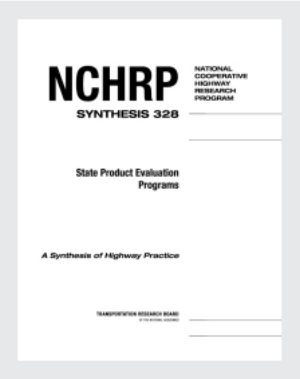

State Product Evaluation Programs

DETAILS

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NCHRP

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

SYNTHESIS 328

State Product Evaluation Programs

A Synthesis of Highway Practice

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

NCHRP SYNTHESIS 328

State Product Evaluation Programs

A Synthesis of Highway Practice

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SUBJECT AREAS

Highway and Facility Design, Materials and Construction, and Maintenance

Research Sponsored by the American Association of State Highway and Transportation Officials
in Cooperation with the Federal Highway Administration

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.
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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

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NOTE: The Transportation Research Board of the National Academies, the National Research Council, the Federal Highway Administration, the American Association of State Highway and Transportation Officials, and the individual states participating in the National Cooperative Highway Research Program do not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of this report.

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The members of the technical committee selected to monitor this project and to review this report were chosen for recognized scholarly competence and with due consideration for the balance of disciplines appropriate to the project. The opinions and conclusions expressed or implied are those of the research agency that performed the research, and, while they have been accepted as appropriate by the technical committee, they are not necessarily those of the Transportation Research Board, the National Research Council, the American Association of State Highway and Transportation Officials, or the Federal Highway Administration of the U.S. Department of Transportation.

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FOREWORD

By Staff
Transportation
Research Board

Highway administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

Information exists on nearly every subject of concern to highway administrators and engineers. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire highway community, the American Association of State Highway and Transportation Officials—through the mechanism of the National Cooperative Highway Research Program—authorized the Transportation Research Board to undertake a continuing study. This study, NCHRP Project 20-5, "Synthesis of Information Related to Highway Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute an NCHRP report series, *Synthesis of Highway Practice*.

The synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

PREFACE

This report of the Transportation Research Board discusses the product evaluation programs of state and provincial departments of transportation (DOTs). It summarizes DOT practices, including program organization, evaluation procedures, funding, and implementation of evaluation process results of potential products available for highway application, including materials, equipment, processes, and technologies. The report addresses the general use of evaluation programs within DOTs (including the use of state specifications, and laboratory and field testing results), the national programs that exist to support the integration of new products and technologies into practice (e.g., the Highway Innovation Technology Evaluation Center, the National Transportation Product Evaluation Program, and the AASHTO Product Evaluation List), and the general issues associated with conducting fair and objective evaluations of new products and implementation of approved products.

Information for this synthesis report was derived from a literature search, on-line questionnaire responses from various DOTs, follow-up interviews and queries to selected public agencies, and other state survey results and summaries.

A panel of experts in the subject area guided the work of organizing and evaluating the collected data and reviewed the final synthesis report. A consultant was engaged to collect and synthesize the information and to write this report. Both the consultant and the members of the oversight panel are acknowledged on the title page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

CONTENTS

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Valuable assistance in the preparation of this synthesis was provided by the Topic Panel, consisting of Duane F. Brautigam, State Specifications Engineer, Florida Department of Transportation; Kevin Conner, Transportation Specialist, Turner–Fairbank Highway Research Center, Federal Highway Administration; Frank T. Darmiento, Manager, Transportation Research Center, Arizona Department of Transportation; Kevin J. Haas, Research Engineer, Oregon Department of Transportation; Frederick D. Hejl, Senior Program Officer, Transportation Research Board; Michael Rafalowski, Materials Engineer, Federal Highway Administration; Robert F. Steffes, Assistant to Research Engineer, Materials Research, Iowa Department of Transportation; Masha Wilson, Product Evaluation Coordinator, Nevada Department of Transportation; and Rodney Wynn, Project Manager, Maryland State Highway Administration, Maryland Department of Transportation.

This study was managed by Stephen F. Maher, P.E., and Jon Williams, Managers, Synthesis Studies, who worked with the consultant, the Topic Panel, and the Project 20-5 Committee in the development and review of the report. Assistance in project scope development was provided by Donna Vlasak, Senior Program Officer. Don Tippman was responsible for editing and production. Cheryl Keith assisted in meeting logistics and distribution of the questionnaire and draft reports.

Crawford F. Jencks, Manager, National Cooperative Highway Research Program, assisted the NCHRP 20-5 Committee and the Synthesis staff.

Information on current practice was provided by many highway and transportation agencies. Their cooperation and assistance are appreciated.

STATE PRODUCT EVALUATION PROGRAMS

SUMMARY

State product evaluation programs have existed for many years. Ever since vendors and manufacturers found a market in highway and transportation agencies, those agencies have dealt with requests to approve various products for application and practice. These agencies have also dealt with internal requests from staff for consideration of new products, practices, or procedures to improve the way their agencies operate.

Departments of transportation (DOTs) have reviewed, tested, and evaluated these products differently and with varying degrees of formality. Some agencies have established formal processes with well-documented procedures that have allowed them to consider hundreds of products, whereas others have been more informal in their approach to evaluations and only evaluated a few products.

This synthesis discusses these various evaluation programs as they relate to contemporary state DOTs. It addresses the general use of evaluation programs carried out within state DOTs, the national programs that exist to support the integration of new products and technologies into practice, and the general issues associated with conducting fair and objective evaluations of new products. This synthesis is based on a search of the literature, on-line questionnaire responses from various DOTs, in-depth follow-up interviews, and other state survey results and summaries.

State product evaluation programs are typically focused on

- Responding to numerous requests from various internal and external sources for product evaluation,
- Conducting fair and objective evaluations to give every request proper consideration, and
- Approving products for use in practice to benefit the department's operations.

Examples of evaluation techniques that are used to assist with product evaluation include certification that products meet established standard specifications, field and laboratory testing, and demonstration and experimental feature projects. National testing center evaluations and other states' experiences also are considered by some as criteria for product approval.

Many DOTs only consider products for which there is no standard specification or general special provision already in place. Other DOTs evaluate products that have never been used by nor previously been evaluated by their respective agencies. There is duplication and inconsistency in the various processes. Although a vendor may get his or her product tested and accepted in a jurisdiction with an evaluation program in place, the same vendor with the same product may not be able to access a state without such a program.

It is clear that the national programs that have been established to facilitate product evaluations are not the complete answer to these problems. Although these programs help to focus common product and technology interests into uniform testing efforts, they are limited in scope. States need to have their own programs to cover unique or uncommon products. National programs can however be very helpful to facilitate and improve communications among the DOTs. By expanding the available information on national testing efforts and the results of those conducting independent evaluations, jurisdictions can share experiences and learn from each other, making their own evaluation processes more effective.

It is also clear that because of the pressing critical issues of program delivery that agencies face the evaluation of new products often is a low priority within a DOT. Although there appears to be a recognized value in and appreciation for integrating new, innovative products into practice, the amount of time and resources to appropriately accomplish this are not always available within an agency.

CHAPTER ONE

INTRODUCTION

BACKGROUND AND PURPOSE OF STUDY

State product evaluation programs exist to help state departments of transportation (DOTs) respond to and analyze proposed changes that affect highway and transportation practices and operations. Typically, these programs evaluate new products that are available for application in the industry. These products can include materials, equipment, processes, devices, and other new technologies, and are often proposed to individual agencies by outside vendors and commercial manufacturers. Sometimes new products are proposed by internal sources such as agency staff. The goal of these evaluation programs is to establish a method of responding to the volume of products submitted for review and to provide a formal process for incorporating new and innovative products into practice.

Product evaluation programs traditionally have been developed independently by DOTs and require varying degrees of administrative resources. Some programs are well established, efficiently managed, and effective, whereas others are still being developed. Differences exist in how DOTs approach the issue and contend with the processes associated with such programs. These processes, including performance testing, have also been developed independently, resulting in a wide range of effectiveness. Often program scopes are not well defined and inconsistencies exist that could create risk for claims of bias or unfair evaluation conclusions. Some DOT programs track their evaluations through the application and implementation of the product, whereas others do not. Some DOTs effectively share their evaluation results and activities, whereas others do not.

DOTs have recognized these inconsistencies and they have generated several mechanisms and programs, primarily through AASHTO, to communicate evaluation processes, practices, and results (*1*). These programs include

- AASHTO's National Transportation Product Evaluation Program (NTPEP), which was created in 1994 as a way to coordinate specific product testing among states.
- The Highway Innovation Technology Evaluation Center (HITEC), a service center of the Civil Engineering Research Foundation, was established in 1994.
- AASHTO's Lead State Program on the Strategic Highway Research Program (SHRP), established in 1996.
- The AASHTO Product Evaluation List (APEL), established in 1997 to communicate evaluation and testing activities nationwide.

The purpose of NTPEP is to pool the professional and physical resources of the individual AASHTO member departments and to focus those resources on testing materials of common interest to improve their cost-effectiveness (*2*). This program is now financially supported by more than 95% of the 52 member organizations and tests products that have been identified and prioritized by the members. Most of the products tested in this national program have been in the categories of durable pavement markings, geotextiles, sign sheeting, and miscellaneous traffic control products.

Although the NTPEP was evaluated for effectiveness in a 2001 study conducted for AASHTO by TransTech Management, Inc. (*3*), neither the economic impacts nor the cost savings of the program have yet been studied. It is anticipated that the economic impacts of NTPEP on the respective state agencies and on the greater transportation research community will be addressed in a separate upcoming AASHTO study.

HITEC is a collaborative program established to become a national service center for implementing highway technologies (*4*). HITEC's primary goal is to facilitate the evaluation of new, innovative technologies and to expedite their transfer into practice. As of February 2003, the program had facilitated 46 evaluations of "high tech" and "low tech" products.

AASHTO's Lead State Program was established in 1996 to provide models and assistance to agencies dealing with the implementation of the SHRP technologies and practices. This program involved more than 30 state agencies in 7 technology focus areas. Although the program did not directly conduct tests, it did help to move innovative products into acceptance and ultimately into practice, as do the respective state evaluation programs. The participants in the Lead State Program used key states for each of the seven technical areas to create implementation tools, strategies, and best practice examples to help non-participating agencies in adopting the new technologies and products without independent testing. The program was focused and targeted with implementation tasks that concluded in December 2000.

AASHTO's APEL is a database that was established in 1997 to share information regarding product evaluations, performance, and acceptability (*5*). This database was preceded by AASHTO's Special Products Evaluation List. The APEL does not focus on reporting approved products, rather it reports and records information on what products have been evaluated by a state, whether ultimately approved or disapproved. To that end, APEL serves as a communications tool on active product evaluations that have or are being conducted by states. APEL provides the opportunity for a state to check on a specific product under consideration and can also serve as a reference on the type and nature of an evaluation that was conducted by a state.

The APEL database also serves as a new product information source that states may search for products of interest. Users can simply search on a product category and review what products have been used by other states to solve a particular problem. APEL not only has information on products, it also has contact information for the product manufacturers and for the state personnel responsible for product evaluations.

All of these programs were created to share experiences and technical information regarding the adoption of new highway and transportation products. However, as is often the case with sharing information and technology transfer, the success in sharing these pooled resources of information is contingent on the respective agency's receptiveness to accept someone else's experience and the relative value or applicability of the information to the respective agency (*6*).

It should also to be noted that NTPEP, HITEC, and the Lead State Program are or have been limited to specific technologies that may not be of equal interest to all agencies. The APEL database includes only information that has been contributed by a respective state and is fluid in that new information is added as states have the time and resources. For these reasons, most states have established their own, independent product evaluation programs. Some states, such as Maryland (*7*) and Oregon (*8,9*), have established their own databases to track product evaluations. AASHTO staff reports that some member organizations participate fully and actively in the above-mentioned national programs to compliment their own programs, whereas others do not.

As a part of this synthesis, the organization and funding mechanisms of these independent state evaluation programs will be considered. Evaluation procedures and the implementation of the evaluation results will be summarized. Various outside acceptance criteria will be considered and a discussion as to how these criteria affect internal DOT programs will be included. Because many options exist for acceptance criteria, whether formally established or informally applied as "rules of thumb," these criteria will be discussed, particularly as to how they contribute to implementation applications.

REPORT FOCUS AND OBJECTIVES

DOTs recognize the importance of dealing with new product evaluations in an efficient, fair, and expeditious manner. This synthesis addresses the magnitude of the problem, the types of criteria used to evaluate products, the strategies employed to communicate acceptance of an approved product, and the mechanisms used to apply an approved product into practice. This synthesis will also draw some parallels to the above-mentioned national product evaluation programs. One key issue surrounding this synthesis is the duplication of effort that exists in the respective evaluation processes. This synthesis identifies the products and technologies of most common interest to the states so that some future duplication may be avoided.

Transportation agencies have provided information, primarily in response to the electronic questionnaire, as to how these programs contribute to agency operations and product implementation. Additional information has been gathered through the survey and in follow-up interviews regarding the extent to which agencies support efforts to respond to requests for evaluation.

This synthesis discusses state product evaluation programs as they exist today. It addresses the issue of creating and administering programs that encourage innovation and improvement in practices. The synthesis is based on a review of the literature, an electronic questionnaire distributed to U.S. state and Canadian provincial transportation agencies, follow-up interviews and queries to selected public agencies, and information from private practice and academic organizations.

REPORT ORGANIZATION

This synthesis is divided into five chapters.

- Chapter one introduces the subject of product evaluation programs and sets the stage by presenting the background and existing state of evaluation programs.
- Chapter two provides a discussion of the critical issues affecting DOTs as they relate to new product evaluations and the implementation and application of those products into practice.
- Chapter three specifically addresses how DOTs conduct their respective programs. Individual mechanisms, funding alternatives, staffing and resource management, best practices, and various models are discussed.

- Chapter four discusses how DOTs measure the effectiveness of their programs. The benefits of implementing new products are addressed and some examples of how these benefits have affected the overall operation of the DOTs are discussed.
- Chapter five provides a summary of the findings and conclusions. Recommendations for future activities on the subject are also presented.

Finally, references and appendixes are provided that indicate the sources of information, including the questionnaires and tabulated responses as noted in the text.

CHAPTER TWO

PRINCIPAL ISSUES

Although it is clear that states strive to improve their operations and practices through the use of better, more innovative, and cost-effective products, there are several factors that affect, and sometimes inhibit, an agency's opportunity to do so. These factors are common throughout the transportation community and are often the result of agencies not having an evaluation process that is consistent, well-defined, or adequately supported.

SCOPE

Fundamental to understanding an evaluation program is to understand how an agency defines a new product. This determination essentially defines a program in terms of its scope and the magnitude of its impact on the operations and practice of an agency. Some agencies narrowly define a new product as a specific manufactured item, whereas others define new products very broadly and include practices, processes, and generic technologies in their evaluation programs.

As is the case with national programs such as NTPEP and HITEC, there are differences in how new potentially beneficial subjects for evaluation are determined (*1*). Some agencies define their subjects for evaluation as any request from external or internal sources, whereas other departments only consider requests from outside sources, such as vendors or manufacturers.

Another consideration that influences the effectiveness of programs is how broadly these programs are recognized and supported within the agency. If these programs are visible and appreciated for contributing to innovation, the potential for the successful deployment and ultimate implementation of a new product is greatly enhanced. Additionally, programs that are open to and encourage suggestions for new products internally provide an opportunity for staff to champion new ideas and products from the grass roots. Such support is the key to successful research and technology implementation.

STAFFING

Although an agency may have a well-defined procedure for conducting evaluations, it may not have the dedicated staff to effectively administer such a program. Of the agencies responding to the survey, less than half have staff committed to new product evaluation activities on a full-time basis (Table 1). Although full-time staff may not be essential to an effective program, it clearly identifies responsibility for a program. This can be a major issue for the outside applicant attempting to communicate with the most appropriate agency staff in what may appear to the outsider to be a large, diverse, and difficult-to-understand agency.

Approximately 75% of those surveyed have an organized task force or committee to oversee the evaluation process. The vast majority of these task forces involve more than five individuals. The use of task forces and committees to oversee evaluation programs appears to be quite common and can be very effective. Some agencies reported that committees include representatives from upper management to lend support to the effort. Agencies also reported using the various organizational units most involved with new products and their related technologies. There is an automatic "buy-in" to process improvements and innovation when those responsible for a program area within an agency promote and encourage the adoption of new products and new technologies.

However, a comprehensive evaluation program takes more than an oversight committee. It also takes the availability and commitment of staff with the appropriate expertise if in-house evaluations are to be successful.

Because of the variety of products being submitted for evaluation, the personnel necessary to properly conduct the evaluations must include a broad array of expertise (Table 2). The expertise necessary for the evaluations may be found in multiple functional areas of an organization such as in offices for materials, construction, maintenance, operations, traffic, and intelligent transportation systems. Although this expertise may be available within the agency, typically there is no dedicated staff within those offices for the purpose of evaluating new or proposed products. The evaluation of new products may be viewed as an extra responsibility outside the typical, day-to-day objectives and mainstream responsibilities of a position. The evaluations may also be sporadic or infrequent in any one area of the organization, making the commitment of time and resources for evaluations unpredictable and difficult to schedule.

These varying degrees of time and resources, even with agencies having well-defined programs in place, can hinder getting a fast, effective evaluation accomplished. The unpredictability of the requests for evaluation also creates

TABLE 1
ORGANIZATION OF EVALUATION PROGRAMS

Survey Respondents	Formal Program	Full-Time Staff	Task Force or Committee	Primary Contact	Dedicated Funding
Alberta	X	X	X	X	
Arizona	X		X	X	X
California	X	X	X	X	
Colorado	X			X	X
Connecticut	X	X	X	X	X
Florida	X	X		X	
Georgia	X		X	X	
Illinois	X	X	X	X	X
Indiana	X		X		
Iowa	X	X	X	X	
Kansas	X		X	X	
Kentucky	X		X	X	
Maryland	X		X	X	X
Minnesota	X			X	
Mississippi	X	X	X	X	
Missouri	X	X	X	X	X
Nevada	X	X	X	X	X
New Hampshire	X			X	
New York	X		X	X	
North Dakota				X	
Ohio	X		X	X	
Oklahoma				X	X
Oregon	X	X	X	X	X
Ottawa, city of	X	X	X	X	
Pennsylvania	X	X		X	X
Quebec	X	X	X	X	
Rhode Island	X		X		
Saskatchewan			X		
South Carolina	X		X	X	
Texas	X		X	X	
Utah	X	X	X	X	X
Virginia	X	X	X	X	
Washington	X		X	X	X
Wisconsin	X	X		X	X
Percent of Total Respondents	91%	47%	76%	91%	38%

demands and challenges on the individual or group responsible for managing such a program. Given that more than 90% of those agencies surveyed have a formal process for evaluating new products and less than one-half have dedicated staff to process the requests and conduct the evaluations, there exists a great need in most agencies to depend on staff otherwise engaged in primary responsibilities. Given that the responsibility of managing an evaluation program is not a primary function of a position in most agencies, there can be difficulty in making evaluations the priority necessary to be effective. This is also true with the technical staff required for evaluations.

The appropriate staff to evaluate a specific product or technology, if not a primary responsibility of that position, must deal with competing priorities in their work schedule. Competing for time in conducting an evaluation does not imply that evaluations are inappropriately conducted; however, it may mean that evaluation results are not reported or acted on in a timely manner. One of the basic keys to good product acceptance and ultimate implementation is timeliness. The Pennsylvania DOT research program peer exchange (*10*), conducted in the fall of 2002, focused on research implementation, including new product acceptance. That exchange effort concluded that timing is everything in product acceptance, deployment, and implementation. The faster a product is acted on, or the faster an approved product is placed into practice, the greater is the chance for successful implementation.

Another indication of the adequacy of staff to support new product evaluations is the degree to which the national APEL database is used by transportation agencies. This database does not report which products have been approved for application, but rather which products have been evaluated, whether approved or rejected. Through discussions with the AASHTO staff and their consultants, and in studying the results of the Maryland State Highway Authority's (MDSHA) 2002 survey (*7*) on a similar topic, there is a low degree of active participation in posting, inputting, and using the product evaluation information in the national APEL database.

As of August 2002, 27 states had entered 4 or more evaluations in APEL, a small percentage of the evaluations reported in the survey. Clearly those conducting the field

TABLE 2
TYPES OF PRODUCTS BEING EVALUATED

Survey Respondents	Materials	Equipment	Processes and Practices	Traffic Control	All Types of Products
Alberta	X	X		X	
Arizona	X	X		X	
California	X			X	
Colorado	X				X
Connecticut					X
Florida	X		X	X	
Georgia	X			X	
Illinois					X
Indiana	X	X	X	X	X
Iowa					X
Kansas					X
Kentucky					X
Maryland	X	X	X		
Minnesota					X
Mississippi					X
Missouri	X	X	X	X	X
Nevada	X		X	X	
New Hampshire	X	X	X	X	X
New York	X	X		X	
North Dakota	X				
Ohio	X	X			
Oklahoma					X
Oregon	X			X	
Ottawa, city of	X		X		
Pennsylvania					X
Quebec	X		X		X
Rhode Island	X				
Saskatchewan					X
South Carolina	X			X	
Texas	X		X	X	X
Utah	X	X			
Virginia	X			X	
Washington	X	X		X	
Wisconsin					X
Percent of Total Respondents	68%	29%	26%	44%	50%

evaluations at the various agencies have limited time for sharing the status and results of their respective evaluations. The amount of data not being contributed to the APEL database is significant, particularly given that the format for inputting data into APEL is considered relatively easy by those who use it.

This was reinforced by various agency managers who acknowledged in interviews and in the formal survey responses that although tremendous work is being dedicated to evaluating new products, the process is a low priority for those conducting the evaluations owing to other work assignments and responsibilities. Some agencies noted the responsibility for new product evaluations as "other duties as required."

One aspect of staffing that proves to be promising in the management of agency programs is that 90% of those surveyed indicated that there is a clearly identified contact person for product evaluations (see Table 1). This is an important point for those who are proposing products for evaluation. If programs exist to encourage innovation and process improvements, they must be accessible and approachable. Having one source or contact for program evaluations is the key to the organization of the respective programs. Although, the degree to which these individuals are recognized and known within and outside of an agency varies, because most agencies have identified a primary contact person provides a key access point for such programs.

FUNDING

It is clear from this study's survey results, as well as from the study that was conducted by the MDSHA on this subject, that most agencies do not have dedicated funding for product evaluations. This means that most agencies have to absorb the cost of evaluations through funding sources that are established primarily for other purposes. These sources include State Planning and Research allocations and state funds. Areas from where these funds were identified included the materials, construction, technology transfer, and research programs of the respective agencies.

It is significant that 13 agencies have established dedicated funding for new product evaluation programs, al-

though the balance of those surveyed have not. The degree to which these 13 agencies have success in meeting the demands of the requests for evaluations has not been determined. Nine states indicated having dedicated funding in the MDSHA survey, with the range of the funding from those states being $7,500 to $245,000 per year. The median amount dedicated by the Maryland respondents was $98,000.

A related funding consideration is the degree to which the APEL database and NTPEP are supported by the individual organizations. Financial support for the APEL database is in its second round after operating 4 years with the initial funding. It is financed by voluntary contributions from the states and it is anticipated that most states will again support the program. NTPEP has been successfully supported by the states since 1994. That these two AASHTO programs have functioned and continue to be financially supported by the states indicates how important product evaluations and product evaluation information is to the respective agencies.

VOLUME

One of the primary reasons for this was to determine how states are responding to the volume and variety of highway products being submitted to the respective agencies for evaluation. The actual number and the diversity of the products make a major impact on the operations, and ultimate efficiency, of an evaluation program. More than 90% of the states responding to the survey indicated that they receive 10 or more requests for evaluations each year and that they have received at least that many requests per year for the past 10 years. In follow-up interviews, the number of annual requests varied significantly, and in several cases, far exceeded 10. No states indicated that they rarely receive requests for evaluation, and only one state considered their program to be relatively unknown outside of the agency.

Outside vendors who are marketing products for highway application frequently go from one state to another to promote their respective products. This is particularly true within some regions of the country where similar conditions, whether environmental or economic, exist. Many states indicated that they are approached for product evaluations after other states have reviewed and/or accepted a product. Several states reported that vendors also go from one district or region to another within the same state to promote their product. Without a unified, central entry point into a state's evaluation program, there is the potential for multiple assessments by the same agency on the same product.

The number of requests is a significant factor in how an agency deals with and organizes an evaluation program; so too is the nature and subject matter of these products. In the survey, respondents indicated that all types of products are subject to requests for evaluation (see Table 2). Products that are by nature new materials or equipment are very common requests. Traffic control devices, traffic system applications, and safety-critical products are also common candidates for evaluation (*11*).

Agency programs have also evaluated new processes and practices. Given that many types of products are subject to evaluation, many types of expertise are required to appropriately conduct legitimate and fair evaluations. One area of expertise may be required to evaluate a specific product and confirm a vendor's claim, whereas another may be necessary to determine its appropriateness for implementation. Programs that are not organized to deal with these issues run the risk of increased volume and poor or incomplete results.

CHAPTER THREE

ORGANIZATION AND PROCEDURES OF EXISTING EVALUATION PROGRAMS

All but three of the survey respondents reported that their respective agencies had a formal program for new product evaluations. How these programs originated and how they currently operate will be the focus of this chapter. Specific operational techniques and practices will be discussed to recognize trends and patterns leading to successful evaluation programs and best practices.

DEFINING A NEW PRODUCT

An underlying issue fundamental to evaluation programs and to the volume of requests discussed in the previous chapter is how the respective products are determined to be new and subject to evaluation. The responses to this survey question provided some of the most comprehensive comments from the respondents.

The majority of responses specified that any request from any source would be a candidate for evaluation (Table 3). Only four states indicated that they only evaluate products proposed by outside sources. This is an important measure of how an agency defines its program and views the commercialization of the process. Agencies that only evaluate products proposed from outside sources are dealing with internally generated new ideas (whether products,

TABLE 3
DEFINING A NEW PRODUCT

Survey Respondents	Product Not Previously Used by Agency	Product Not Previously Evaluated by Agency	Any External or Internal Request for Evaluation	Only Requests from Outside Sources
Alberta			X	
Arizona		X		
California		X		X
Colorado				X
Connecticut			X	
Florida			X	
Georgia*				
Illinois*				
Indiana			X	
Iowa			X	
Kansas				X
Kentucky*				
Maryland			X	
Minnesota				X
Mississippi		X		
Missouri			X	
Nevada			X	
New Hampshire	X			
New York*				
North Dakota				
Ohio	X			
Oklahoma	X			
Oregon			X	
Ottawa, city of		X		
Pennsylvania	X			
Quebec	X			
Rhode Island		X		
Saskatchewan			X	
South Carolina*				
Texas	X			
Utah		X		
Virginia	X			
Washington*				
Wisconsin			X	
Percent of Total	20%	18%	32%	12%

*These respondents (18%) indicated that they define a new product as one that does not have an agency standard specification, general special provision, or listing on an accepted product list.

technologies, or processes) in a different manner and outside the parameters of the formal evaluation program.

The survey also showed that 20% of the respondents considered a product new if it had not been used in practice by the agency, whereas nearly the same number (18%) indicated that a product was considered new if it had not been previously evaluated by the agency.

All of these differences demonstrate that there is no clear-cut, generally accepted definition of a new product.

There is also no consensus on what evaluation programs should provide and how these programs are best conducted. Although it is appropriate for each jurisdiction to determine what works best for them and execute their program accordingly, the context under which these programs operate must be recognized if results are to be shared and lessons are to be learned by others.

For those states that conduct evaluations from all sources it is important that equal and fair consideration be given to the merits of all products. By establishing formal evaluation procedures and processes, which are followed regardless of the origin of the request, agencies are meeting an important test of fairness. More than 75% of the agencies responding to the survey have not had any claims of bias. Although this alone does not indicate that the respective programs are free of bias, it does indicate, given the high percentage of programs evaluating products from all sources, that there is no significant or inherent problem with opening up the evaluation process to all sources.

STRUCTURING A RESPONSIVE PROGRAM

Initiating an Evaluation

One of the most significant indications of the importance of new product evaluation programs to the transportation community is that 29 of 33 agencies responding to the synthesis survey have a clearly identified individual for vendors to contact to request an evaluation for new ideas and technologies. It also indicates that most agencies have at-

TABLE 4
STAFF ACTIVELY PARTICIPATING IN EVALUATION PROGRAM

	Staff			
Survey Respondents	1 or 2	3 or 4	5 to 10	>10
Alberta				X
Arizona				X
California				X
Colorado*				
Connecticut			X	
Florida*				
Georgia			X	
Illinois			X	
Indiana			X	
Iowa			X	
Kansas			X	
Kentucky				X
Maryland			X	
Minnesota*				X
Mississippi	X			
Missouri		X		
Nevada			X	
New Hampshire*				
New York				X
North Dakota*				
Ohio			X	
Oklahoma*				
Oregon				X
Ottawa, city of			X	
Pennsylvania*				
Quebec				X
Rhode Island		X		
Saskatchewan			X	
South Carolina				X
Texas			X	
Utah			X	
Virginia			X	
Washington			X	
Wisconsin*				
Percent of Total Respondents	3%	6%	44%	26%

*These respondents indicated that they did not use a task force or committee to oversee product evaluations.

tempted to organize their evaluation programs in a customer friendly way, by making it clear to a vendor or outside source where to start in the process.

The MDSHA survey, conducted in 2002 (Appendix C), revealed that the vast majority of these contact individuals reside in the materials or research areas of the respective agencies. In a few agencies, contacts are located in the construction or specification office. Where the individual is located within an agency may be perceived as an emphasis area for new product applications. It may also indicate that what an agency is most interested in and apt to be responsive to is a certain type of products.

Several agencies reported having started to use web-based announcements and application processes for their evaluation programs. This provides an equal opportunity for all sources and an organized, uniform, and objective approach to the application process. Given the trend toward establishing electronic databases and communication tools by public agencies, this approach will undoubtedly become more prevalent.

Staff, Committees, and Task Forces

More than 75% of those surveyed use a task force or committee to oversee new product evaluations. Two-thirds of these committees include at least 5 individuals who regularly and actively participate in the evaluation process, with 9 states reporting that more than 10 individuals are involved in the evaluation program. The use of task forces and oversight committees for managing new product evaluations would appear to be the standard. Typically, these committees comprise key personnel representative of the functional nature of the products being submitted for evaluation (Table 4).

Through the surveys and interviews it was found that agencies depend on a variety of professionals and expertise

TABLE 5
AVERAGE FREQUENCY OF TASK FORCE MEETINGS

	No. of Meetings				
Survey Respondents	One per Year	2 to 5 per Year	6 to 11 per Year	Monthly	Other
Alberta			X		
Arizona			X		
California		X			
Colorado					X
Connecticut			X		
Florida					X
Georgia		X			
Illinois		X			
Indiana		X			
Iowa		X			
Kansas*					X
Kentucky	X				
Maryland		X			
Minnesota					X
Mississippi		X			
Missouri		X			
Nevada		X			
New Hampshire					X
New York				X	
North Dakota					X
Ohio	X				
Oklahoma					X
Oregon				X	
Ottawa, city of		X			
Pennsylvania	X				
Quebec				X	
Rhode Island		X			
Saskatchewan					X
South Carolina		X			
Texas		X			
Utah				X	
Virginia		X			
Washington		X			
Wisconsin					X
Percent of Total	9%	44%	9%	12%	26%

Note: Agencies responding "Other" typically do not have a committee per their response in Table 8.
*One agency (Kansas) responded that they meet on an "as-needed" basis or as requested by a member.

to respond to the assortment of products being submitted for evaluation. Some of these are formal committee members who serve on a regular and continuing basis on product evaluations, whereas others are in an ad hoc capacity on an as-needed or as-appropriate basis. This approach allows agencies to draw on the resources and expertise necessary to evaluate a product while minimizing staff time and resources.

The extent to which these task forces meet varies significantly, with 42% of the respondents (15 states) indicating that their committees meet 2 to 5 times per year. Only three states reported meeting just once per year and four states meet monthly. More than one-quarter of the respondents (nine states) indicated that they meet on an as-needed or continual basis, whenever requests for evaluation are received (Table 5).

Dealing with the Numbers

The number of product evaluations completed annually varies greatly from agency to agency. The synthesis survey concluded that all but three agencies receive more than 10 products for evaluation and potential implementation each year and that they have received at least that many annually for the last 10 years.

In response to a similar question, the Maryland survey indicated that the annual number of evaluations ranged from 2 to 60. However, as found during follow-up discussions with respondents in both surveys, how states measured and defined these numbers varied tremendously. Depending on who was counting, what office within an agency had the most complete and accurate information, and whether the count was for applications or completed evaluations, the input from the surveys was inconclusive, primarily because many of the existing evaluation programs are unique and do not measure or record their activity in the same way.

It can also be noted that the degree to which an agency's program is developed will make a difference in how well historical and current activity can be reported. Given that most of these respective programs are not primary, main-

TABLE 6
ACCEPTANCE CRITERIA USED TO EVALUATE

Survey Respondents	State Specs.	Lab and Field Tests	National Testing Centers and Results	Other States Best Practices	Demonstration Projects and Experimental Features	Other
Alberta						X
Arizona						X
California	X	X			X	
Colorado	X					
Connecticut			X			
Florida	X					
Georgia		X				
Illinois		X			X	
Indiana	X					
Iowa						X
Kansas						X
Kentucky						X
Maryland						X
Minnesota	X					
Mississippi					X	
Missouri		X				
Nevada						X
New Hampshire		X				
New York						X
North Dakota	X	X		X	X	
Ohio						X
Oklahoma	X					
Oregon	X	X	X	X	X	
Ottawa, city of						X
Pennsylvania						X
Quebec		X				
Rhode Island	X	X	X	X		
Saskatchewan		X				
South Carolina						X
Texas		X			X	
Utah	X	X			X	
Virginia					X	
Washington		X				
Wisconsin						X
Percent of Total	29%	38%	9%	9%	24%	38%

Note: Agencies indicating "Other" typically responded that all criteria are used.

stream initiatives or priorities within an agency's operations the extent of the information available from a respondent will vary greatly.

Acceptance Criteria

There is a wide range of acceptance criteria used in evaluating transportation products. This is understandable given the variety of products that are subject to evaluation.

An approval based on a determination that a proposed product meets an established state specification or special provision appears to be common (Table 6). If it is a product not previously used by an agency, but meeting adopted specifications, the approval appears to be automatic. This approach, however, does not always apply to new, innovative technologies falling outside the realm of established specifications.

Agencies depend heavily on laboratory and field testing of these products, with 38% of the survey respondents selecting such testing mechanisms for determining acceptance. The obvious benefit of determining acceptance with field and laboratory testing is that states can conduct their own independent analysis of a product incorporating any unique or agency-specific characteristics to the evaluation.

Another popular acceptance criterion is the demonstration project. Here the opportunity exists to put the product into practice and measure its performance in real or simulated application. Of the survey respondents, 24% indicated that demonstration projects were important and had been used to determine product acceptance.

Only three states responded that using the results from national product testing centers, which would include NTPEP and HITEC results and the information provided in APEL, was significant in accepting a new product. Likewise, only three states indicated that using product testing experiences and recommendations from other states was a significant criterion in acceptance, with one reason being the difficulty in determining if the conditions surrounding

TABLE 7
ACCEPTANCE OPTIONS THAT ARE USED

Survey Respondents	Certified Compliance with Specs.	Specified Test Results	Conditional Approval on Project-by-Project Basis	Reciprocity	General Approval
Alberta	X	X	X	X	
Arizona	X	X	X		
California	X	X	X		
Colorado	X	X			X
Connecticut	X	X	X	X	
Florida		X	X		
Georgia	X		X		
Illinois		X			
Indiana	X	X	X	X	X
Iowa	X	X	X		X
Kansas					X
Kentucky		X	X		
Maryland	X	X	X	X	X
Minnesota	X	X			X
Mississippi			X		
Missouri		X			
Nevada	X	X	X	X	X
New Hampshire	X	X	X	X	X
New York		X	X		X
North Dakota	X	X	X		
Ohio	X	X	X	X	
Oklahoma		X	X		
Oregon		X	X	X	
Ottawa, city of	X	X			
Pennsylvania		X	X		X
Quebec		X	X	X	X
Rhode Island	X		X		
Saskatchewan	X		X		
South Carolina	X	X	X	X	X
Texas	X	X	X		X
Utah	X	X			
Virginia	X	X	X	X	X
Washington		X	X		X
Wisconsin		X	X	X	
Percent of Total Respondents	62%	85%	79%	35%	44%

the product testing by one jurisdiction are applicable to another. Perhaps this is because states see themselves as having unique circumstances that affect product acceptance.

The survey indicated that 38% of the respondents have used multiple acceptance criteria. This indicates that depending on the specific product or technology the acceptance criteria will vary.

Acceptance Options

Consistent with the findings on the acceptance criteria is the results from the survey regarding acceptance options (Table 7). It appears that certification by the respective agency that a particular product meets established specifications clears the way for that product to be introduced into practice, with 62% of the survey respondents having such a mechanism in place. The way in which this certification occurs varies from jurisdiction to jurisdiction; however, by using this internally conducted and fairly direct approach, the time that it takes for a product to be approved can be minimal. Such would be the case when an agency authority certifies compliance to state specifications at the time of the vendor's application for approval.

However, agency-conducted testing still prevails in popularity among the survey respondents, with 85% using this approach. Passing one's own test leaves little room for discussion, is relatively direct, and presents established procedures for obtaining approvals, although it does take time. How much time depends on an agency's priorities and commitment to new product evaluations.

An overwhelming majority of the respondents also indicated that conditional approvals on a project-to-project basis are the most common acceptance option. More than 75% indicated that this approach has been used, with 44% reporting the use of a general approval option. Although agencies were encouraged to indicate all methods of accep-

TABLE 8
IMPLEMENTATION PROCEDURES FOR APPROVED PRODUCTS

Survey Respondents	Qualified Products List (QPL)	Incorporating a QPL into Standard Specifications	New Specification Development and Revision	Listing of Approved Products
Alberta	X	X	X	X
Arizona				X
California	X	X	X	X
Colorado			X	X
Connecticut	X	X	X	X
Florida	X			
Georgia			X	
Illinois			X	
Indiana		X	X	
Iowa	X	X	X	X
Kansas			X	X
Kentucky			X	
Maryland			X	X
Minnesota*				
Mississippi	X			
Missouri	X		X	
Nevada	X	X	X	
New Hampshire	X	X	X	
New York	X			
North Dakota			X	
Ohio	X	X	X	
Oklahoma	X		X	
Oregon	X	X	X	X
Ottawa, city of				X
Pennsylvania	X		X	X
Quebec	X		X	
Rhode Island				X
Saskatchewan			X	X
South Carolina	X	X	X	X
Texas	X	X	X	X
Utah*		X		
Virginia	X		X	X
Washington			X	X
Wisconsin	X	X	X	X
Percent of Total	56%	38%	76%	53%

*These respondents indicated that they either do not have records of implementation procedures or that they use their own unique terminology for implementation procedures as presented in chapter four.

tance used in their respective evaluation programs, it was clear that the project-to-project trial is by far the most acceptable to the largest number of respondents.

It was also clear that reciprocity with other states, agencies, or regional collaborations is not a popular option to acceptance of a product, with only 12 respondents reporting that this approach had been used. This was a relatively small number considering all of the evaluations being conducted and the variety of opportunities for acceptance. This could be the result of the unique environmental conditions or legal characteristics of an agency or because the results of individual state evaluations are not widely nor effectively shared within the community.

Implementation

Given that the purpose of a product evaluation program is ultimately to provide an opportunity for adopting new, innovative products and incorporating these products into practice, implementing the results of an approved evaluation becomes crucial. An effective and responsive evaluation program must provide an opportunity for placing the new product into practice once the product is approved. This can be accomplished in several ways.

More than 75% of the survey respondents indicated that establishing a new specification or revising an existing specification was a common approach to implementing an approved product (Table 8). This approach provides a direct response to a successful evaluation. Another popular approach is the establishment of a qualified products list (QPL), with nearly 60% of those responding to the survey indicating that QPLs were used to provide implementation guidelines. Thirteen agencies indicated that QPLs are incorporated into standard specifications. The third most frequently cited approach is a listing of approved products (53%). Each of these mechanisms appears to be in common practice and in response to sharing the relevant information regarding product approvals.

TABLE 9
IMPLEMENTATION OF APPROVED PRODUCTS

Survey Respondents	Use of Products Is Optional	Use of Products Is Recommended	Use of Products Is Required	Other
Alberta	X			
Arizona		X		
California	X		X	
Colorado				
Connecticut	X	X		
Florida*				X
Georgia	X			
Illinois	X			
Indiana	X			
Iowa	X			
Kansas	X			
Kentucky	X			
Maryland	X			
Minnesota*				X
Mississippi	X			
Missouri		X		
Nevada*			X	
New Hampshire			X	
New York	X			
North Dakota	X			
Ohio	X			
Oklahoma	X			
Oregon*	X	X	X	X
Ottawa, city of			X	
Pennsylvania	X			
Quebec				
Rhode Island	X			
Saskatchewan	X			
South Carolina	X			
Texas	X			
Utah*				X
Virginia	X			
Washington		X		
Wisconsin	X			
Percent of Total	68%	15%	15%	12%

*These respondents indicated that there were respective agency procedures that provided for implementation use depending on the product.

On a related issue, almost 70% of the survey respondents noted that once a product is approved for implementation following the evaluation, the use of these products is optional (Table 9). Only five agencies indicated that a product receives "recommended" status, whereas another five noted that the use of an approved product becomes required.

Another factor in measuring the success of product implementation is to what extent those responsible for evaluation track the implementation and application of those products. It was apparent from the survey comments and from subsequent interviews with those involved in the processes that members of the evaluation task forces and committees are not always aware of the actual implementation of the products.

KEEPING UP WITH OPPORTUNITIES AND CHALLENGES

Even in agencies where formal evaluation programs exist it is extremely difficult for staff to keep up with the multiple evaluation opportunities and communication tools that exist within the transportation community. Most states have indicated that contributing to and benefiting from NTPEP and APEL is very difficult given the time and budget constraints faced by those responsible. Managing the data represented in these resources in a way that is efficient and useful is a big task that requires a level of commitment not always available to those who are only involved in new product evaluations part time.

States have indicated that because responsibilities such as new product evaluations do not fall into directly funded projects, they become indirectly funded and subsequently a lower or secondary priority. It has also been noted that given the agency downsizing that has occurred over the last decade and the attrition incurred by agencies owing to work force development challenges, maintaining and developing comprehensive databases has become a challenge in and of itself.

It should be noted that of the 33 states responding to the MDSHA survey, only 5 responded that they regularly or usually use the APEL database. Another 13 states reported occasionally using APEL, with 13 more stating that they never or rarely use APEL. The Maryland survey also documents that 18 states rarely or never post to APEL, whereas 14 states occasionally or usually post their experiences. This demonstrates a definite opportunity for an expanded use of the APEL database.

Similarly, according to the synthesis survey, only three states responded that they primarily use national product testing resources as acceptance criteria in their evaluation programs. However, several additional states indicated using all sources of available information in their respective evaluation process.

CHAPTER FOUR

DISCUSSION OF EFFECTIVE PROGRAMS

Measuring the performance of research and technology programs is a difficult and subjective task. This is well-documented and was recently studied in *NCHRP Synthesis of Highway Practice 300: Performance Measures for Research, Development, and Technology Programs* (*12*). New product evaluation programs fall well within the scope of development and technology issues. The FHWA addressed this in the 1990 *Engineers' Guide to Program and Product Evaluation* (*13*). Given that evaluation programs exist to provide a formal process for incorporating new and innovative products into practice so that improvements may be made in transportation operations and management, it is important to identify and recognize their respective value to the DOTs.

This chapter will look at various examples of how existing programs are defined and how their success and effectiveness is measured. The relevant benefits of introducing a new product into practice as a result of these programs will be discussed as addressed from the standpoint of the respective agency. In addition, any feedback from the DOTs regarding claims of bias from the vendors, manufacturers, or applicants is also reported.

MEASURING FEEDBACK FROM OUTSIDE SOURCES

Of the 34 DOTs that responded to the survey and confirmed that they have formal programs for new product evaluations, 8 have experienced claims of bias from outside sources. These claims ranged in substance from a supplier or vendor believing that an agency used an improper test to verbal claims of bias that were never pursued legally. Typically, formal, legal actions are not often taken to pursue a claim of this nature. The California DOT (Caltrans), however, has experienced claims and has a mechanism for filing appeals designed into their evaluation process.

Only two states reported being asked for compensation as the result of bias. One state resolved the claim by retesting and the other claim was still pending at the time this report was being compiled. It appears to be relatively common for agencies to retest a product to resolve differences and avoid formal claims.

It is apparent that the clearer the process for product evaluation is spelled out, the fewer the number of claims of bias will be presented. Establishing specific and easy-to-follow guidelines as many states have requires careful planning, but may be well worth the effort to avoid claims of bias. DOTs wishing to develop guidelines for filing claims can learn from those examples that have been developed and tested by others, such as in California. It appears that whatever mechanisms DOTs have used to deal with product requests from outside sources, substantiated claims of unfairness are rare.

This synthesis did not include contact with outside sources or vendors who have submitted requests for product approvals. If the issue of claims becomes a significant factor in how DOTs design or revise their evaluation programs, some research or surveying of vendors could be of value to the effort. Seeking input from the private-sector community that uses the various programs could be useful in identifying any potential pitfalls, areas of confusion, or shortcomings of existing programs.

IDENTIFYING EVALUATION PROGRAM SUCCESSES

The range of products that are evaluated and submitted for evaluation is broad (see Table 2). They can be of a technical or nontechnical nature. The products may be market tested and readily available to purchase and deploy or they may be untested in actual practice. They may be totally new to an agency or provide a new perspective of a familiar subject. What works in one jurisdiction may not work or apply in another. Some evaluations can be accomplished in days, whereas others may take years.

Measuring the success of programs and the benefits of various product applications is subjective and difficult for all of these reasons. Nevertheless, there are many examples of program experiences and successes that may be helpful to share, particularly among agencies with common problems. Examples are provided here to illustrate the variety of issues associated with evaluation and testing programs. These examples also illustrate important criteria for measuring effectiveness and success and, to that end, provide a framework for discussion on how evaluation programs add value and support the broader missions of transportation agencies (*14*).

Following are several examples that demonstrate the opportunities for innovation that formal programs create. Some are cases in programs with fairly rigid, well-established guidelines, whereas others are from programs that are still developing and more flexible depending on the nature of the product.

Utah Experiences

Typically, the Utah DOT (UDOT) always strives to measure and evaluate a product against a current UDOT standard specification. If the vendor or supplier can demonstrate that a product meets or exceeds the minimum requirements of that specification, the product is accepted as part of an Accepted Product Listing (APL).

In instances where there is no applicable standard, the Utah program relies on current industry standards for product evaluation. When a product is found to meet one of these standards, it is cited in a Performance Data Product Listing (PDPL).

When there is no UDOT or national standard that covers the product, the need for that product is assessed and, if a need is identified, a demonstration, often an experimental feature in a test section, is conducted. If the test is successful, the product is included in the PDPL for use under provisional conditions. As more information is gathered after subsequent use of the product, a new specification or modification to an existing specification may be recommended and the product may be moved to the APL.

This general approach to product evaluation is fairly common among agencies. The UDOT provides perspective vendors or suppliers with a flow chart that illustrates the agency acceptance criteria and procedures. Specific examples of the UDOT evaluation procedure are described here.

- Several years ago, a manufacturer proposed some temporary pavement markings. The state had no specification to cover such markings, but a need was identified. An evaluation was conducted and the product was field tested as a temporary roadway marking providing guidance to construction traffic and striping crews. The product was very successful and resulted in the creation of a new standard specification on temporary pavement markings. Shortly thereafter, other DOTs adopted similar products.
- Corrosive soils in the west Utah desert have been slowly eroding standard pipe culverts. A new product was presented to the department consisting of an expansive polyvinyl chloride (PVC) liner, which when properly installed conforms to the shape and size of the pipe culvert. This liner system reduces corrosion and repairs damaged pipes without their removal and reconstruction. The product is still being tested, but appears to be very successful and has been placed on the state's PDPL, as no standard specification covers its installation and performance.
- Much discussion has taken place on the subject of concrete sealers, including its different formulations and performance claims. UDOT performed a series of concrete sealer tests under laboratory and field conditions. The findings resulted in the creation of a new standard specification on the subject and a list of approved sealers has been placed on the APL from which state maintenance employees and contractors can choose.

Iowa Experiences

The Iowa DOT approves several products for use each year, with the majority approved as alternates to an existing standard product already used by the agency. They view the value of this effort not so much in direct cost or time savings, but in the added product options it gives their staff and the increased competition within the marketplace to provide better products.

This increased competition is noteworthy because there is considerable volatility in the market with both the suppliers and manufacturers. The shelf life of products can be short, particularly without orders. A formal, active program facilitates the opportunity for suppliers and manufacturers to get to the market in a reasonable time. Several of the products recently approved are briefly described here.

- Iowa noted that geocomposite pavement drains, which are prefabricated drains, placed vertically adjacent to pavements to intercept and remove water from a subbase and subgrade, are an example of a successful evaluation that provides a variety of operational options and applications. These drains are currently used when specific bedrock, soil, or other design conditions exist that preclude the use of longitudinal subdrains.
- Plastic guardrail blockouts have recently been evaluated and approved for use. Specifications are currently being revised to allow for their standard use.
- A procedure for early concrete sawing was recently evaluated and approved by the Iowa evaluation program. This procedure consists of sawing transverse joints in portland cement concrete pavement while the concrete is still green and not fully hardened. The procedure is less expensive than traditional concrete sawing owing to the lighter saw equipment required, the fewer saw blades consumed, and the less power required. There are significant environmental advantages because there is minimal dust caused by the procedure.

Nevada Experiences

The Nevada DOT's (NDOT) new product evaluation program is considered the key to the department's construction operation. By providing a process for the prequalification of highway products and materials the program is

instrumental to an effective and successful construction program.

Nevada's program includes formal, written procedures that are shared throughout the transportation community. This communicates to all parties, including manufacturers and vendors, that the process treats everyone equally and fairly.

The evaluation program is managed from the research office and coordinated with the other appropriate departments to ensure that all facets of the process work to improve the quality of the products and materials used by the department. The process involves high-level managers from the major operating divisions of the agency to provide the broadest perspective to the effort. Many standard specifications for various products and materials have been developed in conjunction with the product evaluation process.

- Several standard specifications have been created in response to safety issues. As a result of the evaluation program, NDOT has developed specifications for fluorescent retroreflective sheeting that helps improve traffic, worker, and motorist safety. This specification has recently been modified for application at school and pedestrian crossings.
- There has also been considerable advancement with hydraulic-related products and materials as a result of the program. The state has developed several hydraulic-related QPLs based on new acceptance criteria and standard specifications that did not previously exist. These products include cellular erosion control mats, stormwater treatment systems, and trench drains.
- Another product of the program is a general QPL, acceptance criteria, and quality control/quality assurance criteria for nonmasonry, nonconcrete, or uniquely constructed soundwall systems (*15*). Vendors are provided with an application package that allows them to show that their product complies with the NDOT criteria for placing their system on the general QPL for soundwall systems. Actual systems are selected from the general QPL based on project-specific requirements.

The Nevada DOT's process evaluates all products on the basis of need, performance, cost-effectiveness, and compliance with recognized specifications and standards.

New York State Experiences

In 2002, the New York State DOT (NYSDOT) adopted a new evaluation procedure. This program has been designed to reduce the time it takes to evaluate, approve, and implement a new product. The new program was the result of a response to an upper management request that the NYSDOT be more responsive to innovative ideas from outside the department. The program focuses on products that are not covered by a standard specification or the 300-plus-page departmental-approved products list. NYSDOT's program evaluates products that are truly unique to the existing practices of the department. These are typically products that are proprietary, limited in use, and out of the conventional or traditional mainstream.

A product evaluation committee with voices from each of the department's 11 divisions was formed to deal with product requests on a monthly basis. This committee makes the process more effective by focusing and centralizing approvals for the entire department. Instead of a product being assigned to one individual to evaluate with no formal follow-up, the committee has elevated the priority of the process and has shortened the time it takes to get resolution of an evaluation request.

The committee has also improved the communication of evaluation results throughout the state by using various tools. One such tool is the *Engineering Bulletin*. As soon as an action is taken on a product and either approved or rejected, a one-page *Engineering Bulletin* is issued. This notice is distributed among manufacturers, the DOT offices, local governments, regions and agencies, surveyors, consultants, and contractors as appropriate. The bulletins serve to communicate the results of an evaluation and are effective immediately. This can reduce the time in getting the product into practice by not requiring the development of standard specifications or special provisions before use. The bulletins expire 1 year after issuance unless replaced sooner. More formal *Engineering Instructions* are issued when an approved new product is considered appropriate for permanent change and a new standard specification.

It should be noted that the New York State program and the new product evaluation committee only consider products for evaluation that show a potential benefit to the department and for which there is no existing department specification. This allows the department to look at a broad range of innovative ideas that would otherwise not get evaluated. Since the program went into effect in 2002, the NYSDOT has seen a sharp increase in the number of products being submitted for evaluation. In turn, they have become more responsive to requests and they better communicate the results of evaluations. Although by their own admission they are still experiencing some growing pains, they are better supporting upper management by encouraging innovation in the department.

California Experiences

The California DOT (Caltrans) has created an effective, formal program and application process for introducing

new products into practice. This is particularly significant and beneficial in such a large, diverse state. Instead of vendors and manufacturers presenting the same request for evaluation to all of the department's 12 district and multi-division offices, Caltrans uses a centralized program that involves top level managers who have statewide responsibilities. The time and resources to act on requests have been minimized and optimized. In California, a centralized process and standardized protocols for product approval have eliminated the main variables that create problems. These processes are well communicated to the customers and access to the program is included on the Caltrans website.

The Caltrans staff responsible for the new product evaluation program has compared themselves to the greeters at WalMart, in that they work extensively with their customers, vendors, and manufacturers to ensure that the process is customer friendly and fair to all. The evaluation staff relies on the technical experts within the agency to actually conduct the evaluations.

Although the staff acknowledged that because of budget constraints and recent downsizing, they cannot change a specification or develop a new standard special provision (SSP) every time they have a request, they do respond to the vast majority of requests. The agency also pointed out that although a sole source approval is a major issue for some states it has not been a major issue for Caltrans. Although some states may shy away from anything that resembles a sole source approval, Caltrans has determined that once the vending/manufacturing community learns of their interest in a specific product or technology there is no shortage of suppliers, vendors, or manufacturers. Examples of successful product evaluations are provided here.

- One example of product evaluation that has been successfully deployed in California was their development of plastic wood standards. Because of environmental and other concerns, use of creosote-treated wood and lumber in marine environments is no longer allowed in the state. Caltrans has developed an SSP for all future projects that require plastic wood applications.
- Remote deicing systems have also been evaluated by the Caltrans program. They are being considered in areas where black ice is a concern. These systems are essentially sprinkler heads charged with deicing products that are sensor controlled by mini-weather stations. When the conditions read a threat of black ice, the sprinklers discharge a few seconds of the deicing material. These systems have applications on both roadways and structures. HITEC is currently working with Caltrans on a full-scale field test of a roadway section in southern California, and the department is undertaking another full-scale field test on a bridge in the Sierra Mountains in northern California. Although there is no SSP yet developed for this technology, it has shown great promise.
- Other product evaluations that have produced SSPs include graffiti removers, pavement markers, and reflective signing materials.

One additional point that the Caltrans staff added to the discussion concerns the affect that political pressure can have regarding the evaluation and acceptance of new products. There have been cases where vendors have gone to their respective state legislators in an attempt to bring some pressure on Caltrans to evaluate or to adopt a specific product. There have also been cases where legislators have questioned Caltrans on their procedures as a follow-up to these vendor contacts. This is something that can happen and for which the evaluation staff must be prepared. It has not necessarily been a negative process and there has never been an example of a legislator putting pressure on the agency to accept or to test a particular product. Caltrans is comfortable that their program is clearly defined and functions as fairly as possible to all applicants within the bounds of their budget and resources.

Maryland Experiences

For many years, the MDSHA has conducted an effective new product evaluation program and it has been assessing its current status and future optimum position within the department. The Maryland program has resulted in many operational successes for the agency and those successes have been shared with others in a variety of ways. In 2002, the MDSHA sponsored and conducted a survey among state transportation agencies designed to lend insight to their ongoing organizational assessment. That survey, given the 65% response rate, has proven to be a great complement to the electronic survey conducted as part of this synthesis, which coincidentally had a very similar response rate. Although the purpose of the Maryland survey was to help their agency assess their own program, the results of that survey reinforced several findings of the synthesis survey and provided additional pertinent information to this study. (The Maryland survey and survey responses can be found in Appendices C and D.)

One area of particular note in the Maryland program is their ongoing effort to improve communications within the evaluation and testing community. Their survey findings on product information indicated that most respondents are using, or are moving toward using, databases to track new product applications and to publish evaluation results. The majority of these databases are available on-line. The Maryland survey also indicated that whereas many states use information on the AASHTO APEL, most do not enter data on APEL. It is a goal of the Maryland program to

make evaluation and product information, records, and results available through an on-line database that will electronically up-link to APEL. As this resource develops it could serve as a national model for respective states to document and share their evaluation information. Additional examples of evaluations are described here.

- One operational area that has been well served by the Maryland product evaluation program is winter maintenance. Several products have been successfully implemented after thorough evaluations and field tests, including deicing and anti-icing technologies and products that have spun off from the successful testing of anti-icing chemicals and treatments. The MDSHA has developed a new saddle tank design tied to their spreader boxes to assist in the effective application of the winter maintenance materials. This design has been installed on more than 90% of agency dump trucks.
- Alternatives to conventional silt fence and stormwater management are currently being studied by the MDSHA and will result in new or revised specifications. These materials show real promise in reducing time and labor.
- Erosion control matting and barriers are other products that have shown great promise. With the assistance of certified erosion control laboratory testing and *NCHRP Report 350* (*16*) crash testing, the evaluation process for these types of products has been considerably reduced.

Florida Experiences

The Florida DOT (FDOT) has a well-established and continuously evolving product evaluation program. It is managed within the state specification office located in the department's design office. The program has four full-time staff members available to facilitate product evaluations with the appropriate technical staff within the department. FDOT uses a QPL as a list of pre-approved products that have been evaluated against adopted and implemented specifications or standards. Typically, these products are common and used in practice by FDOT and by others in the transportation industry. The goal of this approach is to create a reliable list of products for construction personnel that meets the standards of the department and is equitable to all parties. When a QPL has been established for a particular product type, FDOT specifications limit the contractor's choice of products to those on the QPL.

New products that are not common, that have not been used in practice, and for which no adopted and implemented specification or standard exists are directed to a recently established product evaluation oversight committee. The role of this committee is to assess the product's potential for use on the state highway system in Florida. By action of the committee, the product is either

- Determined to be a product of marginal or no interest to the agency,
- Determined to be a product that may be of interest to the department but needs some further technical investigation of potential use by a technical champion assigned by the committee, or
- Determined to be a product that could have some potential use but is not considered a good candidate for inclusion in statewide specifications or standards. These approved products typically have limited use and application in practice. They could be incorporated as a feature of the design of a particular project, but the QPL would not be used in the process.

Florida also uses two programs to keep the QPL updated and reliable. The first addresses and investigates questions of alleged deficiencies in products included on the QPL, which can result in the removal of a product for failure to perform. The second is a requalification process that establishes the time cycles, certification requirements, and technical resubmittal criteria required from the manufacturer or vendor for the product to remain on the QPL.

The Florida product evaluation program, established as a result of a value engineering program in the early 1980s, has historically provided outreach to local governments for product evaluations. The state is now re-evaluating their approach to local government outreach because of the resources necessary to support the demands from locals. Often the product requests from local jurisdictions are of limited interest to, or are no longer used by, the state. Maintaining an effective and prudent outreach program for Florida's local jurisdictions is a challenge facing the DOT.

Other Experiences

There were several other common experiences that DOTs shared regarding their respective programs. There have always been many materials products submitted for evaluation, but there are an increasing number of maintenance products and systems being submitted for review and approval. One reason for this may be the national emphasis on maintaining and preserving the existing infrastructure as opposed to new construction (*17*). Evaluations and innovation for safety, traffic, environmental, winter maintenance, and constructability products are also frequently requested (for example see ref. 18).

In addition, there are many products of new product evaluation programs that help DOTs manage their quests for innovation. These include the various APLs and QPLs that result from successful product testing and evaluation.

One important benefit of successful state product evaluation programs that became apparent is the benefit provided to cities, counties, and other local jurisdictions. Many local governmental agencies do not have the resources, laboratories, personnel, or expertise to appropriately evaluate new products. Often their respective specifications and performance standards originated as a state specification or special provision. These local governments depend on the states to set standards and acceptance criteria on new products. Through programs such as the Local Technical Assistance Program, many cities and counties have gained the knowledge of and access to new products. It is also not uncommon for a state to receive a request from a local jurisdiction to test a specific product.

There are also examples of local jurisdictions that have their own evaluation programs. One such example came from Ottawa, Ontario, Canada. The city of Ottawa has established evaluation procedures that resulted in APLs for their sewer and water distribution systems. The city anticipated having similar APLs and evaluation procedures in place for their road and sidewalk products by mid-2003.

As can be seen by these very diverse examples of product evaluation results, the respective success of a program can be judged on a number of factors. Cost and time savings are always benchmarks for success, but often are difficult to identify and may not yield a true picture of a product's value. Less tangible factors, such as providing greater flexibility in problem solving, can be equally important. Establishing good communications and rapport with various industry and commercial entities is also important and can be critical in bringing new, innovative products to market. New product evaluation programs affect and support the operations of their respective agencies in many ways.

CHAPTER FIVE

CONCLUSIONS

State product evaluation programs exist to help departments of transportation (DOTs) respond to the volume of highway products submitted for review and to provide a formal procedure for incorporating innovative products into practice. DOTs assume this responsibility and take the opportunity for improvement seriously; however, there is no commonly accepted method of dealing with this issue. Although there appears to be a desire on behalf of the states to pursue this opportunity in a unified manner, there remains no widely accepted or practiced standard for states to evaluate or accept new products.

DOTs recognize the importance of evaluation programs in providing fair, efficient methods for integrating new ideas, products, and practices into application; however, there are several issues that affect and sometimes inhibit a state's ability to effectively manage such programs. It is unusual for a state to make product evaluations a primary staff responsibility. It is also relatively uncommon for states to have dedicated funding to support product evaluations and testing. Therefore, many states must depend on the resources and services of others within a department to undertake product evaluations, and they may not have the ability to take full advantage of the opportunities presented by integrating new products into practice.

However, there are several common issues and practices that explain how the states operate their programs to overcome these obstacles. There are also several key experiences that DOTs have reported that can be used as best practices for managing and operating product evaluation programs. These experiences are shared to demonstrate the opportunities that exist by adopting new products. The experiences also demonstrate the many ways in which states measure their effectiveness and success in managing these programs.

The findings of this synthesis, based on the on-line survey, in-depth electronic and traditional interviews, other state survey results and summaries, and literature searches are summarized here.

- There is no national evaluation program that covers the diverse issues that DOTs face in evaluating new products. Although some national programs do a good job in specific areas or with specific technologies, no national or international standard exists for approving and adopting new product applications.

  Although DOTs have participated in national programs both as active testing partners and financially, the programs are limited in scale and address only those technologies and products that are of the greatest interest to the most agencies. This provides an excellent evaluation for those products that are common nationally, but often does not address those products that are unique to a region or locality.

- Better communication of nationwide testing and evaluation efforts is needed. Although the AASHTO Product Evaluation List (APEL) database has made significant progress toward sharing more complete data on evaluations, it is limited. APEL is only as complete as the data that are shared by those conducting evaluations nationwide. Increased reporting will contribute greatly to the value of APEL, and the states need to be encouraged to share their experiences so that others may learn from them.

  Because APEL focuses on what evaluations are being conducted rather than on what products have been approved or rejected, the database provides extensive background without bias for states to use in their own evaluations. This service encourages the states to draw their own conclusions as to whether or not a specific product is appropriate for use by their respective agency.

- New product evaluation programs are often not given the priority within an agency to effectively take advantage of the opportunities for innovation. As a result of budget cuts, downsizing, and the need for staff to do more with less, there is a great deal of pressure within agencies to stay focused on mission critical issues.

  Several states reported that although there was no shortage of products being proposed for testing, there was a shortage of staff and time to deal with these requests. There appears to be no lack of interest in having the DOTs conduct evaluations or administer broad programs that address both local and national concerns if time and staff were available.

- Adopting new products that improve an agency's operational practices is a key element in effective research and technology programs. The opportunities that exist for process improvement and innovation

are often contingent on a new product or a new approach to doing business. When stakeholders' interests are at issue, it becomes critical that DOTs have the necessary confidence in their decision to change from an established practice. Formal evaluation programs that strategically and effectively evaluate new products can provide that confidence.

- Timing is the key to an effective and responsive evaluation process. One of the major complaints shared by agencies from the vendor/manufacturing community is the time that it takes to conduct an evaluation. The critical issues of long, drawn-out evaluations are often lost because of staff or champion changes that occur within an agency.

  Programs that specify and adhere to the time that it may take to obtain the results of an evaluation to the vendor/manufacturer community will minimize the frustrations of all concerned. For those products where long-term testing is necessary, plans could be drafted that provide for the inevitable changes that occur in agencies. One way to provide for continuity during a long-term evaluation is to use a team of individuals to administer and direct the activity.

- Using task forces and committees can be a very effective way of administering programs. By including key individuals in the process, both organizational and management buy-in can be accomplished. The responsibility for effective evaluations and the ultimate implementation of that respective technology becomes the responsibility of those who have the most at stake. By using a committee approach, a program creates advocates for change, improvement, and innovation.
- Documented cases of bias and claims of unfairness in established evaluation programs are unusual. Although transportation agencies do receive complaints regarding their evaluation practices and results, it appears that most of these complaints are resolved by better communicating the processes, steps, and outcomes of the respective evaluations. Retesting a product has also been a common practice to mitigate complaints and avoid legal action.
- A customer-friendly approach is helpful in administering a program and in minimizing complaints from vendors and manufacturers. Although the staff time available to evaluate programs may be limited, it is important that the program remain open and participation encouraged. Extra attention and sensitivity to the way in which the public, customers, and stakeholders are treated by the evaluation staff will go a long way in helping to ensure that all parties believe they have been treated equitably.
- Programs that explicitly spell out all of the procedures of the application and evaluation processes communicate the same clear message to all parties. One of the best ways to avoid confusion and to eliminate potential complaints is to clearly communicate all steps of the process. Several states now have their application and evaluation processes defined in written documents and available on-line. This helps to ensure that all parties have equal access to the relevant procedures and guidelines.
- Another effective way to communicate to the public, stakeholders, and the vendor/manufacturing community is to have one common contact person for product evaluations within the agency. This individual should be clearly identified and accessible to all concerned. A central contact person becomes an important threshold for interested parties participating in the program, allowing direct access to information, guidelines, and help in approaching an agency.

On the basis of the information gathered for this synthesis through the survey, telephone and in-person interviews, a search of the literature, and comments from the study's oversight panel, the following are suggestions for future research:

- Evaluate how research, development, technology, and innovation programs might embrace new product evaluation programs to encourage innovation. Explore how evaluation programs become an integral and effective part of an agency to support the operational programs and goals of those agencies.
- Evaluate how national programs such as AASHTO's National Transportation Product Evaluation Program and the Highway Innovation Technology Evaluation Center might contribute to effective and appropriate new product adoptions. Explore how communication tools could be used to enhance the operating arms of these national programs and the state DOT research community.
- Evaluate the benefits that training courses, listservs, websites, and workshops might have for developing programs through the communication of proven methods for product evaluations and evaluation results.
- Evaluate how the current budget cuts and downsizing facing many states might affect local jurisdictions that rely on state DOTs for product acceptance and approvals.

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APPENDIX A

Survey Questionnaire

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Project 20-5, Synthesis Topic 33-03

STATE PRODUCT EVALUATION PROGRAMS

QUESTIONNAIRE

Many state transportation agencies are coping with a greater number of potential products available for highway application. These products include materials, equipment, emerging technologies, practices, and processes. States have developed their own individual product evaluation programs, with widely differing methods of administration. Given that the goal of each agency is to establish an evaluation program that effectively responds to the volume of submittals and to create a formal procedure for incorporating innovative products into practice, major differences exist in how this is accomplished. Product evaluation programs exist that are well developed and effective and programs exist that are in the development stages and only partially functional. In any event, often the scope of the evaluation program is not well defined and many inconsistencies exist. Program elements differ from state to state, raising concerns regarding the processes for submitting products for evaluation, the program administration structure necessary to conduct the program, the implementation of evaluation results, and the risk created for claims of bias or unfair evaluation conclusions.

You are being asked to help identify the scope of the issue in your state and the techniques your state has used to address the evaluation of new product submittals and the implementation of those approved products into practice and application.

The information you supply will provide valuable input to the development of a summary report of current research and practices addressing this important topic.

Please return your completed questionnaire, along with any supporting documents, by May 30, 2002 to:

William P. Carr
2120 16th Street NW
Suite 904
Washington, D.C. 20009

If you have any questions, please call Mr. Carr at 202-489-5960,
or e-mail him at: wmpcarr@mindspring.com

Thank you very much for your help.

Below, please provide the information requested for the person completing this questionnaire or for someone else who may be contacted to obtain any needed follow-up information.

Name: _____

Title: _____

Agency: _____

Street Address: _____

City/State/Zip: _____

Telephone: _____ Fax: _____ E-mail: _____

1. Does your state have a formal program for new product evaluations?

   _____ Yes _____ No

   Comment: _____

   _____

2. What is the average number of products received for evaluation and potential implementation application each year over the last ten years?

   ☐ 1
   ☐ 2 to 5
   ☐ 5 to 10
   ☐ 10 or more

   Also, please attach copies of any information concerning the frequency, content, costs, and other relevant information regarding product evaluations that your agency may have compiled.

   Comment: _____

   _____

3. If few or no products were received for evaluation, check the box that best describes your opinion as to why this is the case?

   ☐ The agency rarely, if ever, receives requests for new product evaluation.
   ☐ The evaluation program is in the development stages and not fully functional.
   ☐ The evaluation program is not widely known outside the agency.
   ☐ Other reasons, please explain:

   _____

   _____

4. How does your agency define a new product or candidate for evaluation?

   ☐ It is defined as one not previously used by the department.
   ☐ It is defined as one not previously evaluated for application.
   ☐ Any request submitted by an internal or external source is considered to be a potential candidate for evaluation.
   ☐ Only requests from outside sources are considered for evaluation.
   ☐ Other, please explain:

   _____

   _____

Also, please attach the agency's specification language addressing the definition of a "new product" or "candidate for evaluation," if it exists.

5. What types of products have been evaluated? (Check all that apply).

☐ Materials
☐ Equipment
☐ Processes and practices
☐ Traffic control
☐ All the above

Comment: _____

_____

_____

6. What are the acceptance criteria that have been used to evaluate the product?

☐ State specifications
☐ Laboratory and field testing results
☐ National product testing center results such as NTPEP, APEL, etc.
☐ Other state's best practices or recommendations
☐ Demonstration projects or experimental feature applications
☐ Other, please explain:

_____

_____

_____

7. What acceptance options have been used? (Check all that apply).

☐ Approval based upon a certification of compliance with existing state specifications.
☐ Approval based on test specified by the state's evaluation program.
☐ Conditional approval on a project-by-project basis.
☐ Reciprocity with other states or regional collaborations.
☐ General approval for all applicable projects.

Comment: _____

_____

_____

8. What procedures are used to implement new products that have been approved for application? (Check all that apply).

☐ A qualified products' list (QPL)
☐ Incorporating a QPL into standard specifications
☐ A new specification development and revision
☐ A listing of approved products
☐ Other, please explain:

_____

_____

_____

Please attach a copy of relevant provisions if set forth in state specifications.

9. Once new products are approved for application, how is the use of these products implemented?

☐ The use of these products becomes optional.
☐ The use of these products becomes recommended.
☐ The use of these products becomes required.
☐ Other, please explain:

_____

_____

_____

10. Does your state have staff committed to new product evaluation activities on a full time basis?

_____ Yes _____ No

Comment: _____

_____

_____

11. Does your state use a committee or task force to oversee new product evaluation?

_____ Yes _____ No

Comment: _____

_____

_____

12. If the answer to Question 11 is yes, how many state personnel actively and regularly participate in the evaluation program?

☐ 1–2 individuals
☐ 2–5 individuals
☐ 5–10 individuals
☐ More than 10 individuals

13. What is the average frequency of committee or task force meetings conducted to consider product evaluations?

☐ Once per year
☐ 2–5 times per year
☐ 6–11 times per year
☐ Monthly
☐ Other, please explain:

_____

_____

_____

14. Has your state received claims of bias or unfair evaluation conclusions from sources requesting an evaluation?

_____ Yes _____ No

Comment: _____

_____

_____

15. Through claims, proposals, requests for reconsideration, or other means have outside sources that have submitted products for evaluation requested compensation for any claims of bias or unfair evaluation?

_____ Yes _____ No

Comment: _____

_____

_____

16. Does your state have a dedicated funding allocation set aside for new product evaluations?

_____ Yes _____ No

If yes, please explain:

_____

_____

17. Does your state have a clearly identified contact person for vendors to contact for new product evaluations?

_____ Yes _____ No

18. Any final comments?

_____

_____

_____

THANK YOU!

Remember! Please enclose any information that you believe is relevant to the answers given in the questionnaire, including applicable research results, policies, specification language, program documentation, and other information that might be of interest to other states.

APPENDIX B

Interviewees

Dan Avila, Senior Research Project Manager
Utah Department of Transportation

Mujeeb A. Basha, Senior Staff Engineer
American Association of State Highway and Transportation Officials

Duane F. Brautigam, State Specifications Engineer
Florida Department of Transportation

Kevin Connor, Transportation Specialist
Federal Highway Administration

Mark Dunn, Research Engineer
Iowa Department of Transportation

Bonnie Fields, Agility Program Manager
Pennsylvania Department of Transportation

Don Fogle, New Product Coordinator
California Department of Transportation

Bob Garrett, Research Manager
Pennsylvania Department of Transportation

Eric Harm, Deputy Director of Highways
Illinois Department of Transportation

David M. Johnson, Research Services Engineer
Minnesota Department of Transportation

Peter Kemp, New Products Engineer
Wisconsin Department of Transportation

Ken Kobestsky, Program Director for Engineering
American Association of State Highway and Transportation Officials

David Larson
Wisconsin Department of Transportation

John Livingston, Special Projects Manager
Washington State Department of Transportation

Barbara Post, Manager of Information Services
Transportation Research Board

Glenn Roberts, Research Engineer
New Hampshire Department of Transportation

Scott A. Sabol, Assistant Professor
Vermont Technical College

Robert B. Schmiedlin, APEL Contractor
American Association of State Highway and Transportation Officials

Janie Spencer, New Products Office
California Department of Transportation

Don Streeter, Program Manager—Materials Bureau
New York State Department of Transportation

Sandy Tucker, Manager Library and Information Services
Texas Transportation Institute

Masha Wilson, Product Evaluation Coordinator
Nevada Department of Transportation

Rodney Wynn, Project Manager
Maryland Department of Transportation

APPENDIX C

Maryland DOT Survey—2002

1. Within your organization where does the New Products Evaluation program fall (e.g., Construction, Materials, Research, Maintenance, or other area)?

2. Approximately how many products were evaluated last year through your New Products program?

3. What is the size of the staff dedicated to evaluating new products?

4. How do you capture and distribute information about products reviewed and approved? Do you use a database? Is information available on-line?

5. How is your New Products Evaluation program funded? What is the approximate annual budget?

6. Do you use information from AASHTO APEL? ____ Rarely ____ Occasionally _____Usually.

7. Do you post approvals to the APEL cite? If so, how often do you post the information?

Person to contact for follow-up information.

Contact name: _____

Telephone: _____ Fax: _____

E-mail: _____

APPENDIX D

Maryland DOT Survey Results

Thanks to all of you who responded to Maryland"s Survey of New Product Evaluation programs. Thirty-three (33) states responded, which is better than a 65% response rate. We believe that the results of our survey will provide useful insight as we consider relocating the new products program in Maryland. The information also provides some insight on the use of AASHTO–APEL.

HIGHLIGHTS OF SURVEY RESULTS:

Almost all respondents to the survey (97%) have New Product Evaluation programs. However, 35% have no dedicated budget. There appears to be no correlation between the number of products evaluated (an average of about 71 products a year), budget, and assigned staff.

Regarding where organization responsibility for the New Products Evaluation program lies; e.g., Construction, Materials, Research, Maintenance, 48% of the respondents indicated the Materials area. A table indicating the responses is shown below.

Organizational Responsibility for New Products

Materials	Research	Construction	Planning/Design	Maintenance	# Responses
15	10	4	1	1	31
48%	32%	13%	3%	3%	

The number of product evaluations completed annually varied tremendously, from 2 to 250. In some cases we estimated a number from information presented or given in follow-up with the respondent. Although some respondents gave neat numbers, we learned that they are not based on the same premise. Some reported only the number of products that were formally tested, others reported numbers of all products submitted, still others reported only those that were evaluated by the office filling out the questionnaire. This may be due in part to how the programs are organized. The intent of the survey question was to get an idea of the workload and systems in place to handle the workload. Accordingly, please note that in some cases data represents all products presented, in others only products selected by committee for evaluation, and still others only those chosen by someone as promising.

Number of Products Evaluated Annually

2–20	21–40	41–60	61–80	81–100	Over 100	# Responses
10	5	8	1	4	4	32
31%	16%	25%	3%	13%	14%	

Responses to the number of staff dedicated to new product evaluations were not straightforward. However, it is clear that many states use a committee approach to new product evaluation—either standing or ad hoc.

Number of Dedicated Staff Assigned to Product Evaluation

0	1	2	3	≥4	Part-Time	Have Committee	# Responses
5	8	3	2	3	7	12	31
16%	26%	10%	6%	10%	23%	39%	

It appears that most respondents are using or moving toward the use of a database to track new product applications and to publish decisions (lists) on line.

Is a Database Used to Store Product Information?

No	Yes	Planned	# Responses
1	19	4	24
4%	80%	17%	

Is the Database Available On-line?

No	Yes	Planned/Under Development	# Responses
5	15	4	24
21%	62%	17%	

A large number of states do not routinely post product evaluations to AASHTO"s APEL website; however, responses indicate that more use information from APEL than post to it. A number of states indicated that they intend to post to APEL in future.

Do you use information from AASHTO APEL?

No	Rarely	Occasionally	Usually	# Responses
1	12	13	5	31
3%	39%	42%	16%	

Do you post approvals to the APEL?

No	Rarely	Occasionally	Usually	Starting To	# Responses
13	5	7	5	2	32
41%	16%	22%	16%	6%	

Abbreviations used without definition in TRB Publications:

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
IEEE	Institute of Electrical and Electronics Engineers
ITE	Institute of Transportation Engineers
NCHRP	National Cooperative Highway Research Program
NCTRP	National Cooperative Transit Research and Development Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
SAE	Society of Automotive Engineers
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
U.S.DOT	United States Department of Transportation