

Research and Risk: How to Beat the Odds

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It seems fashionable today to be skeptical of the value of research and development, and transportation agencies appear to be no exception. Many administrators believe that research and development by its nature is a risky business where the payoffs are nebulous, relevance unclear, and value uncertain. Individuals engaged in research and development activities are often perceived as better utilized in and for other agency functions. Even though the Surface Transportation Assistance Act of 1982 provides more funding (through HPR and other categories) for research and development in transportation, states may have difficulty finding even the relatively low (15 percent) matching funds required, or justifying the additional expenditure. In some states, therefore, this money may go begging. In times of fiscal crisis, research is usually the most difficult item to justify, the first to be cut or re-

Feature

duced, and the last to be restored. There is some, but not much, truth in this view.

Research involves critical investigation, evaluation, or experiment with the purpose of revising currently accepted conclusions and/or improving practice or procedures in the line of new facts or insights. It is, certainly, exploratory, investigative, and, to some extent, risky. The most successful users of research, however, do not reject it on these grounds. Rather they act to reduce the risks and beat the odds against success. Here's how it might be done.

REDEFINE RESEARCH

First, a more realistic view of research as a generation of usable products is required. The commonly held view (see Figure 1) depicts research as problem solving, producing results or answers that are usable and implementable. The value of research is, simply, whether the dollar savings from the implementation of findings is greater than the cost of the

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research. The problem with such a model is that credit or blame is assigned solely to the research function when, in truth, it ought to be partly assigned to other elements of the agency's structure. There is risk in research—but not entirely the risk of the failure of the research itself. It is more likely to be the failure to utilize results due to barriers in implementation. Implementation and subsequent use of findings are generally the responsibility of other groups in an agency (or possibly other agencies)—not the research group itself. In the administrative transfer of findings, institutional constraints often limit the implementation of what might otherwise be usable findings. A broader view of the research equation (see Figure 2) recognizes the elements of risk but clarifies where this risk lies.

RECOGNIZE RISKS

Second, reducing risks and uncertainty can occur by taking prudent steps in each phase. For instance, identification and selection of problems are fraught with risk. Many need attention, but not all are relevant to agency goals. Some can-

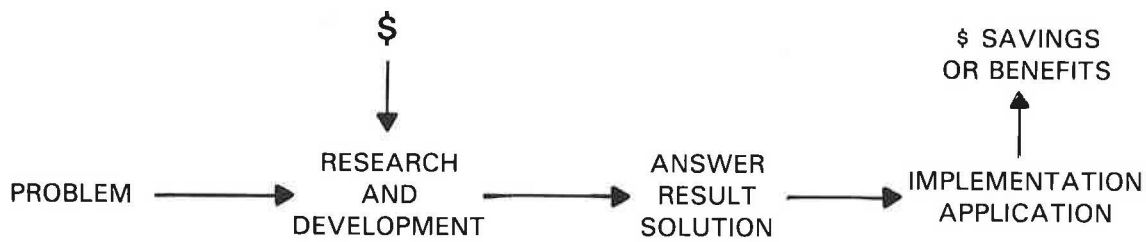


Figure 1. The research equation.

not be addressed with the human resources or financial constraints of the organization. Others may be done better by other groups. Even when proposed projects pass these tests, their potential payoff and the likelihood of success are difficult to assess in advance.

Research itself is never as straightforward as one anticipates. Planned procedures sometimes do not work, anticipated relationships are not discovered, and experiments occasionally fail or must be discontinued. Staffs may change or be drawn off on other projects. Equipment may not operate correctly. In addition, results may be inconclusive or serve largely to substantiate current practice. The mere initiation of research activity does not necessarily mean that the research will be completed, or that, if completed, results will be generally satisfactory.

REVIEW RELEVANCE

Project selection and definition can be made more relevant to agency needs by early and thorough involvement of the client in the identification and review of potential projects. For example, groups that have a strong focus on client input, both in problem identification and in program development, assure relevance to client concerns, improve client commitment to the use of product results, and permit periodic modification. Generally, research programs in which project suggestions are generated largely from client needs are less likely

to suffer decline when funding must be cut back. However, to ensure that fresh ideas are considered and that potential issues are not overlooked, the agency should allow for input of externally generated ideas as well. A balanced pool of suggestions from a variety of sources seems the best overall strategy.

DIVIDE AND CONQUER

One way to increase the use of research results is to pre-structure projects into different types. For instance, one often hears the terms, "basic research", "applied research", and "synthesis". Basic research is generally evaluated along broad, longer-term lines; the availability of an immediately useful product appears less important initially. However, such research also might not justify a large financial commitment, particularly from a goal-oriented client. Applied research is generally focused on putting previously obtained results into practice or searching for answers to specific problems. It contains activities for which completion of results is likely to lead to improvements in procedures and methods. Syntheses or compilations, on the other hand, may be most appropriate for those projects in which it is believed that current knowledge is generally adequate but that dissemination or other implementation methods are necessary to move results into practice. As an example, the National Coopera-

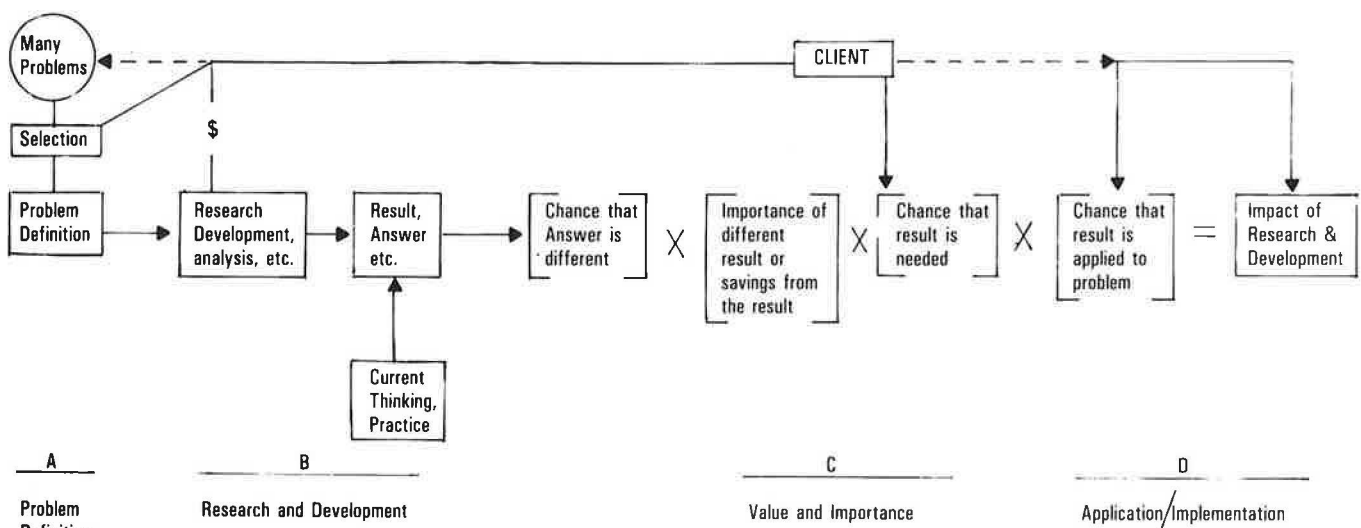


Figure 2. The research and development equation expanded.

tive Highway Research Program (NCHRP) focuses on applied research and synthesis. Although it does not specifically fund basic research, many of the issues raised by NCHRP project findings are used by others in developing basic research programs. This is because the findings of applied research often identify and highlight gaps in knowledge where the basic developmental work is necessary.

Not all research and development should be done by all transportation agencies. Figure 3 suggests that the most appropriate role for the federal government is to do the basic work necessary to develop solutions at the state and local level, and to synthesize the broad range of literature or "best practice" at the national level. Results of such studies can then be passed on to potential clients at the state and local levels. The appropriate role for states, on the other hand, is the translation of methods and findings into practical solutions for their problems. This should be supplemented by a smaller basic research program to round out national issues and study local problems of less-than-national importance. The New York State Department of Transportation, for instance, has traditionally maintained a strong applied planning research program that focuses on the application of methods developed by others to New York's own problems. In New York's program, syntheses are primarily state-based and locally focused.

Once partitioned, separate research and development programs then can be developed for basic, applied, and synthesis

programs. Staffing levels, suggested location, and funding decisions flow more easily from a clear understanding of the function of each program. Many successful research programs contain elements of each type, with most resources going into applied research. Centralization of critical or unique human and physical resources, and reasonable autonomy from crisis atmosphere, have been found to be important ingredients in a successful research program.

ENSURE A NEED

Even if research findings are clear and point to new methods, subsequent client use will depend on the perceived importance of the findings to client goals. Much research fails in implementation because perception of the importance of the findings is low, or the demonstrable savings are not large. Between the time the research starts and the time the work stops, agency priorities may change. As a result, the need for such results is limited to a small (or different) set of clients.

Client input in identifying important pieces of research that need answers has been found to be an extremely successful way of ensuring that research findings get used. Reduction of lead time between project initiation and availability of results is a critical element of this process. A three-level structuring of research projects, as described here, has often been found useful in classifying projects and, thereby, in im-

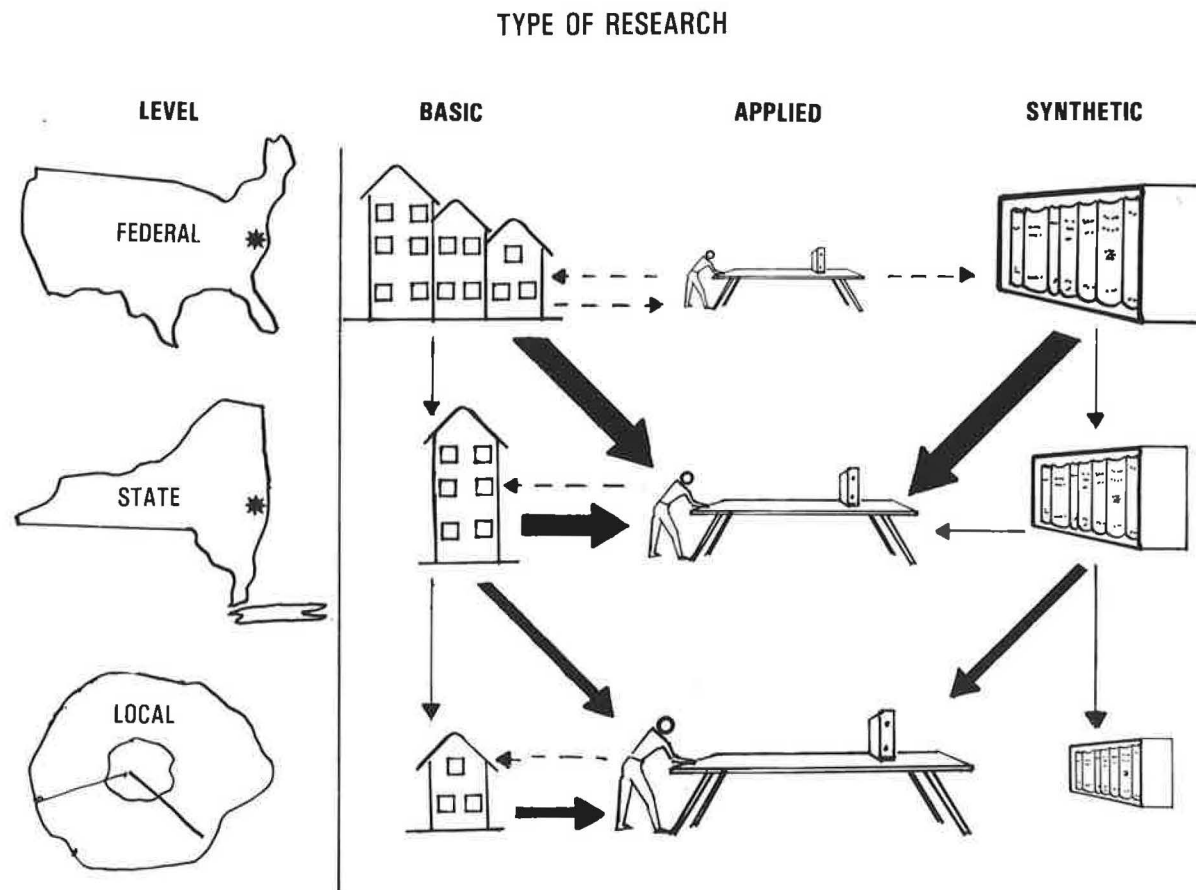


Figure 3. The transportation research hierarchy.

proving their usefulness. To the extent that we can improve the chances that the results will be needed at the time they are available, we may also then increase the return of the research investment.

TRACK THE TRAINING

Application of research findings to practice is by no means assured. Institutional barriers between the research group and agency operating arms, lack of availability of funds for full implementation, diffuse responsibility for implementation, complexity of findings or obtuseness of results, and narrow reporting and follow-up are some of the primary factors that reduce the dissemination of research findings. Many studies fail at this point because funds are not available to push them forward, to train clients in the use of the results, and to further disseminate findings through information channels of the client agency. It is unfortunate that many research programs, both at the state and federal levels, view implementation as a phase beyond the conclusion of the research; this phase, often left to "training", is perhaps the most critical of all in ensuring the use of findings and the least integrated into the research process.

COMMIT THE CLIENT

The risks of failures may be reduced by direct client involve-

ment in the implementation process. This means that the client must be committed to the research findings—that is, the client must view the findings as both relevant and important to the needs of the agency and worth the effort to move forward. Field studies and demonstrations, training, working-level dissemination processes, case examples, etc., may reduce failure at this point. Research should not continue in a vacuum; on the contrary, its strength and value to client agencies will be largely dependent on their perception of the relevance of the research products to ongoing needs. A balanced program that recognizes the importance of selected basic studies, as well as a strong focus on applied research and consolidation or synthesis studies, generally has been found to produce the most useful results.

CONCLUSION

Yes, research is risky. But the probability of successful implementation may be increased at various points in the research process. Managers should look at research in a structured and partitioned way and should take deliberate internal and external actions to reduce the risk of failure at each point in the research process. This implies a commitment to the value of research. With this commitment and a willingness to utilize research findings when demonstrated to be relevant, it is likely that programs will continue to survive.

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