



State of the Art Planning: The Use of Performance Measures & Project Prioritization Methods

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Federal Highway Administration

PERFORMANCE MEASURES

What is Performance Measurement?

“Performance measurement is a process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods & services, the quality of those outputs & outcomes, and the effectiveness of government operations in terms of their specific contributions to program objectives.”

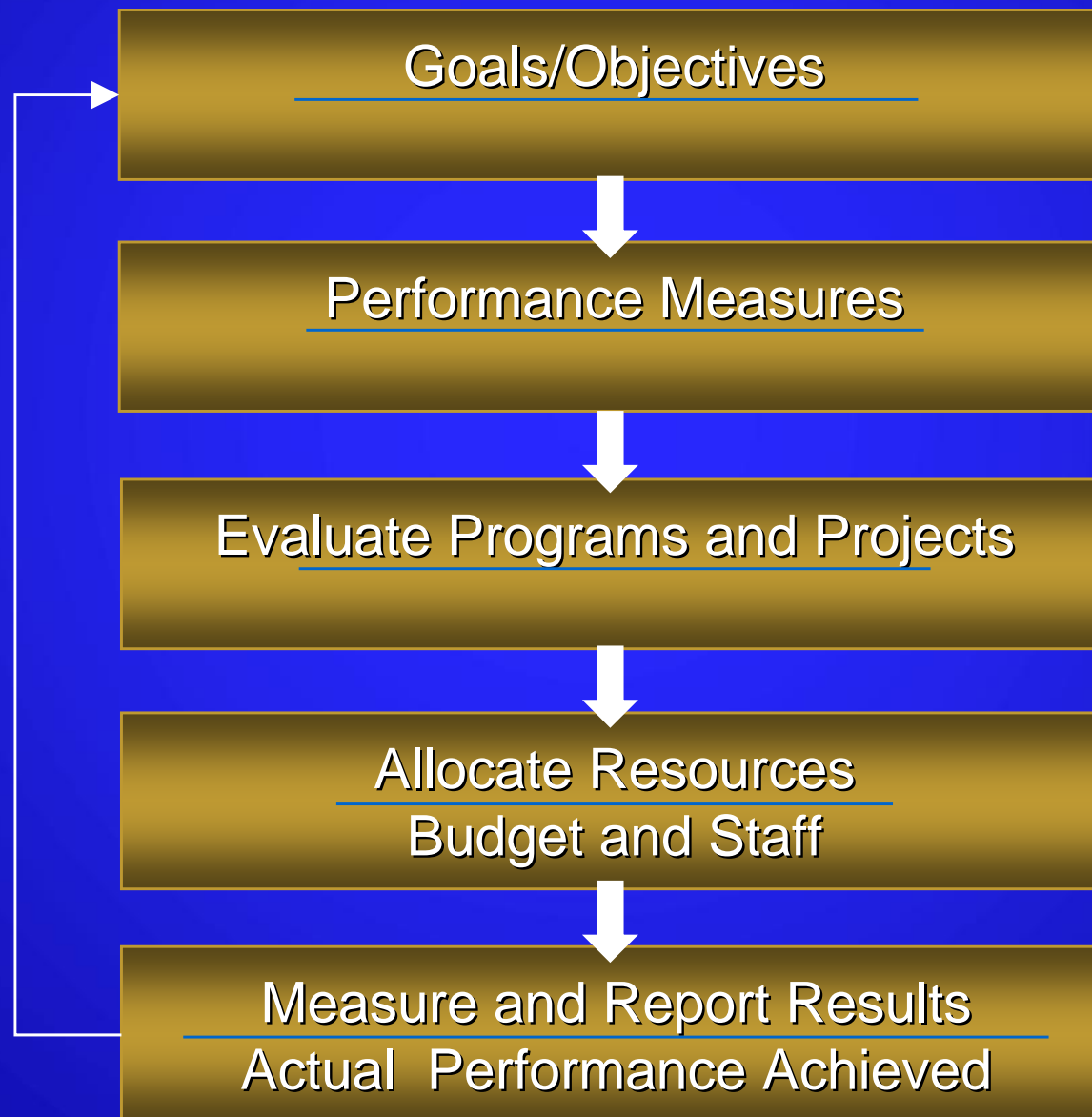
Why Performance Measurement?

- Links goals and actions.
- Allows for the evaluation of policies, plans, and programs.
- Tracks system performance over time.
- Helps to guide the allocation of resources.
- Provides accountability to customers and the ability to communicate results.

Benefits of Performance Measurement

- Enables a more customer oriented focus.
- Provides “real world” data that can be used to assess progress in meeting goals & objectives.
- Fosters greater consideration of the day-to-day functioning of the transportation network, which can help frame transportation plans.
- Helps in prioritizing projects for funding.

Performance Management: Linking Goals/Objectives to Results



Uses of Performance Measures

- To define goals in Statewide Transportation Plans and other Statewide programs. (framing attributes that are most important)
- Reporting of current performance & trends for the state and specific regions.
- Evaluate the success of implemented and ongoing programs & projects.

Uses of Performance Measures (Cont)

- Serve as criteria for investment decisions in the transportation planning process.
- A metric for communicating with decision makers & the public about past, current, and expected future conditions.

Typical Transportation Performance Measures

- Condition of physical assets
- System Usage
- System Service levels
- System Operations
- Customer Satisfaction
- Safety
- Freight
- Environmental

Trends in Performance Measurement

- Performance measures have become a standard management practice for a majority of transportation organizations.
- The Federal transportation reauthorization is likely to emphasize greater accountability and performance measurement.
- Many states have statutes or policies that require performance measurement and reporting of results.
- FHWA, AASHTO among others are providing leadership and support in the area.

Performance Measurement: Examples

Performance Reports

2007
Annual Attainment Report
on Transportation System Performance

Implementing the
Maryland Transportation Plan &
Consolidated Transportation Program

Maryland Department
of Transportation

2007 Annual Attainment Report
Maryland DOT

Washington State
Department of Transportation

Measures, Markers and Mileposts

The Gray Notebook for the quarter ending
December 31, 2005

WSDOT's quarterly report to the Governor and the
Washington State Transportation Commission
on transportation programs and department management

Douglas B. MacDonald
Secretary of Transportation

Measures, Markers and Mileposts
Washington State Department of Transportation

GOOD to GREAT

STRATEGIC PLAN & ANNUAL REPORT
NEW MEXICO DEPARTMENT OF TRANSPORTATION
RHONDA G. FAUGHT, P.E., CABINET SECRETARY

Good to Great
Strategic Plan and Annual Report
New Mexico DOT

SYSTEM CONDITIONS
ORGANIZATIONAL
PERFORMANCE INDEX

MEASURABLE AND ORGANIZATIONAL PERFORMANCE INDICATORS (OPI)

The information in this section summarizes goals to be met for statewide and district maintenance operations and pavement and bridge conditions. ODOT uses its Organizational Performance Index to monitor progress in attaining the established goals in each of these areas. Each OPI measure highlighted in this section has a direct bearing on the department's ability to achieve its overall performance goals. The pavement, bridge and maintenance operation measures have an acceptable level that managers and career professional employees are expected to achieve and sustain.

The highway network ODOT is responsible for is divided into three categories: priority system (interstate and four-lane divided highways), urban system (state highways within municipalities), and general system (primarily two-lane highways across the state). These systems are evaluated annually using a 100-point Pavement Condition Rating (PCR). Priority system pavements are deficient when the PCR is below 65 points. Urban and general system pavements are deficient when the PCR is less than 55 points.

ODOT also conducts annual bridge inspections evaluating four categories:

- **General appraisal ratings** measure the overall condition of a bridge - bridges are considered deficient when this rating drops to 4 or below on a scale of 0 to 9 (the higher the number the better).
- **Floor condition ratings** measure the underside of a bridge - bridges are deemed to be deficient when the floor rating is a 3 or 4 on a scale of 1 to 4 (the lower the number the better).
- **Wearing surface ratings** measure the driving surface of a bridge - bridges are considered deficient when the wearing surface is evaluated at 3 or 4 on a scale of 1 to 4, (the lower the number the better).
- **Paint ratings** measure the corrosion protection applied to the structural steel - bridges are deemed deficient when they are evaluated at 3 or 4 on a scale of 1 to 4, (the lower the number the better).

Statewide and district performance involving maintenance operations is also maintained through several OPI categories. The charts included in this section for these basic roadside conditions provide historical statewide and district condition levels and establish future goals for these activities. Central Office and district work units are expected to achieve these conditions and sustain them in the future.

- **Guardrail** - deficiencies are recorded for damaged or deteriorated guardrail, anchor assembly, bridge anchor assembly or impact attenuator which does not properly function as a safety barrier.
- **Pavement Deficiency** - deficiencies are recorded for the deterioration (ruts and potholes), obstruction, and bleeding of pavement and excessive crack sealing that is dangerous to motorists.
- **Pavement Drop-Off** - deficiencies are recorded for drop-offs exceeding two inches deep and six feet long between the pavement and shoulder.
- **Vegetation Obstruction** - deficiencies are recorded for vegetation obscuring signage, sight distance and guardrail.
- **Litter** - deficiencies are recorded for any tenth mile segment where litter exceeds 10 items.
- **Drainage Obstructions** - deficiencies are recorded for any ditch where 50 percent of the cross section is obstructed and includes damaged or obstructed pipes that cause water spillage onto the pavement.
- **Signs** - deficiencies are recorded for deteriorated signs that includes loss of message, damaged or twisted posts or supports, loss of reflectivity preventing clear visual comprehension, missing, defaciated, and unnecessary or obsolete signs that confuse motorists.
- **Pavement Marking** - deficiencies are recorded for missing or faded pavement striping, lane dividing lines, no passing areas, pavement edge lines, crosswalks, turn lanes and school zones, deterioration (ruts and potholes), obstruction, and bleeding of pavement and excessive crack sealing that is dangerous to motorists.

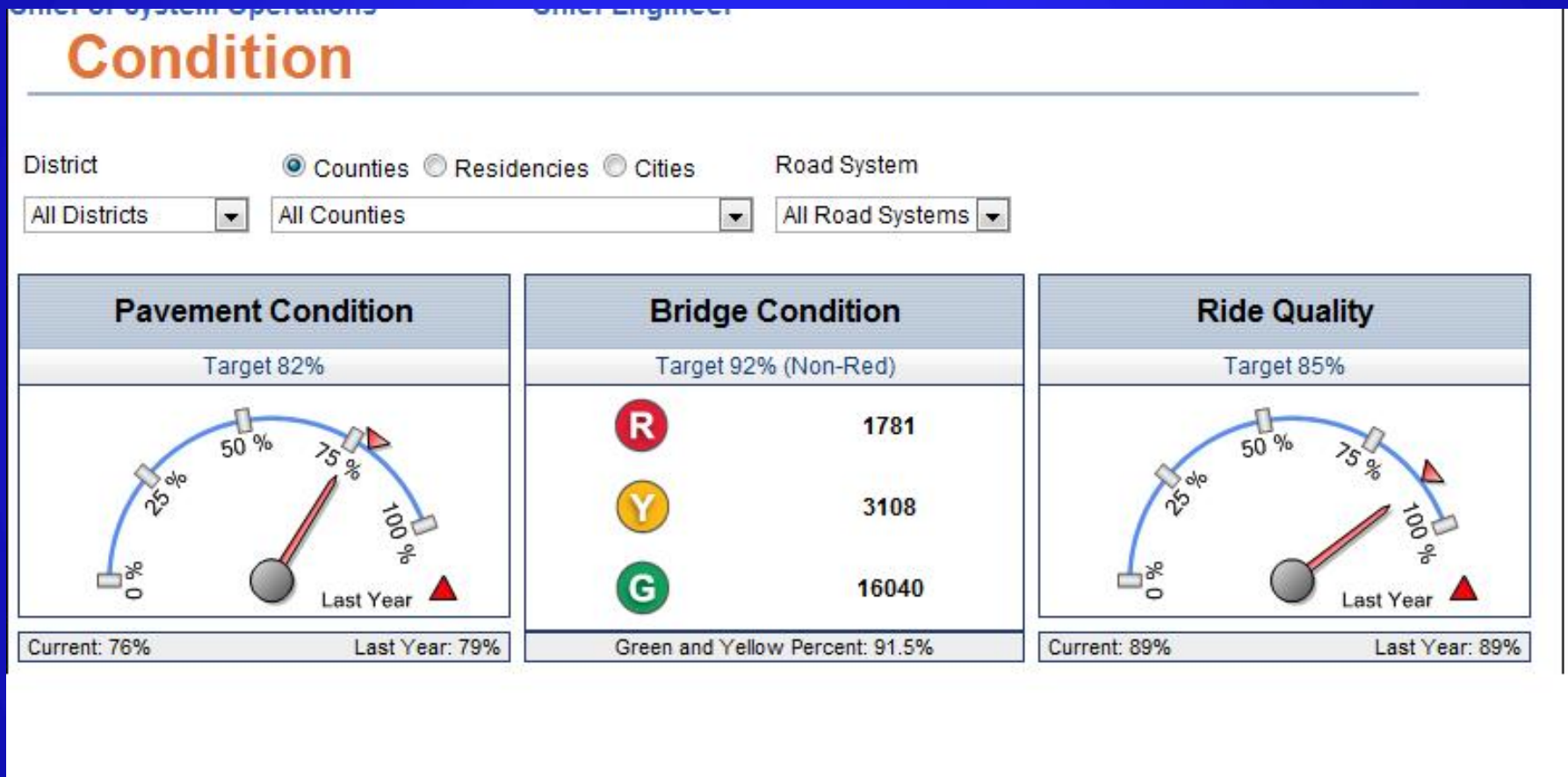
ODOT BUSINESS PLAN 2004 & 2005

ODOT Business Plan 2004 & 2005
Ohio Department of Transportation

Virginia DOT Dashboard



Virginia DOT Dashboard: System Condition




NCDOT Dashboard: System Condition

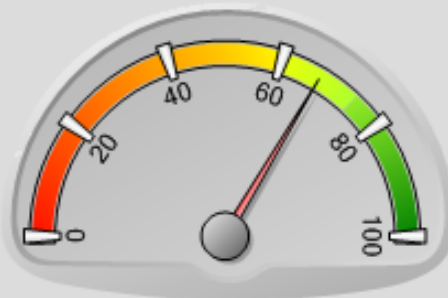
Infrastructure Health

This page displays the Department's success rate for maintaining and improving the health of our highway system. These items are indicators of the health and condition of our bridges, pavements and roadside features such as guardrails, signs and culverts.

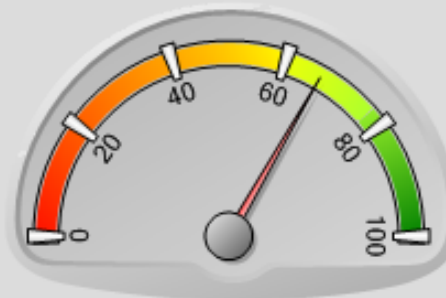
Filter these results by county:

STATEWIDE 

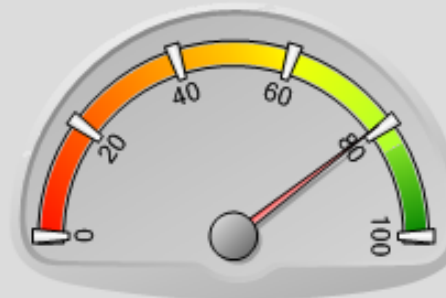
Infrastructure Health: Statewide



Bridge Health Index 67.18%



Pavement Condition 66.66%



Roadside Feature Condition 79.25%

Pavement & Bridge Condition

PERCENTAGE OF SHA ROADWAY MILEAGE WITH ACCEPTABLE RIDE QUALITY

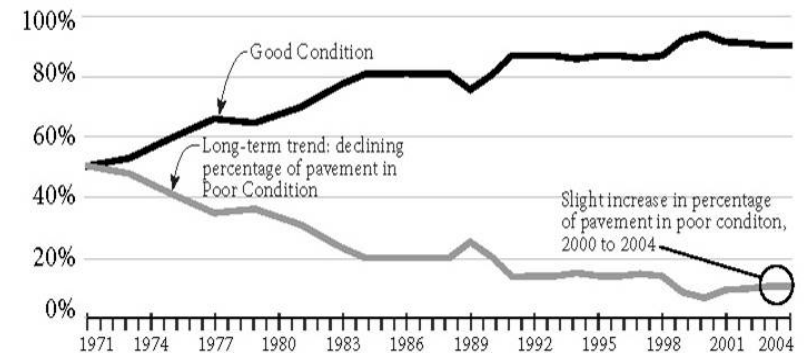
Ride quality facilitates mobility, efficiency, and safe movement of people and goods within Maryland.



2007 Annual Attainment Report
Maryland DOT

Pavement Condition Trends

Percent of Pavements



Source: WSDOT Materials Lab

Measures, Markers and Mileposts
Washington State Department of Transportation

Safety

Fatality Rate



1.29

Incident Duration



75min.

Infrastructure Health



70%

Delivery Rate

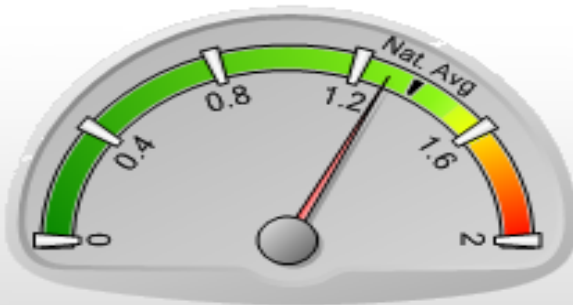


61%

Great Place



Coming Soon



Fatality Rate

Making our transportation network safer: This is defined as the total number of statewide fatalities on NC roads per 100 million vehicle miles traveled for the calendar year to date. The gauge is accompanied by a trend chart of the total number of fatalities, crashes and injuries by year.

[Click here for additional performance information](#)

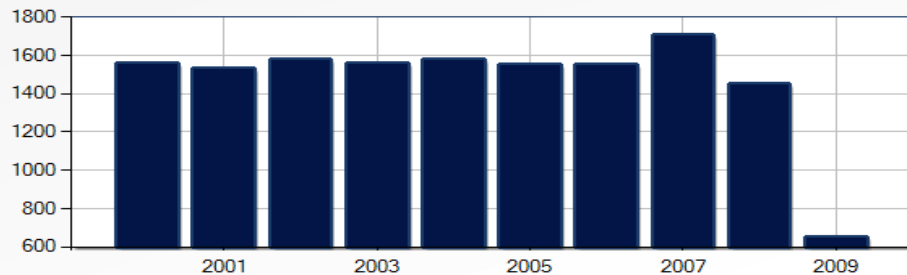
Our mission is connecting people and places in North Carolina — safely and efficiently, with accountability and environmental sensitivity.



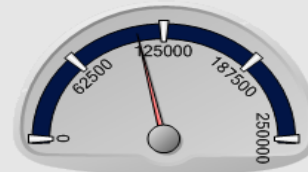
Fatalities



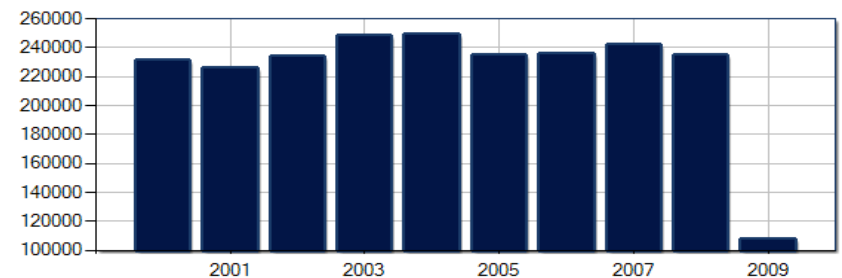
Statewide:
Total Fatalities as of 06/30/2009:
653



Crashes

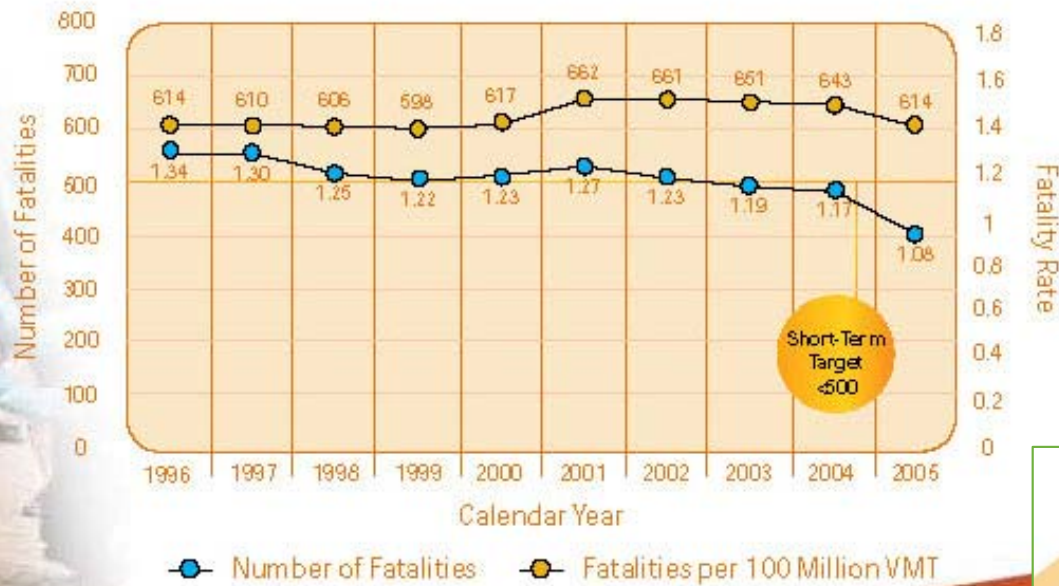


Statewide:
Total Crashes as of 06/30/2009:
107603



Safety

ANNUAL NUMBER AND RATE OF TRAFFIC FATALITIES ON ALL ROADS IN MARYLAND



PEDESTRIAN INJURIES AND FATALITIES PER 1 MILLION MARYLAND RESIDENTS (All Maryland Roads)



2007 Annual Attainment Report
Maryland DOT

PROJECT PRIORITIZATION

What is Project Prioritization?

- A process or method of filtering projects to meet State DOTs goals and objectives.
- A decision making process to determine which needs should be addressed first.
- Prioritization processes can be either quantitative or qualitative and are usually based on items identified in the Statewide Transportation Plan or other strategic planning documents.
- Rating factors are usually asset management based factors which are objective & quantifiable.

Typical Project Prioritization Factors

- System preservation (Road & Bridge)
- Safety improvements
- Capacity improvements
- Freight capacity improvements
- Availability of funding
- Bicycle & pedestrian
- Economic Vitality or development considerations

Why Prioritize Projects?

- Limited amount of resources for transportation improvements and system operation & maintenance. (Stewardship)
- Helps to direct funds to programs and projects that align with agencies goals and performance measures.
- A transparent process that provides explanation to stakeholders of why projects are chosen.
- Part of an overall Asset Management approach.

Prioritization Methods

- System wide or focus on groups of related projects
- Worst First – Focus on condition & addressing the worst problems first
- Functional Classification
- Focus on Economics by using benefit cost ratios or cost effectiveness criteria (Quantitative)
- Optimization processes – Linear programming or integer programming
- Scoring systems or matrix analyses (Qualitative)

Prioritization Methods (Cont.)

- Quantitative methods are generally preferred over qualitative methods
- Benefits of Quantitative methods:
 - Focuses on the beneficiary & thus less likely to double-count or miss benefits
 - Maximizes benefits from a fixed budget
 - Deals with actual impact measures
 - Supported by AASHTO and FHWA

Prioritization Methods (Cont.)

- Issues with Qualitative methods:
 - False specificity, what does it mean that LOS improvement is worth a point value?
 - Hard to equate value with different types of projects. How does project cost figure into the prioritization process?
 - Prone to double counting or missing benefits due to lack of specificity about who benefits and the level of benefit.
 - Lack of independence or irrelevant alternatives.

Project Prioritization: Examples

Utah DOT Decision Support System (DSS)

- A data driven analysis of the relative strengths of capacity projects in the first phase of their Unified Plan.
- Each project receives a score based on the following:
 - Functional Class
 - Current and projected future traffic volumes
 - Truck traffic
 - Safety benefits
- DSS ranks projects using this criteria to assist the Utah Transportation Commission in deciding projects to add to their STIP.
- In addition to major capacity projects, a funding source was created to address smaller scale projects.

WILMAPCO Project Prioritization Process

- A process to evaluate transportation projects using measurable criteria based on the goals contained in the LRTP
- 4 step process:
 - Apply Screening criteria
 - Staff calculates technical score (33 points max)
 - TAC reviews technical score & comments on ranking
 - WILMAPCO Council ranks submissions

WILMAPCO Project Prioritization Process (Cont.)

- Goal 1: Improve Quality of Life (10 pts)
 - Air Quality
 - Environmental Justice
 - Safety
- Goal 2: Transport People & Goods (12 pts)
 - Congestion Management System
 - Transportation Justice
- Goal 3: Support Economic Activity & Growth (11 pts)
 - Freight
 - Support of economic development initiatives
 - Private or local funding contribution

Conclusions

- Performance Measures & Project Prioritization allow:
 - State DOTs to maximize resources
 - System optimization
 - The link between statewide goals and actions
 - Accountability to customers and the ability to communicate results.
 - Enables a more customer oriented focus
 - Part of an overall Asset Management approach.

Questions?

A close-up photograph of a bee on a vibrant orange and yellow flower. The bee is positioned in the center of the flower, facing left. The flower has many petals, with the center being a deep red and the outer petals transitioning to bright orange and yellow. The background is a soft, out-of-focus green, suggesting a natural outdoor setting. The text is overlaid on the image in a white, serif font with a drop shadow.

One Final Thought Before I Go:

**With Performance Measures
& Project Prioritization**

There is a pot (of gold) at the end of the rainbow!





Thank You!

(for staying awake)

For additional information contact
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