Federal Highway Administration

# Performance Outcomes Beyond the Mainstream Peer Exchange: Summary Report

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Prepared by

ICF International
1725 Eye Street NW, Suite 1000
Washington, DC 20006

U.S. Department of Transportation
Federal Highway Administration

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## Introduction and Background

FHWA and AASHTO have been working with transportation agencies to integrate performance management practices in their planning and decision-making for over a decade. While there has been considerable advancement in performance measurement for some aspects of transportation systems, there is a need to develop new performance measurement practices that address transportation's broader role in fostering a better quality of life. 'Beyond the Mainstream' performance measures specifically address measurement of outcomes that are not traditionally measured by transportation agencies, including accessibility, economic development, and public health.

The passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012 increased the emphasis of transportation planning on use of performance measures. Transportation Secretary Foxx has placed a priority on "creating ladders of opportunity" for better jobs, educational choices, and quality of life by advancing transportation accessibility. Meanwhile, the Federal Highway Administration is developing a framework for integrating health considerations into the transportation corridor planning process. As transportation agencies are increasingly asked to consider their impacts on quality of life, there will be a greater need for non-traditional performance measurement.

On June 20, 2014, TRB's Statewide Multimodal Planning Committee in partnership with FHWA and AASHTO held a one-day peer exchange on the topic of 'beyond the mainstream' performance measures in Scottsdale. The peer exchanged focused on performance measurement of accessibility, economic development, and health impacts of transportation. The peer exchange gathered a diverse group of practitioners to hold productive discussions about the state of the practice and key challenges and research needs.

## Overview

The purpose of the peer exchange was for participants to become more familiar with 'beyond the mainstream' measures and identify current practices, key challenges, and research needs. Central questions for the peer exchange were:

- What non-traditional performance measures are being used by States and MPOs?
- How are States and MPOs identifying relevant non-traditional measures in collaboration with partners and stakeholders?
- How are agencies integrating non-traditional performance measures in their planning and programming documents?

A key outcome for the peer exchange was the identification of support and resources that national organizations can provide to state DOTs and MPOs in order to advance the state of the practice in 'beyond the mainstream' performance measures; these are identified in the section on Summary and Action Items.

Approximately 30 practitioners from over 20 states participated in the peer exchange, bringing a wide range of perspectives and issues to the table in the day's discussions. The day's agenda included the following key activities and sessions:

- Opening, introductions, peer exchange purpose
- Challenges to Implementing "Beyond the Mainstream" Measures – *Exercise and discussion*
- Accessibility/ Connectivity- *Presentation by the University of Minnesota and Minnesota DOT and follow-up discussion*
- Economic Development- *Presentation by Puget Sound Regional Council and follow-up discussion*
- Health- *Presentation by ICF International and follow-up discussion*
- Performance Measures- *Breakout Discussion*

See Appendix A for the full peer exchange agenda.

## Pre-Peer Exchange Survey and Webinar

To prepare for the peer exchange, the project team developed a survey to which participants responded. The questions served as a basis for establishing an understanding of the state of the practice helped to identify issues ripe for further discussion. The findings from the survey were a key resource in formulating the peer exchange agenda.

In order to ensure that the discussion focused on measures that were truly 'beyond the mainstream', participants were instructed to consider the following preliminary scopes for each measure category:

### *Accessibility*

- People are able to use the transportation system to reach key destinations (jobs, shopping, etc.) within a reasonable amount of time.
- Transportation facilities conveniently and directly connect existing centers of residential, commercial, and business activity, or are coordinated with land use planning to support the creation of new activity centers.
- For non-automotive modes, households and destinations are located within convenient distance of transit lines, bike lanes and paths, and other important facilities.
- **Not:**
    - Measures that focus on speed, travel time, or reliability without considering the relative location of homes and destinations.
    - Measures that define convenience in terms of travel time without considering comfort, ease of navigation, and ability to spend time on transit productively.
    - Measures that focus solely on access to the roadway network.

### *Economic development*

- Transportation facilities and policies are designed to support and foster land use changes at opportunity sites in areas with the market potential for development.
- Transportation facilities are planned and managed to support growth in economic centers where jobs in high-growth sectors are located or are expected to locate in the future.
- Transportation facilities connect residential neighborhoods with job opportunities that match residents' skill level (e.g., low-income neighborhoods with industrial/service jobs, high-income neighborhoods with financial/knowledge sector jobs).
- **Not:**
    - Macroeconomic measures that are not useful in assessing the economic impact of transportation projects and policies.
    - Measures of jobs associated with the construction and operation of the transportation system, or of downstream economic growth due to these jobs.
    - Economic measures that focus solely on costs associated with travel time, vehicle operation, and transit fares without considering the broader benefits of connecting people with jobs and services.

### *Health*

- Travelers' total in-vehicle time is reduced, either through mode shift, efficient operation of the transportation system, or coordinating transportation and land use investments to shorten the length of trips.

- The transportation system makes it easy for people to use active transportation modes, such as walking, bicycling, and transit to reach destinations and/or for recreational travel.
- The transportation system connects people with destinations that are critical to supporting health, such as grocery stores and health clinics, especially in underserved neighborhoods.
- **Not:**
    - Traditional measures of transportation safety, such as collisions and fatalities.
    - Traditional measures of environmental impacts on health, such as air quality.

### *Survey Results*

The key findings from the survey were:

- There is a wide range of experience with measures, with diverse examples of application in decision making.
- Several issues were common to all three topic areas:
    - Determining objectives
    - Data and evaluation methodologies
    - Coordination with other agencies and jurisdictions
    - Cross-modal comparisons
    - Accommodating both regional and project-level measures

Specific findings for accessibility were:

- Job accessibility and alternative mode accessibility are mentioned frequently.
- Measures must integrate land use information and alternative modes, and move away from congestion metrics.

Specific findings for economic development were:

- Job creation measures are relatively common, but there are significant challenges in demonstrating causality and demonstrating new economic activity.
- Relationship to accessibility and land development could be explored further.

Specific findings for health were:

- A very broad range of measures has been used or considered, but interest is highest around physical activity/ active transportation, and the associated health benefits.
- Capturing behavioral changes to isolate transportation's effect is a key challenge.

See Appendix B: Survey Findings for a full list of survey questions and results.

## Challenges to Implementing "Beyond the Mainstream Measures"

The first peer exchange activity following introductions was a brief writing exercise. Participants were asked to write their key questions about 'beyond the mainstream' performance measures on post-it notes. Each participant could write as many questions as he or she had. Questions were read aloud and grouped by common themes. Participants' questions are summarized below.

### *Accessibility*

- How do we get an accessibility measure that is relevant, explainable, and understandable to the public?
- From a state DOT perspective, what are different options for measuring accessibility/connectivity to jobs when evaluating/prioritizing projects (highway and non-highway)?

### *Economic Development*

- How can we credibly account for economic activity resulting from transportation investments that is new versus relocated?
- Better insight is needed into how to measure the economic impact of policies for land use and investments in transportation, and how to evaluate the more useful allocation of funds across different transportation modes.
- How do we analyze or assess how projects will affect desired outcome measures when there is no direct relationship?
- What are options for evaluation economic competitiveness of projects (highway and non-highway) that take into account development potential?

### *Health*

- What are examples of successful partnerships between transportation agencies and health agencies?

### *General Questions*

- Are there measures that better address the quality of life issues at the heart of these non-traditional measures?
- Are there local measures that are meaningful when scaled up to regional or statewide levels? (Or how can local measures be scaled up in a meaningful way?)
- Are there ideas for monitoring measures that can help us move from LRTP scenario system performance to programming and implementation (and link to target setting)?
- What agencies are ready to start measuring?
- What are successful examples of using non-traditional measures to inform decision making, rather than just reporting measures?
- How do we make the non-traditional measures relevant in the discussion of the state's priorities within the context of performance measures required by MAP-21?
- What are the key research gaps or hurdles that must be filled in order to accelerate adoption of non-traditional measures?
- What data gaps can be filled through partnerships?
- How can DOTs get comfortable with measuring outcomes that are not directly within their control?

## Practitioner Presentations and Discussion

Practitioner presentations were used to inform participants about current practices related to 'beyond the mainstream' measures and spur discussion surrounding the three key topic areas of accessibility, economic development, and health. Each presenter spoke about the work his agency had conducted in the topic area and highlighted key challenges and research needs. The presentations primed the participants on each topic area. A free-flowing discussion on the presentation and the broader topic area followed.

### *Accessibility*

### Presentation by Minnesota Department of Transportation and the University of Minnesota

*Andrew Owen of the Accessibility Observatory at the University of Minnesota and Brian McLafferty of the Minnesota Department of Transportation*

The University of Minnesota (UMN) and Minnesota Department of Transportation (MnDOT) have established a long-term partnership around accessibility. MnDOT considers access to destinations to be the fundamental purpose of transportation and aims to establish a consistent systematic approach to measuring accessibility that can be used across regions. Specifically, MnDOT aims to:

- Look beyond mobility and congestion as transportation performance measures
- Support the agency's vision for transportation outcomes
- Develop a multi-modal approach to planning and performance

UMN has created a standardized data platform that can be used to assess and map accessibility in a variety of different ways including:

- Accessibility to jobs within 40 minutes by car (see Figure 1 below)
- Accessibility to jobs within 20 minutes by car (AM peak period)
- Accessibility to jobs within 20 minutes by transit (AM peak period)
- Worker-weighted 20 minute accessibility to jobs by auto
- Ratio of jobs accessible within 40 minutes by transit to jobs accessible within 40 minutes by car (see Figure 2 below)
- Change in accessibility to jobs within 30 minutes between 2000-2013

**Figure 1: Accessibility to jobs within 40 minutes by car**

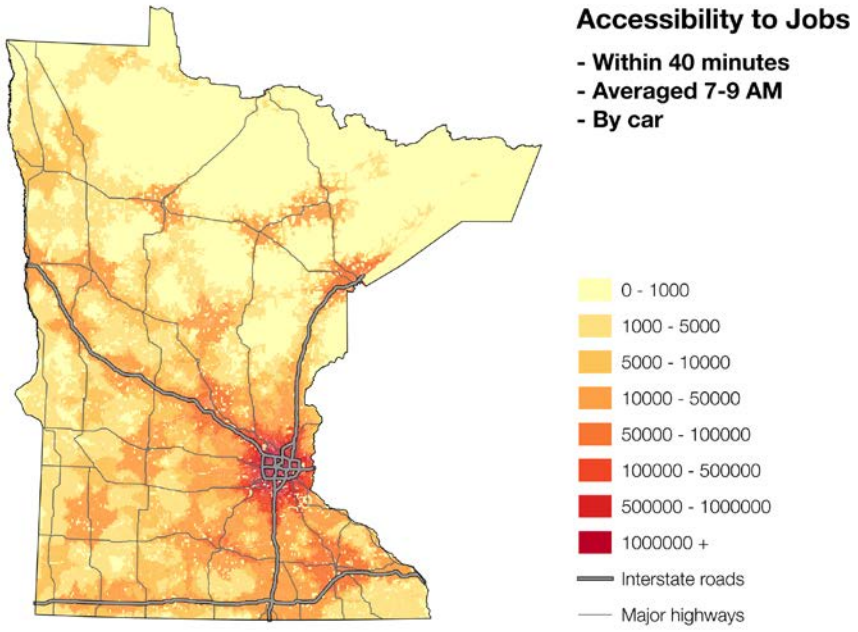
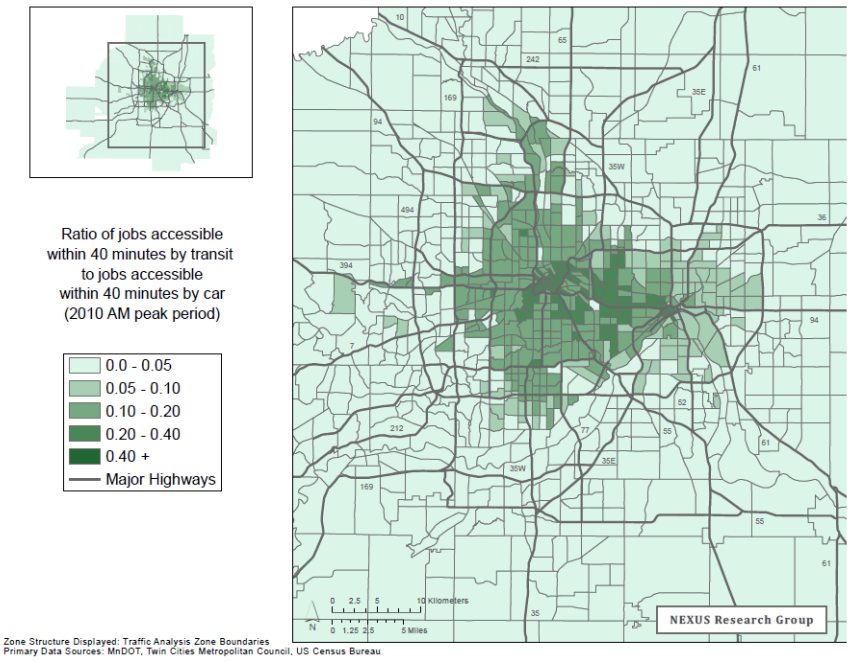


**Figure 2: Ratio of jobs accessible within 40 minutes by transit to jobs accessible within 40 minutes by car (2010 AM peak period)**




UMN's methodological approach to calculating accessibility metrics is based on observed rather than predicted transportation patterns. Accessibility is calculated at the census block level using transportation and land use data from the U.S. Census Bureau, MnDOT, and the Twin Cities Metropolitan Council. The data can be used to visualize multiple metrics and maps for multiple travel time thresholds. Generally thresholds are set to capture typical commuting times (for example, 20, 30, or 40 minutes). Transit trip times are derived from General Transit Feed Service (GTFS) data submitted to Google by many transit agencies, and transit accessibility calculations take both access time and in-vehicle time into account.

UMN is now creating an annual report, Access Across America, that is available on a subscription basis. Subscribers will receive a detailed report and data for their state and/or metropolitan region.

## Discussion

The discussion during and after the presentation focused on several key topics:

**Definitions of Accessibility and Methodological Assumptions**

- While the concept of accessibility seemed familiar to participants, there was no common understanding of how accessibility should be defined in precise terms that translate into measurement. For example, should all travel time be weighted equally, including time spent in a car or on transit, or time spent waiting for transit versus riding transit? How are time thresholds selected? Do transit accessibility measures take into account actual transit performance or just scheduled transit trip times? If accessibility is measured as a percentage of regional jobs accessible within 30 minutes, how should the regional boundary be defined? Are congested travel speeds accounted for?
- "Access of employers to the workforce" was discussed as an alternative accessibility concept.

**Public Comprehension**

- Transportation agencies have been examining accessibility measures for years, but they are still struggling to measure accessibility in a way that makes sense to the public. A good example of an understandable accessibility measure is Walkscore.

**Applications in Decision Making**

- MnDOT is not using this accessibility information yet in decision making but is considering using it in project selection processes. Specifically, accessibility measures could help suggest some low cost/high benefit investments in congestion management.
- Care must be taken when interpreting accessibility measures. For example, the map in Figure X shows that there is higher accessibility in the Twin Cities area than elsewhere in Minnesota, but that is largely a reflection of employment densities rather than the transportation system.

**Partnerships and Control of Outcomes**

- The University of Minnesota has had some conversations with municipal governments about using their accessibility data. Just as transportation agencies are hesitant to use an accessibility performance measure when they do not control land use, these land use agencies are hesitant to use an accessibility performance measure when they do not fully control transportation.
- However, standardized accessibility information can at least provide a common basis for conversations between transportation and land use agencies.

**Key takeaways from the discussion included:**

- Methodologies to calculate accessibility are very sophisticated, but people don't necessarily agree on the underlying definition of accessibility inherent in the methodologies.
- There is a high level of interested in accessibility information. If this information can be provided in a systematic way that is widely accepted by transportation agencies, it could have great value for the industry.
- There are not many examples yet of accessibility measures being used in transportation decision making, and it is not clear how decision makers will respond to the information.

## *Economic Development*

## Presentation by the Puget Sound Regional Council

*Charlie Howard of the Puget Sound Regional Council*

The Puget Sound Regional Council (PSRC) is a comprehensive planning agency in the Seattle, Washington region covering land use, economic development, transportation, and data. Vision 2040 is the planning document that sets the regional policy direction, and includes multicounty planning policies, a regional growth strategy, and an environmental framework. Separate detailed functional implementation plans include Transportation 2040 and the Regional Economic Strategy. Vision 2040 includes several economic development policy focus areas:

- Foster supportive environment for all business
- Focus on developing skills and promoting education
- Focus on jobs/housing balance and protect environment

The Regional Economic Strategy is organized around economic foundations and industry clusters. The economic foundations represent the basic overarching building blocks that any region needs to develop a strong economy:

- Education and Workforce Development
- Business Climate
- Entrepreneurship & Innovation
- Infrastructure
- Quality of Life

Industry clusters are groups of interrelated businesses that have a strong employment base and/or high concentration in the region.

In PSRC's transportation project prioritization process, some measures address the extent to which projects support existing and new businesses and job creation (see Figure 3 below). For example:

- Access to areas of high job concentration – How well does the project support job retention or expansion by improving access?
- Access to economic foundations – How well does the project provide access to job-related training or educational opportunities (vocational schools, community colleges, universities)?

**Figure 3: Example of PSRC's Transportation Project Prioritization Scoring**

| Purpose: Access to areas of high job concentration. How well does the project support job retention or expansion by improving access? | | | | Prepopulated | % No Response |
|---|---|---|---|---|---|
| J1a | Choose one | 3 | The area served by this project has an employment density[6] of 18 jobs per acre, and is planned (has unused zoned capacity) to accommodate a density of 32 jobs per acre. (Areas that currently exceed the higher threshold would receive points here as well). | Yes | 0% |
| J1b | | 1 | The area served by this project has an employment density of 18 jobs per acre. | Yes | |
| J2 | 2 | | The area served by this project has an employment density of 15 jobs per acre for jobs related to cluster employment.[7] | Yes | 0% |
| J3 | 2 | | The area served by this project has an employment density of 15 jobs per acre for family-wage related employment. | Yes | 1% |
| Purpose: Access to economic foundations. How well does the project provide access to job-related training or educational opportunities (vocational schools, community colleges, universities)? | | | | | |
| J4 | 3 | | In area with, or supports access to institutions identified as economic foundations. | Yes | 0% |
| 10 points maximum score | | | | | |

Challenges that PSRC has encountered with regard to measuring economic development include:

- How to anticipate <u>future impact</u> on job retention and creation: measures are all model-based
- How to truly measure improvements to productivity caused by transportation investment
- Multiple outcomes: economic growth, access to opportunity, distribution of economic growth, etc.
- Reconciling the Triple Bottom Line: People, Prosperity, Planet
- "Economic Advantage": competitive edge is a difficult concept to measure

Draft Transportation 2040 performance measures include:

- Freight Mobility is improved
    - FAST partnership projects are completed

    - Project Tracking (grade crossings)
- Access to transportation is improved (for all)
    - Amount of employment within 1/4 mile of transit service (or access points to transit, such as a bus stop, rail station, etc.)
- Access to jobs/activities/education and opportunities is improved
    - Projects connecting low opportunity areas with high opportunity areas

## Discussion

The discussion during and after the presentation focused on several key topics:

**Definitions of Economic Development and Methodological Assumptions**

- There was general agreement that good economic development strategy focuses around development of local industry clusters. Identifying the relevant industry clusters for an area depends on recognizing the strengths of the region and determining how to build on those, rather than trying to imitate the successful industry clusters of another region.
- Resource development (e.g. mining, oil) was suggested as a different type of economic development; however, this concept can fit within the cluster-based development concept.
- A primary challenge for transportation agencies that want to demonstrate an impact on economic development is pinpointing economic development outcomes related to specific transportation investments. Generally transportation allows economic development to happen, but it doesn't usually directly cause economic development.
- Sometimes it can be easier to demonstrate an economic impact of transportation if no action is taken. For example, Oregon was able to secure funding for bridges by demonstrating the number of jobs that were dependent upon bridges for transportation, and the associated cost of bridge failure.
- When asked about their desires for improvements to the transportation system, freight users typically just want to make sure the current system works predictably. They accept the system as it is and design their processes to fit that.
- A survey of corporations shows "Availability of skilled labor" and "highway accessibility" are highest ranked transportation concerns (*Area Development Magazine*, 2011 & 2013 survey)
- On participant suggested that job creation was the core measure of economic development no matter what specific clusters were emphasized; however, there was not general agreement on this topic. In some places, finding skilled workers to fill available positions is the challenge.
- Accessibility is a core component of economic development.

**Partnerships and Control of Outcomes**

- Economic development is an important area for coordination and collaboration, as economic development strategies are not typically driven by transportation agencies.

**Key takeaways from the discussion included:**

- Appropriate economic development performance measures are policy-driven and specific to each region.
- There is no consensus on economic development goals that can be used generically across regions or states

- Therefore, it's not clear whether there it's worth trying to define common goals at a national level

## *Health*

## Presentation by ICF International and North Carolina Department of Transportation

*Frank Gallivan of ICF International and David Wasserman of the North Carolina Department of Transportation*

Frank Gallivan of ICF International presented an overview of current work by transportation agencies on health issues, and David Wasserman of the North Carolina Department of Transportation (NCDOT) discussed his agency's conversations around incorporating health in performance measurement.

A variety of efforts are underway to incorporate health in transportation planning, going well beyond traditional health measures of safety and air quality. Federal initiatives include:

- Developing a Framework for Better Integrating Health into Transportation Decision Making (FHWA)
- H+T Index (FHWA)
- Healthy Communities Index (HUD)
- Community Transformation Grants (CDC)

Other initiatives and groups include:

- Denver Regional Equity Atlas
- TransForm (SF Bay Area)
- Transportation Choices (Seattle region)
- T4America: Planning for a Healthier Future

These new initiatives consider health impacts of transportation broadly to include:

- Active living and fitness
- Obesity
- Cardiovascular disease
- Communicable/infectious disease
- Health care
- Mental health
- Nutrition/healthy eating
- Senior independence/aging
- Respiratory/pulmonary disease
- Transportation-related injuries

Numerous transportation agencies have either used or discussed health-related performance measures for transportation, including measures of physical activity, obesity, mode share, and access to alternative modes. (See Figure 4).

**Figure 4: Sample Health Related Performance Measures in Transportation**

| Agency | Measures |
|---|---|

| | |
|---|---|
| SF Bay Area - Metro. Transp. Commission | • Average daily minutes walking or biking per person for transportation (LRTP) |
| Kansas City Mid-America Regional Council | • Physical inactivity levels (LRTP)<br>• Obesity rates (LRTP) |
| Texas DOT | • Number of transit trips (monitoring) |
| North Carolina DOT | • Alternative mode share (discussed)<br>• Alternative mode access (discussed)<br>• Health equity index (discussed) |
| Massachusetts DOT | • Triple mode share of bicycling, transit + walking (goal) |
| Transit Cooperative Research Program | • Obesity rates (proposed methodology)<br>• Injuries/fatalities (proposed methodology) |

North Carolina DOT includes a reference to healthy communities in its mission statement and core principles. NCDOT and North Carolina State University conducted research on health-based performance measures that could be used in NCDOT's Project Prioritization system specifically for highway, bicycle/pedestrian, and transit projects including:

- Human exposure to air pollutants from transportation
- Bicycle, pedestrian, and transit mode share
- County Level Health Equity Index
- Percent of population within ½ mile of a transit stop

Changes in leadership in North Carolina have shifted the focus of the DOT away from incorporating explicit health measures in the Project Prioritization system; however, regional agencies North Carolina still have the option of using locally-based health measures.

Common challenges and opportunities for all transportation agencies considering health include:

- Forecasting and quantifying behavioral change
- Comparing health impacts across modes
- Collaborating with health agencies
- Measuring health equity

## Discussion

The discussion during and after the presentation focused on several key topics:

**Definitions of Health and Methodological Assumptions**

- Health is a new area for most transportation agencies
- The discussion divided health measures into two categories:
    - Measures that look at accessibility to healthy infrastructure (e.g. pharmacies, health care providers, healthy food sources, etc.)

    - Health through transportation choices (active transportation or transit, which typically requires more walking)
- Forecasting and influencing behavior is a clear challenge. Walking and biking activity have impacts on health, but how do you connect behavior change to transportation projects? Building a facility is no guarantee that you'll get more people walking.
- However, we do know some things. There is research from Portland State University that show a statistical relationship between bike lane availability and bike mode share, for example. Other research has demonstrated that people who take transit as their primary mode have lower obesity rates than people who drive. The pieces are there, but they haven't been patched together in practice yet.
- What does the network connect you to? Apart from just going out for exercise, whether people walk or bike depends on where they can get by doing so.

**Other Examples**

- In addition to the examples provided in the presentation:
    - Alaska has mapped travel distance to the nearest hospital by marine and air modes
    - Alaska has mapped cell phone connectivity in many parts of the state, which is critical for first responders
    - The Colorado Springs MPO's LRTP incorporated some generalized health performance measures into the plan, working with their county health department
    - Georgia Tech and the CDC have considered how to use health-based measures in prioritizing projects along Atlanta's Beltline trail and transit network.
    - ODOT is developing a bicycle 'level of stress' measure and is applying the Integrated Transport and Health Impact Modelling Tool (ITHIM)
    - MassDOT is creating a set of project development guidelines that will require an exception for projects that do not include a bicycle/pedestrian component.

**Partnerships and Control of Outcomes**

- There is an MOU between Oregon DOT and the state health department. Each has representatives on the other's decision making board.

**Key takeaways from the discussion included:**

- Transportation agencies don't fully understand their contribution to public health
- There are lots of ways to measure public health, but establishing a causal link between transportation and public health is a big challenge.

## Performance Measures Breakout Discussions

Breakout discussions were a critical component of the peer exchange. The purpose of the breakout discussions was to review potential performance measures that could be used in various decision making applications, identify gaps, and suggest further research to address gaps. The facilitators proposed three types of decision-making applications for measures:

- Long range planning / strategy development
- Project prioritization

- Monitoring

Participants agreed with these categories, with the stipulation that measures aimed at communicating with stakeholders should be explicitly considered in each category. Participants were then divided into three groups of roughly equal size, based on the topic area of greatest interest to them (accessibility, economic development, or health). Participants were provided with an initial matrix of performance measures in decision making applications gathered from the survey. (See Figure 5 below).

**Figure 5: Draft Matrix of Performance Measures**

| Application | Accessibility/Connectivity | Economic Development | Health |
|---|---|---|---|
| **Long Range Planning/Strategy Development** | • % growth occurring in transit shed<br>• Number of jobs within X distance of transit stations | | • Number of new on-street bicycle facilities, trails, and sidewalks within 100 feet of parks and green space<br>• Presence of policies and programs that educate or encourage active transportation<br>• ADA compliance of the pedestrian system<br>• Sidewalk on at least one side of every street<br>• Level of sidewalk investment<br>• Presence of policies that improve the attractiveness or make better use of public spaces |
| **Project Prioritization** | • Number of jobs accessible by car within 30 minutes during peak periods | • Job "creation" (jobs added or retained as a result of a transportation improvement) | • Integration of multimodal elements in proposed transportation projects<br>• Connectivity to multimodal systems. |
| **Monitoring** | • Number of jobs accessible by car within 30 minutes during peak periods | | |

The following criteria were provided as defining viable 'beyond the mainstream' performance measures:

- Does the measure reflect an outcome that decision makers care about?
- Is the measure understandable to decision makers and the public?
- Is the measure calculated with a robust methodology using available data?

Each group was asked to consider the following questions with regard to the draft matrix:

- Are the measures appropriate in the context of the criteria identified? Can new ones be suggested?
- What are the major technical challenges in each category?

- Are there alternative measures that address those challenges or could be put into practice more quickly?
- Can you think of specific examples of good measures in application?

Summaries of each group's discussions are provided below.

## *Accessibility*

**Measures**

The accessibility breakout group provided the following suggested performance measures:

| Application | Accessibility/Connectivity |
|---|---|
| **Long Range Planning/Strategy Development** | • % Growth occurring in transit shed<br>• Number of jobs within X distance of transit stations<br>• Person carrying capacity of the transportation system, particularly during peak period (especially)<br>• Mode Share<br>• Investment in facilities (e.g. miles of sidewalk or sidewalk added)/network connectivity<br>• Travel time<br>• Worker Shed (Expands access to workforce for an employment center) |
| **Project Prioritization** | • Number of jobs accessible by car within 30 minutes during peak periods<br>• Change in person carrying capacity of the investment in the transportation system particularly at peak period<br>• Change in network connectivity<br>• Worker Shed (Improves worker shed for a job center)<br>• Average commute time |
| **Monitoring** | • Number of jobs accessible by car within 30 minutes during peak periods<br>• WalkScore<br>• TransitScore<br>• Time series in peak period person carrying capacity<br>• Average commute time by census block<br>• Travel time<br>• Worker Shed (Improves worker shed for a job center) |

**Key Challenges**

Key challenges were generally related to methodological questions, for example:

- Should you look at weighted average accessibility?
- Is it better to calculate travel time by point, or how many more things you can get to if the travel time in the corridor improves?
- In monitoring, TransitScore is a useful idea but it's not implemented well, with access to number of transit lines measured rather than destinations accessible by transit.

Other key challenges and considerations included:

- It's difficult to communicate network connectivity measures
- It's important to think about how to set targets for accessibility

**Summary and Key Takeaways**

Primary ways of looking at accessibility are:

- Travel time from destination
- Access to transit to reach a final destination
- Travel time from where people live
- How many workers can access a specific job site

## *Economic Development*

This group's discussion centered around important concepts in economic development and processes for determining locally specific economic development priorities for transportation.

**Long Range Planning / Strategy Development**

Key non-traditional outcome measures could incorporate:

- Jobs
- GDP
- Workforce
- Measures of Economic Competitiveness

A locally specific process was envisioned to arrive at suitable economic development performance measures, as follows:

- Align with strategic initiatives (varies by location, politics, etc.)
- Align with cluster/industry transportation needs
- Leads to traditional measures such as access to markets, access to workforce, or access to a resource
- Leads to travel time metrics or wage-related metrics

**Project Prioritization**

Key non-traditional outcome measures could include:

- Job "creation" (jobs added or retained as a result of a transportation improvement)

**Monitoring**

Monitoring measures should be the same as those for projects and plans.

**Key Challenges**

Challenges identified for economic development performance measures are

- Identifying
    - New new jobs
    - "quality" jobs
    - Environmental justice issues
    - Industry specific jobs
    - Direct/indirect/contingent development
    - Wages

**Possible Next Steps**

- It would be helpful to have a short list of transportation performance measures that could be customized to local needs. This menu should highlight transportation needs specifically (which may fall in the category of traditional measures) in a way that they can be linked to local economic development goals.
- Understanding what clusters are and what measures the local economic development agency is using would be an important first step.

**Summary and Key Takeaways**

- Developing a credible narrative around transportation's role in economic development is key, and that requires a locally-driven process.
- The actual outcome measures used for transportation may not in and of themselves be particularly innovative, but they should be rigorously linked to desired economic development strategies.
- Even if economic outcomes such as job creation aren't improving, the transportation industry can do its part by demonstrating improvement in transportation outcomes.

## *Health*

**Measures**

The health breakout group provided the following suggested performance measures:

| Application | Health |
|---|---|
| **Long Range Planning/Strategy Development** | • Number of new<br>o on-street bike facilities,<br>o trail, and<br>o sidewalks<br>• Presence of policies and programs that educate or encourage active transportation |

| | |
|---|---|
| | • ADA compliance of the pedestrian system<br>• Sidewalk on both sides of the street (non-highways)<br>• Level of sidewalk investment<br>• Presence of TDM program<br>• Percentage of population with access to bike/ped facilities<br>• Percentage of population within X distance of health facility, healthy food sources |
| **Project Prioritization** | • Integration of multimodal elements in proposed transportation projects<br>• Connectivity to multimodal systems<br>• Percentage of population with access to bike/ped facilities |
| **Monitoring** | • Percentage of population with access to bike/ped facilities<br>• Mode shift – as Massachusetts DOT uses it<br>• Improved health – lower incidence of preventable disease (obesity, heart disease, etc.)<br>• Less money spent on health care<br>• Number of children walking or biking to school<br>• Increase in number of bike lanes and ADA ramps |

**Key Challenges**

- We don't know enough about what health community does and what data they collect.
- The role of state DOTs versus local government. State DOTs don't build bike lanes on interstates.
- A data challenge is that most health data is only readily available at county level. This is an issue for project-level analysis.
- There is difficulty making a direct link between many health outcomes and transportation

**Possible Next Steps**

- A peer exchange with non-traditional stakeholders, such as health agencies, would be helpful.

**Summary and Key Takeaways**

- Accessibility is a key aspect of transportation's role in health, including providing access to healthy facilities (hospitals, fresh food, etc.) and providing access to opportunities for active transportation.
- Measures of health outcomes (e.g. obesity) do not resonate as much as measures of mode share and access to transit.
- Transportation agencies need to recognize improving health as a shared societal goal, but don't need to take responsibility for that goal. The transportation agency's responsibility is to manage

transportation facilities in a way that support and don't detract from that goal. For example, don't prevent people from being able to get exercise.

## Summary and Action Items

The pre-survey produced numerous examples of non-traditional performance measures in practice in the areas of accessibility, economic development, and health. However, the broader transportation industry is not yet ready to adopt these measures. The following sections summarize the state of the discussion in each topic area and provide possible action items for advancing the state of the practice. In order to frame the discussion below, we propose that there are four broad needs for implementation of 'beyond the mainstream' performance measures:

- Establish Transportation Agencies' Role
- Define the Concept
- Design Measurement Systems
- Apply in Decision Making

### *Accessibility*

Accessibility is unique among the topics discussed in that participants were generally already comfortable with the role of transportation agencies in managing accessibility. In fact, accessibility was seen as the primary transportation contribution to the other topic areas discussed: economic development and health. By providing access to travel options and destinations, transportation agencies connect workers with jobs, suppliers with customers, patients with medical facilities, and people with opportunities for walking and bicycling.

The definition of accessibility remains fuzzy for many state DOTs. Accessibility measures can be defined in different ways that subtly change the underlying concept. For example, measuring the number of jobs accessible within a certain time threshold allows for changes in land use patterns to affect accessibility. However, measuring travel time between two fixed points does not. Measuring job growth near transit stations is yet another way to look at accessibility.

The University of Minnesota's Accessibility Observatory has produced a significant new data product for measurement of accessibility in states and regions nationwide, using a variety of metrics. Access Across America draws on multiple data sources and is based on substantial research on calculation methodologies. However, transportation agencies have many questions about the methodologies used, and aren't necessarily able to agree on a single methodology.

Finally, accessibility measures are not broadly applied in decision making. MnDOT is not using this accessibility information yet in decision making but is considering using it in project selection processes. The pre-peer exchange survey revealed a handful of other agencies that are using accessibility based measures.

**Action items:**

- *Support broader use of existing data and tools*. The value of standardized data products in the transportation industry is greater than the value of their application in individual regions. The Texas Transportation Institute's *Urban Mobility Report* has been widely used for years as a standard metric of regional transportation system performance, despite its narrow focus on measures of congestion. It remains a product that transportation planners commonly understand and refer to.
- *Research successful applications in decision making and disseminate.* Identify specific examples of accessibility measures used in decision making in long range planning/strategy development, project

prioritization, and monitoring. Develop fact sheets and disseminate the information broadly in order to demonstrate replicable practices and 'early wins' available to other transportation agencies.

- *Support continued dialogue on methodological questions and communicating accessibility outcomes*. Methodological questions are not likely to be neatly resolved, but discussing methodological choices in measuring accessibility is important to promote broader understanding of how accessibility can and should be used in decision making. Transportation agencies should know enough about the methodologies available to be able to adapt measures to fit their own needs and available resources. At the same time, ways to communicate accessibility outcomes, whether by simplifying methodologies or applying measures to decision making in innovative ways, should continue to be discussed.

## *Economic Development*

Compared to accessibility, the role of transportation agencies in economic development was less intuitive to the peer exchange participants, while the basic concept was somewhat clearer. Participants understood economic development as being the development of locally specific industry clusters, often but not always measurable in terms of job creation. The role of transportation agencies in fostering economic development was debated at length. The group concluded that transportation agencies can support economic development by providing access to markets, the labor force, and resources; transportation investments can support but not create economic development. This basic principle was seen as essential for transportation agencies to be comfortable addressing economic development issues.

Additional challenges with the concept of economic development are tied up with most of the measurement challenges cited. If transportation agencies attempt to measure job creation, the need to demonstrate a causal link between transportation decisions and job creation is immediately problematic. Calculating net new jobs and isolating job growth in particular industries and jobs of particular quality compound the issue.

Aside from PSRC's use of economic development performance measures, there were few other applications in decision making provided. PSRC is unique among transportation agencies in that it is responsible for both the regional long range transportation plan and the regional economic strategy.

The process suggested by the economic development breakout group would address many of these challenges by encouraging economic development agencies to take the lead (in collaboration with transportation agencies) in determining what aspects of the transportation system can support local economic development initiatives. Transportation's contribution to economic development would be described in performance measurements that are immediately comprehensible and measurable for transportation agencies.

**Action items:**

- *Develop and pilot a model process for collaboration between economic development agencies and transportation agencies.* The process should flow from development of locally specific economic development strategies (if none are already identified) to goal setting for transportation agencies to measurement and applications in transportation decision making. The product developed should also:
    - *Include a menu of measures that are transportation specific but can be linked to broader economic development goals.*
    - *Include case studies of successful application of similar measures by transportation agencies in decision making.*

## *Health*

As with economic development, peer exchange participants were generally comfortable with the concept of public health but not with transportation agencies' role in promoting public health. Participants asserted that there were too many factors affecting public health that are outside the control of transportation agencies. For example, lifestyle choices, education, and income levels all affect physical activity levels in addition to access to pedestrian and bicycle facilities. On the other hand, transportation agencies saw themselves as potential collaborators in promoting public health, if the transportation factors can be better defined. For example, health agencies can track obesity rates and transportation agencies can track active transportation mode share, and both can share the information.

Measurement challenges discussed in the health area were primarily focused on demonstrating a causal relationship between transportation improvements and health outcomes. There is limited research available to help predict the contribution of individual projects or strategies to changes in behavior, such as increased bicycling and walking. Most travel demand models do not even include bicycling and walking activity.

Despite the obstacles to using health performance measures, there were more examples in decision making of health-based performance measures than any other non-traditional performance measure. The peer exchange presentation provided highlighted several examples in long range planning, project prioritization, and monitoring; and the pre-peer exchange survey highlighted several more. These included measures of access to alternative modes, alternative mode share, time spent walking and bicycling, and obesity rates.

**Action items:**

- *Provide opportunities for transportation agencies to exchange information with health agencies, possibly including another peer exchange.* Transportation agencies will be more confident in addressing health in performance measures if they are confident that their role complements and doesn't duplicate the activities of health agencies.
- *Conduct research about health datasets that could have applications in transportation planning.* A peer exchange with health agencies could help provide some of this information.
- *Facilitate a broader exchange between transportation agencies that are discussing health issues.* There are numerous examples of successful practice in decision making. There are also more groups in the transportation industry that are discussing health performance measures, with efforts by HUD and FHWA among others. Other AASHTO committees, such as the Standing Committee on Environment, may also have information to share about health-related performance measures.

## Appendix A: Agenda

### FHWA/ADA10/AASHTO Peer Exchange on Performance Outcomes Beyond the Mainstream

Friday, June 20 2014
10:00 AM – 5:30 PM

Scottsdale, Arizona

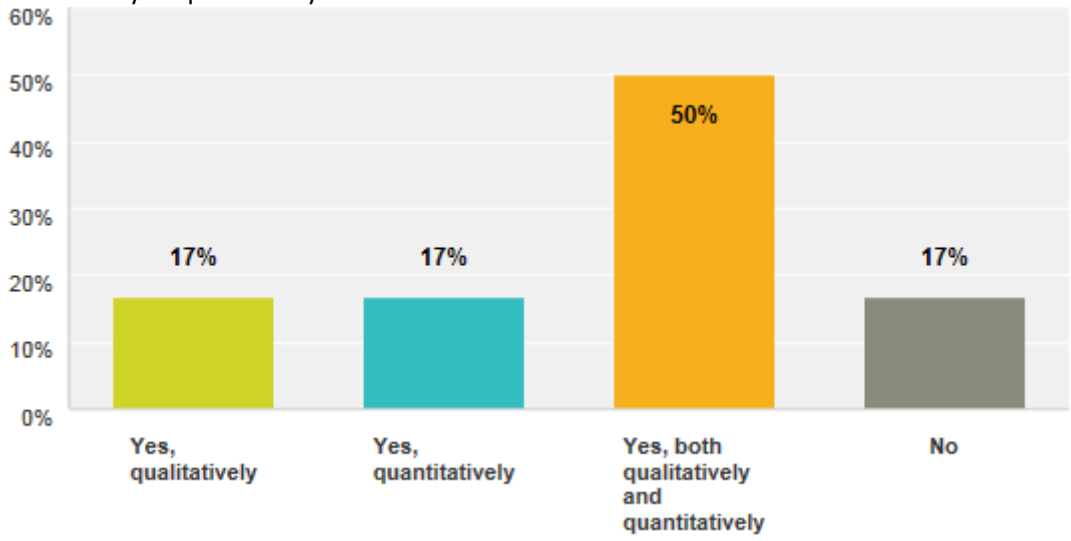
| | |
|---|---|
| **Opening and Introductions** | Harlan Miller, FHWA<br>Jerri Bohard, ADA10 Chair<br>Matt Hardy, AASHTO<br>Janet D'Ignazio, ICF International |
| **Challenges to Implementing "Beyond the Mainstream" Measures** | Janet D'Ignazio, facilitator |
| Exercise and Discussion | Janet D'Ignazio, facilitator |
| **Accessibility/Connectivity** | |
| • Presentation | Andrew Owen, University of Minnesota<br>Brian McLafferty, Minnesota DOT |
| • Discussion | Janet D'Ignazio, facilitator |
| **Economic Development** | |
| • Presentation | Charlie Howard, Puget Sound Regional Council |
| • Discussion | Janet D'Ignazio, facilitator |
| **Lunch** | |
| **Health** | |
| • Presentation | Frank Gallivan, ICF International |
| • Discussion | Janet D'Ignazio and Frank Gallivan, facilitators |
| **Performance Measures Breakout Discussions** | |
| **Question Round Robin** | Janet D'Ignazio, facilitator |
| **Wrap-Up and Closing** | Harlan Miller, FHWA<br>Jerri Bohard, ADA10 Chair<br>Matt Hardy, AASHTO |

## Appendix B: Survey Findings

The survey of practitioners was conducted for the purpose of both establishing a baseline of the state of the practice and supporting identification of issues ripe for further discussion at the peer exchange.

The survey contained 13 questions. It was disseminated to participants on May 30, 2014 closed on June 6, 2014. In total, 22 practitioners responded to the survey. The results of the survey are below; in some cases, open-ended responses were synthesized and condensed.

**Question 1:** Have you used or applied performance measures related to accessibility/connectivity, either quantitatively or qualitatively?




**Question 2:** If you answered yes, what measures have you used, and how did you use them?

- "We are working with FDOT to develop accessibility measures as part of the state's multimodal mobility performance measures program. We previously developed measures of 'economic connectivity' (i.e., proximity to clusters of economic activity dependent on particular modes of transportation) as criteria for designing transportation hubs and corridors as part of FDOT's Strategic Intermodal System. We currently are developing methods for assessing how well FDOT's future corridor investments support connectivity to existing and emerging population and employment centers. We have used similar concepts as input to corridor studies and plan or project evaluations in other states."
- "The Alaska Statewide Long-Range Transportation plan, Let's Get Moving 2030, established eight planning factors for the transportation system: a. Economic vitality b. Safety c. Security d. Environment, energy, quality of life, and consistency between local government and State improvements e. Integration and connectivity f. efficient operation and management g. Preservation of existing system. The LRTP establishes the policies, priorities, and strategies for system accessibility/ connectivity but does not provide specific implementation processes or performance measures. The LRTP notes that these details should be addressed in the regional plans. A review of the six regional transportation plans and the two metropolitan transportation plans do not show any specific performance measures related to accessibility/connectivity. Note that a new LRTP is being worked, so this may be different in the future. The State of Alaska Office of Management and Budget covers each department's key indicators. These indicators reflect Alaska's priorities, which include three for transportation: 1. Maintenance and operation of the transportation system (highways, marine, and aviation), 2. Commercial vehicle enforcement, 3. Construction programs. These three

areas allude to accessibility/ connectivity, but fall short of this question's intent. However, there is a Department interest in corridor management including the: Alaska Strategic Highway Safety Plan, State of Alaska Designated Safety Corridors, Governor's Highway Corridors, Travel demand forecast model for CO conformity analysis, and EPA's MOVES air quality model. While there are ample resources, no concrete quantitative performance measures related to accessibility and connectivity exist."

- "Reviewing studies of policies and performance measures to investigate the impact of different land uses on transportation."
- "We measure the number of jobs the typical Twin Cities resident can access by a car within 30 minutes during the peak period as a way of monitoring the impact of congestion on access to destinations."
- "They are our metrics for evaluating strategies in our long range plan. Some do not match exactly with your definition, but the closest ones are: -Change in peak period person-carrying link capacity Districtwide (Metrorail, High-capacity transit including streetcar, Water transit, Bicycle facilities, Streets) -Number of connections to planned regional facilities (Transit investments, Bicycle facilities, Managed lane facilities, Freight routes) -Presence of policies that directly reduce costs or financial barriers for using transportation options -Percent of forecast 2040 population with access to facilities (Metro Station within 7.5-minute walk; Transit within 7.5-minute walk; Bicycle Lane or Cycle Track within 2-minute ride) -Sidewalk on at least one side of every street -Increased availability of on-street parking in all areas of the city -Travelshed of new transportation facilities -ADA compliance of the pedestrian system -Number of population, employment, and mixed-use centers within 100 feet of new facilities (Transit investments, Bicycle facilities, Streets) -Number of Targeted Redevelopment Areas and low-income census tracts within 100 feet of new facilities (Transit investments, Bicycle facilities, Streets, Sidewalks)"
- "We are considering connectivity measures in all of our plans and programs at this point. Including the long-range plan documents referenced above and working to also factor this issue into our programming documents as we develop project rankings."
- "How: evaluation attainment of WMATA's Strategic Goal: Connecting Communities. What: (1) share of household growth that occurred in transit shed (2) Percentage of bus stops that are accessible (both underdevelopment)
- "Wisconsin DOT's MAPSS performance dashboard applies performance measure to the department's programs & activities. Measure that could be considered applicable to accessibility/connectivity include: 1) Hours of vehicle delay (number of hours spent in interstate traffic below the posted speed); 2) reliability (index based on extreme travel time in a fixed period of time); 3) transit availability (percent of population served by transit); 4) bicycle accommodation (percent of state highway miles with safe bike accommodation); 5) incident response (average time to clear full closures on the interstate); 6) winter response (percentage to bare-wet pavement within a specific time period after a storm). These measures are applied to the infrastructure WisDOT has responsibility for: the interstates & the state trunk highway system. These are intended to be applied uniformly, regardless of land uses. WisDOT applies a slightly different LOS tolerance for rural vs. urban roadways. WisDOT does consider local comprehensive plans in its corridor management planning process."
- "We used 'access to jobs' measures as part of a plan project prioritization process- it was measured qualitatively."
- "Number of intercity transit passenger connections. Passenger rail service."
- "Assessing projects in LRTP/TIP Policy- studies related smart growth."
- "Wisconsin DOT's MAPSS performance dashboard applies performance measure to the department's programs & activities. Measure that could be considered applicable to accessibility/connectivity include: 1) Hours of vehicle delay (number of hours spent in interstate traffic below the posted

speed); 2) reliability (index based on extreme travel time in a fixed period of time); 3) transit availability (percent of population served by transit); 4) bicycle accommodation (percent of state highway miles with safe bike accommodation); 5) incident response (average time to clear full closures on the interstate); 6) winter response (percentage to bare-wet pavement within a specific time period after a storm). These measures are applied to the infrastructure WisDOT has responsibility for: the interstates & the state trunk highway system. These are intended to be applied uniformly, regardless of land uses. WisDOT applies a slightly different LOS tolerance for rural vs. urban roadways. WisDOT does consider local comprehensive plans in its corridor management planning process."

- "For corridor studies and comprehensive planning for city and regional agencies, have used walk and bike shed analysis to investigate activity nodes located within walk/biking distance of transit stops or residential areas; analyze connectivity of bike/ped network to identify infrastructure gaps and prioritize projects"
- "Cumulative opportunities accessibility to jobs as a performance monitoring metric (with MnDOT)."
- Evaluating strategies in the long-term plan such as number of jobs within a certain distance of transit stops."
- Developing and evaluating strategies in statewide plans."

**Question 3:** What aspects of accessibility/connectivity would be most useful for your agency to measure? Why?

- "Clearly the two areas where measuring accessibility/connectivity performance would be of value to the Department are: 1) Destination access and connectivity on the single transportation corridor north on Anchorage 2) Implementation of the Governor's Safety Initiative."
- "Measures that integrate aspects of land use in the evaluation of the performance of transportation and accessibility to places (to support policies for integrated land use and transportation planning). Focus on non-automobile modes, to support evaluation of transit, walking and biking mobility and improvements in these sectors."
- "Access to jobs; access to reliable transportation alternatives. We are interested in access to jobs because it helps to show that congestion and QOL do not always move in lock step. We are also interested in using the concept of accessibility to demonstrate the benefits of improvements that increase choice but may not reduce congestion."
- "Measures that connect transportation and land use and help to understand both to bring the right facilities to where growth is coming and to guide how that growth happens. Our trip and parking generation is starting to get at this (especially parking since Right Size Parking identifies the influential variables)"
- "Connectivity to IH or primary highway network, connectivity to designated freight network, connectivity to key gateways (international border crossings, ports, major freight generators, etc.). Missing links in our transportation network."
- "Location of transit services meeting accessibility/connectivity needs of customers"
- "WisDOT MAPSS measures have been useful as very basic measures. Related data is readily available for these and at a low cost. WisDOT's legal/regulatory responsibilities also allow the department to have a potential to influence the outcomes of these measures."
- "An overall measure of regional access would be useful - especially understanding how it changes with land use and transportation changes."
- "Accessibility - ability to reach desired good, services and activities, including the travel time and costs retuned by various users to reach their destinations"
- "Multimodal/linked travel time and reliability access to first and second job--time and reliability"

- “While the three aforementioned components are potential indicators of a project's ability to improve accessibility/connectivity between people and jobs, there may be additional measures that are better indicators”
- “for university, concerned with network connectivity by mode for commute trips - finding alternatives to SOV use”
- “Change in accessibility over time - Maybe disentangled to estimate relative contributions of land use and transportation changes, though this increases communication burden.”
- “Transit bike/pedestrian”
- “I know we aren't going to talk about time and cost but they are really important. Having access to a transit system that doesn't go where you need it to go, when you need it to go in a timely manner is useless. It doesn't matter how much access I have to the transit system whether by biking or walking if it doesn't function.”

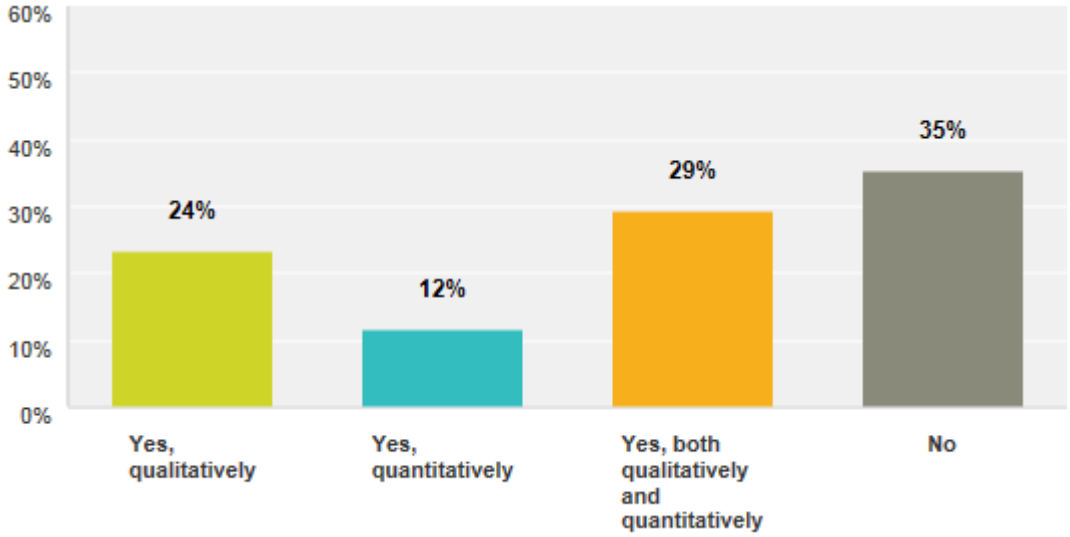
**Question 4:** What challenges do you see associated with measuring accessibility/connectivity?

- “Evaluating future connectivity given the different horizons typically involved in transportation, land use, and economic development planning.”
- “a. Enterprise governance to define roles and responsibilities b. Deployment concept of operations that has stakeholder buy-in or at the very minimum informed consent to clearly define the objectives c. Multimodal nature, i.e., marine highways, international airports, rural airports d. Enterprise solutions to both technical and institutional issues, e.g., geographic information system that includes enterprise licensing agreements (ELAs), spatial road network, and linkages”
- “Many different metrics have been proposed. Different results in studies depending on the way measures are used.”
- “Lack of influence / resistance to measuring things largely beyond our control. How do we estimate the impact of investments on future performance? How frequently does the requisite data become available? What is an appropriate amount of access, and how does the answer to that question change based on location?”
- Figuring out and calibrating perception, for things like comfort particularly. There are a lot of factors that change comfort (age, gender, income, past experiences) and they change over time. What seems like a safe bike facility to me might be totally unacceptable to my mom.”
- “Accuracy and access to the information. Understanding the network complexities and dynamics in the urban areas.”
- “Job growth data in transit shed”
- “Our largest challenges relate to the cost of collecting and maintaining data that is reasonably current, complete, and accurate over time. Consistency between the goals of our TMA congestion management plans related to accessibility & connectivity and the state's overall goals continues to be a challenge as well.”
- “Access is a very hard concept for the average person to grasp. We seem to get it intuitively (for example, if we live in a neighborhood with walk access to activities, we know that our access is good, and people seem to understand the "walk score"), but an abstract measure for a subarea or region is hard to explain.”
- “Accurate data, valid and statistically significant results from a user survey or objective empirical data collection”
- What is "reasonable" time and reliability and safety”
- ” Defining "reasonable amount of time": what's reasonable to someone, may not be to another.”
- “Defining what Accessibility/Connectivity is. NCDOT and its P3.0 Workgroup spent almost two months (with several meetings) trying to derive the definition and the best measures (given our

limited time). Also, is the measure to help get folks from more distress areas to where the jobs are located, increase jobs in the distressed areas, or both?"

- "scalability of measures (to regional or state); quality data (up-to-date, fine-grained, publicly available); comparing across modes"
- "Establishing consistent methodology - Access to consistent network/speed datasets"
- "Insufficient data"
- "Please see response to Question 4. Also, it is easy to get a false sense of what is really happening on the ground because you are only measuring someone's "ability" to use the system. You aren't measuring the efficiency of the system itself."
- "Not everyone defines performance measures the same way."

**Question 5:** Have you used or applied performance measures related to economic development, either qualitatively or quantitatively?




**Question 6:** If you answered yes, what measures have you used and how did you use them?

- "We are working with FDOT to develop methods for linking corridor planning decisions to the location of sites targeted for economic development in various statewide, regional, and local plans. This includes an emphasis on those areas where statewide targeted industry clusters are concentrated."
- "Job "creation" (jobs added or retained as a result of a transportation improvement). The results are based on employer estimates of the number of jobs they will add if an improvement is made. MnDOT uses these estimates when evaluating specific projects."
- "Some of the accessibility measures for evaluating strategies in our long range plan are related to the definition here."
- "All of the above."
- "Expected and actual revenues from joint development and other leases of Metro real property assets"
- "WisDOT's Transportation Economic Assistance (TEA) program is a rapid response grant program designed to create new employment and to retain existing employment, as well as to encourage private investment in Wisconsin. Communities can apply for TEA funds to encourage new businesses or business expansions in their regions by building transportation improvements such as access

roads, highway improvements or rail spurs. WisDOT uses QUANTITATIVE measures that look at total jobs created and cost/job created. We also use QUALITATIVE analysis as part of the selection criteria, using metrics for the types of jobs created and the type of business proposed."

- "Used an access to jobs measure in a project prioritization process for a long range transportation plan. The measure used was qualitative."
- "Policy studies looking at true interdependence of transportation facilities to development (when is transportation the real missing link)"
- "NCDOT has used a criteria called Economic Competitiveness in highway evaluating projects in P3.0. We used a tool called TREDIS to provide the expected long-term jobs (over 30 years) and increase in economic activity within the region (based on a change in GDP) using on the estimated travel time savings and increased in productivity resulting from the project. Existing industries would be likely to expand and create long-term jobs due to the time savings."
- "For campus corridor study (using sustainability framework), $ returned to economy from fuel savings (related to mode switch)"
- "Evaluating strategies in the long-term plan and in corridor studies"
- "Developing & evaluating strategies in statewide plans"

**Question 7:** What aspects of economic development would be most useful for you agency to measure? Why?

- "a. Highways, airports, marine highway vessels - maintenance and operations costs b. Energy development, aka roads to resources, and particularly transportation infrastructure (highways, ports) and access – return on investment c. Marine highway vessel replacement and scheduling – effective transportation system tying the off-road communities to the state's connected road system and cost of new marine vessels."
- "In qualitative terms, we want to know whether a particular improvement made at a specific location can reasonably be expected to increase the competitiveness of the industries operating in that area. We would use this information to describe (in qualitative terms) how transportation investment is strengthening local economies. Understanding what type of improvements are likely to have economic benefits would also allow us to better track and report our investments in "freight" or "economic development"."
- "Isolating sales volume/tax revenue tied to better accessibility"
- "Population, industrial, job growth. Also international trade. We have made limited use to-date of econometric models that consider more quantitative measures of economic development impacts. These models can be a bit suspect at times, but we may consider this further in the future."
- "Increased value of land near Metro facilities (rail) and bus routes"
- "The most useful aspects would be quantitative data identifying jobs created and businesses created as outcome based metrics. Also cost/job (business) and total project investment (state+local+private funds) to identify how state funds were leveraged. What we are not good at is tracking secondary job creation, how long are jobs actually created/retained? What are good income multiplier effects in the local community? Right now the program is job driven, so how should we be creating opportunities for measuring the benefits of businesses that only deal in freight commodities? How do you measure the economic benefit to the community for commodity movement businesses?"
- "Since transportation provides "lubrication" for the economy, it would be useful to be able to understand a quantitative measure of that lubrication - how does transportation access improvement translate into improved economic performance, or potential for improved economic performance. (It's the potential that we'd probably like to see given the long implementation time for actual economic development."
- "With our least cost planning/ mosaic we are trying to look at this as we look at bundles of projects. Assessing the impact of transportation improvements both on job creation and livability"

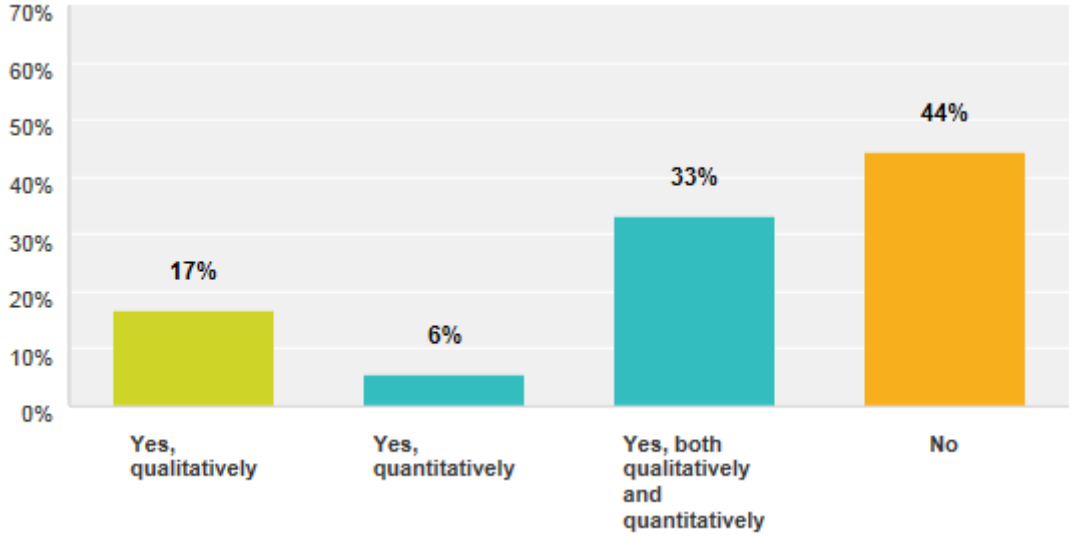
- "The definition of facilities planned and managed to support growth in economic centers is most useful to us because it deals with job growth which is a high visibility area with the public and elected officials."
- "Ability to capture job/economic growth potential resulting from a project"
- "Better transportation provides better opportunity for economic development from freight movement, accessibility to markets..."
- "Amount of permanent jobs created in a corridor after the completion of a transportation project. The measure can be useful because it can provide a broader sense of the benefits of a project that might not be captured in a traditional cost/benefit analysis."

**Question 8:** What challenges do you see associated with measuring economic development?

- "Different time horizons and levels of geographic detail involved in transportation and economic development planning."
- "Challenges are directly related to defining the business needs, establishing the return on investment, and setting the operations and maintenance funding requirements for the three business areas defined for measuring economic development: a. Highways, airports, marine highway vessels - maintenance and operations costs b. Energy development, aka roads to resources, and particularly transportation infrastructure (highways, ports) and access – return on investment c. Marine highway vessel replacement and scheduling – effective transportation system tying the off-road communities to the state's connected road system and cost of new marine vessels."
- "It is dependent on so much more than transportation. It is also highly location specific, making a consistent approach difficult."
- "It is difficult to determine causality in economic development. Also, there is the macroeconomic question of whether you are fostering new economic activity or simply moving jobs and activity around."
- "Economic development can often mean different things to different constituencies. Econometric models can be results that are suspect at times and the time/effort to develop and apply them often does not justify the benefit of the information."
- "Data and agreement on how to estimate increased property values"
- "Since trips are disaggregate from the traveler perspective, and from and to are very important, it's hard to take individual trip improvements and aggregate them to a region and keep them meaningful and understandable to the public."
- "Data collection an understanding when the information received how objective vs. subjective it really is"
- "Suggesting that low income neighborhoods only need access to industrial and service jobs--may not be good assumption, ignores move to higher paying second jobs via reasonable access, and treads heavily into the title VI arena"
- "Availability of accurate data to calculate appropriate measures."
- "We did not include an evaluation of contingent development (if you build it, they will come) as this these promises don't always pan out. What is the desired goal of economic development- are you attempting to grow prosperous areas, improve the economy of distressed areas, both?"
- "Identifying direct measures; in terms of development, distinguishing "good" development from 'less good' development in the long-term (i.e., not all development is created equal); data sharing across agencies"
- "Quantifying potential for economic development it involves many other facets other than transportation, such as quality of workforce resources."
- "It's easy for the measure to be "gamed." It is difficult to know where to draw the line when attributing economic development to a project. Those who are less rigorous in their analytical

methods might end up claiming more benefit than is warranted or end up comparing apples and oranges."

**Question 9:** Have you used or applied performance measures related to health, either qualitatively or quantitatively?




**Question 10:** If you answered yes, what measures have you used, and how did you use them?

- "Testing measures of the relationship between investments in projects to support active transportation (e.g., bicycling) and health benefits"
- "The non-focus areas mostly eliminate those areas where health performance measures are routinely used. Other areas highlighted in the definitions have not been routinely used as the state level and are more likely at the local government level. Here are few targeted statewide programs that involve health that are used: a) Trails and Recreational Access for Alaska (TRAAK) – includes bike and pedestrian paths/trails, overland winter trail markings, historic preservation, waysides, interpretive signage, access to recreational facilities, and other improvements. Evaluate the success and use of the improvements. b) Major disasters, e.g., earthquakes, floods, mudslides, avalanches, etc. Evaluate the Department's disaster response, mitigation, and cleanup. c) Non-routine road closures from weather and natural disaster incidences. Evaluate the timeliness of public notices and 511 traveler information system posted information. d) Travel to and access at to recreational areas which includes winter activities (snow machining and skiing), boating activities, and year around hiking. The public notices may involve incident reports, road weather information, and camera images. Evaluate the timeliness of 511 traveler information system. e) Land access to sewage lagoon facilities and landfills (note: these roads are functionally classified higher than local and are state-maintained). Evaluate the funding allocation and the availability of the road centerline in the enterprise geographic information system. f) Land access to airports, ports, and harbors (note: these roads are functionally classified higher than local and are state-maintained). Evaluate the funding allocation and the availability of the road centerline in the enterprise geographic information system."
- "Review of the use of indicators for air pollutants, health issues, obesity and physical activity to better evaluate the impact of transportation and urban form on health."
- "We have tried to estimate the walking / biking benefits associated with specific improvements. This information has been used to evaluate projects."

- "We used these measures to evaluate strategies in our long range plan. Measures: -Number of new on-street bicycle facilities, trails, and sidewalks within 100 feet of parks and green space -Presence of policies and programs that educate or encourage active transportation -ADA compliance of the pedestrian system -Sidewalk on at least one side of every street -Level of sidewalk investment -Presence of policies that improve the attractiveness or make better use of public spaces"
- "Integration of multimodal elements in proposed transportation projects. Connectivity to multimodal systems."
- "We tried to use health measures in our project prioritization process. While we included several in our non-motorized measures, it was hard to get a handle on overall cross-modal measures that made sense in measuring health outcomes."
- "Access to health care, focus on travel time within time budgets, proximity to transit, total trip time (e.g. walk-bus-walk)"
- "For a health-based city transportation plan, estimating bicycle demand (based on network quality), health impact assessment of specific projects (qualitative using public process); for regional transportation study, used spatial analysis to identify food desserts, inequality in transportation provision (access to different modes by socio-demographic characteristics), etc.; for campus transportation planning, survey analysis of active mode split, barriers to active mode use, sedentary vs. active time"

**Question 11:** What aspects of health would be most useful for you agency? Why?

- "• Access to clean water and waste disposal• Access to transportation hub, especially in the remote, rural parts of the state: harbor (river, lake, ocean), airports• Access to fishing/hunting resources and recreational areas• Responsive incident response, whether natural or man-made.• Delivery of road weather and incidences to the public for informed travel decisions"
- "Impact on physical activity and related health issues."
- "Opportunities for and frequency of active transportation; air quality / emissions associated with transportation; traffic fatalities from a public health perspective"
- "Measures that capture how we are supporting behavior change."
- "Multimodal systems. Broader measures of health may be worthy considerations, but from a policy standpoint, they don't carry the same weight as providing a safe and reliable transportation system."
- "Quantify the health benefits associated with taking transit vs. car"
- "Pre- & Post- counts on people walking or biking. Health benefits for rural & suburban communities to show the need for biking and walking infrastructure."
- "A cross-modal measure that relates transportation investments to health outcomes. This is what our decision-makers are interested in, but it's a hard thing to produce."
- "Measuring the relationship of active transportation efforts to health improvements"
- "Actual modal usage in active transportation as opposed to availability"
- "Reduction of in-vehicle time is useful to us because as an agency, we may be able to affect that aspect - it fits well with Transportation Systems Management and Operations."
- "Mode split --> physical activity levels (relates to travel times, intensity, etc.); types and percentage of trips that could be completed via non-auto;"
- "Maybe obesity, lung disease"

**Question 12:** What challenges do you see associated with measuring health?

- "• Communication technology with rural areas• Coordination with local government and Native American community that may have significantly different transportation and health needs. This

includes meeting a diverse array of needs in transportation planning and project development.• Coordination with other state and federal agencies• Governance model for coordination and data sharing that defines roles and responsibilities• Effective feedback from stakeholders and the public to adjust current plans"

- "Data availability; Transportation is only one piece of the public health picture"
- "The issue with health beyond traditional measures (air quality, safety) is that there are huge non-transportation influences there and it is hard to isolate transportation's effect. For example, bike facilities may be available, but if there are public safety issues (muggings, etc.), then you won't get people riding."
- "It is a very broad subject with a wide range of opinions as to how and what elements associated with 'health' should be considered in the performance measure process for transportation."
- "Uniform approach to quantifying health benefits"
- "1) resources to collect data, take counts; 2) how best to demonstrate "needs" in rural & suburban communities; 3) how to demonstrate the economic benefits/savings in health care costs by providing opportunities for active transportation."
- "Showing causality between transportation and desired health outcomes. Most measures focus on the potential for activity, but fall short of following through with the actual health outcomes."
- "What data to collect, how to collect it and maintain it over time"
- "Cannot ignore air quality--just looking at criteria pollutants doesn't capture all concerns re: at risk populations proximity to highways, rail, seaports, airports (i.e. diesel particulates, coal dust, derailments, etc."
- "Improving health can depend on changes in behavior. This may present a challenge in determining appropriate measures."
- Health can be perceived as more a quality of life issue, as a opposed to a transportation issue. While transportation projects can support improving health, a big question for agencies is should they be trying to solve a transportation problem or a health issue (or both)?"
- "Development of valid survey instruments; scalability of measures"
- "Unfamiliar with the measures that are common in the health industry and be able making the linkage."
- "I find the "construct" between a healthy lifestyle and one's proclivity to drive or use transit to be false. I think we are attempting to apply attributes to modes of transportation that have no or weak correlation."

**Question 13:** The three topics that are to be discussed during the peer exchange have some common elements and, therefore, can have interrelated outcomes. To help explore these interrelationships in a more concrete context, the facilitators are hoping to identify a specific project or case study to frame the discussion of the relationships between accessibility/connectivity, health, and economic development performance outcomes and measures. Is there a project your agency is currently implementing or has recently implemented that was intended to have a beneficial impact on all three of these areas. If so, please briefly describe the project below. Note: it is not essential that your agency established actual performance outcomes for all three, but it would be helpful if policy makers or staff identified the potential for the project to affect all three.

- "This one is undoubtedly too big and just getting started but is a very interesting one covering the three areas: the Knik Arm Crossing, aka the 2nd Bridge to NoWhere."
- "A road diet could be a good example. We have one currently on Maryland Ave NE that may have explicit measures (I am still checking) for some of these items. This project and ones like it are an opportunity to discuss a how these "non-traditional" measures run up against the "traditional" measures when we try to implement projects. Our Maryland Ave NE project is a good example (or

any “road diet” for that matter) when the automobile impacts can be more easily measured, but we lack good, reliable, accepted measures for potential benefits.”

- “Texas Freight Mobility Plan http://www.movetexasfreight.com/ 2040 Texas Transportation Plan http://www.txdot.gov/inside-txdot/division/transportation-planning/statewide-plan.html.html”
- “Silver Line expansion would be a good example but I was not involved in the "pitch" of this project so don't know if all three non-traditional areas were used to support the project. Most likely accessibility and econ development were.... but doubt health was raised....”
- “As previously noted, NCDOT incorporates a form Accessibility/Connectivity and Economic Competitiveness in our Strategic Prioritization Process when evaluating projects.”
- “Campus corridor redevelopment - using a sustainability framework (that addresses all three of the topics) to develop goals and targets and evaluate impacts of redeveloping into multimodal, mixed-use corridor. Corridor is an important connector between campus and the city.”
- “Statewide bike/pedestrian transportation plan”

## Appendix C: Attendee List

| Name | Agency | Email |
|---|---|---|
| Elise Barella | James Madison University | barrelem@jmu.edu |
| Sandy Beaupre | Wisconsin DOT | Sandy.Beaupre@dot.wi.gov |
| Clinton Bench | Massachusetts DOT | Clinton.Bench@state.ma.us |
| Katie Benouar | Caltrans | katie.benouar@dot.ca.gov |
| Jerri Bohard | Oregon DOT | jerri.l.bohard@odot.state.or.us |
| Giovanni Circella | Georgia Tech | gcircella@ucdavis.edu |
| Janet D'Ignazio | ICF International | janet.d'ignazio@icfi.com |
| Stephanie Dock | Washington DC DOT | stephanie.dock@dc.gov |
| Jamie Fischer | Georgia Tech | gth223a@gatech.edu |
| Frank Gallivan | ICF International | frank.gallivan@icfi.com |
| Matt Hardy | AASHTO | mhardy@aashto.org |
| Trish Hendren | WMATA | PHendren@wmata.com |
| Paul Hershkowitz | CDM Smith | hershkowitzp@cdmsmith.com |
| Stephanie Hickman | FHWA | stephanie.hickman@dot.gov |
| Charlie Howard | Puget Sound Regional Council | choward@psrc.org |
| John Kaliski | Cambridge Systematics | jkaliski@camsys.com |
| Alanna McKeeman | ICF International | alanna.mckeeman@icfi.com |
| Brian McLafferty | Minnesota DOT | Brian.Mclafferty@state.mn.us |
| Harlan Miller | FHWA | harlan.miller@dot.gov |
| Andrew Owen | University of Minnesota | aowen@umn.edu |
| Rob Pennington | West Virginia DOT | Robert.Pennington@wv.gov |
| Kyle Schneweis | High Street Consulting | schneweis@highstreetconsulting.com |
| Francine Shaw-Whiston | FHWA | Francine.shaw-whitso@dot.gov |
| Brian Smith | (Former) Washington DOT | BrianSmith2014@comcast.net |
| Jack Stickel | Alaska DOT | jack.stickel@alaska.gov |
| Jeffrey Sudmeier | Colorado DOT | jeffrey.sudmeier@state.co.us |
| Jennifer Toth | Arizona DOT | jtoth@azdot.gov |
| Montie Wade | Texas Transportation Institute | montie-wade@tamu.edu |
| David Wasserman | North Carolina DOT | dswasserman@ncdot.gov |

## Appendix D: Breakout Group Handout

**FHWA/ADA 10/AASHTO Peer Exchange on**

**Performance Outcomes Beyond the Mainstream**

**Breakout Discussion**

**Purpose:**

The purpose of this breakout session is to vet and improve the measures in the draft matrix and identify specific challenges associated with performance measures for accessibility, economic development, and health.

**Outcome:**

By the end of the breakout session, each group will have revised their part of the matrix and listed challenges associated with each decision-making application.

**Instructions:**

Using the criteria proposed and the discussion questions listed below, consider whether the existing measures are suitable or not. Refer back to the definitions of each topic area as necessary. Try to avoid detailed comparisons of one measure to another. Rather focus the discussion on whether a range of suitable measures is available for each decision-making application, or conversely whether a particular application lacks good measures and requires further research. Additional examples of possible measures are provided at the end of this sheet.

**Key Questions to Consider:**

- Are the measures appropriate in the context of the criteria identified? Can new measures be suggested?
- What are the major technical challenges in each category?
- Are there alternative measures that address those challenges or could be put into practice more quickly?
- Can you think of specific examples of good measures in application?

**Draft Matrix**

| Application | Accessibility/Connectivity | Economic Development | Health |
|---|---|---|---|
| **Long Range Planning/Strategy Development** | • % growth occurring in transit shed<br>• Number of jobs within X distance of transit stations | | • Number of new on-street bicycle facilities, trails, and sidewalks within 100 feet of parks and green space<br>• Presence of policies and programs that educate or encourage active transportation<br>• ADA compliance of the pedestrian system<br>• Sidewalk on at least one side of every street<br>• Level of sidewalk investment<br>• Presence of policies that improve the attractiveness or make better use of public spaces |
| **Project Prioritization** | • Number of jobs accessible by car within 30 minutes during peak periods | • Job "creation" (jobs added or retained as a result of a transportation improvement) | • Integration of multimodal elements in proposed transportation projects<br>• Connectivity to multimodal systems. |
| **Monitoring** | • Number of jobs accessible by car within 30 minutes during peak periods | | |