

MEMORANDUM

SUBJECT: Background research on mode shift measurement and goals

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DATE: July 6, 2015 (revised September 1, 2015)

The Massachusetts Department of Public Health (MDPH), in partnership with WatsonActive and the Metropolitan Area Planning Council (MAPC), is engaged in an effort to determine best practices, create guidelines, and provide technical assistance to communities to measure bicycling and walking mode share and set mode shift goals. The relationship between the built environment and physical activity is well understood, as is the relationship between physical activity and health outcomes. MDPH is interested in bridging those relationships to directly predict and measure the impact of bicycling and walking projects and programs on health outcomes. Communities could then set mode share goals for based on anticipated/desired health outcomes, and MDPH could use changes in mode share as a measure of project or program outcomes.

WatsonActive was tasked with providing background research to the project team to assist them in determining what tools and methods to test for measuring mode share and establishing mode shift goals. WatsonActive focused its efforts on a literature search, but also conducted several key informant interviews. This memorandum is a guide to the resulting resource library that is now available to the project team, consisting of Google Drive folders organized by topic and chronologically, supplemented by Evernote Notebooks containing relevant web pages. Links to these resources have been shared with the project team, and these resources may be moved to other platforms at the discretion of the project team.

Google Drive folders:

- Data: bicycle and pedestrian data reports
- HIA: documents related to Health Impact Assessments incidentally discovered during literature search
- Measurement Tools: see Section III below
- Miscellaneous: other interesting, but not directly relevant, materials
- Plans and Goals: see Section V below

Evernote Notebooks:

- Data Analysis: see Section IV.A below
- Mode Shift: see Section IV.B below

Section I (page 3) defines mode share and mode shift for purposes of this project.

Section II (page 4-5) enumerates the types of mode shift goals observed in plans discovered by the literature search, and other goal concepts.

Section III (pages 6-15) is a complete bibliography and summary, in chronological order, of the documents in the “Measurement Tools” folder in the resource library. Much of this material is technical and requires further review.

Section IV (pages 16-22) lists all the resources contained in the Evernote Notebooks, with direct links to the original sources.

Section V (pages 22-37) contains summaries of representative state, regional, local, and international mode shift goals, as expressed in a variety of planning documents.

Section VI (page 38) suggests next steps and additional work.

I. Working Definitions

Mode Share

1. Percentage of travelers using a particular type of transportation
2. Percentage of trips made using a particular type of transportation
3. Percentage of miles traveled using a particular type of transportation

Mode Shift

A change between mode shares, in this context from use of motor vehicles (particularly SOV) toward increased use of sustainable types of transportation including bicycling, walking, and transit.

II. Types of Mode Shift Goals

A. Observed in Reviewed Plans

1. Aspirational Shift (either from driving or to other modes)
 - a. Policy statement to reduce driving and/or increase other modes without specific target
2. Aspirational VMT Reduction
 - a. Policy statement to reduce VMT without specific target
3. Specific VMT Reduction
 - a. Reduce VMT to a specific percentage share of trips/miles traveled
 - b. Reduce average VMT to specific miles per day
 - c. Reduce VMT by a specific percentage (usually relative to a baseline year)
4. Specific Shift From Driving to Other Modes
 - a. Shift % trips driving to other modes
 - b. Shift % of people to other modes
5. Shift To Specific Other Modes (e.g., biking, walking, transit)
 - a. % of trips by other modes
 - b. % of miles traveled by other modes
 - c. Number or % of people using other modes
6. Other Specific Goals (measurable goals not covered by other types)
 - a. Miles of bicycle/pedestrian facilities
 - b. Miles of bicycle/pedestrian facilities within a specific distance of destinations
 - c. Number of bicycle/pedestrian facilities
 - d. % of population within a specific distance to a bicycle facility
 - e. % of infrastructure spending for other modes
 - f. Number or % of population reached by encouragement/educational/promotional programs
 - g. Specific increase to WalkScore/BikeScore/TransitScore
 - h. % of population who feel safe from traffic
 - i. % reduction in bicyclist/pedestrian injuries/crashes
 - j. Shift % of trips from peak to non-peak hours

B. Other Goal Concepts

1. Specific Shift From Driving to Other Modes
 - a. % of miles driven to other modes

2. Other Specific Goals (measurable goals not covered by other types)
 - a. % completeness of bicycle network/pedestrian network
 - i. overall network
 - ii. in proximity to certain destinations (e.g., schools, transit stops, shopping)
 - b. Specific \$ infrastructure spending for other modes
 - c. Specific \$ spending on bicycling/walking encouragement/educational/promotional programs

III. Resource Library: Measurement Tools (available in Google Drive)

The resources in this section represent the most frequently cited, most comprehensive, most authoritative, and/or most interesting measurement resources discovered during the literature search. Resources generally cover two main subject areas, often both within the same resource: tools and methods for the collection of non-motorized usage or trip data, and models for the measurement and prediction of mode share and/or mode shift. Note that resources are listed chronologically by year but may not be chronological within a given year.

Resources listed in **bold** may be more helpful or interesting in the context of this project. While the technical merits of these resources have not been evaluated, the marked resources provide more comprehensive overviews, more current information, and/or more innovative thinking regarding the state of the art. None of these resources delve into passive collection of data from mobile phones, perhaps the most recent and promising development in the collection of trip data.

1. *Guidebook on Methods to Estimate Non-Motorized Travel: Overview of Methods*
Guidebook on Methods to Estimate Non-Motorized Travel: Supporting Documentation
 - a. Author (Affiliation): Cambridge Systematics, Bicycle Federation of America, FHWA Turner-Fairbank Highway Research Center
 - b. Organization/Publication: Federal Highway Administration
 - c. Year: 1999
 - d. Description: Describes and compares a variety of methods for forecasting bicycle and pedestrian travel. While comprehensive for its time, this guide has not been updated and FHWA's website flags it as archived and possibly outdated.

2. ***Data Collection and Modeling Requirements for Assessing Transportation Impacts of Micro-Scale Design***
 - a. Author (Affiliation): Parsons Brinckerhoff Quade & Douglas, Inc.
 - b. Organization/Publication: Federal Highway Administration
 - c. Year: 2000
 - d. Description: Examines how to measure and incorporate human-scale built environment features in transportation models and projects

3. *Sensitivity Analysis Approach for an Integrated Land Development & Travel Demand Modeling System*
 - a. Author (Affiliation): Joel P. Franklin, Paul Waddell (University of Washington), and John Britting (Wasatch Front Regional Council)
 - b. Organization/Publication: ACSP 44th Annual Conference
 - c. Year: 2002
 - d. Description: Integrates a land use model with a travel model that includes non-motorized modes.

4. *Walking and Bicycling: An Evaluation of Environmental Audit Instruments*
 - a. Author (Affiliation): Anne Vernez Moudon, Chanam Lee (University of Washington)
 - b. Organization/Publication: *American Journal of Health Promotion*
 - c. Year: 2003
 - d. Description: Examines existing tools to measure how the built environment influences walking and biking, from a public health viewpoint.

5. *Estimating Bicycling Demand*
 - a. Author (Affiliation): Gary Barnes and Kevin Krizek (University of Minnesota)
 - b. Organization/Publication: Transportation Research Record
 - c. Year: 2005
 - d. Description: Estimating total bicycling levels from known commuter bicycling data.

6. *Evaluation of Potential Measures for Achieving Modal Targets*
 - a. Author (Affiliation): Cogan Owens Cogan, Alta Planning + Design, David Evans and Associates
 - b. Organization/Publication: Oregon Metro
 - c. Year: 2005
 - d. Description: Review of strategies for influencing mode shift.

7. ***NCHRP Report 552: Guidelines for Analysis of Investments in Bicycle Facilities***
 - a. Author (Affiliation): Kevin J. Krizek, Gary Barnes, Gavin Poindexter, Paul Mogush, Kristin Thompson, David Levinson, and Nebiyu Tilahun (University of Minnesota), David Loutzenheiser and Don Kidston (Planners Collaborative), William Hunter, Dwayne Tharpe, Zoe Gillenwater, and Richard Killingsworth (UNC-Chapel Hill)
 - b. Organization/Publication: Transportation Research Board, National Cooperative Highway Research Program
 - c. Year: 2006
 - d. Description: Summarizes methods and tools to estimate the cost of bicycle facilities, measure and forecast demand, quantify benefits of bicycle facilities, and cost-benefit analysis of bicycle facilities.

8. *Health Benefits of Bicycle Facilities*
 - a. Author (Affiliation): Theodore A. Petritsch, Bruce W. Landis, Herman F. Huang, Christopher B. Fellerhoff (Sprinkle Consulting), Dennis Scott (Florida DOT)
 - b. Organization/Publication: Florida DOT
 - c. Year: 2007
 - d. Description: Model to forecast the potential induced recreational travel from building bicycle facilities and how that relates to increased health benefits. Superseded by *Conserve by Bicycling and Walking* report.

9. *Testing the Effectiveness of Bicycle and Pedestrian Access Improvements in Reducing Commute Vehicle Trips*
 - a. Author (Affiliation): William R. Loudon (DKS Associates), Mandi Roberts (Otak, Inc.), Sarah Kavage (Lawrence Frank & Co.)
 - b. Organization/Publication: Washington State DOT
 - c. Year: 2007
 - d. Description: Incorporating bicycle and pedestrian access into TDM Effectiveness Evaluation Model (TEEM).

10. *Predicting Induced Recreational Walking Trips Resulting from Infrastructure Improvements*
 - a. Author (Affiliation): Theodore A. Petritsch, Peyton S. McLeod, Bruce W. Landis (Sprinkle Consulting)
 - b. Organization/Publication: Florida DOT
 - c. Year: 2008
 - d. Description: Model to forecast the potential induced recreational travel from building pedestrian facilities. Superseded by *Conserve by Bicycling and Walking* report.

11. ***Conserve by Bicycling and Walking Phase II Report***
(Final Report, Executive Summary, Appendices, and Benefits Calculator)
 - a. Author (Affiliation): Sprinkle Consulting, Kittelson & Associates, University of Southern Florida Center for Urban Transportation Research
 - b. Organization/Publication: Florida DOT
 - c. Year: 2009
 - d. Description: Final versions of Petrisch models for induced bicycle and pedestrian recreational travel, and benefits calculator including health benefits.

12. *Automatic Count Technologies*

Count Adjustment Factors

Extrapolation Spreadsheet

- a. Author (Affiliation): Alta Planning + Design
- b. Organization/Publication: National Bicycle and Pedestrian Documentation Project
- c. Year: 2009
- d. Description: Summary of various available technologies, limited information. Separate documents provide count adjustments for time of day, seasonality, climate, and day of week, and a tool for extrapolating from short-term counts to longer-term estimates.

13. *Measuring Non-motorized Accessibility: Issues, Alternatives, and Execution*

- a. Author (Affiliation): Michael Iacono (University of Minnesota), Kevin J. Krizek (University of Colorado), Ahmed El-Geneidy (McGill University)
- b. Organization/Publication: *Journal of Transport Geography*
- c. Year: 2010
- d. Description: Review of challenges of modeling non-motorized travel and proposed solutions

14. ***Seamless Travel: Measuring Bicycle and Pedestrian Activity in San Diego County and its Relationship to Land Use, Transportation, Safety, and Facility Type***

- a. Author (Affiliation): Michael G. Jones, Sherry Ryan, Jennifer Donlon, Lauren Ledbetter (Alta Planning + Design), David R. Ragland, Lindsay Arnold (UC Berkeley Traffic Safety Center)
- b. Organization/Publication: Caltrans
- c. Year: 2010
- d. Description: Complete project history, including background research, data collection, and development of bicycle and pedestrian demand models.

15. *Health Co-Benefits and Transportation-Related Reductions in Greenhouse Gas Emissions in the Bay Area: Technical Report*

- a. Author (Affiliation): Neil Maizlish (Center for Chronic Disease Prevention and Health Promotion, California DPH), James Woodcock (UKCRC Centre for Diet and Activity Research (CEDAR), Institute of Public Health), Sean Co (Metropolitan Transportation Commission), Bart Ostro (Centre for Research in Environmental Epidemiology (CREAL)), Amir Fanai, David Fairley (Bay Area Air Quality Management District)
- b. Organization/Publication: California DPH
- c. Year: 2011
- d. Description: Application of ITHIM to biking and walking in San Francisco Bay Area.

16. *Using Inductive Loops to Count Bicycles in Mixed Traffic*

- a. Author (Affiliation): Krista Nordback, Daniel Piatkowski, Bruce N. Janson, Wesley E. Marshall, Kevin J. Krizek, and Deborah S. Main (University of Colorado)
- b. Organization/Publication: *ITE Journal of Transportation*
- c. Year: 2011
- d. Description: Study of accuracy and efficacy of Eco-Counter bicycle counting technology.

17. *NCHRP Report 716: Travel Demand Forecasting: Parameters and Techniques*

- a. Author (Affiliation): David Kurth, John (Jay) Evans, Daniel Beagan, Bruce Spear, Robert Schiffer, Ramesh Thammiraju, Amlan Banerjee, Yasavi Popuri (Cambridge Systematics), Richard Roisman (VHB), C. Y. Jeng (Gallop), Chandra R. Bhat, Philip Shapiro (Shapiro Transportation Consulting), William Martin (Martin/Alexiou/Bryson)
- b. Year: 2012
- c. Organization/Publication: Transportation Research Board, National Cooperative Highway Research Program
- d. Description: Very detailed review of current practice in developing and using travel demand forecasting models. Section 4.7 deals specifically with mode choice.

18. *Recent Practices in Regional Modeling of Non-Motorized Travel*

- a. Author (Affiliation): Feng Liu, John E. (Jay) Evans, Thomas Rossi (Cambridge Systematics)
- b. Year: 2012
- c. Organization/Publication: submitted to TRB Annual Meeting
- d. Description: Review of current practice incorporating non-motorized travel into regional travel demand models, discussion of modeling approaches and pros and cons.

19. ***TCRP Report 95: Traveler Response to Transportation System Changes Handbook, Chapter 16 - Pedestrian and Bicycle Facilities***
- a. Author (Affiliation): Richard H. Pratt, Consultant, Inc., in association with Jay Evans Consulting LLC, the Texas Transportation Institute, Parsons Brinckerhoff, Inc., J. Richard Kuzmyak, L.L.C., Cambridge Systematics, Inc., Vanasse Hangen Brustlin, Inc./VHB, Gallop Corporation, McCollom Management Consulting, Inc., Herbert S. Levinson, Transportation Consultant, and K.T. Analytics, Inc.
 - b. Organization/Publication: Transportation Research Board
 - c. Year: 2012
 - d. Description: Analysis of effect of different types of biking and walking facilities on traveler mode share.
20. Model Inventory of Roadway Elements (MIRE):
- MIRE Element Collection Mechanisms and Gap Analysis*
- a. Author (Affiliation): Jagannath Mallela, Suri Sadasivam, and Nancy Lefler (VHB, Applied Research Associates)
 - b. Year: 2012
- MIRE Data Collection Guidebook*
- a. Author (Affiliation): Jag Mallela, Suri Sadasivam, Rachel Becker, Deepak Raghunathan, Nancy Lefler, Rebecca Fiedler, and Hugh McGee (VHB, Applied Research Associates)
 - b. Year: 2013
- MIRE Fundamental Data Elements Cost-Benefit Estimation*
- a. Author (Affiliation): Rebecca Fiedler, Kim Eccles, Nancy Lefler, Ana Fill, and Elsa Chan (VHB)
 - b. Year: 2013
 - c. Organization/Publication: FHWA Safety Program
 - d. Description: MIRE is a data dictionary of roadway and traffic data elements. These publications explain the data elements in detail, and review data collection methods for the various elements. Recognizes the need for bicyclist and pedestrian data, but does not address how to collect it, merely includes bicycle facility information in the data dictionary. These publications build upon the earlier 2010 MIRE report.
21. *Counting Bicyclists and Pedestrians to Inform Transportation Planning*
- a. Author (Affiliation): Sherry Ryan (San Diego State University) and Greg Lindsey (University of Minnesota)
 - b. Organization/Publication: Active Living Research
 - c. Year: 2013
 - d. Description: Overview of counting technologies, and purposes for which counts can be used.

22. FHWA Traffic Monitoring Guide

- a. Author (Affiliation): Shawn Turner (Texas Transportation Institute) (Chapter 4)
- b. Organization/Publication: Federal Highway Administration
- c. Year: 2013
- d. Description: Chapter 4 covers non-motorized traffic, including counting technologies and methodologies. First time FHWA has included non-motorized users in the guide. Helpful as an overview but lacks depth.

23. Development of Performance Measures for Non-Motorized Dynamics

- a. Author (Affiliation): Jun-Seok Oh, Valerian Kwigizile, Ron Van Houten, Joseph McKean, Farhad Abasahl, Hamidreza Dolatsara, Bryce Wegner, and Matthew Clark (Transportation Research Center for Livable Communities, Western Michigan University)
- b. Organization/Publication: Michigan DOT
- c. Year: 2013
- d. Description: Covers crash factors, performance measures, data collection, and volume modeling.

24. The Minnesota Bicycle and Pedestrian Counting Initiative: Methodologies for Non-motorized Traffic Monitoring

- a. Author (Affiliation): Greg Lindsey, Steve Hankey, Xize Wang, and Junzhou Chen (University of Minnesota)
- b. Organization/Publication: Minnesota DOT
- c. Year: 2013
- d. Description: Overview of count methodologies, short-duration manual counts, continuous counts, and data analysis.

25. Conducting Bicycle and Pedestrian Counts: A Manual for Jurisdictions in Los Angeles County and Beyond

- a. Author (Affiliation): Kittelson & Associates, Ryan Snyder Associates, Los Angeles County Bicycle Coalition
- b. Organization/Publication: Southern California Association of Governments and Los Angeles County Metropolitan Transportation Authority
- c. Year: 2013
- d. Description: Comprehensive instructional guide for performing counts. Covers a broad range of topics at an introductory level.

26. *Tools for Estimating VMT Reductions from Built Environment Changes*
- Author (Affiliation): Anne Vernez Moudon, Orion Stewart (University of Washington)
 - Organization/Publication: Washington State DOT
 - Year: 2013
 - Description: Overview of demographic and built environment factors affecting mode choice, and tools to measure changes in VMT.
27. *Roadway Safety Data and Analysis Toolbox: Primer on Data and Analysis Tools—DRAFT*
- Author (Affiliation): Frank Gross and Geni Bahar
 - Organization/Publication: FHWA
 - Year: 2014
 - Description: Guide to using FHWA Roadway Safety Data and Analysis Toolbox
28. **LA Metro Bicycle Model:**
Modeling the Impacts of Bicycle Facilities on Commute and Recreational Bicycling in Los Angeles County
- Author (Affiliation): Monique Urban, Christopher Porter, Kimon Proussaloglou (Cambridge Systematics), Robert Calix, and Chaushie Chu (LA Country Metropolitan Transportation Authority)
- Los Angeles County Metropolitan Transportation Authority Bicycle Travel Demand Model: Phase II Model Description***
- Author (Affiliation): Chaushie Chu, Robert Calix, Robert Farley, Ying Zhu, Falan Guan, Jim Zhang, John Stesney, Owen Mo (LACMTA), Tom Rossi, Michael Snavely, Kimon Proussaloglou, Feng Liu, Monique Urban (Cambridge Systematics)
 - Organization/Publication: submitted for TRB 2014
 - Year: 2014
 - Description: Commuter and recreational models to predict increases in bike trips and miles traveled from investment in bicycle facilities. Related 2013 report from Southern California Council of Governments contains background on this and other models.
29. ***NCHRP Report 770: Estimating Bicycling and Walking for Planning and Project Development***
- Author (Affiliation): J. Richard Kuzmyak (Renaissance Planning Group), Jerry Walters (Fehr & Peers), Mark Bradley (Mark Bradley Research and Consulting), Kara M. Kockelman (University of Texas)
 - Organization/Publication: Transportation Research Board, National Cooperative Highway Research Program
 - Year: 2014
 - Description: Comparison of several model types for predicting mode choice.

30. ***NCHRP Report 797: Guidebook on Pedestrian and Bicycle Volume Data Collection***
- a. Author (Affiliation): Paul Ryus, Erin Ferguson, and Kelly M. Laustsen (Kittelsohn & Associates), Robert J. Schneider (University of Wisconsin-Milwaukee), Frank R. Proulx (Safe Transportation Research & Education Center, University of California, Berkeley), Tony Hull (Toole Design Group), Luis Miranda-Moreno (McGill University)
 - b. Organization/Publication: Transportation Research Board, National Cooperative Highway Research Program
 - c. Year: 2014
 - d. Description: Tools and methodologies for collecting, correcting, and adjusting count data. Review of sensor technology does not include cell phones.
31. ***Differences Between Walking and Bicycling Over Time: Implications for Performance Management***
- a. Author (Affiliation): Jessica Schoner and Greg Lindsey (University of Minnesota)
 - b. Organization/Publication: University of Minnesota
 - c. Year: 2014
 - d. Description: Explores differences between bicyclists and pedestrians, including trip distance and purpose, seasonality, and factors associated with likelihood of biking or walking. Questions whether non-motorized transportation should be considered a single mode, and advocates different performance measures.
32. ***Performance measures for bicycle and pedestrian investments***
- a. Author (Affiliation): Robbie Webber (State Smart Transportation Initiative)
 - b. Organization/Publication: Pro Walk/Pro Bike/Pro Place presentation
 - c. Year: 2014
 - d. Description: Identifies and categorizes possible performance measures into output-based metrics and outcome-based metrics. References ongoing research into use of anonymous cell phone data.

- 33. *Monitoring Bicyclist and Pedestrian Travel and Behavior: Current Research and Practice***
- a. Author (Affiliation): Greg Griffin (Texas A&M Transportation Institute), Krista Nordback (Oregon Transportation Research and Education Consortium Portland State University), Thomas Götschi (Institute of Social and Preventive Medicine, University of Zurich), Elizabeth Stolz (Sprinkle Consulting), Sirisha Kothuri (Portland State University)
 - b. Organization/Publication: Transportation Research Board, *Transportation Research Circular*
 - c. Year: 2014
 - d. Description: Overview of tools and methods for counting bicyclists and pedestrians and monitoring their behavior.
- 34. *Data Collection and Econometric Analysis of the Demand for Nonmotorized Transportation***
- a. Author (Affiliation): Ricardo A. Daziano and Yutaka Motoaki (Cornell University)
 - b. Organization/Publication: University Transportation Research Center
 - c. Year: 2014
 - d. Description: Looks at bicycle data collection from an econometric perspective, then performs discrete choice modeling and time series analysis of bicycle count data to determine effect of weather on demand.
- 35. *Health Benefits of the MassDOT Capital Investment Program***
- a. Author (Affiliation): Chris Porter, Joe Zissman, Marc Cutler (Cambridge Systematics) and Jennifer Slesinger, Stephen Woelfel (MassDOT)
 - b. Organization/Publication: MassDOT
 - c. Year: 2015
 - d. Description: Discusses MassDOT mode shift goal, demonstrates the calculation of the Person Miles Traveled (PMT) metric, and plugs the results into established public health models.
- 36. *A Bicycle Network Analysis Tool for Planning Applications in Small Communities***
- a. Author (Affiliation): Seungkyu Ryu (Utah State University), Jacqueline Su (University of California Davis), Anthony Chen (Utah State University)
 - b. Organization/Publication: Mountain-Plains Consortium
 - c. Year: 2015
 - d. Description: Very limited attempt to develop a network analysis tool specifically for estimating bicycle trips in small communities.

IV. Website Resources (captured in Evernote)

The resources in this section represent a broad range of online tools and information collections discovered during the literature search. The resources are divided into two sections: Data Analysis and Mode Shift.

Data Analysis resources include data sources, data providers, tools for collecting data in the field, analytical tools, indicators, and examples from municipalities.

Mode Shift resources include websites tracking mode shift goals in the US and abroad, potentially helpful organizations, and more. The resources listed here supplement the specific plans and goals discussed in Section V below.

Resources listed in **bold** may be more helpful or interesting in the context of this project.

A. Data Analysis

1. Tools for Sustainable Communities

- a. Organization: FHWA Office of Planning, Environment, & Realty, Livability Initiative
- b. Link: http://www.fhwa.dot.gov/livability/tools/sustainable_communities/index.cfm
- c. Notes: Links to many tools and resources.

2. Sustainable Community Indicator Catalog

- a. Organization: Partnership for Sustainable Communities
- b. Link: <http://www.sustainablecommunities.gov/indicators>
- c. Notes: Compendium of sustainability indicators, can drill down for details.

3. Massachusetts Travel Survey

- a. Organization: MassDOT Planning
- b. Link: <http://www.massdot.state.ma.us/planning/Main/MapsDataandReports/Reports/TravelSurvey.aspx>

4. National Household Travel Survey

- a. Organization: FHWA Center for Transportation Analysis
- b. Link: <http://nhts.ornl.gov/>

5. Travel Model Improvement Program

- a. Organization: FHWA Office of Planning, Environment, & Realty

- b. Link: <http://www.fhwa.dot.gov/planning/tmip/>
 - c. Notes: Interesting, but does not appear to be up-to-date.
- 6. **Integrated Transport and Health Impact Modelling Tool (ITHIM)**
 - a. Organization: Centre for Diet and Activity Research
 - b. Link: <http://www.cedar.iph.cam.ac.uk/research/modelling/ithim/>
- 7. Tools and Applications
 - a. Organization: Transpo Group
 - b. Link: <http://www.transpogroup.com/innovation/tools-and-applications/>
 - c. Notes: Modeling-focused transportation consulting firm.
- 8. **Cycletracks application (original implementation)**
 - a. Organization: San Francisco County Transportation Authority
 - b. Link: <http://www.sfcta.org/modeling-and-travel-forecasting/cycletracks-iphone-and-android>
 - c. Notes: App designed specifically to track bicycle trips for planning purposes. Requires user interaction, not passive. Developed in San Francisco, has been used and modified by other communities.
- 9. Cycletracks application (later implementation)
 - a. Organization: Puget Sound Regional Council
 - b. Link: <http://www.psrc.org/transportation/bikeped/cycletrack/>
- 10. Bicycle and Pedestrian Reports
 - a. Organization: Florida Department of Transportation, State Safety Office
 - b. Link: <http://www.dot.state.fl.us/safety/4-Reports/Bike-Ped-Reports.shtm>
- 11. **Cell phone geolocation data provider**
 - a. Organization: AirSage
 - b. Link: <http://www.airsage.com/>
 - c. Notes: Generates location data from cell phone signals.
- 12. **Mobility data analytics provider**
 - a. Organization: StreetLight Data
 - b. Link: <http://www.streetlightdata.com/>
 - c. Notes: Working with SSTI on tracking bikes/peds using passively-collected cell phone data.
- 13. **Bicycle and Pedestrian Data Subcommittee**
 - a. Organization: Transportation Research Board
 - b. Link: <https://sites.google.com/site/bikepeddata/home>

- c. Note: Useful group to connect with, but website is not particularly active.
14. *Performance Measures for Bicycle and Pedestrian Safety: Challenges in Monitoring Traffic and Assessing Exposure to Risk*
- a. Organization: University of Minnesota, Roadway Safety Institute
 - b. Link: <http://www.roadwaysafety.umn.edu/events/seminars/2014/092514/>
15. Bicycle and Pedestrian Data Clearinghouse
- a. Organization: Transportation Research Board
 - b. Link: <https://sites.google.com/site/bikepedclearinghouse/home>
 - c. Notes: Appears inactive and not currently maintained.
16. Roadway Safety Data Program
- a. Organization: FHWA Office of Safety
 - b. Link: <http://safety.fhwa.dot.gov/rsdp/>
17. Sustainable Communities Index
- a. Organization: San Francisco Department of Public Health
 - b. Link: <http://www.sustainablecommunitiesindex.org/>
 - c. Notes: Data limited to San Francisco. Set up in 2012 as a model for other communities, but appears inactive.
- 18. Health Economic Assessment Tool (HEAT)**
- a. Organization: WHO/Europe
 - b. Link: <http://www.heatwalkingcycling.org/>
- 19. Guide to Bicycle & Pedestrian Count Programs**
- a. Organization: Portland State University Initiative for Bicycle & Pedestrian Innovation
 - b. Link: <http://www.pdx.edu/ibpi/count>
 - c. Notes: Good basic reference site, appears to be relatively current and maintained. PSU is a national leader in bike/ped research.
- 20. Low-cost sensors and tracking app**
- a. Organization: Knock Software
 - b. Link: <http://bikeportland.org/2015/07/13/ride-portland-mobile-startup-hopes-gather-5000-answers-every-week-145847> and <http://bikeportland.org/2015/01/13/50-device-change-bike-planning-forever-130891>
 - c. Notes: This project is in beta testing as, so the technology is not widely available yet. The sensors are not as small as originally reported.

21. TEMS - The EPOMM Modal Split Tool
 - a. Organization: European Platform on Mobility Management (EPOMM)
 - b. Link: <http://www.epomm.eu/tems/>
 - c. Notes: Tool contains mode share data for hundreds of cities, mostly in Europe, and lets you compare cities. City data includes information on data sources and collection.

22. Travel Monitoring and Traffic Volume
 - a. Organization: FHWA Office of Highway Policy Information
 - b. Link: <http://www.fhwa.dot.gov/policyinformation/travelmonitoring.cfm>
 - c. Notes: Many links and resources, but focus is on motor vehicles.

23. Bicyclist and Pedestrian Count Program
 - a. Organization: MetroPlan Orlando
 - b. Link: <http://www.metroplanorlando.com/plans/bicycle-and-pedestrian-program/bicyclist-and-pedestrian-count-program/>
 - c. Notes: Example of local count program using traditional counts and Strava Metro data.

- 24. National Bicycle and Pedestrian Documentation Project**
 - a. Organization: Alta Planning & Design and the Institute of Transportation Engineers (ITE) Pedestrian and Bicycle Council
 - b. Link: <http://bikepeddocumentation.org/>
 - c. Notes: Focuses on counting and modeling, appears up-to-date and active.

25. Bike Count Data Clearinghouse
 - a. Organization: Southern California Association of Government and Los Angeles County Metropolitan Transportation Authority
 - b. Link: <http://www.bikecounts.luskin.ucla.edu/>
 - c. Notes: Online mapping of count data in the Los Angeles area, may not be currently active.

26. California Active Transportation Safety Information Pages (CATSIP), Counting Pedestrians and Bicyclists
 - a. Organization: University of California, Berkeley Safe Transportation Research and Education Center
 - b. Link: <http://catsip.berkeley.edu/resources/counting-pedestrians-and-bicyclists>
 - c. Notes: Links to regional and national counting resources.

27. Bicycle Counts

- a. Organization: NYC DOT
- b. Link: <http://www.nyc.gov/html/dot/html/bicyclists/bike-counts.shtml>
- c. Notes: Example of seasonal counting in major metro area.

B. Mode Shift

1. *MassDOT Announces Mode Shift Goal To Triple The Share Of Travel In Massachusetts By Bicycling, Transit And Walking*
 - a. Organization: MassDOT
 - b. Link: <http://www.massdot.state.ma.us/main/tabid/1085/ctl/detail/mid/2937/itemid/223/MassDOT-Announces-Mode-Shift-Goal-to-Triple-the-Share-of-Travel-in-Massachusetts-by-Bicycling--Transit-and-Walking.aspx>
 - c. Notes: Official announcement of MassDOT's "triple the share" goal.
2. SUPERHUB: SUsustainable and PERsuasive Human Users moBility in future cities
 - a. Organization: European Commission
 - b. Link: <http://superhub-project.eu/>
 - c. Notes: Project to develop a technological platform to improve multi-modal mobility at the local level, including promoting mode shift. Piloted in three cities.
3. Traffic & Mobility Management Incl. Modal Split
 - a. Organization: BUND, European Environmental Bureau
 - b. Link: <http://sootfreecities.eu/measure/traffic-mobility>
 - c. Notes: Summaries of mode shift efforts in more than 20 major European cities.
4. TRANSPORTATION USE MEASUREMENTS
 - a. Organization: City of Boulder, CO
 - b. Link: <https://bouldercolorado.gov/transportation/transportation-use-measurements>
 - c. Notes: Example of municipality using a variety of measures and tools to track mode share and mode shift.
5. Adoption of statewide goals to reduce annual per capita vehicle miles traveled by 2050
 - a. Organization: Washington State Legislature
 - b. Link: <http://app.leg.wa.gov/rcw/default.aspx?cite=47.01.440>
 - c. Notes: Example of state law requiring mode shift.

6. TRB Health and Transportation Subcommittee
 - a. Organization: Transportation Research Board
 - b. Link: <http://www.trbhealth.org/>

7. **State and Local Mode Shift Policy Database**
 - a. Organization: American Council for an Energy-Efficient Economy
 - b. Link: <http://database.aceee.org/city/mode-shift>
 - c. Notes: Compilation of dozens of mode shift goals and strategies across the US.

8. *SFMTA Board Debates Mode Shift Goal at Workshop*
 - a. Organization: Streetsblog
 - b. Link: <http://sf.streetsblog.org/2010/09/21/sfmta-board-debates-mode-shift-goal-at-workshop/>
 - c. Notes: Interesting account of debate over proposed mode shift goal in San Francisco.

9. **Mode Shift Work Group**
 - a. Organization: MassDOT GreenDOT Advisory Group
 - b. Link: <https://www.massdot.state.ma.us/GreenDOT/AdvisoryGroup/ModeShiftWorkGroup.aspx>
 - c. Notes: Repository of meeting agendas and minutes. Currently the only publicly-available materials on MassDOT's mode shift goal.

V. Representative Mode Shift Goals

This section contains summaries of plans containing mode shift goals reviewed during the literature search. The examples include national, state, regional, and municipal plans. Many of the plans focus on climate change, with transportation and mode shift included in relation to GHG reduction goals. Other plans focus on transportation; some of these are specific to active transportation, bicycling, or walking.

Plans of particular note are highlighted in **bold**.

A breakdown of mode shift goals observed in the reviewed plans is presented in the accompanying chart “Mode Shift Goal Summary By Plan”.

Suggested process for reviewing the mode shift goals:

1. Use chart to identify plans containing goals of interest.
2. Review summaries of those plans below.
3. For more detailed information, review the plans themselves in the Google Docs Resource Library “Plans and Goals” folder.

Many of the plans referenced in this section include goals significantly outside the scope of active transportation and transportation mode shift. For purposes of this project, goals not related to active transportation or mode shift have generally been omitted from the summaries.

TERMINOLOGY NOTE: The use of terms such as “goal”, “objective”, “target”, “action”, and “measure” varies from plan to plan. For simplicity, this document uses “goal” as a catch-all term to capture specific, measurable commitments.

A. U.S. States/Regions (alphabetical order):

California

Type(s): Specific VMT
Specific Other Modes

Source(s): Caltrans 2015-2020 Strategic Management Plan

Goal(s): 2020 trip targets:

1. Triple bicycling (approx. 4.5%)
2. Double walking (approx. 33%)
3. Double transit (approx. 9%)
4. Reduce per capita VMT by 15% from 2010 levels

Measure(s): California Household Travel Survey (2010-2012 baseline)

Process: 15-month process. Caltrans established teams for each of five high-level goals. Teams comprised Caltrans and CalSTA (State Transportation Agency) staff and external stakeholders.

Contact(s): John Bulinski, District 2 Director
Ryan Chamberlain, District 12 Director
Steven Cliff, Assistant Director, Sustainability
Bijan Sartipi, District 4 Director

Massachusetts

Type(s): Specific Other Modes

Source(s): 2012 GreenDOT Implementation Plan

Goal(s): triple mode share of bicycling, transit and walking by 2030

Measure(s): Measure: Person Miles Traveled (PMT)

Process: Goal and PMT metric developed internally by MassDOT. Mode Shift Advisory Group with internal and external stakeholders formed later as part of the GreenDOT implementation process.

Contact(s): Steve Woelfel, MassDOT Director of Strategic Planning
857-368-9800
steve.woelfel@state.ma.us

Metro MPO (Portland, OR and 24 other municipalities)

Type(s): Specific VMT
Specific Driving
Specific Other Modes

Source(s): 2005 Metro 2040 Modal Targets Project
2014 Regional Transportation Plan
2014 Regional Active Transportation Plan

Goal(s): 2040 Regional Non-SOV Modal Targets (from 2005):

1. Central city 60-70% non-SOV
2. Regional centers, town centers, main streets, station communities, corridors 45-55% non-SOV
3. Industrial areas, intermodal facilities, employment areas, inner neighborhoods, outer neighborhoods 40-45% non-SOV

2014 Regional Transportation Plan:

1. By 2040, triple walking, biking and transit mode shares compared to 2010 modeled mode shares
 - a. Increase transit to 13%
 - b. Increase walking to 27%
 - c. Increase biking to 11.1%
2. By 2040, reduce vehicle miles traveled per person by 10 percent

Measure(s): The modal targets were developed by the MPO with input from the regional transportation agencies and public comment, as well as observed travel behavior from 1994-1995 and 2011 surveys.

Process: Municipalities in the Metro region have adopted the 2005 and 2014 regional goals into their local transportation plans. In Oregon, state law requires that local transportation plans be consistent with regional transportation plans, which in turn must be consistent with the state transportation plan. See Appendix document, section 2.2 for background on development of mode shift targets and the relationship between regional and local targets.

Contact(s): Regional transportation planning
503-797-1750
trans@oregonmetro.gov

Washington State

Type(s): Specific VMT

Source(s): 2008 statutory VMT reduction requirement (RCW 47.01.440)

Goal(s):

1. 18% VMT reduction per capita by 2020
2. 30% VMT reduction per capita by 2035
3. 50% VMT per capita by 2050

Measure(s):

Process:

Contact(s): Kristina Walker
Downtown: On the Go! Manager
Tacoma-Pierce County Chamber
253-682-1739
kristinaw@tacomachamber.org

B. U.S. Municipalities (alphabetical order)

Arlington, VA

Type(s): Specific VMT
Specific Driving
Specific Other Modes

Source(s): 2008 Master Transportation Plan

Goal(s):

1. Maintain peak-period vehicle-miles traveled across Arlington's street network within five percent of 2005 levels.
2. Maintain peak-period vehicle trips traveled across Arlington's street network within five percent of 2005 levels.
3. Shift 10 percent of peak-period trips to nonpeak hours by the Year 2020.
4. Increase daily peak-period non-SOV mode share (transit, carpooling, walking, bicycling) by one-half percentage point annually throughout the County for all types of trips for the next 20 years.

Measure(s):

Process:

Contact(s):

Atlanta, GA

Type(s): Specific Other Modes

Source(s): Connect Atlanta Plan (2013 goal updates)

Goal(s): Double bicycle commute to work mode share to 2.2% by 2016

Measure(s):

Process:

Contact(s): Heather Alhadef, AICP
City of Atlanta
Transportation Planning Division
404-330-6800
halhadef@AtlantaGa.Gov

Paul J. Moore, P.E.
Atlanta Transportation Planning Group
404-541-6552
pmoore@glatting.com

Beaverton, OR

Type(s): Specific VMT
Specific Driving
Specific Other Modes

Source(s): 2010 Transportation Element of Comprehensive Plan

Goal(s): adopted 2040 Regional Non-SOV Modal Targets (see Metro MPO)

Bellingham, WA

Type(s): Specific Driving
Specific Other Modes

Source(s): 2006 Bellingham Comprehensive Plan

Goal(s):

1. Reduce auto trips from 87% in 2004 to 84% in 2010, 80% in 2015, and 75% in 2022
2. Increase transit trips from 2% in 2004 to 3% in 2010, 4% in 2015, and 6% in 2022
3. Increase bicycle trips from 3% in 2004 to 4% in 2010, 5% in 2015, and 6% in 2022
4. Increase pedestrian trips from 8% in 2004 to 9% in 2010, 11% in 2015, and 13% in 2022

Measure(s):

Process: Goals developed by Public Works and WTA transportation planners, based on 2004 FTA/Social Data Study.

Contact(s):

Boston, MA

Type(s): Specific VMT
Specific Driving

Source(s): Climate Action Plan (2014 update)

Goal(s): 5.5% below 2005 (2010 referenced in some places) VMT by 2020, estimate shift 4% of SOV drivers to other modes

Measure(s):

Process:

Contact(s): Greenovate Boston

Boulder, CO

Type(s): Aspirational Shift
Specific VMT
Specific Driving
Specific Other Modes

Source(s): 2008 Transportation Master Plan
2014 Transportation Master Plan

Goal(s): 2008 Transportation Master Plan: (2025 targets)

1. Reduce SOV trips to 25% of all trips
2. Prioritize pedestrian trips and increase transportation alternatives
(2014 TMP update has this specific breakdown for 2008 TMP, but these numbers are not in the 2008 TMP)
 - Pedestrian trips 24%
 - Bicycle trips 15%
 - Transit trips 7%
 - SOV trips 25%

- MOV trips 29%
3. Additional 92 miles of bicycle lanes, routes, and shoulders will be added
 4. (Unspecified) enhanced crossings, overpasses and underpasses will be added to the bicycle network
 5. 55 new underpasses, 60 enhanced pedestrian crossings and an additional nine (9) miles of new pedestrian facilities will be added (not including multi-use paths included in bicycle facilities)

2014 Transportation Master Plan: (2035 targets resident/non-resident)

1. Reduce VMT by 20%
2. Reduce SOV trips to 20% of all trips for residents and to 60% of work trips for non-residents
3. Pedestrian trips 25%/0%
4. Bicycle trips 30%/2%
5. Transit trips 10%/12%
6. SOV trips 20%/60%
7. MOV trips 15%/26%

Measure(s): Bi- or tri-annual Travel Diary Survey, Boulder Valley Employee Survey. See 2012 Modal Shift in Boulder Valley report, which analyzed historical modal split and modal shift from 1990-2012 (previously done 1990-2009).

Process:

Contact(s):

Burlington, VT

Type(s): Specific VMT

Source(s): Climate Action Plan (2014 update)

Goal(s): reduce community-wide VMT by 10% per capita by 2025

Measure(s):

Process:

Contact(s):

Chicago, IL

Type(s): Specific Other Modes

Source(s): Chicago Forward CDOT Action Agenda: 2012-2014

Goal(s): Increase the share of all trips under five miles made by cycling to at least 5%

Measure(s):

Process:

Contact(s):

Denver, CO

Type(s): Specific Driving

Source(s): 2020 Sustainability Goals

Goal(s): reduce SOV trips to no more than 60% of all commuting trips by increasing biking, walking and transit trips

Measure(s):

Process:

Contact(s):

Falls Church, VA

TDM policy calls for mode shift goals in development proposals

Fort Worth, TX

Type(s): Specific Other Modes

Source(s): 2009 Bike Fort Worth Plan

2014 Walk Fort Worth Plan

Goal(s):

1. 2009 Bike Fort Worth Plan:
 - a. Increase bicycle mode share from 0.2% in 2007 to 0.6% by 2020
 - b. Decrease the level of bicyclist related crashes by 10% ☐
2. 2014 Walk Fort Worth Plan:
 - a. Increase pedestrian mode share from 1.2% in 2012 to 3.2% by 2025
 - b. Decrease pedestrian fatality rate by 15 percent from 2012 levels by 2025
 - c. Increase adults meeting the recommendations for physical activity from 47.4 percent to 60 percent and decrease obesity from 19 percent in 2009 to 9% in children ages 2-14 by 2025

Measure(s): Counts from 5-year ACS estimates, TxDOT Crash Records Information System, BRFSS. Bike plan also recommends implementing following measures:

- Establish baseline bicycle counts; ☐
- Track mileage of constructed facilities; ☐
- Calculate the percentage of residents who have convenient access to ☐existing bikeways each year; ☐
- Track the number of bike racks or storage spaces added each year by the ☐City and, if known, by the private sector; ☐
- Track bike rack usage on buses and the number of bikes on board ☐commuter trains; ☐
- Identify unsafe areas and potential solutions to reduce bicycle related ☐crashes; and ☐
- Conduct public opinion surveys relating to the effectiveness of the bicycle ☐program. ☐

Process: Public website, public survey, bicycle and walking technical committees, multiple public workshops and meetings, presentations on-request, data collection by city staff

Contact(s): Julia Ryan
Senior Planner
817-392-2593
julia.ryan@fortworthgov.org

Gresham, OR

Type(s): Specific VMT
Specific Driving
Specific Other Modes
Source(s): 2013 Transportation System Plan
Goal(s): adopted regional MPO non-SOV and modal share targets (see Metro MPO)
Contact(s): Kelly Clarke, Senior Transportation Planner
503-618-2517
Kelly.Clarke@GreshamOregon.gov

Jacksonville, FL

Type(s): Specific VMT
Source(s): 2030 Mobility Plan (2011)
Goal(s): reduce per capita VMT by 10% by 2030
Measure(s):
Process:
Contact(s):

Kansas City, MO

Type(s): Specific VMT
Specific Other Modes
Source(s): 2013 Climate Protection Plan
Goal(s):
1. reduce citywide VMTs 20% below 2000 levels by 2020 and 30% below 2000 levels by 2030
2. increase bicycling from 0.4% of all trips to 5.4% of all trips (by when?)
3. increase walking from 3.9% of all trips to 8.9% of all trips (by when?)
4. 1% of all transportation infrastructure expenditures for bicycling
5. 2% of all transportation infrastructure expenditures for walking
Measure(s):
Process: Steering Committee, subject-matter Work Groups, Chamber of Commerce Energy Policy Task Force, city staff, outside facilitators and city environmental management commission met from October 2006 to May 2008. Meetings were open to the public, but no specific public meetings were mentioned.
Contact(s): Dennis Murphey
Chief Environmental Officer
City of Kansas City, Missouri

816-513-3459
dennis_murphey@kcmo.org

Louisville, KY

Type(s): Specific VMT
Specific Other Modes
Source(s): 2013 Sustainability Plan
Goal(s):

1. Reduce vehicle miles traveled by 20% by 2025
2. Increase transit ridership by 25% by 2025
3. Increase bicycle ridership by 100% from 2012 levels by 2025
4. Increase bicycle facilities by 40 lane miles within 3 miles of CBD

Measure(s):
Process:
Contact(s): Sustainability
502-574-4140

Minneapolis, MN

Type(s): Aspirational Shift
Aspirational VMT
Specific Driving
Specific Other Modes

2012 Sustainability Indicators:

1. Reduce SOV commuters to 61% by 2015
2. Increase bicycle mode share of 7% by 2014
3. Increase cyclists in annual counts by 60% over 2008 levels by 2014

2013 Climate Action Plan:

1. Reduce VMT
2. Double regional transit ridership by 2030
3. Increase bicycle mode share of 7% by 2014 and 15% by 2025
4. Increase cyclists in annual counts by 60% over 2008 levels by 2014
5. Increase walking as a percentage of trips

Measure: annual counts

New York, NY

Type(s): Specific Other Modes
Other Specific Goals
Source(s): 2008 NYCDOT Sustainable Streets Strategic Plan
Goal(s):

1. Double number of bicycle commuters by 2015 from 2007 level and triple by 2020
2. Double the number of Leading Pedestrian Intervals (over 2007 levels) at intersections by 2014 and add 9 seconds of crossing time to existing LPIs citywide
3. Install 200 new bicycle lane-miles 2007-2009

4. Install 15 additional miles of protected on-street bike lanes by 2010 and 30 miles from 2011–2015
5. Install 37 bicycle parking shelters and 5,000 CityRack bike parking racks by 2011

Measure(s): annual counts

Process:

Contact(s):

Park City, UT

Type(s): Specific VMT

Source(s): 2010 Save Our Snow Action Plan

Goal(s): 2% VMT reduction by 2020

Measure(s):

Process:

Contact(s):

Philadelphia, PA

Type(s): Specific VMT

Source(s): 2009 Greenworks Plan

Goal(s): reduce VMT 10% by 2015

Measure(s):

Process:

Contact(s):

Portland, OR

Type(s): Specific VMT
Specific Driving
Specific Other Modes

Source(s): 2009 Climate Action Plan
2015 Climate Action Plan (draft)

Goal(s):

2009 Climate Action Plan:

1. Create vibrant neighborhoods where 90% of Portland residents and 80% of Multnomah County residents can easily walk or bicycle to meet all basic daily, non-work needs and have safe pedestrian or bicycle access to transit
2. reduce per-capita daily VMT by 30% from 2008 levels by 2030
3. reduce SOV commute mode share to 30% by 2030
4. increase bicycle commute mode share to 25% by 2030
5. increase pedestrian commute mode share to 7.5% by 2030
6. increase transit commute mode share to 25% by 2030
7. increase carpool commute mode share to 10% by 2030
8. increase telecommuting mode share to 2.5% by 2030
9. build 15 miles of bicycle boulevards before 2010
10. construct 2 miles of sidewalks on arterial roadways before 2012

11. Expand Safe Routes to School to serve all Portland schools before 2012

2015 Climate Action Plan (draft):

1. Create vibrant neighborhoods where 80% of Portland and Multnomah County residents can easily walk or bicycle to meet all basic daily, non-work needs and have safe pedestrian or bicycle access to transit
2. reduce per-capita daily VMT by 30% from 2008 levels by 2030
3. reduce SOV commute mode share to 20% by 2030
4. increase bicycle commute mode share to 25% by 2030
5. increase pedestrian commute mode share to 10% by 2030
6. increase transit commute mode share to 25% by 2030
7. increase carpool commute mode share to 10% by 2030
8. increase telecommuting mode share to 10% by 2030

Measure(s): ACS

Process: Climate Action Plan Steering Committee, various city and county agencies and staff, public comments, and multiple town hall meetings.

Contact(s): Bureau of Planning and Sustainability

Riverside, CA

Type(s): Specific VMT

Source(s): Green Action Plan

Goal(s): decrease VMT 15% by 2015 based on the 2009 baseline

Salt Lake City, UT

Type(s): Specific VMT

Source(s): Sustainable Salt Lake Plan

Goal(s): reduce VMT 6.5% by 2015 from 2009 baseline

San Antonio, TX

Type(s): Specific VMT
Specific Other Modes
Other Specific Goals

Source(s): SA2020 Plan (unofficial)

Goal(s):

1. reduce daily per capita VMT to 18.7 by 2020 from 20.8 in 2010
2. increase WalkScore to 53 by 2020 from 44 in 2010
3. 6465 miles of Complete Streets by 2020 from 2155 in 2010
4. increase public transit boardings to 126M by 2020 from 42M in 2010

Measure(s): VMT, WalkScore, boardings

San Francisco, CA

Type(s): Specific Other Modes

Source(s): SFMTA 2013-2018 Strategic Plan
SFMTA 2013-2018 Bicycle Strategy

Goal(s): Strategic Plan:

1. 50% private auto
2. 50% sustainable modes by 2018 (11% shift from private auto to sustainable modes)

Bicycle Strategy:

1. 50% private auto from 61% in 2010 (18% reduction)
2. 19-21% transit from 17% in 2010 (18% increase)
3. 8-10% bicycle from 3.5% in 2010 (157% increase)
4. 19-21% walking from 17.5% in 2010 (14% increase)
5. 1% vehicle sharing from <1% in 2010 (25% increase)

San Jose, CA

Type(s): Specific VMT
 Specific Driving
 Specific Other Modes
 Source(s): 2011 Envision 2040 General Plan
 Goal(s):

1. Commute mode share targets (2008 baseline)
 - a. SOV 40% (77.8%)
 - b. Carpool 10% (9.2%)
 - c. Transit 20% (4.1%)
 - d. Bicycle 15% (1.2%)
 - e. Walk 15% (1.8%)
 - f. Other (including telecommute) not included (5.8% in 2008)
2. Reduce VMT by 40% (2009 baseline)

Measure(s): annual counts, 5-year ACS

Process:

Contact(s): Planning Division
 408-535-3555

Seattle, WA

Type(s): Specific VMT
 Source(s): 2011 City Council Resolution 31312
 Goal(s): 14% reduction in VMT by 2020 and a 20% reduction in VMT by 2030 from 2008 levels

Measure(s):

Process:

Contact(s):

Tacoma, WA

Type(s): Specific Driving
 Specific Other Modes
 Source(s): 2008-2015 ARRA project
 2010 Mobility Master Plan
 Goal(s): ARRA project: 11% reduction in SOV trips by 2015
 Mobility Master Plan: 5% active transportation mode split by 2015

Washington, DC

Type(s): Specific Driving
Specific Other Modes

2010 DDOT Action Agenda:

1. Increase bicycle mode share from 2.3% in 2009 to 5% in 2012
2. Increase walk mode share from 12% in 2009 to 14% in 2012

2012 Sustainable DC Plan:

1. Increase transit to 50% of commute trips by 2032
2. Increase biking and walking to 25% of commute trips by 2032
3. Reduce car or taxi to 25% of commute trips by 2032

Wilsonville, OR

Type(s): Specific VMT
Specific Other Modes

Source(s): 2013 Transportation Systems Plan

Goal(s):

1. Reduce VMT/capita by 10% by 2035 compared to 2005
2. Triple walking, biking and transit mode share from 2005 to 2035

Measure(s): MPO mode split forecasts, “qualitative assessments”, regional transit data, VMT from travel demand model

C. International (alphabetical order)

Copenhagen (Denmark)

Type(s): Specific Other Modes

Source(s): 2007 "Eco-metropolis – Our Vision for Copenhagen 2015"

Goal(s):

1. In Copenhagen at least 50% of people will go to their workplace or educational institution by bike (from 36%)
2. The number of seriously injured cyclists will drop by more than half compared to today (from 118)
3. At least 80% of Copenhagen cyclists will feel safe and secure in traffic (from 58%)
4. 90% of Copenhageners should be able to walk to a park, a beach, a natural area or sea swimming-pool in less than 15 minutes (from 60%)

Measure(s):

Process:

Contact(s): City of Copenhagen

Technical and Environmental Administration

+45 3366 3500

tmf@tmf.kk.dk

Ireland

Type(s): Specific Driving

Specific Other Modes

National Cycle Policy Framework: 10% of commute trips by bike by 2020

SmarterTravel – A Sustainable Transport Future: 2009-2020

1. Work-related commuting by car will be reduced from a current modal share of 65% to 45% by 2020
2. Car drivers will be accommodated on other modes such as walking, cycling, public transport and car sharing (to the extent that commuting by these modes will rise to 55% by 2020) or through other measures such as e-working
 - a. Transit 30%
 - b. Biking and walking 25%

London (England)

Type(s): Specific Driving

Specific Other Modes

Source(s): 2010 Mayor's Transport Strategy

Goal(s): 2031 trip targets:

1. Private motorized transport 37%
2. Public transport 34%
3. Walking 25%
4. Cycling 5%

Local Implementation Plans for each borough of London fine-tune local targets

Measure(s): London Travel Demand Survey, continuous automated cycle counters (proposed), bikes parked in racks counted via existing CCTV

Ottawa, ON (Canada)

Type(s): Specific Driving
Specific Other Modes

Source(s): 2008 Transportation Master Plan
2013 Transportation Master Plan

Goal(s):
2008 Transportation Master Plan: 2031 trip targets

1. Motorized 87%
 - a. Automobile 70%
 - b. Transit 30%

2. Walking 10%
3. Cycling 3%

2013 Transportation Master Plan: 2031 trip targets

1. Automobile Driver 50%
2. Automobile Passenger 9%
3. Transit 26%
4. Walking 10%
5. Cycling 5% (including 8% in one area)

2013 model projects increase in VKT (Vehicle Kilometers Traveled) in 2031 due to population growth

Measure(s):

Process:

Contact(s):

Vancouver, BC (Canada)

Type(s): Aspirational Shift
Specific Other Modes

Source(s): 2011 Metro 2040 Plan
2012 Transportation 2040 Plan

Goal(s):
2011 Metro 2040 Goal 5: Support sustainable transportation choices

1. Strategy 5.1: Coordinate Land Use And Transportation To Encourage Transit, Multiple-Occupancy Vehicles, Cycling And Walking
2. 2040 Intent: To achieve a greater share of trips by transit, multiple- occupant vehicles, cycling, and walking

2012 Transportation 2040 Plan:

1. By 2040, at least two-thirds of all trips will be made on foot, bike, or transit. The total number of trips by sustainable modes will grow significantly, while motor vehicle volumes will slightly decline.
2. 50% of trips by sustainable modes by 2020

Measure(s): Baseline established by 2011 Metro Vancouver Regional Trip Diary Survey, no data since then.

Process: The mode share target was developed using TransLink's regional transportation model as well as a robust trend analysis. The regional model considered a range of factors, including forecasted population and employment growth, shifting demographics, changing transportation costs, and planned regional road and transit projects. The trend analysis provided a more refined understanding of recent changes in travel behaviour and active transportation trips. It looked at a number of data sources including pedestrian, cyclist, and motor vehicle volumes at various locations, growing transit passenger volumes as services have been added, and census and TransLink trip diary surveys.

Contact(s):

VI. Next Steps

Recommended Further Research:

1. Fully identify inputs and outputs for each measurement tool/model
2. Follow-up directly with researchers for most interesting models and tools
3. Learn more about goal-setting process by contacting local officials directly
4. Request additional information on PMT model from MassDOT
5. Engage with Cambridge Systematics, which has significant expertise in the field of modeling non-motorized transportation
6. Secondary literature review of source materials cited in Measurement Tools references
7. For representative mode shift goals, identify community types according to MAPC community type classification system
8. From the list of types of mode shift goals, identify goals for which data is most readily available or easily collected in target communities in Massachusetts.

Recommended Testing:

1. Selected methods for directly or indirectly measuring mode share
2. Selected models for predicting mode share or mode shift