Managing Oregon's bridges is a complex assignment

Among the many skills needed to manage bridges in Oregon is the ability to scale these tall, beautiful structures without fear.

ODOT is responsible for the preservation of more than 2,700 state highway bridges, and managing them is one of our most complex challenges. Bridge preservation activities are based on a variety of factors:

- condition-based needs caused by both structural and non-structural deterioration;
- risk-based needs such as scour and seismic vulnerabilities;
- safety needs driven by changing design standards; and
- freight mobility needs, including inadequate load capacity and geometric clearances.

As early as 1964, we performed the first bridge condition assessments by underwater dive teams following massive floods. Bridge inspectors have continued to make assessments over the past several decades inspecting bridges, tunnels, sign structures, culverts and minor structures (6 – 20 feet long). In the early 1990s, Bridge Management System (BMS) software began helping agencies like ODOT manage large and complex inventories. We obtained a license for the software soon after it became available and began recording bridge inspection data based on the Commonly Recognized (CoRe) Structural Elements. This system, published by the AASHTO in 1997, provides a uniform basis for data collection and facilitates data sharing among states.

In general, all bridge "parts" such as girders, trusses, arches, cables, floor beams, stringers, abutments, piers, pins and hangers, culverts, joints, bearings, railings, decks and slabs are identified as CoRe elements. The element listing includes a description, a definition, condition language, a unit of measurement, and feasible actions for each element. In some cases, the element definitions are supplemented with a "smart flag" to highlight the risk-based condition of the element. We currently use 142 CoRe elements, including smart flags, to describe the condition of our bridge inventory. We've been using this condition data for many years to help evaluate and select bridge rehabilitation projects.

With ODOT's adoption of Asset Management principles, the Bridge Program Unit is working to refine the BMS so it can be used for both asset management and project selection purposes. Like many other bridge managing agencies, we have found that our current BMS falls short of providing the tools we need for effective asset management and project programming.

We're looking now at the work of other agencies, such as CalTrans, to see if developing multi-objective functions for project prioritization might work. The promising characteristic of this approach is the ability to combine benefits that otherwise lack a common scale. We are also looking at the development of prototype risk-based approaches to asset management by other groups. We are particularly interested in this because it could provide a way to incorporate risk-based needs such as scour (the removal of soil and rock that supports bridge foundations by fast moving water during floods), seismic and collision damage considerations into the equation. Risk-based approaches consider the probability and consequences of service interruptions.

In the spirit of continuous improvement, we are viewing this opportunity to upgrade the BMS as a creative as well as technical challenge. When it's all said and done, we believe a fully effective BMS will:

- incorporate a mechanism for considering all bridge "needs" whether subject to deterioration or not;
- have the ability to consider multiple objectives: for example, least long-term cost, route hierarchy and continuity, freight mobility, and performance measure improvement;
- have the ability to combine, in practice, all important benefits and policy considerations into a single project benefit measure that can be used in project prioritization; and
- enable evaluation of the effects of various investment levels on project selection, performance measures and program goals.

For all the latest from the Bridge program, visit our intranet site, http://intranet.odot.state.or.us/tsbbridge/.

Unique program supports Oregon's 'livability'

Oregon's Transportation and Growth Management program, or TGM, invests in a wide variety of projects all over the state. But these aren't your typical bridge or highway projects; these dreams range from creating walkable downtowns to preserving open spaces… and everything in between!

This year, TGM will award grants annually instead of every other year. Another change in program updates the criteria to support planning for projects that:

- support compact growth;
- increase the availability of alternative transportation; and
- reduce the need for automobile travel.

"We revised the TGM criteria to encourage transportation and land use planning projects that reduce emissions contributing to climate change," said Robert Maestre, ODOT's Long Range Planning Unit manager.

The TGM program, jointly managed by ODOT and the Department of Conservation and Land Development, works in partnership with local governments "to create vibrant livable places in which people can walk, bike, take transit or drive where they want to go." Funding is a mix of federal, state and local government matching funds.

This year's criteria changes were reviewed and approved by TGM staff from both agencies along with a Governor-appointed advisory committee. The team also agreed to the award period change, which allows the program to be more responsive to community needs.

"Under the previous process, we often came across two situations: communities whose projects were not ready to proceed but submitted applications anyway because it would be two more years until they could do so again, and communities with projects ready to proceed who contacted us mid-biennium hoping that we still had funding," Maestre said. "Now, with the opportunity to apply each year, we can better match funding to the scheduling needs of a community."

TGM received 134 pre-applications for its grant and other community assistance programs. Pre-applications allow communities to present project ideas and get guidance from staff before the formal grant application period, which began in mid-January. Grant applications are due this month; awards will be announced in May.

Learn more about the TGM Program at www.oregon.gov/LCD/TGM/index.shtml.

Oregon celebrates 150 years

As Oregon celebrated 150 years of statehood on February 14, thousands of people gathered at the Capitol to join in the festivities. Part of the celebration included a giant, seven-tiered birthday cake decorated with symbols of the state, including beavers (the state animal) and Oregon grape (the state flower).