Redefining Transportation Metrics in the Complete Streets Era

Metric (mět'rĭk) – a standard of measurement
WHY METRICS MATTER

Community Sustainability Framework

- Environmentally Sustainable Community
- Safe Community
- Economically Vital Community
- Good Governance
- Livable Community
- Accessible & Connected Community
- Healthy & Socially Thriving Community

Boulder Valley Comprehensive Plan

- Priority-Based Budgeting
- Department Strategic/Master Plans
- Subcommunity and Area Plans

Operating Budget

Capital Improvements Program

Development Standards and Zoning
1. How did we get the measures we have today?
People were mobile before roads/cars
The League of American Wheelmen and the Good Roads movement were bankrolled by Albert Pope, a veteran of the Civil War and the manufacturer of Columbia bicycles, the leading brand of the day. – Jan 1893
Our great-grandparents built great streets
Our grandparents built roads for speed and travel
Our parents enjoyed the auto lifestyle
Gen X enjoyed some of it
Then we came to our senses
They want something different

MILLENNIALS

2007 - 2009
increase in millennial population
+
11,207

3rd Nationally

2010 - 2012
increase in millennial population
+
11,988

2nd Nationally

2007 - 2012
increase in millennial population
+
23,195

1st Nationally

U.S. Census
2. How are we doing with LOS?
Historically the key measure

<table>
<thead>
<tr>
<th>LEVELS OF SERVICE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>for Intersections with Traffic Signals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Factors Affecting LOS of Signalized Intersections**

**Traffic Signal Conditions:**
- Signal Coordination
- Cycle Length
- Protected left turn
- Timing
- Pre-timed or traffic activated signal
- Etc.

**Geometric Conditions:**
- Left- and right-turn lanes
- Number of lanes
- Etc.

**Traffic Conditions:**
- Percent of truck traffic
- Number of pedestrians
- Etc.

<table>
<thead>
<tr>
<th></th>
<th>≤10</th>
<th>11-20</th>
<th>21-35</th>
<th>36-55</th>
<th>56-80</th>
<th>&gt;80</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
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<tr>
<td>C</td>
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<td>D</td>
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<tr>
<td>E</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Historically the key measure
LOS is not multimodal

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Comprehensive</th>
<th>Multi-Modal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Level-Of-Service (LOS)</td>
<td>Intensity of congestion on a road or intersection, rated from A (uncongested) to F (most congested)</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multi-modal Level-Of-Service (LOS)</td>
<td>Service quality of walking, cycling, public transport and automobile, rated from A to F</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Travel Time Index</td>
<td>The ratio of peak to off-peak travel speeds</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Avg. Traffic Speed</td>
<td>Average peak-period vehicle traffic speeds</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Avg. Commute Time</td>
<td>The average time spent per commute trip</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Congested Duration</td>
<td>Duration of “rush hour”</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Delay Hours</td>
<td>Hours of extra travel time due to congestion</td>
<td>Yes</td>
<td>No if for vehicles, yes if for people</td>
</tr>
<tr>
<td>Congestion Costs</td>
<td>Monetized value of delay plus additional vehicle operating costs</td>
<td>Yes</td>
<td>No if for vehicles, yes if for people</td>
</tr>
</tbody>
</table>

Various indicators are used to evaluate congestion. Only a few are comprehensive and multi-modal.
<table>
<thead>
<tr>
<th>Top Transportation Concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motorists</strong></td>
</tr>
<tr>
<td>1. Congestion</td>
</tr>
<tr>
<td>2. Driving slow</td>
</tr>
<tr>
<td>3. Parking</td>
</tr>
<tr>
<td><strong>Pedestrians</strong></td>
</tr>
<tr>
<td>1. Killed by Motorist</td>
</tr>
<tr>
<td>2. Killed by Motorist</td>
</tr>
<tr>
<td>3. Killed by Motorist</td>
</tr>
<tr>
<td><strong>Bikers</strong></td>
</tr>
<tr>
<td>1. Killed by Motorist</td>
</tr>
<tr>
<td>2. Killed by Motorist</td>
</tr>
<tr>
<td>3. Killed by Motorist</td>
</tr>
</tbody>
</table>
Lincoln @ Dakota

- 30 MPH posted speed
- Off peak parking
- Peak AM in bound transit lane
- Residential frontage
Lincoln @ Dakota - Daily Travel Speeds

Miles per Hour

12:00:00 AM 12:30:00 AM 1:00:00 AM 1:30:00 AM 2:00:00 AM 2:30:00 AM 3:00:00 AM 3:30:00 AM 4:00:00 AM 4:30:00 AM 5:00:00 AM 5:30:00 AM 6:00:00 AM 6:30:00 AM 7:00:00 AM 7:30:00 AM 8:00:00 AM 8:30:00 AM 9:00:00 AM 9:30:00 AM 10:00:00 AM 10:30:00 AM 11:00:00 AM 11:30:00 AM 12:00:00 PM 12:30:00 PM 1:00:00 PM 1:30:00 PM 2:00:00 PM 2:30:00 PM 3:00:00 PM 3:30:00 PM 4:00:00 PM 4:30:00 PM 5:00:00 PM 5:30:00 PM 6:00:00 PM 6:30:00 PM 7:00:00 PM 7:30:00 PM 8:00:00 PM 8:30:00 PM 9:00:00 PM 9:30:00 PM 10:00:00 PM 10:30:00 PM 11:00:00 PM

AM peak

PM peak

Monday 6/8

Thursday 6/4

Tuesday 6/2
I want to see changes on Broadway and Lincoln because... traffic is too fast, to help residents and businesses feel safe and come together better. #denvermoves
1 Coloradano dies every 33 hours

Note: Data is preliminary as of release of this Report!
Source of Data: Colorado DOT & "As Reported" to NHTSA by FARS
ALL CRASHES 2008-2012

Bicycle Crash Analysis
Understanding and Reducing Bicycle & Motor Vehicle Crashes
Safety before speed
3. Do we need new measures?
It’s OK to deny progress
AMERICA HAS THE FEWEST 16-YEAR-OLD DRIVERS THAN AT ANY TIME SINCE THE 1960's

The Federal Highway Administration (FHWA) published new data today showing a record-low 8.49 million teenaged licensed drivers in the U.S., including 1.08 million who were 16 or younger in 2014.
Automated/Connected Vehicles are here
Choices are everything
Private sector will be a partner
Private sector will be a partner
Small changes are big for Safety

- Hit by a vehicle traveling at 20 MPH: 9 out of 10 pedestrians survive.
- Hit by a vehicle traveling at 30 MPH: 5 out of 10 pedestrians survive.
- Hit by a vehicle traveling at 40 MPH: only 1 out of 10 pedestrians survives.
Driving standards
Road-traffic deaths, selected rich countries

Per 100,000 population

United States
Belgium
Slovenia
New Zealand
Canada
Austria
France
Australia
Finland
Japan
Ireland
Germany
Norway
Israel
Netherlands
Denmark
Switzerland
Britain
Sweden

Per 100m vehicle-miles travelled

Japan
Slovenia
Belgium
United States
New Zealand
Austria
France
Canada
Israel
Australia
Finland
Germany
Netherlands
Norway
Switzerland
Ireland
Denmark
Britain
Sweden

Sources: US Centres for Disease Control and Prevention, WHO, OECD; The Economist

Economist.com
Health

• Percent of US children who are obese

2012: Percent of WIC children aged 2 to 4 years who have obesity †
Social Equity Considered

- Discrimination of recognized minorities (Black, Hispanic, people with disabilities, etc.)
- User fees (transit fares, road tolls and vehicle taxes) imposed on lower-income travelers.
- Distribution of public transit funding between buses and rail.
- High pollution exposure in disadvantaged neighborhoods.
- Accommodation of people with disabilities.
Social Equity Ignored

FIGURE 4
Pedestrian fatality rate per 100,000 persons, by race and age, 2003–2010
4. What are the new measures?
Safer People, Safer Streets:
Summary of U.S. Department of Transportation Action Plan to Increase Walking and Biking and Reduce Pedestrian and Bicyclist Fatalities
September 2014
Feds are leading the way
Feds are leading the way

<table>
<thead>
<tr>
<th>Metric</th>
<th>Program-Level</th>
<th>Project-Level</th>
<th>Process</th>
<th>Product</th>
<th>Outcome (pre)</th>
<th>Outcome (post)</th>
<th>Data Requirements</th>
<th>Advantages</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of intersections with improved crossings</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>Project design details</td>
<td>Simple to measure</td>
<td>May not to relate to where pedestrian activity occurs (or is desired)</td>
</tr>
<tr>
<td>Percent of street-miles within one-half mile of schools with accessible routes</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>Project locations and design, school locations</td>
<td>Measure specifically addresses school accessibility</td>
<td>Simple linear measure may not indicate priority of problems or need/demand addressed</td>
</tr>
<tr>
<td>Average number of jobs accessible via low-stress bicycle facilities</td>
<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>Locations of workers and jobs</td>
<td>Measures potential access to economic opportunity</td>
<td>Jobs accessible may not match skill levels of workers</td>
</tr>
<tr>
<td>Number of trips on TAP-funded facilities diverted from automobile (or diverted VMT)</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td>User counts; surveys on prior mode of travel and trip length</td>
<td>Reduced vehicle trips/VMT directly relates to environmental and congestion benefits</td>
<td>May be data-intensive to develop facility-specific estimates</td>
</tr>
</tbody>
</table>
States are Changing

• Florida

Figure 3-1
Examples of LOS By Mode for Urban Roadways

<table>
<thead>
<tr>
<th>LOS</th>
<th>Automobile</th>
<th>Bicycle</th>
<th>Pedestrian</th>
<th>Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/B</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
<td>&gt;4 buses/hour</td>
</tr>
<tr>
<td>C/D</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
<td>2 to 4 buses/hour</td>
</tr>
<tr>
<td>E/F</td>
<td>![Image]</td>
<td>![Image]</td>
<td>![Image]</td>
<td>≤ 1 bus/hour</td>
</tr>
</tbody>
</table>
States are Changing

• California: Benefit-cost analysis
  • takes into account all impacts of a decision to maximize social welfare
    • safety, environmental, economic, equity, and other impacts
  • Example: Caltrans 1B bond- $20B

• Improvements
  • Include multimodal and induced demand in B/C model
  • Include socioeconomic and equity factors
5. How are they applied?
The City of Boulder transformed a state highway into a corridor for people and art.

- Bus stops, a retaining wall and an underpass all received artistic treatments in addition to improved landscaping throughout the corridor.
- Travel lanes were narrowed and bus pull out areas were added.
KEY OUTCOMES

More People Biking and Walking
Pedestrian and bicyclist activity in the area has increased since the first two phases of the project have been completed. 17

An Attractive, Functional and Progressive Corridor
The project received an award for encouraging non-motorized transportation from the Federal Highways Administration by enhancing the human environment. Functional art was concentrated around transit stops, a pedestrian underpass and a retaining wall.

New Development
Five new multi-family housing developments catering to the elderly and students are under construction next to 28th Street. 17

More Capacity to Develop
As a result of the improvements to transit, pedestrian and bike facilities, the planning board and city council approved new zoning for the area that increased allowable housing density. 17
Vehicle Hours Traveled (VHT)
Vehicle hours traveled is a measurement of the total hours traveled by all vehicles. Vehicle Hours of Travel (VHT) = Travel Time * Volume. It is calculated using the regional model.

Greenhouse Gas Emissions (GHG)
Greenhouse gas emissions are gases from fuel combustion, industrial processes, agriculture, land use change and waste includes all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride which contribute to global warming. It is calculated using the regional model and national carbon emission factors.

Transportation Energy Use
Transportation energy use is the amount of energy used by transportation systems out of total energy consumption. Motor vehicles are the largest single consumers of petroleum in the United States and represent a significant impact of the country's total energy consumption. Transportation Energy Use is calculated using the regional model and national fuel efficiency rates.

Average Trip Length (ATL)
Average trip length is the average number of miles vehicles travel to reach a destination. It is calculated using the regional model.

Walkability and Bikeability Index
The walkability and bikeability indices provide an estimation of pedestrian and bicycle activity on streets and trails. Pedestrian and bicycle demand is estimated using factors that describe land use characteristics, proximities to key destinations, socio-economic attributes, and accessibility/permeability of streets in Fort Collins. It is calculated with a GIS model.

Vehicle Trips (VT)
Vehicle trips is the number of all trips being made on the Fort Collins roadway network. It is calculated using the regional model.

Person Miles on Transit
Person miles on transit is a measure of the total mileage traveled by all persons using transit. It is calculated using the regional model.

Capital Cost
The capital cost metric is used to understand how expensive key choices will be to construct. In general, capital costs for each key choice were estimated by determining the appropriate cost for each identified project type and the approximate number of projects that would need to be completed for each key choice.

O&M Cost
The operation and maintenance (O&M) cost metric is used to understand how expenses key choices will be to operate and maintain. In general, capital costs for each key choice were estimated by determining the appropriate cost for operating and maintaining project types and the approximate number of projects that would need to be completed for each key choice.

Transit Boardings
Transit boarding is the amount of pedestrian boarding a transit facility. It is calculated using the regional model.

Person Miles in Vehicles
Person miles in vehicles is the number of miles traveled by all people in a vehicle in Fort Collins. It is calculated using the regional model. Vehicle miles traveled output and the average vehicle occupancy rate for Fort Collins.

Percent Congested Major Arterial Lane Miles
The percent congested major arterial lane miles is used as a metric to understand the level of congestion in Fort Collins. It is calculated using the regional model.
We Need to Get Beyond Traffic because... I have better things to do!
August 2016
### Goal 1: Everyone Arrives Safely to Their Destination

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Before Data</th>
<th>6 Months After</th>
<th>15 Months After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crashes by Mode &amp; Type</td>
<td>Completed: 2012-2014 DPD crash database</td>
<td>Total crashes will be reported</td>
<td>Crash analysis will be reported</td>
</tr>
<tr>
<td>Public Perception of Safety</td>
<td>To Be Completed</td>
<td>Survey results will be reported</td>
<td>Survey results will be reported</td>
</tr>
<tr>
<td>Speed Limit Compliance</td>
<td>Completed: 2015 average mean speed from DPDW database</td>
<td>Not reported during this timeframe</td>
<td>Compliance results will be reported</td>
</tr>
<tr>
<td>Signal Compliance</td>
<td>Not Required</td>
<td>Not reported during this timeframe</td>
<td>Compliance results will be reported</td>
</tr>
<tr>
<td>Stop Compliance at Unsignalized Intersections</td>
<td>Not Required</td>
<td>Not reported during this timeframe</td>
<td>Compliance results will be reported</td>
</tr>
<tr>
<td>Stop Compliance at Driveways</td>
<td>Not Required</td>
<td>Not reported during this timeframe</td>
<td>Compliance results will be reported</td>
</tr>
<tr>
<td>Parking Compliance</td>
<td>Not Required</td>
<td>Not reported during this timeframe</td>
<td>Compliance results will be reported</td>
</tr>
<tr>
<td>People Driving in Transit Lane (3-6 PM)</td>
<td>Underway</td>
<td>Compliance results will be reported</td>
<td>Compliance results will be reported</td>
</tr>
<tr>
<td>Bicycle Riding Location</td>
<td>Completed: September 2015</td>
<td>Riding location results will be reported</td>
<td>Riding location results will be reported</td>
</tr>
</tbody>
</table>

### Goal 2: Collaborate with the Community and Businesses

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Before Data</th>
<th>6 Months After</th>
<th>15 Months After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Input</td>
<td>Completed: July 2015</td>
<td>Survey results will be reported</td>
<td>Survey results will be reported</td>
</tr>
<tr>
<td>Retail Sales Tax</td>
<td>Completed: Q3 2015</td>
<td>Not reported during this timeframe</td>
<td>Sales tax results will be reported</td>
</tr>
<tr>
<td>Community Input</td>
<td>Completed: October 2015</td>
<td>Survey results will be reported</td>
<td>Survey results will be reported</td>
</tr>
<tr>
<td>Commuter Input</td>
<td>Completed: October 2015</td>
<td>Survey results will be reported</td>
<td>Survey results will be reported</td>
</tr>
<tr>
<td>Participation in Outreach Opportunities</td>
<td>Completed: October 2015</td>
<td>Participation results will be reported</td>
<td>Participation results will be reported</td>
</tr>
<tr>
<td>Business/Community Bikeway &quot;Ownership&quot;</td>
<td>Not Required</td>
<td>Not reported during this timeframe</td>
<td>Results will be reported</td>
</tr>
</tbody>
</table>

### Goal 3: Provide Mobility Options for Everyone

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Before Data</th>
<th>6 Months After</th>
<th>15 Months After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Travel Times</td>
<td>Completed: September 2015</td>
<td>Travel times will be reported</td>
<td>Travel times will be reported</td>
</tr>
<tr>
<td>Vehicle Traffic Volumes</td>
<td>Completed: March/September 2015</td>
<td>Traffic volumes will be reported</td>
<td>Traffic volumes will be reported</td>
</tr>
<tr>
<td>Parallel Corridor Traffic</td>
<td>Completed: March-June 2016</td>
<td>Traffic volumes will be reported</td>
<td>Traffic volumes will be reported</td>
</tr>
<tr>
<td>Parking Space Utilization</td>
<td>Completed: March 2016</td>
<td>Parking results will be reported</td>
<td>Parking results will be reported</td>
</tr>
<tr>
<td>Transit On-Time Arrival</td>
<td>Underway</td>
<td>Not reported during this timeframe</td>
<td>Arrival results will be reported</td>
</tr>
<tr>
<td>Transit Ridership (Boardings/Alightings)</td>
<td>Underway</td>
<td>Not reported during this timeframe</td>
<td>Ridership results will be reported</td>
</tr>
<tr>
<td>Bicycle Volumes</td>
<td>Completed: September 2015</td>
<td>Bicycle volumes will be reported</td>
<td>Bicycle volumes will be reported</td>
</tr>
<tr>
<td>Bicyclist Demographic</td>
<td>Completed: September 2015</td>
<td>Bicyclist demographics will be reported</td>
<td>Bicyclist demographics will be reported</td>
</tr>
<tr>
<td>Bike Parking Utilization</td>
<td>Not Required</td>
<td>Not reported during this timeframe</td>
<td>Parking results will be reported</td>
</tr>
<tr>
<td>Sidewalk Pedestrian Volume</td>
<td>Underway</td>
<td>Pedestrian volumes will be reported</td>
<td>Pedestrian volumes will be reported</td>
</tr>
<tr>
<td>Summer/Winter Maintenance</td>
<td>Not Required</td>
<td>Not reported during this timeframe</td>
<td>Results will be reported</td>
</tr>
</tbody>
</table>
Pop-up protected bike lanes on Broadway receive praise, criticism

POSTED 9:48 PM, SEPTEMBER 26, 2015, BY KENT ERDAHL

The latest COEmergency Watch! paper.li/COEmergency/13... Thanks to @SheriffMesaColo #cowx #utwx

Don’t Forget — Ride the Broadway Bike Lane Starting Monday paper.li

Kudos! City meets with Broadway businesses to resolve deleted parking & promising to address. #BikesOnBroadway

Reply to CO - Emergency Mgmt,...

Reply to Tom Nguyen
### Traffic Collisions

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>933</td>
</tr>
<tr>
<td>2003</td>
<td>807</td>
</tr>
<tr>
<td>2005</td>
<td>756</td>
</tr>
</tbody>
</table>

**Figure 12 Traffic Accidents**

### Bike & Pedestrian Collisions

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>34</td>
</tr>
<tr>
<td>2003</td>
<td>18</td>
</tr>
<tr>
<td>2005</td>
<td>19</td>
</tr>
</tbody>
</table>

**Numbers at your fingertips**

<table>
<thead>
<tr>
<th>How Much/Many?</th>
<th>Of What?</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>9,200</td>
<td>Students riding the bus to school (2009)</td>
<td>↔</td>
</tr>
<tr>
<td>767</td>
<td>Traffic collisions not involving pedestrians or bicyclists</td>
<td>↔</td>
</tr>
<tr>
<td>22</td>
<td>Collisions involving pedestrians or bicyclists (improving: fewer collisions)</td>
<td>↓</td>
</tr>
<tr>
<td>7.6%</td>
<td>Traffic growth for selected intersections since 1996 (2008) (worsening: more traffic)</td>
<td>↑</td>
</tr>
<tr>
<td>36%</td>
<td>AM commuters traveling by non-single occupancy vehicle (2009)</td>
<td>↑</td>
</tr>
</tbody>
</table>

*Data for 2010 unless otherwise noted. Visit www.redmond.gov/communityindicators for more information about the above figures.*
Setting Course for a Low-Carbon Future: Boulder’s Climate Commitment
Transportation Master Plan

• Since 1990, Boulder’s TMP updates include travel trend assessments and on-going monitoring programs
• 2014 TMP includes 9 measurable objectives
• Bi-annual Transportation Report on Progress
• Safe Streets Boulder Report
• Continuous improvement
2014 TMP
Measurable Objectives

- No Growth in Long Term Vehicle Traffic
- Reduce SOV to 25% of Trips
- Reduce Mobile Source Emissions
- Max of 20% roadways at LOS F
- Expand Fiscally Viable Alternatives for Residents & Employees
- Increase Alternatives with rate of Employee Growth
- Safety Toward Vision Zero
- Neighborhood Accessibility
- VMT per Capita
### TMP Objectives Summary

<table>
<thead>
<tr>
<th>Objective</th>
<th>Baseline</th>
<th>Progress</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce vehicle miles of travel (VMT) in the Boulder Valley by 26 percent by 2035</td>
<td>1,964 level of 2.44 million daily VMT for the Boulder Valley, target now 1.5 million daily VMT</td>
<td>Est. 2.42 million daily VMT for the Boulder Valley in 2014</td>
<td>Further reduction in daily VMT</td>
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<td>Reduce single occupant vehicle travel to 22 percent of all trips for residents and to 90 percent of work trips for nonresidents</td>
<td>1990: 44 percent SDV mode share for residents</td>
<td>Reduced to 16.5 percent in 2015 for residents</td>
<td>Positive but needs to accelerate</td>
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<tr>
<td>1991: 81 percent nonresident SDV commute mode share</td>
<td>Remains at 60 percent in 2014 for nonresident employed</td>
<td>Static, needs significant change</td>
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<tr>
<td>Achieve a 15 percent reduction in greenhouse gas emissions and continued reduction in mobile source emissions of other air pollutants</td>
<td>310, 729 million metric tons of GHG in 2013</td>
<td>New objective</td>
<td>To be determined in next 2035 report</td>
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<tr>
<td>No more than 20 percent of roadways congested at level of service F</td>
<td>23 percent in 1998</td>
<td>9 percent in 2015</td>
<td>Positive</td>
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<td>Expand readily viable transportation options for all Boulder residents and employees, including other adults and people with disabilities</td>
<td>2001: $490, 000 city support to VTA</td>
<td>2010 - $290, 000 city support to VTA</td>
<td>6.3 percent annual increase</td>
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<td>2011 - 1, 872 sq. residents eligible for Neighborhood EcoPass</td>
<td>2015 - 1, 822 sq. residents eligible for Neighborhood EcoPass</td>
<td>16.3 percent annual increase</td>
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<td>Increase transportation alternatives commensurate with the rate of employment growth</td>
<td>2002: 51, 339</td>
<td>2015: 60, 413</td>
<td>Positive</td>
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<td>2002: 10, 567</td>
<td>2015: 10, 000</td>
<td></td>
<td></td>
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<tr>
<td>&quot;Towards Vision Zero&quot; for fatal and serious injury crashes continuous</td>
<td>2016 Safe Streets report in progress</td>
<td>New objective</td>
<td>To be determined</td>
</tr>
<tr>
<td>Increase the share of residents living in complete, walkable neighborhoods to 50 percent</td>
<td>26 percent of residents lived in a walkable neighborhood in 2014</td>
<td>New objective</td>
<td>To be determined</td>
</tr>
<tr>
<td>Reduce daily resident VMT to 2.5 miles per capita and nonresident oneway commute VMT to 11.4 miles per capita</td>
<td>11.2 miles per day for Boulder residents in 2012</td>
<td>New resident data in 2016</td>
<td>To be determined</td>
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<td>13.4 nonresident oneway commute in 2014</td>
<td>New nonresident data will be collected in 2017</td>
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</tbody>
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Types of Transportation Data

- Safety data for all modes
- Vehicle Volume & Speed
- Intersection Delay
- Travel Times
- Pedestrians and Bicycles
- Transit Ridership
- Resident Travel Diaries
- Employee Surveys
Safety Trends

• The year 2015 marked the largest increase in traffic deaths since 1966 and preliminary estimates for the first half of 2016 show an alarming uptick in fatalities - an increase of about 10.4 percent as compared to the number of fatalities in the first half of 2015.
Safe Streets Boulder Moving Toward Vision Zero

Engineering Education Enforcement Evaluation

From 2009-2014, approximately 3,275 COLLISIONS were reported to the Boulder Police Department each year.

Collisions that resulted in a SERIOUS INJURY or FATALITY have been relatively flat at 2% of total collisions in the past six years.

BICYCLISTS & PEDESTRIANS are overrepresented in collisions that result in serious injuries or fatalities, ONLY 8% of all traffic collisions in the City of Boulder involve bicyclists or pedestrians. They account for approximately 60% of serious injuries and fatalities.

IMPAIRED PERSONS are overrepresented, especially those involving bicyclists and pedestrians resulting in serious injuries or fatalities. Approximately 3% of total collisions involve an impaired person. 12% of serious injuries and 38% of fatalities involve an impaired person.
Metrics – Bike Counts
Metrics – Transit Ridership
Boulder: Daily Boardings – Local and Regional

In 2013, Boulder is doing more with less. Ridership is driving up toward the City's 10 year high, while service hours are 9% lower on local routes than they were in...
Metrics - Surveys

• Major effort and unique long-term data since 1990
• Travel Diary
  • Boulder residents
• Employee Surveys
  • Residents and non-resident employees
Boulder Valley Employee Survey

- Continued trend of SOV mode share reduction for Boulder residents
- No change for non-resident employees
2035 TMP goal: Reduce SOV trips to 20% of all trips by residents.

All Trip SOV Mode Share Source: 1990-2012 Modal Shift Report data (Travel Diary of Boulder Residents).
Transportation Data
What’s Next?
New Technology: Mobile App

- Smartphone app to collect travel data
  - GPS-based
  - Increased accuracy
  - Cost-effective data processing
  - Adaptable to a variety of survey needs
New Technology: Real-time Travel Data

• Current pilot project
• Real time MAC address “sniffing”
• 24/7 data collection
• Analytics for speed, congestion origin/destination
Transportation Metrics – Summary

> Continued data collection, analysis, and reporting through TMP updates, Report on Progress, and Safe Streets Boulder Report

> Application of new technologies

> Explore opportunities for Open Data

> More info:
> www.BoulderTMP.net