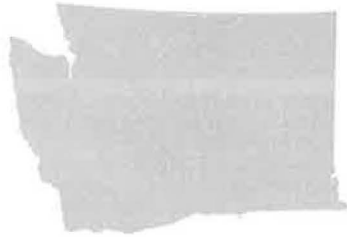


# HIGHWAY RESEARCH MANAGEMENT

## The Washington State System



Hollis R. Goff

The highway research management policy of the Washington State Department of Highways reads as follows:

... to encourage the advancement of highway engineering and transportation through a program of research recognizing the benefits of operations which may result from these research efforts and to assign a high priority to research and the implementation of its results so that these benefits may be realized as soon as possible.

That the highway commission and the department are committed to carrying out the policy is indicated by their willingness to commit an average of \$400,000 per year to research during the past 5 years. Even in these times of reduced revenues, \$500,000 has been programmed for fiscal year 1975. This represents a substantial amount of state funds in addition to the federal HP&R funds.

Three specific research objectives carry out the department's policy and support national research goals: to improve highway planning, design, construction, and maintenance as part of the integrated transportation system in the state of Washington; to advance the role of highway transportation in promoting good land use and urban development by improving the safety, service, and operation of existing highway systems; and to foster the integration of highways into the community through improved identification and measurement of social, political, economic, and aesthetic factors in highway transportation.

The tasks required to accomplish these objectives are identify highway needs; manage and conduct research projects and programs; monitor past and current research and distribute findings as appropriate; evaluate new procedures, techniques, materials, and products; and oversee the application of research results.

In carrying out these objectives and tasks, the department conducts research in problem areas related to its

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*A research technician operates the conductivity test apparatus used to evaluate bridge deck waterproofing membrane systems in the laboratory of the Washington State Department of Highways.*

own particular highway transportation operations and encourages NCHRP or FCP to undertake those programs having regional or national implications.

To solve problems that arise in one of the functional areas of planning, design, construction, maintenance, and management in a timely, economic, and effective manner requires that a research management program be established and that the program involve the highway engineer or other professionals deeply enough in the specific research project so that they can produce meaningful and applicable results but be relieved of the administrative details associated with research such as budget, proposal preparation, and funding. Washington has established a research administrative organization, a policy guidance body, and a means whereby all department personnel may participate in the research program.

Organizationally, the Research Division is under the department's assistant director for planning, research, and state aid (PRSA). The assistant director acts as the research program manager for the department and serves as the chairman of the advisory committee. He is the official highway research coordinator with all government and private agencies. He is responsible for monitoring research and recommending changes in policy and procedures to ensure timely incorporation and use of research results in the department's operations and the establishment of priorities. The principal functions of the Research and Special Assignments Division are as follows:

1. Administer the research program, considering recommendations by the Research Advisory Committee and policy decisions of the department's assistant director and director;
2. Prepare the annual research work program and supporting budget;
3. Coordinate activities with the Transportation Research Board and other outside research agencies and activities;
4. Develop and promulgate instructions pertaining to research, including the Research Manual, and distribute

- research results within and outside the department;
- 5. Provide liaison between PRSA and all other department agencies pertaining to research matters; and
- 6. Monitor and promote implementation of research findings from any source.

The department established the Research Advisory Committee to assist in the development of policy; evaluate the requirements for research and recommend project priorities; review and evaluate research program progress, accomplishments, and management; and review and evaluate the results of the research. The committee consists of each of the assistant directors of construction and materials, highway development, management services, toll facilities, maintenance and administrative services; 2 district engineers; and the deputy director who is an ex officio member. The director of highways appoints the 2 district engineers on a yearly basis, one from each side of the Cascade Mountains. The highway librarian, public information officer, FHWA representative, and others who have an interest are invited to attend all meetings. This committee meets quarterly, or more often if the need arises.

The committee provides a forum for discussion and review of the progress of research. It allows the researcher or potential researcher an opportunity to present ideas, exchange information, and discuss problems.

The department's Research Manual provides guidelines for nondepartment and department personnel who are interested in doing research on a specific problem or who may have a better way to perform a function. The manual also defines the responsibilities of the various staff positions in the Research Division and of other

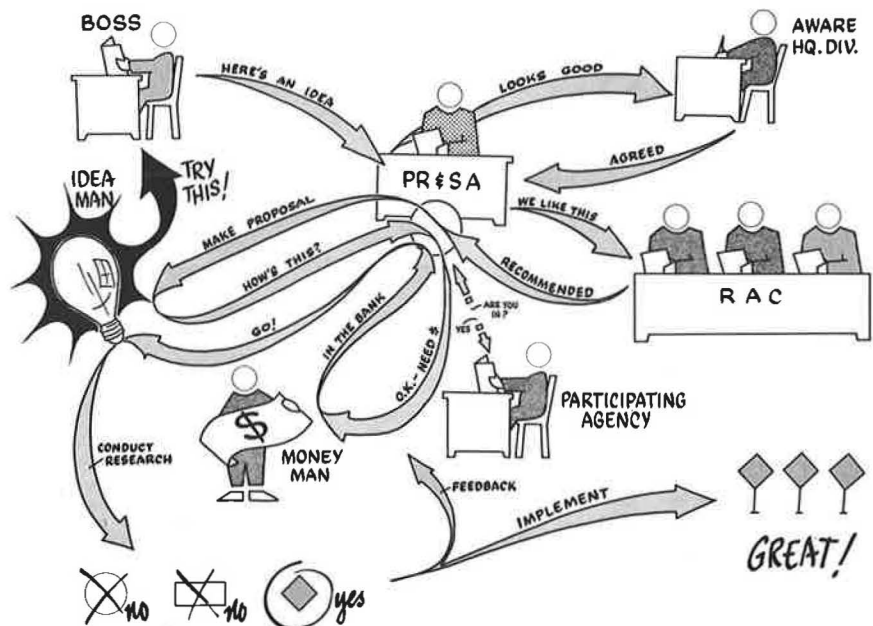
positions in the department as they relate to the research program.

Figure 1 shows the flow of activities from the beginning of an idea to the implementation of results. The manual clearly enumerates the various steps in the development of a project proposal and gives guidelines for evaluating the proposed research project.

The department conducts all research studies in-house except when the necessary skills or equipment are not available within the department. Research studies performed by department people tend to produce solutions that can be readily implemented in the department. If the necessary resources are not available in-house, the department normally looks to the 2 state universities or to a nonprofit institution to undertake the research and, if necessary, to the private sector.

Close liaison is maintained by the Research Division staff as the research progresses; periodic reviews are made to provide the department and the researcher the opportunity to discuss progress and become better acquainted with each other's respective needs, objectives, and areas of concern. These reviews are the surveillance visits to each project at approximately 3-month intervals by either the division or department representatives. In addition, annual review sessions are attended by department representatives and representatives of FHWA, industry, or other research agencies if they are involved as sponsors or contributors.

Quarterly reports and a final report are required on each research project. The final report completely documents all technical data and analyses including research findings. Copies of the final report are customarily sent to the state library system, all other states, various techni-



PROJECT LIFE CYCLE





*State Capitol and Office Buildings,  
Olympia, Washington*

cal information services, and FHWA (if it participates) for further distribution.

The most important aspect of managing an active research project is to be sure that the department's principal investigator fully understands the problem being researched, is knowledgeable of research procedures, and has adequate time and resources to properly manage the research project.

Other areas that require close attention and adequate management are ensuring that schedules are maintained and that the research is productive and is not being carried on by the researcher just to have something to do. Disposition of equipment purchased under the research agreement is also important. The research manager must be sure that there are adequate funds for preparing and publishing a final report.

Other important phases are making the literature search, collecting of research documents, and communicating.

Close liaison maintained by the research administrative staff, the highway department technical librarian, and the 7 districts assists in stimulating interest in research programs, results, documentation, and implementation.

Implementation of research results is the key measure

of the success of research. Some research cannot be directly implemented, and some results in negative findings. Many times research results are implemented piecemeal during the research process. Most research conducted for and by state highway departments is to solve problems and, therefore, produces solutions that can be applied.

Implementation of these solutions will normally result in changes in design criteria, specifications, operating or administrative procedures, organization or equipment and other material changes, or changes in technical and professional qualifications of personnel involved in various department activities.

Resistance to change seems to be inherent in all operations; therefore, a "selling" job is sometimes necessary before changes are possible. Managers, who must make the decisions to change, need to be kept informed of progress in research so that changes can be planned for. The means by which this is accomplished is a continuing information program through the Research Advisory Committee and the research and technical coordinator, liaison visits by the research staff to all operating activities of the department, and training of personnel as part of the research project.