GUIDEBOOK FOR PEDESTRIAN AND BICYCLE PERFORMANCE MEASURES

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U.S. Department of Transportation

Federal Highway Administration

Project Background and Context

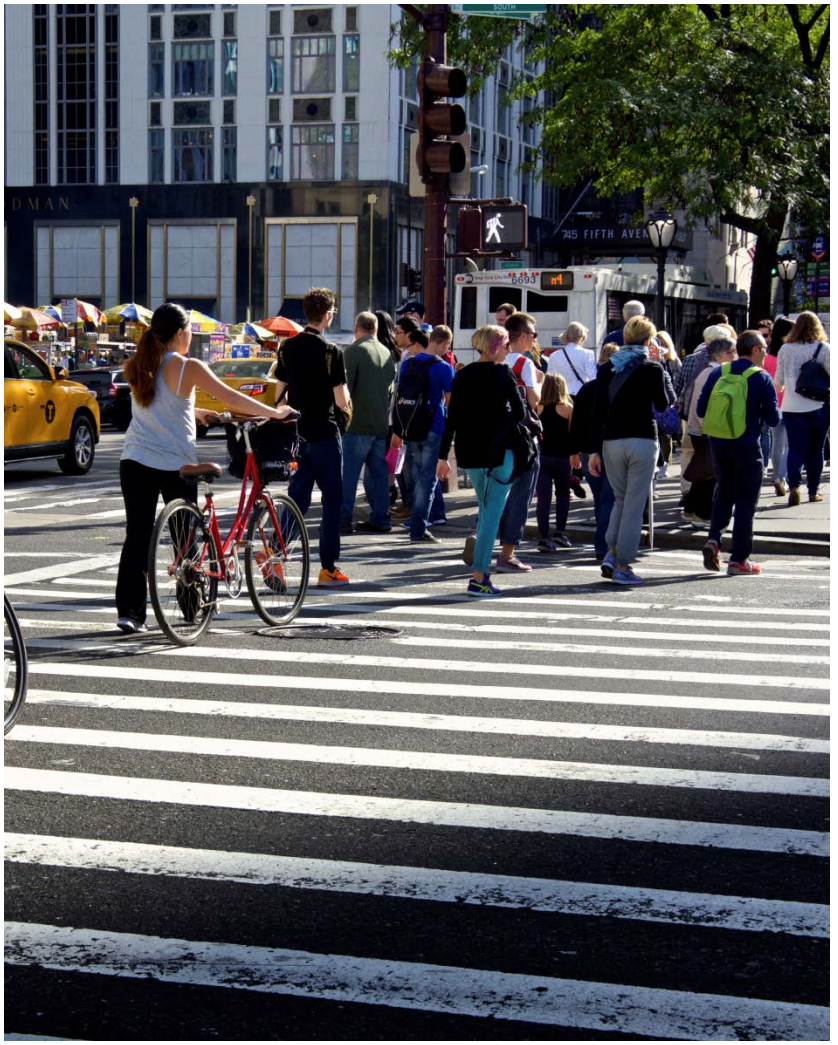
U.S.Department of Transportation
Federal Highway Administration

- 2013 FHWA Work Plan
- 2010 *Policy Statement on Bicycle and Pedestrian Accommodation*
- National Performance Objective
- FHWA support for:
  - Design flexibility
  - Connected bicycle networks
  - OST priorities and *Safer People, Safer Streets* initiative
- Other ongoing research projects and data initiatives

Overview of the Study Process

U.S.Department of Transportation
Federal Highway Administration

- FHWA Technical Staff Leads
- FHWA Ped/Bike Work Group
- Literature review
- Technical Work Group
- Other stakeholder engagement
  - AASHTO, NACTO, ITE
  - Conferences
  - Peer exchanges
- Peer exchange meetings
  - State
  - Regional
  - Local
- Performance Measure Toolbox



Overview of the Study Process

U.S.Department of Transportation
Federal Highway Administration

Technical Work Group

- **Josh Benson**, New York City
- **Lauren Blackburn**, North Carolina Department of Transportation
- **Dongho Chang**, Seattle Department of Transportation
- **Darren Flusche**, League of American Bicyclists
- **Shelia Lyons**, Oregon Department of Transportation
- **Byron Rushing**, Atlanta Regional Commission
- **Kate Sylvester**, Maryland Department of Transportation
- **James Wagner**, Indian Nations Council of Governments (Tulsa, OK Metropolitan Planning Organization)
- **Amy Weymouth**, Greater Buffalo-Niagara Regional Transportation Council

Peer Exchange Meetings

State

- Caltrans
- Colorado DOT
- Florida DOT
- Maryland DOT
- Minnesota DOT
- North Carolina DOT
- Oregon DOT
- Washington DOT
- State Smart Transportation Initiative

Region

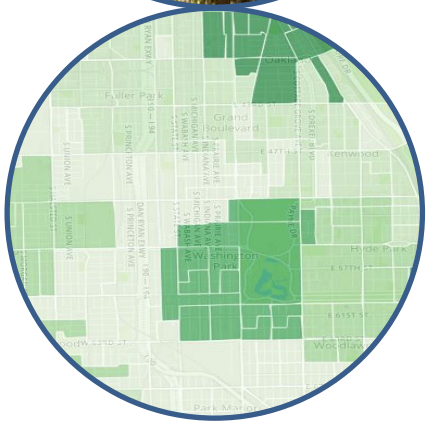
- Atlanta Regional Commission
- Blacksburg Transit
- DVRPC (Philadelphia)
- Greater Buffalo Niagara RTC
- LA County MTA
- Memphis Urban Area MPO
- Metro (Portland)
- North Central Texas COT
- SEMCOG (Detroit)
- Volpe Transportation Center

Local

- Arlington County, Virginia
- Charlotte
- Fort Collins
- Hennepin County, Minnesota
- New York City
- Phoenix
- Seattle
- Washington County, Oregon
- Washington, DC

What is a Performance Measure?

- The metric we use to evaluate if our system is functioning the way we want it to function
  - Evaluate our existing system
  - Plan our future system
  - Prioritize projects and programs
  - Set standards for development
  - Allocate funding



Vision and Goals

- Provide strategic direction for investment and policy decisions

Objectives

- Describe how a goal can be accomplished

Performance Measures

- How we know if we are meeting our objectives

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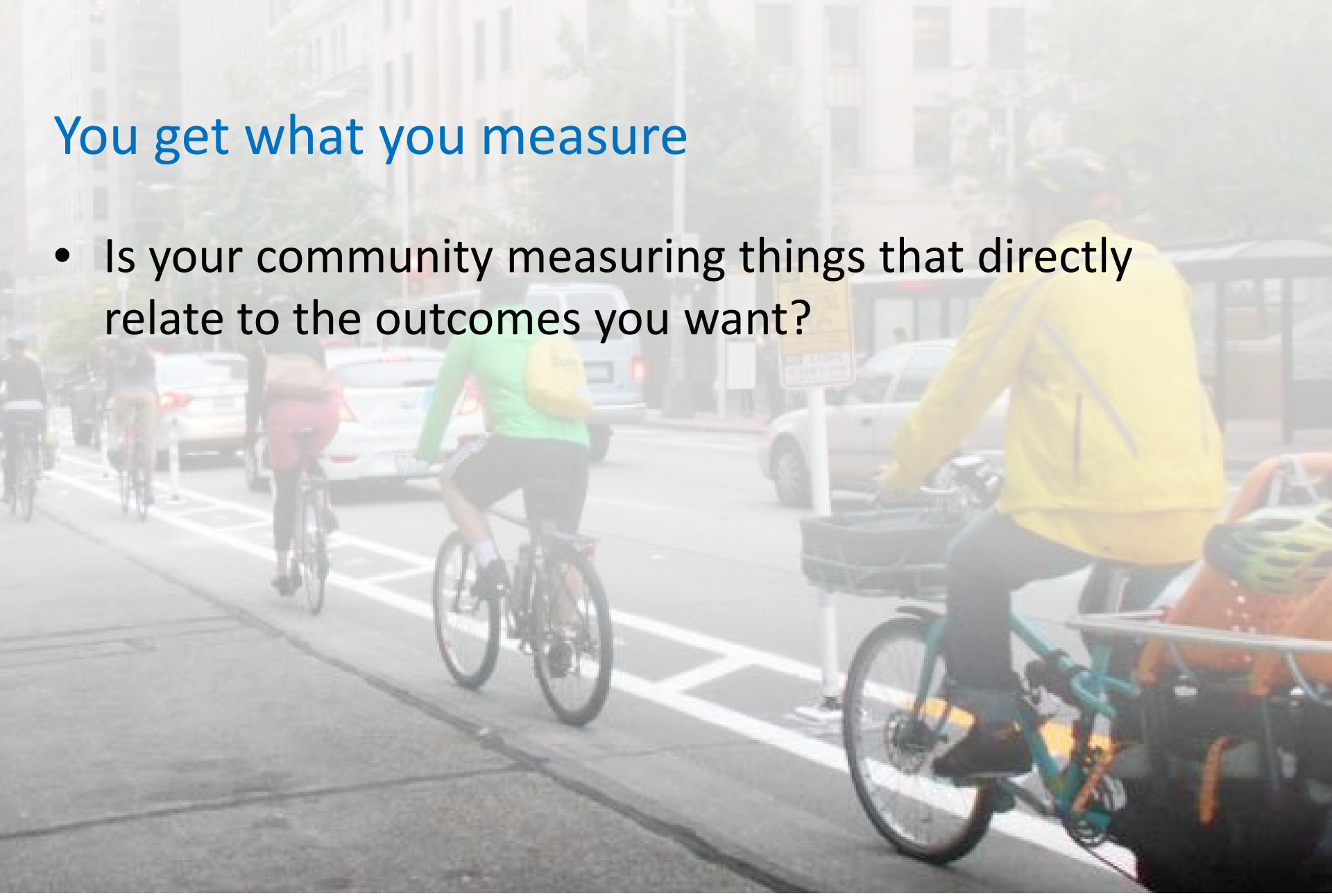
You get what you measure

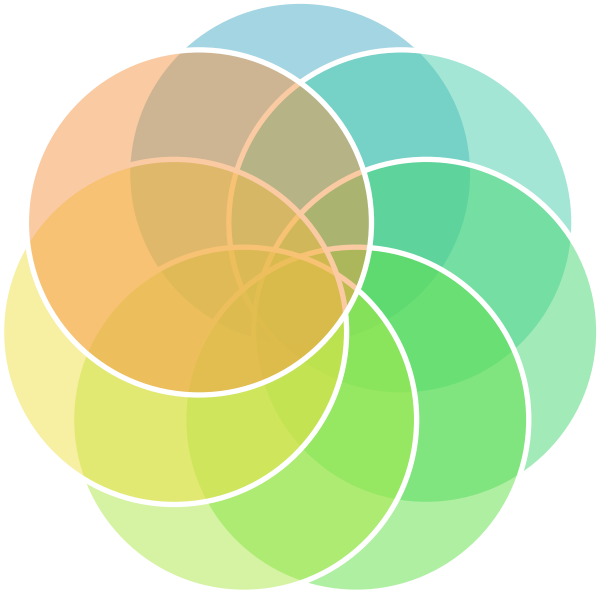
- Is your community measuring things that directly relate to the outcomes you want?



Comprehensive Approach – Measure What Matters

Safety &
Security

Equity



Environment

Livability

Economic
Vitality

Connectivity

Health

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Guide Highlights

U.S.Department of Transportation
Federal Highway Administration

1. Context and Organizing Framework
2. Applying Performance Measures in Practice
3. Performance Measures Toolbox

Establishing a program: Key Questions

1. What goals does this performance measurement program support?
2. How will the measures be used?
3. What is the geography of the analysis?
   - State
   - Regional
   - Local
4. What is the land use type?
   - Urban
   - Suburban
   - Rural

Goals and Transportation Measures

COMMUNITY GOALS CATEGORIES	TRANSPORTATION MEASURES CATEGORIES					
	ACCESSIBILITY	COMPLIANCE	DEMAND	INFRASTRUCTURE	MOBILITY	RELIABILITY
CONNECTIVITY	High			High	High	Low
ECONOMY	High			Low	High	High
ENVIRONMENT	High		High		Low	Low
EQUITY	High	Low	Low	High	High	Low
HEALTH	High	Low	High	High	Low	Low
LIVABILITY	High	Low	Low	High	Low	High
SAFETY	Low	High		High	Low	Low

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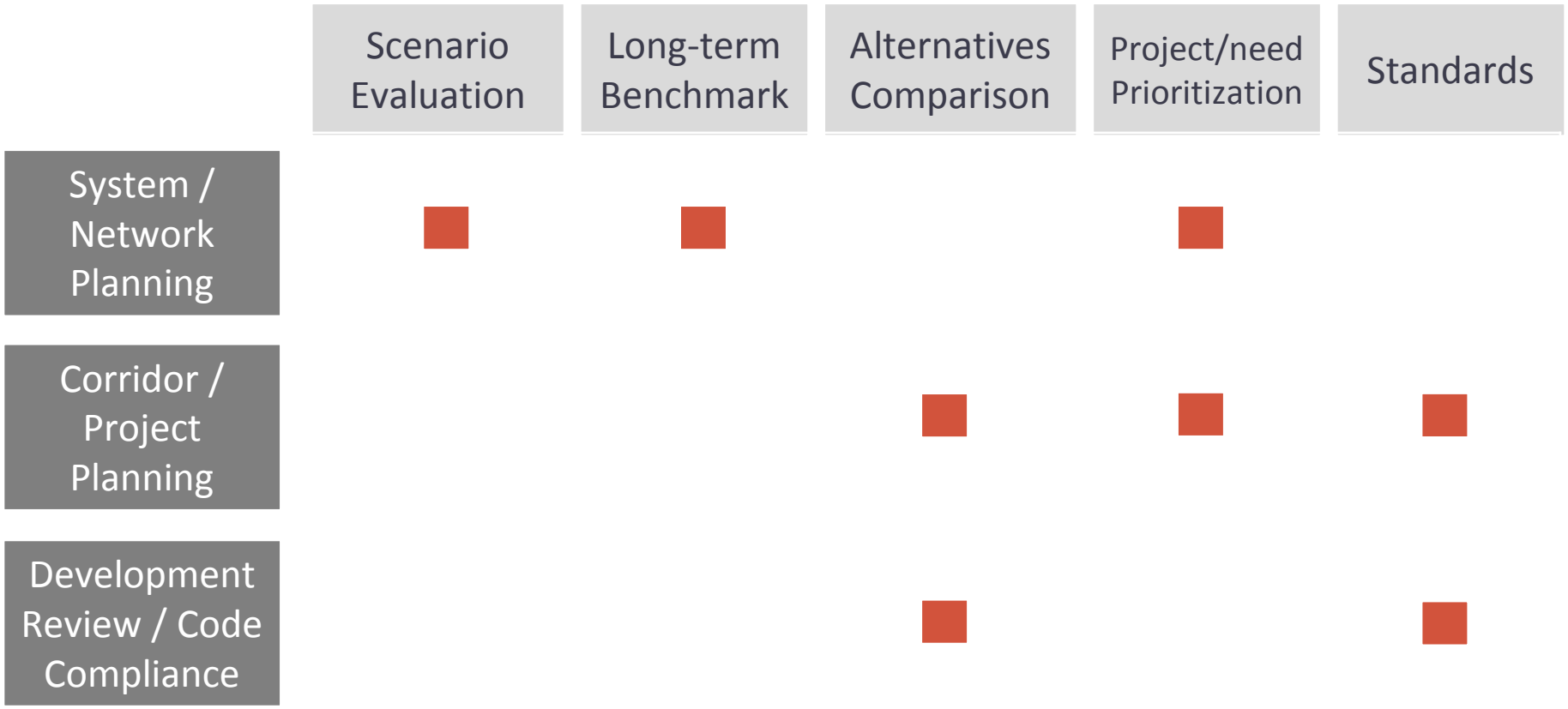
How will the measures be used?

- System / Network Planning
- Policy Development
- Corridor / Project Planning
- Funding Allocation
- Development Review / Code Compliance
- Street Design

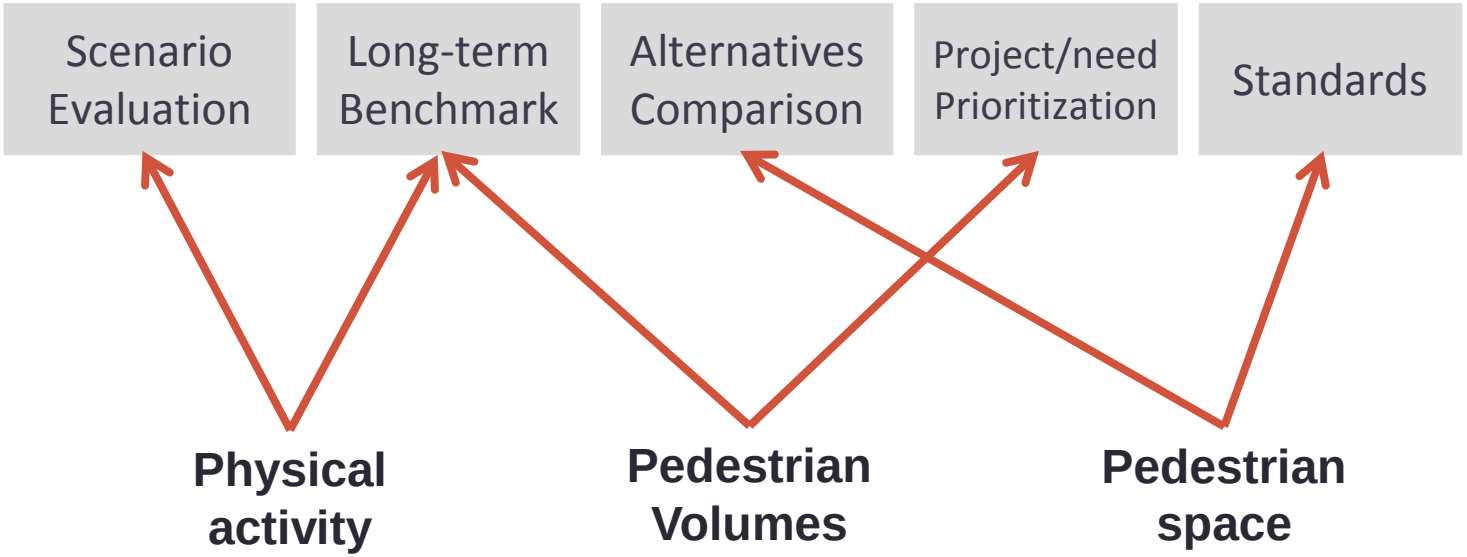
How will the measures be used?

	Scenario Evaluation	Long-term Benchmark	Alternatives Comparison	Project/need Prioritization	Standards
System / Network Planning					
Corridor / Project Planning					
Development Review / Code Compliance					

How will the measures be used?



Not all measures serve all purposes:



AGENCY/APPLICATION	PLANNING SCENARIO EVALUATION	LONG-TERM BENCHMARK	ALTERNATIVES COMPARISON	PROJECT NEED/ PRIORITIZATION	NEAR-TERM STANDARD
LOCAL JURISDICTION (COUNTY, CITY)					
System/Network Planning	X	X		X	
Corridor or Project Planning			X	X	X
Development Review/ Code Compliance			X		X
Street Design					X
REGIONAL PLANNING AGENCY (MPO)					
System/Network Planning	X	X	X	X	
Regional Policy Development		X			X
Funding Allocation				X	
STATE AGENCY (DOT)					
Statewide System/ Network Planning	X		X	X	
Statewide Policy Development		X			X
Funding Allocation				X	
Code Compliance					X

Establishing a program: Key Questions

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Performance Measures Toolbox

- Top 30 measures for walking and bicycling
- Organized for quick and consistent referencing
- Categorized according to key questions:
  - Goals
  - Application / use
  - Geography
  - Land Use Context

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/performance_measures_guidebook/pm_guidebook.pdf

TABLE 5 GOALS APPLICABLE TO PERFORMANCE MEASURES

PERFORMANCE MEASURES	GOALS						
	CONNECTIVITY	ECONOMIC	ENVIRONMENT	EQUITY	HEALTH	LIVABILITY	SAFETY
Access to Community Destinations	X	X	X	X	X	X	X
Access to Jobs	X	X		X			
Adherence to Accessibility Laws	X	X		X	X	X	X
Adherence to Traffic Laws					X		X
Average Travel Time	X	X		X		X	X
Average Trip Length	X	X		X		X	X
Connectivity Index	X	X		X		X	X
Crashes				X	X	X	X
Crossing Opportunities	X			X	X	X	X
Delay				X		X	X
Density of Destinations	X	X		X	X	X	X
Facility Maintenance	X			X		X	X
Job Creation		X					
Land Consumption		X	X			X	
Land Value		X					

PERFORMANCE MEASURES	GOALS						
	CONNECTIVITY	ECONOMIC	ENVIRONMENT	EQUITY	HEALTH	LIVABILITY	SAFETY
Level of Service				X		X	X
Miles of Pedestrian/Bicycle Facilities	X			X	X	X	X
Mode Split			X	X	X	X	
Network Completeness	X	X	X	X	X	X	X
Pedestrian Space		X		X		X	X
Person Throughput		X		X			
Physical Activity and Health				X	X	X	
Population Served by Walk/Bike/Transit	X			X	X	X	X
Retail Impacts		X					
Route Directness	X	X	X	X		X	X
Street Trees			X		X	X	X
Transportation-Disadvantaged Population Served	X			X			
User Perceptions					X	X	X
Vehicle Miles Traveled (VMT) Impacts			X		X	X	X
Volume			X		X		X

PERFORMANCE MEASURE

NETWORK COMPLETENESS

The portion of the transportation network that is usable for people walking or bicycling, and represents the minimum accommodations needed for a facility to be considered part of the walking or bicycling network.

GOALS

- CONNECTIVITY (X)
- ECONOMIC (X)
- ENVIRONMENT (X)
- EQUITY (X)
- HEALTH (X)
- LIVABILITY (X)
- SAFETY (X)

RELATED MEASURES

"Connectivity Index"

"Miles of Pedestrian/ Bicycle Facilities"

"Pedestrian Space"

"Route Directness"

CONTEXT

PERFORMANCE MEASURE APPLICATION

PROJECT PRIORITIZATION
A measure of network completeness can be used to prioritize projects that fill crucial gaps or meet unaddressed needs for walkers and bicyclists.

ALTERNATIVES COMPARISON
When comparing design options, an agency may consider how two or more possible configurations contribute to a more complete transportation network for those walking or biking.

SCENARIO EVALUATION (POSSIBLE)
Network Completeness can be applied in evaluating future scenarios of potential transportation investments and land use changes.

BENCHMARKING
An agency can report change over time through regular updates to inventories of intersection treatments, bicycle facilities, and sidewalks.

STANDARD
A performance baseline related to network completeness may call for a given percentage of the network to be completed each year or for a given percentage of sidewalks to meet ADA standards by a given year.

GEOGRAPHY	PREFERRED	POSSIBLE
STATE	X	
REGION	X	
LOCAL	X	

LAND USE CONTEXT	PREFERRED	POSSIBLE
URBAN	X	
SUBURBAN	X	
RURAL		X

DATA NEEDS & SOURCES

Inventory data for:

- Roadways.
- Sidewalks.
- Bike facilities.
- Pavement markings.
- Signs.
- Signals.

HOW TO TRACK

In some cases, agencies set a threshold for what qualifies as complete based on the context of the street (e.g., wider sidewalks in commercial areas or separated bike lanes in higher traffic conditions).

System completeness can be defined and measured in a variety of ways:

- Percent of roadway miles with complete sidewalks or bicycle facilities on both sides.
- Percent of planned pedestrian or bicycle network that is constructed.
- Percent of pedestrian or bicycle or roadway system that serves pedestrian and bicycle users ages 8 to 80.
- Percent of signalized intersections that have complete pedestrian and bicycle facilities, such as detection, push buttons or pedestrian-recall, striped crossings.
- Percent of sidewalk facilities accessible to users of all abilities.
- Percent of arterial and collector roadways with crossing opportunities every XX miles.

System completeness and inventory information can be reported as an aggregate measure (e.g., total miles of bike lanes) or stored in a GIS database.

PEERS TRACKING THE MEASURE

- Most agencies maintain an inventory of sidewalk, crosswalk, and/or bicycle lane infrastructure.
- A number of agencies, including the City of Oakland (California), the City of Boulder (Colorado), Montgomery County (Maryland), and Delaware DOT measure network connectivity using the Level of Traffic Stress method.[48] LTS is an effective measure for assessing the completeness of a network, particularly because it highlights all streets that are appropriate for the "interested but concerned" bicycling demographic. LTS also highlights areas of concern where the network is not complete and uncomfortable for less experienced bicyclists.

NOTES

Completeness can be a subjective term and should be explicitly defined. For example, a minimum width of a sidewalk should be identified to qualify as part of a complete system.

Collecting inventory data can be time consuming and expensive, and some agencies lack documentation on pedestrian and bicycle infrastructure. With ever improving photographic inventories such as third party aerial photography and street-level photo inventories, agencies may be able to collect bulk information much more easily.

Network Completeness can be tied in with agencies' ADA Transition Plans, which require DOTs and other agencies to identify barriers to access for persons with disabilities.

Thank you!
Questions?