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A Study of Benefits, Accomplishments, and Resource Needs of the Local Technical Assistance Program



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Innovation Through Partnerships

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16. Abstract <p>This study was undertaken to document accomplishments of the Technology Transfer (T²) Centers, funded through the Local Technical Assistance Program (LTAP) of the Federal Highway Administration in partnership with State highway agencies, universities, and local governments. The study further documents the benefits that local governments have derived from the Centers.</p> <p>The users of T² Center services are the nearly 36,000 local government agencies with responsibilities for maintaining streets and roads. With budgets totalling \$30 billion in 1991, these agencies maintain 2.9 million miles of roadways and more than 290,000 bridges. Prior to the establishment of LTAP, local agencies had little opportunity for training or assistance specifically designed to meet their needs.</p> <p>T² Centers in the 50 States and Puerto Rico typically operate with average annual budgets of \$300,000 and five part-time employees. Centers offer technical assistance, primarily in the form of training. Collectively, during the past 5 years, the Centers offered 20,187 days of training that were attended by 263,061 individuals. Highway safety, pavements, and management were the major training topics.</p> <p>The benefits stated in this report were identified by the local government agencies through a random survey distributed in 39 States and through personal interviews conducted with local agency personnel in 15 States. The study profiles the transportation responsibilities of local governments, provides a functional and resource overview of T² Centers, describes benefits in seven specific areas, documents cost savings, and provides testimonials from the personal interviews conducted. It also presents recommendations for future program areas, projects resource needs, and proposes specific 1998 source contributions.</p>					
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The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This not only ensures transparency but also helps in identifying any discrepancies or errors in the accounting process. The text further explains how proper record-keeping is essential for the preparation of financial statements and for compliance with tax regulations.

In addition, the document highlights the need for regular audits and reconciliations. By comparing the internal records with bank statements and other external sources, businesses can detect and correct mistakes promptly. This practice is crucial for maintaining the integrity of the financial data and for providing reliable information to stakeholders. The text concludes by stating that a robust accounting system is the foundation of a successful business.

The second part of the document focuses on the role of technology in modern accounting. It describes how software solutions have revolutionized the way businesses manage their finances. From automated data entry to advanced reporting tools, technology has significantly reduced the risk of human error and increased the efficiency of accounting operations. The text also mentions the importance of staying updated with the latest technological advancements in the field.

Furthermore, the document discusses the impact of globalization on accounting practices. As businesses expand their operations across different countries, they must navigate various accounting standards and tax laws. This requires a deep understanding of international accounting principles and the ability to adapt to different regulatory environments. The text suggests that businesses should invest in training and professional development to ensure they are well-equipped to handle these challenges.

Finally, the document touches upon the ethical responsibilities of accountants. It stresses that accountants have a duty to act with integrity and to provide unbiased and accurate information. This includes maintaining confidentiality and avoiding conflicts of interest. The text encourages accountants to adhere to professional codes of ethics and to promote a culture of honesty and transparency within their organizations.

In conclusion, the document provides a comprehensive overview of the key aspects of accounting, from record-keeping and technology to ethics and globalization. It serves as a valuable resource for anyone interested in the field, offering practical insights and recommendations for success. The text is well-structured and easy to read, making it an excellent starting point for further exploration of the subject.

PREFACE

This report was undertaken as the first attempt to put to paper the benefits of a program that, since its beginning, has been heralded by local governments as the only program of its kind to assist them with providing safe and efficient local roads. While letters and testimonials in various forms filled many file folders in individual State Technology Transfer Centers, a compilation had never been attempted.

A study of this magnitude cannot be accomplished without the efforts of many people and organizations. While contributors to this study are too numerous to name individually, the author does offer special recognition and appreciation to the following groups:

- The local government officials who set aside time for personal interviews; The staffs of the 15 Technology Transfer Centers who arranged the interviews and provided support throughout the interviewing process;
- The staffs of the 41 Technology Transfer Centers who conducted mail surveys of local government officials;
- The staffs of all the Technology Transfer Centers who provided five-year plans and projected resource needs;
- The members of the Technical Working Group for their time in reviewing and revising the work plan and draft report;
- Lisa Pogue, Manager of the T² Clearinghouse of the American Public Works Association for collecting Center Profiles;
- The staff of Technautics for their excellent staff support throughout the project;
- John Anderson of New Hampshire and Marvin Espeland of South Dakota for serving as interviewers;
- Janet Coleman, Bob Kelly, and Ray Griffith of the Technology Management Division, Office of Technology Applications, Federal Highway Administration, for their guidance and assistance; and, finally,
- The Federal Highway Administration for making the study possible.

There is a great deal of information in this report. It is the intent of the author that it be useful not only to the Federal Highway Administration but also to the Technology Transfer Centers and their clients, the local officials.

Cities, counties, and other local governments have always carried a major responsibility for financing, constructing, and maintaining highways and bridges. It

is important to recognize their efforts as an integral part of our transportation system. It also is necessary to have an effective mechanism in place for providing them with state-of-the-art transportation technology. The Local Technical Assistance Program and the Technology Transfer Centers, funded in partnership with State highway agencies, local governments, and universities, are currently providing that assistance.

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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	1
The Clients	1
The Centers	1
The Benefits	3
Future Directions and Resource Needs	4
I. INTRODUCTION	7
II. PROFILE OF LOCAL GOVERNMENT TRANSPORTATION RESPONSIBILITIES	11
III. PROFILE OF LTAP CENTERS	13
Background	13
Resources	14
Funding	15
Staffing	16
IV. ACCOMPLISHMENTS OF TECHNOLOGY TRANSFER CENTERS	17
V. BENEFITS	19
Personal Interviews	19
The Survey	22
Management	23
Safety	24
Pavements	26
Unpaved Roads	26
Drainage	27
Bridges	27
Equipment	27
Miles Maintained by Local Governments	28
Cost Savings	28
Testimonials	30
VI. FUTURE DIRECTIONS	35
VII. RESOURCE NEEDS OF TECHNOLOGY TRANSFER CENTERS	39
VIII. FINDINGS	41

EXECUTIVE SUMMARY



This study was undertaken to document accomplishments of the Technology Transfer Centers, funded through the Local Technical Assistance Program of the Federal Highway Administration in partnership with State highway agencies, universities, and local governments. The study further documents the benefits that local governments have derived from the Centers.

The Clients

The users of Technology Transfer Center services are the nearly 36,000 local government agencies with responsibilities for maintaining streets and roads. These agencies maintain 2.9 million miles of roadways and more than 290,000 bridges, with budgets totalling \$30 billion in 1991.

While some States legally require cities and counties to employ registered professional engineers to administer local road programs, most local government road and street departments are directed by individuals who have practical experience but little formal technical education or training.

Prior to the establishment of the Local Technical Assistance Program, local agencies had little opportunity for training or assistance specifically designed to meet their needs.

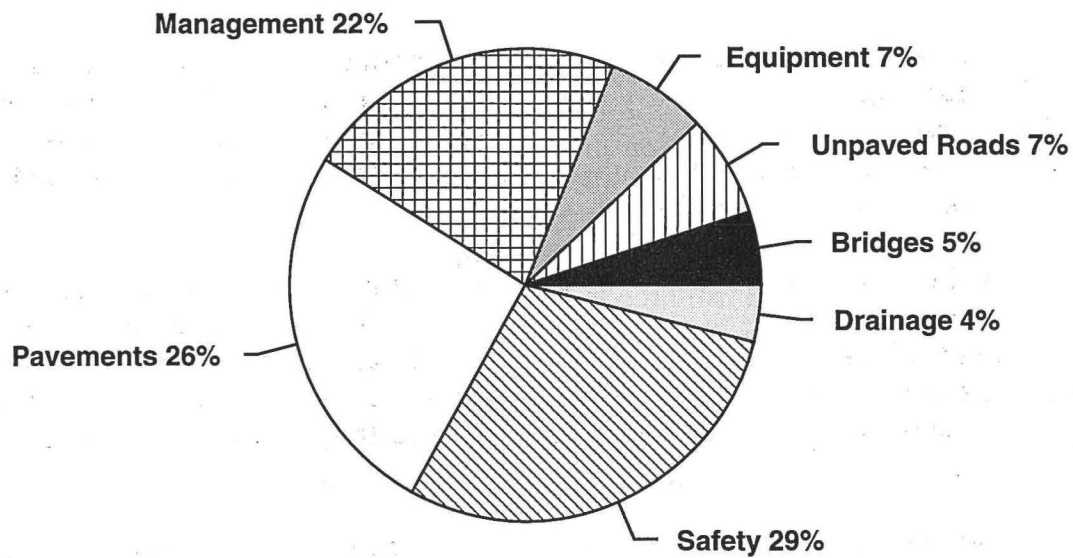
The Centers

Currently, a typical Technology Transfer Center operates with an average annual budget of \$300,000 and five part-time employees. Each Center has offered an average of 79 days of training per year over the past 5 years. The Centers are maintaining mail lists collectively totalling 109,400 entries, with an average growth rate of 37.5 percent over the past 5 years. Usage of Center libraries has nearly doubled in the past 5 years, while distribution of training videotapes has grown 200 percent. The Centers provide technical assistance, both in person and by telephone. Statistics are not available on usage of technical assistance services.

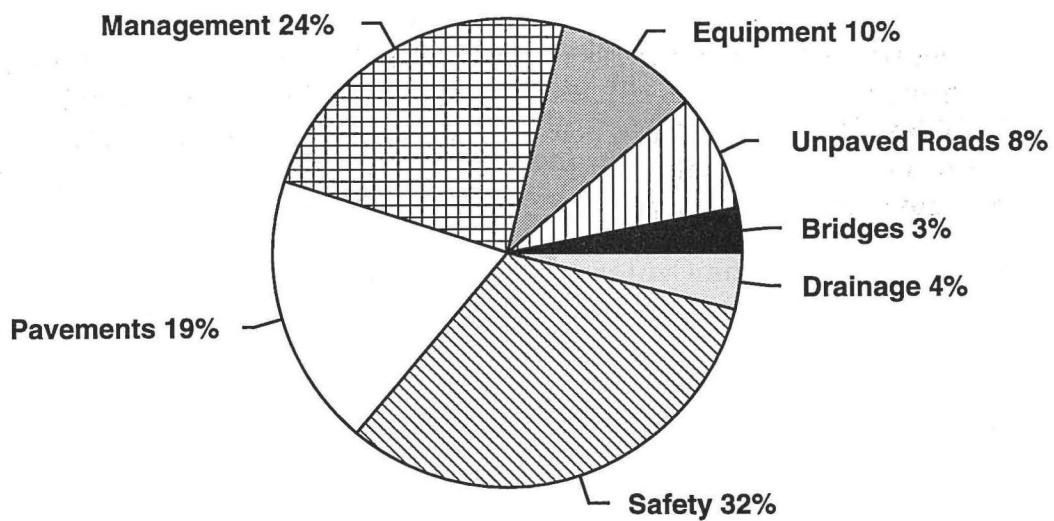
The largest component of the Centers' efforts has been in presenting training. Training packages targeting local governments have been developed with funding provided by LTAP, and in some instances the Centers themselves serve as the developers. The Centers individually develop programs geared to the needs of their States. Where appropriate, these programs are shared with the other Centers.

Collectively, during the past 5 years, the Centers in the 50 States and Puerto Rico offered 20,187 days of training, attended by 263,061 individuals. The following charts show that highway safety, pavements, and management were major topics.

20,187 days of training have been offered on these topics



263,061 participants attended workshops on these topics



The Benefits

The benefits stated in this report were identified by the local government agencies through a random survey distributed in 39 States and through personal interviews conducted with local agency personnel in 15 States. The local officials praised the responsiveness of their Centers, indicating that their requests for materials, videos, and assistance were usually answered within two days.

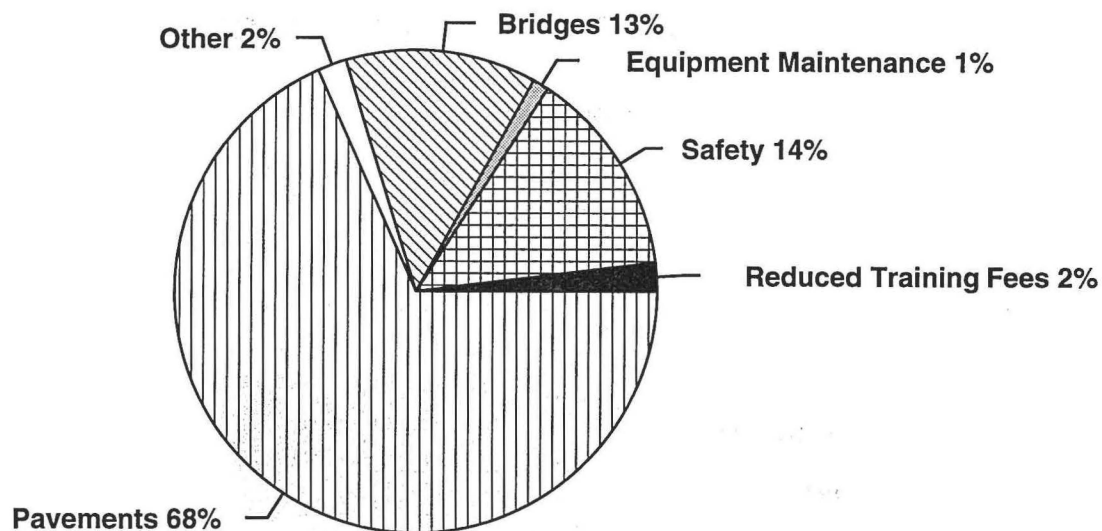
The locals pointed to the intangibles as the most beneficial part of the Local Technical Assistance Program. As a result of training provided by the Centers, the workers have a higher sense of self-esteem and more confidence in their abilities. The higher morale and improved attitude of workers have resulted in fewer absences and greater productivity.

Every person interviewed pointed to safety training and assistance as the greatest cost saver, through avoided accidents and lawsuits. Many pointed to the number of days without a loss-of-time accident on the job or to time without a tort liability claim as being directly tied to the training they had received from their Centers. In some instances, dollars saved were reported, and they are documented in the report.

Local agencies credit the Centers for their improved management skills, especially computer-based management techniques. Computer usage was nearly non-existent in local government transportation departments ten years ago when LTAP began. Now, locals are looking to the Centers for help in meeting the requirements for management systems set forth in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.

Areas where locals could document actual dollar savings were in maintenance activities. Through personal interviews, local government officials attributed savings of \$54.5 million to the 39 Technology Transfer Centers that have been in service for 4 or more years that participated in the study. The following chart identifies the savings by category.

SAVINGS BY CATEGORY



Future Directions and Resource Needs

The local government officials, through the survey and personal interviews, requested a continuation and expansion of services offered through the Centers. Most frequently they asked for more training in safety, management tied to the ISTEA requirements, environmental regulations, and pavement maintenance. They want more videotapes to assist them with in-house training, and they want more training closer to them.

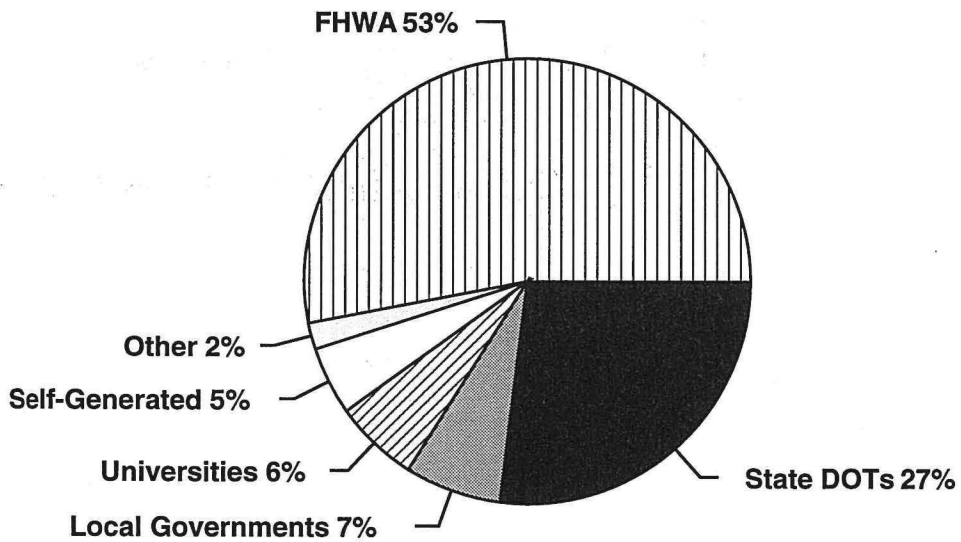
The Centers estimate that 45 percent of local governments currently take advantage of Center services on a routine basis. Without increased funding, Centers do not have the resources necessary to increase usage or increase services to the current users.

To determine additional resources needed by the Centers to continue and expand their services, the Centers were invited to prepare five-year projections. Thirty-two Centers responded, and their projections indicate a need for a 50 percent increase in funding by 1998 to meet the needs of current clients and raise usage to 75 percent of local government agencies.

This funding increase could come in 10 percent increments over the next five years. The Centers suggest the need for an investment by all partners by 1998 of

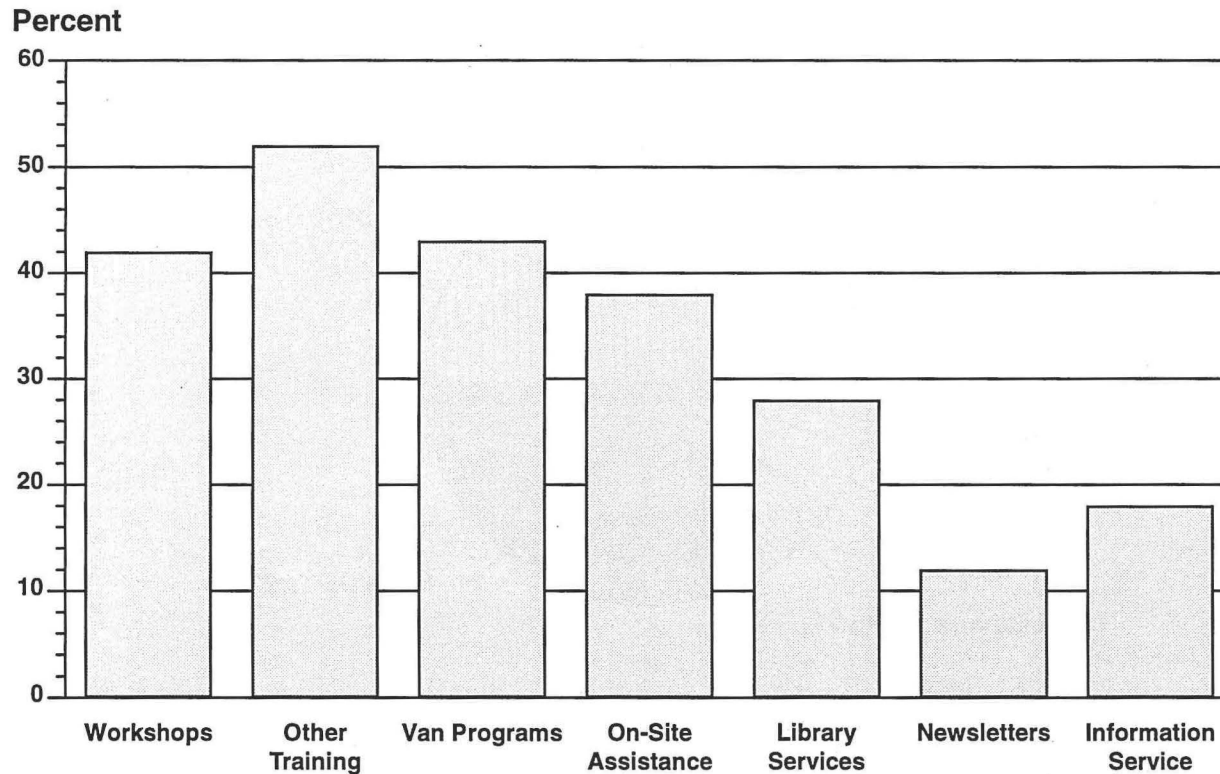
\$23.1 million, with FHWA/LTAP providing \$12.2 million (53 percent). The following chart shows other suggested contributions.

FUTURE FUNDING SOURCES



With this increase in funding, the Centers predict they can expand their services by the following percentages.

FUTURE EXPANSION OF SERVICES



The following full report of the study provides a detailed discussion of these findings.



I. INTRODUCTION

As the nation's attention focuses on reducing the national debt, government spending at all levels will come under close scrutiny. Programs receiving Federal funds may need written documentation of accomplishments and benefits to respond to inquiries from policy-makers at local, State and Federal levels. The eleven-year history of the Local Technical Assistance Program (LTAP), originally known as RTAP (Rural Technical Assistance Program), of the Federal Highway Administration (FHWA) has seen tremendous growth in the demand for services provided by the Technology Transfer (T²) Centers which it funds. This report attempts to identify and document benefits to local governments, calculate return on investment, and identify additional resources necessary to continue and expand the program.

Patsy Pratt Anderson managed the project under an Intergovernmental Personnel Act agreement between the Federal Highway Administration and the University of Kentucky where she is the director of Kentucky's LTAP Center. While working on the project, she was assigned to the Office of Technology Applications, State and Local Programs Branch, which is part of the Office of the Associate Administrator for Safety and Systems Application.

To provide guidance, a technical working group consisting of representatives from FHWA, local jurisdictions, States, and T² Centers was appointed. Membership is listed elsewhere in this report. The technical working group assisted in developing the work plan and in reviewing the final report.

The T² Clearinghouse, operated by the American Public Works Association, assisted in data-gathering from the T² Centers concerning the operation and management of the Centers.

FHWA's LTAP began in 1982 with 10 Centers and now partially funds Technology Transfer Centers in all 50 States and Puerto Rico. In 1992, four Centers were established to serve Native Americans. For purposes of documenting benefits and accomplishments, this project focused on those Centers that have been operational for at least 4 years. Experience has shown that the first 2 years of operation are spent establishing an audience and marketing services, with the following 2 years showing substantial growth in program usage. All Centers were requested to participate in the accomplishments and resource needs portion of the study.

There are 41 States and Puerto Rico that have had programs in operation for 2 or more years. Participation in the study was voluntary, and 39 States took part. The project manager conducted interviews with local government officials in her home State of Kentucky to test survey format and interviewing techniques. Following these test contacts, the work plan was finalized. Since Kentucky served as the

test State, findings there were excluded from the study. New Mexico had recently undergone a major administrative reorganization and chose not to participate. Because of a heavy workload resulting from its hosting the 1993 National LTAP Conference and the difficulty of Spanish translation of the project documents, Puerto Rico chose not to participate.

States in the study were as follows.¹

Alabama	Montana
Alaska	Nebraska
Arizona*	New Hampshire
Arkansas	New Jersey
California	New York
Colorado*	North Carolina*
Connecticut*	North Dakota*
Florida*	Ohio
Georgia	Oklahoma
Indiana*	Oregon*
Iowa	Pennsylvania*
Kansas*	South Carolina
Louisiana*	Texas
Maine	Vermont
Maryland*	Virginia
Massachusetts	Washington*
Michigan*	West Virginia
Minnesota	Wisconsin
Mississippi	Wyoming
Missouri	

The Technology Transfer Centers in the 39 States distributed surveys personalized for their States to a sampling of local government officials. There was no incentive for the local government officials to participate in the survey other than their desire to express themselves concerning the services of the Centers. The final tally shows 17 percent of survey recipients returned completed survey forms, a good response rate for a poll of this type.

To further document benefits, visits were made to 15 States to conduct personal interviews with local government officials. The purpose of the visits was to receive first-hand information on benefits of LTAP. An unbiased statistician employed by FHWA's Office of Research and Development randomly selected the 15 States by geographic location as representative of the United States.

¹States marked with an asterisk are those in which personal interviews were conducted.

In each State, 10 to 20 local government users of T² Center services were interviewed, with 155 government entities interviewed in the 15 States. The governments interviewed represented a wide geographic spread within each State and were chosen to represent small and large, rural and urban counties, cities, towns, townships, and municipalities.

While benefits of the program are best identified by the users, the accomplishments of the program must be identified and documented by the Technology Transfer Centers. For purposes of this study, accomplishments are defined as tangible results of performing the tasks assigned by FHWA/LTAP such as number of workshops conducted, entries on mail list, distribution of materials, etc., along with growth rates within each task. To provide this data, Centers were requested to complete a profile survey developed and distributed by the American Public Works Association Technology Transfer Clearinghouse. A copy of the profile form is included in the Appendix.

To assist in identifying resources necessary to continue and expand the services over the next 5 years, the Federal Highway Administration asked all 51 Centers to review past growth rates and develop a practical 5-year plan. They also were asked to consider the resources that would be necessary to carry out their plans. Thirty-two Centers responded to the invitation to provide this data.

The services of Technautics, a support services group under contract to FHWA, developed a computer program for data analysis of the local government surveys, completed data entry, and provided the project manager with a tabulation of responses.

The project manager has analyzed the data collected and this report documents her findings. The report first examines local governments and their transportation responsibilities, and then profiles the Technology Transfer Centers. The accomplishments of the Centers precedes a chapter on benefits to local governments. Two chapters offer suggestions for future directions of the Program and discuss resources identified by the Centers as necessary to continue their programs over the next 5 years. The final chapter details study findings.

II. PROFILE OF LOCAL GOVERNMENT TRANSPORTATION RESPONSIBILITIES



Locally managed roads and streets play a vital role in the national highway network. Often, they are the beginning link in tying farms and industrial producers to national and world markets, and they play a key role in determining the economic well-being of urban and rural areas across the United States.

There are 37,000 local governments in the United States, with 36,000 maintaining roads and streets. Data provided by the 50 States and Puerto Rico, through their LTAP Centers, indicate the following breakdown of governmental entities with transportation responsibilities.

Cities and Municipalities	12,700
Towns	8,588
Townships	7,990
Counties	2,968
Villages	2,413
Boroughs	970
Other	<u>303</u>
TOTAL	35,932

These local governments are responsible for 2.9 million miles of roadways, with 54 percent of those miles being unpaved. The vast majority of this mileage, 2,254,680 miles, is classified as rural, while 652,961 miles are considered urban.² The 1987 National Bridge Inventory of the Federal Highway Administration shows that local governments are responsible for 229,685 bridges equal to or greater than 20 feet in length.

While some States legally require cities and counties to employ registered professional engineers to administer local road programs, most local government road and street departments are directed by individuals who have practical experience but little formal technical education or training. These public works directors and local road supervisors report to commissions, boards, and councils of elected officials who are the final policy-makers at the local level.

To manage their road and street programs, local governments spent \$30 billion in 1991.³ The expenses by category follow.

²*Highway Statistics 1991*, U. S. Department of Transportation, Federal Highway Administration

³ibid

ROAD AND STREET MANAGEMENT EXPENSE CATEGORIES

Expense Category	Counties, Towns, Townships	Municipalities
Capital Outlay	3,703,000,000	5,114,000,000
Maintenance/Traffic	5,628,000,000	6,424,000,000
Administration/Research	1,189,000,000	1,266,000,000
Law Enforcement/Safety	852,000,000	2,860,000,000
Debt Service	408,000,000	1,055,000,000
Bond Retirement	498,000,000	1,007,000,000
TOTAL	\$12,278,000,000	\$17,726,000,000

Financing for local roads and streets comes from a variety of sources. While they operate independently, they share in the Federal-Aid Highway Program administered by the Federal Highway Administration through State governments. They also receive intergovernmental grants and other tax-sharing programs, portions of fuel taxes, licensing fees, and various locally collected taxes.

Prior to the establishment of the Local Technical Assistance Program, local governments had little opportunity for specialized training or access to state-of-the-art technology. While private industry, some governmental associations, and some State governments conducted training, limited budgets prohibited participation in existing programs when they were open to local agencies.

III. PROFILE OF LTAP CENTERS



Background

At the start of fiscal year 1982, Congress appropriated \$5 million to be used by the Federal Highway Administration (FHWA) to provide improved access to highway technology to meet the growing demands placed on rural roads, bridges, and public transportation under what became known as the Rural Technical Assistance Program (RTAP). FHWA divided the money among 12 projects, 11 of which were training efforts, manuals, and other "deliverables" designed to assist local highway agencies. The twelfth and largest project funded 10 State Technology Transfer (T²) Centers located in universities which were to function as transportation extension services. The Centers became known as "T² to Locals Centers" with the following objectives.

- (1) Improve the system for transferring technology to local transportation agencies.**
- (2) Improve communications on transportation technology between FHWA, State highway agencies, local agencies, and universities.**
- (3) Encourage implementation of effective procedures and technology at the local level.**
- (4) Synthesize experiences of the Centers to serve as models that could be used in other States.**

In FY 1983, Congress added \$5 million to RTAP, and four additional T² Centers were established, two of which were located in State departments of transportation; in FY 1984, nine Centers were established; with FY 1985 funds, seven more Centers came into existence with 18-month programs. In 1987, FHWA required T² Centers to match on a 50/50 basis funds received through RTAP. This extended the partnership concept of T² with State and local governments and universities sharing in funding of the Centers.

The program continued to grow and succeed, and in 1991 the Intermodal Surface Transportation Efficiency Act made provisions for extending the T² services to urban areas, defined as incorporated places with populations of between 50,000 and 1,000,000. At that time FHWA changed the name of the program from "Rural" to "Local" Technical Assistance Program (LTAP). Each T² Center received startup funding of \$25,000 for what is often referred to as the "cities program" and in 1992 received an additional \$4,000 per urbanized area.

In 1992, a Center was established in Hawaii, and Minnesota (previously served by North Dakota) formed its own Center. All 50 States and Puerto Rico are now part of the T² family.

Funded through Federal aid agreements, the Centers are given the freedom to establish their own programs to deliver products provided by the national program and to meet the needs in their particular States. They do share the following common tasks.

- (1) **Establish a mailing list** of local government officials and others of importance to the local road program.
- (2) **Publish a quarterly newsletter** aimed at local governments as a way of marketing the program, informing locals of training opportunities, and offering articles on technology applications for local governments.
- (3) **Provide training sessions**, a minimum of ten per year.
- (4) **Provide an information service** through lending libraries of audiovisual material as well as written documents.
- (5) **Provide technical materials** in non-technical format usable by local government personnel
- (6) **Evaluate the program** by encouraging locals to complete evaluation forms at workshops, give feedback on publications, etc.

The Centers report to their State departments of transportation, who communicate with the FHWA division offices. Both State governments and FHWA are considered partners in the overall administration of the T² to Locals Program. Required reporting is reviewed at the FHWA regional level, where work plans and Center operating budgets are approved. LTAP and other FHWA technology exchange activities are under the direction of the Associate Administrator for Safety and Systems Applications' Office of Technology Applications.

Resources

In addition to the State departments of transportation and the Federal Highway Administration, the T² to Locals Program has become part of a network of organizations with the common goal of assisting local governments. A major role is played by the American Public Works Association through the administration of a T² Clearinghouse. The Clearinghouse provides a vital communications link between the Centers, publishes training resource catalogs, newsletters, a central

source for videotapes, and otherwise acts as a repository linking together the expertise of all the Centers. Active in T² activities are the National Association of County Engineers (NACE), the American Association of State Highway and Transportation Officials (AASHTO), and other public, private, and industry-based associations.

In 1991, the T² Centers organized the National Association of Transportation Technology Transfer Centers as a way of providing peer assistance to each other in meeting their common goals. Through the Association, Centers set up committees to address common issues of concern and, through sharing of resources, eliminate wasted time and money by avoiding duplication of effort.

Through LTAP, FHWA provides the Centers with training packages, publications, videos and other products to assist them in transferring state-of-the-art technologies to the problems of local roads, bridges, and public transportation.

The staffs of the Centers develop training packages specifically geared to meet the needs of their local government audiences and share these packages with other Centers where appropriate. Centers also have developed training packages for national use under separate contracts with FHWA; in these instances, additional funding is provided for the course development.

Funding

Thirty-two of the 51 Centers responded to the invitation to submit information on current funding. The following information concerning funding is taken from these responses and extrapolated to the entire 51 Centers. While accuracy may vary somewhat, it is believed that it is a credible estimate of current financing levels.

The 32 responding Centers reported \$4.9 million Federal funding for 1993, which extrapolates to \$7.9 million nationwide. The base level funding actually provided by FHWA was up to \$110,000 per Center to provide services to rural local governments with a required 50/50 match. Additionally, FHWA made available \$4,000 per urban area with a cap of \$200,000 per Center and with an 80/20 match requirement. Where Centers could not obtain the required match, the FHWA amount was adjusted to meet the match available.

Centers reported the following funding level for 1993 by contributor.

FHWA/LTAP	\$7,961,355
State Highway Agencies	4,527,219
Universities	1,004,139
Local Governments	868,122
Self Generated	403,104
Other	<u>714,969</u>
TOTAL FUNDING	\$15,478,908

The self-generated funding resulted from charging small registration fees for participation in workshops and conferences. The other funding includes carryover from the previous year, as well as contributions from agencies and private industry that have a vested interest in well-trained local transportation agency personnel. For instance, insurance companies in one State contributed \$15,519 toward safety training.

While the budgets varied, a typical Center operated on an annual budget of approximately \$300,000 in 1993.

Staffing

To provide services to local governments, T² Centers employ and pay either full or partial salaries for 276 individuals—an average of 5.4 employees per Center who usually work a percentage of their time on T² Center activities. These employees usually have other responsibilities, either in university colleges of engineering or continuing education departments, or in training units located in State highway agencies. When viewed as full-time equivalents, the Centers collectively employ the following staff.

24.3	Directors
37.4	Professional staff
28.5	Technical staff
<u>47.7</u>	Support staff
Total Full-time Equivalent Employees: 138	

An analysis of this data indicates that an average Center is staffed by a half-time director; a three-quarter time professional staff member who manages publications, edits newsletters, and coordinates the training program; a half-time technical staff member who may be an engineer and who conducts van programs, offers technical advice, and teaches workshops; and one full-time clerical employee. This staff contracts with other individuals to teach workshops and otherwise fulfill the demands of their clients.

IV. ACCOMPLISHMENTS OF TECHNOLOGY TRANSFER CENTERS



The Centers have made great strides in establishing mechanisms to meet the needs of local governments. This section reports by task the accomplishments for the past 5 years.

Mailing List. The first contact many locals have with their T² Centers comes by mail. It is vital to the success of LTAP that Centers continuously update and expand their audiences by maintaining accurate mail lists. In 1988, the T² Centers collectively reached 71,274 local agency contacts; in 1992, mail list local agency contacts had risen to 102,485. In 1988, Centers also included 38,120 State government, transportation industry, other State Center, and Federal contacts on their mailing lists; in 1992, that figure had grown to 47,679. Total mail list contacts in 1988 were 109,394 and in 1992, 150,164, an increase of 37.5 percent.

Technical Assistance. While statistics are not available on the actual number of governments receiving technical assistance, either through personal contact or by telephone, it is important to recognize the contributions of the Centers in providing this service. All Centers have technical staffs available to answer questions and offer advice. Many have toll-free telephone numbers to provide easy access to this service.

Newsletters. Each Center issues quarterly newsletters containing, as a minimum, a technical article applicable to local road and bridge management or maintenance, lists of training opportunities, and listings of available publications and videos. These newsletters are continually refined, with many Centers adding local success stories submitted by their readers and various incentives for participation in Center activities. Survey responses indicate 87 percent of local governments use the newsletters.

Libraries. Libraries are set up in the Centers to fulfill the requirements of providing an information service through publications and audiovisual materials. During the past five years, distribution of publications has nearly doubled, while use of videos has increased by more than 200 percent. Many locals have set up their own in-house training programs built around videos provided through Center libraries.

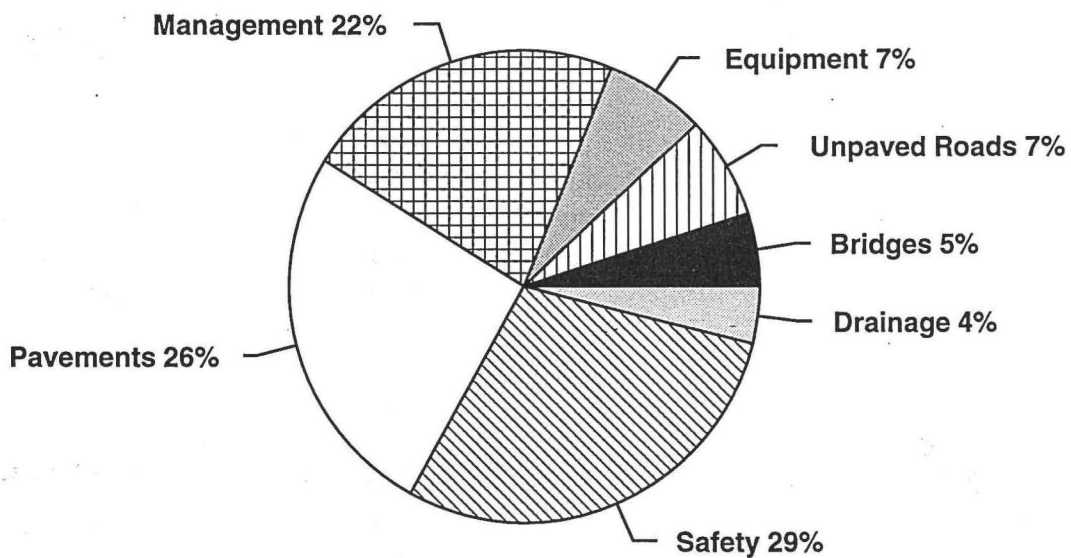
Training. The largest component of the T² Centers' efforts has been presenting workshops, seminars, and van programs on a wide variety of subjects. In the past 5 years, based on a 6-hour training day, Centers have presented 1.1 billion person-days of training in the following areas.

TRAINING SUBJECT AREAS, 1988-1993

Topic	Days of Training	Attendance	Person-Days of Training
Management	4,370	63,364	276,900,680
Safety	5,876	82,958	487,461,208
Pavements	5,242	48,812	255,872,504
Unpaved Roads	1,423	19,734	28,081,482
Drainage	766	13,611	10,426,026
Bridges	1,057	8,511	8,996,127
Equipment	1,453	26,071	37,881,163
TOTALS	20,187	263,061	1,105,619,190

Safety areas—including work zone traffic control, roadway safety features, and traffic operation and safety—have been covered slightly more than pavements, as the following chart demonstrates.

20,187 days of training have been offered on these topics





V. BENEFITS

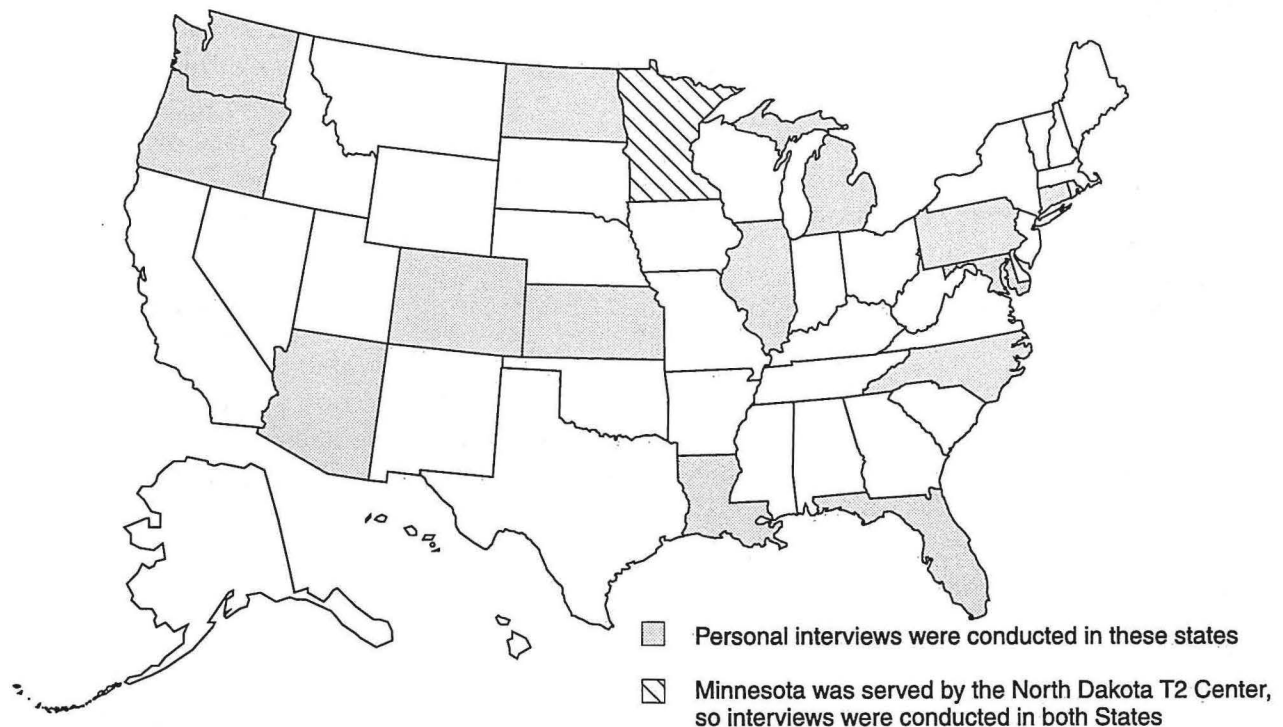
Two methods were employed to determine the benefits of the Local Technical Assistance Program. Personal interviews provided insight into the operation of local government transportation agencies and permitted dialogue to analyze in-depth benefits that are being realized from LTAP through the Technology Transfer Centers. The selected interviewers were individuals who were familiar with FHWA/LTAP and had some experience working in a Technology Transfer Center. Through the interviews, local agencies were asked to calculate a per-year savings as a result of using Center services.

A survey sent randomly to a sampling of local agencies nationwide provided benefits data on a broad range of services. The survey was designed to examine acceptance and benefits of topical areas over the life of the LTAP program.

Personal Interviews

Personal interviews were conducted in 15 States, which were randomly chosen as representative of the United States.

PERSONAL INTERVIEW SITES



Prior to 1992, the North Dakota Center provided services to local governments in both North Dakota and Minnesota. In 1992, Minnesota developed a Center of its own. To get a clearer picture of the benefits of the North Dakota Center, interviews were conducted in both States. In each State, a minimum of ten local government agencies were studied. In most cases, the individual in charge of the local transportation department, either a public works director or county road supervisor, was interviewed. A broad geographic area in each State was covered, and both large and small and urban and rural governmental agencies were involved. One hundred and fifty-five governments were included in the study.

To evaluate the effectiveness of the various tasks assigned to all Centers, questions were asked about how the locals became aware of the services and their use of the newsletters, libraries, and telephone services. Interviewees gave examples, and some of their quotes are included elsewhere in the report.

The locals had become aware of the LTAP program from reading the Centers' newsletters, from other local governments (either one-on-one or at a gathering of roadway officials), or through personal visits from their Center directors. All of the locals took part in an LTAP-sponsored program within six months of learning of its existence. After they had attended once, they became regular users of the services.

The locals praised the responsiveness of their Centers and indicated that, in most instances, their requests for videos and other library materials were handled within two days. They commented on the accessibility of the service, indicating that advice is a phone call away. Most know the Center staff members on a first-name basis and praise their genuine desire to assist local governments. Sixty percent of locals expressed appreciation for the concern exhibited by Center staff through personal visits.

Sixty-two percent of those interviewed indicate that all of their employees have benefitted from LTAP services directly by attending workshops. Thirty-eight percent send supervisors and foremen to training, and the knowledge they gain is transferred to the workers in the field and through in-house sessions. All indicate that their crewmen as well as supervisors and foremen benefit from the lending libraries, especially the videos. Van programs, whereby Center staff bring practical, crew-oriented training to a city or county, rank very high in effectiveness for workers who would not otherwise be amenable to attending day-long training sessions.

All those interviewed pointed to the intangibles as the most beneficial part of the LTAP program. They attested to the fact that, by receiving training, workers have more self-confidence and a higher sense of self-esteem. A public works director

stated that productivity has increased threefold since his workers not only know how to do a procedure but also why they are doing it. The higher morale and improved attitude of workers make the jobs of supervisors easier. Supervisors and managers are more willing to try new techniques when they have the support of the Center professionals.

Technology Transfer Centers have opened other avenues for sharing information. Through contacts made at workshops, locals are setting up networks among themselves and are learning of the services of other associations such as their local chapters of the National Association of County Engineers, the National League of Cities, and the American Public Works Association. Technology Transfer Centers are cooperating with these groups and with trade associations, such as the International Municipal Signal Association and the American Traffic Signal and Sign Association, paving associations, and other suppliers to provide low-cost programs for locals.

The opportunity to receive any training and technical assistance at all was stated by everyone as a primary benefit of LTAP. Prior to LTAP, local governments had little access to assistance other than the biased viewpoints of suppliers, consultants, and contractors. While some training may be available from other sources, it is not always geared to the concerns of local governments. If it is, the courses are offered in locations that require overnight travel, or the registration fees are prohibitive. Some governments said they would have no training program without LTAP; others indicated training cost savings of about \$2,000 per year per government.

Every person interviewed pointed to safety training and assistance as the greatest cost saver. They would not, however, put actual dollar figures on savings, stating that avoided accidents and lawsuits are not documentable. Many pointed to the number of days without a loss-of-time accident on the job or to time without a tort liability claim as being directly tied to the training they had received through LTAP. Some supervisors could point to actual dollars saved in this area, either through a lawsuit won because of better record keeping or because they could document that they had attended training and followed approved safety procedures. Those savings are listed in a following section of this report.

Computer use was nearly non-existent in local government transportation departments 10 years ago when the LTAP program began. Individuals interviewed cited the Technology Transfer Centers as their source for computer-based management techniques. In some instances, the Technology Transfer Centers assist locals in obtaining hardware, educate them in its use, and provide software and training in using the software. Where necessary, on-site technical assistance is offered in making the system operational. Many locals say the cost savings are

immeasurable because, before LTAP, they had not kept records necessary to calculate actual costs. Through computer technology, they are able to formulate complete road programs and plan for the future. They are able not only to spend their limited dollars wisely but also to present solid work plans to the elected officials who ultimately control their budgets. Because of the services of LTAP, many local government managers say they are making headway in "getting politics out of our road programs."

Areas where locals could document actual dollar savings were in maintenance activities and in use of materials. Many praised the work that the Centers are doing in pavement maintenance, asphalt technology, and pavement recycling as saving millions of dollars. One road supervisor said that prior to LTAP they were using maintenance techniques that had been outdated for 5 years. He further accredited LTAP with bringing his operation into the 21st century by providing updated maintenance technology.

The Survey

The survey form was developed with the assistance of the technical working group to determine benefits in various transportation concerns. A survey form was personalized to each of the 40 Centers participating in the study and mailed to the Centers for distribution. Some States chose to mail the survey to a representative sampling of local governments in their States, while others mailed to their total mail list of all locals. In all, 23,422 survey forms were distributed and 4,067 were returned—a 17 percent response rate. There was no incentive for local governments to complete the survey other than to express their beliefs concerning LTAP. In all but a few cases, local governments paid return postage. The response rate is considered good for a poll conducted in this manner.

Survey results indicate 60 percent of local governments across the nation are aware of and taking advantage of the services offered through the Local Technical Assistance Program. Of the 40 percent not using the services, most (71 percent) are unaware of the Program. The 29 percent who are aware but not using the LTAP services indicate they receive assistance elsewhere (21 percent), primarily from consulting firms. Others (10 percent) believe they are too small to benefit from services or their budgets are too small to allow them to apply new technology. Five percent say the workshops and services are too far away or they don't have the time to participate. Those locals not now using the program were interested in knowing more about the services, and it is believed that their interest is demonstrated by their taking the time to return the survey form.

The vast majority of survey respondents praised the LTAP program as being very beneficial to them. Like those interviewed, survey respondents commented on the

intangible benefits intrinsic in educational programs: improved morale among workers, pride in their work, improved self-esteem, and better work ethics and habits. Many felt they could neither put actual dollar savings to saved lives as a result of safety training nor estimate the amount of avoided lawsuits. Others indicated that prior to LTAP they did not keep records of expenses in such a way that they can now compare. Forty percent were willing to give an amount of dollar savings. Those savings documented through the survey are included in a following section of the report.

The survey looked for Center helpfulness in seven areas: management, safety, pavements, unpaved roads, drainage, bridges, and equipment. The following narrative details responses in each area.

Management

Centers have devoted 22 percent of their efforts toward improving management skills of local government transportation managers. Topics such as road surface management, equipment management, safety management, personnel management, and tort liability and risk management, along with public relations training are targeted to decision-makers and their first-line supervisors.

Through road surface management training and technical assistance, Centers have shown local government managers how to gather and analyze data necessary to formulate a cost-effective road program. Survey results show that 62 percent of respondents believe this training has been very helpful, with 36 percent indicating a somewhat helpful response. An average annual savings of \$18,135 per government was reported by the 19 survey respondents who placed a dollar value on the assistance they have received. Through road surface management, local governments are encouraged and shown ways to plan both current and future activities. Training in planning techniques shows a benefits rate of 83 percent.

Equipment management training, which includes effective methods for maintaining, scheduling, and replacing equipment, shows a 92 percent response of very or somewhat helpful.

Safety management systems are new to local governments, and LTAP assistance in this area has shown the highest level of approval by local governments, with 97 percent indicating high benefits. Safety also is the area where locals have the most difficulty in estimating savings. Only nine survey respondents were willing to quote dollar savings, with the average savings per government being \$4,708.

Personnel management includes classes on supervisory techniques, team building and scheduling, employee evaluation, and disciplinary actions. Local government

transportation managers are usually chosen from the ranks of the road crew or have come into their positions without the benefit of training in personnel management. LTAP workshops and other assistance is typically their first exposure to how to manage and motivate their work crews in a cost effective, equitable manner. The survey shows that 82 percent consider this assistance to be helpful.

The use of computers in road departments was very low 10 years ago when LTAP Centers began. Many local government decision-makers still do not recognize the importance of computer-based management in road/street departments. Through the efforts of LTAP Centers, major inroads have been made in familiarizing road and street managers with the benefits of computer-based management. Sixty-nine percent of survey respondents verify the benefits of this training effort, while 19 percent say the training has not been helpful and 10 percent indicate the training has not been available. The 19 percent report that a major reason the training has not been helpful is that they do not have the computer equipment to take advantage of the training.

Citizens often have no awareness of what is involved in providing adequate transportation systems or have a negative view of their government's efforts in this area. LTAP Centers have offered programs aimed at improving public image by making road departments aware of public relations techniques. Eighty-three percent of survey respondents acknowledge these efforts as being helpful.

Risk management and tort liability is a major concern of all governmental agencies. Ninety percent of survey respondents believe the training they have received in this area has been helpful and quote an average per government savings of \$21,510 per year.

Other management areas mentioned by locals as being helpful to them include bridge management, assistance in understanding legislated and administrative requirements, and overall record-keeping techniques.

Safety

The area that shows the greatest acceptance and appreciation by LTAP Center audiences are those efforts offering assistance with improving crew working conditions and highway safety. Centers have devoted the largest portion of their efforts, 29 percent, toward improving highway safety at the local level.

Ninety-eight percent indicated that work zone traffic control training has been helpful; 97 percent found training in safety features for local roads and streets helpful; while 65 percent found assistance with traffic operation and safety

helpful. Twenty-seven percent indicated they had not been offered training in traffic operation and safety.

Through the survey, 71 percent of local government officials express a belief that their roadways are safer for the travelling public because of this program. Twenty-five percent report a reduction in accidents. Safety training resulted in changes in operating procedures for 57 percent of those persons responding to the survey. About half of the survey respondents felt strongly enough about the benefits of safety training to make specific comments. Those comments are paraphrased in the following table, along with the percentage of survey respondents making that comment.

BENEFITS OF SAFETY TRAINING

Percent	Comment
24	Work zone traffic and control and flagging have greatly improved with trained personnel.
29	There is a greater awareness of safety issues and a greater understanding of Federal and State safety requirements.
13	Proper traffic signalization and signing according to MUTCD standards are now being used, and sign inventory programs are in place.
12	Governments have developed and implemented safety programs and plans.
6	Tort liability has been reduced and, in some cases, insurance premiums have dropped. There are fewer workmen's compensation claims and roadways are safer for the public.
11	Loss-of-time worker accidents have been greatly reduced or eliminated, and there are safer working conditions.
5	Policy-makers have been willing to invest more money in safety equipment as they have become aware of potential savings in money and fewer accidents.

Local government officials were more willing to quote savings through safety training in specific areas of work zone traffic control, safety features for roads/streets, and traffic operations. Seventeen governments estimated a savings

of \$163,825, or a per-government savings of \$9,636. Another benefit listed was "peace of mind."

Pavements

Local governments are responsible for 1.3 million miles of paved roadways, with the majority of those pavements being asphalt. Centers have devoted 26 percent of their training efforts and the majority of their on-site technical assistance to providing locals with the latest technology in pavement construction, maintenance, and construction inspection; introducing them to new materials; and teaching new pavement recycling techniques. Maintenance areas have included surface treatments such as chip seals, slurry seals, overlays, crack seals, pothole patches, etc.

Maintenance training received the greatest approval rating, 97 percent, with asphalt construction and surface treatments each receiving a 95 percent approval. Helpful ratings were received for inspection (83 percent), materials (93 percent), and recycling (79 percent). Recycling has produced large dollar savings for locals as evidenced through personal interviews.

Comments indicate that pavements last longer when new techniques are used. Locals also expressed appreciation of an unbiased source of information on materials.

Survey responses indicate that 42 percent have changed some aspect of managing their pavements. Fifty-three respondents ventured a guess that they have saved \$332,538, for an average per-government savings of \$6,274.

Unpaved Roads

Local governments must maintain 1.6 million miles of unpaved roadways. Many times these are important farm-to-market roadways that also are travelled by school buses. Keeping these roads in good condition is critical to the well-being of the communities. Since the beginning of LTAP, efforts have been made to stress to local governments that a gravel roadway can be serviceable and often is the best choice for low-volume roadways. Efforts have been made to give the locals the knowledge to make the decision to pave wisely. Centers have devoted seven percent of their training efforts to both promoting proper maintenance of gravel roads and introducing them to technology such as the proper use of geotextiles and dust control.

Maintenance of gravel roads, which includes blading and crowning, pothole repair, use of aggregates, etc., received the highest approval rating of 90 percent, with

construction being helpful to 84 percent. Dust control training is helpful to 83 percent of respondents, and use of geotextiles rated a 79 percent approval rating. Other topics that rated as highly beneficial were soil stabilization, motor grader operation, and the proper use of chemicals.

Nineteen respondents indicated savings averaging \$2,873 per government because of training received in gravel road maintenance.

Drainage

The usual cause of roadway failure is lack of adequate drainage. Drainage is stressed at all roadway maintenance workshops, and Centers devote four percent of their training efforts exclusively to teaching proper drainage techniques. Topics include ditching and shouldering, culvert installation and maintenance, and slope maintenance.

Overall, drainage workshops are considered helpful by 90 percent of respondents, with 14 respondents indicating a per-government savings of \$4,409.

Bridges

Bridge maintenance ranks highest in this area with a 76 percent helpful rating; inspection ranks 74 percent and maintenance 71 percent. Locals had difficulty putting savings to bridge training, with nine respondents showing average savings of \$1,945 per government for a total of \$17,501.

Equipment

The manpower to conduct hands-on equipment training has prohibited many Centers from offering this training. Because of the great demand for the training, many Centers are looking for innovative ways to address the subject, with some implementing peer-to-peer training. Others are using videos, publications, and classroom training. It is anticipated that eventually interactive computer training will be available in this area.

Equipment operation and maintenance training received an approval rating of 92 percent and a savings of \$26,850 by the 12 respondents who fixed a savings to the training, an average of \$2,238.

Miles Maintained by Local Governments

The chart below profiles survey respondents by the mileage they maintain.

MILES MAINTAINED BY RESPONDENTS

Mileage Range	* %	Average Mileage			Average No. of Employees	Average Total Road Budget	Budget Per Mile
		Paved	Unpaved	Total			
1-10	4	5.4	2.6	8	2.3	42,658	5,332
11-100	43	39.3	12.3	51.6	7.1	436,145	8,452
101-600	27	206.9	97	303.9	28.1	2,141,274	7,046
601-1000	11	358.2	469.2	827.4	41.5	3,535,829	4,273
>1000	9	957.9	933.4	1,891.3	75.3	7,236,788	3,826

*Percentage of Respondents

This chart shows that the largest user group of LTAP services has 11 to 100 miles to maintain, with the average mileage being 52 miles of roadways to maintain followed by those with an average of just over 300 miles. Oftentimes, their budgets do not permit employment of full-time engineers or other expertise. They are spending more per mile to provide transportation services than are their larger counterparts. The need for technical assistance and training magnifies when reviewing data that demonstrate the demand.

Cost Savings

In the personal interviews in 15 States, local government officials were asked to estimate a per year dollar savings. The following tables show the dramatic savings identified through personal interviews.

Savings by Area Identified in 15 States	
Pavements	13,744,000
Safety	2,834,000
Bridges	2,655,000
Reduced Training Fees	301,000
Equipment Maintenance	127,000
Other	304,200
TOTAL	\$19,965,200

Extrapolation Based on 41 States That Have Been Offering Services for More Than 4 Years	
Pavements	37,566,947
Safety	7,746,253
Bridges	7,257,000
Reduced Training Fees	822,747
Equipment Maintenance	347,147
Other	831,480
TOTAL	\$54,571,574

The total savings identified through personal interviews in 15 States was \$19,965,200, with an average per State savings of \$1,331,014 per year. Since 41 States are in the same category (those having been in operation 4 or more years), it is assumed that the same information would be obtained by an in-depth study of all 41 States. By extrapolation, it is logical to assume that the overall savings identified in 1 year for the services offered by Technology Transfer Centers is \$54.6 million. This is a conservative estimate eliminating the benefits of those other Centers that have been offering services less than 4 years. It also is important to remember that all locals readily stated that they had saved money; many, however, felt that they did not have records that document actual savings.

The survey also asked locals to show cost savings by category and then give an overall estimate of savings realized through changes in how they are managing their overall programs. Two hundred and three survey respondents (5 percent) provided data by category, while 984 (24 percent) showed savings because of changing some aspect of managing their road/street program. The following chart shows the per-government savings reported. Because of the low response rates, it would not appear valid to extrapolate to the entire 41 States in the survey. Most respondents did not identify whether this was a per-year savings or a savings through their overall involvement with their Center. Without additional information, it is not valid to project these savings nationwide.

Testimonials

Throughout the personal interviews, locals were quick to praise the services of LTAP and the benefits they have derived. The following are quotes taken from the interviews.

"Because of construction inspection training, employees are better equipped to prevent mistakes at the construction phase, thereby alleviating problems later on." George Michael, Sierra Vista, Arizona

"We are a small city with four people responsible for our streets. Our people have to know how to do a lot of jobs. We are moving into TQM (Total Quality Management) because of information we got through T²." Lynn Karchner, Goodyear, Arizona

"T² is a good source for transferring the engineer to the street superintendent." Terry Zerger, Gunnison, Colorado

"Today's employees desire more knowledge and T² satisfies that demand." Bob Carman, Mesa County, Colorado

"T² efforts have not resulted in big operational changes, but there are incremental changes—it's an evolutionary process." Monte Potter, LaPlata County, Colorado

"By educating the workers on the right way to put down cold patch, productivity has tripled. Less material is used and less labor is involved so money is saved." Bob Carrol, Waterbury, Connecticut

"We've saved money in paving operations, but once you start doing things the right way you don't track the cost of how much it cost you when you

were doing the project the other way." David Monckton, Woodbury, Connecticut

"Jack Stevens (T² staff member) helped us use a sand seal that cost \$20,000. The other alternative would have cost \$100,000. We wouldn't have saved that money if it weren't for Jack Stevens." John Balasz, Ashford, Connecticut

"Effectiveness of a program cannot be judged on hard dollar savings. How do you determine how much money you save by improved attitude, using safety gear, learning the proper way to flag? You know you have saved money, lots of it, but you're just thankful for any accidents you may have prevented." Andy Curro, Leon County, Florida

"Use of stabilization and ditching has cut necessity for grading at least in half." Harry Lampe, Putnam County, Florida

"Because of T², our roads are safer, our employees are happier, and we are better able to satisfy the citizens. I'm sure we have saved thousands of dollars, but we don't have actual documentation." Frank Thompson, Putnam County, Florida

"The most cost effective program I know of. We'll do whatever we have to do to see that its funding keeps coming." Ed Culpepper, Alachua County, Florida

"The HERPICC staff are very cooperative; getting assistance is easy. They go out of their way to help us. I like the fact that training is done here at our own local facility." Bill Fife, Lafayette, Indiana

"We wouldn't be getting training without T². T² does an exceptional job of letting us know of techniques being used in other counties." Milan Levett, Marshall County, Indiana

"We've saved \$1.9 million on 24 new bridges over 4 years due in part to knowledge gained at T² workshops." Mike Williamson, Newton County, Indiana

"This county highway department is so far ahead of what it was 10 years ago, it's like a different county organization. The change has come through technology applications and T² is largely responsible for providing this expertise. I believe the only way technology from FHWA and KDOT (Kansas Department of Transportation) can effectively be

transferred to the users is through an organization such as T²." Ron Zimmerman, Miami County, Kansas

"Yes, I can identify a benefit. The county had a \$2.5 million lawsuit which was thrown out because the traffic controls within the work zone where the accident happened were done right. T² training on this subject could certainly be given major credit." Jim Hague, Dickinson County, Kansas

"This small city has had a pavement management system since 1988, the first in the State. T² provided the training and technical support to get this system operational. The improved street rating program allows priority setting that helps take the politics out of the street department." Al Brewer, Ruston, Louisiana

"T² has taught us techniques like stabilization with emulsion, has given us a better understanding of and working relationship with consultants and contractors; has taught us how to inspect our own bridges which saves about \$30,000 a year." Tom Janway, Ouachita Parish, Louisiana

"In 1992 this road and bridge department had only one lost-time accident--this excellent record is due to the safety training received through T². This Parish now has safety meetings, using materials from the T² library." Perry Blanchard, Terrebonne Parish, Louisiana

"T² knows local government and their needs." Jim Little, Co. Road Association of Michigan

"It would be an awful situation not to have T². The bottom line is we would have no training. We rely heavily on T²." Jim Manderfield, Houghton County, Michigan

"We have saved money because potholes stay patched now, there are fewer accidents, and there is better communication between the supervisors and the crews." Rhea Fuller, Warren County, Mississippi

"T² is a valuable asset to our organization. Because of training, lower level employees have been given more responsibility. They can handle it because of improved self-esteem and more self-confidence. With better trained employees, there are less accidents, less insurance claims and fewer citizen complaints." Buddy Broadway, Gulfport, MS

"The savings we have incurred are in pavement efficiency. We do repairs in a timely manner and I would have to say we save \$20,000 a year in pavements alone." Matthew W. Jordan, Gastonia, North Carolina

"T² has built a knowledge base for us and supply us with 95 percent of what we know about asphalt technology. We have implemented a pavement management plan that covers all roads every 15 years. T² helped us do this." John Cannon, Morganton, North Carolina

"The T² circuit rider program brings the training right to us. T² training is about all we can afford; anything comparable would cost \$300 and up." Chad Deibel, McMinnville, Oregon

"We draw heavily on the written material, both from the newsletter as well as other library publications." Stan Stevenson, Redmond, Oregon

"About five years ago T² helped us find a new highway marking material that saved us 50 percent over what we had been using." Ed Knittel, Newberry Township, Pennsylvania

"Our public officials have no problem with us taking time for training because they know how good T² is for our roads." Dennis Millhouse, Millersvilleboro, Pennsylvania

"I have learned in 2 years what would have taken 15 years in the garage." Jay C. Steinmetz, Cumru Township, PA

"The newsletter and field brochures are great. They not only keep us abreast of what is happening, they get us to thinking on our own." Craig Patterson, Whitman Co., Washington

"We just can't say enough good things about the T² program." Terry Van Driver, Yelm, Washington

VI. FUTURE DIRECTIONS



In the 11 years since the beginning of LTAP, Federal, and State mandates have required local governments to accept more responsibility. Beginning with the loss of general revenue sharing monies in 1987, outside funding sources have dwindled. The current Intermodal Surface Transportation Efficiency Act requires locals to accept major management as well as maintenance responsibilities. While a larger portion of the Federal highway dollar is being funnelled to the locals, they have had little experience with prioritizing and, without LTAP, little access to the expertise necessary to meet the new requirements. The Technology Transfer Centers funded through FHWA's Local Technical Assistance Program have become their primary source of assistance.

Local governments have expressed their needs and praised the services of the Technology Transfer Centers. Both through the personal interviews and the surveys, specific demands were made of the Technology Transfer Centers.

Through personal interviews, locals most often requested simply a continuation of the programs currently being offered, possibly with graduated levels of difficulty. Specific areas where additional assistance was requested by the 155 local government officials interviewed follows, along with the frequency of response:

INTERVIEWS: REQUESTED PROGRAM AREAS

Response Frequency	Topics
65	Safety: Work zone safety, traffic safety, tort liability, risk management
48	Management Training: Setting up management systems required by ISTEA, road surface management, equipment management, personnel management
35	Pavement Management: Setting priorities, condition surveys, resource allocation
23	Equipment Operation and Maintenance
20	Environmental Regulations: Wetlands, water runoff, hazardous materials handling
18	Training of Public Officials: Awareness of requirements, restraints in meeting requirements, road surface management
17	Pavement Inspection
17	Unpaved Roads: Management and maintenance
16	Drainage: Systems development, maintenance
14	Clarification and Requirements of Regulations: ISTEA, OSHA, ADA, and others
10	Slope Maintenance/Slide Restoration
10	Right of Way: Maintenance, vegetation control, use of chemicals

The surveys reveal that the majority of the respondents believe the program should continue as it is, with the Centers using their own methods of selecting topics to be covered. Others quoted needs similar to those mentioned in personal interviews as well as other needs.

SURVEYS: REQUESTED PROGRAM AREAS

Response Frequency	Topics
62	Pavements: Construction, rehabilitation, maintenance, inspection
51	Equipment: Management, operation, maintenance, purchasing
44	Safety: Equipment, on-the-job, risk management, tort liability, hazardous materials
39	Regulations: Requirements of and compliance with Federal and State mandates, licensing (OSHA, ADA, ISTEA, EPA, DEA)
34	Drainage: Urban and rural, catch basins, culverts, ditching, systems
33	Computer Training: Use of hardware, software, applications for local governments
32	Bridges: Design, construction, maintenance, inspection
31	Management: Supervisory training in personnel issues, team building, total quality management
30	Traffic: Management, operations, safety, signing, signalization
18	Winter Maintenance: Snow and ice removal, cold weather repair
17	Road Surface Management: Inventorying, prioritizing, resource allocation, computer applications
11	Right of Way: Maintenance, vegetation control
12	Environmental Issues: Wetlands, runoff, shop management
12	Unpaved Roads: Dust control, blading
11	Recycling: Asphalt, use of recycled materials
11	Materials: Introduction to new materials and their uses, evaluation of materials
10	GIS
10	Project Management: Working with contractors, consultants, understanding blueprints, monitoring
10	Public Officials: Training aimed at policy makers to acquaint them with regulations and the need for planning

Both the personal interviews and the survey responses indicate that the current delivery methods are appropriate. The survey shows that 87 percent use the newsletters, 86 percent take advantage of training sessions, library use is 58 percent, and access of on-site technical assistance is 26 percent. Comments during interviews and survey remarks indicate a high use of toll-free telephone numbers to get advice.

There is a demand for training for very small towns and townships and very rural, sparsely populated counties. Comments on survey forms indicate this group want to take advantage of the program but do not have the financial resources to implement technology that is appropriate for the typical rural government. They also ask that more workshops be presented in remote areas.

While current delivery methods meet with a high rate of approval, locals are aware of and anxious to take advantage of alternative learning tools. There is a demand for more State-specific videos on all areas. Several respondents suggested teleconferencing as a way to provide training that does not require them to travel. Many want more easy-to-use how-to manuals, especially the "pocketbook" variety that can be used on work sites.

The need for marketing of Technology Transfer services is evident from the vast majority of nonusers who indicate they are unaware of the program. Centers need to look at ways of increasing awareness in small communities.

Statistics show that at the present time the LTAP program is benefitting about 60 percent of the country's local governments. Those unaware of the program indicate a desire to know more about it and how they can access the services. There seems to be a demand for the program to grow and to specialize in various levels of government in order to increase overall benefits. In order to meet increasing demands, Technology Transfer Centers will need additional resources, both financial and through the development of new products.

VII. RESOURCE NEEDS OF TECHNOLOGY TRANSFER CENTERS



The findings of this study suggest a high degree of approval of the services of the Centers, and it is therefore reasonable to assume the demand for services will continue to increase. To determine additional resources needed by the Centers to continue and expand their services, the Centers were asked to submit 5-year projections. Thirty-one Centers responded, and the calculations in this section are based upon those responses and extrapolated to the 51 Centers.

The Centers believe a funding level of \$23.2 million* will be required to carry out an effective program in 1998. The sources they suggest are as follows.

PROJECTED 1998 FUNDING SOURCES

Source	Funding	Percent
FHWA	\$12,239,184	53
State DOTs	6,383,874	27
Universities	1,453,857	6
Local Governments	1,534,131	7
Self-Generated	1,078,089	5
Other	464,814	2
TOTAL	\$23,153,949	100

This represents a 50 percent increase over the current funding level of \$15,478,908.

The strength of the T² Centers has been the ability of each Center to adapt to the changing needs of local governments. It is difficult to develop long-range plans in a program that is client driven. Based upon past experiences, however, the Centers did predict the following increases in their programs based on tasks.

*The desired funding for the T² Centers does not imply any future budget commitment on the part of FHWA. Such decisions will be considered in future budget processes.

PROJECTED PROGRAM BUDGET INCREASES

Task	Percent Increase
Workshops	43
Other Training	52
Van Programs	43
On-Site Assistance	37
Library Services	18
Newsletters	12
Information Service	19

Centers estimate they are routinely serving 45 percent of local governments in the country. Survey results indicate 60 percent are served. The difference can be explained by the fact that the 45 percent figure represents governments that are taking an active part on a regular basis in the program by attending workshops, seeking advice, or otherwise making their use known to Center staffs. The 60 percent figure includes those locals who are passively using the program by reading newsletters and other publications generated by the Center or who sporadically attend workshops or request videos and other library materials.

With increased funding, Centers estimate they can be providing assistance to 75 percent of local governments in 1998, an increase of 67 percent over the current level of service. This increase in service levels will require additional staff, as well as additional product development. Of primary importance will be the development of videos, computer-based training programs, and teleconferences. To increase awareness at the local level will require a major marketing effort.

VIII. FINDINGS



This study documents the tremendous contributions of the Local Technical Assistance Program to a safer and more efficient transportation system. Throughout the year-long study, it became evident that the greatest contributions of LTAP have been in areas where local government officials found it difficult to assign dollar amounts of savings, such as improved work habits, better morale, greater self-esteem of employees, etc. It also became evident that LTAP has made a significant contribution in safety-related areas—again, areas where local governments hesitated to assign dollar savings.

Information provided by local governments did, however, document a significant return on investment for the services offered through the Centers.

The average savings per State for 1 year was identified by locals through personal interviews as \$1,331,014. 1993 financial information provided by the Centers indicate an FHWA/LTAP average funding level of \$156,105 per State. Applying these statistics to the 41 Centers that have been operational for 4 or more years documents a return on FHWA/LTAP's 1993 investment as \$54,571,574 or \$8.53 for every dollar invested.

The Centers estimate that they will need a 50 percent increase in funding by the year 1998 to increase their current services. With this increase in funding, they predict they can raise the number of governments being served from 45 percent to 75 percent.

If such funding can be identified, the average Center budget would increase to \$455,000. The Centers suggest that 53 percent of this funding come from FHWA/LTAP, or \$241,150 per Center. With the addition of the 4 Native American Centers, there are currently 55 Centers receiving LTAP funding, which equates to a suggested 1998 FHWA/LTAP contribution of \$12.2 million.

Assuming the savings per Center would increase proportionately to the projected 66 percent increase in services reveals a savings per State or Center by 1998 of \$2.2 million, for a national savings of \$121 million.

Should the Federal Highway Administration, through its Local Technical Assistance Program, choose to provide the suggested support to the Technology Transfer Centers, it is predicted that FHWA will realize a return of their 1998 contribution of \$9 for every dollar invested.