103067.



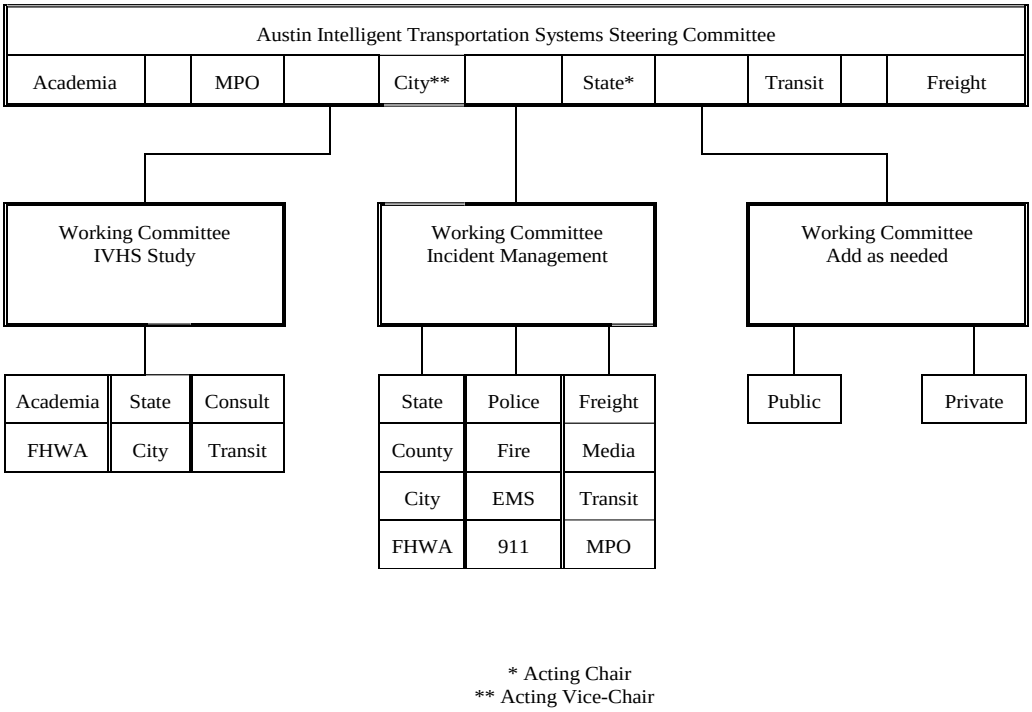
Local ITS Integration_Figure I-1

IVHS is an evolving tool for agencies to use. IVHS must remain flexible and able to change with the local environment in which it is used. ISTEA has placed more emphasis on multiple mode of travel. Intelligent Transportation Systems (ITS) is a title that has steadily replaced IVHS. ITS reflects the evolving multimodal nature of the local planning process. Therefore, it is recommended that the local IVHS steering committee be titled Austin ITS Steering Committee.

The local ITS steering committee may be subject to the golden rule of government. The golden rule holds that "he who has the gold rules". Representation on the steering committee should include local infrastructure providers. These providers usually possess the required resources. The State, City, Transit, and MPO, agencies have indicated an enthusiastic response to planning and deployment of ITS user services. Additionally, ITS technologies have undergone considerable research by private and academic institutions. Local Austin academic institutions have participated in this research. Representation from academia could provide important information from this area of ITS. The effect of freight transportation in Austin has been discussed earlier. Representation from this transportation sector could facilitate improved freight operations. The steering committee can serve as an administrative funnel for ITS technologies in the Austin area. Only single representation from agencies is required. The problem solving should take place in working committees or groups that report to the steering committee.

Working committees are where the technical expertise for local ITS technologies lies. Working committees are where you will find multiple representation from a single agency. This is where deployment issue will be brought to the surface and discussed. At least two working committees

can be envisioned for immediate deployment. This study should comprise one of the committees. The other committee should be formulated to address the short term goal to develop an incident management plan. A recommended organizational diagram is shown in **Figure I-2**.



Local ITS Steering Committee_Figure I-2

The ITS steering committee representatives should participate on other existing coalitions or committees. When a need arises that can be addressed though ITS, the vice-chair could call a meeting of the committee to discuss the issue. If needed, the chair could form a working committee to study the issue and make recommendations for the committee to consider.

Steering Committee Roles

Chair

- Create working committees
- Coordinate working committees

Vice Chair

- Call the meetings
- Provide minutes of meetings

Working Committee

- Provide technical expertise
- Recommend solutions to Steering Committee

Steering Committee Responsibilities

- Texas Senate Bill 383, 73rd Legislature, 1993
- TxDOT Minute Order 103067 dated December 22, 1993
- No more than 24 members
- Private sector must be represented
- Must meet once a calendar year
- Must have a quorum to vote
- Must elect a chair and vice chair by a majority vote

References

Specific citations were not utilized in this section, however, the following documents contain general information used to formulate recommendations made in this task. The reader is encouraged to become familiar with these documents.

IVHS Planning and Project Deployment Process, Federal Highway Administration, Version 1.0 April 1993.

IVHS Architecture Development Program, Interim Status Report, IVHS America, April 1994.

National Program for Intelligent Vehicle-Highway Systems (IVHS), Volume 1 and 2, Federal Highway Administration, Draft May 1994.