U.S. Department of Transportation

Technology and Planning Assistance Needs of State and Local Transportation Agencies

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Technology and Planning Assistance Needs of State and Local Transportation Agencies

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I. INTRODUCTION

BACKGROUND

This report presents a description of current technology and planning assistance needs of state, regional, and local transportation agencies and recommendations for satisfying those needs. The needs assessment was sponsored by the Office of Technology and Planning Assistance 1/ which is part of the Office of the Secretary, the U.S. Department of Transportation.

The Office of Technology and Planning Assistance participates in the joint federal, state, and local effort to develop and disseminate approaches to the resolution of transportation problems. The specific mission of the Office is "to assure that new technologies are transmitted to state and local levels, to coordinate the technology sharing activities of the Department, to assist state and local officials in maximizing the effectiveness of DOT planning programs, and to provide policy direction and guidance for management of intermodal planning."

It is imperative for the Office of Technology and Planning Assistance to keep abreast of state and local technology and planning

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1/ Formed in 1982 by consolidating the Office of Technology Sharing and the Office of Community Planning Assistance.

assistance needs. This is a particularly challenging task now because of the substantial changes which are occurring in the transportation sector. The focus of transportation agencies has changed from infrastructure and service expansion to facilities maintenance, service rationalization, and operating efficiency. Simultaneously, funding for transportation has had little if any real growth (until passage of the recent gas tax legislation), putting a tremendous strain on the ability of state and local governments to fulfill their transportation responsibilities. In addition, significant institutional changes are being made. Regulation of transportation services is being relaxed resulting in more emphasis on private sector initiatives and market mechanisms. The Reagan Administration's new federalism proposal also seeks to place more responsibilities for public transportation facilities and services in the state and local government domain.

Within this context, state and local transportation agencies confront new and difficult issues. The Office of Technology and Planning Assistance decided that it was an appropriate time to identify these issues and the areas of technology and planning assistance that would be useful in addressing them. To this end, the Office sponsored a needs assessment, the results of which are presented here.

OBJECTIVES AND APPROACH

The specific objectives of the study were to (a) determine the areas of technology and planning assistance which state and local transportation agencies would find of value, and (b) make program recommendations to the Office of Technology and Planning Assistance for providing this assistance. The recommendations involve identifying areas of assistance to be provided and recommending mechanisms for providing the assistance.

To accomplish these objectives, a select group of state and local transportation officials was contacted. The individuals were identified by a U.S. Department of Transportation steering committee as particularly knowledgeable of state and local transportation issues and needs.1/ They represent various types of agencies (state DOTs and modal administrations; regional and local transportation agencies; planning agencies; service providers) and various levels of management within those organizations. Over 90 individuals were contacted and engaged in free-form discussions. Their names and affiliations are listed in Appendix A.

Contact with each of these individuals was made by telephone or in person. They were asked to discuss the areas of issues currently confronting their agencies and to indicate the topics for technology and planning assistance which they would find useful in addressing these issues. They also were asked to identify mechanisms which they considered effective for the provision of technology and planning assistance. It should be emphasized that the approach taken in this study was not to conduct a statistical survey of needs, but to have open discussions of needs with knowledgeable persons, who represented a cross-section of the program's potential users.

ORGANIZATION OF THE REPORT

The remainder of this document presents the findings of the study. In the next chapter is presented a list of the areas of

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1/ The steering committee was comprised of representatives of the various technology and planning assistance units within the U.S. DOT.

technology and planning assistance cited as potentially valuable by state and local transportation agencies. The subsequent chapter describes the mechanisms which were cited as potentially effective ways of providing technology and planning assistance. The report also contains three appendices: (a) a list of the contacts, (b) definitions of technical and planning assistance cited by the contacts, and (c) definitions of the mechanisms recommended by the contacts.

II. FINDINGS WITH RESPECT TO AREAS OF ASSISTANCE

INTRODUCTION

As noted in the Introduction, over 90 individuals associated with state and local transportation agencies were asked to identify useful areas of technology and planning assistance. The areas of assistance cited by these individuals are summarized in Exhibit 1. They are organized according to six major topics: (1) policy analysis, (2) planning methods, (3) management strategies and techniques, (4) funding and financial strategies, (5) operations, and (6) databases and systems. More complete definitions are presented in Appendix B.

DIVERSITY OF AREAS OF ASSISTANCE

The areas of assistance identified are tremendously diverse. They range from broadly defined policy issues, such as what level of service should be maintained, to narrowly defined technical concerns, such as the capability of transit fare boxes to collect paper money.

Besides being diverse, there is a dispersion of interest across the various areas of assistance. This finding is revealed by the distribution of interest by area of assistance shown in Exhibit 2. There is strong support for two areas of assistance, "revenue sources/funding

EXHIBIT 1

AREAS OF USEFUL TECHNICAL AND PLANNING ASSISTANCE CITED BY THE CONTACTS

Area	Area Definition
POLICY ANALYSIS	
Service Levels	At what level should transportation systems and services be maintained?
Truck Size and Weight	What size and weight restrictions should be imposed?
Energy Conservation	What actions should be taken to ensure that public investments in transportation are responsive to probable energy futures?
Economic Effects of Transit	What is the relationship between transit services and the economic vitality of urban areas and what implications does this relationship have for public support of transit?
Paratransit	What role can paratransit be expected to play in meeting transportation demand and what implications does this have for public support of paratransit?
Role of States in Rail Service Issues	What should be the states' involvement in rail service issues analysis and resolution?
PLANNING METHODS	
Contingency Planning	What contingency planning techniques are available particularly for the examination of financial futures and the implications of these futures on the level of services which government can provide?
Resource Allocation Techniques	What methods are available to determine the optimal allocation of resources among transportation agencies functions?
Strategic Planning	What is strategic planning and what applications does it have in the planning and programming of transportation services and facilities?
Needs Assessment	What methods are available to produce credible assessments of transportation service and facility needs?
Planning Function Redefinition	Given the shift in emphasis from a long-range, capital investment orientation to a short-range, systems maintenance and management orientation, what types of issues should be addressed by the planning function and what methods are available for addressing these issues?
Rail Service Rationalization	What methods are available to accurately predict the effects of rail service loss and to identify actions which can mitigate adverse effects of rail service loss?

EXHIBIT 1 (Cont.)

AREAS OF USEFUL TECHNICAL AND PLANNING ASSISTANCE CITED BY THE CONTACTS

Area	Area Definition
Planning Methods for Small Urban and Rural Areas	What methods are available to address transportation issues unique to small urban and rural areas?
Effects of Deregulation and other Federal Policies	What methods are available to predict the effects of federal policy and program changes and to develop strategies for dealing with these effects?
Effects of Changing Technology on Transportation Demand	What major technological changes are likely to occur in transportation and how are these changes likely to affect intermodal competition, mode choice, and demand for services and facilities?
Assistance with Federally Mandated Planning Processes	What opportunities do changes in the processes create for transportation agencies and how can the agencies capitalize on these opportunities? For the 100 new urbanized areas, what tools are needed to establish an effective planning process which meets federal requirements?
Alternatives Analysis	How can the predictive accuracy and credibility of alternatives analysis be improved?
Bridging the Gap Between Theory and Practice	What are the practical applications of new advances in transportation theory?
Traffic Analysis	What models are available for projecting traffic volumes and patterns in small urban areas?
Intermodal Tradeoffs	What methods are available to assess the intermodal implications of major transportation issues and government policies with respect to the issues?
Railroad/Community Conflicts	What methods are available to identify, assess, and resolve conflicts between railroad operations and community activities?
MANAGEMENT STRATEGIES AND TECHNIQUES	
Safety	What actions can be taken to change unsafe motorists behavior? What strategies should be employed to provide for the safe transport of hazardous materials?
Contract Administration and Claims Settlement	What are the characteristics of a good contracts management process, including the control of contract claims?

EXHIBIT 1 (Cont.)

AREAS OF USEFUL TECHNICAL AND PLANNING ASSISTANCE CITED BY THE CONTACTS

	Area	Area Definition
	Retention of a Viable R&D Function	How can a productive R&D program be maintained in light of substantial reductions in R&D funding?
	Budgeting	What changes have been made in the budget process used by transportation agencies and what have been the benefits of these changes?
	Training	What training programs are available to develop competent mid-level management and to retrain professional staff with respect to the substance of new issues and methods?
	Marketing Transit Services	What techniques have proven successful in promoting transit use?
	Maintenance Management	What methods are available to determine and monitor the condition of the highway system and to evaluate alternative approaches to highway maintenance?
		What preventive maintenance programs are available to transit providers and are they cost-effective?
	Management Information Systems	What types of information systems are being established and how do these enhance planning, budgeting, programming, and overall financial management and performance?
	TSM--Concepts and Actions	What new TSM actions have been successfully applied and how can individual TSM actions be merged into an overall process for the better day-to-day management of the transportation system?
	Labor Agreements/Management	What strategies have been successfully used to deal with problems of absenteeism and to control labor costs?
FUNDING AND FINANCIAL STRATEGIES		
	Financial Analysis	What methods are available to project funding needs and funding availability and to evaluate alternative strategies for funding revenue shortfalls?
	Revenue Sources/Funding Mechanisms	What innovative funding ideas have been developed and what are the advantages and disadvantages of these ideas?

EXHIBIT 1 (Cont.)

AREAS OF USEFUL TECHNICAL AND PLANNING ASSISTANCE CITED BY THE CONTACTS

Area	Area Definition
Cost Allocation/User Fees	What methods have been developed to determine an equitable cost allocation among highway users, and how would the implementation of new users' fees affect intermodal competition and the demand for transportation services and facilities?
Private Sector Involvement	What types of private sector involvement in the financing and/or provision of transportation services and facilities have been identified and what are the advantages and disadvantages of each?
Information on Federal Program Changes	What changes have occurred or are likely to occur, what are the potential repercussions of these changes, and how should other levels of government respond to the changes?
OPERATIONS	
Bus Rehabilitation	What are the costs and performance characteristics of rehabilitated buses relative to new purchases?
Operating Efficiency of Cost Savings	What types of innovative cost savings measures are being introduced in the operating area?
Ridesharing Options	What ridesharing options have been tried and with what results?
Elderly and Handicapped Services	What approaches are being used to provide efficient transportation services for elderly and handicapped persons?
Parking Regulations As To A TSM Strategy	What types of parking regulations are being implemented as transportation system management tools and how effective have these regulations been?
Weigh-in-Motion	What new weigh-in-motion technology is being developed and what is the prognosis in terms of costs, benefits, and data management?
Materials Performance	What is the most recent data on the costs and performance of various materials used in highway construction and maintenance?
Equipment Performance	What are the performance characteristics, maintenance requirements, and life-cycle costs of various pieces of equipment (e.g., small transit vehicles, computerized signal systems, fare boxes)?

EXHIBIT 1 (Cont.)

AREAS OF USEFUL TECHNICAL AND PLANNING ASSISTANCE CITED BY THE CONTACTS

	Area	Area Definition
	Port/Rail Interface	What new methods are being introduced to improve capacity and operating efficiency?
	Fleet Management	What actions have been taken to increase operating efficiency through fleet acquisition, maintenance, and development practices?
	Motor Vehicle Services Rationalization	What changes are being introduced in the delivery of motor vehicle services to improve operating efficiency?
DATABASES AND SYSTEMS		
	Database Development and Maintenance	How can planning databases be more efficiently developed and maintained? What databases are needed to effectively monitor highway conditions? What opportunities are available to automate the collection of transit vehicle data?
	Minicomputers and Microcomputers	How can minicomputers and microcomputers be used by transportation agencies? What are the benefits and costs of these applications?

EXHIBIT 2 (Cont.)

AREAS OF USEFUL TEHNOLOGY AND PLANNING ASSISTANCE CITED BY THE CONTACTS

	Number Who Cited Interest in the Assistance by Organization					Area of Application*		Modal Application*				
	Total	State	Regional	Local	Other	Urban	Rural	Highway	Transit	Rail	Aviation	Waterway
POLICY ANALYSIS												
1. Service Level Evaluations	7	4		1	2	4	4	5	4	1		
2. Truck Size and Weight	3	3				2	3	3				
3. Energy Conservation	1		1				1	1	1			
4. Economic Effects of Transit	2				2	2			2			
5. Paratransit	1		1				1	1	1			
6. Role of States in Rail Service Issues	2				2	2	2			2		
PLANNING METHODS												
7. Contingency Planning	6		3	3		6	2	4	6	1		
8. Resource Allocation	1		1			1	1	1				
9. Strategic Planning	1				1	1			1			
10. Needs Assessment	6	2	2		2	4	2	2	4			
11. Planning Function Redefinition	3			1	2	3	2	3	3	1	1	1
12. Rail Service Rationalization	4	1	1		2	2	4	3		4		2
13. Methods for Small Urban & Rural Areas	8	1	2	4	1	5	4	8	8	2	1	
14. Effects of Deregulation and Other USDOT Policies	5	1	1		3	5	3	3		3	2	3
15. Effects of Changing Technology	4	1	1		2	3	3	4	1	3		2
16. Assistance with the Federally Mandated Planning Process	4	1			3	2	4	4	3	1		
17. Alternatives Analysis	3		3			3	1	2	1	1		
18. Bridging the Gap Between Theory of Practice	7	2	2	2	1		7	7	7	7		7
19. Traffic Analysis/Management	2			2		1		2	1			
20. Intermodal Impacts, Tradeoffs	4	2	1		1	3	2	3	3	3	3	4
21. Railroad/Community Conflicts	2				2	2	2	2	1	2		
MANAGEMENT STRATEGIES & TECHNIQUES												
22. Safety	5	3			2	5	5	4	2	3	1	
23. Contract Administration & Claims Settlement	1	1					1	1				
24. Retention of a Viable R&D Function	1	1				1		1	1	1	1	1
25. Budgeting	2	2				1	2	2	2			
26. Training	5	1		3	1	5	1	4	3	1	1	1
27. Marketing Transit Services	5	1	1	2	1	2	2	2	1	2		
28. Maintenance Management	27	11	1	13	2	5	1		5			
29. Management Information Systems	3	1			2	22	14	19	9			
30. TSM--Concepts of Actions	7		1	4	2	2	2	2	3			
31. Labor Agreements/Management	6			6		6			6			
FUNDING AND FINANCIAL STRATEGIES												
32. Financial Analysis	9	1	1	3	4	8	3	4	8	1	1	1
33. Revenue Sources/Funding Mechanisms	33	8	2	20	3	27	9	11	29	2	3	2
34. Cost Allocation/User Fees	8	4	2		2	6	6	6	1	2		4
35. Private Sector Involvement	6		2	3	1	6		2	6	2	1	1
36. Information on Federal Program Changes	7	1		6		7	1		7			

EXHIBIT 2 (Cont.)

AREAS OF USEFUL TECHNOLOGY AND PLANNING ASSISTANCE CITED BY THE CONTACTS (cont.)

	Number Who Cited Interest In the Assistance by Organization					Area of Application*		Modal Application*				
	Total	State	Regional	Local	Other	Urban	Rural	Highway	Transit	Rail	Aviation	Waterway
OPERATIONS												
37. Bus Rehabilitation	1			1		1			1			
38. Operating Efficiency/Cost Savings	6	2	2	2		4	3	2	6	1		
39. Ridesharing Options	2	1	1			2	1	2	1			
40. Elderly/Handicapped Services	2	1		1		2	1		2			
41. Parking Regulations	2			2		2		2	1			
42. Weigh-in-Motion	2	2					2	2				
43. Materials Performance	7	7				4	7	7				
44. Equipment Performance	4	2		2		3	2		3	1		
45. Port/Rail Interface	3	1	1		1	3		2		3		3
46. Fleet Management	3	2		1		3		3	1			
47. MV Services Rationalization	1	1				1		1				
DATABASES AND SYSTEMS												
48. Database Development & Maintenance	4	1	1	2		3	2	4	2			
49. Micro & Minicomputers	6		2	2	2	5	2	5	6			

*The urban/rural and mode totals may exceed the number of contacts who cited the need because some contacts have both urban and rural and multi-modal responsibilities.

mechanisms" and "maintenance management." Otherwise, interest in other topics comes from specific state or local users faced with problems in those areas.

Modal Differences

The dispersion of interest also is reflected in differences as to which areas of assistance are important to each mode. One such difference is the substantial concern within the transit community for revenue sources/funding mechanisms. While agencies involved with other modes also identified assistance in the area of transportation financing as a primary concern, this area of assistance tends to be the dominant concern of transit service providers. Obviously, this concern reflects the growing deficits faced by transit agencies and proposals to reduce, if not eliminate, federal participation in financing transit operating deficits.

A second notable difference among the modes is the orientation of highway/transit interests as opposed to rail/aviation/waterway interests. Agencies having highway and transit responsibilities cited a preference for assistance related to the direct provision and management of facilities and services. Those with rail, aviation, and waterways responsibilities appear to prefer assistance related to the regulation of services and facilities and responses to changes in the private transportation sector. These differences, of course, parallel the roles of public agencies in the respective modal areas.

Urban Versus Rural Differences

The needs of agencies which have rural versus urban constituencies tend to differ, particularly at the local and regional levels. The differences are not well-reflected in Exhibit 2, because they involve differences in content within areas of assistance. That is,

differences in the issues confronting rural and urban agencies and differences in the capabilities of these agencies to address these issues result in different technology and planning assistance needs.

With respect to issue differences, local agencies with a rural constituency are addressing a different level of issue than their urban counterparts. For example, many of these agencies are just beginning their involvement in transit, ridesharing, and system management. Consequently, these agencies are seeking very basic assistance such as: 1) how to realize transit service quality and efficiency improvements through coordination of existing, independent services, 2) what ridesharing options are applicable in rural areas and how can they be established, and 3) what types of traffic analysis models can be applied in rural areas. In contrast, agencies with an urban constituency are addressing issues associated with more mature systems and thus tend to seek assistance in more specialized areas and in keeping abreast of changes in the state-of-the-art.

Another difference between urban and rural issues involves the types of transportation service reductions each is facing. In rural areas the reductions tend to be the loss of service options (e.g., rail, transit, and air service losses), whereas in urban areas the reductions tend to be declines in service levels. Consequently, rural areas seek assistance in identifying ways to avoid the loss of options or to mitigate the loss of options. Urban areas seek assistance in identifying ways to circumvent service reductions or to reduce services with minimal adverse impacts.

The difference between urban and rural local transportation agencies reflects differences in capabilities as well as differences in issues. Rural agencies often do not have the resources to hire a large, highly specialized staff with substantial experience. Consequently,

professionals with rural agencies tend to have a more diverse set of responsibilities than their urban-based counterparts, not all of which are in their area of experience. At the same time, rural agencies tend to have small training and consultant budgets which restrict their access to outside expertise. In sum, this means that professionals with rural agencies need assistance in quickly identifying and becoming familiar with basic methods and techniques to address a variety of concerns. A final reason for the relative emphasis on more basic methods and techniques within rural agencies is the relative paucity of tools available to address rural transportation issues. The contacts stated that development of methods and techniques has focused on urban areas and that little has been done to develop tools to address rural transportation concerns. Thus, while rural agencies are seeking assistance in the development and implementation of relatively basic methods, urban agencies prefer information on more specialized innovations and advances in the state-of-the-art.

COMMON AREAS OF INTEREST

Despite the diversity and dispersion of interest discussed above, some central themes for technology and planning assistance did emerge from discussions with the contacts. The first is the overriding concern with funding. This concern is apparent in the large number of contacts who expressed an interest in assistance in the area of "revenue sources/funding mechanisms." But the concern for funding also pervades many other areas of assistance cited as useful. That is, many of the issues confronting state and local transportation agencies, and hence the most useful areas of technical and planning assistance, are associated with

funding constraints and how to deal with them. This commonality is apparent in each of the following types of assistance cited by the contacts:

- Service level evaluations
- Contingency planning
- Resource allocation techniques
- Needs assessment
- Budgeting
- Maintenance management
- Management information systems
- Financial analysis
- Cost allocation/user fees
- Private sector involvement
- Operating efficiency and cost savings
- Fleet management
- Motor vehicle services rationalization

Each of these items addresses financial issues: how to allocate scarce resources; how to develop credible assessments of funding needs; how to maximize the utility of available resources; how to improve operating efficiency; and how to reduce costs.

A second dominant issue is maintenance management. Reference to Exhibit 2 shows that a large number of contacts identified "maintenance management" as a useful area of technology and planning assistance. Additionally, as with transportation financing, there is a cluster of other types of assistance which derive from the increasing focus and concern for the maintenance of existing facilities and services. The following types of assistance concern, at least in part, the determination of appropriate

levels of service to maintain, how policy decisions affect maintenance requirements, how limited maintenance budgets can be most efficiently allocated, how materials and equipment performance can be enhanced, how information systems can improve management capability, and what planning tools are available to address these, and other maintenance issues:

- Service level evaluations
- Truck size and weight
- Planning function redefinition
- Materials performance
- Equipment performance
- Fleet management
- Databases and systems

Several of these types of assistance overlap with those associated with transportation financing. Clearly, the demand for improved methods of maintenance management derives from the fact that service and facility maintenance is becoming the dominant task of state and local transportation agencies from both a technical and a budgetary perspective. The demand for maintenance management assistance reflects the need to control the maintenance function technically and financially in order to meet the agencies' responsibilities to provide safe and efficient transportation services in the context of limited budgets.

TYPES OF ASSISTANCE

Within each area of assistance, the contacts also identified the types of assistance which would be useful. These include the following:

- Development of new planning and analytical methods.

- Identification of and instruction in the implementation of existing planning and analytical methods.
- Identification of management and operating techniques and equipment and materials technology.
- Procurement of information on current and future events (e.g., hearings, conferences, training courses), changes in the transportation industry (e.g., legislation, rules and regulations, technology), basic transportation data and assumptions and the experience of others with methods and techniques.

Of particular note is the strong desire for information on the experience of others. While the other types of assistance vary by area of assistance, the experience of others with methods and techniques was consistently cited as valuable information. The experience of others provides a test of methods and techniques revealing their strengths and weaknesses. Experience also is valuable as an aid to selecting methods and techniques for specific applications and in approaching their use or implementation in the most effective manner. Finally, the experience of others provides legitimacy and credibility to a new proposal or a work product and thus improves the probability of success in dealing with elected officials and the public.

CONCLUSION

The areas of assistance defined as potentially useful to state and local transportation agencies reflects the tremendous diversity of issues, problems, and opportunities faced by those agencies. They also reflect the different environments and capabilities of the agencies.

The diversity of need creates a particular challenge for defining a responsive technology and planning assistance program. The challenge is to determine among which areas of assistance limited program resources should be allocated and which aspects of those areas should be emphasized?

An answer may be found in the common concerns which prevail in many of the areas of assistance identified. Funding and maintenance are the predominant issues facing state and local transportation agencies. Professional assistance in these areas (financial analysis, funding mechanisms, needs assessment, resource allocation, operating efficiency, maintenance strategies, materials performance) will be valuable to a large audience of state and local transportation agencies. Similarly, there continues to be a demand for basic methods and technologies as well as state-of-the-art advances.

III. FINDINGS WITH RESPECT TO MECHANISMS FOR PROVIDING ASSISTANCE

INTRODUCTION

In addition to defining the areas of assistance, they would find useful, some of the state and local agency contacts identified assistance mechanisms they would consider effective. Mechanisms are defined to include the physical arrangements for providing assistance and the nature of the assistance provided (e.g., manuals, abstracts, contacts).

Twenty-three mechanisms were identified by the agency contacts. They are listed in Exhibit 3. These mechanisms were identified as consistent with the Office of Technology and Planning Assistance program.

KEY COMPONENTS OF AN ASSISTANCE PROGRAM

The mechanisms listed in Exhibit 3 reveal the primary components of an effective program of technology and planning assistance from the contacts' perspective. That is, the mechanisms can be grouped into the following five functional components:

1. Provision of an information and contact broker service.
2. Preparation of abstracts or executive summaries of newly published documents.
3. Publication and dissemination of documents which detail new technology and planning methods.

EXHIBIT 3

TECHNOLOGY AND PLANNING ASSISTANCE MECHANISMS
CITED AS EFFECTIVE BY THE CONTACTS

Mechanism	Description
Information/Contact Broker	Provide a central contact which directs users to sources of requested information.
Key Contacts List	Maintain a list of experts by area of specialization.
Basic Library	Maintain a bibliography and procurement information on basic references.
Innovations Surveys	Conduct and publish a periodic survey of state and local innovations in specified areas.
Summary of R&D Projects	Publish and disseminate a periodic summary of State R&D activities.
State-of-the-Art Benchmarks	Review new work to determine whether it advances the state-of-the-art and publish the reviews to keep agencies abreast of such changes.
Reader's Guide	Evaluate materials available on specific subjects to identify the most relevant materials for transportation agencies.
White Card System	Alert agencies of the availability of new documents by sending them a postcard on which is presented an abstract of the document's content and procurement information.

EXHIBIT 3 (Cont.)

Mechanism	Description
Research Bulletins	Publish a periodic bulletin which contains abstracts of recently published materials.
Issues Reports	Publish a periodic paper or newsletter which focuses on a current issue or "hot topic." The paper would define the issue, present brief case studies, and identify relevant references and contacts.
Conference Presence/Synopses	Attend conferences to keep abreast of issues and new approaches to resolving them, alert participants to the office's program, increase the office's network of contacts, and identify opportunities for technology and planning assistance.
Executive Summaries	Publish executive summaries to inform managers of relevant new materials.
News Releases with Documents Dissemination	Alert agencies to the release of new material to libraries by publishing a "news release" which describes the material.
Document Printing and Dissemination	Identify, publish, and disseminate documents which present successful approaches to transportation issues.
Manuals/How-To Documents	Publish documents which provide step-by-step instructions for applying new techniques and methods.
Central Documents Repository in each State	Participate in the National Highway Institute activity to establish as a document clearinghouse a major library in each state.

EXHIBIT 3 (Cont.)

Mechanism	Description
Case Studies	Publish case studies which present practical experience with new techniques and approaches.
Seminars/Workshops/Courses	Conduct, sponsor, and/or develop curricula for training in the application of new techniques and specific issues.
Host Agency Program	Arrange on-site visits to observe first-hand successful methods and technologies.
Use of Telecommunications	Evaluate telecommunications as an alternative to personal contact to exchange methods and technologies.
R&D Coordination	Coordinate federal, state, and local R&D activities and results dissemination.
Use of Existing Networks	Use established networks of communication, such as those maintained by associations, to enhance dissemination of new materials.
Marketing	Improve the Office's name recognition through marketing so that agencies are aware of the services provided.

4. Publication of case studies to impart the results of practical experience with new technology and planning methods.

5. Preparation of training materials, conduct of training courses, and provision of access to experts to provide instruction in technology and planning methods.

In addition to these five components, some of the mechanisms relate to basic support which is requisite to successful performance of the components. Following is further discussion of each of the components and the support mechanisms.

Information and Contact Broker

The first step in addressing a new transportation issue is to determine the state-of-the-art in dealing with the issue, i.e., to identify applicable technology or planning methods. A central contact (or focal point) which could direct agencies to sources of relevant information (documents and experts) would greatly facilitate the agencies' search. The central contact would not provide direct planning and technology assistance to those requesting it, but rather would be the initial contact or broker between requests for information and sources of information.

The ability to perform this task well is not straightforward. It requires the contact to be well-informed of state-of-the-art references and experts in the field. Thus, the contact must keep abreast of the major transportation issues confronting state and local government, maintain a listing of basic references and experts, and update the lists as new developments occur. (See "Innovations Survey," "Summary of State R&D Projects," "Key Contacts Listing," and "Basic Library.") The agency contacts indicated that the screening or evaluation of new technology and planning methods would be an important task in maintaining state-of-the-art awareness. (See "State-of-the-Art Benchmarks" and "Readers' Guide.") This

would not be essential for the broker insofar as the broker could direct agencies to experts who could provide an evaluation of relevant materials in the context of the agencies' request for information.

Another ingredient to successful information brokering is that potential users must be aware of the broker service and how to use it. Word of mouth, although important for developing long-term credibility, cannot be relied on to establish this awareness. Rather, a systematic marketing effort is needed.

Preparation of Abstracts and Executive Summaries

In addition to responding to requests for information from state and local governments, the agency contacts believe that an office of technology and planning assistance should alert them to new ways to address issues, solve problems, and realize opportunities. At the same time, innundation of the agencies with materials is not an effective or efficient way to accomplish this objective. Indeed, many of the agency contacts mentioned that because of the substantial volume of material they receive, much of it remains unread.

In light of this situation and the desire to keep abreast of relevant developments in the field, the agency contacts recommended a number of mechanisms which can be categorized as the preparation of abstracts or executive summaries of larger documents. These mechanisms include research bulletins, executive summaries, news releases, readers' guides, issue reports, R&D summaries, conference synopses, and the white card system used currently by the Office of Technology and Planning Assistance.

A well-written abstract will highlight the key contents of a document in a few paragraphs or pages and thus is an efficient way to alert state and local transportation agencies of new developments. In addition to keeping managers informed of new developments, the abstract serves as a screening device for more lengthy documentation of new technology and planning methods. It provides managers sufficient information to decide whether the parent document is worth acquiring.

The "white card," which was developed and currently is used by the Office of Technology and Planning Assistance, was cited as an efficient way to inform agencies of documents published by the Office. A postcard is sent to individuals on the Office's mailing list and to other select individuals depending on the document's content. The card presents an abstract of the document's contents and procurement information. In addition to alerting agencies of new documents, the white card is a good marketing tool. Recognition of the white card far exceeded recognition of the Office title among the agency contacts.

It was suggested that an executive summary for each document published by the Office be prepared to complement the white card notification. An executive summary would expand on the abstract presented in the white card by outlining key findings and conclusions and/or new technology and planning methods. The executive summary would serve an intermediate role in the notification-of-available-materials/dissemination-of-new-development-highlights/publication-of-detailed-instructional-materials continuum. SMD Briefs also was cited as a good model for presenting synopses of new documents and new developments.

Publication and Dissemination of Documents

The opinion of the contacts is that the publication and dissemination of documents is a valuable component of a technology and planning assistance program if the documents are well-prepared and supplemented with other materials and activities. While it is essential to document new technology and planning methods, the contacts expressed the view that (1) lengthy documents are not read, particularly by managers and (2) documents alone do not provide adequate education with respect to new technology and methods. On the other hand, the contacts stated that documents are valuable references when (1) they are supplemented by abstracts or executive summaries which provide sufficient detail to determine if the complete document warrants reading, (2) they are written from the practitioner's perspective (how-to manuals and case studies are strongly preferred), and (3) follow-up information and instruction (through contacts and courses) are readily available. The strength of this conviction on the part of the agency contacts cannot be overemphasized. Indeed, it is reflected in the five key components of an effective technology and planning assistance program.

A further note with respect to manuals is worthwhile. As noted above, this type of document is preferred, along with case studies, by the agency contacts because the step-by-step presentation provides a thorough, comprehensible, and practical treatment of the subject. The Office of Technology and Planning Assistance has published some manuals. These documents are highly regarded by the agency contacts familiar with them. Indeed, the contacts' awareness of the Office of Technology and Planning Assistance Program is in many cases attributable to the manuals which those contacts have found to be very useful in carrying out their responsibilities.

A final suggestion with respect to document dissemination is to designate a library in each state and/or major metropolitan area as the repository for all technology-sharing documents. With notification of the availability of the documents (i.e., through publication of abstracts), agencies could have access to relevant materials at less publication cost to the assistance program. FHWA's National Highway Institute is currently examining this idea.

Publication of Case Studies

This function was mentioned above in the context of publishing documents on new technology and planning methods. Its importance, and the fact that it is an often neglected function, warrants its separate treatment. The agency contacts deem case studies to be a particularly effective way to educate state and local agencies in new technology and planning methods. Relating practical applications enhances the comprehension and credibility of new technology and methods. Case studies also provide insight into the strengths and weaknesses of the technology or method, conditions in which it can be applied, and ways to approach implementation. Providing this type of information increases the probability that new technologies and methods will be applied elsewhere and will be applied successfully.

Preparation of Training Materials, Conduct of Training Courses, and Access to Experts

Technology transfer in some cases requires in-depth instruction with personal contact to be successful. The conduct of seminars, workshops, and training courses provides an opportunity for professionals to work through new technologies and methods for solving transportation

problems. This interaction enhances technology transfer because it provides for detailed discussion and clarification of new ideas and their application in various state and local contexts. Such a process also can result in advancing the ideas to their next logical step or in new ideas.

Obviously, not all new developments warrant training courses. Some can be self-taught, particularly if manuals and case studies are provided. Also, demand for instruction must be sufficient to justify the considerable cost associated with course development and staging. Where demand is not sufficient, other instruction options may be used. Examples suggested by the agency contacts include a "host agency program" and individual contact with experts. Under a host agency program, agencies with an interest in a particular technology or method visit another (host) agency which has successfully applied the technology or method. The role of the assistance program in this case would be to set up the initial contact between the agencies. The agencies would handle all other arrangements. This role of the assistance program and the linking of agencies with experts could be handled through the broker function described above.

Another consideraton in the development of training courses is the ability of potential participants to attend them. This consideration is becoming increasingly significant as state and local transportation agencies experience increasingly restrictive travel and training budgets and policies. Some agency contacts suggested that telecommunications, such as closed circuit television, be examined as a means of overcoming travel and training restrictions.

Support Elements

In addition to the above components, which describe direct support to state and local transportation agencies, the agency contacts identified some mechanisms which support direct assistance efforts. The mechanisms, some of which were mentioned in the discussion of the components, include the following:

- Summary of State R&D Projects. To support the information/broker function, a current listing of state R&D activities would be useful. Currently, no such list is maintained by USDOT or any interest group. Publication of the list would facilitate R&D coordination among the states as well.

- Key Contacts List. Performing the broker function requires current knowledge of experts in the field who are willing to discuss new technologies and planning methods with state and local agencies.

- Basic Library. Maintenance of a bibliography and procurement information of basic transportation literature is essential to performing the broker function. Many issues confronted by state and local transportation agencies have been addressed and, thus, many requests for assistance can be answered by reference to basic literature.

- Innovation Surveys. To keep abreast of new developments, an annual innovations survey of state and local transportation agencies may be used. The survey results also will reveal sources of information and potential subjects for documentation of new technology or for case study verification of existing technology.

- Conference Presence/Synopses. Attendance at conferences provides an opportunity to identify new technologies and methods which warrant dissemination, to identify case studies, to expand contracts, and to market the assistance program.

- Use Existing Networks. Communication networks maintained by interest groups such as NLC, ICMA, APTA, AASHTO, and others could be used to expand the coverage of the assistance program and to reduce the costs of maintaining a current mailing list of target populations.

- Marketing. Marketing is needed to ensure that name recognition, which is critical to the success of an assistance program, is achieved.

CONCLUSIONS

The individuals contacted during this study recommended a number of mechanisms which they deem to be effective ways to provide technology and planning assistance. The mechanisms define five components which represent the foundation for a successful assistance program. These components are the following:

1. Provision of an information/contact broker service.
2. Preparation of abstracts or executive summaries for new documents.
3. Publication and dissemination of documents which detail new technology and planning methods.
4. publication of case studies to report practical experience with new technology and planning methods.
5. Preparation of training materials, conduct of training courses, and provision of access to experts for instruction in new technology and planning methods.

The contacts emphasized the essential interrelationship among these components. In particular, they emphasized the importance of the ability to alert agencies to new ideas and opportunities as well as the ability to respond to their questions. They emphasized the importance of abstracts and executive summaries to impart information and to serve as a screening device for managers innundated with written material. They emphasized that documents are effective if supported by training and access to experts for answers to questions regarding the documents' contents. And, they emphasized the value of manuals and case studies in bridging the gap between theory and practice.

APPENDIX A

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APPENDIX B

AREAS OF TECHNOLOGY AND PLANNING ASSISTANCE CITED BY THE CONTACTS

POLICY ANALYSIS

1. Service Level Evaluations

The need cited in this case is for methods and data for conducting an evaluation of various levels of service. In the transit industry, the need is cited with respect to service reductions which are becoming necessary as a result of budget constraints. In this case, an analysis of the trade-offs among service levels is needed. In the highway area, the issue of service levels currently is focusing on the level at which the highway systems should be maintained. In this case, there are economic and financial issues. The economic issue is to determine the optimal service level from a public welfare perspective; i.e., accounting for agency, user and non-user costs and benefits. From the financial perspective, the issue is to determine the implications (agency, user and non-user) of various funding levels and hence levels of service. A specific, related issue is the downgrading or abandonment of low volume roads. Assistance is requested in identifying the implications of such actions and in techniques and data bases for the evaluation.

2. Truck Size and Weight

Truck size and weight regulations continue to be an issue faced by state highway agencies. Requests for relaxation of size and weight restrictions are made citing realizations of transport efficiencies as the

rationale. The concerns with respect to the relaxation of restrictions involve the effect of larger trucks on highway construction and maintenance requirements. Also of concern are the effects on highway traffic flows and safety. Highway agencies are interested in information on the implications of relaxing size and weight restrictions in order to formulate a sound policy decision on the restrictions and on complementary taxing rates and structures.

Another issue with respect to truck size and weight is the rationalization of regulations within states and the coordination of policies among states. Information on the benefits of simplifying the regulations and how states have approached this issue is of interest.

3. Energy Conservation

Although it is a lower priority concern than it was a few years ago, energy conservation in transportation remains an interest of state and local transportation agencies. The agencies continue to have an interest in information about feasible energy futures, methods they can use to estimate the repercussions of these futures on transportation services within their areas, and actions they could take to circumvent or mitigate adverse social and economic effects of energy developments. With respect to actions, agencies are interested in programs which their counterparts have tried and the results of those programs. Energy contingency planning, analysis and action programs continue to be of interest due to the uncertainty associated with the energy future.

4. Economic Effects of Transit

Actual and proposed reductions in federal aid to public transit, and particularly federal operating assistance reductions, has led many state and local transportation agencies to evaluate their public transit programs. The basic issue is what level of transit service is appropriate to maintain. A major concern in this evaluation is the relationship between the economic vitality of an urban area and the level of transit service provided in that area. It is important to understand this relationship in order to make the trade-off between reducing transit services and increasing state and local contributions to transit. Currently, information on this topic is largely anecdotal. Agencies are seeking assistance to better understand the trade-offs in their specific areas.

5. Paratransit

Promotion and support of paratransit remains an active component of many transportation agencies programs. As such, the agencies remain interested in learning new approaches to expanding paratransit services and patronage. Additionally, many agencies are just becoming involved in paratransit programs. This involvement stems from an interest in improving transportation service efficiency, a concern for providing alternatives to the private car, and a concern for energy conservation. Some agencies also are interested in paratransit as they consider options to traditional transit services for which funding is being reduced. Smaller urban and rural areas are becoming more interested in paratransit for this last reason. The agencies which are newly involved in paratransit are

interested in assistance to identify and evaluate the options available to them.

6. Role of States in Rail Service Issues

The establishment of the Local Rail Services Assistance Program provided the mechanism and the funding for many states to become actively involved in rail service issues. Much of the activity has emphasized light density branch lines, but many states also have become involved in rail system rationalization and other issues.

The federal assistance program is now being phased out. This raises the question of what role the states will play in the rail services areas. Related issues are what authority/responsibility will be assumed by state agencies and how their activities will be funded. Information on what the various states intend to do in the rail service area and how they intend to accomplish their objectives is of interest to state transportation agencies.

PLANNING METHODS

7. Contingency Planning

The identification of contingency planning tools as an assistance need relates primarily to the financial outlook and its implications on the level of services which public agencies can provide. The greatest concern was expressed in the public transit sector in which possibly dramatic changes in funding levels and sources may occur. The tremendous uncertainty associated with the funding outlook makes it exceedingly difficult to plan and program facility and service changes. Contingency

planning is one tool which has been cited as a potential management tool to deal effectively with the uncertainty. Some agencies believe that they are successfully applying this tool to develop action plans. Other agencies would like to know more about the techniques used in contingency planning, how these techniques should be applied, and whether they have been applied successfully.

8. Resource Allocation Techniques

The question of how best to allocate resources among various state and local transportation agency functions is a long standing one. The question becomes more significant and more difficult to answer when funding levels become more restrictive. Some transportation agencies have asked for information on alternative ways to determine resource allocation. They would like to know the requirements and the strengths and weaknesses of the alternatives in order to select a methodology suitable to their needs.

9. Strategic Planning

Strategic planning is a process by which a plan of action is developed for an organization to improve its performance with respect to its goals and objectives. The process is becoming widely used in the private sector in a variety of industries. There is an increased interest in applying strategic planning in public agencies as well (contingency analyses may be one type of strategic planning tool). State and local transportation agencies would like information on the elements of the process, what modifications may be necessary for public sector applications, what the applications for strategic planning are, who has tried the process, and with what results.

10. Needs Assessment

The type of assistance asked for in this area is for techniques which produce credible estimates of transportation facility and service needs. Needs assessments of the past tended to be viewed as wish lists by the public and elected officials. The label was often accurate. In addition, it reduced the agencies credibility with the public and, hence, their ability to convince the public of legitimate funding requirements. Recognizing these problems and the difficult funding issues currently faced by public agencies, some state and local transportation agencies would like to have information concerning alternative needs assessment methodologies, including their accuracy and public credibility.

11. Planning Function Redefinition

Many persons to whom we spoke said that the planning function must be redefined. With the redefinition are needed the tools to fulfill the expanded planning role. Traditionally, planning has had a long-range, comprehensive, capital investment orientation. While there remains a need to take this perspective, many transportation issues today involve systems and operations management, system maintenance, and shorter time frames. The need identified in this respect is to promote an understanding of the expanded role, to support the establishment of the role by identifying relevant issues to be addressed, and provide techniques and planning assistance to address these issues. [In some cases, resistance to changing the planning function by outside agencies may be experienced. Assistance in overcoming such resistance may be needed.]

12. Rail Service Rationalization

Throughout the country efforts are being made to "rationalize" the rail system. To many states and regions, particularly in rural areas, this means the loss of service on light density rail lines. The issue this poses for state and local transportation agencies is what adverse effects the loss of rail service may have on the area economy and how these adverse impacts can be eliminated or mitigated. The assistance requested is for methods which can accurately predict the effects of rail service loss, for actions which can be taken to mitigate adverse effects and the experience with these actions. These tools also could support a state role in developing positions with respect to railroad proposals to abandon specific services.

13. Planning Methods for Small Urban and Rural Areas

This call for assistance has three components: (1) The paucity of sound methods of transportation planning in small urban and rural areas; (2) the need to become quickly familiar with methods to address a variety of transportation issues; (3) problems of access to existing methods. With respect to the first component, there is a perception that the development of transportation planning methods has emphasized large urban areas and that little has been done to develop techniques for small urban and particularly for rural areas. Furthermore, the methods developed for large urban areas are not readily transferable to small urban areas and even less useful for rural areas. Assistance then is needed in developing new methods and documenting existing methods for these areas.

The second component is a statement of fact rather than need, but does underline the need for assistance. The fact is that smaller local and regional agencies which deal with transportation issues often do not have the resources available to hire a highly specialized staff. Consequently, these professionals are required to conduct analyses in a variety of issue areas, not all of which are in their area of experience. These professionals need to be able to have ready access to a variety of basic planning methods which they can learn to apply to their specific issue analyses. However, it is also these professionals who do not have good access to sources of good planning practice (the third component). They often are isolated geographically, and have small travel, consultant, and document budgets. As a consequence of these factors, professionals with non-urbanized and rural transportation agencies need assistance in quickly identifying planning methods applicable to their issues and subsequently they need instruction in the use of the methods.

14. Effects of Deregulation and Other Federal Policies

During the past several years, there has occurred a significant reduction in the extent of transportation industry regulation. The sectors primarily affected are rail, air, and motor carrier transport. Deregulation of intercity bus services also is a topic of congressional discussion. Transportation agencies expressed interest in knowing more about techniques for determining what the effects of deregulation (on transportation services and hence social and economic well-being) will be and what role these agencies can play in maximizing the benefits and/or minimizing the adverse effects of deregulation. Particular concern was expressed for the effects of rail, air, and intercity bus services

deregulation in rural areas which tend to be more substantially affected by deregulation.

Similarly, agencies are interested in receiving assistance in predicting effects of federal policy and program changes in general and in developing plans to deal with these effects. Specific areas cited include noise and hazardous materials regulations.

15. Effects of Changing Technology on Transportation Demand

This issue was raised with respect to rail transportation, but it could apply to all modes of transportation. Some new technologies are being tested which could have substantial effects on intermodal competition, mode choice, and demand for public facilities and services. The request is for information to alert transportation agencies of major technological changes and the implications of those changes. Such information could enhance the agencies ability to respond adequately to the changes.

16. Assistance With the Federally Mandated Planning Process

One result of the 1980 census of population was the designation of approximately 100 new urbanized areas. This brings the total number to around 375 urbanized areas. The new urbanized areas enter a new status with respect to transportation planning requirements. Traditionally, urbanized areas have been required to conduct a comprehensive planning process with specific outputs in order to qualify for federal transportation assistance.

The federally mandated requirements are being changed; more flexibility with respect to both the planning process and the planning products is

being established by the new regulations. This is particularly true for urbanized areas under 200,000 population. Nonetheless, the new urbanized areas will need assistance in understanding and responding to planning requirements. More basically, they will need assistance in establishing a credible planning capability. The relaxation of federal planning requirements actually may increase the need for assistance as planning agencies have more options open to them and have the opportunity to be more creative in their planning process and products. Indeed, the increased flexibility opens up planning opportunities in existing as well as new urbanized areas. Assistance to existing areas--recognizing options, developing new processes and techniques, emphasizing new issues, etc.--also will be valuable.

17. Alternative Analysis

Alternatives analysis--the examination and selection of a course of action from among a set of alternatives--is an integral component of transportation planning, programming, management, and operations. Because it is such an integral component of transportation agencies responsibilities, these agencies are continually looking for ways to improve their analysis capabilities. In particular, agencies are looking for ways to improve the predictive accuracy and credibility of their recommendations. One individual who reported alternatives analysis as an area of assistance need cited the work by PTI on contraflows lanes as an excellent example of the kinds of factual data that is needed to perform alternatives analyses well. He also added the need for better growth forecasting tools as a component of the alternatives analysis need.

18. Bridging the Gap between Theory and Practice

A considerable amount of research and development is conducted with respect to transportation. However, it is felt that the usefulness of these efforts could be substantially improved if more attention were given to translating the R&D results into practical applications. Several actions were suggested to accomplish these objectives: (1) presenting research results in a format which is readily understood by policy makers and managers; (2) relating the results to specific policy and program responsibilities of transportation agencies and presenting possible implications for those policies and programs; (3) presenting case studies to illustrate the research results; (4) developing "how to" manuals providing instruction with respect to the applications of new methodology; and (5) providing seminars and workshops to instruct individuals in the use of new methods and practice.

19. Traffic Analysis

This is an area identified by some of the small urban areas which are initiating transportation studies. Projecting traffic volumes and patterns is an integral component of their work plans, but they are experiencing difficulties in selecting models on calibrating the model they are applying.

20. Intermodal Trade-offs

Many of the transportation issues facing state and local agencies and private industry have intermodal implications. Among these issues are cost allocation and users fees, truck size and weight, rail rationalization, new technologies (e.g., the "rail roader"), energy costs,

deregulation, and others. Transportation agencies are interested in improving their ability to assess the intermodal implications of these issues and responses to them. On the one hand, improved assessment techniques will enhance the policy analyses and decison-making of the agency because they will be more aware of the intermodal repercussions of public policy. Secondly, the agencies will be better able to judge the transportation implications of events taking place around them; eg., the implications for demand for transportation services and facilities. With this knowledge, the agencies can develop plans and programs which are responsive to changing transportation needs.

21. Railroad/Community Conflicts

There has been an increase in railroad/community conflicts in recent years, primarily as a result of increased unit coal train traffic. Increased coal production in the west, coal export activity on the coasts, and utility plant conversions to coal throughout the country have caused increased coal traffic and hence increased conflicts with communities. Railroad mergers, which have concentrated traffic on fewer main lines, also may cause increased conflicts. Railroads and communities need information on how to resolve these conflicts. The information should include recommended processes for identifying solutions as well as analytical techniques and funding ideas.

MANAGEMENT STRATEGIES AND TECHNIQUES

22. Safety

Two areas of concern were raised in the realm of safety: (1) how to influence motorists behavior, and (2) how to insure safety in the

transport of hazardous materials. In the first instance, many highway accidents are the result of unsafe motorists behavior. The most apparent unsafe driving behavior is drunk driving, which is receiving attention in many states. Other driving habits and driver errors contribute to safety problems as well. Information is requested on innovative ways to modify motorists' behavior--what approaches are being tried; with what success or failure; at what cost?

There is also a growing concern for safety associated with the transport of hazardous materials. Assistance is requested to determine how to minimize the potential for accidents involving hazardous materials and how to respond to such accidents when they do occur.

23. Contract Administration and Claims Settlement

This area of assistance is of interest to state highway agencies which let a substantial number of contracts each year for various highway capital, maintenance and other (e.g., design) projects. In fact, the reliance of highway agencies on outside contractors is growing as efficiencies in hiring contractors instead of maintaining an in-house capability have been realized. The increase in contracting for services has made contract administration an increasingly important management function. Agencies are interested in identifying "good practice" with respect to contracts management including techniques for contractor selection, contract negotiation, performance incentives, contract monitoring, and contract close-out. Another area of concern is with contract claims. The primary concern is to identify whether there are specific patterns associated with such claims. If certain patterns are

discerned, changes in contracting procedures may be identified which would enable highway agencies to better control and thus reduce the number and costs of contract claims.

24. Retention of a Viable R&D Function

Significant reductions in R&D efforts are occurring in transportation; the federal R&D budget has been substantially reduced and state programs have been cut back in response to budget constrants. With these reductions, many areas of needed research will not be pursued unless traditional institutional approaches to R&D are changed. Assistance is requested in identifying viable options for retaining a strong R&D effort with respect to issues confronting state and local transportation agencies. The federal cutback is of particular concern in those areas of research which individual states cannot pursue because of the large investment required and/or the high risks involved.

25. Budgeting

With increasingly severe budget constraints, the proper allocation of funds among programs and budget management have become even more critical. To ehance the allocation and management of resources, transportation agencies are attempting to develop new budgeting processes. These processes include steps by which the major budget issues confronting the agency are identified, alternatives analyses are conducted, and policy positions are formulated. The end result is a budget more responsive to the transportation needs and objectives of the agency's constituents than the traditional incremental budgeting approach. The budgeting processes being developed also includes a system for ongoing budget monitoring and

rebudgeting to respond to changing needs and conditions. Useful assistance in this area would be information on the new budgeting processes which have recently been introduced, how they were designed and implemented, how they have been refined, and what effect they have had on the management of resources available to transportation agencies.

26. Training

Training was brought up in several contexts: (1) development of competent mid-level managment and supervisors in the high-turnover transit industry; (2) the retraining of professional staff to develop capabilities for addressing current issues with current techniques; (3) the problem of maintaining a useful professional development program in the face of drastic reductions in training and travel budgets. The theme among these is the desire for information on existing training programs and training curricular for professional transportation staff development.

27. Marketing Transit Services

Agencies concerned about the future of transit services, and particularly about possible reductions in services associated with reduced funding, are interested in marketing techniques to promote transit's image. They believe that the general public's awareness and understanding of transit is poor. Marketing would be used to overcome this problem, i.e., to inform the public of the social, economic, and environmental contributions of transit. With this understanding a more rational decision with respect to public transit policy (funding and service levels) may be made.

28. Maintenance Management

Given the rapidly deteriorating condition of the highway system and constrained revenues for system maintenance, there is a need for information on highway maintenance management strategy. Transit properties, too, are experiencing increasing maintenance difficulties while, simultaneously, deficits are increasing.

The interest with respect to highways is to develop methods which can be used to determine and monitor the condition of the system to support needs assessments. Secondly, there is a need for information on various approaches to maintenance (actions and their timing) including the level of services which can be achieved and the lifecycle costs. Finally, there is a need for methods which relate various highway conditions to user and non-user costs such that the implications of various management strategies can be discerned.

In the transit industry, the maintenance issue cited is whether a program of preventive maintenance is cost-effective. With an increasing number of in-service breakdowns experienced by some systems, there is increasing interest in preventive maintenance programs--their elements, effectiveness, and costs.

29. Management Information Systems

With increasingly constrained resources available to public agencies, more emphasis is being put on developing a management capability which can maximize the use of available funds. To develop this capability, many transportation agencies are updating existing and establishing new managements information systems (MIS). These systems are designed to

improve the agencies' planning, budgeting, programming, project, and overall financial management and performance through the provision of accurate and timely information. The systems also can result in operating savings as data collection maintenance and processing is automated. Given the level of activity in MIS development, there is an opportunity to share system designs and results among transportation agencies. The emphasis should be in identifying conceptual alternatives and the advantages and disadvantages of each. While most of the activity is currently at the state level, assistance in determining regional and local systems applications also deserves attention.

30. TSM--Concepts and Actions

Interest in this area is from two perspectives. One is a call for a new way of viewing TSM. Rather than viewed as isolated actions designed to address site-specific problems, TSM should be viewed as a comprehensive approach, comprised of various interrelated actions, to manage the day-to-day operation of the urban transportation system. As such, it also should be viewed as a flexible strategy, not a static one, so that responses to short-term changes in service and facility characteristics and uses can be made.

The second area of interest is for information on specific components of TSM strategies--which actions are available for what types of applications; what results have been achieved; where have the actions been implemented (successfully/unsuccessfully); and what are the implementation requirements.

31. Labor Agreements/Management

Several transit authority managers cited labor management as an area of interest. The training or human resources development component was

noted earlier. (See item #26.) In addition, problems of absenteeism and how to deal with them and contract negotiations strategies to control labor costs were cited as areas for which managers would like to receive information and technical assistance.

FUNDING AND FINANCIAL STRATEGIES

32. Financial Analysis

Financial constraints were cited as the most pressing issue confronting state and local transportation agencies. The concern here is to provide transportation with the analytical capability to project funding needs and revenue receipts. Beyond these basic projections is the need to be able to evaluate alternative strategies for funding revenue shortfalls. This includes the estimation of revenues to be provided by various sources and the evaluation of various sources in terms of equity, administrative efficiency, certainty, political acceptability, and other characteristics.

33. Revenue Sources/Funding Mechanisms

Related to financial analysis is the demand for information on innovative funding mechanisms. What new ideas are agencies using to fund highway, transit, rail, aviation, and maritime services and facility construction and maintenance? What has been the experience with these new sources in terms of legal and institutional constraints/requirements, administrative costs, revenue productivity, etc?

34. Cost Allocation/User Fees

A topic of considerable discussion in recent years has been the effect of various types of vehicles on highway design and deterioration. The corollary issue is whether the various vehicles (users) are paying a fair share of highway construction and maintenance costs. The issues are of growing interest due to the need for many transportation agencies to increase their revenue receipts. Continued requests for relaxation of truck size and weight restrictions also contribute to an interest in the cost allocation question.

At the time this effort was began, the FHWA cost allocation study had not been completed. The demand at that time was for information on the study results in order for states to determine its applicability to their particular situations. Now that the study has been released, the interest is on how the states may respond to the methodology and findings including how various states may use the results to assess and/or modify their tax structures. Some states have noted difficulty in applying the methods used in the FHWA study and would like assistance in developing techniques tailored to their specific interests and needs.

Another issue raised with respect to cost allocation/user fees is the effect which changes in cost allocation could have on intermodal competition. Information on this issue is needed as input to policy decisions with respect to user fees.

35. Private Sector Involvement

In attempting to develop new ways to fund and to provide transportation facilities and services, considerable attention is being given to private sector involvement. However, while the concept is attractive, there are few state and local transportation agencies that know what opportunities exist or how to develop them. The agencies would like to know what types of private sector involvement in funding and in providing services have been thought of and/or tried; which have succeeded or failed; what are the advantages and disadvantages of the various approaches; what legal, institutional, contractual, legislative, and financial actions were required to establish private sector involvement; what are the risks; and what lessons have been learned with respect to successful/unsuccessful processes for establishing private sector involvement. While agencies are looking for ideas for involving the private sector, the processes they can use to identify, evaluate, and pursue opportunities for private sector involvement are equally important.

36. Information on Federal Program Changes

This is an area designated exclusively by transit managers to be of primary importance. They would like to be kept abreast of proposed changes in federal programs in order to present their position during the decisionmaking process. Secondly, they would like to be alerted to any program changes as they occur so that they can respond adequately. Assistance in discerning the potential effects of program changes and how to respond to these changes would be useful.

37. Bus Rehabilitation

Related to the question of small transit vehicles performance (item 44) is the desire for more information on the performance of rehabilitated transit vehicles. Budget constraints are leading some transit service providers to consider the alternative of rehabilitated buses. To make an informed choice, these operators would like to know more about the availability, purchase cost, operating costs, maintenance needs, and other performance data for rehabilitated vehicles.

38. Operating Efficiency and Cost Savings

As budgets become increasingly limited, state and local transportation agencies have become increasingly interested in ways to stretch their dollars. Because operations require a large part of most agencies budgets, this is an area looked to with some success (e.g., fleet management, performance objectives, and productivity standards) for cost savings. The need, as expressed by the agencies, is for the identification of any type of cost savings opportunities in the operating area: what are the opportunities; what are the potential magnitudes of saving; what effects does their implementation have on service quality; what strategies are used to pursue the opportunities.

39. Ridesharing Options

Ridesharing continues to be an important mode of transportation in urban and rural areas. Places which have little experience with

ridesharing opportunities and programs have asked for ridesharing information. They want to known the options available to them, the viability and effectiveness of the options in various settings, and the process to be used in establishing a ridesharing system.

40. Elderly and Handicapped Services

Like ridesharing, this area of assistance tends to be cited by places which have had little experience with transit and paratransit services. Budget constraints are forcing these agencies to find ways to provide E&H services at less cost. Opportunities for realizing economies of scale and other efficiencies through coordination of services currently provided by separate agencies is an area of interest. Of particular interest is the process by which coordination can be achieved, including legislation needed to allow/facilitate coordination.

41. Parking Regulation as a TSM Strategy

Public transportation agencies have been providing and regulating on- and off-street parking for many years. Recently, new parking policies have been adopted as one means to influence the volume and flow of vehicles on urban streets, as well as to provide needed parking capacity. Examples are residential parking permits, off-street parking requirements, and preferential treatment of multiple occupancy vehicles. Agencies would like more information on parking policies used as a TSM strategy: how they were established; how they are enforced and at what cost; what effects they have had on traffic volume flow and mode split.

42. Weight-in-Motion

States recognize the importance of weighing trucks which travel on the state highway system. At the same time, the traditional weighing stations are costly to maintain, are disruptive to traffic flow, and impose a cost on truckers. Technologies have been developed recently which provide for the weighing of vehicles in motion without the requirement for personnel to operate the equipment. Thus, the new technology may offer a less costly, less disruptive way to obtain continuous data on truck weights on the highway system. State agencies would like to know how workable the technology is, how much it costs to install and maintain, to what extent it reduce user costs, and the usefulness of the data generated.

43. Materials Performance

Information on materials performance was raised with respect to highway and bridge construction and maintenance. State highway agencies are interested in receiving state-of-the-art information on the costs and performance of a range of materials used in construction and maintenance. Some specific examples cited include pavement treatments, crack sealants, bridge joint sealants, concrete slope protection materials, pavement foundations, bridge underside protection, and a variety of other materials.

44. Equipment Performance

The request for information on equipment performance was raised as a part of the fleet management question, but more specifically with respect to small transit vehicles. Maintenance difficulties experienced by some operators of small transit vehicles have led them to desire information on

the general performance of these vehicles, how other transit agencies have addressed the maintenance requirements, the life-cycle costs of these vehicles given the maintenance requirements, and the implications of the requirements on fleet composition and acquisition strategies. Other specific areas of interest mentioned include bus air conditioning systems and computerized signal systems (performance, costs, and maintenance problems and strategies). Fare box (on buses) technology also was mentioned to be of interest particularly with respect to innovations for the collection and processing of paper money fares.

45. Port/Rail Interface

The port/rail interface has become of interest in part due to the potential development of the coal export market. In examining the United States coal export capability, it has been found that adequate capacity and operating efficiency of the port/rail interface is a concern. Some innovative ways to overcome capacity constraints and operating inefficiencies (e.g., reservations for ship loading) have had substantial positive effects on port operations. More information on such innovations (their characteristics, implementation process, results, cost) and on other new ideas to improve port effeciency and competitiveness are welcomed.

46. Fleet Management

State and local transportation agencies own and maintain vehicle fleets for the operation of transportation services or for the construction and maintenance of transportation facilities. As pressure has increased for improving operating efficiency, it has been found that improvements in fleet acquisition, maintenance, and deployment practices can result in

substantial operating cost savings. Various methods are being used to identify opportunities for operating efficiencies. State and local government would like to know more about these methods and the nature and extent of the efficiencies which they reveal.

47. Motor Vehicle Services Rationalization

As state transportation agencies seek ways to save costs and to provide equivalent services at lower costs, some attention has been given to motor vehicle services. The objective with motor vehicle services is twofold, (1) to reduce the ratio of collection costs to revenue received, and (2) to retain or improve services levels dispite increasing costs. Several techniques have been found to contribute to these objectives including ways to reduce peak demands, alteration of fee structures and schedules, contracting out services, providing single stop service, increased use of rail, instant issue drivers license systems, and others. New ideas in this area, and experience with tried ideas, would be useful to dissiminate.

DATA BASES AND SYSTEMS

48. Database Development and Maintenance

One area of interest is the development and maintenance of a database for planning purposes. The concern was expressed that declining funds for planning were causing agencies to reduce their database maintenance and updating efforts. As a consequence, the credibility of the database, and hence the products based on those data, is being eroded. The issue, then, is how agencies can establish a database for planning which is credible yet

not costly to maintain. What basic data requirements must be met? What alternatives are there for obtaining and updating these data? How can these data best be stored and retrieved?

Databases for monitoring highway conditions is of interest to the highway maintenance community. This interest is an element of the request for assistance in developing maintenance and pavement management systems. The database must be able to specify the condition of the system and its segments at any point in time as well as provide an historical record of change. This database would be valuable in policy analysis (i.e., determining maintenance needs, funding requirements, and strategies) and in budgeting and scheduling maintenance activities. It also could provide the basis for evaluating the cost effectiveness of various maintenance strategies.

Finally, automation of data collection procedures used by transit operators was raised as an area of interest. Specifically, what opportunities are there to automate the daily collection of bus mileage, revenue, oil and fuel consumption, and other data?

49. Minicomputers and Microcomputers

Substantial activity is occurring in the development of hardware and software, including the development of packages for the transportation sector. Much of the development is occuring in the private sector. State and local transportation agencies perceive potentially substantial benefits in the application of minicomputers and microcomputers. Yet, they are uncertain as to what applications are possible, what the benefits and costs are, and which packages are preferable. Others see possible applications

(e.g., financial analysis) and want assistance in determining what packages are available, what the experience has been with the various packages, and what the relative advantages and disadvantages of the various packages are.

APPENDIX C

MECHANISMS RECOMMENDED BY THE CONTACTS FOR PROVIDING TECHNOLOGY AND PLANNING TECHNICAL ASSISTANCE

1. Information/Contact Broker

When confronting new issues, transportation agency personnel may require information on analytical techniques and basic data to address the issues. A central contact (or focal point) which could direct these people to sources of relevant information would greatly facilitate their search. The central contact is not meant to provide all the information requested, but rather to be the initial contact. This service would make the search more efficient and more effective because the person requesting information would be directed immediately to the best sources of information.

2. Key Contacts List

State and local transportation agency personnel rely heavily on contact with other professionals to learn about new directions, approaches, ideas, etc., in transportation. Personal contacts are particularly valuable for discussing practical experiences. It was suggested that USDOT maintain a listing of persons with expertise in specified areas and that state and local agencies have access to this listing.

3. Basic Library

Many of the issues confronted by state and local transportation agencies are not new in the sense that someone has dealt with them before. As transportation agenies encounter these recurring issues, a readily available set of basic references would be valuable. Such a set of references would be particularly useful to smaller agencies. These agencies rely on a small staff to address a variety of issues which may be outside their experience. These agencies also experience high staff

turnovers. The references would include a bibliography and procurement information. (Note: The Federal Aviation Administration maintains a system whereby all references can be purchased from the Government Printing Office.)

4. Innovations Surveys

There is a substantial amount of innovation taking place throughout the transportation industry, including the efforts of state and local governments. It is believed that much of this innovation may go unnoticed because channels of communication are inadequate. One suggestion to overcome this barrier to technology transfer is to conduct a periodic survey of state and local government innovations, noteworthy solutions to problems common to many transportation agencies. Contacts could be made with selected agencies to solicit innovative practice in general or for a targeted issue area. The results would be published and disseminated through appropriate mechanisms. (Note: In making contacts for the needs assessment, we came upon a variety of innovative practices in the areas of pavement management, parking regulations as a TSM strategy, data collection, levels of service policies, human resources development, equipment, and others.)

5. Summary of State R&D Projects

Before transportation agencies initiate an R&D project, they first ascertain whether the work has been done by another agency, or if there is another agency which would like to participate in the project. However, in discussing R&D efforts at the state and local levels, it became apparent that there is no comprehensive summary of such efforts. The various USDOT modal administrations prepare a periodic summary of in-house and USDOT

sponsered R&D. Similarly, states with particularly large R&D programs (e.g., Texas, Iowa, New York) systematically disseminate information on their programs. R&D conducted by other state and local agencies, however, is learned of only through personal contacts and other specific efforts. A number of the contacts said that a more systematic way to keep abreast of R&D efforts would be to publish a periodic (e.g., semi-annual) summary of those efforts which are not sponsered by USDOT. The listing would include past and proposed projects. Initially, the listing would include only state agencies' efforts. It later could be expanded to include local agencies' programs.

6. State-of-the-Art Benchmarks

Agencies which have highly qualified professionals with years of experience are interested in being made aware of advances in the state-of-the-art in their area. Of assistance in this regard would be a group which reviews new work in transportation to determine whether the work indeed advances the state-of-the-art. The group would inform transportation agencies of relevant new developments. This effort would relieve the agencies of having to keep abreast of all new work and having to independently review that work.

7. Reader's Guide

Similar to the state-of-the-art benchmark assistance, the purpose of this activity would be to evaluate available materials to determine those which are superior. Unlike the benchmark assistance, which is meant to keep professionals on the cutting edge of new developments, this activity would be broader in scope. It would identify for transportation agencies the best materials (new and old) available on various topics. This type of

assistance would be particularly valuable to smaller agencies which do not have extensive staff resources.

8. White Card System

The white card system, currently used by the Office of Technology and Planning Assistance (OTPA), alerts recipients to the availability of documents on new technology in transportation. The white card provides an abstract of the document's contents and procurement information. Thus, the white card system provides the type of information many transportation professionals prefer (i.e., a synopsis of material contained in the document) and is a relatively inexpensive way to disseminate information. Significantly, the system is the primary recognition factor for OTPA; many contacts who did not recognize the office title are familiar with the white card system.

9. Research Bulletins

As noted in the discussion of the white card system, many agency personnel prefer an abstract of available materials to the materials themselves. A frequent comment was that the agencies receive a substantial amount of material and, consequently, much remains unread. This is particularly true with lengthy documents. A well-written abstract provides the reader with sufficient information to determine whether reading the complete document would be of value. SMD Briefs were cited as a good example of this type of information dissemination.

10. Issues Reports

Several of the types of information deemed most useful in technical and planning assistance could be compiled into periodic issue reports. Each

report would focus on a specific transportation issue (e.g., innovative financing, the use of minicomputers, private sector involvement) and would present a definition of the issue, brief case studies showing how the issue is being addressed, a list of references, and a list of contacts for further information.

11. Conference Presence/Synopses

Conferences often provide an understanding of current issues and the state-of-the-art in addressing those issues. Conferences also bring together professionals who are most interested in the topics discussed. Thus, conferences provide unique opportunities for technology transfer. The suggestion in this regard is that the Office of Technology and Planning Assistance provides several opportunities: (1) to alert participants to OTPA's functions and current materials available from OTPA; (2) to enhance OTPA's mailing list; (3) to keep abreast of innovations; (4) to identify opportunities to provide needed technical and planning assistance; (5) to keep abreast of unresolved issues--areas where OTPA should seek out innovations and (6) to expand OTPA's contacts. It also was suggested that OTPA could share conference output with non-participants by preparing a conference summary. The summary would highlight key elements of discussion and interest and provide sources of more detailed information to interested individuals.

12. Executive Summaries

Executive summaries of new publications are recommended as an assistance tool for several reasons. (See also item #16.) An executive summary informs the reader of the most pertinent material contained in the publication in a few paragraphs or pages. Thus, it is an efficient way to

provide managers with relevant information. It also serves as a screening device, providing managers and staff with enough information to decide whether the publication is worth reading and follow-up. Finally, it provides staff with an instrument with which to inform the superior of innovations worthy of staff research or application.

13. News Releases with Document Dissemination

A large volume of material relevant to state and local transportation issues is published each year. It was suggested that this material be disseminated to libraries which are accessible to state and local agencies. (See item #15 above.) The agencies would be alerted to the document's availability by receiving a notice prepared by the disseminating agency. Thus, the agencies would be made aware of new materials without having to review large documents. They also would have access to the materials, but at lesser cost (fewer documents distributed) to the disseminating agency.

14. Document Printing and Dissemination

The opinion of the contacts is that documents can be a valuable tool for technology transfer and assistance if well-prepared and supplemented with other materials. The contacts' primary concerns are: (1) that lengthy documents are not read, particularly by managers, and hence by themselves are an inadequate assistance mechanism, and (2) that documents alone do not provide adequate education with respect to new techniques and approaches. It is the opinion of these contacts that documents are valuable references when (1) they are supplemented by abstracts or executive summaries which provide sufficient detail to determine if the complete document is worth reading; (2) they are written from the practitioner's perspective--i.e.,

how-to manuals and case studies are preferable; and (3) follow-up information (i.e., through contacts or courses) is readily available.

15. Manuals/How-to Documents

Of the documents published to disseminate new techniques and methods, manuals which provide step-by-step instruction were mentioned as the most useful. The step-by-step presentation provides a more thorough, comprehensible, and practical treatment of the subject and thus improves the transfer of technical information.

16. Central Document Repository in Each State

The National Highway Institute with assistance from FHWA is attempting to designate a university library in each stste as the repository for transportation publications. The library would not screen materials, but would act as a clearinghouse for transportation documents. The details of the process (which documents will be sent by whom, what kind of instruction would be given to the library staff, how will users be made aware of the resource, etc.) are not finalized. It is suggested that the Office of Technology and Planning Assistance participate in establishing and/or maintaining this system. (See also item #21 below, "News Releases with Document Dissemination".)

17. Case Studies

Case studies are deemed a particularly useful way to transmit information because they provide a practical experience with new techniques and approaches. Putting new techniques and approaches into a practical context enhances the reader's comprehension of the material's credibility making it more likely to be applied. A comment made by some

contacts is the need to bridge the gap between theory and practice. Case studies accomplish this objective.

18. Seminars/Workshops/Courses

This type of assistance provides opportunities for professionals to interact with each other in learning new techniques and approaches to transportation problems. That interaction enhances the technology transfer process because it allows participants to discuss in detail the application of new techniques and approaches in specific situations. It also allows questions to be asked and answered about the techniques and approaches, which improves the educational process and hence the probability that the techniques and approaches can and will be applied.

19. Host Agency Program

It was clear from the contacts' statements that examples of practical experience with new techniques, methods, strategies, etc., are an effective means of technology transfer. One way to take advantage of relevant experiences is to provide a system whereby agencies with a specific problem/issue/opportunity or an interest in a specific technology or method can visit another (host) agency which has relevant experience. This interaction provides an opportunity for the first agency to review first-hand the actions taken by the host agency and the results of those actions.

20. Use of Telecommunications

State and local transportation agencies are experiencing increasingly restrictive travel and training budgets and policies. The restrictions

have reduced the amount of personal contact among agency professionals (e.g., at conference and training courses), which is deemed an invaluable means of technology transfer. It was suggested that telecommunications (e.g., closed circuit television) may be a means of providing personal contact among professionals and that USDOT look into potential applications of telecommunications for providing technology and planning assistance.

21. R&D Coordination

With R&D budgets being cut at the federal, state, and local levels, coordination of R&D efforts conducted by these agencies is increasingly important. Coordination can improve resource allocation among R&D opportunities and enhance research results by providing for complementary rather than redundant efforts and by pooling research funds. Coordination of efforts to disseminate research results also will improve R&D programs.

22. Use of Existing Networks

Part of the Office of Technology and Planning Assistance's (OTPA's) target population (elected officials and other policy makers) tends to be characterized by a high level of turnover. This characteristic makes it exceedingly difficult to keep abreast of relevant contacts. To overcome this problem, it was suggested that OTPA use existing communication networks to disseminate information. For example, the National League of Cities, the International City Management Association, the American Public Transit Association, and many other organizations maintain contact with many of the same people OTPA is trying to reach. Working with and through these organizations will facilitate OTPA's task.

23. Marketing

To be effective in providing technical and planning assistance, particularly through direct assistance, name recognition is important. People must know who to contact. The Office of Technology and Planning Assistance (OTPA) has poor name recognition. To overome this problem, it was recommended that OTPA market its services. The most apparent approach is to advertise in journals and other periodicals read by OTPA's target population. Other approaches may prove useful as well.

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TECHNOLOGY SHARING

A Program of the U.S. Department of Transportation