PROJECT # 8
Task 2 - Traveler Information Services (TIS)

A Definition of Goals for the I-95 Corridor TIS System

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1. <u>INTRODUCTION</u>

This Working Paper, the second in a series of six, summarizes the results of Task 2-Define TIS Goals-of the Traveler Information Services (TIS) Project. This paper is submitted to the Project's Technical Review Committee (TRC) for review and consensus. The TRC's comments, recommendations, and assigned action items wlth respect to this paper will be analyzed and substantively included in the Final Report for this Project.

1 .1 <u>PROJECT OBJECTIVES</u>

The f-95 Traveler Information Services Project is an ATIS implementation tailored to the unique needs of the Northeast Corriir. The project is designed to acquire and disseminate information on roadway traffic conditions, and other pertinent transportation information throughout the Corridor. It will utilize a variety of static and dynamic information ranging from transit schedules and call-in reports to real-time traffic monitoring data and transit status information. TIS will ingest, aggregate, and fuse these data in a database architecture that supports dissemination through a variety of communications systems and services to help travelers in the l-95 Corridor choose the most efficient transportation modes and/or routes.

This Projects objectives are:

+ To present a conceptual design and requirements for a Corridor-wide TIS; and

+ To identify opportunities and principles for private/public partnering in providing Traveler Information Services.

1.2 <u>TASK 2 OBJECTIVES</u>

This task's purpose is to define, in consultation with the Technical Review Committee, a set of clear, concise, realistic, and obtainable goals for the l-95 Corridor Traveler Information Services system.

The goals discussed in this paper are the I-95 Corridor Coalition's members' goals for Traveler Information Services in the Corridor. They are distinct from the needs of travelers for information; these were discussed in Working Paper 1. Task 3--Requirements Analysis-of this project depends heavily, indeed critically, on the needs developed in Task I and the goals developed in Task 2; thus, the goals defined here, together with user needs, form the foundation of subsequent design tasks.

The goals defined need to be consistent with the Coalition's mission and objectives. The goals also need to consider the views of all involved parties. Goals are important not only because they will set the context for subsequent requirements and design tasks, but also because they clarify expectations, provide measures of progress and performance, and provide feedback and recognition for accomplishments.

Because the scope and boundaries associated with the kinds of information available in a TIS are vast, this task first addresses the various kinds of information that the TIS is capable of compiling and distributing. Next, this list is prioritized and a consensus proposed that identifies TIS "basic" elements or those elements with the highest priority. The highest-priority items on the list will be pursued in the earliest implementation of the Traveler Inforrnatiin Services system. Lower-priority items on the list are likely to hinge on areas that require further technical research or are items that are applicable only to specific Coalitiin members or private entities.

1.3   TASK 2 ▬▬▬ROACH

Task 2 was conducted according to the following five steps:

- ● Research of existing literature on TIS goals, including:

    - Analysis of the Coalition Business Plan to derive the Coalition's early thoughts on TIS goals and to ensure consistency with the Coalition's mission and objectives.

    - Analysis of the Strategic Plan for Intelligent Vehicle Highway Systems (IVHS) in the United States.

.   Review of the National Program Plan for IVHS.

•   Review of various other research and survey documents relevant to TIS goals.

+   Formation of "strawman" TIS goals and objectives.

+   A survey of Coalition members to ascertain their views.

+   Development of a candidate set of goals.

+   Ranking of the candidate goals.

As depicted in Figure 1-1, the Loral Team's approach to defining goals is centered on defining
goals with good characteristics", and on working closely with the Technical Review Committee for
consensus. A goal with 'good characteristics" is a goal that is specific, challenging, yet realistic
and obtainable.
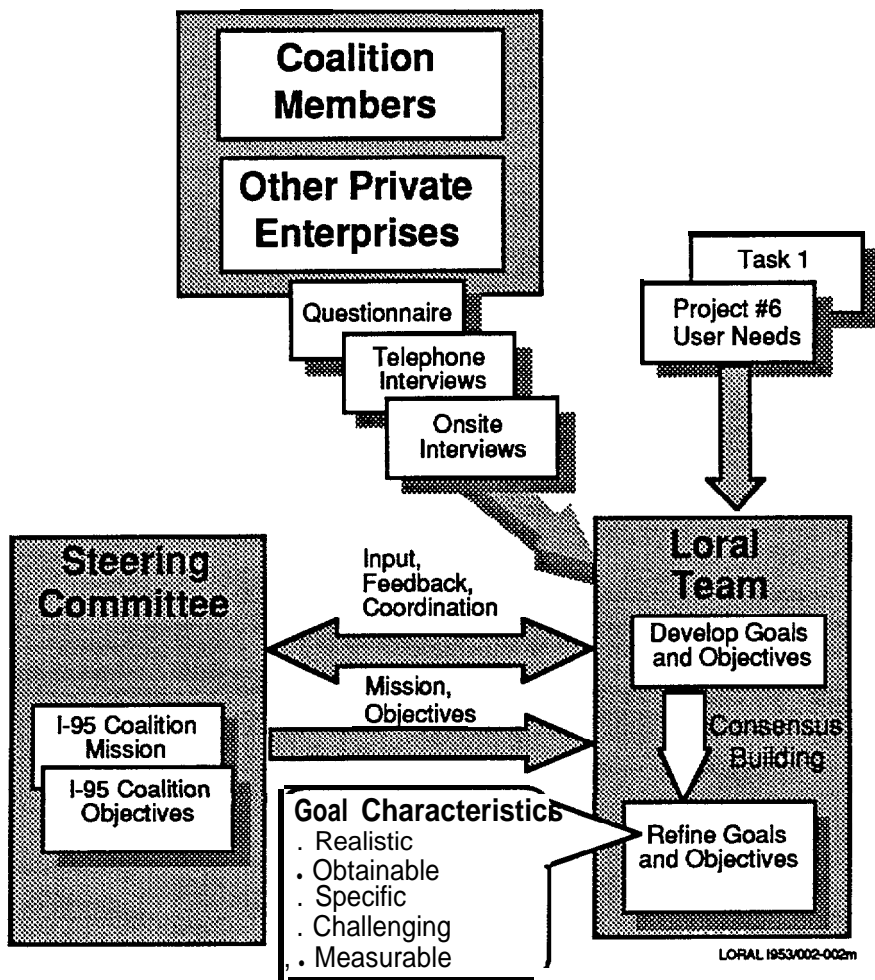
Figure   1-1.   Loral Team Goal Setting Process

1.4 ORGANIZATION OF WORKING PAPER

This Working Paper is organized to follow the logical flow of the steps listed above. Section 1-Introduction-provides an overview of the project's and this Task's objectives and approach. Section 2-Literature Review-reviews and recapitulates in summary form, existing research on goals for a Traveler Information Services system. Section 3-Survey Results--presents the results of our survey of Coalition members. Section 4-TIS Goals-sets out the candidate goals and objectives we propose for a Corridor Traveler Information Services system. Section 5-Conclusion-describes our approach to priiritizing and finalizing the goal set, and building consensus for them.

2.0 <u>LITERATURE   REVIEW</u>

In this section, we discuss the results of our literature review. The literature review was performed to ensure that TIS goals would be consistent with other Federal, Corridor, and State ITS goals.

2.1   <u>REVIEW OF EXISTING LITERATURE A N D RESEARCH ON TRAVELER INFORMATION SERVICES GOALS AND OBJECTIVES</u>

Efforts to define comprehensive intelligent transportation systems have resulted in the publication of numerous documents. Many of these documents include discussions of goals and objectives. Several of these documents were selected for review and a synopsis of the goals and objectives found in the documents are presented here. The following documents were reviewed:

+   Corridor Coalition Business Plan.

+   Strategic Plan for IVHS in the United States.

+   National Program Plan for IVHS.

Additionally, a literature search of the Reach Network of ITS America was done. The results are presented in Section 2.6.

2.2 <u>I-95 CORRIDOR COALITION BUSINESS PLAN</u>

The I-95 Corridor Coalition Business Plan provides a series of goals and objectives derived from their mission. The Corridor Coalition mission is defined as an effort to ' Work cooperatively to improve mobility, safety, environmental quality and efficiency of interregional travel in the Northeast through real-time communication and operational management of the transportation

system. In so doing, the coalition will seek to establish an economically beneficial, multimodal framework for early implementation of appropriate IVHS technology."

The objectives associated with each goal form a foundation for defining how system development, operations, maintenance, and evolution need to be addressed. The goals presented by the Corridor Coalition emphasize the need to define a partnership to coordinate the development of the system across state and regional jurisdiction. A summary of objectives and their related goals is presented in the following text.

The first major goal is to enhance the capabilities of transportation agencies within the Corridor to effectively manage nonrecurring incidents which disrupt the transportation system. Although this goal is mainly supported by Project #2, Incident Managment, TIS plays a significant role by informing motorists of incident locations. Objectives associated with this goal are:

+ Ensure rapid-response to incidents and the anticipation of congestion by recommending and advising travelers of the delay or to otherwise revise their travel plans.

+ Serve as a coordinating facility for assisting in responses to major incidents.

The next major goal is to improve environmental quality in the Corridor. This goal will help achieve conformity with the federal air quality standards established as a result of the Clean Air Act, and will be achieved through the following objectives. This goal is established mainly through implementation of TIS, which aims to:

+ Reduce congestion by influency mode, route, or travel time changes.

+ Reduce traffic congestion and other factors that contribute to mobile source emissions.

+ Contribute to the attainment of federal and local air quality standards by managing passenger and freight traffic in an environmentally sensitive way.

The third major goal is to cooperatively develop and assist in the operation of an interregional traffic and travel information network. This goal will focus primarily on communicating traffic, construction, incident, and weather information and is supported by the following objectives.

+ Coordinate the management of facilities and the delivery of traffic/travel information across jurisdictional and modal boundaries - The system should appear 'seamless" to the user, providing information on the entire Corridor from any point within the Corridor.

+ Monitor and help coordinate individual systems operated and maintained by individual states, local authorities, local jurisdictions and private entities.

+ Coordinate the integration of local IVHS systems which remain under the jurisdiction of individual states or operating authorities.

+ Coordinate analysis of current and anticipated future user needs for both personal travel and commercial vehicle traffic within the corridor.

+ Link to the individual traffic operations centers of all members of the coalition to receive messages on current and anticipated traffic conditions on major facilities from all agency jurisdictions within the Corridor.

Providing Traveler Information Services is a goal of the Corridor Coalition. These services include providing trip planning support and real-time information to motorist and to public transit users at home, on the toad, and in major activity centers. Objectives which will be addressed are:

+ Monitor the operation of these facilities so that a optimum use is made of existing available highway and other modal capacity under varying conditions of traffic demand.

+ Effectively integrate information about other modes, particularly air and rail information, with operational information of the highway system.

+ Make available timely, accurate, multimodal information on traffic and travel conditions between key points in the Corridor to both private travelers and commercial operators of both passenger and freight transportation services.

+ Maintain and disseminate information on travel conditions, by other modes, within the Corridor.

The goal to implement IVHS technologies through the use of advanced technologies for integrated, real-time traffic control and provide in-vehicle traffic information and route guidance will also enable the Corridor to act as an operational test bed to evaluate other IVHS technologies as new technologies evolve. Objectives to be fulfilled in reaching this goal are:

+ Provide a foundation for the continuing, effective application of advanced technology within the Corridor as a whole.

+ Establish central real-time IVHS "clearinghouse" function, designed to facilitate the coordination of traffic communications and traffic operation strategies/actions within the Corridor on a real-time basis, and to collect and disseminate real-time information on travel and conditions by all modes.

+ Disseminate real-time information on traffic conditions to other control centers, user facilities, and personal users via radio, TV, satellite, telephone, or other means.

The last goal listed is the development of a Corridor-wide partnership which will foster cooperative relationships among all involved transportation organizations. The program will be designed so it maximizes stable funding available through the IVHS Corridors Program and the increased flexibility of state, federal, toll agency, and private sector funding options provided by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. In addition to addressing joint funding issues, the program will provide for information gathering and sharing, joint procurement, and will address areas of mutual interest in meeting the transportation needs of the Corridor. The objectives listed which will support reaching this goal are:

+ Coordinate operations of all major highway traffic facilities over the length of the corridor including all segments of I-95 itself plus critical elements of the adjacent free and toll highway systems and related elements of other transportation systems.

+ Development of any necessary interagency cooperative agreements, uniformity of institutional approaches and commitments needed to operate and manage the Corridor program successfully.

+   Coordinated planning, implementation, and operation of IVHS systems to help meet these needs throughout the Corridor.

2.3 <u>STRATEGIC PLAN FOR INTELLIGENT VEHICLE-HIGHWAY SYSTEMS IN THE UNITED STATES. MAY 20. 1992</u>

The Strategic Plan for IVHS emphasizes nationwide goals and objectives presented at a high level. They are not specific to a particular system or region in which a system is being implemented. As such, they address areas of national interest including developing a viable IVHS-based industry, expanding the capabilities of existing transportation organization, and developing an institutional structure for technology development and deployment. The objectives associated with achieving the Strategic Plan goals are provided in the following text.

+   Develop a viable and profitable U.S.- based IVHS industry.

    .   Establish a U.S.-based supply industry for in-vehicle IVHS hardware and software.

    .   Establish a U.S.-based supply industry for IVHS infrastructure hardware and software.

    .   Establish a U.S.-based IVHS transportation services industry.

    .   Achieve a substantial market penetration in the U.S by U.S based industry of IVHS hardware, software, and services.

+   Focus the transportation profession, expanding the capabilities of existing transportation organizations, and bringing new organizations into the transportation field.

    .   Develop new transportation educational programs in support of IVHS

    ·   Educate a new generation of transportation professionals.

    ·   Integrate those professionals into public, and private sector transportation organizations.

.   Utilize the technical skills and technologies of the national labs and the defense
industry to advance IVHS research, development and deployment.

+   Develop and demonstrate a new institutional structure for technology development
and deployment in the U.S.

·   Develop new modes of operation among organizations at all levels of government
involved in IVHS.

.   Develop new modes of cooperation among private sector organizations
participating in IVHS.

.   Develop effective public/private/academic partnerships in support of IVHS
research, development, and deployment.

The Strategic Plan indicates that there are wide-ranging benefits to achieving the objectives and
fulfilling the goals laid out in the strategic plan. These benefits are important because they impact
all states and jurisdictions. The I-95 Corridor Coalition's implementation of an IVHS system will
realize these benefits for the Corridor. The Strategic Plan indicates that in addition to the
improvements in productivity, the reduction of air pollution, and the reduction of traffic
congestion, additional jobs may be generated, safety enhancements will be available to both the
urban and rural areas, efficient running of public transit systems will enable their use, and
tourist/recreational attractions will benefit. The financial benefits derived from additional jobs,
energy savings, increased productivity, and safer operations will benefit the areas implementing
IVHS.

2.4   NATIONAL PROGRAM̶̶̶̶̶̶̶̶̶̶̶ INTELLIGENT TRANSPORTATION SYSTEMS, VOLUME 2

The National Program Plan for Intelligent Transportation Systems also takes a national view of
goals and objectives for implementing Intelligent Transportation Systems. The Plan's goals and
objectives used the ISTEA goals as a basic framework and those set forth in the ITS America
Strategic Plan for Intelligent Vehicle-Highway Systems and the U.S. Department of
Transportation's (DOT) IVHS Strategic Plan. The Plan provides a comprehensive list of high level
goals and objectives which form a foundation set of goals upon which project specific goals can
be added. The majority of these goals were found in the other documents reviewed.

The number one goal of the Plan is to improve the safety of the Nation's surface transportation system and reduce the number and severity of fatalities and injuries on the roadway system. The other five goals listed include increasing the operational efficiency and capacity of the roads, reducing energy and environmental costs, enhancing productivity, enhancing personal mobility, and creating an environment in which the development and deployment of ITS can flourish. A synopsis of the objectives, as they relate to the individual goals, is listed here.

+   Improve the safety of the Nations Surface Transportation System and reduce the number and severity of fatalities and injuries on the roadway system.

·   Assist the driver in avoiding collisions.

·   Monitor and advise the driver (or others) on the condition and safety readiness of the vehicle, driver, and driving environment.

.   Enhance driver and vehicle performance and driver response to hazardous situations.

.   Reduce stress associated with travel in unfamiliar or congested areas.

+   Increase operational efficiency and capacity of the Surface Transportation System.

.   Reduce disruptions caused by traffic incidents.

.   Improve level of service and convenience.

.   Provide information for route adjustment.

.   Improve traffic flow.

.   Rapid response to traffic incidents.

.   Improve time predictability.

.   Reduce Energy and Environmental Impact by working to achieve energy, environmental, and Clean Air Act goals.

· Reduce congestion through improved traffic control, incident reporting and routing information.

. Provide traveler information on public transit availability so the traveler has greater ease and confidence in using different routes and modes.

+ Enhance productivity for individual, private, and commercial entities.

. Reduce transportation costs for all users of the surface transportation system.

· Maximize the use of current facilities and reduce the needs to finance new facilities.

. Support just-in-time delivery via efficient transportation systems.

· Implement electronic services to reduce time delay imposed by collecting fares, tolls and parking fees.

. Improve productivity and minimize costs by reducing the time spent in congested traffic.

+ Create an environment in which the development and deployment of ITS can flourish.

. Support the establishment of a significant U.S.-based industry for hardware, software, and services that can achieve substantial domestic market penetration and a strong international presence.

· Diversify and redirect the transportation profession.

. Support the transportation needs created by the North American Free Trade Agreement.

The goals and objectives of the Plan focus on the development of interrelated services and capabilities created and deployed as building blocks. In establishing the goals and objectives on a nationwide basis, common characteristics and features are intended but the building blocks will be combined in a variety of combinations depending on the needs of the area being served. The goals and objectives for a specific area will be added to those listed here.

2.5 LITERATURE SEARCH OF REACH NETWORK

The literature related to ATIS identified through the search of the Reach Network provided information about specific projects and studies. While there were many articles relevant to this project, a sample review of three articles is included here. These articles did not present a comprehensive review of goals. Rather they discussed project specific objectives which relate to goals mentioned in the National Program Plan for ITS. They are being included in this section to give a flavor of other high-level TIS related goals and objectives in use by other projects.

2.5.1 Dulles Area ATIS

The Dulles Area Advanced Traveler Information System is a proposed public-private partnership which will provide TIS information to travelers going to Dulles Airport in Northern Virginia. The objective of the system is to provide information for pretrip planning and enroute travel. The proposed system will collect and consolidate information from public and private sources, analyze the data, and transmit it to the public using a variety of communications channels. The objectives supported by this system support the goal of providing timely and accurate access to information on transportation, including routes, congestion, alternate modes, and intermodal connections.

2.5.2 SmarTraveler

The SmarTraveler service provides free, real-time route specific, traffic and transit information to travelers in the Boston metropolitan area via telephones. The TIS information is provided through audiotext and contains condition and incident information for more than 20 monitored highways but does not provide alternative routing information. The SmarTraveler service fulfills some of the objectives listed for the goal to provide timely and accurate access to information on transportation, including routes, congestion, alternate modes, and intermodal connections. While the SmarTraveler service does not provide the full range of ATIS services needed its use rate is growing, especially during periods of adverse weather conditions.

2.5.3 Travlink

The Travlink Concept Definition and Preliminary System Design provides an overview of the Travlink System. The Travlink System is an integrated Computer Aided Dispatch/Automatic Vehicle Location (CAD/AVL) system. The system distributes real-time and static transit and traffic information to travelers. A primary objective of the system is to determine the extent to which improved information can assist travelers with trip-making decisions and influence travel behavior. It is designed to encourage commuters to consider alternatives to single-occupant travel. Other objectives are to improve fleet management for better on-time performance, to provide better incident management, and to increase security for transit passengers and bus drivers.[l] The objectives of the Travlink System address four of the goals recommended for the l-95 Corridor Coalition, improving traveler safety, enhancing productivity, providing timely, accurate information, and enhancing modal and intermodal travel.

3. <u>SURVEY RESULTS</u>

The purpose of the TIS goal survey was to understand the importance of each Traveler
Information Service, as defined in the Task 1 -- Inventory of Traveler Information Services and
Commercial Opportunities in the I-95 Corridor deliverable, by the various Coalition member
agencies. In this section, results to the survey are presented. The results of this survey were
then used to flesh out and prioritize the Candidate TIS Goals, presented in Section 4.

3.1 <u>TIS SURVEY RESULTS</u>

The Task 2 Goals and Traveler Information User Services Questionnaires were sent to 37 Coalition
member agencies and four selected Transit Agencies (reference Appendix A for agency point of
contacts). The Transit Agencies included Southeastern Pennsylvania Transit Authority (SEPTA),
New Jersey Transit, Philadelphia International Airport, and the Maryland Mass Transit. Of the 41
agencies surveyed, there were 30 respondents; a 73.17% response rate. Table 3-1 provides a
brief summary of the types of agencies surveyed and their respective response rates. Since the
questionnaires were distributed to various public and private agencies, the questionnaire results
will, in some cases, be reported by transportation agency type (e.g., DOT, Authority, Affiliated, or
Transit Agency). Responding Affiliated Agencies included Amtrak, the Federal Highway
Administration, the Federal Railroad Administration, the Federal Transit Administration, ITS
America, the National Private Truck Council, and the U.S. Dept. of Intermodalism.

Table 3-1.   List of Respondents

Agency Type	Number of Respondents	Number Surveyed	Percentage Responding
State Departments of Transportation	10	14	71.43
Transportation Authorities	10	12	83.33
Affiliated Organizations	7	11	63.64
Transit Agencies	3	4	75.00
TOTAL	30	41	73.17

Figures 3-1 through 3-24 provide graphic profiles of the questionnaire results. The results are presented in both a raw data and a prioritized data format. The prioritized results were ascertained from the raw results by accumulating, averaging on a scale of 4, and sorting the raw results for each questionnaire question. Results from each of the following questionnaire categories are reported (reference Appendix B for a sample Goal Questionnaire):

1. TIS Goals

2. TIS Traveler Information User Services

3. TIS Output Devices

Figures 3-1 and 3-2 provide TIS Goal results obtained from all respondents. The information presented in the figures indicates the following:

+   Enhancement of urban and interurban corridor road travel is the highest priority TIS goal. Approximately 64% of all respondents ranked this goal as high.

+   The second highest priority TIS goal is to improve corridor environmental quality. This goal was ranked high by 61% of all respondents.

+   Ranked just slightly lower in priority, the third and fourth highest priority goals are enhancement of modal and intermodal travel for urban and inner-city mass transit, and promoting TIS and its use to demonstrate the benefits of using an ATIS, respectively.

+   The lowest priority goal, ranked as low by 64% of all respondents, was to contribute to/organize revenue generating schemes to supplement TIS funding.
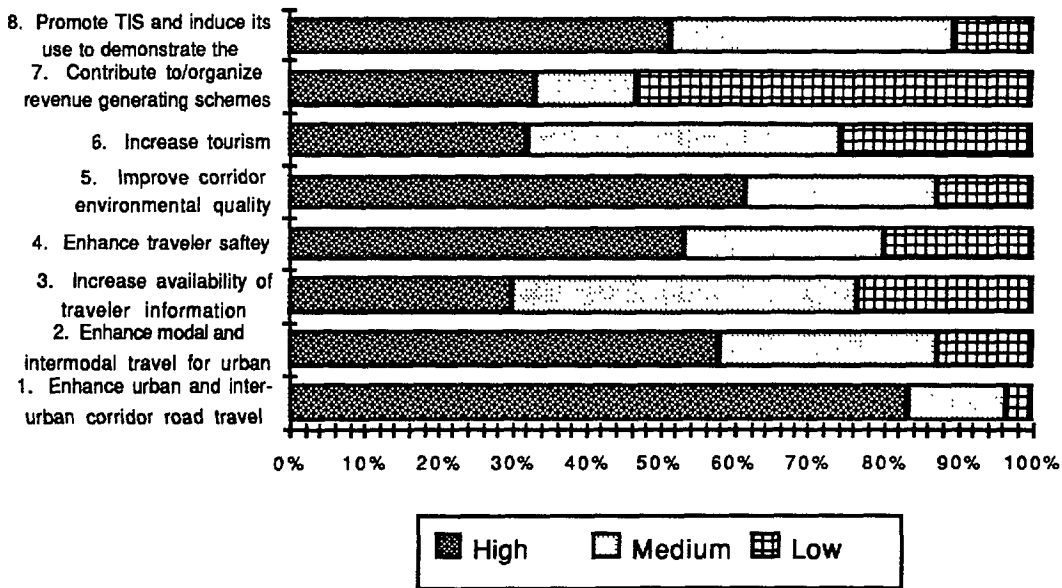
Figure 3-1. TIS GOALS - A Profile of Raw Data From All Respondents
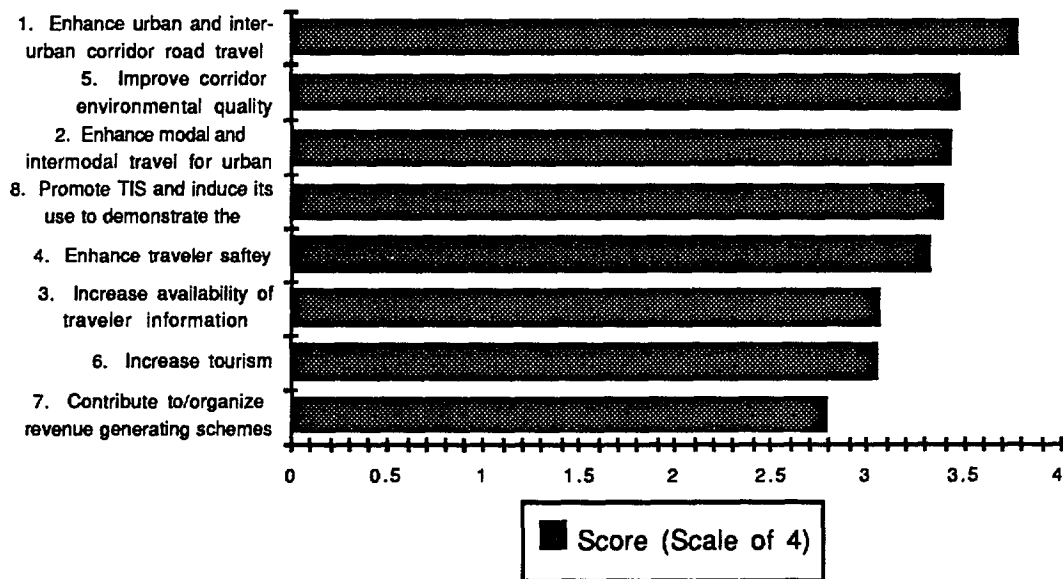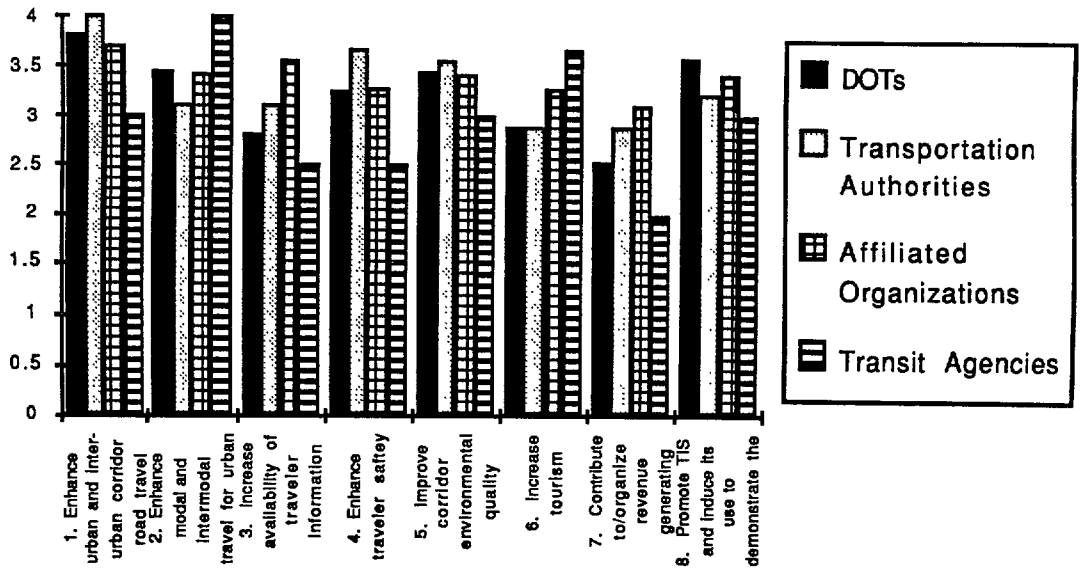

Figure 3-2. TIS GOALS - A Prioritization From All Respondents

An additional goal, ranked as high by one respondent, was to provide commercial vehicle operations services. This goal did not explicitly appear in the questionnaire; however, the respondent provided it as an "Other" desirable goal.

Figure 33 charts the TIS Goal results per transportation agency type (e.g., DOT, Authority, Affiliated or Transit Agency). This information enables one to clearly see which TIS goals are most and least important to the various types of transportation agencies.Informatbn presented in Figure 3-3 is summarized below:

+   The highest priority TIS goal, enhancement of urban and interurban corridor road travel, was almost equally important to DOTS, transportation authorities, and affiliated organizations. The goal, however, was not as important to transit agencies.

+   As expected, enhancement of modal and intermodal travel for urban and inner-city mass transit was ranked the highest by transit agencies. Assigning it a slightly lower priority ranking than transit agencies, DOTS, and affiliated organizations viewed this goal as equally important. Transportation authorities viewed the goal as least important.

+   Improving corridor environmental quality was ranked similarly to the goal of enhancing urban and interurban corridor road travel. DOTS, transportation authorities, and affiliated organizations viewed the goal as almost equally important. Again, the agency assigning this goal its lowest priority ranking was transit agencies.

+   The goal consistently viewed as having the least importance was contributing to/organizing revenue generating schemes to supplement TIS funding. This goal was viewed as decreasingly important by affiliated organization, transportation authorities, DOTS, and transit agencies, respectively.

+   Of the four transportation agency types surveyed (e.g., DOT, authority, affiliated, or transit agency), transit agencies provided the lowest ranking for six of the eight TIS goals. The two goals not ranked the lowest by transit agencies were the enhancement of modal and intermodal travel for urban and inner-city mass transit, and the increase of tourism. In fact, transit agencies provided a higher ranking for these two goals than any of the other types of transportation agencies.

Figure 3-3. TIS GOALS - A Prioritized Comparison Among Responding Groups

♦ Overall, the least amount of variance in the ranking of the goals appears to be between the DOTs and affiliated organizations. On an average, these organizations viewed the importance of the goals very similarly. After DOTs and affiliated organizations, and with a slight increase in the variance of ranking the goals, were transportation authorities. The largest amount of variance in ranking the goals was provided by the transit agencies. As noted above, transit agencies ranked six of the eight goals, a considerable amount lower than any of the other transportation agencies.

Figures 3-4 through 3-11 present raw and prioritized data for each of the TIS goals from each of the various transportation agency types (e.g., DOT, Authority, Affiliated, or Transit Agency). This information is provided to enable a better understanding of and to show how different types of transportation agencies rank the different goals.
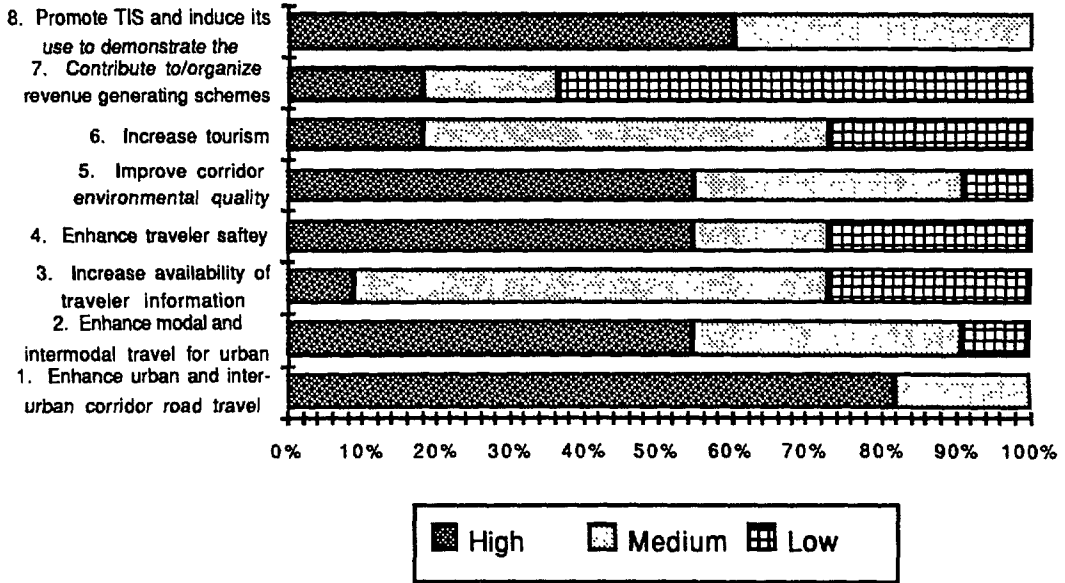
Figure 3-4 . TIS GOALS - A Profile of Raw Data from DOT Respondents
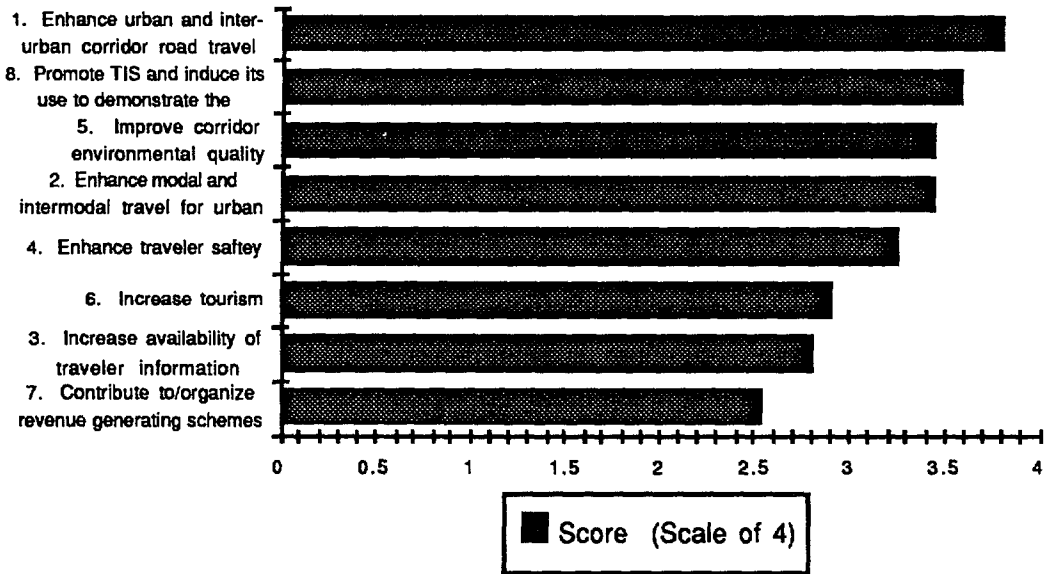
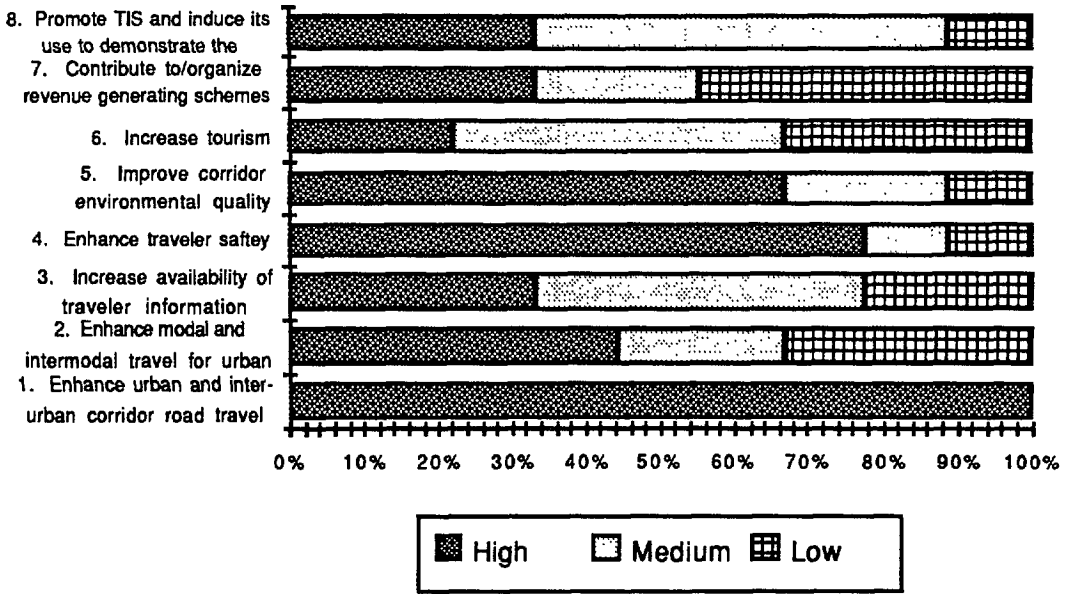**Figure 3-5. TIS GOALS - A Prioritization from DOT Respondents**

Figure 3-6.   TIS GOALS - A Profile of Raw Data from Responding Transportation
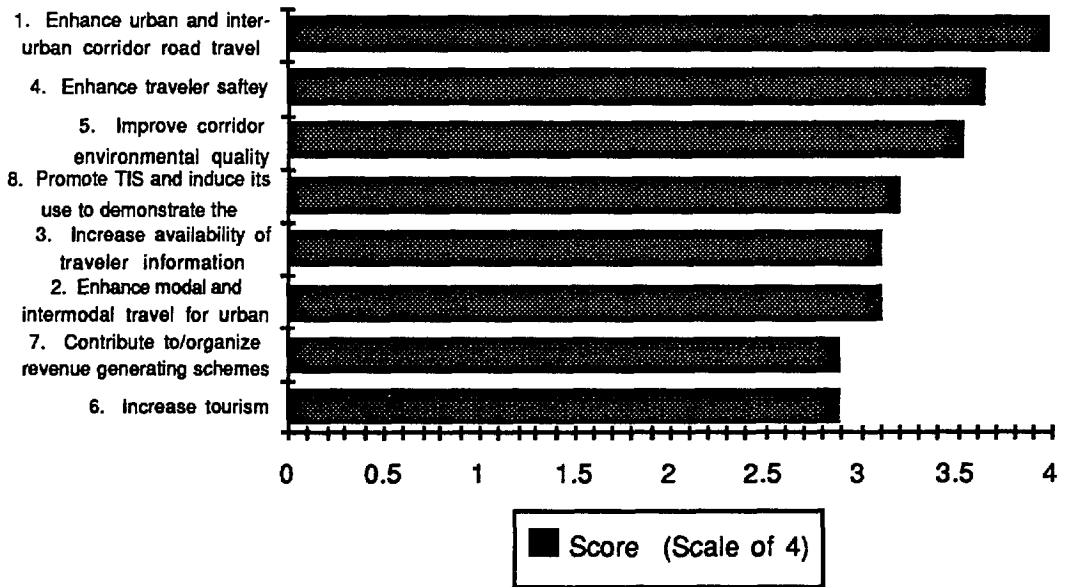Authorities

Figure 3-7.   TIS GOALS - A Prioritization from Responding Transportation
Authorities

8. Promote TIS and induce its use to demonstrate the
7. Contribute to/organize revenue generating schemes
6. Increase tourism
5. Improve corridor environmental quality
4. Enhance traveler saftey
3. Increase availability of traveler information
2. Enhance modal and intermodal travel for urban
1. Enhance urban and inter-urban corridor road travel

0%   10%   20%   30%   40%   50%   60%   70%   80%   90% 100%

■ High   ▨ Medium   ⊞ Low

Figure 3-8.   TIS GOALS - A Profile of Raw Data from Responding Affiliated Public and Private Organizations

1. Enhance urban and inter-urban corridor road travel
3. Increase availability of traveler information
8. Promote TIS and induce its use to demonstrate the
5. Improve corridor environmental quality
2. Enhance modal and intermodal travel for urban
6. Increase tourism
4. Enhance traveler saftey
7. Contribute to/organize revenue generating schemes

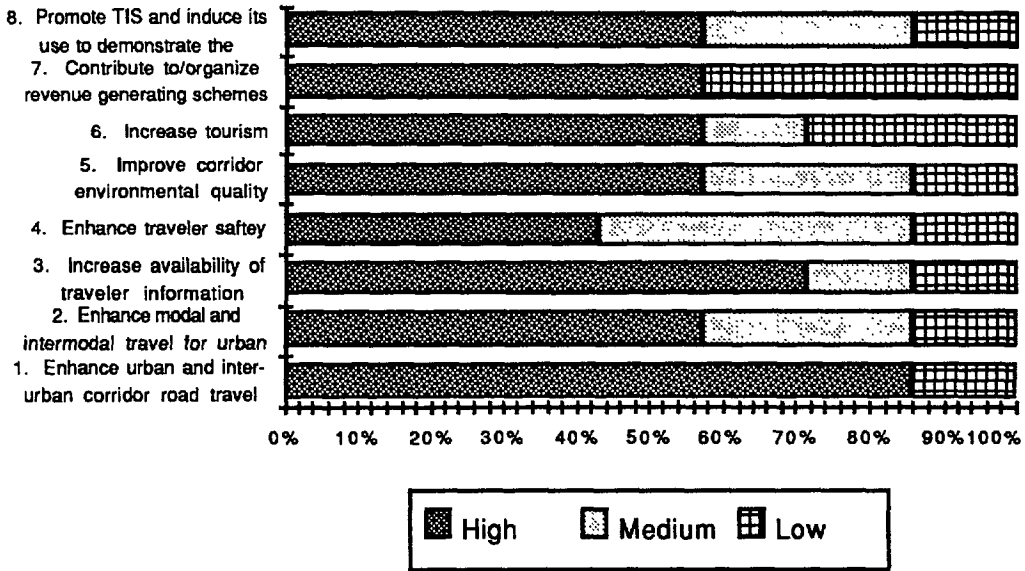0   0.5   1   1.5   2   2.5   3   3.5   4
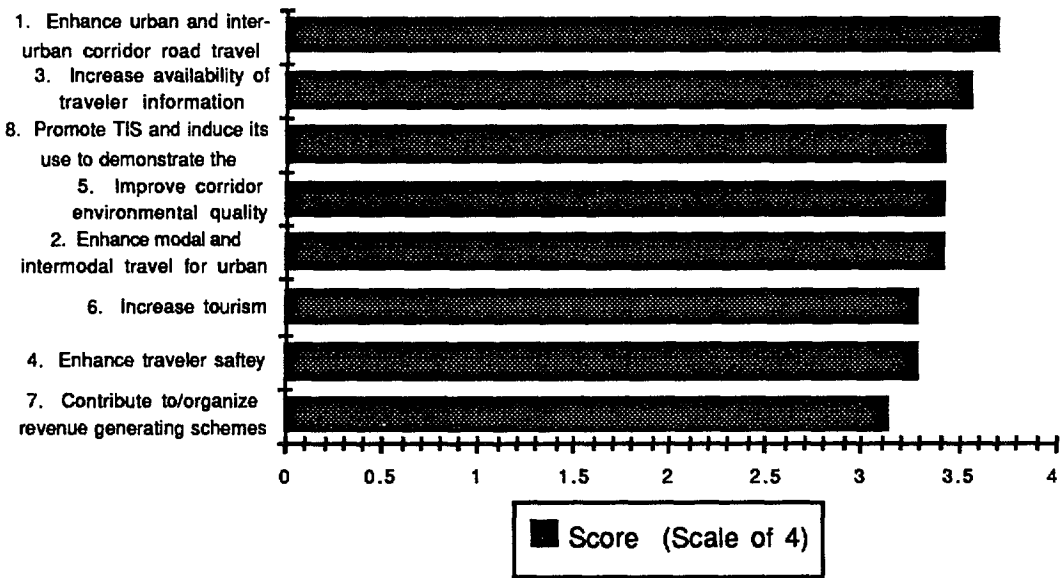
■ Score   (Scale of 4)

Figure 3-9.   TIS GOALS - A Prioritization from Responding Affiliated Public and Private Organization
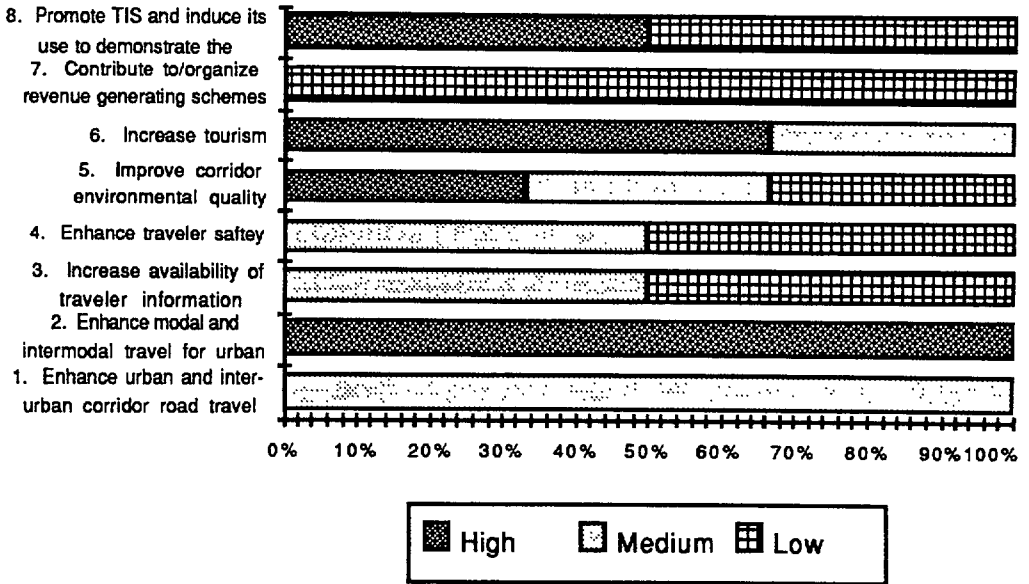
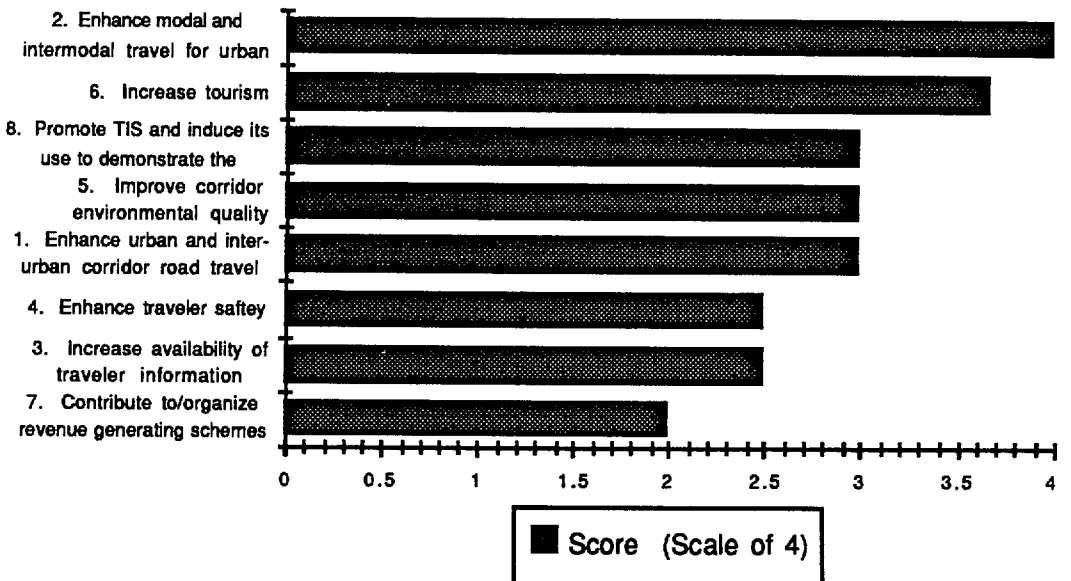*Figure 3-10. TIS GOALS - A Profile of Raw Data from Responding Transit Agencies*

Figure 3-11. TIS GOALS - A Prioritization from Responding Transit Agencies

3.3   TIS TRAVELER INFORMATION USER SERVICES SURVEY RESULTS AND RANKINGS

In the following subsections, an analysis of the results for the various types (e.g., Road and Traffic Information, Static Transit and Modal Information, Real-time Transit and Modal Information, Miscellaneous Transit and Modal Information, and Traveler Services Information) of Traveler Information User Services is provided. The results presented are results from all respondents; they are not categorized by transportation agency type. The results are presented via a raw data chart and a prioritized data chart for each type of Traveler Information User Services category. Later in this analysis, Figure 3-22 provides a chart that prioritizes all user services across all categories.

3.3.1   Road and Traffic Information

Figures 3-12 and 3-13 present results indicating the importance of providing various types of road and traffic information. The results are summarized below:

   ♦   Providing Real-Time Incident/Congestion Summaries to travelers was viewed as the most important road and traffic information that could be provided. This information was ranked as high by 87% and as medium by 3% of all survey respondents.

   ♦   Ranked slightly lower in priority than Real-Time Incident/Congestion Summaries was Providing Traveler Advisories (e.g., variable speed limits, dangerous road conditions...). This information was ranked high by 72% and medium by 22% of all respondents.

   ♦   Providing Road Weather Conditions (e.g. , temperature, precipitation, rain, snow, ice) and Providing Construction Summaries were equally ranked and of next highest priority. Each of these were ranked as high by 50% of all respondents.

   ♦   Providing Road Specific Environmental Conditions (e.g., carbon monoxide, nitrous oxide, particulates) was ranked as the least important information to provide. This service received a high ranking from only 9% of all respondents.

Other road and traffic information suggested by respondents to be supplied to travelers include the following:

♦ Road restrictions for over-limit trucks (height, width, weight).

♦ Travel time comparison to transit modes of transportation.
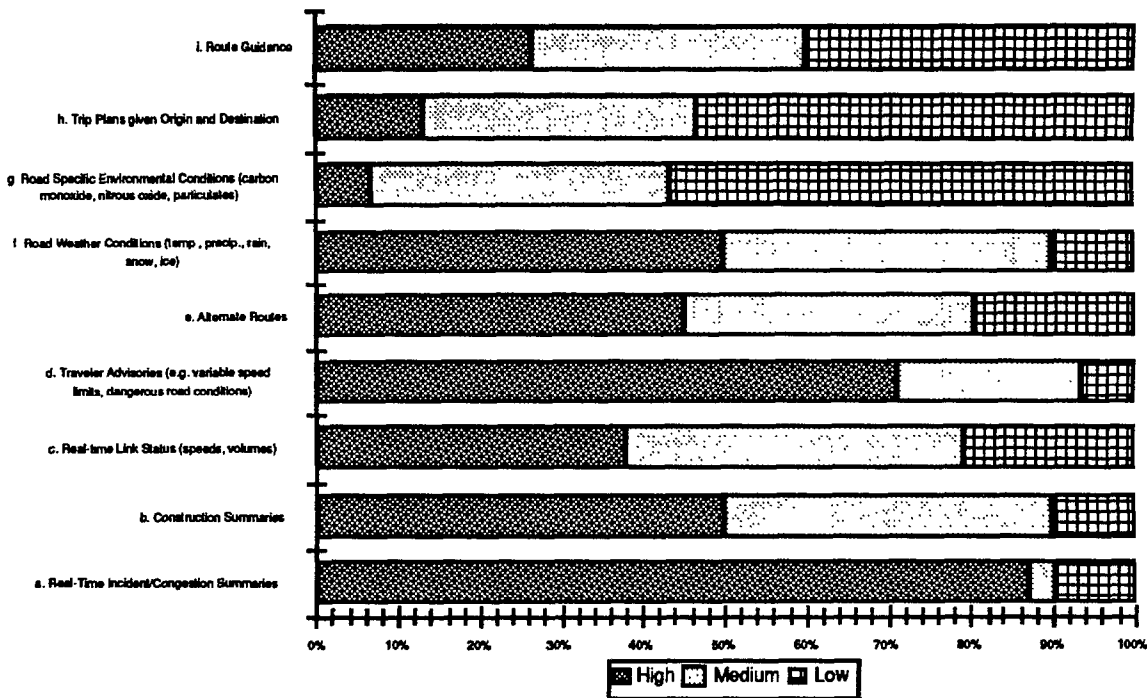

Figure 3-12. Traveler Information User Services for Road and Traffic Information - A Profile of Raw Data from All Respondents
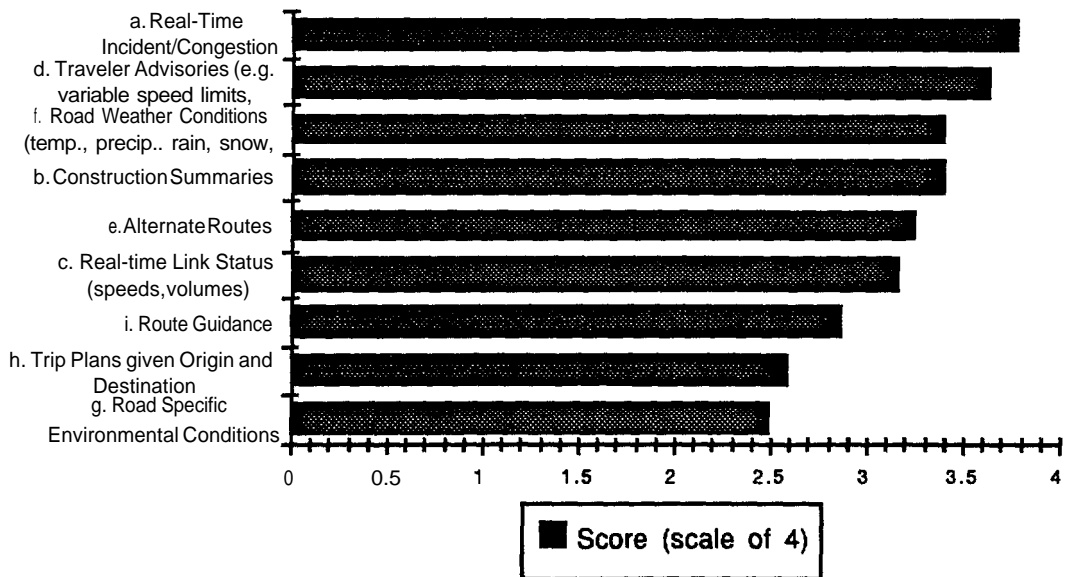
Figure 3-13. Traveler Information User Services for Road and Traffic Information - A Prioritization from All Respondents

3.3.2 Static Transit and Modal Information

Figures 3-14 and 3-15 present results indicating the importance of providing Static Transit and Modal Information. This information consists of schedule, route, and fare data for busses, trains, subways, airlines, and ships. Information provided in the figures indicates the following:

+ Not surprisingly, providing schedule, route, and fare information for busses, trains, and subways ranked higher than providing the information for airlines and ships. Providing the information for busses, trains, and subways were ranked as high by 59%, 53%, and 40% of respondents, respectively. Providing the information for ships was indicated to be least important; only 14% of respondents ranked this as high.

3.3.3   Real-Time Transit and Modal Information

Figures 3-16 and 3-17 present results indicating the importance of providing Real-Time Transit and Modal Information (e.g., bus, train, air, and ship location information). The results pertaining to this type of information are summarized below:

♦   Prioritization of the Real-Time Transit and Modal Information is the same as the Static Transit and Modal Information except that providing the information for airlines and subways have traded places. For real-time purposes, providing information for airlines is ranked higher than providing information for subways. From highest to lowest priority, providing real-time information for the different modes of transportation is ordered as follows: busses, trains, airlines, subways, and ships. These modes of transportation received high rankings of 52%, 48%, 31%, 28%, and 23%, respectively.

Figure 3-14.   Traveler Information User Services for Static Transit and Modal Information   - A Profile of Raw Data from All Respondents

Figure 3-15. Traveler Information User Services for Static Transit and Modal Information - A Prioritization from All Respondents
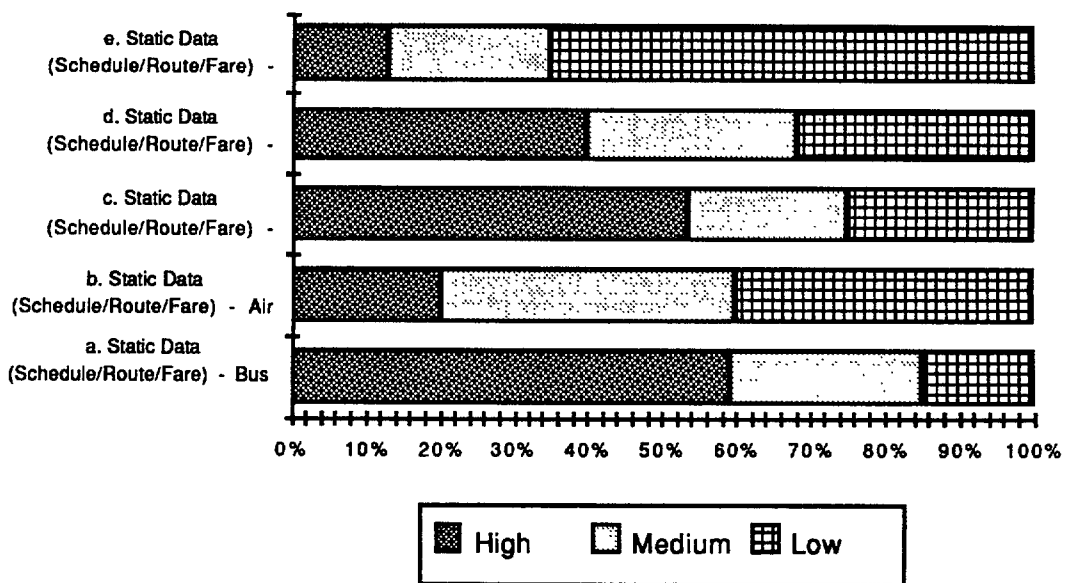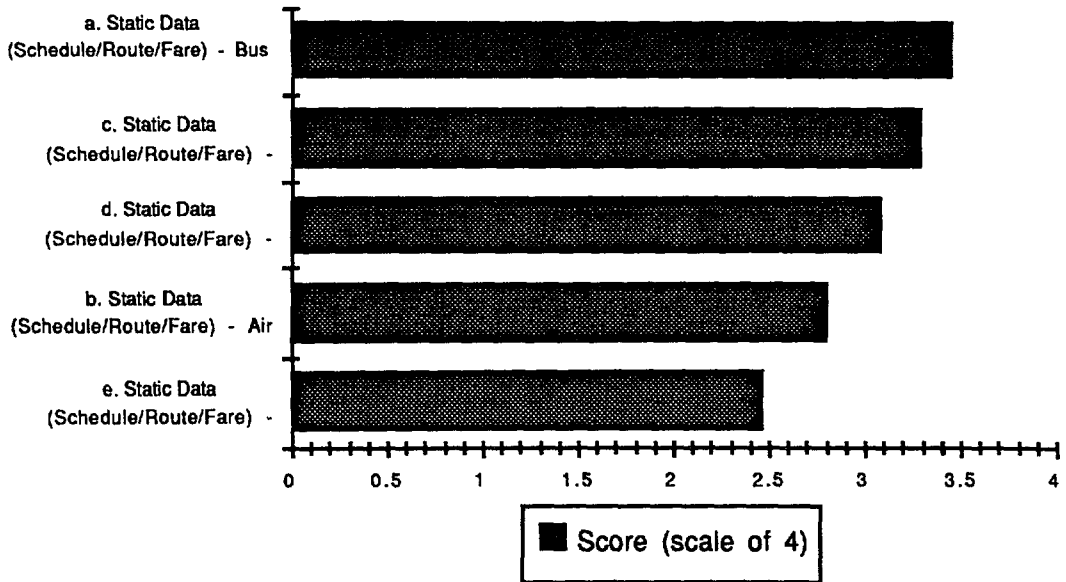
Figure 3-16. Traveler Information User Services for Real-Time Transit and Modal Information - A Profile of Raw Data from All Respondents
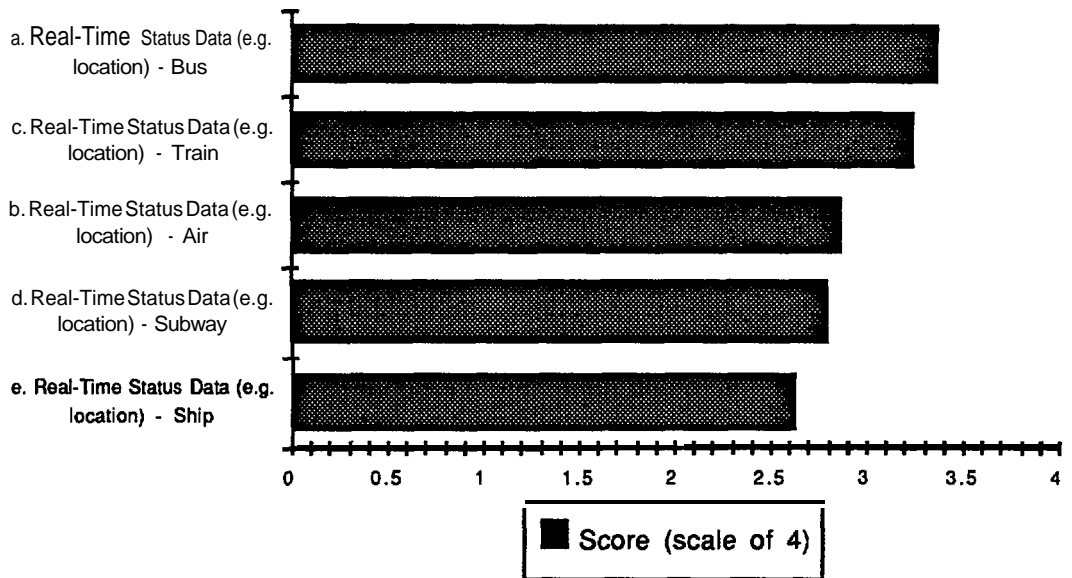
Figure 3-17.   Traveler Information User Services for Real-Time Transit and Modal Information - A Prioritization from All Respondents

3.3.4 Miscellaneous Transit and Modal Information

As outlined in the questionnaire, Miscellaneous Transit and Modal Information consist of the following: 1) ParaTransit Services (e.g., car/van pooling, ride sharing, taxis, subscription busses); 2) Ride-Matching Services; 3) Trip Plans (specify modes, and how user can tailor, .e.g., least costly, quickest, etc.). Figures 3-18 and 3-19 present results indicating the importance of providing- this information to travelers. Summaries of the results are as follows:

+ Providing ParaTransit Services received the highest priority ranking; 42% of the respondents ranked this service as high.

+ Providing Ride-Matching Services was the next highest ranked service. This service received a 34% high ranking.

+ Of the three Miscellaneous Transit and Modal Information Services, providing trip plans received the lowest ranking. Only 31% of respondents ranked this service as high.

3.3.5 Traveler Services Information

Information indicating the importance of providing various types of traveler service information is presented in Figures 3-20 and 3-21. Traveler Services Information encompasses a wide variety of information including: environmental and weather conditions: safety information; special event/attractions information; parking information; and food/gas/lodging information. Information provided in Figures 3-20 and 3-21 indicate the following:

+ The seven types of traveler services information included in the questionnaire were partitioned via their priority ranking into basically three groups: the high, medium, and low rankings groups. The high ranking's group consisted of two services: to provide safety information and to provide regional weather conditions. These services were each ranked as high by 50% of all respondents. In the medium ranking's group, were the services to provide parking information, food/gas/lodging information, and special events/attractions information. These services received high rankings of 28%, 22%, 26%, and 18%, respectively. The bw ranking's group consisted of the service to provide regional environmental conditions. A high ranking of only 4% was given to this service.
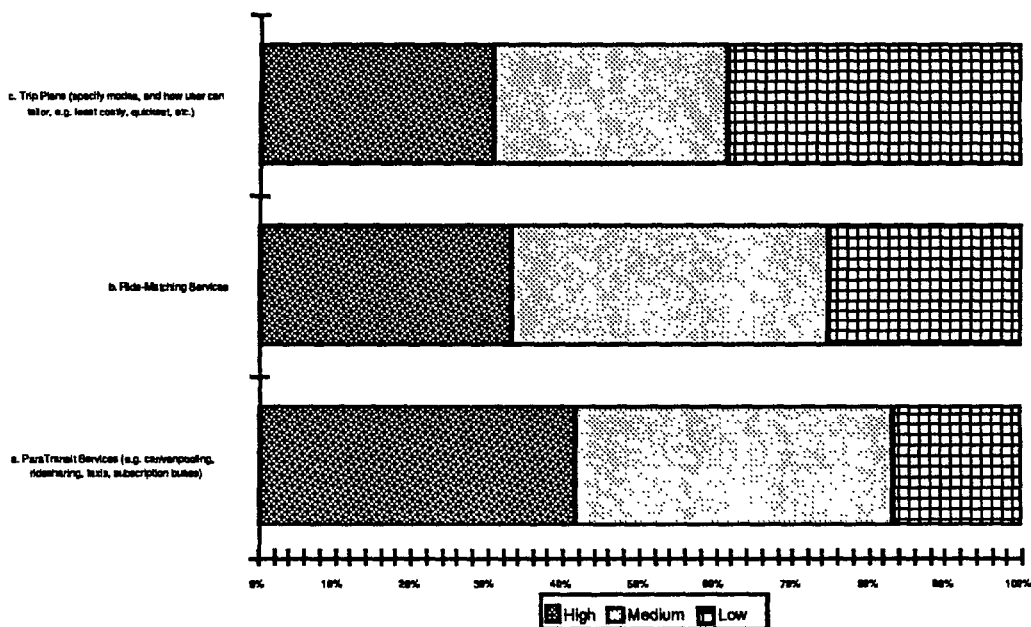
Figure 3-18. Traveler Information User Services for Misc. Transit and Modal Information - A Profile of Raw Data from All Respondents
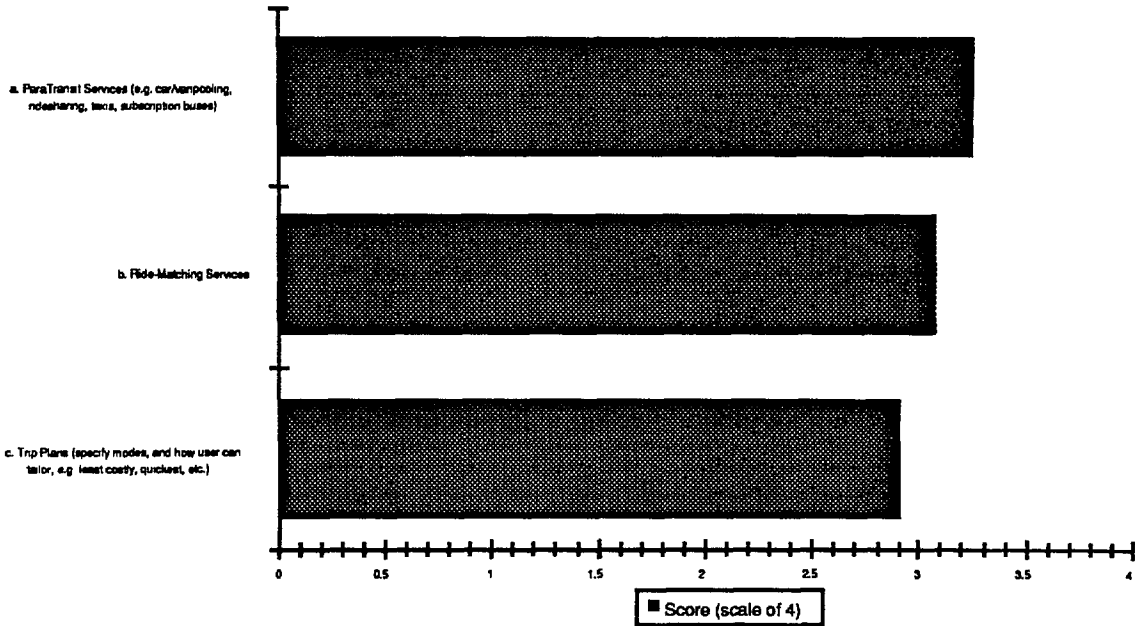
Figure 3-19.   Traveler Information User Services   for Misc. Transit and Modal Information - A Prioritization from All Respondents
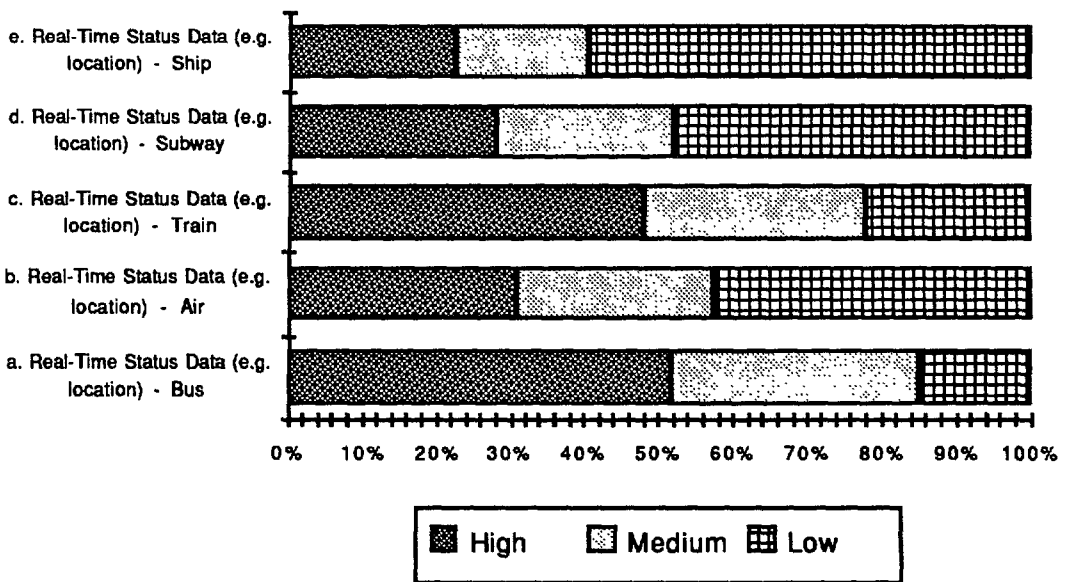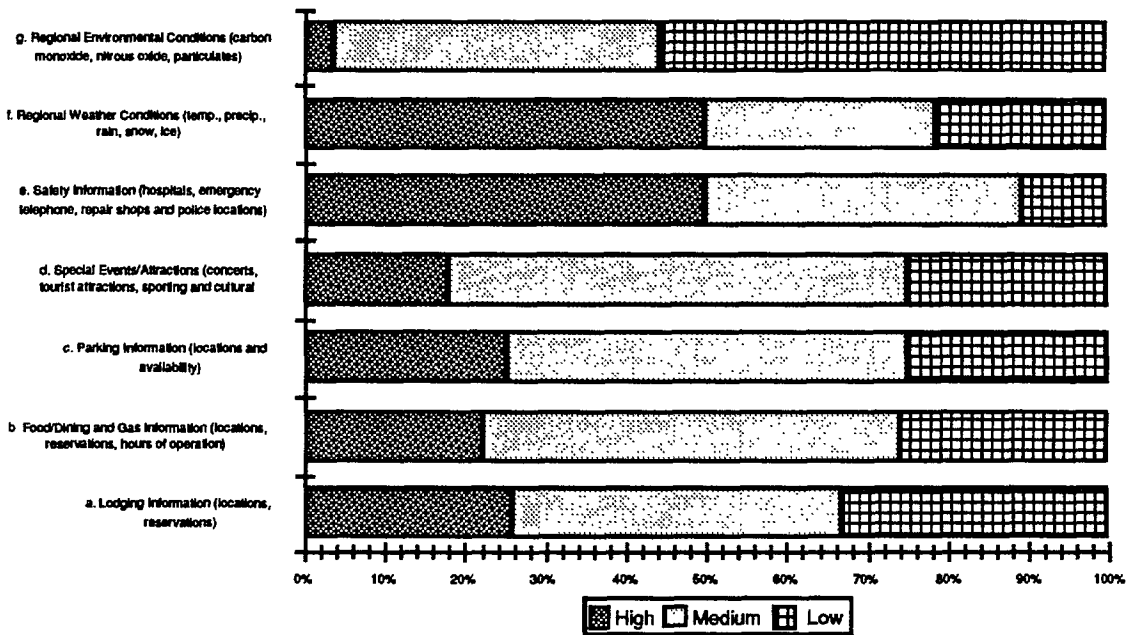

**Figure 3-20.   Generic Traveler Information Services -
A Profile of Raw Data from All Respondents**
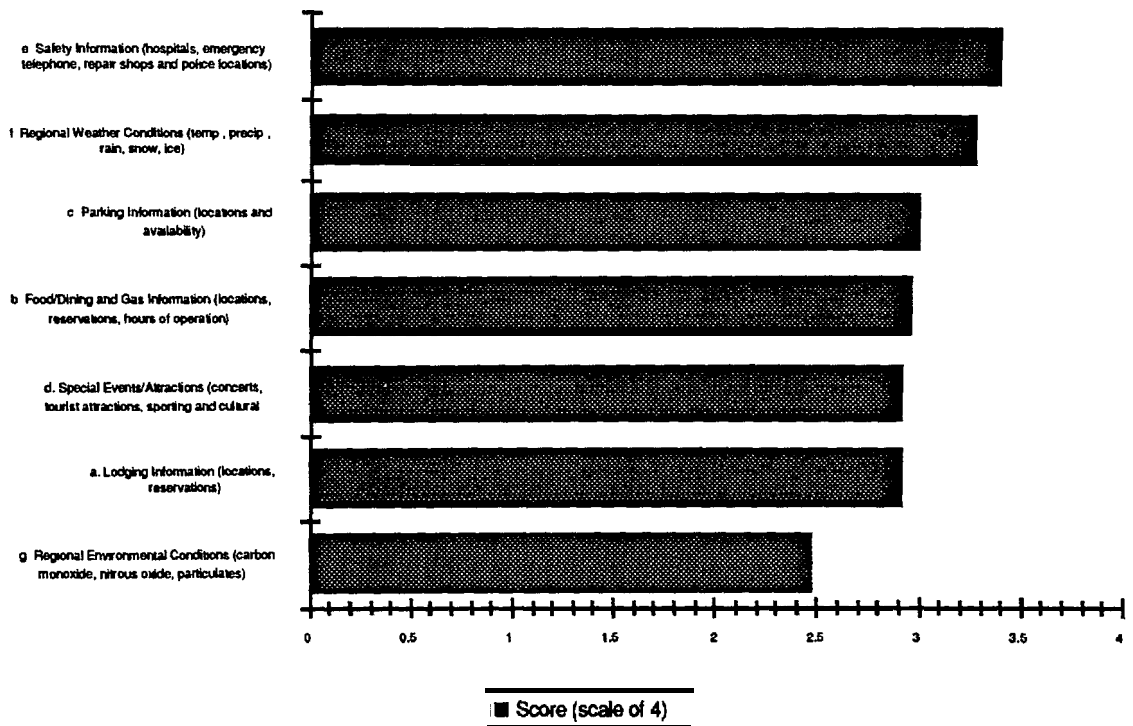
Figure 3-21. Generic Traveler Information Services -
A Prioritization from All Respondents

3.3.6   A Prioritization of Traveler Information Services Across All Categories

The previous few subsections provided prioritized results within each of the Traveler Information User Service categories; (e.g., Road and Traffic Information, Static Transit and Modal Information, Real-time Transit and Modal Information, Miscellaneous Transit and Modal Information, and Traveler Services Information). All tolled, these categories were composed of 29 individual Traveler Information User Services. This subsection provides a prioritized ranking of the 29 user services across all categories. Figure 3-22 provides this ranking. The priority ranking information presented in the figure is based on a scale of 4 (highest priority) and is summarized below:

+   Receiving 3.8 and 3.6 priority rankings respectively, providing Real-Time
    Incident/Congestion Summaries and providing Traveler Advisories were the two
    highest priority Traveler Information User Services.

+   The two lowest priority Traveler Information User Services were providing Regional
    Environmental Conditions and providing Ship Schedule, Route, and Fare
    information. These services each received a priority ranking of 2.49.

+   Interestingly, Traveler Information User Services from the Road and Traffic Information
    category appeared at both ends of the priority spectrum. Four of the five highest
    priority and three of the five lowest priority user services were from this category. The
    four high priority services were Real-Time Incident/Congestion Summary Reports,
    Traveler Advisories, Road Weather Conditions, and Construction Summaries. The
    low priority services were Ship Location, Trip Plans given and Origin and Destination,
    and Road-Specific Environmental Conditions.

+   User services from the Static Transit and Modal Information category were fairly evenly
    distributed throughout the priority spectrum. For this category, at the high priority
    end of the spectrum, was the service to provide Schedule, Route, and Fare
    Information for Busses. This service was ranked third highest of all services with a
    3.45 priority ranking. At the middle and low end of the spectrum were the services to
    provide Schedule, Route, and Fare Information for Subways and Ships, respectively.
    These services received respective priority rankings of 3.1 and 2.49. As noted
    earlier, the service of providing Schedule, Route, and Fare Information for ships was
    the lowest ranking of the 29 user services.

+   Real-Time Transit and Modal Information User Services were also somewhat spread
    throughout the priority spectrum with priority rankings of 3.35, 3.25, 2.9, 2.8, and
    2.65. The 3.35 ranking is for the service to provide Bus Location Information and the
    2.65 ranking is for the service to provide Ship Location Information.
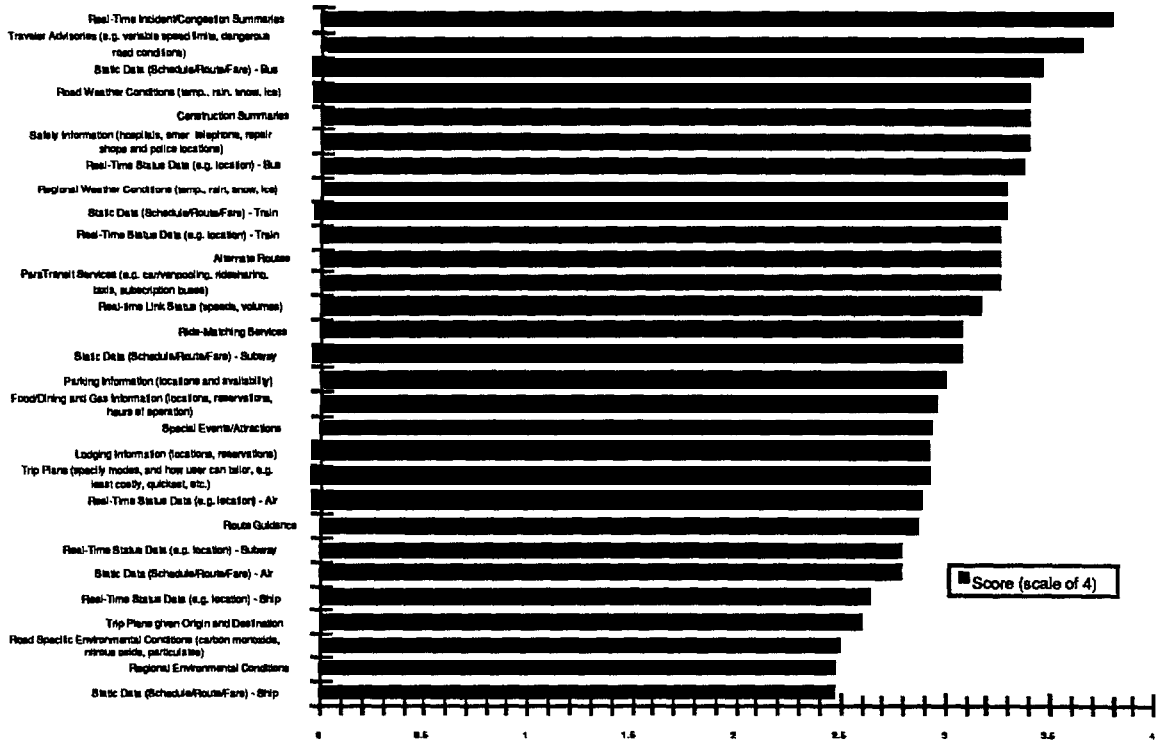
Figure 3-22. Traveler Information User Services (All
Categories) -
A Prioritization from All Respondents

+   The three services in the Miscellaneous Transit and Modal Information category were
    in the middle of the priority spectrum with rankings of 3.25, 3.1, and 2.95. These
    rankings were for providing ParaTransit services, Ride-Matching services, and Trip
    Plans, respectively.

+   Providing Safety Information, providing Regional Weather Conditions, and providing
    Regional Environmental Conditions, received priority rankings of 3.35, 3.3, and 2.49,
    respectively. Of the seven user services in the Traveler Service Information category,
    four were consecutively grouped in the middle of the priority spectrum with 3, 2.95,
    2.9, and 2.9 priority rankings. These services were to provide Parking Information,
    Food/Gas/Dining Information, Special Events/Attractions Information, and Lodging
    Information, respectively.

+   Overall, and after separately averaging the priority rankings of user services in each
     Traveler Information User Service category, it was determined that the services in the
     Road and Traffic Information category collectively received a higher priority ranking
     than the services in any other Traveler Information User Services category.

3.4 TIS OUTPUT DEVICES SURVEY RESULTS, RANKINGS, AND UTILIZATION

The two following subsections provide an analysis of the priority ranking and the current and
planned usage of various TIS Output Devices. Fifteen different modes of outputting TIS
information were included in the questionnaire. The results obtained were tabulated and
conveyed in three separate charts: a raw data chart, a prioritized data chart, and a utilization chart.
The results presented in the charts were ascertained from questionnaire responses from all
responding agencies; the resuts are not categorized on a transportation agency type basis.

3.4.1 TIS Output Devices Priority Ranking

Figures 3-23 and 3-24 present information indicating TIS output device priority. From the figures
it can be seen that with one exception, output devices fell into one of several groupings.
Information on these groupings is summarized as follows:

+   Outside of any grouping and ranked as the highest priority, the TIS output device was
     Variable Message Signs (VMS). These devices were ranked as high priority by 79%
     of all respondents.

+   Slightly lower in priority, the first grouping of output devices included the following:
     Commercial Traffic Reporting Agencies, Telephone Access Using Phone Menus,
     Public Kiosks, Highway Advisory Radio (HAR), and Interfaces to Public (i.e.,
     commercial) Radio Stations. These devices were ranked as high by 72%, 70%, 64%,
     68%, and 56% of respondents, respectively.

+   The second grouping of devices, again at a lower priority, were Cable or Regular TV
     Using Images, Internet Accessed Information, and Dial-In Computer Bulletin Boards.
     These devices were all ranked with the same priority.

+ Next, at still a tower priority ranking, were In-Vehicle Monitors/Displays, Faxes, and Cable or Regular TV using Teletext. These devices were ranked as high by only 37%, 34%, and 27% of respondents, respectively.

+ The lowest priority grouping of output devices consisted of Hand-Held Devices or Lap Top Computers, Pagers, and Citizens Band (CB)/Amateur Radio; with the CB/Amateur Radio receiving the lowest priority ranking of all the output devices. This device was ranked as high by only 4% of all respondents.
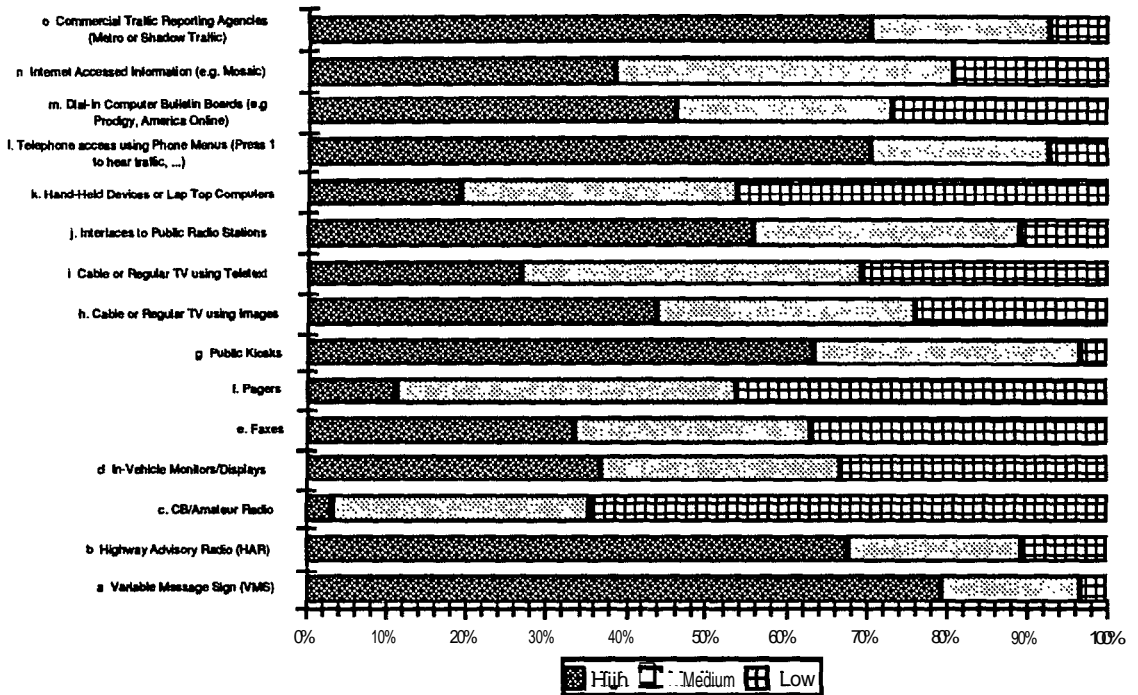
Figure 3-23. Traveler Information User Services TIS Output Devices - A Profile of Raw Data from All Respondents
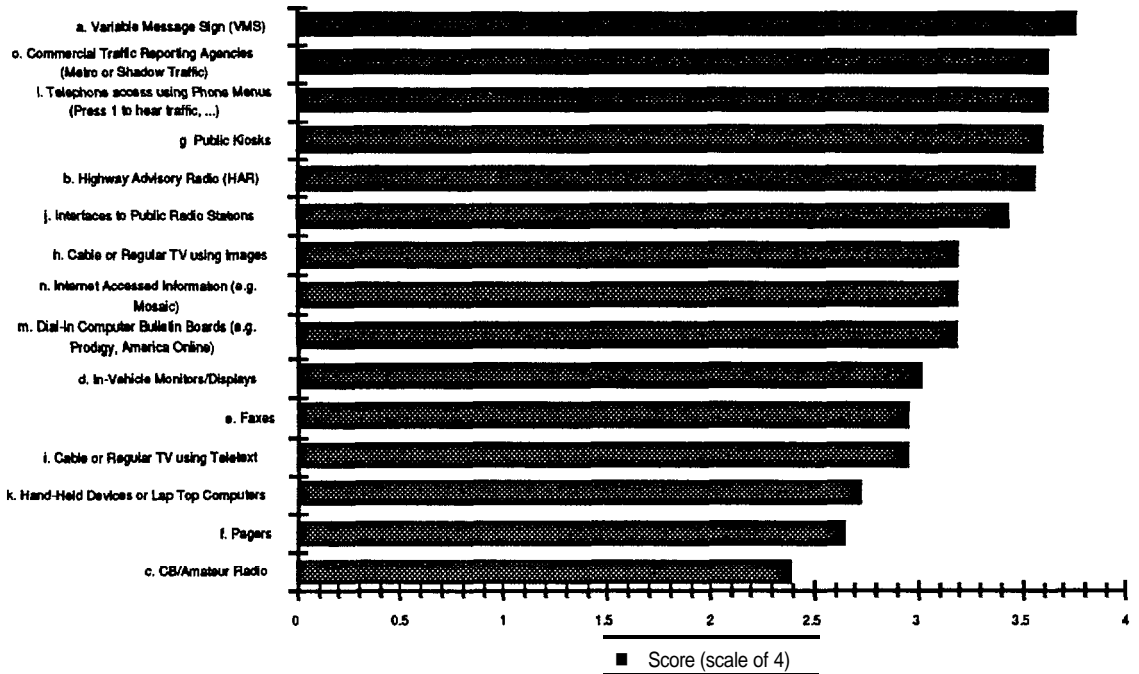
Figure 3-24.   Traveler Information User Services TIS
Output Devices -
A Prioritization from All Respondents

3.4.2 TIS Output Devices Current and Planned Utilization

Table 3-2 presents a profile of TIS output device utilization. The table indicates the percentage of responding agencies utilizing each output device in the time frame specified. The 'current column utilization information obtained in this survey varied somewhat from the 'current' utilization information obtained in the TIS Task 1 Survey. Therefore, for this column, Table 3-2 presents utilization percentages representing a combined result of the TIS Task 1 and Task 2 data. The remaining columns present information only obtained in the Task 2 survey. The information in these columns could not be directly compared to information from Task 1 as specific output device utilization dates were not asked for in the Task 1 survey. Regardless, a summary of TIS Output Device Utilization information is presented as follows:

+   With two exceptions, all 15 output devices are currently being used to some degree
    by some transportation agency; the exceptions being Hand-Held Devices or Lap Top

Computers, and Internet Accessed Information. These devices are planned for use in 1995.

+ The five most currently used output devices are Telephone Access using Phone Menus, VMSs, HAR, Commercial Traffic Reporting Agencies, and Faxes. These devices are currently in use by 69.23%, 65.38%, 53.64%, 38.46%, and 38.46% of all respondents, respectively.

+ Of the currently in use output devices, Cable or Regular TV using Teletext, In-Vehicle Monitors/Displays, Dial-In Computer Bulletin Boards, CB/Amateur Radio, and Pagers are used the least. These devices are currently used by only 3.84%, 4.55%, 7.69%, 11.5%, and 11.5% of responding agencies.

+ As in the current time frame, the 1995-1996 time frame has Telephone Access using Phone Menus, VMSs, and HAR remaining the three predominate devices for outputting TIS information. The utilization percentages for the devices however increase to 82.56%, 77.27%, and 77.27%, respectively. Also, during the 1995-1996 time frame, In-Vehicle Monitors/Displays become the least used output device with an 18.18% usage rating and Hand-Held Devices or Lap Top Computers and Internet Accessed Information will begin to be used as TIS output devices.

+ During the 1997-1999 time frame, VMSs become the single most frequently used device to output TIS information; their usage rate increases to 95.45%. Telephone Access using Phone Menus and HAR follow close behind with 89.23% and 81.82% usage rates respectively. No increase in the use of CB/Amateur Radio occurs during this time frame and it becomes the least used TIS output device with a 22.73 usage rating.

+ With two exceptions, the 2000+ year time frame brings only minimal changes to the usage of TIS output devices. During this time, usage ratings for the output devices remain constant or increase only slightly from previous years. The two exceptions are In-Vehicle Monitors/Displays, and Hand-Held Devices or Lap Top Computers; usage ratings for these devices increase significantly. In-Vehicle Monitors/Displays see a 27.27% increase in usage, from 31.82% to 59.09%. Hand-Held Devices or Lap Top Computers see an 18.18% increase in usage, from 27.27% to 45.45%.

Table 3-2. TIS Output Device Current and Planned Utilization Percentages

TIS Output Device	Current	1995-1996	1997-1999	2000+
a. Variable Message Sign (VMS)	65.38	77.27	95.45	95.45
b. Highway Advisory Radio (HAR)	53.84	77.27	81.82	81.82
c. CB/Amateur Radio	11.5	22.73	22.73	27.27
d. In-Vehicle Monitors/Displays	4.55	18.18	31.82	59.09
e. Faxes	38.46	45.13	45.13	48.46
f. Pagers	11.5	22.73	31.82	36.36
g. Public Kiosks	19.2	50.00	63.64	68.18
h. Cable or Regular TV using Images	15.38	31.82	45.45	50.00
i. Cable or Regular TV using Teletext	3.84	31.82	45.45	50.00
j. Interfaces to Public (Commercial) Radio Stations	34.61	50.00	54.55	54.55
k. Hand-Held Devices or Lap Top Computers	0.00	22.73	27.27	45.45
l. Telephone access using Phone Menus (Press 1 to hear traffic,...)	69.23	82.56	89.23	92.56
m. Dial-In Computer Bulletin Boards (e.g. Prodigy, America Online)	7.69	40.91	50.00	54.55
n. Internet Accessed Information (e.g. Mosaic)	0.00	31.82	45.45	50.00
o. Commercial Traffic Reporting Agencies (Metro or Shadow Traffic)	38.44	63.64	68.18	68.18

NOTE: As indicated earlier, the 'current' column utilization information obtained in this survey varied somewhat from the 'current' utilization information obtained in the TIS Task 1 Survey. Therefore, for this column, Table 3-1 presents utilization percentages representing combined results of TIS Task 1 and Task 2 data. The remaining columns present information obtained in the Task 2 survey only. The information in these columns could not be directly compared to information from Task 1 as specific output device utilization dates were not asked for in the Task 1 survey.

4. <u>CANDIDATE TIS GOALS</u>

This section discusses candidate goals and objectives for the Corridor-Wide TIS System. Two types of goals and objectives are provided in this section:

+   Overall TIS System Goals and Objectives.

+   Specific Traveler User Service Goals and Objectives.

In addition, a mapping is provided in the latter half of this section to show how TIS Goals are consistent with and supportive of I-95 Corridor Business Plan Goals.

4.1   <u>OVERALL TIS SYSTEM GOALS AND OBJECTIVES</u>

Table 4-1 presents our candidate goals and objectives for the Corridor Traveler Information Services system. The first column gives the higher-order goals. The second column gives the lower-order objectives for each goal. These goals and objectives were derived from the Corridor Business Plan, the National Program Plan for IVHS, and our own research. The last column gives our proposed rank for each objective. These rankings are based on our experience with Traveler Information Services. We believe that they are consistent with the rankings provided by Coalition member agencies in Section 4.2.

Table 4-1. Overall TIS System Goals
and Objectives

Goals	Objectives	Rank
1. To make available timely, accurate multimodal information on traffic and travel conditions in the Corridor to both private travelers and commercial operators of both passenger and freight transportation services.	1. To provide traffic and other travel information *to* any point in the Corridor *about* any point in the Corridor or about facilities *between* any two points in the Corridor.	High
	2. To support just-in-time delivery by providing usable and actionable information on the state of the transportation network, thus enabling just-in-time shippers to adjust their operations to reduce cost yet make deliveries.	Med
	3. To reduce stress associated with travel in unfamiliar or congested areas by providing routing and other information to travelers new to an area in the Corridor.	Low
	4. To promote the Corridor Traveler Information Services system and induce its use by providing information to the public via public relations and advertisements of TIS services, access methods, and locations utilizing signage (electronic, fixed), radio, TV, newspapers, etc.	High
2. To shift highway travel to non-highway modes by giving travelers information on modes that may get them to their destination faster, cheaper, more safely, or more comfortably.	1. To maintain and disseminate real-time and non-real-time information on travel conditions, by other modes, in the Corridor.	High
	2. To integrate effectively information about other modes, particularly air and rail information, with operational information on the highway system.	Med
	3. To provide usable and actionable information on non-highway modes, particularly to route travelers around congestion.	Med
	4. To improve multimodal and intermodal transportation operations by providing information on, e.g., link travel times for transit time-of-arrival estimates, park-and-ride lot status, and passenger-loading estimates.	Med

Table 4-1. Overall TIS System Goals
and Objectives (Cont'd)

Goals	Objectives	Rank
3. To coordinate the management of facilities and the collection and delivery of traffic and other travel information across jurisdictional and modal boundaries, and to render such boundaries (particularly jurisdictional boundaries) transparent to the traveler.	1. To develop new modes of cooperation that facilitate, even effect, the striving toward goals common to all agencies in the Corridor involved in Traveler Information Services.	High
	2. To monitor and help coordinate Traveler Information Services and systems operated and maintained by individual states, local authorities, and local agencies.	High
	3. To receive regular communications on current and anticipated traffic and other travel conditions on major facilities from all transportation agencies in the Corridor.	High
	4. To establish a "clearinghouse", virtual or real, to coordinate the collection and delivery of traffic and other travel information in the Corridor on a real-time basis.	High
4. To support management of highway traffic in the Corridor.	1. To assist transportation agencies in the Corridor to manage nonrecurring incidents that disrupt the transportation system by advising travelers of the delay and recommending that they revise their travel plans.	Med
	2. To enhance real-time traffic control operations by providing information on, e.g., High Occupancy Vehicle (HOV) facilities, reversible lanes, and congestion pricing.	Low
	3. To enhance traffic management during snow storms and other emergencies by providing information on, e.g., snow removal scheduling & operations.	Low
	4. To reduce disruptions caused by traffic incidents by quickly sending to motorists information about the incidents and how to avoid them.	Low

Table 4-1. Overall TIS System Goals
and Objectives (Cont'd)

Goals	Objectives	Rank
5. To gain and increase the private sector's participation in the design, development, operation, maintenance, and enhancement of the Corridor Traveler Information Service and system.	1. To develop new modes of cooperation, communication, and coordination between the public sector and the private-sector entities participating in Traveler Information Services.	High
	2. To gain private-sector stakeholders' buy-in to the traveler information system's requirements and design.	Med
	3. To supplement public funding of the Corridor Traveler Information Services system by organizing revenue-generation schemes, such as the sale of traveler information to private-sector entities for resale, redistribution, or other added-value reuse, or through fees, royalties, and similar payments from private-sector entities wanting their products or services advertised or promoted through the Corridor Traveler Information Services system.	High
	4. To privatize appropriate portions or functions of the Corridor Traveler Information Services system.	Med
6. Improve corridor environmental air quality.	1. Reduce air pollution (attainment of carbon monoxide, nitrous oxide, particulates) by minimizing peak period congestion.	High
	2. Reduce air pollution by encouraging carpooling.	High
	3. Reduce air pollution by increasing transit ridership and increasing the ease of transfers between modes.	High
	4. Reduce air pollution by providing TIS to influence route, mode or travel time changes.	High

4.2 SPECIFIC TRAVELER USER SERVICE GOALS AND OBJECTIVES

In this section, specific traveler user service goals and objectives are discussed. The goals and objectives are a revised version of the "strawman" goals that were identified in the TIS Goals Questionnaire (reference Appendix B). The revision incorporates the following changes:

+   Comments received from Steering Committee during questionnaire interviews.

+   Restructuring to map goals to supporting objectives.

+   Additions to support the suite of users/customers identified by Project #6.

+   Additions based on feedback from private sector.

+   Additions for consistency with National Program and Strategic Plans.

For traceability to original goals, all additions and changes are shown in bold. It should be pointed out that there were no major additions/changes to existing goals or objectives. Thus, the rankings provided by responding Coalition members remain valid. Several of the strawman goals, however, that did not have specific objectives that provided traveler information (e.g., promoting TIS and inducing its use) were moved from the Specific User Service Goals list to the Over TIS System Goals list.

Table 4-2 identifies specific traveler user service goals and objectives. These are the specific goals and objectives for the ultimate TIS system, that will serve as a baseline for developing system requirements and a high-level conceptual design. The goals and objectives were designed to address the following areas:

+   TIS high-level functions and services.

+   TIS users.

+ TIS challenges.

It is important to note that goals do not address the specific technologies or the specific functions/requirements that will be implemented by the ultimate system. These are activities to be carried out in subsequent tasks.

Also, note that the objectives identified in Table 4-2 have been separated in two categories, short-term and tong-term. Short-term objectives (as defined by the I-95 Corridor Business Plan)[1], are to be satisfied within the next 0-5 years, while long-term goals are to be satisfied in years 5-20. The basis for this segmentation originates from two areas:

+ Section 3, Survey Results, where goals and objectives were ranked based on questionnaire responses from Coalition members.

+ A preliminary assessment of available technologies.

It is important to note that this segmentation is subject to change based on feedback received from the I-95 Corridor Coalition and from results from Task 4, Technology Assessment.

4.3   Candidate TIS Goals to I-95 Business Plan Mappings

Table 4-3 maps our overall goals and objectives to the goals presented in the I-95 Corridor Coalition Business Plan (June 15, 1994, pp 2 f.). Table 4-4 maps our goals and objectives to the vision and objectives presented in the Business Plan (pp. 3-5). In both tables, the column relevant TIS Objective refers to the goals and objectives contained with Table 4-l. For example Relevant TIS Objective 4.1 refers to the fourth goals first objective.

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[1] I-95 Corridor Coalition. Business Plan, 1994 Update, June 15, 1994.

Table 4-2. Specific User-Service Goals

Candidate Goals - Ranked	Candidate Objectives - Ranked (Bold - changes/additions, Underlined- Long-Term Objectives)
1. Enhance urban and interurban corridor road travel for various roadway users: • **business travelers** • **tourists** • **commuters** • **CVO/dispatchers** • **transit/paratransit operators**	Provide timely and accurate information on the following, to both pretrip (home, workplace, transit stops, rest stops, public locations, etc.) and enroute (in-vehicle) users: 1. Real-time incident/congestion summaries. 2. Traveler advisories. 3. Road weather conditions. 4. Construction summaries. 5. Alternate routes **and modes**. 6. Real-time link status. 7. Route guidance information. 8. Parking availability. 9. Parking locations. 10. Trip planning capability. 11. Road environmental conditions.
2. Enhance modal and intermodal travel for various urban and inter-city mass transit users: • **Bus, Subway Travelers** • **Air Travelers** • **Rail Travelers** • **Ferry Travelers**	Provide timely and accurate information on the following, to both pretrip and enroute users: 1. Schedule, route, and fare information on all transit modes (bus, train, subway, air, ferry). 2. Real-time status location information on transit modes (bus, train, air, subway, ferry). 3. Paratransit services. 4. Ride-matching services. 5. Trip plans. 6. **Modal travel time comparisons.**
3. Enhance the safety of travelers.	Provide timely and accurate information on the following, to both pretrip and enroute users: 1. Locations of hospitals. 2. Locations of emergency telephones. 3. Locations of repair shops. 4. Locations of police.
4. Increase the availability of traveler information.	Provide timely and accurate information on the following, to both pretrip and enroute users: 1. Regional weather conditions. 2. Food/dining and gas information. 3. Lodging. 4. Regional environmental conditions.
5. Increase tourism.	Provide timely and accurate information on the following, to both pretrip and enroute users: 1. Special events. 2. Attractions. 3. Historic sites. 4. Festivals. 5. Parks and recreational facilities. 6. Cultural and arts activities. 7. Educational institutions. 8. Resorts.

Table 4-3. Mapping of Corridor Business Plan Goals to Candidate TIS Objectives

Goal	Relevant TIS Objective	Relevance to Traveler Information Services
Enhance the capabilities of transportation agencies within the Corridor to effectively manage nonrecurring incidents which disrupt the transportation system. Improve environmental quality in the Corridor through reduced traffic congestion and other factors to help achieve conformity with the federal air quality standards established as a result of the Clean Air Act.	4.1	TIS assists in reducing congestion by giving travelers information on nonhighway modes that may get them to their destination faster, cheaper, more comfortably, etc., & by encouraging travelers to take less congested routes.
Cooperatively develop and assist in the operation of an interregional traffic and travel information network, focusing primarily on communicating traffic, construction, incident, and weather information.	all	TIS is the embodiment of this goal.
Transform the I-95 Corridor into a showcase of IVHS technologies through the use of advanced technologies for integrated, adaptive, and real-time traffic control strategies for both arterial and freeway management control, and for providing in-vehicle traffic information and route guidance. Establish the Corridor as an operational test bed to evaluate other IVHS technologies as they evolve.	n/a	The development of a Corridor TIS is a major component of reaching this goal. The Corridor TIS will test emerging ATIS technologies.
Foster cooperative relationships among all involved transportation organizations to address issues of information gathering and sharing, joint procurement, joint funding, and other areas of mutual interest in meeting the transportation needs and environmental goals of the Corridor. In order to successfully deploy a program of this magnitude, the corridor program must be designed to maximize the stable funding available through the IVHS Corridors Program, and the increased flexibility of state, federal, toll agency, and private sector funding options provided by the ISTEA of 1991.	3.1 5.1	Several of our candidate overall goals and objectives for TIS require "new modes" of interaction among public agencies , and between the public and private sectors. As TIS works to achieve these objectives, it will lead the rest of the Corridor Business Plan in establishing new cooperating relationships.
Demonstrate to the public (including Congress) the benefits of IVHS and a partnership approach to addressing inter-regional and intraregional multimodal mobility needs.	1.1 1.3 1.4 2.3	TIS will offer the most prominent demonstration of intelligent transportation systems' benefits.

Table 4-4. Mapping of Corridor Business Plan Objectives to Candidate TIS Objectives

"Vision"	Objective	Relevant TIS Objective	Relevance to Traveler Information Services
By the year 2000, the I-95 Corridor will have in place a set of integrated, traffic management and traffic/travel information systems which:	Coordinate operations of all major highway traffic facilities over the length of the corridor, including all segments of I-95 itself plus critical elements of the adjacent free and toll highway systems and related elements of other transportation systems.	3.1-3.4	The proposed Corridor TIS will coordinate the information activities of all facilities, major and many minor, in the Corridor.
	Monitor the operation of these facilities so that optimum use is made of existing available highway and other modal capacity under varying conditions of traffic demand.	n/a	TIS may be a tool in the monitoring of these facilities.
	Effectively integrate information about other modes, particularly air and rail information, with operational information of the highway system.	2.2	This objective will be met by the TIS.
	Ensure rapid-response to incidents and the anticipation of congestion by recommending the diversion of traffic as appropriate to other routes/modes, and/or recommending and advising travelers of the delay or to otherwise revise their travel plans.	4.1	TIS will be used as a key tool in advising travelers of incidents, congestion, and alternate routes and modes.
	Make available timely, accurate multimodal information on traffic and travel conditions between key points in the Corridor to both private travelers and commercial operators of both passenger and freight transportation services.	1.1	This is TIS's key goal and objective.

Table 4-4. Mapping of Corridor Business Plan Objectives to Candidate TIS Objectives (Cont'd)

"Vision"	Objective	Relevant TIS Objective	Relevance to Traveler Information Services
	Coordinate the management of facilities and delivery of traffic/travel information across jurisdictional and modal boundaries—the system should appear "seamless" to the user, providing information on the entire Corridor from any point within the Corridor.	3.1-3.4	From this flows several high-ranking objectives for TIS.
	Contribute to the attainment of federal and local air quality standards by managing passenger and freight traffic in an environmentally sensitive way.	n/a	TIS contributes by reducing congestion.
	Provide a foundation for the continuing, effective application of advanced technology within the Corridor as a whole.	n/a	TIS will form part of this foundation.
A series of local IVHS systems, each planned, designed, implemented, and operated in close coordination with the others, but remaining under the jurisdiction of individual states or operating authorities. Under such a scenario, the primary focus of the Coalition's activities would be on:	Coordinated analyses of current and anticipated future user needs for both personal travel and commercial vehicle traffic within the Corridor.	n/a	
	Coordinated planning, implementation and operation of IVHS systems to help meet these needs throughout the Corridor.	3.2	A major objective of TIS is to coordinate local traveler information systems and facilities.
	Compatibility of technology and communications protocols and similar technical guidelines at all IVHS system implemented with the Corridor.	3.3	Implicit in the TIS goal to coordinate and to gather information from local TISs is the need to establish common protocols for communication.

Table 4-4.   Mapping of Corridor Business Plan Objectives to Candidate TIS Objectives (Cont'd)

"Vision"	Objective	Relevant TIS Objective	Relevance to Traveler Information Services
	Establishment of a central real-time IVHS "clearinghouse" function, designed to facilitate the coordination of traffic communications and traffic operation strategies/actions within the Corridor on a real-time basis, and to collect and disseminate real-time information on travel and traffic conditions by all modes.	3.4	The corridor TIS is such a clearinghouse for traveler information.
	Development of any necessary interagency cooperative agreements, uniformity of institutional approaches and commitments needed to operate and manage the Corridor program successfully.	3.1	Implementation of a Corridor TIS will require such agreements, approaches, and commitments to be developed. Thus, TIS will pilot these for the Coalition and the Corridor.
A central clearinghouse is a key ingredient of all of the above activities. It would be located at a central point in the Corridor and would serve as the central communications facility and emergency action coordination center for all agencies within the Coalition. It would:	Be linked to the individual traffic operations centers of all members of the Coalition.	3.3 3.4	And to their traffic information centers (if different).
	Receive regular communications on current and anticipated traffic conditions on major facilities from all agency jurisdictions within the Corridor.	3.3	This is a key requirement and objective of the Corridor TIS.
	Disseminate real-time information on traffic conditions to other control center user facilities and personal users via radio, TV, satellite, telephone or other means.	1.1	The "personal users" component of this will be carried out by the TIS.
	Serve as a coordinating facility for assisting in responses to major incidents.	3.4	The TIS will take care of the public information component of the response plan.
	Maintain and disseminate information on travel conditions, by other modes, within the Corridor.	2.1	TIS will manage and disseminate this information, integrated with highway information.

5. <u>CONCLUSION</u>

This section concludes the Task 2, Define TIS Goals, document. in closing, we highlight the major TIS goals to be realized by the ultimate system and discuss our approach for building consensus and revising the Candidate TIS Coals and Objectives.

5.1 <u>CONCLUSION</u>

This document has defined candidate goals and objectives for the I-95 Corridor-wide TIS system, that are consistent with among other things the I-95 Corridor Business Plan and the National ITS Program Plan. The goals have captured the aims, intentions, and aspirations of the ultimate TIS system as defined by Coalitiin members. In addition, because goals are starting points for requirements and requirements are starting points for system design, emphasis was placed on developing a clear, concise, realistic and complete set of goals and objectives. Finally, because it is anticipated that the private sector will play a substantial role in the development and operation of TIS, their needs have been incorporated into the TIS goals.

In summary, the major goals to be achieved by the TIS system are the following:

+ Enhance urban and inter-urban corridor road travel for business travelers, tourists, pleasure travelers, commuters, CVO/dispatchers, and transit/paratransit operators.

+ Improve Corriir environmental air quality.

+ Enhance modal and intermodal travel for all urban and inter-city mass transit users.

+ Promote TIS and induce its use to demonstrate to the public the benefits of using ATIS.

+ Enhance the safety of travelers.

+ Encourage private sector participation in the design, development, operations, maintenance, and evolution of the system to ensure TIS success.

5.2 APPROACH TO FINALIZING TIS GOALS AND PRIORITIZATION

TRC Feedback, SC feedback, Technology Assessment, Project #6 User Needs Input

5.2.1 Building Consensus for Recommend Goals

TRC Meetings, Private Sector buy-in

5.2.2 Revising and Prioritizing Goals

Comments incorporated, revised, and published in final report. Final prioritization will not occur until completion of Task 4, Technobgy Assessment.

5.2.3 Coordination with Project #6, User Needs and Marketability

Since the results of Project #6 User Needs and Marketability Analysis were not available as of the date of this deliverable our team has based the goals on two major assumptions:

+ The strawman TIS user needs analysis, defined in Task 1, is valid as a starting point until results are available from Project #6

+ The TIS rankings provided by coalition member agencies through the Goal questionnaire will roughly correlate to high priority user needs.

Our team, however, is in close contact with Project #6. We have received an updated list of user groups and TIS providers. This information was used in this working paper to ensure that all TIS user classes were addressed in the TIS goals. In addition, we are anticipating some early results

from the Project #6 User Focus Group meetings. This information will be used in the next Task, Requirements Analysis.

5.2.3 Compatibility with other I-95 System/Project Goals

Of current I-95 projects, only Project 3 - Surveillance Requirements & Technology - explicitly sets goals and objectives. That project's Working Paper 1, issued November 21, 1994, sets out recommended goals and objectives for a Corridor-wide surveillance system. A consistency check has been performed to ensure that SR/T goals and objectives are completely compatible with and supportive of the TIS goals set forth in this working paper.

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