“How To” Calculate the Value of Research

A white paper developed for AASHTO committees to provide guidance on research-related activities.

Given limited research funding in transportation and increasing questions about the benefits of research, it is absolutely critical to demonstrate the value of research that is conducted. In doing this, we help to ensure future research funding. This value should be expressed in both qualitative and quantitative terms, as appropriate. This is not an easy task. Documentation of the value of research needs to begin in the early stages of the research cycle. It needs to be planned for so that any data needs are addressed early and opportunities are not missed.

1. Background

The Value of Research (VoR) can be calculated in many ways and can be determined for any research project. Value can turn the subjective into the objective, which can often turn uncertainty into support. It also builds stakeholder support for projects and to further research if new phases or possibilities arise. Determining value assists practitioners in investigating benefits that might not have seemed obvious at project inception and thereby identify new advocates. Below is just one example of how the VoR can be calculated for a research project.

While you will not likely determine the value of research projects, your expertise will be needed by your research manager who may lead the effort to determine the value of research. You may provide assumptions, estimates of money and time savings, and other data that is key in determining the value of research.

2. VOR Benefits

The Project Lead will select and “define” the qualitative (Qual) and Economic (Eco) benefit areas based on its association to the project during the proposal period. A few examples of benefit areas are listed below:

<table>
<thead>
<tr>
<th>Benefit Area</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Satisfaction</td>
<td>Qual</td>
</tr>
<tr>
<td>Environmental Sustainability</td>
<td>Qual</td>
</tr>
<tr>
<td>Reduced Construction, Operations, and Maintenance Cost</td>
<td>Eco</td>
</tr>
<tr>
<td>Increased Service Life</td>
<td>Eco</td>
</tr>
<tr>
<td>Engineering Design Improvement</td>
<td>Both</td>
</tr>
<tr>
<td>Safety</td>
<td>Both</td>
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3. Value of Research Calculations

For the economic selections, variables should be defined (i.e., man-hours, crash and/or severity reduction, life-cycle costs) and details given on how they were determined. The expected value and expected value duration should be included for each. The Net Present Value of all benefit areas is then determined using a Federal discount rate. An aggregate of all economic areas should be generated. Assumptions should be taken into consideration and documented to ensure there is an understanding of what was considered. View a detailed example of benefits calculation.

[ Continues on next page ]
4. Reporting the VOR

In reporting the VoR, a narrative should be written on each of the selected qualitative areas explaining the benefits associated with the research. Economic benefit area calculations should be reported and variables, inputs, and assumptions discussed to validate the estimates of the VoR. Include references and source material as needed. Researchers should highlight and discuss findings of the research that affects VoR benefit areas and how.

5. Available Resources

- Performance Measurement Tool Box and Reporting System for Research Programs and Projects. This document was developed to provide State transportation agencies a standardized methodology to follow when measuring the benefits of their research programs. The product was developed by taking research performance measures and some tools to develop the Research Performance Measurement (RPM) System. It takes into consideration the following five categories: outcome measurements, output measurements, resource allocation measurements, efficiency measurements, and stakeholder measurements.

- AASHTO RAC State Representative
- AASHTO Staff
- NCHRP Staff
- Research Staff in your DOT

The complete set of “How To” documents include the following:

- Committee Approach to Research
- Writing a Strategic Plan
- Writing a Problem Statement
- Funding Resources
- Experimental Features
- Sharing Results
- Implementing Results
- Determining the Value of Research
- Monitoring Results