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State DOTs are moving rapidly toward performance planning and programming techniques. A major motivation for this shift is that, now that they are required to meet federal performance measures, states have an interest in developing project selection systems to help meet those measures most effectively.

This has led to a massive cultural shift that has transformed the transportation industry. The American Recovery and Reinvestment Act of 2009 (ARRA) and subsequent U.S. Department of Transportation (DOT) discretionary grant programs made calculations such as benefit–cost ratios, reliability, and return on investment commonly understood. Outside of the transportation industry, these calculations would help governments meet increased calls for transparency and merit-based processes.

This article highlights three statewide performance-based, data-driven project selection processes. All were created for different reasons, but all share common factors in the development of their process and the criteria selected.

Minnesota’s Corridors of Commerce Program

Since the early 2000s, Minnesota DOT’s traditional planning and project development process has focused primarily on preservation. As a result, major legacy capacity expansion projects that once were moving through the agency’s pipeline now are not likely to be constructed. In 2013, the affected communities successfully lobbied the Minnesota legislature to create the Corridors of Commerce program.

This new program focused on constructing major-capacity projects on the state’s Interregional Corridor (IRC) System. Developed in the 1990s, the IRC System served as the backbone connecting the state’s regional economies. In the past, these
highway corridors saw focused capacity investment through Minnesota DOT’s traditional process until the agency’s attention shifted to pavement and bridge preservation (1). Today, the IRC System largely has been retired; however, because of legislative requirements, it was used for the Corridors of Commerce process.

Although the newly created Corridors of Commerce program had a defined network, the legislation did not offer prescriptive guidance on how to select projects. The law listed general selection criteria but left Minnesota DOT significant discretion on which criteria to use and did not limit the use of any additional criteria (2).

**Selection Criteria**

After three selection processes, the state legislature decided to revisit the program in 2017, solidifying eligibility requirements and establishing eight prescriptive selection criteria (3). The law requires Minnesota DOT to use all eight criteria—no more and no less—and to publish project evaluation scores once projects are selected (see Table 1, right). This left Minnesota DOT to develop a transparent, quantifiable project selection process that would be used to award newly appropriated funding in 2018—the first step of which was to gather and make eligibility determinations on submitted projects.

The law requires Minnesota DOT to accept project recommendations from the general public; however, proposed projects also must meet a strict set of six eligibility requirements to be considered for the program. An eligible project must be:

- Consistent with the Statewide Multimodal Transportation Plan’s five objectives (open decision-making, safety, connectivity, system stewardship, and healthy communities);
- Located on a statewide IRC or on a trunk, or state, highway within Minnesota DOT’s Metro District (Minneapolis–St. Paul area);
- Focused on developing capacity or improving freight mobility;
- Able to start construction within 3 years (or longer, if approved by the Minnesota Transportation Commissioner);
- Able to be fully funded without exceeding total dollars available to the project; and
- Not listed in the State Transportation Improvement Program (STIP).1

**TABLE 1 Legislative Selection Criteria for Minnesota DOT**

<table>
<thead>
<tr>
<th>Legislative Criteria</th>
<th>Scoring Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return on Investment</td>
<td>A return-on-investment measure that provides for comparison across eligible projects. Overall project effectiveness was measured by dividing the travel time and crash reduction savings by the total Corridors of Commerce funding requested.</td>
</tr>
<tr>
<td>Economic Competitiveness</td>
<td>Measurable impacts on commerce and economic competitiveness. Using the U.S. Department of Commerce’s Regional Input–Output Modeling System economic multipliers, job creation numbers were calculated using localized multipliers for each Minnesota DOT district.</td>
</tr>
<tr>
<td>Freight Efficiency</td>
<td>Measures of AADT and commercial VMT, which may include data near the project location on that trunk highway or on connecting trunk and local highways, and measures of congestion or travel time reliability, which may be within or near the project limits, or both. Two equally weighted criteria were used: heavy commercial AADT and travel-time reliability. Reliability figures were calculated using the National Performance Management Research Data Set.</td>
</tr>
<tr>
<td>Safety</td>
<td>Improvements to traffic safety. Since the return-on-investment criterion used crash reduction savings as a key factor, Minnesota DOT elected to use a combination of average total crashes and fatal or severe crashes over the past 5 years.</td>
</tr>
<tr>
<td>Regional Connections</td>
<td>Connections to regional trade centers, local highway systems, and other transportation modes. To accomplish this, Minnesota DOT developed a scoring matrix that assigned a score based on a project’s facility and project type. Projects that closed a gap in a larger corridor on an Interstate scored better than those building passing lanes on a rural two-lane highway.</td>
</tr>
<tr>
<td>Policy Objectives</td>
<td>The extent to which the project addresses multiple transportation system policy objectives and principles. Minnesota DOT developed a scoring matrix to measure a project’s ability to support the policy objectives of the Statewide Multimodal Policy Plan, including 1) open decision-making, e.g., asking if a project has a plan, and 2) system stewardship and healthy communities.</td>
</tr>
<tr>
<td>Community Consensus</td>
<td>Support and consensus for the project among members of the surrounding community. Points are awarded for letters and formal resolutions of support from MPOs, affected communities, and chambers of commerce.</td>
</tr>
<tr>
<td>Regional Balance</td>
<td>Regional balance throughout the state. After the projects were scored and ranked against each other statewide, projects would be selected to ensure regional balance.</td>
</tr>
</tbody>
</table>

NOTE: AADT = average annual daily traffic; VMT = vehicle miles traveled; MPO = metropolitan planning organization.

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1 STIP is the formal 4-year programming document required by U.S. DOT to obligate federal surface transportation funding. By excluding projects that are listed in the current STIP, the process deliberately focused on projects not already in the Minnesota DOT project development pipeline.
Although these criteria narrow down the list of submissions, they are not specific enough to create a homogeneous list of projects. This left Minnesota DOT with the challenge of developing project selection methodologies that aligned with the law, but were comprehensive enough to compare projects of varying type, geographic location, and levels of technical development.

Throughout 2017, Minnesota DOT worked internally to analyze the merits of various options. Once a set of favored project-scoring methodologies was selected, the agency conducted a series of public outreach activities to gather feedback. The final scoring methodologies were released with a call for projects in January 2018 (4).

Results
Traditionally, Minnesota DOT employs a concept known as “regional balance” for many of its programs, which ensures equitable funding between the Metro District and Greater Minnesota regions. The agency adopted a 50–50 funding split for the Corridors of Commerce program and shared their decision at the public outreach events held before the selection process began (5).

In early May, considering only the new criteria’s quantitative scores, Minnesota DOT awarded four projects totaling $417 million from the 2017 appropriation. Although the selected projects were split almost equally between Metro and Greater Minnesota, the latter were located just outside of the Metro District, along corridors that non-transportation professionals might consider to be within the Minneapolis–St. Paul area (6).

The May 2018 project announcement took place while the state legislature was still in session. In response, Greater Minnesota legislators appropriated an additional $400 million for the Corridors of Commerce program—with a small caveat. The bill language includes an additional requirement that projects could not be awarded within the counties already receiving Corridors of Commerce funding in 2018 (7).

On May 30, Minnesota DOT awarded a second round of Corridors of Commerce projects according to the new requirements (6).
Ohio’s Transportation Review Advisory Council

In 1997, the Ohio General Assembly created the Transportation Review Advisory Council (TRAC) to develop and oversee a process to select projects for Ohio DOT’s Major New Capacity Program. Projects included in this program are “greater than $12 million, request Major New funding, and add capacity to or reduce congestion on an Ohio DOT transportation facility.” Every couple years, TRAC evaluates its 4-year programming document and makes adjustments based on available funding, progress towards project development, and a series of project selection criteria.

In 2015, TRAC revised its traditional highway performance–related criteria to include freight and transit categories with corresponding criteria comparing projects across modes. Additionally, TRAC added criteria to measure economic performance, local area investment, and non–Ohio DOT funding commitments (8).

**Transportation Factors**

TRAC accounts for traditional transportation performance using a series of measures: traffic performance, benefit–cost, air quality, functional classification, and connections to an Ohio DOT network known as the Strategic Transportation System (STS). Although the evaluation factors for highway projects are fairly straightforward, Ohio DOT developed a series of equivalent measures for transit and freight (see Figure 1, at right) (8).

In addition to these factors, the TRAC awards points to projects that improve access to or flow on the STS, which identifies corridors that link the “state’s most used and valuable aviation, bicycle, highway, maritime, rail, and transit corridors, and the diverse multimodal transportation facilities connecting them …. and represents the backbone of Ohio’s transportation network” (9).

**Economic Performance Factors**

TRAC added criteria in the early 2000s to measure the potential impact of submitted projects. The first criterion focuses on existing jobs, an indicator of potential job retention. The second criterion, job creation, uses the Ohio DOT Statewide Transportation Model—which has a post-process economic impact module—to identify job creation over 20 years. Although this provides a consistent analysis for projects across the state, it does not consider local considerations, like development stipulations. Additionally, TRAC uses the Ohio DOT model to score projects on their ability to improve Ohio’s gross state product.

The scoring framework also considers a project’s potential to alleviate economic distress. Points are awarded for county-level average unemployment and poverty. TRAC also evaluates how effective a potential project’s impact could be by integrating the job creation and Ohio gross state project calculations as a function of the total economic distress points awarded (8).

**Local Investment Factors**

This criterion focuses on the economic development potential and investment within a project’s area. TRAC evaluates the percentage of acres served by utilities, existing building square footage, transit availability, and the overall building vacancy rate. TRAC also will consider the ratio of past and future public- and private-sector investment in the area as a function of total project cost. This criterion is designed to favor economic development areas that have a distinct plan as well as prior investment (8).

An update of the West Shoreway in Cleveland, approved by TRAC, creates multimodal connections and increases access to Lake Erie.
Kentucky’s Strategic Highway Investment Formula for Tomorrow, or SHIFT, funds the operation of the Augusta Ferry, which transports passengers across the Ohio River.

**Project Funding Plan Factors**
The final category awards points based on the availability and diversity of funding sources—specifically, non-Ohio-DOT funding sources. The first two scoring criteria focus on non-Ohio-DOT funding percentages allocated to the total project and requested project phase. The final criterion looks at the diversity of funding sources; for example, a project must have at least three funding sources to score any points. The goal of this last criterion is to incentivize nontraditional funding sources, like value capture and tolling (8).

**Kentucky’s SHIFT Process**
Following the completion of the 2016 Kentucky Highway Plan, Governor Matthew Bevin directed the Kentucky Transportation Cabinet (KYTC) to develop an objective, data-driven approach to prioritizing and funding highway improvements for its next 6-year highway plan (10).

What became known as the Strategic Highway Investment Formula for Tomorrow (SHIFT) began as a multidisciplinary committee charged with developing the program’s scoring criteria. The committee analyzed other states’ project processes and KYTC’s capabilities. They worked with Kentucky’s area development districts (ADDs) and metropolitan planning organizations (MPOs) to develop a collaborative process that worked statewide—a series of criteria that focused on five components: safety, asset management, economic growth, congestion, and benefit–cost (see Table 2, below) (10).

**Project Selection Process**
The development of the 2018 Kentucky Highway Plan began with a call for projects from KYTC districts and their ADD and MPO partners. The resulting 1,200 projects were scored and prioritized using the SHIFT scoring criteria (see Figure 2, page 31).

The overall scoring process was divided into two parts: statewide and regional scoring processes (10).

**Statewide Process** Projects located on the National Highway System statewide, safety and mobility projects, and statewide economic development projects all were scored against each other (10).

**Regional Process** All remaining projects, including those not selected in the statewide process, were assigned to one of four regions defined by KYTC. These regions were designed to be contiguous with KYTC districts that have similar terrain, mileage, and urban–rural populations.

Although the statewide process is completely quantitative, only 70 percent of the regional process’s points are based on analytical analysis. KYTC assigned the remaining 30 percent of the points in consideration of local and district priorities. These subjectively based “boosts” ensure that the process accounts for local knowledge and the qualitative aspects of projects that are not necessarily captured in a strictly mathematical formula (10).

**Results**
The SHIFT process created a defensible, transparent programming tool to help KYTC assign projects within a fiscally constrained 6-year plan. It is important to note, however, that the SHIFT results were not the only factors utilized to create the final funded project list. According to the agency, “these [additional] considerations include investments to date and associated impacts to communities, fulfillment of previous commitments, and completion of significant corridors.”

Additionally, the SHIFT program identifies a clear, defensible list of highway needs. The 1,200 projects submitted and scored by the process account for nearly $9 billion, but the 6-year plan identified only

### TABLE 2 Kentucky Selection Criteria

<table>
<thead>
<tr>
<th>Selected Criteria</th>
<th>Statewide Points</th>
<th>Regional Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Crash history and roadway characteristics</td>
<td>10</td>
</tr>
<tr>
<td>Asset Management</td>
<td>Bridge and pavement needs addressed by the proposed project</td>
<td>15</td>
</tr>
<tr>
<td>Economic Growth</td>
<td>Accessibility and connectivity needs based on improvement type, county economic indicators, and AADT</td>
<td>20</td>
</tr>
<tr>
<td>Congestion</td>
<td>Volume and V/C ratio</td>
<td>20</td>
</tr>
<tr>
<td>Benefit–Cost Analysis</td>
<td>Travel-time and crash reduction savings divided by the project cost</td>
<td>20</td>
</tr>
<tr>
<td>Local Priorities</td>
<td>Kentucky Transportation Cabinet District Boost</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>ADD/MPO Boost</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: V/C = volume–capacity; AADT = average annual daily traffic; ADD = area development district; MPO = metropolitan planning organization.
$2.6 billion of available state and federal funding. Along with creating a data-driven highway plan, the process created a vetted list of highway needs—not just a wish list—and a solid funding gap. These figures can be used to advocate for new funding and financing programs within the Commonwealth (10).

Conclusion
Although the impetus for each state’s performance-based, data-driven project development processes were different, the implementation of these processes by Minnesota, Kentucky, and Ohio shared many commonalities. All processes integrated traditional roadway measures, but more telling were their efforts to capture the economic and holistic impacts on nearby communities.

How each state went about capturing these impacts varies greatly, however. Ohio DOT and KYTC employed a commonly used—yet proprietary—economic impact tool, and Minnesota focused on developing an absolutely transparent process by using Regional Input–Output Modeling System multipliers. Both approaches are appropriate, but this demonstrates the “missing middle” between complex economic models and complete transparency. A similar challenge exists in the development of benefit–cost analyses for discretionary grant programs.

As an industry, transportation has rightly focused on job creation and overall impact as key economic metrics. As tools evolve, however, so must metrics. For example, a key missing aspect from many analyses is the impact of a singular project on the accessibility between economic nodes within a state or megaregion.

As this work continues nationally, abstract methods to capture economic impact will transition into complex economic models, much the way travel-demand models have over the past 20 years.

References