

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM  
SYNTHESIS OF HIGHWAY PRACTICE

**90**

# **NEW-PRODUCT EVALUATION PROCEDURES**

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM  
SYNTHESIS OF HIGHWAY PRACTICE

90

## NEW-PRODUCT EVALUATION PROCEDURES

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TRANSPORTATION RESEARCH BOARD  
NATIONAL RESEARCH COUNCIL  
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## NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

In recognition of these needs, the highway administrators of the American Association of State Highway and Transportation Officials initiated in 1962 an objective national highway research program employing modern scientific techniques. This program is supported on a continuing basis by funds from participating member states of the Association and it receives the full cooperation and support of the Federal Highway Administration, United States Department of Transportation.

The Transportation Research Board of the National Research Council was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as: it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state, and local governmental agencies, universities, and industry; its relationship to its parent organization, the National Academy of Sciences, a private, nonprofit institution, is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the Academy and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the Academy and its Transportation Research Board.

The needs for highway research are many, and the National Cooperative Highway Research Program can make significant contributions to the solution of highway transportation problems of mutual concern to many responsible groups. The program, however, is intended to complement rather than to substitute for or duplicate other highway research programs.

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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 National Academy of Sciences, or the program sponsors.

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## PREFACE

A vast storehouse of information exists on nearly every subject of concern to highway administrators and engineers. Much of this information has resulted from both research and the successful application of solutions to the problems faced by practitioners in their daily work. Because previously there has been no systematic means for compiling such useful information and making it available to the entire highway community, the American Association of State Highway and Transportation Officials has, through the mechanism of the National Cooperative Highway Research Program, authorized the Transportation Research Board to undertake a continuing project to search out and synthesize useful knowledge from all available sources and to prepare documented reports on current practices in the subject areas of concern.

This synthesis series reports on various practices, making specific recommendations where appropriate but without the detailed directions usually found in handbooks or design manuals. Nonetheless, these documents can serve similar purposes, for each is a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems. The extent to which these reports are useful will be tempered by the user's knowledge and experience in the particular problem area.

## FOREWORD

*By Staff  
Transportation  
Research Board*

This synthesis will be of special interest to materials engineers, maintenance managers, and others concerned with the processes used for evaluating new products. Information is presented on improved procedures and methods of communication in new-product evaluations.

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Administrators, engineers, and researchers are continually faced with highway problems on which much information exists, either in the form of reports or in terms of undocumented experience and practice. Unfortunately, this information often is scattered and unevaluated, and, as a consequence, in seeking solutions, full information on what has been learned about a problem frequently is not assembled. Costly research findings may go unused, valuable experience may be overlooked, and full consideration may not be given to available practices for solving or alleviating the problem. In an effort to correct this situation, a continuing NCHRP project, carried out by the Transportation Research Board as the research agency, has the objective of reporting on common highway problems and synthesizing available information. The synthesis reports from this endeavor constitute an NCHRP publication series in which various forms of relevant information are assembled into single concise documents pertaining to specific highway problems or sets of closely related problems.

Procedures used by highway agencies for the evaluation and acceptance of new products and materials vary significantly from state to state. This report of the Transportation Research Board reviews evaluation processes and methods of information exchange. Ideas are presented for improving existing procedures.

To develop this synthesis in a comprehensive manner and to ensure inclusion of significant knowledge, the Board analyzed available information assembled from numerous sources, including a large number of state highway and transportation departments. A topic panel of experts in the subject area was established to guide the researcher in organizing and evaluating the collected data, and to review the final synthesis report.

This synthesis is an immediately useful document that records practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As the processes of advancement continue, new knowledge can be expected to be added to that now at hand.

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# NEW-PRODUCT EVALUATION PROCEDURES

## SUMMARY

The construction, maintenance, and operation of highways and other transportation facilities require the use of great numbers of manufactured products, large quantities of materials, and frequent application of specialized processes. Many new products are proposed for use to highway and transportation agencies each year; and each item must be evaluated thoroughly before acceptance to provide assurance that the product will fill a need, be cost-effective, and not be likely to produce undesirable side effects.

New products that improve highway service and reduce the costs borne by taxpayers are sought after and valued highly by highway and transportation officials at any time, but the need for these products has become particularly acute in recent years of inflation, dwindling tax revenues, and diminished supplies of vital and nonrenewable natural resources. At the same time, adverse forces of inflation and losses of tax revenue strain the efforts of highway and transportation departments to provide additional resources for intensifying new-product evaluation operations.

A sizable number of state highway and transportation departments have, in recent years, improved new-product evaluation by adding structure, in varying degrees, to what traditionally has been an unstructured, informal process. Changes have been made to provide a more positive means for quickly locating and identifying newly marketed products that can offer improved services and reduced costs, at the same time more quickly screening out those products that do not measure up to needs. These changes require the understanding and support of both top management and middle-level managers. The promulgation of changes aimed at upgrading existing new-product evaluation systems through the use of carefully prepared communications from top management detailing both responsibilities and expected cooperative relationships is important in avoiding future management problems.

One modification of the traditional new-product evaluation process that offers advantages in making certain that all evaluations are carried through to completion involves assignment of the overall responsibility of assuring that proper action is taken on all new-product submittals to a single division head regardless of where the evaluation takes place. In addition, the focalization of all vendor approaches in a single area, which reduces the number of unnecessary duplicative calls by vendors to several divisions, offers an opportunity for improving control over new-product evaluations.

New-product evaluation committees that include division heads or their representatives from the divisions most involved in the evaluation of new products,

and also other interested parties, serve effectively in bringing to bear a variety of viewpoints on the selection of products for evaluation and the dissemination of useful product information.

New-product evaluation as a full-time activity, although practiced in only a few agencies at present, appears to offer the best opportunities for control, standardization, and pursuit of the evaluation process. It also offers, for the benefit of top management, the opportunity to apply budgeting and funding practices that permit the measurement of productivity and benefits accruing from new-product evaluation. Full-time staffing for new-product evaluation appears to have the best potential for use where the volume of evaluations is high.

Well-organized channels of communication within agencies regarding new-product evaluation and use are necessary to receive full value from evaluation systems. Well-planned evaluations that produce conclusive results and orderly and understandable reports with appropriate documentation have an important bearing on the correctness of decisions regarding the disposal of products that have undergone evaluation.

Little information is currently available on the benefits being derived from new-product evaluations. The use of service performance observations and feedback to document the benefits appears to be a neglected phase of the total new-product evaluation process.

The regular exchange of information on new products among states and on a national basis is valuable for locating useful new products and avoiding unnecessary duplication of evaluation effort.

Many similarities exist between the aims and processes of new-product evaluation and the carefully structured and tested methodologies that characterize value engineering. It is therefore recommended that these methodologies be considered in any review of an existing new-product evaluation system for the purpose of improvement.

## CHAPTER ONE

## INTRODUCTION

The construction, maintenance, and operation of highways and other transportation facilities require the use of great numbers of manufactured products, large quantities of materials, and frequent applications of specialized processes (all referred to as "products" for convenience herein). Each new item that is proposed for use, and many are proposed to highway and transportation agencies each year, must be evaluated thoroughly before acceptance to provide assurance that the product will fill a need, will be cost-effective, and will not be likely to produce undesirable side effects. The December 1979 issue of the Special Product Evaluation List (SPEL) (1) compiled by the Federal Highway Administration for the American Association of State Highway and Transportation Officials from information supplied by state agencies identified a total of 5,337 new products in various stages of evaluation in 24 wide-ranging categories in 37 states.

New products that improve highway service and reduce the costs borne by taxpayers have always been sought after and valued highly by highway and transportation officials, but the needs have become particularly acute in recent years due to inflation, dwindling tax revenues, and diminished supplies of vital and nonrenewable natural resources. Unfortunately, the pressures of inflation and losses of tax revenues strain the efforts of highway and transportation departments in providing additional resources to intensify new-product evaluation operations.

## PURPOSE OF SYNTHESIS

This synthesis is directed primarily toward a review, analysis, and comparison of the processes used by state highway and transportation agencies in evaluating new products. Needs are identified and recommendations made. Secondly, state highway and transportation department experiences with the use of the AASHTO-FHWA Special Product Evaluation List (SPEL) (1) and the FHWA National Experimental Projects Tabulation (NEPT) (2) in the evaluation of new products are reviewed, and recommendations for improvement are presented.

## TYPES OF PRODUCTS

The types of products (and materials and processes) under discussion in this synthesis are newly marketed products primarily of an engineering nature and proposed for use in the construction, maintenance, and operation of highways, bridges, and incidental structures. Products that may not be entirely new but have been modified to the extent that re-evaluation becomes necessary are included.

Many of the products offered for evaluation are under proprietary control. This sometimes presents purchasing

problems because of legal requirements that purchases with public funds be made through the process of receiving competitive bids unless it can be shown that single-source purchases are clearly in the public interest. Usually this is a joint problem of agency and vendor and is not always solvable, as indicated from the responses to inquiries made both to highway and transportation departments and to vendors.

Because federal funds are often used in state highway work, the eligibility of materials and products for federal funding is often a consideration. With respect to this matter, the code of Federal Regulations (Title 23, Chapter I, Item 635.411) states:

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

Certain new products, although meeting the preceding descriptions, do not always pass through the new-product evaluation process as discussed in this report. For example, new products submitted for testing for compliance with existing specifications, plans, and standards will be handled in many agencies by routine testing procedures rather than by procedures established for new-product evaluations. (This

and other exclusions are discussed more extensively in Chapter 3.)

State highway and transportation departments, as public agencies, have a responsibility to taxpayers to encourage private development of new products useful to the highway industry. However, as public agencies, they must exercise discretion in avoiding developmental efforts that may be construed as favoring private industry over public need. The development of a new product and determination of its uses are primarily functions of the developer or manufacturer (termed "vendor" herein) to be accomplished before presentation to a state highway and transportation department for possible evaluation. New-product evaluation in highway and transportation agencies consists of checking a vendor's claims regarding the merits of a new product that has been developed by the vendor, establishing the need for the product, and often testing under local conditions to assure that the product will perform as expected.

Because highway and transportation department interest in new products often crosses normal organizational lines (material, construction, maintenance, etc.), the need for bridging the natural separations so that evaluations can be conducted effectively and efficiently introduces added complexity in the evaluation process.

## BACKGROUND

The evaluation of new products for possible use is not a new activity of highway and transportation agencies. In fact, the evaluation of new materials and processes was often a principal activity in the state highway agencies that were formed at the beginning of highway expansion following the introduction of the automobile. As practice became more standardized, principal attention shifted to other matters and new-product evaluation became a routine function to be initiated and undertaken along with other activities by staff members of the division or divisions of the departments to which the product was of most interest. Frequently, the evaluations involved the materials and testing divisions because of the nature of their operations and the availability of testing expertise. This became the traditional method for handling new-product evaluation in most state highway and transportation departments and is still used today by a significant number of departments.

There were, of course, many exceptions to the traditional procedure. In one state during the 1930s, an investigation of concrete pavement jointing practice was initiated at the direct request of the governor of the state. The governor asked the president of the state university to appoint a committee to conduct the investigation after the use of proprietary metal joints found not to be serving as anticipated was discontinued by the highway department.

Within the past 17 years, a proliferation of new products, an increasing need to seek out and make use of all possible economies, and a desire to improve lines of internal communication made cumbersome through growth have led many highway and transportation departments to institute measures aimed at improving the traditional new-product evaluation process. Some measures involve relatively simple modifications aimed at modest improvements in efficiency; others

involve more extensive changes such as the establishment of separate entities for new-product evaluation.

## EVALUATION PROCESS

Typically, the new-product evaluation process begins with a personal presentation by a manufacturer, developer, salesman, or other individual (vendor) of a new product that, once approved, has the potential for producing volume sales. The presentation usually is arranged at the request of the vendor, but may also be invited by agency representatives. The vendor will be expected to demonstrate that the product can fill an existing need of the department and to provide appropriate engineering reports, laboratory test data, past performance records, and other information in support of the economic and engineering advantages claimed for the product.

For the purposes of this synthesis, the entire new-product evaluation process, after presentation by the vendor, has been broken down into the following six steps (obviously, not all products go through the entire process):

1. Initial screening
2. Preliminary examination
3. Detailed evaluation (laboratory and field)
4. Translation into "media of practice"
5. Implementation
6. Performance feedback

The details of each of the preceding six steps of new-product evaluation are frequently alluded to in this report (see Chapter 3 for full discussion).

## SOURCES OF INFORMATION

The major portion of the information contained in this report was obtained from 32 state highway and transportation departments and 3 Canadian provincial departments responding to a questionnaire sent to the chief materials engineers of all state highway and transportation departments and a sampling of Canadian departments. Additional information was obtained regarding state practices from telephone discussions and written correspondence with representatives of the departments in the remaining contiguous states that did not return the questionnaire.

The exchange of information on a national scale relating to new-product evaluation was also covered in the questionnaire sent to the states.

In the belief that full coverage of the new-product evaluation process of highway and transportation agencies should include observations from outside as well as from inside the systems, the vendor viewpoint was solicited from representative manufacturers of highway products and from trade associations having contact with the highway industry.

Information on the likely interest in user-prepared (as opposed to the more common commercially prepared) reports on available new highway products was solicited from editors of a number of magazines circulated within the highway industry.

## NEW-PRODUCT EVALUATION AND VALUE ENGINEERING

It is useful to recognize that the concepts and techniques of new-product evaluation are similar in many ways to the concepts and methodologies of value engineering. A reading of *NCHRP Synthesis 78: Value Engineering in Preconstruction and Construction* (3) will make the similarities apparent to those familiar with the processes of new-product evaluation. Although written from a perspective that is somewhat different from that of this report, *NCHRP Synthesis 78* contains a considerable amount of information on methodology that applies to new-product evaluation as well as to value engineering.

Although value engineering concerns a broader area, the basic aims of new-product evaluation and value engineering are the same. Both seek to do more with available resources and without loss of service. Improvements made in new-product evaluation processes in recent years aim toward the carefully structured methodologies that characterize value

engineering. Both apply user-oriented approaches. Further understanding of the similarities can be gained from the following definition of value engineering as provided by the Society of American Value Engineers: "Value engineering is the systematic application of recognized techniques which identify the function of a product or service, establish a value for that function, and provide the necessary function reliably at the least overall cost" (3).

The Florida Department of Transportation, in recognition of the close relationship of the functions of value engineering and product evaluation, handles both functions in an Office of Value Engineering and Product Evaluation. Minor involvement of value-engineering staff members in the new-product evaluation function was reported by two other agencies.

A study of *NCHRP Synthesis 78* (3) in association with this report is recommended for readers directly concerned with the procedural aspects of new-product evaluation.

## CHAPTER TWO

# ORGANIZATION OF THE NEW-PRODUCT EVALUATION PROCESS

The importance that the management of a highway and transportation agency places on an activity within the department will be reflected in its relative strength as compared to other activities. The survey of practice conducted in preparation of this synthesis did not directly address the question of attitude on the part of management toward new-product evaluation, but responses to other questions (and some unsolicited comments) provided an opportunity to appraise general attitudes. As could be expected because of the wide ranges in size, responsibilities, funding, and other conditions that affect the operation of state highway and transportation departments nationwide, substantial differences were found to exist in the degree of importance placed on new-product evaluation activities.

At one end of the importance scale was the response from a representative of a lightly populated, high-road-mileage state with little manufacturing activity:

We are not opposed to evaluation but do believe that practically all products reaching (this state) have been thoroughly evaluated and possibly even rejected by other states. In developing a recommended New-Product Evaluation Procedure, you must provide for the . . . so-called minimum manufacturing states. We do not have the manpower to do a thorough evaluation of new products nor do we feel we owe it to manufacturers to do the research and evaluation on their products.

At the other end of the scale is the following abstract from an East Coast state of a policy statement regarding new-

product evaluation that was considered of sufficient importance to be included in a Commissioner's Administrative Memorandum:

New materials, products, or methods which promise improvement, or greater economy, in transportation services shall be evaluated. Such evaluation will involve cooperative efforts on the part of industry and the Department. In the collaboration, the establishment of an atmosphere of mutual respect is essential. Industry representatives shall be given equal opportunity to present their product. It is stressed, however, that the Department will not engage in product evaluation unless an adequately developed, screened, tested, and marketable product is offered.

The support of both top management and middle management (usually the division-head level in this case) is important to the success of new-product evaluation programs.

New-product evaluations are designed to provide reasonable assurance, before large expenditures are made, that a new product, material, or process will serve a worthwhile function and that costly failures would be avoided. All state highway and transportation departments, and probably most others of any stature around the world, engage in some degree of new-product evaluation. Almost all of the evaluations, at least in the United States, are conducted in-house. The remainder of this chapter is devoted to an analysis of the various types of organizations that have been developed in the state highway and transportation departments of this

country and in some of the provincial departments of Canada to conduct new-product evaluations.

### TRADITIONAL ORGANIZATION

As indicated in Chapter 1, new-product evaluations conducted under the traditional process still used by some state highway and transportation departments are initiated and prosecuted by the division or divisions (construction, materials, etc.) most interested in the product. Less frequently, evaluations are undertaken by field forces with or without communication with the central offices.

Under the traditional process, new-product evaluations are an auxiliary activity of existing operational forces. No special organization is required, and location of the activity close to the potential users can be advantageous. If a temporary reduction in work load occurs, new-product evaluation can be a "fill-in" activity.

The traditional system also has disadvantages. Relative obscurity at the upper management level has the potential for making overall control difficult. The "out of sight, out of mind" precept can also produce a tendency at the upper level to discount the value or importance of new-product evaluation. Lack of uniformity in prosecution and control when conducted under many managers and a tendency to suffer from a shortage of staff or funds when competing with operational programs can at times reduce effectiveness. Independent actions by individual managers who may have a preference for the status quo rather than for innovation or, when harassed by a myriad of other problems, may approve a product for use without adequate evaluation can further reduce the effectiveness of new-product evaluations under the traditional system.

When two or more divisions or both division and field offices are involved, responsibilities for accomplishing the evaluation may shift from group to group depending on the nature of the work currently under way, in some instances with no one assigned overall responsibility for assuring complete evaluation. Official directives detailing responsibilities for new-product evaluation, or official policy statements on the conduct of such evaluations, have rarely been issued where the traditional process of new-product evaluation is followed. For this reason, the system was alluded to in the questionnaire as an "informal" system.

Although its susceptibility to deficiency appears to be high, the traditional process may be workable under the right environment, and its use continues in a number of highway and transportation departments, both large and small. The highway and transportation departments in 20 of the 48 contiguous states and 1 of 3 responding Canadian provinces appear to be handling new-product evaluations in the traditional manner. (For a breakdown of highway and transportation agencies based on whether they approach new-product evaluations in the traditional manner or have added more than very minor modifications, see Table 1.)

### MODIFIED ORGANIZATIONS

The agencies using organizations and systems for new-product evaluation referred to as "modified" in this report in

TABLE 1  
HIGHWAY AND TRANSPORTATION AGENCIES  
USING EITHER THE TRADITIONAL (21 AGENCIES)  
OR MODIFIED (30 AGENCIES) PROCEDURES FOR  
NEW-PRODUCT EVALUATIONS

Traditional	Modified	
California	Alabama	South Dakota
Delaware	Arkansas	Tennessee
Idaho	Arizona	Texas
Kansas	Colorado	Utah
Kentucky	Connecticut	Vermont
Minnesota	Florida	West Virginia
Missouri	Georgia	Wisconsin
Montana	Illinois	Manitoba
Nebraska	Indiana	Ontario
Nevada	Iowa	
New Hampshire	Louisiana	
New Mexico	Maine	
North Carolina	Maryland	
North Dakota	Massachusetts	
Ohio	Michigan	
Rhode Island	Mississippi	
South Carolina	New Jersey	
Virginia	New York	
Washington	Oklahoma	
Wyoming	Oregon	
Nova Scotia	Pennsylvania	

general use variations of the traditional process to which some degree of structuring has been added to improve control and effectiveness in operation. Simple variations include the designation of a single office to which all vendors are referred for initial screening, and administrative designation of one division head or other individual to assume overall responsibility for making sure that all new products receive proper evaluation. These changes may or may not be accompanied by additional changes to the traditional procedure. Modifications of greater consequence include the formation of committees to provide advice and direction and the assignment of new-product evaluation to individuals or groups for handling as a full-time activity.

The organizational and procedural changes that are made to improve the new-product evaluation process usually are promulgated by administrative directives or other official communications of top management. In some instances, cooperative relationships that are expected among divisions, and between division and field offices, are spelled out. This is an advantageous feature in reducing the temptation to bypass established evaluation procedures, as reported by several agencies responding to the questionnaire.

### Vendor Referral to Single Office

Under the traditional process of new-product evaluation, vendors approach and are given hearings in any division

where their products might be of potential interest. Most of the agencies that have departed from the traditional process have chosen, at the least, to channel vendor approaches through a single office. This procedure provides two advantages: it aids in improving uniformity and control of the new-product evaluation process, and it offers a means for reducing unnecessary work interruptions caused by vendors using a blanket approach toward receiving product acceptance.

It was thought that vendors would find the focalizing modification advantageous in allowing them to concentrate their efforts at a single location. However, an inquiry sent to a number of representative manufacturers and trade associations showed an overwhelming preference for the opportunity to select individuals of their own choice for presentations of new products.

Information provided by departments making use of the single-office control of vendor approaches reflected general satisfaction with the procedure, and several departments not currently using this procedure indicated that it might improve their new-product evaluations. The only complaint registered in connection with the referral of all vendors to a single office, and this only in isolated instances, was that occasional internal bypassing was preventing operation of the system at full potential. The strong preference of vendors for seeking out their own contacts for new-product presentations undoubtedly contributes to the problem. However, better communication with respect to the advantages of this procedure, and a clear indication from top management regarding the cooperative relationships expected for new-product evaluations, should reduce this problem.

Of the 28 state highway and transportation departments and 2 Canadian provincial departments classified in this report as having departed from the traditional process of new-product evaluation, 24 state departments and both provincial departments customarily refer vendors through single offices where their product information submittal is given an initial screening. In 2 of the other 4 states, vendors are received in any division office where they are given forms to furnish prescribed information which, together with other pertinent information, must be submitted to one receiving office. The remaining 2 departments accept vendor approaches in any division, but have other features that depart from the traditional process.

Three agencies that have been classified in this report as otherwise using the traditional new-product evaluation system direct vendors to approach a single office where arrangements are made for further contacts with potential user divisions.

Among highway and transportation departments with modified new-product evaluation systems, 23 have established the Materials Division as the central office for receiving vendors. Within those that have combined materials and research functions, vendors usually are received by the research branch. Four departments with research at the division level that also refer vendors to a single office make the referrals to the Research Division. One department with a Division of Value Engineering and Product Evaluation refers all vendors to this division. Another department that is otherwise following the traditional method of new-product evaluation refers vendors to the Research and Development Division where arrangements are made for presentations to interested operating divisions.

## Overall Responsibility

With the traditional process of new-product evaluation, overall responsibility for an adequate evaluation is assumed by the head(s) of the division(s) conducting the evaluation. The Materials Division is usually involved in new-product evaluations and is likely to have overall responsibility for the adequacy of the evaluation.

With modified processes of new-product evaluation, overall responsibility for the adequacy of evaluation also frequently rests with the head of the Materials Division, usually by organization design but occasionally by specific directive. In the few agencies where new-product evaluation is assigned to the Research Division, overall responsibility for the program rests in that division. Three agencies place overall responsibility with committees on which division heads most frequently involved in new-product evaluations serve. Two agencies, in which several operating divisions are grouped under a single individual, place the responsibility with that individual.

Details of new-product evaluations are usually handled at the unit or equivalent subgroup level within divisions, sometimes with field assistance, and the overall responsibility is likely to pass from section to section, within and across division lines, wherever the work is being done, until the evaluation process is completed. This is true for either the traditional or modified processes of new-product evaluation.

## New-Product Evaluation Committees

A considerable number of highway and transportation departments have organized committees for the purpose of improving the new-product evaluation process. These committees, most of which have been given official standing by administrative directives from top management, include representatives from the highway divisions most involved with the introduction of new products.

Most of the new-product evaluation committees are considered to serve in an advisory capacity to top management. However, in many agencies, decisions that are made within the committees are usually considered tantamount to decisions by top management in all situations except when major changes, such as sharp breaks with long-established practice, are being recommended. A few committees routinely function in an administrative capacity.

Typically, the chairman of a new-product evaluation committee is the head of the division to which overall responsibility for new-product evaluation has been assigned, and the secretary is the member of the chairman's staff who has responsibility for the details of new-product evaluation.

Information regarding new submittals serves as the basis for committee decisions and usually is prepared for the membership in summary form by the committee secretary following confirmation of the validity of vendor claims. Some committees occasionally invite vendor presentations at regularly scheduled meetings. Committees meet monthly, quarterly, semiannually, or at the call of the chairman.

Most or all of the following tasks are usually performed by the new-product evaluation committee:

1. Review and evaluate information on new items and

determine if a need exists for an item and if an item has potential for filling the need.

2. Determine and suggest additional physical evaluative studies as necessary.
3. Monitor studies in progress.
4. Act on acceptance or rejection of new products.
5. Monitor implementation of accepted products.
6. Monitor service performance of accepted products.
7. Encourage development and introduction of new and improved products.

The following agencies use committees in the new-product evaluation process: Alabama, Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Mississippi, New Jersey, Oregon, Pennsylvania, South Dakota, Tennessee, West Virginia, Wisconsin, and Ontario. Most of these committees have been established by administrative order. Those in Massachusetts, Oregon, and Tennessee have unofficial status. The committees in Colorado, Connecticut, Mississippi, and Wisconsin are concerned with both product evaluation and research undertakings. In addition to department personnel, the committees in these states include representatives from educational institutions performing research for the department and nonvoting representatives of the Federal Highway Administration. The committee in Colorado is concerned solely with implementation. In Pennsylvania the committee is composed solely of laboratory group heads in the Materials and Testing Division. The committees in Colorado, Louisiana, New Jersey, South Dakota, and Tennessee apparently act in an administrative function on a routine basis. The others, although serving administratively in varying degrees, are nominally advisory committees.

The principal advantages of new-product evaluation com-

mittees are their capabilities for providing valuable multiple-channel communications and eliciting both general and specific comments that may otherwise be difficult to obtain.

In response to the request on the questionnaire sent to highway and transportation departments for comments on improvement of existing new-product evaluation systems, no unfavorable remarks were expressed with respect to new-product evaluation committees; several respondents stated that the establishment of such committees would improve their evaluation systems. Official statements used in Iowa and New Jersey to establish new-product evaluation committees are given in Appendix A.

#### New-Product Evaluation as a Full-Time Activity

Only six of the contiguous 48 state highway departments (and none of the 3 Canadian departments) sampled thus far have established units for full-time new-product evaluation service or have assigned evaluation responsibilities to an individual on a full-time basis (see Table 2).

New-product evaluation as a full-time activity appears to offer the best opportunity for the selection, control, and full utilization of evaluation procedures. It also offers, for the benefit of top management, the opportunity to apply budgeting and funding practices that will allow measurement of productivity. However, each agency must determine for itself the relative amount of importance it wishes to place on new-product evaluation consistent with available funding and manpower. Full-time staffing for low-volume new-product evaluation most likely would not be an efficient use of funds and manpower.

TABLE 2  
ORGANIZATION OF NEW-PRODUCT EVALUATION AS A FULL-TIME ACTIVITY

State	Responsible Unit Or Individual	Activities
Colorado	Product Evaluation Engineer in Central Laboratory of Materials Division	Acts for the Chief Materials Engineer in reviewing new-product submittals, in selecting and assigning evaluation activities to evaluators selected on the basis of expertise in the product field, and in coordinating evaluation activities.
Florida	Office of Product Evaluation in Value Engineering/Product Evaluation Division	Enters into all phases of the new-product evaluation process, with assistance from operational offices as required.
Illinois	Products Evaluation Unit in Bureau of Materials and Physical Research	Enters into all phases of new-product evaluation inclusive of field investigations, but depends on the Regular Materials Laboratory for laboratory testing. Also serves as a secretariat to the Illinois Highway Development Council.
Oklahoma	Product Evaluation Engineer in Research Division	Coordinates the efforts of other engineers in the Research Division conducting new-product evaluations and also conducts some of the major evaluations.
Pennsylvania	Development and Materials Evaluation Unit in Materials and Testing Division	Enters into all phases of new-product evaluation.
Tennessee	Product Evaluation Subsection in Central Laboratory of the Materials and Tests Division	Enters into all phases of new-product investigation, with assistance from other divisions and agencies as appropriate. Data control is maintained in the Materials and Tests Division.



## NEW-PRODUCT EVALUATION PROCEDURES

Based on the responses to the survey of practice conducted for this synthesis, procedures devised by highway and transportation departments for new-product evaluations are generally similar in pattern but vary in approach and scope. This is to be expected in view of the differences that exist among departments in attitudes toward the importance of evaluating new products and in the organizations that have been developed for new-product evaluation as described in Chapter 2. However, all the respondents generally adhere to the six-step process for new-product evaluation as described in Chapter 1. Details of the application of this process, along with other details of practice, are presented in this chapter.

### EXCLUSIONS

As discussed in Chapter 1, not all new products enter into the systems that have been established specifically for new-product evaluations.

#### Nonhighway Products

The systematic evaluation of new products by state departments of transportation rarely appears to extend beyond highways to other modes of transportation. Although this matter was not addressed directly in the survey of practice, only one agency gave any indication of broadening the role of new-product evaluation. In this instance, the inclusion of representatives from modes of transportation other than highways on its new-product evaluation committee was noted.

#### Compliance Testing

Many agencies exclude from consideration in new-product evaluation systems new products submitted for approval for compliance with existing specifications, plans, and standards. These products are handled through the regular compliance-testing systems. Of the 26 agencies that have established modified systems of new-product evaluation, 20 reported excluding new products submitted for compliance testing.

#### Other Exclusions

According to the responses to the questionnaire, of the 26 agencies with modified systems of new-product evaluation, 8 normally do not evaluate new products of prime interest to a single division, 8 indicated that the systems may be bypassed where special handling is required due to urgency of need,

and 11 indicated that products not introduced through outside promotion do not pass through the systems.

Frequent requests for reevaluation following minor product changes after rejection, and sometimes even before evaluation of the original submittal has been completed, have been cited as being burdensome and less likely to produce favorable results than evaluation of entirely new products. However, questionnaire responses indicate that the problem is not widespread, and that each resubmittal is dealt with on an individual basis. Not one agency has seen fit to exclude resubmittals from consideration, nor did any agency propose other ways to avoid the problem.

A few other exclusions, unique to special conditions within individual agencies, were also noted in the responses to the questionnaire.

### REQUISITES FOR EVALUATION

All highway and transportation agencies expect vendors of new products to provide a reasonable amount of responsible documentation supportive of their claims that a new product will perform as stated, that a true need exists for the product, and that the product will be economically competitive with other products available to serve the same function in filling the perceived need. If this information is not forthcoming, no further evaluation will be made and the product will be rejected. A few agencies provide a written statement of the conditions required before accepting a product for evaluation. This statement is sometimes included on the product evaluation form provided by the department to be signed by the vendor in the submittal of basic information relevant to the product. However, it appears that most agencies assume that acceptance of a product for evaluation implies tacit agreement to generally accepted conditions, which need not be covered specifically in a written statement.

#### Selection of Tests and Test Criteria

Only one of the responding agencies (Arkansas) is known to state in writing its intention to reserve for itself the determination of tests and test criteria in the evaluation of a new product. The new-product evaluation form used by Arkansas requires the vendor's signature and contains, among several statements of conditions under which products are accepted for evaluation, the following statement: "Product evaluation will be in accordance with applicable laboratory testing and field evaluation criteria which shall provide a true test of the product's stated characteristics and application. Such criteria shall be determined by Arkansas Highway and Transportation Department staff."

## Liability Agreements

Maryland is the only agency that makes specific reference to liability for injury caused by a product defect. The letter written to the vendor in acceptance of a product for detailed evaluation contains the following statement: "The manufacturer and vendor shall retain all liabilities for injuries caused by defects in the design of, or manufacture and labeling of, their products." When a product is incorporated as a construction feature under a construction contract, as is often the case, the usual "save harmless" provisions included in the standard contractual requirements for the entire construction project presumably would apply.

Two agencies (Arkansas, by means of a statement on product evaluation forms, and Maryland, in the letter of acceptance of a product for evaluation) remind vendors that acceptance for test does not guarantee general use. The statements of both states are similar, with that of Arkansas reading: "Acceptance of a product for evaluation by the Arkansas Highway and Transportation Department is in no way a commitment to purchase, recommend, or specify the product investigated regardless of its performance." Maryland also includes in its letter the following condition of acceptance of a product for evaluation: "State acceptance for evaluation or for general use shall not operate as a waiver of any of the warranties, expressed or implied."

Although not specifically a condition for evaluation, one agency includes the following statement in the letter notifying a vendor that a product has been approved for general use: "Approval is further contingent on periodic evaluation to determine possible changes in the characteristics or quality of the product."

## Burden of Cost

As a requisite for evaluation, some agencies routinely require vendors to provide any product offered for evaluation free of charge and to furnish without cost to the agency any labor or equipment that might be involved in demonstrating or installing the product. Nine of 32 agencies responding to the survey questionnaire are in this category, in which the burden of cost is placed with the vendor, even though the costs may be substantial.

Seven agencies indicated that the distribution of cost responsibility between agency and vendor is determined individually for each evaluation. Sixteen agencies do not require free provision of a product or of any labor or equipment necessary for installation as a condition for evaluation.

## Vendor Presence at Installation

Vendors customarily try to be present when a new product submitted for evaluation is to be installed or otherwise subjected to field trial. Both agency and vendor can be expected to benefit from having the vendor's expertise available during first installations or field trials. Vendor presence at this critical period can be of further advantage to the agency when problems develop and the vendor must be told that the product is not acceptable.

Twelve of 31 agencies responding to the questionnaire reported that the presence of the vendor at the first installation or use of a new product for evaluation is a requirement for acceptance of the product for evaluation. Three other agencies may or may not require the presence of the vendor at first installation or use, depending on the situation. The remaining 16 agencies do not require a vendor's presence at first installation of a new product, although it is often encouraged.

## Release of Information

Several highway and transportation agencies consider it worthwhile to express in writing (either before acceptance of a new product for evaluation or when a vendor is notified that a product has been accepted for general use) conditions regarding the release of information resulting from the evaluation.

Although all states undoubtedly consider evaluation results to be public information, only six of 32 questionnaire responses reported that vendors are informed in writing that information developed in new-product evaluation will be considered public information to be released at the discretion of the agency. Four of the six agencies state this as a condition of acceptance of a new-product for evaluation and place the notification on the product evaluation form that the vendor signs. The other two agencies notify vendors of this condition in letters of acceptance of products for general use.

The following statements from Alabama and Louisiana are representative of notification to the vendor concerning release of information. From Alabama: "The vendor is hereby notified that the Product Evaluation Board of the Alabama Highway Department reserves the right to release or distribute any of the information included in this form as well as any recommendations the Board might make concerning this product." From Louisiana: "Data resulting from an evaluation of the submitted product is public information and will not be considered privileged. This information is authorized for public release by the Louisiana Department of Transportation and Development by the signature below." These statements, when used by a state highway and transportation department in connection with new-product evaluation, would appear to leave little doubt that the department can, and will if it chooses to do so, release evaluation findings even though they indicate that a product has performed poorly.

In Maryland's letter of acceptance of a product for evaluation, a cautionary statement is included to the effect that none of the test findings may be published without the express permission of the agency.

Twelve agencies responding to the questionnaire report that vendors are informed, either in writing or verbally, that the agencies do not wish to have new-product evaluations or findings reported in a manner that implies endorsement of a product. This is not expressed as a condition for acceptance of a new product for evaluation by any agency, but rather is dealt with when a product is accepted for use. Typical of the written statements used are the following: (a) "[T]his approval is not to be used for advertising or promotional purposes without the written permission of the Commissioner of

the Department of Transportation"; and (b) "Endorsement of this product by the Maine Department of Transportation is not intended or implied."

## NEW-PRODUCT EVALUATION PROCESS

The total process of evaluating new products has been divided into six steps for the purpose of analysis in this report.

### Step 1—Initial Screening

Typically, the initial screening begins with the hearing of a vendor's introductory, verbal presentation of the new product and/or a review of summary data on the product submitted by such means as completing a department product evaluation form. The vendor may be received by an individual, or by several individuals separately, depending on the organizational setup (see Chapter 2). Less frequently, the vendor may, at this stage, make a presentation to a group.

The vendor customarily brings a sample of the product (if feasible), test data, performance records, endorsements, and whatever else may support claims for the product. The documentation usually is left by the vendor for more intensive study at a later date. At this stage many agencies give the vendor a new-product evaluation form to be completed and submitted, along with other prescribed information, before further evaluation of the product will be considered. Conditions that the vendor must observe before an evaluation will be undertaken may also be stated on the form. Some agencies expect the form to be completed by the vendor at the time of the initial visit; others expect it to be completed at the vendor's convenience and returned at a later date.

After a review of the information presented by the vendor at the initial call, the first of several decisions is made with respect to adoption, rejection, or further evaluation of the product. This decision is usually made at or near the division-head level by, or upon the recommendation of, the heads of potential user divisions. In some of the agencies employing new-product evaluation committees, the secretary presents the information to the full committee for guidance on future action. More frequently, the secretary either determines that the product should be rejected at this stage, or that the process should continue through step 2, preliminary examination. If the submittal goes to the full committee, the committee makes the decision on whether the product should be accepted or rejected at this time, or if the evaluation should be continued.

Outright acceptance of a product for immediate adoption at the conclusion of the initial screening is the exception rather than the rule. Rejection of a new product at this stage is not uncommon. Obvious cases of underdevelopment, lack of need, and the absence of potential for economical competition with available products serving the same function are the usual causes for rejection at this early stage.

## New-Product Evaluation Forms

A total of 31 states use new-product evaluation forms to obtain from vendors information to aid in properly evaluating a new product. These forms provide those responsible for making the important initial decisions with orderly and concise information, reduce misunderstandings with respect to the nature and extent of information the vendor must furnish, and avoid delays resulting from the absence of needed information that may be available but is not included in the submittal. Occasionally the forms also have caused ill-prepared vendors to voluntarily withdraw submittals from further consideration.

New-product evaluation forms are usually designed to obtain the following information:

- Trade name of product
- Manufacturer and location
- Manufacturer's representative and location
- Recommended use and limitations
- Description, composition, laboratory analysis
- Plans, sketches, photographs, specifications
- Patent status
- Royalty cost
- Guarantee terms
- Features and advantages claimed
- Existing standards, plans, specifications met
- Instructions for use
- Material and in-place costs
- Limitations on availability
- Willingness to provide samples (cost)
- Willingness to demonstrate
- Current users (experimental, routine)

Less frequently, information on the following items is requested:

- Background of company
- Date product introduced on market
- Name of person recommending department as potential user
- Names of persons contacted in department
- Precautions to be used in handling
- Known health hazards
- Agencies that have rejected the product

As noted previously, some agencies make use of the evaluation form to state a variety of conditions that must be accepted before evaluation will be considered. The vendor's signature is considered to indicate his acceptance of the conditions.

New-product evaluation forms appear to offer a sufficient number of advantages so as to be worthy of consideration for use by all highway and transportation departments conducting new-product evaluations. Typical forms, as used by Arkansas and New York, are presented in Appendix B.

### Step 2—Preliminary Examination

The second step of the new-product evaluation process typically includes an in-depth study of all material submitted by the vendor including such items as test reports, research

reports, and approvals of other highway agencies. A search is made of pertinent literature, the product is compared with similar products already in use, and contact may be made with other agencies that are evaluating or using the product. In searching the literature and in contacting other agencies, product evaluators must recognize that, on occasion, product formulations may be changed without a change in name, or that the same formulation may appear under different names.

In agencies where vendor contacts are not focalized in one area, the preliminary examination will be conducted in the division with the primary interest and expertise; most often this will be in the materials division. In agencies where vendor contacts are focalized in one area, the preliminary examination is likely to be conducted in that area, although it may sometimes be conducted in the principal area of use.

In the agencies where committees review and act on vendor submittals at the conclusion of the initial screening stage, the committees are likely to make or recommend assignments for preliminary examination if this step is considered to be warranted. Where no committee exists, the results of the preliminary examination usually will be reviewed by the interested division head, or heads if more than one division is involved, and another decision made as to whether to adopt, reject, or continue evaluating under step 3 of the process, detailed evaluation.

In the agencies with new-product evaluation committees, the secretary is generally responsible for preparing information summaries on which the committee bases its actions. In some instances, the secretary has the authority to reject obviously inferior products; this reduces committee work load by limiting committee actions to products with the most promising capabilities.

Acceptance of products for routine use at the completion of this stage is rare. However, most products offering no more than moderate promise will be rejected at this time.

### **Step 3—Detailed Evaluation**

The third step in the new-product evaluation process consists of in-house laboratory testing and/or field trials to test performance under local field conditions. This is likely to be the most expensive and time-consuming part of the evaluation process, and is applied only to those new products that appear to have a particularly good chance of filling a need. Some caution must be exercised in the acceptance of samples for testing to be certain that the sample truly represents the product to be furnished. Randomly chosen samples are preferable to stock samples.

When laboratory testing is undertaken as part of new-product evaluation, the testing, with perhaps a few exceptions, is assigned to the central laboratory of an agency's materials division to be handled by regular laboratory personnel. Laboratory forces sometimes are also responsible for test selection, establishment of test criteria, and interpretation of results. In those agencies that maintain a research division or a combination materials and research division, or have full-time new-product evaluation groups, personnel from these groups are likely to participate in, or be made responsible for, laboratory test design and interpretation of results.

Field trials may involve either products and materials that become integral parts of the highway facility, or processes and equipment used in the construction, maintenance, or operation of the facility. These trials often involve field forces as well as central division personnel and frequently require a special effort to assure the achievement of definitive results. Often the field trial must be depended upon to provide the final evidence that a new product will, or will not, serve the function for which it is intended.

The design of field trials is usually handled by the materials (or materials and research) division, by user division forces, or by joint action. Where research personnel are available, they are likely to be involved. In the few agencies where new-product evaluation is a separate function, these forces will be involved.

Observations and record keeping of the installation of new products in highway facilities and of field trials of processes and equipment are often performed by an agency's central office materials and research personnel, with participation by user division and field forces. If available, full-time product evaluation personnel will handle this function. Long-term observations and reporting of the behavior of products and materials incorporated in the highway facility usually become functions of research forces, or of full-time product evaluation forces if available. Otherwise, they are most likely to be assigned to the central materials division and to field forces, with some participation by user division forces.

Well-designed experiments for field trials, careful attention to performance observations, accurate record keeping, and reporting of the results are essential components of any successful product evaluation system. Improperly designed and conducted field trials that result in early failure can be both expensive and sources of public embarrassment; and can also lead to inconclusive results that unnecessarily prolong testing or, when serving as the basis for rejection of a product, produce controversy between vendor and agency.

Completion of this stage of the new-product evaluation process usually leads to either acceptance or rejection of a product, except in those few instances where the need for further evaluation becomes evident. The decision rests with those responsible for the overall evaluation process, either a division head or a committee. When major changes in practice and/or increase in cost will result from acceptance of a new product, concurrence of top management in the decision is sought.

### **Step 4—Translation to Media of Practice**

Once a product has been found to be acceptable, evaluation results must be converted into the "media of practice," which include standards, specifications, manuals, policy statements, and the like. Although major emphasis tends to be placed on the activities of product evaluation that lead to acceptance or rejection of a product, continued involvement of evaluation forces beyond the point of acceptance can contribute added assurance that a worthy new product will be used and used as intended.

With respect to current practice, 21 of 35 questionnaire responses indicated that evaluative forces prepare, at least in draft form, the particular medium of practice that must be developed before a new product can be used. Another 7

agencies handle the conversion by the joint effort of evaluation and user forces, and the remaining 7 agencies assign the responsibility to user forces.

#### **Step 5—Implementation**

Vendors usually can be expected to apply their promotional expertise in encouraging the use of approved new products. However, internal measures considered to be within the scope of the total new-product evaluation process may also be necessary for a new product to reach its full potential of usefulness; in response to the questionnaire, agencies indicated the use of the following measures (in descending order of frequency): demonstrations, policy statements, training materials, documentation feedback, workshops, and promotional announcements.

With some exceptions, it appears that the responsibilities and activities of implementation often take place outside the communication network established for new-product evaluation.

#### **Step 6—Performance Feedback**

Follow-up observations and evaluations of the service performance of approved new products can provide documentation of benefits, point out early failures, and call attention to adjustments that may be needed to achieve intended objectives. Of 35 reporting agencies, 17 agencies conduct routine observations of service performance and 18 depend on notification by field forces of the existence of problems before observations are made. Apparently little information is acquired to document benefits achieved.

In many instances, feedback of information on service performance appears to be outside the new-product evaluation communication network.

### **CASE STUDIES**

Presented below are four case studies generally representative of the different systems of new-product evaluation used in the states and Canadian provinces surveyed.

The new-product evaluation process used by the Minnesota Department of Transportation generally represents the systems that are referred to as traditional in this report; the other case studies are representative of the different systems that are modifications of the traditional. The process of the New York Department of Transportation features the channeling of all vendor calls into a single office. At the New Jersey Department of Transportation, in addition to channeling all vendor calls in a single office, a new-product evaluation committee is used. In Illinois, all vendor calls are channeled into a single office, a new-product evaluation committee is used, and a full-time new-product evaluation unit is maintained.

#### **Minnesota**

In the Minnesota Department of Transportation, representatives of the various interested divisions meet jointly to hear a vendor's presentation of a new product. If the primary specifier or user division wishes to investigate further or undertake experimental work, that division will initiate the action.

The vendor's documentation is studied in detail and a background search made within the area of experience with the type of product under consideration. No form sheets are used to obtain product information from the vendor.

If laboratory or field tests are considered desirable, the Office of Materials Engineering under the Director of Materials Engineering will generally handle the testing. If trial installations are of considerable size and scope, the Office of Research and Development may become involved. The Director of Materials Engineering and/or the Director of Research and Development make the determination following laboratory or field testing as to whether a new product should be accepted, rejected, or subjected to further testing.

Standards, specifications or other media of practice required for implementation are usually prepared in draft form by evaluation forces for inclusion with information submitted to user forces when a product is accepted. In the past demonstration projects have been successful in encouraging use of a new product.

Feedback of service performance information is limited to reports received from field forces when problems develop.

The results of new-product evaluations are reported in an informal manner; personnel limitations have prevented doing otherwise.

#### **New York**

In the New York State Department of Transportation, the vendor initiates a request for new-product evaluation by contacting any staff member, generally in the central office. The vendor is given a new-product evaluation form upon which the staff member supplying the form is identified. (The application form is restricted to products that are not covered by specifications, plans, and other department standards.) The vendor completes the form and returns it to the Director, Materials Bureau, for initial screening.

The Assistant Director, Materials Bureau, reviews the completed form and consults with staff members within the department responsible for the product area to determine whether a need exists for the product. If no need can be identified, the Materials Bureau immediately notifies the vendor that his product will not be evaluated. If it is determined that the product has potential for use, the Assistant Director makes a copy of the first page of the completed form for future reference and forwards the full application form, along with samples or other materials that may be submitted, to the appropriate groups for preliminary examination.

The group that performs the preliminary examination usually assumes full responsibility for managing the product through the evaluation and, if accepted, through the implementation stage. The actual work in evaluating the product may be shared with other groups. A staff member performing the preliminary examination often will make direct contact

with persons in other states and agencies listed by the vendor in response to a request on the application form.

During the evaluation period, contact is maintained with the vendor by the group performing the evaluation and the vendor often is invited to make a presentation or demonstration. Upon completion of the evaluation, the Materials Bureau is informed of the disposition of the product by a copy of the notification to the vendor. The Materials Bureau is responsible for making sure that action is taken on each product submitted for evaluation.

The New York Department of Transportation does not formally publish information on the acceptance and rejection of the evaluated products, but supplies information to other agencies upon specific request. Test results are given to the vendor upon completion of an evaluation. The vendor is instructed not to use this information for sales promotion in advertisements. Patent rights of the vendor are honored.

The department considers its new-product evaluation procedure to be effective and efficient. Strengths of the system include placing the management of the evaluation process in the control of the group that establishes policy and standards for the particular item and providing for direct contact between vendor and the person managing the evaluation.

#### **New Jersey**

The New Jersey Department of Transportation places the responsibility for assuring that new products receive adequate evaluation with a Materials Committee consisting of members drawn from the following operating units of the department: Construction and Maintenance, Design, Division of Research and Demonstration, and Division of Transportation Operations and Local Aid. The Chief of the Bureau of Quality Control in the Construction and Maintenance Unit serves as committee chairman, and a Senior Engineer, Materials in the Bureau of Quality Control serves as committee secretary. Currently there are nine other committee members.

The committee evaluates new products other than those submitted for compliance with existing standards or specifications, products of interest in a single unit, and products not introduced through outside promotional effort. Other exclusions include products belonging to a class for which a continuing program not under committee purview has been established, and products scheduled for evaluation by an "Interagency Committee" on which New Jersey holds membership.

Vendors of new products that approach the Department of Transportation usually are referred to the chairman or secretary of the Materials Committee for proper submission of a new product. The vendor is given a product evaluation form, to be returned with product-related information that supports the vendor's claims. This information and other available product-related information in SPEL and NEPT and from other sources is reviewed by the committee secretary, and pertinent information is compiled by the secretary to be circulated with a "New Product Survey" form to all committee members and to other units that may have a potential interest. After review and response by the committee, the vendor may be invited to make a formal presentation before the

committee by consensus request. Arrangements for a presentation are coordinated by the committee secretary. The product is then placed on the agenda for a scheduled meeting and committee action.

If the product is accepted by the committee for further evaluation, the secretary (frequently with the assistance of other staff engineers) reviews in detail and assesses data supplied by the vendor. The secretary also reviews SPEL and, if circumstances warrant, contacts other agencies listed in SPEL and by the vendor for information on product experience. The vendor's proposed specifications are reviewed for obvious deficiencies. At the conclusion of the preliminary examination, the results are submitted to the committee for evaluation at a scheduled meeting. The committee decides by consensus the next course of action.

If the committee decides on a detailed evaluation by laboratory or field testing, it selects the group to conduct the evaluation. Laboratory test programs are usually assigned to the Bureau of Quality Control (Materials Testing Laboratory). For a trial installation, a committee-designated task group normally is assigned the responsibility for coordinating the overall evaluation. The task-group chairman is selected from the unit most closely associated with the product class. Other members of the task group will be selected from units with the greatest interest in the evaluation. The task group will draw from available resources and expertise to fulfill its responsibilities. It has been the experience that the bulk of the trial installations are undertaken by the Bureau of Maintenance.

Laboratory and field test programs are carefully designed to reveal advantages and disadvantages related to performance. The experience of other agencies is often sought in the design of the programs. Vendors are requested to participate in field installations for the purpose of assistance and to minimize claims of failure due to improper installation.

A common approach to test programs consists of a three-phase evaluation:

1. Laboratory testing and evaluation.
2. Limited trial installation and evaluation.
3. Pilot installation on several full-scale projects.

Implementation of phases 2 and 3 often depends on the outcome of the preceding phase(s).

The Materials Committee decides on acceptance, rejection, or further study by consensus action after assessing the findings, conclusions, and recommendations reported by the designated task group for laboratory testing and field studies.

Normally, standards, specifications, and other media of practice are proposed by the Materials Committee and refined by the unit primarily responsible for publishing the medium. Initial preparation represents a collective effort that may include participation by the vendor, evaluation forces, and user forces.

Implementation of a new product is reported not to be a significant problem because the forces that frequently participate in the evaluation effort are under the management of units or divisions that provide the committee membership and publish specifications.

Follow-up observations of the service performance of a new product after acceptance are usually in response to reports from field forces of the existence of problems. If the

impact of a product is of sufficient magnitude, follow-up observations and evaluations will be continued as an extension of the initial process.

Full reports of completed new-product evaluations are made available internally and to outside agencies upon request. Product evaluation status reports are circulated routinely in-house and are reported to SPEL.

#### *A New-Product Evaluation in New Jersey*

The following step-by-step description of an actual new-product evaluation by the New Jersey Department of Transportation typifies the evaluation process used by this agency. This particular evaluation resulted in the acceptance and application of a useful new product.

The evaluation process began in February 1980 when the vendor of a new detour-grade (temporary) reflectorized pavement marking tape requested that NJDOT consider it as an alternative to temporary traffic paint requiring physical removal from the pavement (i.e., would not be covered over by resurfacing, etc.) after its need was served.

Upon receipt of the completed new-product questionnaire from the vendor, information was disseminated and the product formally introduced to the members of NJDOT Materials Committee. After declaring an interest, the committee (by consensus) invited the vendor to present and demonstrate his product before the committee and other interested non-member representatives of the department at a scheduled meeting. The committee then determined that a need existed for a temporary marking system that could readily be removed from the pavement so as not to scar the surface or leave any visible marks. It was decided that immediate field trials would be the best approach for product evaluation. The normal preliminary laboratory testing was bypassed.

Two trials were programmed. One trial consisted of applying several stripes transverse to the flow of traffic at a previously established pavement marking test site—a section of four-lane highway separated by a grass median [the south-bound lanes were portland cement concrete and the north-bound lanes were bituminous concrete surfaces, with a test lane ADT of 6,000 vehicles (12 percent commercial)]. The second trial consisted of “piggy-backing” on a formal research effort being conducted on a full-scale project where several other experimental pavement marking systems had been scheduled for evaluation.

A task group within the NJDOT Materials Committee was formed to conduct the evaluation. The task-group chairman provided progress reports to the committee on product performance at both locations (i.e., appearance, night visibility, durability, removability) until completion of the evaluation.

Where applied transverse to flow of traffic, full-lane-width tape strips were removed at approximately 30-day intervals, with difficulty being encountered only in cold (20° F) weather. Tapes at this site were easily removed after 300 days in use. Where applied on the full-scale project, it was noted that the tapes were easily applied and performed well during the term of use. Tapes were easily removed without surface scarring or leaving a visible trace at termination of the test.

With respect to the properties evaluated (ease of applica-

tion, daylight appearance, night visibility, removability, etc.), performance was judged to be better than that of the existing standard, although the cost of materials was considerably higher than that of the standard material. It was determined that although the cost of the material was higher, contractor personnel could apply the material with a few minutes of training and thus the contractor would not have to specially subcontract and schedule a striping outfit for low-volume (high-cost) application.

Under the circumstances, the committee decided to recommend that this type of system be considered an acceptable alternative to temporary traffic paint for detour use. The recommendation was approved and, by January 1982, contractors had utilized the tape system on several projects.

Follow-up evaluations of these projects by the Materials Committee task group indicate that the system is performing well, even under prolonged use, and has resolved the problem of residual traces and pavement surface scarring associated with removal of traffic paint systems.

#### **Illinois**

The new-product evaluation process of the Illinois Department of Transportation features both a committee (the Illinois Highway Development Council established in 1964) and a full-time Products Evaluation Unit (established in 1963 and located in the Bureau of Material and Physical Research) (4, 5). The Development Council is composed of bureau chiefs or their representatives from the Bureaus of Bridges, Construction, Design, Local Roads and Streets, Maintenance, Materials and Research, and Traffic; and district engineers or their representatives from the district that includes the Chicago area and from a downstate district. The Illinois Tollway is represented by a nonvoting member. The Engineer of Physical Research, under the Engineer of Materials and Physical Research, serves as chairman of the Council, and the Chief of the Products Evaluation Unit under the Engineer of Physical Research serves as secretary of the Council.

All new products submitted by vendors for evaluation (except those intended for compliance with existing standards or specifications, of interest to a single bureau, in need of special handling due to urgency of need, or produced internally) pass through the product evaluation system. Overall responsibility for new-product evaluation lies with the Engineer of Material and Physical Research. The Chief of the Products Evaluation Unit is responsible for the direct management of new-product evaluation activities.

A vendor may either approach the department or be invited to present a product. Any office may be approached, including the Executive Office, but the vendor is referred to the Products Evaluation Unit to fill out a “Preliminary Information for Products Evaluation” form and to submit supporting data.

A Background Investigation Engineer in the Products Evaluation Unit studies the material presented based on knowledge of the function or use for which the product is proposed. The engineer compares the physical and chemical properties and costs with those of materials already in use and contacts other agencies claimed by the vendor to be

using or evaluating the product in order to determine the validity of the claims and the experience of other agencies. Then, based on all the information that bears on the proposal, and assuming that the product has potential, the engineer summarizes the important features in a report for the members of the Development Council to study before a scheduled meeting at which the product is introduced (meetings are held at least three times per year). If the engineer finds the product to have little or no potential, it is screened from further consideration without going to the Council and the vendor is notified. Over the years, only about one product out of four has successfully passed this point.

At the meeting of the Development Council, the product is introduced by the secretary, discussion takes place in light of the various viewpoints represented on the Council, and a determination is made on acceptance, rejection, or need for additional evaluation. The additional evaluation may consist of laboratory testing, but more often will consist of field testing.

The Products Evaluation Unit is responsible for carrying out the recommendation of the Development Council. In the case of rejection, the evaluation is ended and the vendor is notified. If the decision is to conduct laboratory or field testing, the Product Evaluation Unit designs the tests and arranges for conduct of the test. In the case of field testing, FHWA approval is obtained if necessary, the construction is observed, and the necessary observations and measurements are made to evaluate the performance of the product. A Development Studies Engineer from the Products Evaluation Unit is responsible for the conduct of the tests and the final report.

At its first meeting after completion of the recommended testing, the Development Council again takes up the product and makes a final recommendation. By its constitution, all recommendations by the Development Council are subject to review by the Director of Highways before they are imple-

mented. However, it has become established practice to send to the Director for review and concurrence only exceptional decisions, such as those that affect long-standing practice.

When the Development Council recommends approval of a product, it is the responsibility of the Products Evaluation Unit to inform the proper bureau and then provide any needed assistance in implementation. Usually, a specification is prepared and sent, along with applicable back-up information, to the bureau most directly affected (usually the Bureau of Design). Formal policy statements, demonstration projects, and documentation of benefits from feedback have been used in addition to specification and operational manual changes to assist in implementation.

After each Council meeting the Products Evaluation Unit updates its Products Evaluation Circular and sends copies to each highway district, county, and municipality within the state; to the FHWA; and to members of the AASHTO Subcommittee on Materials. Change cards also are sent to the FHWA office that produces SPEL.

Follow-up observations of the service performance of approved new products are made routinely by Products Evaluation Unit staff members as part of the total evaluation process.

The Illinois Highway Development Council, since its beginning in 1964, has approved over 100 products that the Department has put to routine use. Many of these have been optional products that have increased competition in supplying items specified in contracts. Others have been new types of products not in use before, thereby permitting new and improved (and often more economical) construction procedures and higher levels of service.

An economic evaluation of the dollar benefits identified for three products in the FY 1977 product-evaluation program showed a total average annual dollar benefit of \$10,360,900 to be realized by the Illinois Department of Transportation and Illinois taxpayers. The benefit-cost ratio realized was 45:1 (6).



## INFORMATION EXCHANGE

### REPORTING RESULTS

Preparation of readable and usable reports of new-product evaluations is one of the most difficult procedures of the total new-product evaluation process. Much time and painstaking work are required to produce a comprehensive evaluation report. Nevertheless, clearly written and understandable reports must be compiled if full value is to be realized from new-product evaluations; even the most careful and thorough evaluations will not be of much value if not adequately reported.

Orderly and understandable reports containing appropriate documentation are not only of value to management in determining whether a new product should be adopted for use or rejected, but are also important to other agencies in selecting worthwhile products for use and in avoiding costly and unnecessary duplication of evaluation efforts.

Product evaluation reports can be expected to be scaled to some extent to the importance of the innovations with which they are concerned. Thus reports may range in size and scope from simple departmental memoranda and meeting minutes to comprehensive reports of major stature.

In response to an inquiry in the questionnaire concerning the probable usefulness of evaluation reports to other agencies in avoiding unnecessary duplication of effort, 19 agencies indicated that their reports usually were sufficiently comprehensive to prevent unnecessary duplication and 12 agencies indicated this to be only occasionally true.

There has been some concern that negative findings from new-product evaluations tend not to be reported in the same detail as positive findings. In response to an inquiry on this matter, of 31 agencies reporting, 25 noted no difference in the comprehensiveness of their reports between negative and positive findings. One agency indicated that reports of rejections may tend to be more comprehensive than reports of acceptances. It should be noted that thorough documentation and reporting of negative findings certainly can assist in avoiding disputes with vendors.

It has been reported previously in *NCHRP Synthesis* 23 (7) that, in the past, agencies have been hesitant to identify products that have performed poorly, the major concern being that legal action may be initiated against a department by a disgruntled vendor. It was further noted that those agencies with successful new-product evaluation programs maintain that the possibility of a lawsuit is merely a paper tiger. Replies to the questionnaire prepared for this synthesis concerning experiences with legal action in connection with adverse reports resulting from new-product evaluations support that finding. Of 34 agencies responding to this question, 32 reported that the problem had never arisen in their agencies. The other two agencies reported complaints being filed against them, all of which resulted in exoneration.

As discussed in Chapter 3, several agencies provide some protection in this respect by stating in writing an express

intent to consider the information from new-product evaluation as public information to be released at their discretion. One agency expressed the following viewpoint with respect to the release of adverse results from new-product evaluations:

It is generally understood by the vendor that a new-product evaluation applies to the product as reviewed by the agency, under conditions of test as conducted by the agency, and with respect to specific performance requirements as determined by the agency, that do not preclude acceptance by other agencies depending on their respective needs, intended use, and evaluation criteria. Frequently, the vendor is invited to view the end-result of an evaluation which usually is persuasive in itself.

### DISTRIBUTION OF REPORTS

For new-product evaluation reports to be useful, they must reach the people to whom they can be useful, including both those in-house and those in outside agencies with similar interests.

Of the 31 agencies responding to an inquiry about in-house circulation of new-product evaluation reports, 15 indicated that the reports are regularly circulated among central office and field forces. One agency reported regular circulation to central offices only, and another to evaluation committee members only. Two agencies reported occasional general internal distribution of new-product evaluation reports.

Only 5 of the 31 reporting agencies maintain lists of outside state highway and transportation agencies to which they regularly send reports of new-product evaluations. Reports of evaluations are made available as a matter of regular procedure to the Federal Highway Administration where federal funding is involved. The reports are also made available to other state highway and transportation agencies when requested.

Regular circulation of reports of new-product evaluations that result in rejections is not common. Only 1 of 30 agencies responding to this question circulates rejection reports to outside agencies on a regular basis; however, they are usually made available on request. One agency volunteered the information that, even though the situation had never developed, wide circulation would be given to any results that showed a hazard during the course of an investigation.

### STATUS LISTS

A considerable number of state highway and transportation agencies regularly prepare and internally circulate lists showing the status of the evaluation of each product in their new-product evaluation programs. Of the 31 agencies reporting on this matter, 21 routine provide general internal circulation of new-product evaluation status lists and 2 report

routine distribution only to new-product evaluation committee members. Only 4 agencies indicated routine distribution of their product status lists to other state highway and transportation agencies. One agency reported occasional outside distribution of its status listings.

### **SPECIAL PRODUCT EVALUATION LIST**

The AASHTO-FHWA Special Product Evaluation List (SPEL) has been published every other year since 1975. SPEL is the most comprehensive tabulation of information available to highway and transportation departments on new-product evaluations; in 1979 5,337 evaluations were listed. The information is provided by state highway department materials engineers and by the FHWA as an activity of the AASHTO Subcommittee on Materials. For the 1979 list, information regarding state evaluations was contributed by the materials engineers of 37 state highway and transportation departments.

Preparation and publication of the list was undertaken by the FHWA in response to concern expressed by state materials engineers that lack of communication regarding new-product evaluations was causing needless and expensive duplication of testing and evaluation efforts. The document lists each product by name; gives the name and address of the manufacturer; provides a short description of the product and its use; identifies the reporting state; gives the status of the evaluation (accepted, not accepted, and pending) and the dates of acceptance or nonacceptance; references the state identification of the evaluation; and provides remarks that pertain most often to reasons for nonacceptance. Products are divided into 24 categories (including a miscellaneous category) for tabulation. An alphabetical index names each product tabulated and gives the page(s) on which the tabulation can be found.

Because brief descriptions are necessary to keep the SPEL report within manageable limits, the greatest value of the document is as a lead to new-product evaluations completed or in progress in state highway and transportation departments. Details of the reported evaluations usually required for decisions regarding further evaluation or acceptance of the products must be obtained from the individual evaluators.

As part of the questionnaire survey addressed to materials engineers, detailed inquiry was made regarding agency interest in SPEL, and suggestions for improvements were solicited. Of 31 responses to an inquiry regarding utilization of SPEL in new-product evaluations, 20 agencies reported regular use and 10 reported occasional use. One respondent was not familiar with the document. With respect to the benefit derived from SPEL, of 30 agencies responding, 11 indicated SPEL to be regularly beneficial in new-product evaluations and 19 found it to be occasionally beneficial. None of the respondents familiar with the document indicated that it was rarely found to be beneficial.

With respect to the format of SPEL, 26 of 28 respondents indicated satisfaction with the format. The two agencies suggesting that the format could be improved appeared to be at least equally concerned with content (see below).

Of the 29 agencies responding to the question on the appro-

priateness of the information contained in SPEL, 22 indicated satisfaction and 7 offered suggestions for improvement. Five respondents noted that SPEL can reflect only the information provided by the state highway and transportation departments, and expressed concern that some agencies might not be as careful as desirable in reporting status changes. One agency reported that on several occasions follow-ups on specific new items showed unreported changes. This agency noted that after being reported in SPEL, products have been altered by manufacturers without a change in product designation, thereby raising the possibility that the reporting on some products may not reflect the current market edition of the product.

Other agencies expressed a need for more information on tests conducted, observations made and results obtained; on the basis for acceptance and rejection; and on the use made of the item, with benefits stated in terms of monetary, labor, and energy savings; and the inclusion of recommendations.

Although not suggested by any of the responses to the questionnaire, it appears that wider participation by state highway agencies in the compilation of SPEL (only 37 states submitted information for the 1979 edition) could add substantially to the completeness of coverage.

### **NATIONAL EXPERIMENTAL PROJECTS TABULATION**

The National Experimental Projects Tabulation (NEPT) summarizes data submitted to the FHWA on FHWA Form 1461 by states participating in experimental projects in the FHWA Experimental Construction Program. This document is prepared and circulated annually by the Experimental Projects Branch in the Construction and Maintenance Division, Office of Highway Operations, FHWA. The most recent issue of NEPT available at the time of the preparation of this synthesis is dated August 1980 and contains a number of changes from previous issues to facilitate the identification and evaluation of the experimental features covered.

In contrast to the 37 state highway and transportation departments providing information for inclusion in SPEL, all 50 states furnished information for NEPT; providing information to SPEL is voluntary, whereas submittal to the Federal Highway Administration of the information presented in NEPT is required by the joint agreement for federal participation.

Generally the information regarding evaluations provided in SPEL and NEPT is similar. However, many of the items included in NEPT appear to be in the category of experimental research rather than new-product evaluation. A cross-check of the items tabulated in the two reports showed little duplication, indicating that many of the items included in NEPT are not considered new products to be passed through new-product evaluation processes. Nevertheless, the responses to the questionnaire indicated that many agencies are finding NEPT useful in new-product evaluations.

Based on responses to the question on the use of NEPT in new-product evaluations and to the request for suggestions for improvement, it appears that NEPT is not as widely used as SPEL. Of 32 agencies responding to the questionnaire, only 5 indicated regular use of NEPT. Thirteen agencies reported occasional use, 10 reported rare use, and 4 were not

familiar with the document. Only 3 agencies found NEPT to be regularly beneficial in the new-product evaluation process; 18 indicated the document to be occasionally beneficial, and 5, rarely beneficial.

Of the 22 responses to the query regarding format, 19 agencies indicated satisfaction. No meaningful recommendations were made for improvement of format. And of the 22 agencies commenting on the appropriateness of the content of NEPT, 20 indicated satisfaction, 1 agency suggested the inclusion of recommendations, and 1 agency suggested that more complete reporting of information by the states would improve the content.

#### **OTHER SOURCES OF INFORMATION**

In response to the request on the questionnaire for sources of information in addition to SPEL and NEPT that have been found useful in new-product evaluations, the agencies did not disclose any sources unfamiliar to most personnel currently evaluating new products. The sources mentioned, in addition to new-product evaluation reports of other agencies, were the Highway Research Information Service summaries and other reports of the Transportation Research Board, trade association publications, and magazine reports of new products.

#### **COMPUTERIZED DATA BASE**

The Research and Development Division of the Oklahoma Department of Transportation has successfully developed a computerized new-products data base termed EXMT. The data base provides a user with the most current information about new products that is available to the Research and

Development Division. Computer terminals are located both in central offices and field offices of the department. Only the Research and Development Division has the capability for making changes in the new-products data program.

The program has been designed for use with video-type terminals and, although very time-consuming, can be used with printer-type terminals. Considerable use of the video system is reported.

The data base contains information similar to that contained in SPEL for about 1,000 products in various stages of evaluation and of interest in Oklahoma. Updatings are made quarterly and the entire output is printed annually.

#### **MAGAZINE REPORTS OF NEW PRODUCTS**

Based on a suggestion that communication of new-product evaluation results through reports in magazines with large circulation in the highway industry would be beneficial, the editors of representative magazines were contacted to obtain their views on the practicality of, and the potential interest in, published new-product reports based on user-supplied information. A high proportion of those contacted responded, and all expressed both the view that a receptive audience exists and interest in publishing such reports. In response to a request for observations on difficulties that might arise, several potential problems were mentioned but none appeared to be a deterrent. Among the possible problems mentioned were: (a) even though the reports are user supplied, probable continued commercial involvement would prevent total elimination of bias; (b) the potential for patent infringement; (c) unintentional revelation of "guarded" test data; (d) difficulty in getting necessary approvals; and (e) a general reluctance on the part of public officials to take controversial positions.

## FINDINGS AND RECOMMENDATIONS

Few would question the severity of the problem now facing highway and transportation departments of providing reliable and safe highways in the face of the opposing forces of declining revenues and increasing needs. The situation requires an aggressive and intensive search for means to achieve more at less cost. The problem must be approached on many fronts, not the least of which is improved application of existing technology. Fitting into this category is the intensified search for new and useful highway products. Costly developmental effort using scarce highway funds is not required, and the benefits, although perhaps not spectacular, can be substantial because of the large volume of products used in the construction, maintenance, and operation of highways.

This study indicates that in recent years many highway and transportation agencies have attempted to improve their new-product evaluations by adding structure in varying degree to what traditionally had been a largely informal process. The changes have been made with the expectation of providing a means for more quickly locating and identifying newly marketed products that can offer improved services and reduced costs and, at the same time, more quickly screen out those products that do not measure up to needs.

This study also reflects a fairly widespread belief that, at the middle and lower management levels directly concerned with new-product evaluation, new-product evaluation systems generally can be improved by additional structuring and greater input of funds and personnel. These changes require the understanding and support of top management. Full support of involved middle-level managers (division and district heads) also is necessary.

New-product evaluation, although practiced to some extent in all highway and transportation agencies, is probably a function that is almost invisible to top management in the majority of agencies where it is a part-time activity of forces generally engaged in preemptive operational work without separate budgeting and funding that can identify the cost of the activity. No doubt more effort could be directed in many existing organizations toward isolating for analysis the cost of conducting new-product evaluation programs.

Although most agencies can, and many agencies did in the survey, identify outstanding examples of success in new-product evaluations, it is apparent that little documentation exists to provide a measurement of the benefits that have accrued from new-product evaluations. The assembly of documentation showing the benefits being derived from the successful use of new products should be encouraged.

In a review of current new-product evaluation systems with the intent of introducing possible improvements, it is useful to recognize that the aims and processes of new-product evaluation and value engineering are similar in many ways, and that the already carefully structured and tested methodologies that characterize value engineering can serve

as a general pattern for new-product evaluation. A study of *NCHRP Synthesis 78 (3)* is therefore suggested.

When changes are proposed to top management to improve the efficiency and effectiveness of an existing product evaluation system, the recommendations should include carefully devised organizational and procedural plans and expected cooperative relationships. The advantages accruing from a system that more quickly identifies worthwhile new products to improve service and reduce costs should be expressed. The current paucity of documentation on the cost-effectiveness of new-product evaluations to support proposals for changes in the systems requires that some reliance will need to be placed on the faith of top management in the judgment of its middle management in the acceptance of recommendations for change.

All state highway and transportation departments are similar in many respects and face many of the same problems. However, differences are sufficient to make inappropriate the development of a standard organization or standards of procedure for new-product evaluation to fit the requirements of all agencies. With this in mind, the recommendations that follow are offered for consideration when existing new-product evaluation organizations and procedures undergo review; they are not offered as a total improvement package to be considered for adoption by all agencies.

### ORGANIZATION

In the past, new-product evaluation was usually handled in most state highway and transportation departments as a generally informal and nonstructured activity along with other work by forces of a potential user division, or frequently jointly by several user divisions. Because of a background of expertise in testing, the materials division of an agency very frequently was one of the participants in new-product evaluations, and often the prime participant. Many departments continue to conduct new-product evaluations under this traditional system.

However, a majority of state highway and transportation departments have developed modified systems by adding varying degrees of structure to these traditional systems in order to cope with the great expansion in the number and types of products being placed on the market in recent years, and also to improve the efficiency with which worthwhile new products are placed in use and ineffective products are screened out of consideration.

#### Traditional Organization

The traditional process for new-product evaluation requires no special organizational arrangement, which is one

of its advantages. Vendors may approach directly any division(s) where they believe some interest in their product may exist. If interest develops in any division(s), that is where the evaluation will take place as a user activity. The evaluation will be a part-time activity requiring no special forces, and can serve as a "fill-in" during periods of temporary work-load reduction.

Among the disadvantages of the traditional process of new-product evaluation is the difficulty of exercising overall control at the upper management levels because of the previously mentioned lack of visibility of the system at that level. The "out of sight, out of mind" precept can lead to lack of recognition at the upper management level of the potential value of an aggressive system of new-product evaluation. Other disadvantages include a potential for lack of uniformity in the prosecution and control of new-product evaluations when conducted under many managers; loss of follow-through and documentation during periods of staff or fund shortage because of preemption by operational programs; and the possible inadequate evaluation under individual managers with preference for the status quo or not attuned to the advantages of systemization in new-product evaluation.

#### **Modified Organizations**

All of the features that have been added in recent years to the traditional system of new-product evaluation to overcome some of its disadvantages have required organizational changes. In the great majority of instances, however, the changes have been limited to a redefinition of responsibilities. In only a few instances have organizational realignments or the addition or reassignment of personnel been involved.

Most highway and transportation departments, in adding any degree of structure, have promulgated the changes to their new-product evaluation systems by administrative memoranda or other types of official communication issued by top management. Thoughtfully prepared communications that not only detail responsibilities, but also spell out the cooperative relationships expected among divisions and between divisions and field offices, are important in avoiding later problems. Detailing the expected cooperative relationships can be of particular value in reducing the temptation to bypass established evaluation systems.

A simple change from the traditional new-product evaluation process is the assignment of the overall responsibility of assuring that proper action is taken on all new-product submittals to a single division head (usually materials) regardless of where the evaluation takes place. This division head is kept in the communication network until final disposition of a product. This change is advantageous in making certain that all evaluations are carried through to completion.

The focalizing of all vendor approaches in a single area, especially when accompanied by assignment of the responsibility for assuring proper action on all submittals, can improve the control of new-product evaluations. It can also reduce the number of unnecessary duplicative calls by vendors in several divisions.

New-product evaluation committees, usually consisting of division heads or their representatives from the divisions in-

involved, are being used successfully by a substantial number of highway and transportation departments. The use of committees can be advantageous in providing a ready means for multichannel communication across division lines, for disseminating information, and for bringing to bear the viewpoints of a variety of interests in the selection of products for evaluation. Most committees are designed to serve in an advisory capacity to top management, thereby offering opportunities to keep top management within the new-product evaluation communication network.

New-product evaluation as a full-time activity, practiced only in a few agencies at present, appears to offer the best opportunities for control, standardization, and pursuit of the evaluation process. It also offers, for the benefit of top management, the opportunity to apply budgeting and funding practices that permit the measurement of productivity and the benefits being derived from new-product evaluation. The use of full-time staff appears to have the best potential where the volume of evaluations is large.

#### **PROCEDURES**

Most new products submitted to highway and transportation departments for consideration for highway use enter a six-step process as identified in this report. No agencies accept products for evaluation unless vendors meet, or agree to meet, certain prescribed conditions. The process of the selection of products to be evaluated and the conditions for acceptance vary among agencies.

#### **Exclusions**

The modified new-product evaluation systems, with accompanying standardization of the evaluation process, generally are reserved for products meeting a number of predetermined conditions designed to avoid unnecessary use and overloading of the systems. Most agencies with structured systems exclude from the systems new products submitted for testing for compliance with existing specifications, plans, or standards, preferring to handle these through their long-established compliance testing systems. Also frequently excluded are products of interest to a single division and products not introduced through outside promotion. All of these exclusions appear to be appropriate providing that the systems can be made available for evaluating the normally excluded products upon request of interested parties.

Established systems are sometimes bypassed to obtain a quick answer where unusual urgency appears to exist for use of a new product, or where quick action is desired for other reasons. Bypassing of this nature should be held to a minimum, both to support those involved in the systems and to obtain maximum effectiveness.

#### **Requisites for Evaluation**

A few agencies state requisites for evaluation in writing before acceptance of a new product from a vendor for evaluation. Others consider that submittal and acceptance imply

consent to generally established requisites. Some agencies also state requisites in writing when notifying a vendor that his product has been accepted for general use. Additional use of written statements of requisites may be justified as a means for avoiding disputes with vendors.

In recognition of their responsibility to keep their activities within the public domain, highway and transportation agencies normally do not provide vendors with developmental assistance in establishing a need for a new product, or in expanding an idea or partially developed and untested product into a useful item. Before a new-product evaluation is undertaken, vendors are required to provide adequate documentation showing that a need exists for a submitted product, that the product has a good chance of filling the need, and that the product will be competitive with other products available to serve the same function.

All agencies conducting new-product evaluations appear to reserve the prerogative of determining the tests and test criteria for evaluation of a product. Only one of those surveyed, however, places this in writing as a condition for acceptance of a product for evaluation.

Only one agency sets down in writing the condition that the vendor must retain all liabilities for injury caused by a defective product as a condition for acceptance of the product for evaluation. Where a new product is incorporated as a construction feature, the standard "save harmless" clause of the overall project contract should apply.

A few agencies indicate in writing that acceptance of a product for evaluation is not to be construed as a guarantee of general use. Some agencies state this when a vendor is notified that his product has been accepted for use.

Several agencies will not undertake evaluation of a new product unless the vendor is willing to furnish the product at no cost; some require that the vendor also furnish labor and installation at no cost. Many agencies state in writing as a requisite for evaluation that the vendor be present during trial or installation of the product; others usually encourage the vendor's presence.

A few agencies express in writing, before acceptance of a new product for evaluation, that the results of the evaluation are to be considered public information to be released at the agency's discretion. Most agencies apparently consider this to be generally understood. However, a written statement is preferable as a means for quickly disposing of complaints from vendors about the release of unfavorable information about their products.

A considerable number of agencies inform vendors, when a product is approved for use, that approval is not to be construed as endorsement of the product and not to be used for advertising and promotional purposes without express permission of the agency.

#### **Evaluation Forms**

A majority of the highway and transportation agencies utilize forms as a convenience in obtaining from vendors, in a complete and orderly fashion, the information needed to make initial decisions regarding the potential value of new products. The form, to be signed by the vendor, is used to inform the vendor of the requirements for acceptance of new products for evaluation.

#### **Evaluation Process**

##### *Step 1—Initial Screening*

The initial screening of a new product begins with the hearing of a vendor's presentation and extends through a review of the documentation presented to support claims regarding the value of the product. This relatively straightforward part of the evaluation process is important in that it involves the first decision on whether a product should be rejected or receive further evaluation. Rejections should be made by knowledgeable people after careful consideration to avoid losses of worthwhile products. Well-prepared forms can be a particular convenience at this stage of the evaluation.

##### *Step 2—Preliminary Examination*

The second step of the evaluation process often produces a considerable volume and variety of information from an in-depth review of the vendor's documentation, contacts with other agencies evaluating or using the product, and study of other agency reports, research reports, and other pertinent literature. This review usually is assigned one or two levels below the division-head level where the second decision usually is made as to the future of the product. A well-prepared summary of the findings at this stage will have an important bearing on the correctness of the decision regarding acceptance, rejection, or further evaluation.

##### *Step 3—Detailed Evaluation*

The third step of the evaluation process includes the laboratory testing and field trials that are very often a part of new-product evaluation. This usually is the most time-consuming and expensive part of the evaluation process, and leads to the final decision on acceptance or rejection. Much care needs to be exercised in designing both laboratory test programs and field trials that will be sufficiently definitive to prevent further uncertainty with respect to a product's worth. Research skills can be of special value in developing acceptable experimental designs for field trials because of the number of uncontrollable variables likely to be involved.

Field trials can suffer from inadequacies in the observation and record-keeping processes. Irretrievable losses of performance data can result when other activities are allowed to interfere with observation schedules, or by assignment to inexperienced observers chosen on the basis of proximity to the trial installation.

Reports prepared at the conclusion of the detailed studies should be clearly written and contain the basic backup data on which acceptance and rejection are based.

##### *Step 4—Translation into Media of Practice*

The fourth step is the essential link between product study and product use. Involvement of evaluation forces in the preparation of the specifications, plans, standards, or whatever other medium is required for implementing use of a new

product, as practiced by most agencies, is preferable to simply handing over evaluation results to users, because this procedure is more effective in ensuring that a new product will be used as intended.

#### *Step 5—Implementation*

Evidence from the survey of practice indicates that the responsibilities and activities involved in the fifth step of the new-product evaluation process very often take place outside the communication networks established for new-product evaluation. Although the information can always be obtained for the asking, it would appear essential that evaluation communication networks include informing those responsible for evaluations of the use being made of approved products.

#### *Step 6—Performance Feedback*

The last step involves follow-up observations of service performance with feedback into the new-product evaluation systems. Some agencies routinely conduct performance surveys and provide for feedback on a regular basis; others receive performance information only when field forces observe and report back the development of problems. Regular observations and feedback can call attention to deficiencies for which adjustments can be made, or to products unable to perform as anticipated, before failure becomes widespread.

Also of importance is the potential of service performance studies for providing documentation of the benefits being derived from the use of new products and from the new-product evaluation systems. This use of service performance observations and feedback appears to be a particularly neglected phase of the new-product evaluation process, and a much more intensive effort in this area is recommended.

### **INFORMATION EXCHANGE**

Well-organized channels of communication within agencies regarding new-product evaluation and use are needed to receive full value from new-product evaluation systems. Also the regular exchange of information on new products among states and on a national basis can be a valuable asset in locating useful new products and avoiding unnecessary duplication in testing.

#### **Reports**

Orderly and understandable reports of new-product evaluations containing appropriate documentation are of great importance both to management within the evaluating agency in making correct decisions regarding the adoption or rejection of new products and to evaluators in other agencies in avoiding unnecessary duplication of effort. Thorough documentation and reporting of negative findings can be just as valuable as reports of positive results. Legal action over the release of negative findings has been an extremely rare experience, as reported by the agencies in this survey, and

has never resulted in an unfavorable court decision. Based on the results of the survey, it is suggested that reports of new-product evaluations, in general, be upgraded, with more emphasis on negative findings.

#### **Report Distribution**

About half of the agencies responding to the survey indicated regular internal distribution of new-product evaluation reports. However, only a few agencies routinely send their reports to outside agencies, and only one agency reported sending out negative reports regularly. It appears that all agencies make reports available upon request. It is suggested that agencies now circulating their reports minimally may find it advantageous to expand circulation. Cooperative agreements with other states for the exchange of product-evaluation reports could prove useful.

#### **Status Lists**

Records maintained by agencies of the status of items in new-product evaluation programs, if prepared regularly and kept current, provide a quick means for locating information on new-product availability. Most of the surveyed agencies reported preparation and internal distribution of periodically prepared new-product status lists for their own programs. Only a few routinely distribute these to other agencies. Based on the survey results, it appears that this feature of new-product evaluation could be improved. Regular exchanges of status lists with other states should be useful.

#### **SPEL and NEPT**

From the information obtained from highway and transportation departments with respect to the utilization of the AASHTO-FHWA Special Product Evaluation List (SPEL) and the National Experimental Projects Tabulation (NEPT) in new-product evaluation and the request for suggested improvements of the two documents, it appears that greater use is being made of SPEL than of NEPT and that agencies consider SPEL to offer greater benefits. However, as only 37 states currently contribute information to SPEL, it is suggested that its value as a nationwide summary of new-product evaluations could be greatly enhanced by additional state participation.

About two-thirds of the agencies regularly use SPEL in connection with new-product evaluations, and the other third use the document occasionally. About one-third of the responding agencies find it to be regularly beneficial, and two-thirds find it to be occasionally beneficial. The great majority of agencies appear to be satisfied with SPEL as currently published. A few noted that individual states are sometimes slow in updating the status of evaluations; more attention to this matter was recommended. Other agencies would like to see more information on observations made and results obtained, on the use that has been made of evaluated items, and on the benefits achieved. Further evaluation of these suggestions is recommended, with the limitation that any changes be consistent with the identity of SPEL as a status report.

It appears that NEPT is not used as widely as SPEL because a great many of the evaluations listed in NEPT are considered by agencies to be experimental research rather than product evaluation, and thus would not pass through the systems established for new-product evaluation. Only slightly more than half of the agencies indicated much use of NEPT in connection with new-product evaluation, and several were not even aware of the document. There were only two suggestions for improvement: that recommendations be included in the document and that state reports be more complete.

#### Other Sources of Information

Other sources of information being used in new-product evaluation include the Highway Research Information Service summaries and other reports of the Transportation Research Board, trade association publications, and magazine

reports of new products. Editors of magazines circulated in the highway industry expressed a willingness to publish, or publish more, new-product reports submitted by product users, and a general belief that a receptive audience exists for user-submitted new-product reports.

#### Computerized Data Base

A new-product evaluation computerized data base developed and placed in service by the Research and Development Division of the Oklahoma Department of Transportation, which contains information on about 1,000 products, is reported to be serving successfully. Computer terminals are located both in central and field offices of the department. Other agencies that have similar computer setups and are conducting relatively large volumes of new-product evaluations may also find computerization of evaluation data useful.

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## REFERENCES

1. "Special Product Evaluation List (SPEL)." Prepared by American Association of State Highway and Transportation Officials for the Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. (1979).
2. "National Experimental Projects Tabulation (NEPT)." Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. (1980).
3. Transportation Research Board, "Value Engineering in Preconstruction and Construction." *NCHRP Synthesis* 78 (1981) 23 pp.
4. Burke, J. E., "The Illinois System of Evaluating New Highway Products, Materials and Procedures." *Highway Research News*, No. 27 (Spring 1967) pp. 52-55.
5. Illinois Department of Transportation, "The Products Evaluation Unit." *Research News Digest*, No. 3. (July 1981) pp. 1-3.
6. Illinois Department of Transportation, "Physical Research Program Evaluation FY '77." (June 1977) 13 pp.
7. Transportation Research Board, "Getting Research Findings Into Practice." *NCHRP Synthesis* 23 (1974) 24 pp.



# APPENDIX A

## TYPICAL CHARTERS FOR NEW-PRODUCT ADVISORY COMMITTEES

Iowa Department of Transportation

### POLICIES AND PROCEDURES MANUAL



SUBJECT		POLICY NO.
Products Evaluation Task Force		420.03
RESPONSIBLE DIVISION(S), OFFICE(S)	RELATED POLICIES & PROCEDURE	
Highway Division, Office of Materials		
EFFECTIVE REVISION DATE	APPROVED	
10/22/69 2/10/78	<i>[Signature]</i>	

- I. Affected Division(s), Office(s): Highway Division, All Offices
- II. Policy Statement and Purpose: The purpose of this policy is to describe the composition and duties of the Products Evaluation Task Force.
- III. Authority: This policy is established by authority of the Director of the Highway Division.
- IV. Definitions: None
- V. Summary of Responsibilities: A Products Evaluation Task Force is charged with the responsibility of insuring that new highway products that have been developed are brought to the attention of the appropriate office of the Highway Division and that the products receive thorough and fair evaluation.
- VI. Procedures: The composition of the Products Evaluation Task Force and its operating procedures are:
  - A. Information concerning new products shall be referred to the Task Force secretary, who in turn shall furnish the Task Force with information on the proposals received.
  - B. New products, materials, and procedures which relate primarily to a specific office of the Highway Division are the responsibility of that office; however, the Task Force shall review such items upon request.
  - C. The Task Force shall be composed of the following members:
    1. Research Engineer, Chairman
    2. Specifications Engineer, Secretary
    3. Road Design Engineer
    4. Bridge Design Engineer
    5. Materials Engineer
    6. Construction Engineer
    7. Maintenance Engineer
    8. Secondary Roads Engineer

The Task Force may consult with other technical experts in the Department.

Policy No. 420.03

- D. The Products Evaluation Task Force shall provide recommendations concerning the potential use of new products, materials, and procedures that are proposed or developed for use in the highway field, including proposals for the implementation of recommendations from research and development. Recommendations shall include:
1. Immediate adoption.
  2. Rejection.
  3. Field trial for further evaluation.
  4. Investigation by the Office of Materials laboratory.
  5. Referral to the Research Section, Office of Materials, for formal research and development.
  6. Referral to the initiator for additional information.
- E. The Products Evaluation Task Force shall serve in an advisory capacity; it shall not have administrative or executive functions.



## DEPARTMENT OF TRANSPORTATION

## ADMINISTRATIVE DIRECTIVE

No.	9.020-A
Page	1 of 2

SUBJECT MATERIALS COMMITTEE	EFFECTIVE DATE 3/19/82	APPROVAL <i>Amel Canby</i> Commissioner of Transportation
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I. PURPOSE

To redesignate the Materials and Construction Procedures Committee as the Materials Committee and to restate its membership, objectives, and functions.

II. SUPERSEDES

Administrative Directive No. 9.020

III. MEMBERSHIP

The Materials Committee consists of a Chairman, notably the Chief, Bureau of Quality Control, a secretary to be appointed by the Chairman, and representatives from each of the following operating units:

- . Division of Construction & Maintenance
- . Division of Design
- . Division of Research & Demonstration
- . Division of Transportation Operations & Local Aid

IV. CHAIN OF COMMAND

- . Director of Engineering & Operations
- . Chief Engineer, Construction & Maintenance
- . Chairman, Materials Committee

V. OBJECTIVES

The Materials Committee meets as required:

- A. To consolidate the input of new processes and materials through a committee of knowledgeable individuals so as to eliminate redundant evaluative effort.
- B. To screen vendors to insure that the various NJDOT operating units are presented with legitimate solutions to materials related operating and construction problems.

VI. FUNCTIONS

- A. Insure that the prospective vendor demonstrates that his product serves a need of the NJDOT.
- B. Insure that in no case does a prospective vendor attempt to place with the NJDOT the responsibility for developing a use for his product.

**ADMINISTRATIVE DIRECTIVE**

<b>SUBJECT</b>  MATERIALS COMMITTEE		<b>No</b> 9.020-A
		<b>EFFECTIVE DATE</b> 3/19/82
		<b>Page</b> 2 <b>of</b> 2

V. FUNCTIONS (Cont'd)

- C. Evaluate prospective vendors on the basis of ethical, moral, and professional considerations.
- D. Evaluate all proposals involving new products, materials, or processes and render a decision as to their acceptability.
- E. Publish all findings involving new products, materials, or processes if found acceptable, allowing for all appropriate operating units to become aware of their existence.
- F. Decide which proposals satisfy an existing or future need, or which offer improvement over currently used products, materials, or processes.

## APPENDIX B

### NEW-PRODUCT EVALUATION FORMS

Research Section File \_\_\_\_\_

#### ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

#### PRELIMINARY INFORMATION FOR PRODUCT EVALUATION

Instructions - Answer all questions. Where a question is not applicable, enter "N/A".  
Attach extra sheets if needed. Refer to item number when explaining any item.

1. Trade Name \_\_\_\_\_  
 Manufacturer \_\_\_\_\_  
 Address \_\_\_\_\_ Patented? Yes \_\_\_\_\_ No \_\_\_\_\_ Applied for \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_
2. Local Distributor \_\_\_\_\_  
 Address \_\_\_\_\_ Phone No. \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_
3. Background description of company and its product: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
4. Recommended Uses - Primary \_\_\_\_\_  
 \_\_\_\_\_
5. Recommended Uses - Alternate \_\_\_\_\_
6. Outstanding Features or Advantages Claimed \_\_\_\_\_  
 \_\_\_\_\_
7. General Composition of Material (Attach laboratory report when applicable) \_\_\_\_\_  
 \_\_\_\_\_
8. Date Introduced on Market \_\_\_\_\_ Alternate for What Existing Product? \_\_\_\_\_  
 \_\_\_\_\_
9. Cost Per Unit Material? (F.O.B. \_\_\_\_\_) \_\_\_\_\_
10. Cost Per Unit in Place? (F.O.B. \_\_\_\_\_) \_\_\_\_\_
11. Material Specifications Furnished by Manufacturer? Yes \_\_\_\_\_ No \_\_\_\_\_ To be Mailed \_\_\_\_\_  
 Plans, Sketches, Etc. Furnished by Manufacturer? Yes \_\_\_\_\_ No \_\_\_\_\_ To Be Mailed \_\_\_\_\_  
 Instructions for Installation Available? Yes \_\_\_\_\_ No \_\_\_\_\_ To Be Mailed \_\_\_\_\_
12. Product Availability: Seasonal \_\_\_\_\_ Non-Seasonal \_\_\_\_\_ Delivery at Site Within \_\_\_\_\_ Days After Receipt of Order.

13. Does product meet requirements of following specifications? (Give Specification Number)  
 AASHTO \_\_\_\_\_ ASTM \_\_\_\_\_ Fed. Spec. \_\_\_\_\_ Ark. \_\_\_\_\_ Others \_\_\_\_\_
- 
14. Is product approved for use by other highway authorities or other agencies? (State by whom used and whether use is routine or experimental only) \_\_\_\_\_
- 
15. Has another office of Arkansas State Highway and Transportation Department been contacted?  
 Yes \_\_\_\_\_ No \_\_\_\_\_ Which Office? \_\_\_\_\_ When? \_\_\_\_\_
- 

#### STATEMENT OF CONDITIONS FOR NEW PRODUCT FIELD EVALUATION

In the event a Field Evaluation is deemed necessary the following conditions will apply:

- I. Product Evaluation will be in accordance with applicable laboratory testing and field evaluation criteria which shall provide a true test of the product's stated characteristics and application. Such criteria shall be determined by AHTD staff.
- II. Acceptance of a product for evaluation by the AHTD is in no way a commitment to purchase, recommend, or specify the product investigated regardless of its performance.
- III. The supplier or his representative will be requested to be present when the product is installed at the test site to lend assistance and provide his expertise to those involved in the installation. He shall also provide any special equipment necessary to the installation, provided such equipment is not supplied by AHTD.
- IV. The AHTD will prepare a summary report upon completion of a suitable evaluation period to allow adequate exposure of the product to its functional environment.
- V. Data resulting from an evaluation of the submitted product is public information and will not be considered privileged. As authorized by the signature below, all information developed during this product evaluation may be released by the Arkansas State Highway and Transportation Department at its discretion.

\_\_\_\_\_  
 Supplier's Authorizing Agent (Signature)

\_\_\_\_\_  
 AHTD Representative (Signature)

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

After completion of this form, it should be forwarded to the Research Manager, Arkansas State Highway and Transportation Department, P. O. Box 2261, Little Rock, Arkansas 72203.

## NEW YORK STATE DEPARTMENT OF TRANSPORTATION

APPLICATION FOR PRODUCT EVALUATION OF

(Trade Name)

*The purpose of this application form is to provide the Department with information about the product being submitted for evaluation. This application procedure is intended only for those products which are not covered by specifications, plans, or other Department standards. The product manufacturer or his representative shall complete the form accurately and thoroughly, and send it to the address shown below. The person submitting the application for product evaluation will be notified by the Department as to what action it intends to take on the submitted application.*

Director  
Materials Bureau  
New York State Department of Transportation  
1220 Washington Avenue  
Albany, New York 12232

Name of NYSDOT staff member supplying this form: \_\_\_\_\_

Subdivision: \_\_\_\_\_

Date: \_\_\_\_\_ Phone: \_\_\_\_\_

Name and title of person completing this form: \_\_\_\_\_

Date: \_\_\_\_\_ Phone: \_\_\_\_\_ Manufacturer \_\_\_\_\_ Representative \_\_\_\_\_

*Please answer all questions; if not applicable, write "NA"*

Product Name: \_\_\_\_\_ Patent No.: \_\_\_\_\_

Manufacturer: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Representative: \_\_\_\_\_

Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Primary recommended use: \_\_\_\_\_

Alternate recommended use: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Briefly describe background of manufacturer and product: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Describe product, material, equipment, or process\*: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Material composition\*: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Outstanding features or advantages\*: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Approximate cost (specify units): \$ \_\_\_\_\_ per \_\_\_\_\_

Royalty cost: \$ \_\_\_\_\_

If product, material, equipment, or process meets requirements of specifications or standards of one of the following, identify:

AASHTO	_____	_____	_____
ASTM	_____	_____	_____
FEDERAL	_____	_____	_____
NYS DOT	_____	_____	_____
Other	_____	_____	_____

\*Note: Product literature may be substituted when the literature contains all the requested information.



*Cite use by other agencies and persons to be contacted concerning experience with use, including how many years used, and whether use has been experimental or routine (list names, titles, mailing address, and phones):* \_\_\_\_\_

*Note here and attach any test results, reports, etc., from the organizations above:* \_\_\_\_\_

*Please answer the following by placing an X in the appropriate box:*

Yes    No

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Can demonstration be provided?  |
| <input type="checkbox"/> | <input type="checkbox"/> | Are <input type="checkbox"/> movies or <input type="checkbox"/> training courses available?   |
| <input type="checkbox"/> | <input type="checkbox"/> | Can <input type="checkbox"/> plans, <input type="checkbox"/> drawings, <input type="checkbox"/> pictures be furnished by manufacturer?<br><input type="checkbox"/> attached <input type="checkbox"/> to be mailed |
| <input type="checkbox"/> | <input type="checkbox"/> | Can material specifications be furnished by manufacturer?<br><input type="checkbox"/> attached <input type="checkbox"/> to be mailed  |
| <input type="checkbox"/> | <input type="checkbox"/> | Are instructions or directions for installation application, or use available? <input type="checkbox"/> attached <input type="checkbox"/> to be mailed  |
| <input type="checkbox"/> | <input type="checkbox"/> | Is availability seasonal?   |
| <input type="checkbox"/> | <input type="checkbox"/> | Are quantities available limited?   |
| <input type="checkbox"/> | <input type="checkbox"/> | Can samples be provided <input type="checkbox"/> free or <input type="checkbox"/> at cost for laboratory testing?   |
| <input type="checkbox"/> | <input type="checkbox"/> | Can samples be provided <input type="checkbox"/> free or <input type="checkbox"/> at cost for field evaluation?   |
| <input type="checkbox"/> | <input type="checkbox"/> | Will manufacturer provide <input type="checkbox"/> free or <input type="checkbox"/> at cost for test installation of material in the field?   |
| <input type="checkbox"/> | <input type="checkbox"/> | Is product guaranteed? <input type="checkbox"/> copy attached <input type="checkbox"/> to be mailed   |

*Who recommended contacting the New York State Dept. of Transportation?*\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

*Who else has been contacted within this Department?*\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

*Use remaining space for additional comments.*

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