transportation performance measures

Sonoran Institute
July 17, 2013
agenda today

- why
- methodology
- reporting - examples
1. sustainability
2. new transportation era
3. federal requirements

why
1. sustainability

5 core issues

- transportation
- economics
- environment
- energy
- health
- equity
- sustainability
- asset management
- cost of travel, cost of travel + housing
- governmental efficiency
- job growth

economics
- greenhouse gas emissions
- air quality/pollutant emissions
- water quality
- land
- habitat

environment
petroleum dependence
use of alternative energy
energy intensity (btu per capita)
technology
- personal injury accidents
- fatal crashes
- obesity, disease
- active living

health
- access to jobs
- access to healthy foods
- access to services
- distribution of transportation impacts
- housing + transportation costs
- community involvement

equity
2. new transportation era
VMT Growth – 5 Year Increments

United States

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-1972</td>
<td>31%</td>
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<tr>
<td>1972-1977</td>
<td>12%</td>
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<td>1977-1982</td>
<td>13%</td>
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<td>1982-1987</td>
<td>20%</td>
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<td>1987-1992</td>
<td>17%</td>
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<tr>
<td>1992-1997</td>
<td>14%</td>
</tr>
<tr>
<td>1997-2002</td>
<td>12%</td>
</tr>
<tr>
<td>2002-2007</td>
<td>6%</td>
</tr>
<tr>
<td>2007-2012</td>
<td>-3%</td>
</tr>
</tbody>
</table>
Transit Ridership Growth – 5 Year Increments

United States

1967-1972: -20%
1972-1977: 15%
1977-1982: 7%
1982-1987: 8%
1987-1992: -3%
1992-1997: -2%
1997-2002: 15%
2002-2007: 6%
2007-2012: 3%
Per Capita VMT 2004 Pivot
Development patterns in US history:

- **1800 - 1900**: Rural
- **1900 - 2000**: Cities
- **2000 -**: Suburbs
- **2000 -**: Mixed-use centers
VMT and GDP

Data Sources: VMT: US DOT, BTS, Table 1-32: US Vehicle Miles, FHWA Traffic Volume Trends August 2010. GDP: BEA National Income and Product Account Table, Table 1.1.6 Real GDP, Chained (2005) Dollars

Source: “Growing Wealthier – Smart Growth, Climate Change and Prosperity” January 2011 Center for Clean Air Policy
grandfather’s
(not your father’s transportation program)

new transportation era
3. federal requirements
surface transportation program

- **1956**: original federal aid to highways act FAHA, first highway revenues act
- **1961**: first federal appropriation for transit (housing act)
- **1964**: first federal aid to urban mass transit (UMTA)
- **1973**: FAHA – created MPOs
- **1982**: surface transportation authorization act - 1¢ to transit
- **1991**: ISTEA
- **1998**: TEA-21
- **2003 - 2005**: three temporary extensions
- **2005**: SAFETEA-LU
- **2009-2012**: ten temporary extensions
- **2012**: MAP-21
national goals & performance-based planning

asset management – national highway performance program

map-21 *

*(moving ahead for progress in the 21st century)*
national goals in legislation

USDOT to establish performance targets

purpose: to guide planning

focused primarily on highways

directed at state dots and mpos

map-21

national goals & performance-based planning
map-21

1. safety
2. infrastructure condition
3. congestion reduction
4. system reliability
5. freight movement & economic vitality
6. environmental sustainability
7. project delivery

national goal areas
map-21

- USDOT rule making – April 2014
- states establish targets – April 2015
- reporting starts – October 2016

implementation schedule
- metropolitan long range transportation plans (lrtp) & transportation improvement programs (tip)
- state transportation improvement program (stip)
- state asset management plans
- state performance plans under cmaq

state performance targets
map-21

usdot rulemaking

state dot performance targets

stip

rural cities, towns, counties

rural impact
map-21

- interstate highway performance
- national highway system (NHS) performance
- interstate pavement condition
- NHS pavement condition
- NHS bridge condition
- fatalities and injuries per vehicle mile traveled
- number of fatalities and injuries
- metropolitan congestion
- on-road “mobile source” emissions
- freight movement on Interstate highways
- transit safety
- transit state of good repair

performance measures
due within 180 days of state targets (10/2015)

- mpo sets performance targets in relation to state performance measures
- mpo must coordinate with state & transit providers in setting targets
map-21 process
• importance of being involved in development of state dot, mpo and transit agency development of performance measures
• importance of discretionary grant programs (TIGER, etc.)

bottom line
why

- 1. sustainability
- 2. new transportation era
- 3. federal requirements
why
methodology
reporting

agenda today
- planning systems
- metrics
- causation
- internal vs external
- outputs vs outcomes
- reporting

**methodology**
planning systems

(accountability)
vision

goals

objectives

indicators

strategies

programs, studies, ordinances, projects

output

outcomes

performance monitoring & reporting

plan & program accountability
Project accountability

Vision

Goals

Objectives

Indicators

Performance monitoring & reporting

Strategies

EIS, EA, CIS, AA

Projects

Output

Outcomes

Before & after
indicators

- accuracy
- baseline – starting point
- benchmark – peers
- target

metrics

cost
causation

- action
  - project
  - regulation
  - pricing, taxes, fees
  - maintenance
  - operations

- effect
  - traffic
  - mode share
  - expenditures
  - emissions

- outcome
  - health
  - environment
  - economy
  - energy
active living example

build bike lanes
(easy to measure)

increased bicycling
(can be observed, but there are many causes)

reduced obesity
(can be observed, but there are many causes)
air quality example

vehicular travel

(affected by fleet efficiency, fuel type, vehicle speeds)

air pollution emissions

(can be estimated, but not observed)

air quality

(can be observed, but many causes)
street safety example

street design
(width, lanes, intersections, turns, access, signalization)

crashes
(can be observed, but there are many causes)

fatalities
(can be observed but there are many causes)
example: Iowa DOT Performance Report

- % of time IT network is available
- % of employee evaluations current
- % of light fleet into service within time standard
- % of officer’s crash reports submitted electronically
example: Iowa DOT Performance Report

- # of fraud investigations conducted
- # of commercial vehicle safety inspections
- miles of new shoulders awarded for construction
- % of programmed projects let for construction

internal vs. external
example: Iowa DOT Performance Report

- # of fraud investigations conducted
- # of commercial vehicle safety inspections
- miles of new shoulders awarded for construction
- % of programmed projects let for construction

outputs vs. outcomes
outputs vs. outcomes

- % of highway miles ≥ tolerable sufficiency rating
- average pavement condition – interstate routes
- average pavement condition – other primary routes
- % of rail miles able to carry heavy unit trains

example: Iowa DOT Performance Report
performance measures trend
- mode share
- vmt
- safety
- transit
- health

metrics – focus topics
focus: mode share
## City of Boulder – mode share

### Figure 1: Modal Split of Trips for Boulder Valley, 1990-2012

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Single-Occupancy Vehicle</td>
<td>35.9%</td>
<td>37.1%</td>
<td>38.4%</td>
<td>39.0%</td>
<td>41.5%</td>
<td>40.4%</td>
<td>41.5%</td>
<td>40.5%</td>
<td>42.3%</td>
<td>44.2%</td>
<td>-8.3%</td>
</tr>
<tr>
<td>Multiple-Occupancy Vehicle</td>
<td>19.6%</td>
<td>23.7%</td>
<td>25.0%</td>
<td>23.5%</td>
<td>23.8%</td>
<td>25.0%</td>
<td>25.6%</td>
<td>25.6%</td>
<td>25.7%</td>
<td>26.3%</td>
<td>-6.7%</td>
</tr>
<tr>
<td>Transit</td>
<td>4.9%</td>
<td>5.4%</td>
<td>4.0%</td>
<td>4.6%</td>
<td>4.2%</td>
<td>4.1%</td>
<td>2.8%</td>
<td>2.9%</td>
<td>2.2%</td>
<td>1.6%</td>
<td>+3.3%</td>
</tr>
<tr>
<td>School Bus</td>
<td>0.6%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.3%</td>
<td>0.7%</td>
<td>0.7%</td>
<td>0.5%</td>
<td>0.5%</td>
<td>0.7%</td>
<td>0.6%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>18.7%</td>
<td>15.9%</td>
<td>13.6%</td>
<td>14.0%</td>
<td>10.0%</td>
<td>8.2%</td>
<td>9.2%</td>
<td>11.3%</td>
<td>12.1%</td>
<td>9.1%</td>
<td>+9.6%</td>
</tr>
<tr>
<td>Foot</td>
<td>20.3%</td>
<td>17.9%</td>
<td>18.9%</td>
<td>18.6%</td>
<td>19.8%</td>
<td>21.4%</td>
<td>20.4%</td>
<td>19.2%</td>
<td>17.1%</td>
<td>18.2%</td>
<td>+2.1%</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>+2.1%</td>
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</tbody>
</table>

Number of Trips

<table>
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<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Trips</td>
<td>4,835</td>
<td>5,505</td>
<td>6,081</td>
<td>6,380</td>
<td>6,791</td>
<td>5,987</td>
<td>6,454</td>
<td>6,723</td>
<td>6,681</td>
<td>7,355</td>
<td></td>
</tr>
</tbody>
</table>

Modes with shifts that are statistically significantly different between 1990 and 2012 are shaded.
Modes with shifts that are statistically significant different between 2009 and 2012 are bolded.

* These estimates have a margin of error of ±1.3% using a 95% confidence interval.
- based on resident travel diary + employee survey (staggered years)
- not every change is statistically significant
- season/date problem
- cost

City of Boulder – mode share
City of Boulder – mode share
can be estimated & forecast but not directly measured

standard traffic model output

can be calibrated to arterial traffic

vmt fees are future revenue source

focus: vmt
what matters?

focus: transit

cost

ridership
• increased service frequencies
• reduced travel time
• more crosstown service
• more flex routes

key elements
- incremental service hours
- incremental service miles
- incremental service cost
- ridership

operating plan metrics
what matters?

- number or rates?
- bicycle and pedestrian rates?
- frequency of minor fender benders?
- fatalities?
- personal injuries?

focus: safety
The U-Shaped Curve

Source: FHWA-RD-98-154
Crash Severity

Speed at Impact

Probability of Fatality

Source: FHWA-RD-98-154
what improves safety?

- wider streets?
- wider intersections?
- higher speeds? lower speeds?
- medians?
- bike boxes?
- separated pathways?
- raised crossings?

focus: safety
focus: health
5 key transportation - health pathways

- Traffic safety
- Physical activity
- Access to healthy food
- Exposure to pollution
- Community cohesion
Health Pathway: Traffic Safety

- Traffic safety design elements
- Traffic speed
- VMT per capita
- Accident rate & severity
- Personal injuries & fatalities

*health outcomes*
traffic safety design elements

- land use mix
- street widths
- connectivity
- modern pedestrian facilities
- modern bicycle facilities
- high level of transit service

make safer

make less safe
traffic fatalities

- Hawaii: 8.4
- US Average: 11.0

- low: 4.8
- high: 24.6

- Hawaii: 1.09
- US Average: 1.13

- low: 0.7
- high: 2.1

fatalities/100K population  
fatalities/100M vmt

Source: NHTSA 2011
change in annual vmt 2000 – 2009

- 10%  0  +10%

US  - 0.4%

Hawaii  + 9.2%

Source: FHWA, Highway Statistics, 2009
Pedestrian fatalities

**Pedestrian fatalities as % of all traffic fatalities**

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii</td>
<td>1.5%</td>
<td>14.7%</td>
</tr>
<tr>
<td>US</td>
<td>12.1%</td>
<td>48.3%</td>
</tr>
</tbody>
</table>

**Pedestrian fatalities/100K population**

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawaii</td>
<td>0.37</td>
<td>1.23</td>
</tr>
<tr>
<td>US</td>
<td>1.33</td>
<td>2.51</td>
</tr>
</tbody>
</table>

Source: NHTSA 2011
health pathway: physical activity

physical activity design elements

active living

active transportation

personal physical activity

obesity, cancer, diabetes, stroke, heart disease

health outcomes
adult physical activity

≥ 30 minutes exercise
≥ 5 days/week

Source: CDC BFRSS State and Metro Area Data 2009
youth physical activity

% of high school students physically active
≥ 60 minutes, ≥ 5 days/week

US 44.0%
Hawaii 34.4%
low 33.3  high 53.6

Source: CDC YBRS 2009
health pathway: access to healthy foods

access to healthy foods

design elements

high nutrition, low calorie, balanced diets

obesity, asthma, cancer, heart disease, high blood pressure, high cholesterol, osteoarthritis

health outcomes
adult healthy diets

% eat minimum fruits & vegetables

Hawaii
23.5%

US
23.4%

low
14.6%

high
31.5%

Source: CDC BFRSS 2009
youth healthy diets

% eat minimum fruits & vegetables

Hawaii 17.2%

US 22.3%

low 13.7%

high 24.4%

Source: CDC YBRS 2009
adults: % overweight or obese

Hawaii: 57.8%
US: 63.1%
low: 55.7%
high: 70.3%

Source: CDC BFRSS State Data 2009
youth: % overweight or obese

US
27.8%

low
16.9%

Hawaii
28.5%

high
34.8%

Source: CDC YBRS State Data 2009
THE COLORADO MILE MARKERS:
RECOMMENDATIONS FOR MEASURING ACTIVE TRANSPORTATION

A Report for Kaiser Permanente, Colorado
May 2012
<table>
<thead>
<tr>
<th>Category</th>
<th>Indicator</th>
<th>Priority Level</th>
<th>State Survey</th>
<th>Local Survey</th>
<th>Leverage new technology</th>
<th>Counts (auto)</th>
<th>Facility Inventory</th>
<th>Accident / Injury</th>
<th>GIS data</th>
<th>Other secondary data</th>
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</thead>
<tbody>
<tr>
<td>Population level demand</td>
<td>1. WTF: Number of walk trips per capita.</td>
<td>A</td>
<td>x</td>
<td>x</td>
<td></td>
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<tr>
<td></td>
<td>2. BF: Number of bicycle trips per capita.</td>
<td>A</td>
<td>x</td>
<td>x</td>
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<td></td>
<td>3. WMT: Walk miles traveled, for total population and key subgroups.</td>
<td>B</td>
<td>xx</td>
<td>x</td>
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<td></td>
<td>4. BM: Bicycling miles traveled, for total population and key subgroups.</td>
<td>B</td>
<td>xx</td>
<td>x</td>
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<td></td>
<td>5. WAT: Number of walk access trips to transit</td>
<td>B</td>
<td>xx</td>
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<td></td>
<td>6. BAT: Number of bike access trips to transit</td>
<td>B</td>
<td>xx</td>
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<td>Facility use demand</td>
<td>7. ADT-W: Average daily traffic—walking (for facility/corridor/neighborhood)</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>xx</td>
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<td></td>
<td>8. ADT-B: Average daily traffic—bicycling (for facility/corridor/neighborhood)</td>
<td>A</td>
<td></td>
<td></td>
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<td>xx</td>
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<tr>
<td>Infrastructure supply</td>
<td>9. LOS—-W: Level of service for walking (for facility/corridor/neighborhood)</td>
<td>B</td>
<td></td>
<td></td>
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<td>xx</td>
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<td></td>
<td>10. LOS—B: Level of service for bicycling (for facility/corridor/neighborhood)</td>
<td>B</td>
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<td>xx</td>
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<td></td>
<td>11. FM—W: Facility miles for those walking by classes of facility.</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>xx</td>
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<tr>
<td></td>
<td>12. FM—B: Facility miles for those bicycling by classes of facility.</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>xx</td>
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<tr>
<td>Support and safety</td>
<td>14. Colorado Ped Score</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>xx</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>15. Colorado Bike Score</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td>xx</td>
<td></td>
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<td></td>
<td>16. ATE: Active transportation employees—percent of local government employees directly working on AT issues.</td>
<td>C</td>
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<td></td>
<td>17. ATP: Active transportation policies—number of local government policies that directly advance AT goals (e.g., requiring bicycle parking)</td>
<td>C</td>
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<td></td>
<td>18. IF-W: Injuries and fatalities per pedestrian.</td>
<td>C</td>
<td>x</td>
<td>x</td>
<td></td>
<td>xx</td>
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<tr>
<td></td>
<td>19. IF-B: Injuries and fatalities per bicyclist.</td>
<td>C</td>
<td>x</td>
<td></td>
<td></td>
<td>xx</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>20. PSF: Perceived safety of facilities.</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td>xx</td>
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</tbody>
</table>
- American Community Survey (ACS)
- American Time Use Survey
- Behavioral Risk Factor Surveillance System (BRFSS)
- Fatality Analysis Reporting System (FARS)
- Injury Facts
- National Ambulatory Medical Care Survey (NAMCS) and National Ambulatory Hospital Medical Care Survey (NAHMCS)
- National Automotive Sampling System (NASS)
- National Bicycle and Pedestrian Documentation Project
- National Bike Helmet Use Survey (1999)
- National Electronic Injury Surveillance System (NEISS)
- National Emergency Medical Services Information System (NEMSIS)
- National Household Travel Survey (NHTS)
- National Health and Nutrition Examination Survey (NHANES)
- National Health Interview Survey
- National Sporting Goods Association Sports Participation Survey
- National Transportation Statistics
- Walkscore.com

national surveys, inventory, protocol
agenda today

- why
- methodology
- reporting
reporting

accessibility + credibility
Redmond, Washington
2008 Mobility Report Card

Redmond’s Transportation Performance Monitoring System
Redmond city government strives to provide mobility choices for people who live, work, and visit Redmond. The City achieves this by planning for multi-modal transportation infrastructure that complements the community’s long-term land-use plan, and by partnering with agencies such as Metro and Sound Transit that provide public transit.

According to a survey conducted by the state Department of Transportation, 31% of “CTR-affected” (see definition in box above) employees arrived at work by a mode other than driving alone.

Bus service from Downtown Redmond to key regional centers remained about the same during 2007. In early 2008, Sound Transit increased midday service frequency on the popular 545 route to/from Downtown Seattle. Also in early 2008 Sound Transit discontinued the 540 route between Redmond and Kirkland; Metro replaced that service with route 248, which serves the Avondale, Downtown Redmond, Rose Hill, and Downtown Kirkland areas.
Boulder, Colorado
1. no growth in long-term vehicle traffic
2. reduce SOV travel to 25% of trips
3. reduction in mobile source emissions
4. ≤ 20 percent of roadways congested (LOS F)
5. expand fiscally viable transportation alternatives for all residents & employees, including elderly & those with disabilities
6. increase transportation alternatives @ rate of employee growth

Boulder tmp example
Boulder tmp

major goal
Boulder tmp

major goal
Boulder tmp
Boulder tmp

major goal
Boulder tmp
## Diagnostic Data

<table>
<thead>
<tr>
<th>Category</th>
<th>2002</th>
<th>2010</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Boulder Employees</td>
<td>96,938</td>
<td>96,800</td>
<td>-0.14%</td>
</tr>
<tr>
<td>Local Transit Service Hours</td>
<td>215074</td>
<td>197500</td>
<td>-8.90%</td>
</tr>
<tr>
<td>Regional Transit Service Hours</td>
<td>100956</td>
<td>109980</td>
<td>8.21%</td>
</tr>
<tr>
<td>Centerline miles of bike system</td>
<td>138</td>
<td>159</td>
<td>15.2%</td>
</tr>
</tbody>
</table>

**Boulder tmp**
balanced scorecard
Charlotte will be:

- The safest large city in America
- The most prosperous for all citizens
- A city of great neighborhoods
- The premier city for integrating land use and transportation choices
- A city of environmental stewardship

CDOT balanced scorecard
<table>
<thead>
<tr>
<th>Corporate Objective</th>
<th>KBU Initiative (* indicates Focus Area Initiative)</th>
<th>Measure ($ - indicates incentive pay measure)</th>
<th>Prior Year Actual</th>
<th>Lead or Lag</th>
<th>Performance Data</th>
<th>Comments/Explanation (complete at mid-year and year-end)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serve the Customer</td>
<td>Provide Transportation Choices</td>
<td>Establish baseline to track increase in bicycle usage over previous year.</td>
<td>New</td>
<td>Lead</td>
<td>June 2010</td>
<td>100% + Locations for bicycle counts selected and counts will be done in FY11.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Complete and/or build new bikeways and sidewalks annually</td>
<td>18.7 miles</td>
<td>Lead</td>
<td>10 miles of bikeways</td>
<td>22 + 10 mile goal exceeded by a combination of bike lanes and signed bike routes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>17.8 miles</td>
<td>Lead</td>
<td>10 miles of sidewalks</td>
<td>14.6 + CDOT exceeded target for new sidewalk construction.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>% of transportation bond road projects on schedule</td>
<td>93%</td>
<td>Lead</td>
<td>90% completed or forecasted to be completed on time</td>
<td>90% +</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decrease in vehicular accidents per mile traveled</td>
<td>+2.92%</td>
<td>Lag</td>
<td>Decrease annually</td>
<td>Not available till end of July TBD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decrease in pedestrian and bicycle accidents per capita</td>
<td>+9.22% +23.34%</td>
<td>Lag</td>
<td>Decrease annually</td>
<td>Not available till end of July TBD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor intersection crash rate</td>
<td>1.03</td>
<td>Lag</td>
<td>Rate less than 2 crashes per million entering vehicles</td>
<td>Not available till end of July TBD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td>Lead</td>
<td>Continue to apply the USDG to 100% of Area</td>
<td>100% +  The USDG are being applied to all Area Plans and CDOT’s CIP</td>
</tr>
</tbody>
</table>
Austin, Texas
- system effectiveness
- economic impacts
- environmental impacts
- social equity

Capital Area MPO Austin, TX
<table>
<thead>
<tr>
<th>System Effectiveness</th>
<th>Measures</th>
<th>2010</th>
<th>2035</th>
<th>No Build</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve Mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Average Freeway Speed</td>
<td>47.7</td>
<td>38.0</td>
<td>34.4</td>
</tr>
<tr>
<td>2</td>
<td>Average Network Speed</td>
<td>38.6</td>
<td>33.3</td>
<td>30.0</td>
</tr>
<tr>
<td>3</td>
<td>Percent Congested</td>
<td>8.31%</td>
<td>22.21%</td>
<td>28.30%</td>
</tr>
<tr>
<td>4</td>
<td>Vehicle Hours of Delay Per Person during 24 hours</td>
<td>0.12</td>
<td>0.3</td>
<td>0.44</td>
</tr>
<tr>
<td>Improve Accessibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Number of roadway system intersections</td>
<td>2,201</td>
<td>2,667</td>
<td>2,201</td>
</tr>
<tr>
<td>6</td>
<td>Transit Stops</td>
<td>5,467</td>
<td>6,588</td>
<td>5,467</td>
</tr>
<tr>
<td>7</td>
<td>Number of Intermodal stations</td>
<td>21</td>
<td>49</td>
<td>21</td>
</tr>
<tr>
<td>8</td>
<td>Percent of fixed guideway and rapid bus miles serving high density areas</td>
<td>75%</td>
<td>85%</td>
<td>88%</td>
</tr>
<tr>
<td>9</td>
<td>Population within half mile transit</td>
<td>41.3%</td>
<td>40.21%</td>
<td>32.85%</td>
</tr>
<tr>
<td>Improve System Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Vehicle Hours Traveled Per Person during 24 hours</td>
<td>0.6</td>
<td>0.78</td>
<td>0.93</td>
</tr>
<tr>
<td>11</td>
<td>Percent Non-SOV Trips</td>
<td>44%</td>
<td>44%</td>
<td>44%</td>
</tr>
<tr>
<td>12</td>
<td>No. transit trips</td>
<td>158,377</td>
<td>275,341</td>
<td>222,748</td>
</tr>
<tr>
<td>13</td>
<td>Vehicle Miles Traveled Per Person during 24 hours</td>
<td>24.20</td>
<td>23.01</td>
<td>22.44</td>
</tr>
<tr>
<td>14</td>
<td>Average Home-base work trip time</td>
<td>14.04</td>
<td>14.65</td>
<td>15.27</td>
</tr>
</tbody>
</table>
Chicago, Illinois
1. long-term economic development
2. congestion
3. work trip commute time
4. mode share
5. job-housing access
6. air quality
7. energy use
8. natural resource preservation
9. infill and reinvestment
10. peak period utilization
11. facility condition (highways only)

CMAP performance measures
CMAK example
universe of projects → candidate projects → constrained projects

universe of projects → candidate projects → unprogrammed projects

policy screen

funding forecast

psrc 2040 (lrtp)
prioritization measures

- air quality
- freight
- jobs
- multimodal
- Puget Sound land & water
- safety and system security
- social equity & access to opportunity
- support for centers
- travel

psrc scorecard
## Possible ways to use the Scorecard Report

<table>
<thead>
<tr>
<th>Sort by category and by benefit score</th>
<th>Provides a benefit score ranking of projects by infrastructure category.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sort by category and by project status</td>
<td>The Boards could consider moving projects from the constrained to the unprogrammed parts of the Transportation 2040 Plan. This would likely apply only to projects that have “Candidate” status.</td>
</tr>
<tr>
<td>Sort by category and by decade as compared to the Transportation 2040 Financial Strategy by decade</td>
<td>Provides information about which projects are receiving a high benefit score by decade. The Boards could consider the project benefit scores as compared to available funding.</td>
</tr>
<tr>
<td>Sort by measures</td>
<td>This could be a form of weighting. For example, if the Boards wanted to which projects are supporting the Jobs measure, this information could be useful.</td>
</tr>
</tbody>
</table>
Florida Traffic Crash Fatalities and Serious Injuries

Number of Serious Injuries

- 2005: 3,533
- 2006: 3,365
- 2007: 3,221
- 2008: 2,983
- 2009: 2,563
- 2010: 2,444
- 2011: 2,400

Number of Fatalities

- 2005: 29,250
- 2006: 27,920
- 2007: 25,559
- 2008: 23,758
- 2009: 22,743
- 2010: 21,501
- 2011: 19,978

Source: Florida Dept. of Highway Safety and Motor Vehicles

MAP 21: Moving Ahead for Progress in the 21st Century

Florida DOT
The Gray Notebook

Washington State Department of Transportation

Quarter ending June 30, 2012 • Published August 21, 2012

Paula J. Hammond, P.E., Secretary of Transportation

46

Reaching across the waters:
A closer look at bridge systems

Building on success:
New construction gets under way

Striving for Target Zero:
When nothing is a great thing
Reduction of traffic fatalities continues

The state has experienced a continuous reduction in the number of traffic fatalities each consecutive year over the past six years. A 29 percent reduction in fatalities has occurred, comparing 649 fatalities in 2005 with 458 fatalities in 2011 (2011 data is considered preliminary).

Although significant fatality reductions have occurred within the six-year period, there were only two less fatalities from 2010 to 2011. In the spirit of the state’s strategic highway safety plan called “Target Zero” it is imperative that the number of fatalities and serious injuries continue to drop in order to meet the goal of zero by 2030.

Washington annual traffic fatalities
2005-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010¹</th>
<th>2011¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>All public roads</td>
<td>649</td>
<td>633</td>
<td>571</td>
<td>521</td>
<td>492</td>
<td>460</td>
<td>458</td>
</tr>
<tr>
<td>State highways</td>
<td>316</td>
<td>308</td>
<td>280</td>
<td>234</td>
<td>241</td>
<td>233</td>
<td>227</td>
</tr>
</tbody>
</table>

Data source: Fatal Accident Reporting System (FARS).

Notes: 1 GNB 42 reported the number of traffic fatalities in 2010 for all public roads and state highways as 459 and 232, respectively. These numbers have been updated to 460 and 233 due to updates made to FARS. The 2011 numbers are considered to be preliminary until January 2013.
## One-Page Status Overview of ODOT External Performance Measures

<table>
<thead>
<tr>
<th>Category</th>
<th>Status</th>
<th>Measure</th>
<th>Definition</th>
<th>Actual</th>
<th>Target</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Traffic Fatalities</td>
<td>Traffic fatalities per 100 million vehicle miles traveled</td>
<td>0.99</td>
<td>0.96</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Public Injuries</td>
<td>Traffic injuries per 100 million vehicle miles traveled</td>
<td>1.05</td>
<td>1.00</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Impaired Driving</td>
<td>% of traffic fatalities that involved alcohol</td>
<td>25%</td>
<td>31%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Safety Belts</td>
<td>% of all vehicle occupants using safety belts</td>
<td>97%</td>
<td>97%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Large Truck Crashes</td>
<td>Number of large truck (commercial motor vehicle) at fault crashes</td>
<td>0.17</td>
<td>0.07</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Rail Crossing Incidents</td>
<td>Number of highway railroad at-grade incidents</td>
<td>10</td>
<td>14</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Driveway Incidents</td>
<td>Number of driveway incidents</td>
<td>31</td>
<td>29</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Business Solutions</td>
<td>Percent of businesses served by ODOT</td>
<td>91%</td>
<td>90%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Employee Safety</td>
<td>Employees disabling (time lost) claim rate per 100 ODOT Employees</td>
<td>1.30</td>
<td>1.30</td>
<td>Yes, new measure</td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Engineering, educating and enforcing a safe transportation system</strong></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Travel Delay</td>
<td>Hours of travel delay per capita in urban areas</td>
<td>20</td>
<td>25</td>
<td>Steady</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Incident Response</td>
<td>Roadway clearance: % of lane blocking crashes cleared within 5 minutes</td>
<td>75%</td>
<td>80%</td>
<td>New measure</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Special Transit Riders</td>
<td>Average number of special public transit rides per each elderly and disabled Oregonian</td>
<td>8</td>
<td>7</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Rail Ridership</td>
<td>Number of rail service passengers</td>
<td>204,860</td>
<td>203,574</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Intercity Bus Service</td>
<td>Percent of Oregon communities of 2,500+ with intercity bus or rail passenger service</td>
<td>91%</td>
<td>90%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Commuting to Work</td>
<td>Percent of Oregonians who commute alone to work during peak hour</td>
<td>30%</td>
<td>30%</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Mobility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Keeping people and the economy moving</strong></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Preservation</td>
<td>Percent of pavement miles rated &quot;fair&quot; or better out of total miles on ODOT highway system</td>
<td>86%</td>
<td>83%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Bridge Condition</td>
<td>Percent of State highway bridges that are not deteriorated</td>
<td>77%</td>
<td>79%</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Preservation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Preserving and maintaining infrastructure</strong></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Fish Passage</td>
<td>Number of priority oulets that need to improve fish passage</td>
<td>150</td>
<td>155</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Bike Lanes and Sidewalks</td>
<td>Percent of urban state highways with bike lanes and sidewalks</td>
<td>42%</td>
<td>42%</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Sustainability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sustaining the environment and communities</strong></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Stewardship</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximizing value from transportation investments</strong></td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Construction Jobs</td>
<td>Number of jobs sustained as a result of annual construction expenditures</td>
<td>11,700</td>
<td>14,200</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Contracting Timeliness</td>
<td>Percent of projects going to construction phase within 90 days of target date</td>
<td>95%</td>
<td>95%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Delivery Timeliness</td>
<td>Percent of projects with construction phase completed within 90 days of original date</td>
<td>56%</td>
<td>54%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Projects On Budget</td>
<td>Percent of ODOT projects that are awarded by ODOT</td>
<td>95%</td>
<td>90%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Certified Businesses</td>
<td>% of ODOT contract dollars awarded by Disadvantaged Business Enterprise (DBE) businesses</td>
<td>30%</td>
<td>30%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Customer Service</td>
<td>% of ODOT customers who are satisfied with services</td>
<td>95%</td>
<td>90%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Office Wait Time</td>
<td>% of ODOT customers who are satisfied with Services</td>
<td>90%</td>
<td>15</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Phone Wait Time</td>
<td>% of ODOT customers who are satisfied with Services</td>
<td>90%</td>
<td>15</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>✔</td>
<td>Title Wait Time</td>
<td>% of ODOT customers who are satisfied with Services</td>
<td>90%</td>
<td>15</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Status and Color Formatting: Green (check mark) is within 5% of target, Yellow (!) is within 15% of target and Red (star) is beyond 15% of target.
Virginia DOT
Atlanta
1.35  Travel Time Index
57.4 minutes  Average travel time

Extra rush hour delay
14.8 mins

Travel time without traffic
42.5 mins

Chicago
1.43  Travel time without traffic
35.6 minutes

Extra rush hour delay
10.7 minutes

Though Atlanta has a much lower (better) Travel Time Index (TTI), Chicago commuters spend 20 minutes less per peak period trip.

pitfalls

source: Transportation for America
- what is the objective?
- what is the source of the objective?
- what is the indicator?
- where does indicator data come from?
- what are the baseline and target?
- how are we doing?
- analysis: why?

keys to reporting
wrap up
- Charlotte Balanced Scorecard
- City of Redmond, WA Mobility Report Card
- Chicago MPO (CMAP)
  - [http://www.cmap.illinois.gov/cmp/measurement](http://www.cmap.illinois.gov/cmp/measurement)
- City of Boulder, Colorado mode share report and transportation use measurement
- “Growing Wealthier”
  - [www.ccap.org/tag/growing-wealthier/](http://www.ccap.org/tag/growing-wealthier/)
- MAP-21
  - [www.dot.gov/map21](http://www.dot.gov/map21)
  - [www.t4america.org/resources/map-21/](http://www.t4america.org/resources/map-21/)
- Active Transportation Measurement
  - [www.charlier.org/index.php?id=1,323,0,0,1,0](http://www.charlier.org/index.php?id=1,323,0,0,1,0)
- Austin Capital Metro
  - [www.campotexas.org/](http://www.campotexas.org/)
- Washington DOT Gray Notebook
  - [www.wsdot.wa.gov/accountability/](http://www.wsdot.wa.gov/accountability/)
- Florida DOT MAP-21 Performance Measures Report
- Oregon DOT Performance Dashboard
  - [www.oregon.gov/ODOT/CS/PERFORMANCE/Pages/index.aspx](http://www.oregon.gov/ODOT/CS/PERFORMANCE/Pages/index.aspx)
- Virginia DOT Performance Dashboard
  - [www.dashboard.virginiadot.org/](http://www.dashboard.virginiadot.org/)
transportation performance measures

Sonoran Institute
July 17, 2013