TODAY'S SPEAKERS

- Jordan Whisler (ODOT)
- Joe Fish (TDG)
- Na Chen (UC)
- Patricia Kovacs (OBF)
NONMOTORIZED PERFORMANCE MEASURES, PROJECTS & RESOURCES

Jordan Whisler, AICP
OTEC 2018
NONMOTORIZED PERFORMANCE MEASURES:
Over the next few minutes?

- Introduction to NM Performance Measures
- Current ODOT Initiatives
- Available resources
INTRODUCTION TO NONMOTORIZED PERFORMANCE MEASURES

What, where, why...
Performance management techniques promote informed decision making by relating community goals to the measurable effects of transportation investments.

Key steps in performance management are to decide what to measure in order to capture the current state of the system, to set targets to improve those measures, and to use the measures to evaluate and compare the effects of proposed projects and policies.

SOURCE: Guidebook for the Development of Pedestrian and Bicycle Performance Measures
NONMOTORIZED PERFORMANCE MEASURES:

What is Performance Management?

TABLE 4 EXAMPLE APPLICATIONS OF PERFORMANCE MEASURES BY DIFFERENT AGENCIES

<table>
<thead>
<tr>
<th>AGENCY/CITY APPLICATION</th>
<th>PERFORMANCE MEASURES</th>
<th>NEAR-TERM STANDARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL JURISDICTION (CITY)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AGENCY/PLANNING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYSTEM/WATERFRONT</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PERFORMANCE MEASURE

LEVEL OF SERVICE

A level of service is a quantifiable measure of service that reflects how users perceive a service condition (e.g., delay, travel time, speed, comfort). Pedestrian and bicycle level of service can be measured through travel time, delay, and travel cost. The level of service primarily based on travel time for pedestrians and

GUIDEBOOK

FOR DEVELOPING PEDESTRIAN & BICYCLE PERFORMANCE MEASURES

MARCH 2018

DATA NEEDS & SOURCES

- Traffic volumes
- Speeds
- Accidents
- Incidents
- Weather
- Traffic signals
- Bicycles
- Pedestrians
- Motorized vehicles

NEAR-TERM STANDARD

Setting near-term standards that establish a minimum baseline for walking and bicycling performance provides consistency with agency goals and benchmarking measures, and ensures that larger policy goals are reflected in detailed evaluations, project-level decisions, and implementation. Standards are applied most frequently during development review and code compliance at the project level, and complete understand optimal service performance for walking and bicycling, including conditions that are generally utilized to describe the performance of these modes.

NEAR-TERM STANDARD

Setting near-term standards that establish a minimum baseline for walking and bicycling performance provides consistency with agency goals and benchmarking measures, and ensuring that larger policy goals are reflected in detailed evaluations, project-level decisions, and implementation. Standards are applied most frequently during development review and code compliance at the project level, and complete understand optimal service performance for walking and bicycling, including conditions that are generally utilized to describe the performance of these modes.
Different communities and audiences have different values and goals.

There are many ways to track performance and communicate need.

It's up to you to connect need for investment to your community's values.
COMMUNITY GOALS:

NONMOTORIZED PERFORMANCE MEASURES:

Connectivity Measures

CONNECTIVITY MEASURES:

“Interconnected pedestrian and/or bicycle transportation facilities that allow people of all ages and abilities to safely and conveniently get where they want to go.”

Connectivity Index
Density of Destinations
Network Completeness
Population Served by Walk/Bike/Transit
Route Directness
NONMOTORIZED PERFORMANCE MEASURES:

Where are the most walkable areas of a city?

SOURCE: Measuring Multimodal Network Connectivity (FHWA)
NONMOTORIZED PERFORMANCE MEASURES:
How complete is the network?

CONNECTIVITY

ECOLOGY

ENVIRONMENT

EQUITY

HEALTH

LIVABILITY

SAFETY

SOURCE: Central Ohio Greenways
NONMOTORIZED PERFORMANCE MEASURES:
Where are the most walkable areas of a city?

SOURCE: FHWA
COMMUNITY GOALS:

NONMOTORIZED PERFORMANCE MEASURES:

Economic Measures

CONNECTIVITY

ECONOMY

ENVIRONMENT

EQUITY

HEALTH

LIVABILITY

SAFETY

ECONOMIC MEASURES:

“Describes how transportation decisions impact the economic health of a municipality or region.”

Access to Community Destinations
Access to Jobs
Average Travel Time
Average Trip Length
Retail Impact
Job Creation
NONMOTORIZED PERFORMANCE MEASURES:
Access to jobs and community destinations

SOURCE: Cuyahoga Greenways Project

- Total jobs within 1-mile of existing regional corridor: **355,159** (120 regional trail miles)

- Total jobs within 1-mile of the full existing + proposed regional network: **528,564** (295 regional trail miles)
NONMOTORIZED PERFORMANCE MEASURES:

Economic impact of nonmotorized investments

**Economic BENEFITS Of The Trails**

- **Hard Good Purchases**
  - Bike
  - Bike Supplies
  - Auto Accessories
  - Roller Blades
  - Footwear
  - Clothing

- **Soft Good Purchases**
  - Beverages
  - Candy or Snack Food
  - Sandwiches
  - Ice Cream
  - Meals at Restaurants

- **Overnight Stays**
  - Bed and Breakfast
  - Friend or Relative
  - Motel or Hotel
  - Campground
  - Other

- **71%** of trail users purchased hard goods related to their trail use and spent an average of $507.
- **48%** of trail users purchased soft goods related to their trail use and spent an average of $13.

- **16%** of trail users come from outside the Miami Valley and spend locally.

- **$13.4 million** in economic activity is generated through the trails.

**SOURCE:** Tale of the Trails (MVRPC)
Environmental measures promote the creation and maintenance of a transportation system that minimizes and/or mitigates impacts to the natural environment.

- Land Consumption
- Mode Split
- Street Trees
- Vehicle Miles Traveled (VMT) Impacts
NONMOTORIZED PERFORMANCE MEASURES:

What are the impacts of transportation/land use investments on VMT?

Annual Vehicle Miles Traveled (VMT) in 2050

- **Past Trends**: 15.9 B mi
- **Planned Future**: 15.4 B mi
- **Focused Growth**: 12.0 B mi
- **Maximum Infill**: 11.1 B mi

**SOURCE**: insight2050 (MORPC)
**COMMUNITY GOALS:**

<table>
<thead>
<tr>
<th>CONNECTIVITY</th>
<th>ECONOMY</th>
<th>ENVIRONMENT</th>
<th>EQUITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH</td>
<td>LIVABILITY</td>
<td>SAFETY</td>
<td></td>
</tr>
</tbody>
</table>

**NONMOTORIZED PERFORMANCE MEASURES:**

**Equity Measures**

“Households without access to vehicles may not be well-served by auto-oriented transportation solutions and require walking, bicycling, and transit infrastructure.”

**EQUITY MEASURES:**

- Transportation-Disadvantaged Population Served
- Access to Jobs
- Average travel time
NONMOTORIZED PERFORMANCE MEASURES:
Which communities have access to Bikeshare?
NONMOTORIZED PERFORMANCE MEASURES:

Where are the most walkable areas of a city?

![Bar chart showing self-assessed rating of bicycle paths/trails in surveyed neighborhoods by race.]

- **Connectivity**
- **Economy**
- **Environment**
- **Equity**
- **Health**
- **Livability**
- **Safety**
Public health impacts of transportation decisions typically include changes to levels of physical activity, safety, and air quality. Increases in walking and bicycling are correlated with higher levels of public health.

User Perceptions
Health Outcomes
Access to trails
NONMOTORIZED PERFORMANCE MEASURES:

Active living & Health Outcomes

**Annual Health Costs in 2050**

<table>
<thead>
<tr>
<th>Dollars (in millions)</th>
<th>Scenario A used as baseline for comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0 M</td>
<td>-$41</td>
</tr>
<tr>
<td>$100 M</td>
<td>-$246</td>
</tr>
<tr>
<td>$200 M</td>
<td>$-315</td>
</tr>
<tr>
<td>$300 M</td>
<td>$-315</td>
</tr>
<tr>
<td>$400 M</td>
<td></td>
</tr>
</tbody>
</table>

Sources:
- Insight2050 (MORPC)
NONMOTORIZED PERFORMANCE MEASURES:
Active living & Health Outcomes

Neighborhood Areas with No Parks

**Uses:** This tool focuses on areas that lack nearby parks and can be used to guide future park planning.

**Method:** Defines a half mile radius around all parks in the state to determine park area availability.

**Metrics** for area of analysis shown:
16.6% of residents live without any park within .5 miles

**Parks within 1/2 mile?**
- no
- yes
- parks

SOURCE: California Natural Resources Agency
### NONMOTORIZED PERFORMANCE MEASURES:

**Active living & Health Outcomes**

<table>
<thead>
<tr>
<th>Desired outcome</th>
<th>Indicator (source)</th>
<th>Baseline (year)</th>
<th>2019 target</th>
<th>2022 target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce heart disease</td>
<td>Percent of adults ever diagnosed with coronary heart disease (BRFSS)</td>
<td>4.2% (2015)</td>
<td>N/A (2022 target only)</td>
<td>4.0%</td>
</tr>
<tr>
<td></td>
<td>Percent of adults ever diagnosed with heart attack (BRFSS)</td>
<td>4.9% (2015)</td>
<td>4.7%</td>
<td>4.4%</td>
</tr>
<tr>
<td></td>
<td>Percent of adults ever diagnosed with hypertension (BRFSS)</td>
<td>34.3% (2015)</td>
<td>34.3%</td>
<td>32.6%</td>
</tr>
<tr>
<td>Reduce diabetes</td>
<td>Percent of adults who have been told by a health professional that they have diabetes (BRFSS)</td>
<td>11% (2015)</td>
<td>N/A (2022 target only)</td>
<td>10.4%</td>
</tr>
<tr>
<td></td>
<td>Percent of adults who have been told by a health professional that they have pre-diabetes (BRFSS)</td>
<td>7.5% (2015)</td>
<td>7.9%</td>
<td>7.5%</td>
</tr>
<tr>
<td>Reduce child asthma morbidity</td>
<td>Emergency department visits for pediatric asthma, per 10,000 children, ages 0-17 (excludes patients with cystic fibrosis or abnormalities of the respiratory system, and transfers from other institutions) (Ohio Hospital Association Clinical-Financial Data Set)</td>
<td>86.9 (2012)</td>
<td>82.5</td>
<td>78.1</td>
</tr>
</tbody>
</table>

**Strategies to address SHIP priority Outcomes:**

- **Local/regional built environment changes to support active living and social connectedness**
  - Community-scale urban design land use policies/Streetscape design (Complete Streets)
  - Bike and pedestrian master plans
  - Green spaces and parks
  - **Public building siting considerations** (such as location of school buildings)

**SOURCE:** State Health Improvement Plan (ODH)
Livability measures directly acknowledge the interactions and trade-offs between the needs of travelers passing through an area and those living adjacent to the transportation infrastructure.

<table>
<thead>
<tr>
<th>LIVABILITY MEASURES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Traffic Stress</td>
</tr>
<tr>
<td>Route Directness</td>
</tr>
<tr>
<td>Volume</td>
</tr>
</tbody>
</table>
COMMUNITY GOALS:

- CONNECTIVITY
- ECONOMY
- ENVIRONMENT
- EQUITY
- HEALTH
- LIVABILITY
- SAFETY

NONMOTORIZED PERFORMANCE MEASURES:
What is the extent to which users feel safe and comfortable using the network?

SOURCE: ALTA Planning

LEVEL OF TRAFFIC STRESS:

- 1
- 1.5
- 2
- 2.5
- 3
- 3.5
- 4

BICYCLE TRAFFIC STRESS

SOURCE: ALTA Planning
COMMUNITY GOALS:

NONMOTORIZED PERFORMANCE MEASURES:

How much activity do we see along the system?

TRAIL MILES TRAVELED (TMT) BY TRAIL

2017 - Average Annual Daily Trail Traffic (AADTT)

Variation in AADTT by trail segment (Central Ohio Greenways)

SOURCE: COG Trail Count Report
NONMOTORIZED PERFORMANCE MEASURES:

Safety Measures

SAFETY MEASURES:

“These measures addresses the safety of the transportation system for all users. Safety performance measures typically track crashes, injuries, and fatalities, though some are based on estimated changes in numbers of crashes.”

Crashes
NONMOTORIZED PERFORMANCE MEASURES:

How safe is our transportation system for nonmotorized users?

<table>
<thead>
<tr>
<th>CRASH YEAR</th>
<th>PEDESTRIANS</th>
<th>BICYCLISTS</th>
<th>COMBINED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fatalities</td>
<td>Serious Injuries</td>
<td>FSI Total</td>
</tr>
<tr>
<td>2006</td>
<td>96</td>
<td>578</td>
<td>674</td>
</tr>
<tr>
<td>2007</td>
<td>107</td>
<td>459</td>
<td>566</td>
</tr>
<tr>
<td>2008</td>
<td>98</td>
<td>511</td>
<td>609</td>
</tr>
<tr>
<td>2009</td>
<td>81</td>
<td>457</td>
<td>538</td>
</tr>
<tr>
<td>2010</td>
<td>91</td>
<td>472</td>
<td>563</td>
</tr>
<tr>
<td>2011</td>
<td>99</td>
<td>494</td>
<td>593</td>
</tr>
<tr>
<td>2012</td>
<td>117</td>
<td>537</td>
<td>654</td>
</tr>
<tr>
<td>2013</td>
<td>88</td>
<td>531</td>
<td>619</td>
</tr>
<tr>
<td>2014</td>
<td>93</td>
<td>496</td>
<td>589</td>
</tr>
<tr>
<td>2015</td>
<td>118</td>
<td>522</td>
<td>640</td>
</tr>
<tr>
<td>2016</td>
<td>140</td>
<td>556</td>
<td>696</td>
</tr>
<tr>
<td>2017</td>
<td>143</td>
<td>520</td>
<td>663</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,271</td>
<td>6,133</td>
<td>7,404</td>
</tr>
</tbody>
</table>

SOURCE: AT 2017 Progress Report (ODOT)
### Transportation Safety Performance Measures

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>2015 Benchmark</th>
<th>2020 Target</th>
<th>2020 Track</th>
<th>2040 Target</th>
<th>2040 Track</th>
<th>2017 Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Fatalities</td>
<td>96</td>
<td>-10%</td>
<td>10.2%</td>
<td>-39%</td>
<td>27.2%</td>
<td></td>
</tr>
<tr>
<td>Number of Serious Injuries</td>
<td>890</td>
<td>-10%</td>
<td>-7%</td>
<td>-39%</td>
<td>-32.9%</td>
<td></td>
</tr>
<tr>
<td>Number of Non-Motorized Fatal &amp; Serious Injuries</td>
<td>138</td>
<td>-10%</td>
<td>22.7%</td>
<td>-39%</td>
<td>180.5%</td>
<td></td>
</tr>
<tr>
<td>Rate of Fatalities per 100 Million VMT</td>
<td>0.69</td>
<td>0.63</td>
<td>0.76</td>
<td>0.42</td>
<td>0.86</td>
<td></td>
</tr>
<tr>
<td>Rate of Serious Injuries per 100 Million VMT</td>
<td>6.40</td>
<td>5.83</td>
<td>5.95</td>
<td>3.91</td>
<td>4.21</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- The benchmark and targets represent five-year rolling averages.
- Million Vehicle Miles Traveled (MVMT).
- “TARGET” = Performance target included in the 2016-2040 MTP.
- “TRACK” = Progress should current trends continue.

**Source:** State of Safety Report (2012-2016) (MORPC)
NONMOTORIZED PERFORMANCE MEASURES:

CURRENT ODOT NONMOTORIZED DATA INITIATIVES

We are here to help.
## ODOT Nonmotorized Data Initiatives:

### Current Projects

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Level of Service</th>
<th>Miles of Pedestrian/Bicycle Facilities</th>
<th>Retail Impact</th>
<th>Mode Split</th>
<th>Crashes</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORIL - LTS Research</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NM Count Program Development</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>MS2 NMDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STRAVA Metro Data</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bicycle Facility Data Collection</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>TIMS Dataset Development</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ohio Household Travel Survey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>StreetLight Data M2 Pilot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OUR MISSION**

To provide easy movement of people and goods from place to place, we will:

- Take care of what we have;
- Make our system work better;
- Improve safety;
- Enhance capacity.
## Facility Type: Definition:

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared Use Path</td>
<td>A bikeway physically separated from motor vehicles by an open space or barrier and either within the highway right-of-way or within independent right-of-way.</td>
</tr>
<tr>
<td>Bike Lane</td>
<td>A portion of roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs.</td>
</tr>
<tr>
<td>Buffered Bike Lane</td>
<td>A bikeway physically separated from motor vehicles by a barrier and within the highway right-of-way.</td>
</tr>
<tr>
<td>Contraflow Bike Lane</td>
<td>Bicycle lanes designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic.</td>
</tr>
<tr>
<td>Shared Roadway</td>
<td>A lane of a traveled way that is open to both bicycle and motor vehicle travel. Includes bicycle boulevard and use of shared lane markings.</td>
</tr>
<tr>
<td>Paved Shoulder</td>
<td>The paved portion of the roadway contiguous with the traveled way that accommodates stopped vehicles, emergency use and bicyclists.</td>
</tr>
</tbody>
</table>
## ODOT Nonmotorized Data Initiatives: Bicycle Facility Data Collection & LTS

### Street Width

<table>
<thead>
<tr>
<th>Speed Limit or Prevailing Speed</th>
<th>2-3 lanes</th>
<th>4-5 lanes</th>
<th>6+ lanes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 25 mph</td>
<td>LTS 1&lt;sup&gt;a&lt;/sup&gt; or 2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LTS 3</td>
<td>LTS 4</td>
</tr>
<tr>
<td>30 mph</td>
<td>LTS 2&lt;sup&gt;a&lt;/sup&gt; or 3&lt;sup&gt;a&lt;/sup&gt;</td>
<td>LTS 4</td>
<td>LTS 4</td>
</tr>
<tr>
<td>35+ mph</td>
<td>LTS 4</td>
<td>LTS 4</td>
<td>LTS 4</td>
</tr>
</tbody>
</table>

<sup>a</sup> Increasing Level of Comfort, Safety, and Interest in bicycling for transportation

![Bicycle Facility Diagram](image_url)
ODOT NONMOTORIZED DATA INITIATIVES:
Non Motorized Count Program Development

Overview:

- Develop a baseline understanding of current data collection activities in the state.
- Consolidate available data.
- Outline technical structure for collecting non-motorized volumes within the state of Ohio.

Tasks:
- Project Management
- Work Plan
- Kick-off meeting (by phone)
- Kickoff meeting notes
- Monthly progress reports and invoices – ongoing

1. Identify non-motorized volumes
   - Stakeholder Survey
   - Stakeholder Interviews

2. Program goals, objectives, and outcomes
   - Goals and objectives

3. Review Existing Traffic Monitoring
   - Data needs, program goals, existing program memo

4. Develop Program Technical Structure
   - Program technical structure memo

5. Develop educational materials on count program structure
   - Educational materials

6. Consolidated Data File
   - Consolidated data file

7. Implementation Plan
   - Program Implementation Plan (actions table) and timeline

8. Pilot Implementation
   - Short-Duration Counts Pilot

COMPLETE
NONMOTORIZED PERFORMANCE MEASURES:

AVAILABLE RESOURCES

You are not alone.
NONMOTORIZED PERFORMANCE MEASURES:
Transportation Information Mapping System


TIMS is ODOT's web-mapping portal where you can discover information about Ohio's transportation system, create maps, and share information.

- PROJECT SEARCH
- CREATE A MAP
- DATA DOWNLOAD
- STANDARD PDF MAPS
- MAP VIEWERS
- DATA GLOSSARY
- CRASH DATA SEARCH
- Search by PID
NONMOTORIZED PERFORMANCE MEASURES:

ODOT MS2 Non-Motorized Database System

[Dashboard, Analysis, Admin]

Yearly Volume

Highest ADT Locations

<table>
<thead>
<tr>
<th>Rank</th>
<th>ADT</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5552</td>
<td>High St and Rosevelt (2000)</td>
</tr>
<tr>
<td>2</td>
<td>4710</td>
<td>High St and Lyon (2000)</td>
</tr>
<tr>
<td>3</td>
<td>5693</td>
<td>High St and State St (2002)</td>
</tr>
<tr>
<td>4</td>
<td>1259</td>
<td>High St and City St (2000)</td>
</tr>
<tr>
<td>5</td>
<td>3117</td>
<td>N High Str and 3rd (2003)</td>
</tr>
<tr>
<td>6</td>
<td>5435</td>
<td>Lane Ave and Park (2004)</td>
</tr>
<tr>
<td>7</td>
<td>2092</td>
<td>South Creek Trl (2014)</td>
</tr>
<tr>
<td>8</td>
<td>2159</td>
<td>Gey Str and Pearl A (2002)</td>
</tr>
<tr>
<td>9</td>
<td>1728</td>
<td>N High Str and 4th (2004)</td>
</tr>
<tr>
<td>10</td>
<td>1701</td>
<td>High St and Rose St (2002)</td>
</tr>
</tbody>
</table>

Monthly Volume

Daily Volume

[Map of MS2 with various markers and locations]
NONMOTORIZED PERFORMANCE MEASURES:
STRAVA METRO DATA

Streets

OD Pairs

Intersections
NONMOTORIZED PERFORMANCE MEASURES:

LTAP Equipment Loan Program

OHIO LTAP | Local Technical Assistance Program

11cm (4.3")
DATA SOURCES:

- Open Street Map
- Tiger Shapefiles
- US Census Bureau
- Regional Planning Organizations

GUIDANCE:

- Guidebook for the development of Pedestrian & Bicycle Performance Measures (FHWA)
- Measuring Multimodal Network Connectivity (FHWA)