

**CITY OF BOULDER
TRANSPORTATION ADVISORY BOARD
AGENDA ITEM**

MEETING DATE: Oct. 10, 2016

AGENDA TITLE: Public hearing and TAB recommendation on the Mobility Section of the *Climate Commitment* strategy document for consideration by City Council

PRESENTERS: Michael Gardner-Sweeney, Director of Public Works for
Transportation
David Driskell, Executive Director, Planning, Housing, and
Sustainability
Brett KenCairn, Senior Environmental Manager
Kathleen Bracke, GO Boulder Manager
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I. EXECUTIVE SUMMARY

This item provides the Transportation Advisory Board (TAB) with the Mobility section of the *Climate Commitment* strategy document for review and recommendation to City Council. Transportation is one of the three target categories under the Energy Action Area of the *Climate Commitment* strategy document. As part of the *2014 Transportation Master Plan* (TMP) update, staff and consultants conducted extensive analysis of the transportation sector related greenhouse gas (GhG) emissions and evaluated strategies for achieving deep greenhouse gas emissions in transportation over the next twenty years. This effort resulted in new measurable objectives for the TMP and informed the Mobility Section of the *Climate Commitment* strategy document. The primary goal of the *Climate Commitment* is to develop strategies capable of achieving a minimum 80% reduction in GhG emissions below 2005 levels by 2050.

As part of the TMP process, vehicle miles travelled (VMT), VMT per capita and single occupant vehicle (SOV) mode share targets were updated in coordination with the city's new GhG goal. These targets are reflected in the Mobility Section of the *Climate Commitment* strategy document. During this process, it was also recognized that fundamental system change was needed such as transportation energy source change strategies, and that additional innovations were needed to meet the 80 percent reduction goal in the transportation sector.

The full [Climate Commitment strategy document](#) is available on the city's website.

TAB Action Requested

Review of the Mobility Section of the draft *Climate Commitment* strategy document with a recommendation to City Council. As this is a draft document, the opportunity remains for modifications to the document as it moves to the other boards and council over the remainder of 2016.

II. BACKGROUND

Brief History of Boulder's Climate Efforts

The City of Boulder was one of the first communities in the US to formally recognize climate change and to adopt a climate action plan. City Council adopted Resolution 902, A Policy To Take Cost-Effective Actions That Benefit The Community By Reducing Local Greenhouse Gas Emissions in 2002 and then approved the city's first *Climate Action Plan (CAP)* in June 2006. The *CAP* outlined baseline information, including the first emissions inventory and established the context for programs and priorities with 2012 emission reduction goals. Those strategies were to increase energy efficiency (i.e. reduce energy use), shift to renewable energy sources, and reduce vehicle miles traveled. As a result of CAP-funded programs, Boulder avoided more than 50,000 metric tons of emissions between 2007 and 2015 keeping community emissions fairly constant despite growth in population, jobs and economic activity. The 2006 *CAP* recognized the *1996 TMP* and its primary objective of returning vehicle traffic to 1994 levels.

In 2007, Boulder was the first municipality in the nation to tax energy as a method to fund GhG emissions reduction strategies. This tax was reauthorized in 2015 for five years. Since 2010, the *CAP* tax has directed over \$3.5 million to support energy efficiency and renewable energy efforts, leveraging over \$17 million in additional private sector investments. These investments contribute to both emissions reduction and long-term energy and financial savings for local residents and businesses.

III. ANALYSIS AND ISSUES

National Efforts

The reality of climate change is widely accepted by the scientific community and are now increasingly evidenced by the effects of ongoing warming. Recent events exacerbated by climate change include larger and more intense wildfire, glacial and ice melting across most parts of the globe, more intense storm events with record rainfall in many areas, and record global temperatures. The combustion of coal, gas and petroleum is the largest contributor to the warming of the earth's atmosphere. If left unchecked, these emissions are projected to raise local temperatures on average between 2-6 deg F.¹ At the upper end of this range, Boulder's average climate conditions would be similar to those currently found in Albuquerque, NM. A recent Rocky Mountain Climate Organization synthesis of climate analysis indicates that local seasonal extremes could result in a tripling of summer days over 95 degrees F by mid-century—from the current average of 11 to over 30. By end of century, much of the summer

¹ From the Western Water Assessments "Colorado Climate Change Report" 2014.

would average over 95 degrees F with many of these days in excess of 100.² Scientists generally agree that an increase in global temperatures above 2 degrees C (4 degrees F) will significantly impact and disrupt natural and human social systems. To prevent this, dramatic near-term reductions in greenhouse gas emissions are needed, with the internationally recognized goal of at least an 80 percent reduction in GhG emissions by 2050.

Boulder is hardly the only community addressing climate change through GhG reduction efforts. At the time of the 2014 TMP, more than 20 US cities had adopted climate action plans. Numerous national and international groups are also working on the issue, with ICLEI being the leading global network of more than 1,500 cities, towns and regions committed to building a sustainable future. The ICLEI Network aims to help cities become sustainable, low-carbon, and resource-efficient. The Federal Highways Administration (FHWA) is currently considering whether to adopt a greenhouse gas (GHG) performance measure and the State of Colorado has a climate action plan. Within the US, the state of California is the leader in addressing climate change, having passed legislation mandating GhG reduction and tying land use and transportation decisions to achieving this goal.

Policy Alignment with TMP

The Energy action area of the *Climate Commitment* strategy document represents activities producing close to 90 percent of GhG emissions in Boulder. These action areas include: High Performance Buildings; Clean Mobility; and Clean Energy Sources. Boulder's ground transportation system produces about 21 percent of GhG emissions. The GhG analysis conducted in the TMP process produced an extensive analysis of transportation related emissions and options for achieving an 80 percent reduction or more by 2050. This analysis included four major elements:

1. A thorough analysis of Boulder's transportation GhG emissions by seven categories.
2. Analysis of GhG reduction potential of existing and anticipated TMP related programs and initiatives.
3. Analysis of the remaining GhG emissions reductions necessary to achieve an 80% reduction goal by 2050 objective.
4. A comprehensive assessment of the GhG reduction potential of alternative fuels in the public transit program.

Based on this analysis, the TMP established new VMT, VMT per capita, and SOV mode share objectives for 2035 to help achieve a portion of the GhG emissions reductions needed in transportation. The revised and new measurable objectives for the TMP were discussed in the [Jan. 13, 2014](#) and [May 12, 2014](#) Board memos.

The next stage of the city's transportation emissions reduction effort was to formulate clear objectives, metrics, targets and associated strategies to achieve emissions reduction associated with the energy sources utilized in travel. The TMP GhG analysis forms the basis of the Mobility Section of the *Climate Commitment* strategy document. An update on these efforts was provided to the TAB on [Oct. 13, 2014](#). Transportation and Climate Commitment staff have

² "Future Climate Extremes in Boulder County". Rocky Mountain Climate Organization, 2016

continued working together to develop and refine the Mobility Section of the *Climate Commitment* strategy document to reflect the continued development of clean mobility strategies and programs within the city. The preparation of the *2014 TMP*, Mobility section and on-going development of city and community actions for GhG reduction is an iterative process with each step building on the former.

Mobility Sector Strategies

The mobility section of the *Climate Commitment* outlines three broad focus areas of action to achieve emissions reduction while also delivering a range of other community co-benefits. These action areas include:

Reduction—This broad area of action encompasses the diversity of programs and initiatives designed to reduce the need for fossil-fuel-based transportation, particularly the use of single occupant vehicle (SOV) trips. Actions in this area include:

- Expanding access and affordability of public transit
- Expanding ride share and other approaches which decrease SOV trips
- Enhancing non-vehicle mobility options such as biking and walking
- Expanding the use of tele-work and other approaches which reduce the need for vehicle trips
- Managing parking to incentivize utilization of personal vehicle mobility options

Replacement—Actions in this area focus on replacing fossil-fuel based vehicles with electric vehicles and other low/now-emission vehicle and fuel options. These actions include:

- Insuring accessibility of electric vehicle charging in both public and private settings
- Development of employee commuting strategies that maximize SOV alternatives or EV utilization where good public transportation options are limited
- Development of low-emission public transit options such as electric or other non-fossil fuel bus/transit options.

Redesign—Actions in this area recognize the significant role that land use and urban design play in supporting low-emission mobility options. Actions in this area include:

- Parking management
- Complete streets
- Mixed use neighborhoods that enable access to a wide variety of services within a 15 min walking radius

Mobility Sector Targets

The *2014 TMP* contains mode shift targets developed to support achieving the measurable objectives of the plan. These targets were developed through the planning process based on the anticipated investments and programs of the plan, and given the trends and experience of the city in mode shift since 1989. The major new modal target added in 2014 is the reduction in single occupant vehicle (SOV) for non resident employees. This target reflects the GhG analysis conducted for the TMP and the recognition that the city's GhG inventory needs to include half of the full non resident commute trip to comply with existing standards. As the non resident

employee mode share has remained relatively constant since 1991 while the resident SOV mode share has shown continued progress, affecting the mode share of the regional trip is a major challenge.

The mode share targets contained in the Mobility section of the *Climate Commitment* strategy document reflect the 2014 TMP were prepared by Transportation staff. The 2035 targets come from the 2014 TMP while the 2050 modal targets represent a straight line extrapolation of the rate of change in each mode between 2015 and 2035. Additional discussions since the *Climate Commitment* strategy document lead Transportation staff to suggest including the more complete mode share targets table below. This table includes all the modes for Boulder residents and the multiple occupant vehicle (MOV) targets for non resident employees. It also reflects the results of the 2015 Modal Shift Report, which was not available until early 2016. Differences in mode share resulting from the 2015 Modal Shift Report are small and not statistically significant.

Clean Mobility Metrics and Targets					Targets		
Population	Sector	Metric	Current	Source	2020	2035	2050
	Resident VMT/day	vehicle miles/resident/day	12.8	2015 Travel Diary	10	7	4
	SOV mode share	residents all trips	36%	2015 Travel Diary	32%	20%	8%
	Transit mode share	residents all trips	4%	2015 Travel Diary	6%	10%	15%
Boulder Residents	Bicycle mode share	residents all trips	20%	2015 Travel Diary	23%	30%	38%
	Walking mode share	residents all trips	18%	2015 Travel Diary	20%	25%	30%
	Multiple occupant vehicle mode share	residents all trips	22%	2015 Travel Diary	20%	15%	9%
	Electric & Alternative Vehicles	percent owned	<1%	2015 Travel Diary	15%	NC	75%
Non-Resident Employees	Non-Resident Employee VMT/day	work trip vehicle miles/non-res/day	31	2014 BVES	29	23	17
	SOV mode share	non-resident employee work trips	80%	2014 BVES	75%	60%	45%
	Transit mode share	non-resident employee work trips	8%	2014 BVES	9%	12%	15%
What does that mean to you?							
As a resident	SOV Trips per Week	resident all trips	13	2015 Travel Diary	12	8	3
AS a non-resident employee	SOV trips per Week	non-resident employee work trips	8	2014 BVES	7.5	6	4.5

While the mode share targets provide a way to measure progress and result from the planning process, the primary focus remains the reduction of SOV trips, both for residents and non residents. Reducing non resident SOV trips is particularly critical for GhG reduction given the long distance nature of these trips. Over the next twenty years there a likely to be significant changes in the transportation sector including the rapidly changing shared mobility area. These targets may need to be adjusted to reflect these changes but any change that resduces SOV travel and the level of GhG emissions per person mile of travel will contribute to the goals of the *Climate Commitment* and 2014 TMP.

IV. PUBLIC PROCESS

The *Climate Commitment* strategy document had an extensive public process, including over 30 presentations directly reaching over 1,000 people. Staff and partner organizations also administered an on-line and in-person survey taken by over 600 respondents. Over 95% of respondents believe climate change is happening and over 90% reported taking actions to address it. Reducing motor vehicle use was among the top three actions reported, with 77% indicating they were taking actions in this area. Transportation related actions were also ranked as the third highest priority for community action behind installing more renewable energy (#1) and reducing energy use through behavior changes (#2). Land use changes to reduce transportation use were also ranked in the top three priorities for city action among respondents. Respondants were also asked what measures would indicate success towards meeting the community's climate goals. Five of the top 12 metrics were transportation related including:

- Reduced vehicle miles travelled throughout the community;(7th)
- Increased affordable housing to reduce in-commuting (8th)
- Increased number of buses and better access to public transit;(10th)
- Reduced yearly mileage on my car (11th)
- More dedicated walk and bike lanes (12th)

The proposed draft will also be reviewed by numerous city boards prior to council acceptance.

V. BOARD ACTION REQUESTED

The Board is asked to provide comments and suggestions on the draft Mobility section of the *Climate Commitment* Strategy document and a recommendation for consideration to City Council.

VI. NEXT STEPS

Approval of the *Climate Commitment* strategy will formalize the beginning of a next stage of community efforts already well-underway to develop new approaches to energy systems, resource use and conservation, and ecosystem stewardship that both enhance community well-being and support stabilization of the local, regional and global climate. City staff are working in close collaboration with a wide variety of different organizations within and outside the community to jointly broaden support and participation in existing programs and initiatives and stimulate new innovative approaches and solutions. Among the next steps already in development are the following.

Boulder Energy Challenge—The city has reserved approx. \$300,000 in CAP funds for a second round of the Boulder Energy Challenge, an open solicitation to the Boulder community to bring forward new approaches to energy system transition and emissions reduction. The 2014 Energy Challenge funded 6 projects, two of them working directly on transportation related emissions reduction—a mobility advising program developed by eGO carshare, and a regenerative braking system developed by Lightning Hybrids. The next round of the Energy Challenge is scheduled to launch in late 2016 with proposals due at the end of January 2017.

Community Action Campaign—In collaboration with a broad range of community partners including CU, non-profit organizations, local business and resident organizations, the

city will help coordinate the development of a community-led energy transition initiative focused on actions designed to make significant progress in the expansion of local solar generation, non-fossil-fuel mobility options, and natural gas appliance replacement. This initiative will launch in early 2017.

Electric Vehicle Strategy—The city and County will continue to work closely to develop a coordinated electric vehicle adoption initiative that builds on recent collaborative efforts to expand EV charging and promote EV purchases. A multi-department team at the city will develop a draft of its EV and alternative vehicle fuel strategy by the end of 2017.

ATTACHMENTS

- A.** Mobility Section of the *Climate Commitment* strategy



CLEAN MOBILITY

By 2050, people and goods will travel around Boulder generating little or no carbon emissions.

This will include walking and biking as well as shared transportation like transit, car share, and van pools. The personal and work vehicles that remain will use clean energy sources such as renewably produced electricity and alternative fuels such as hydrogen or fuel cells.

How We Move Today

Boulder has over 63,000 vehicles registered to residents. Tens of thousands of additional vehicles enter and depart from Boulder every day carrying employees, students, goods, and visitors. While Boulder has one of the highest per capita percentages of hybrid and EV ownership, we also have one of the highest per capita proportions of SUVs, bringing Boulder’s average fuel efficiency to 21.4 MPG, a little higher than the state average. Together, this ground transportation accounts for 21 percent of the city’s recorded emissions. An additional 11 percent is added for Boulder’s share of the regional air travel out of Denver International Airport.

Targets & Timeframe

SECTOR	METRIC	2020	2035 ¹	2050 ²
Passenger	miles/resident/day	10	7	4
SOV mode share	residents all trips	32%	20%	8%
SOV mode share	non-resident work trips	75%	60%	45%
Transit mode share	residents all trips	6%	10%	14%
Bicycle mode share	residents all trips	22%	30%	38%
Electric & Alternative Vehicles	percent owned	15%	not calculated	75%

Transportation Share of Emissions

Buildings

The proportion of total emissions from buildings and their related energy sources are discussed in the section on “High Performance Buildings.”



¹Transportation Master Plan (TMP) Adopted Objectives set long-term goals using a 2035 timeframe.

²Projected levels based on simple linear extrapolation of TMP objectives out to 2050. Continued reductions between 2035-2050 will require additional investment, innovations and community land use changes beyond those in the TMP. Targets will continue to be refined over time.

A Boulder Success Story: Holding the Line on Vehicle Miles Traveled

In 1996, Boulder's Transportation Master Plan (TMP) established a goal of holding VMT steady to 1994 levels. Now 20 years later, while most other communities on the Front Range have seen vehicle miles traveled increase by 113 percent, Boulder has been able to keep its VMT from growing, despite growth in population and employment.

To help meet the new 2050 GHG reduction goals, the 2014 TMP Update established a goal to reduce vehicle miles traveled (VMT) by 20 percent by 2035. Together, the VMT reduction programs and strategies outlined in the TMP are projected to achieve close to a quarter of the transportation emissions reduction goal by 2050.

The Many Benefits of a Low Carbon Transportation System

A low emissions transportation system has many community benefits in addition to helping reduce climate change. Boulder's 20-year success in managing vehicles miles traveled has avoided an estimated 1.9 million additional daily vehicle miles of travel around the Boulder Valley.

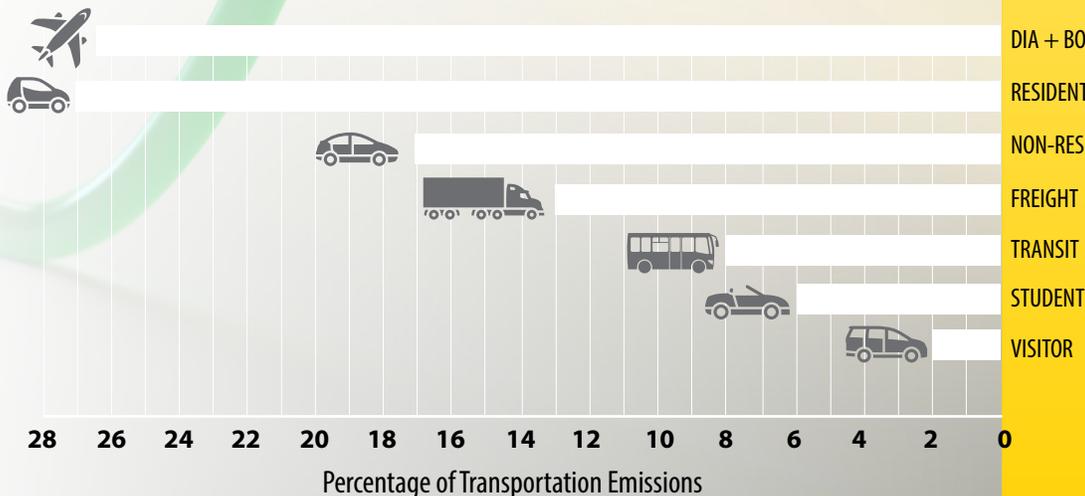
This has kept a significant amount of pollutants out of the air, even as VMT and related emissions have nearly doubled in the Denver metro region. The city has also enhanced pedestrian, bike and transit systems providing transportation options to all members of the community, saving transportation costs and supporting forms of mobility that improve our health. The city's support of RTD's Eco Pass program has had significant impact on travel behavior and GHG emissions as residents with Eco Passes emit 45 percent less transportation related GHGs than residents without access to the annual unlimited use transit pass. The city also continues to integrate more diverse and connected neighborhoods. This, combined with the city's goal to make all areas accessible by walking and biking, minimizes the miles we have to travel by vehicle and the distance we have to travel when we do use our cars.



16%
**REDUCTION
IN OVERALL
EMISSIONS
BY 2050**

DID YOU KNOW?
Approximately 70,000 Boulder residents and employees have access to an Eco Pass; RTD's discounted unlimited ride annual transit pass.

2012 Transportation Emissions By Travel Type





2015-2020 City Action Priorities

Similar to the actions described for the building and related energy use sectors, there are three broad areas of action within which the city has initiated programs.

R E D U C E

Create multiple mobility options

- Expand access to transit including implementation of a community-wide EcoPass and expansion of Bus Rapid Transit routes.
- Expand ride share programs by adding additional incentives and support for expanded carpool/vanpool.
- Enhance bike and pedestrian travel options through creating protected bike lanes on key travel corridors and improved pedestrian efficiency through mobile route mapping.

Use digital technology to maximize our transportation efficiency

- Pilot and promote telework and other no-travel work options.
- Create enhanced mobility tools through development of new mobile applications for trip planning.

Create incentives to explore new mobility options

- Use parking management to encourage other travel options by creating financial incentives that reward commuters who don't require daytime parking.

R E P L A C E

Support the adoption of electric vehicles and other non-fossil fuel mobility options for personal vehicles

- Collaboratively expand regional electric vehicle (EV) charging infrastructure.
- Implement electrification of city vehicle fleet.
- Co-organize Workplace Charging Challenge with other leading employers.
- Develop employee EV commuting pilot project.

Catalyze the development of non-fossil fuel transit systems

- Promote electrification/clean fuel options for the Regional Transportation District (RTD) transit fleet.
- Pilot clean energy transit on select local routes, especially the city's "HOP" route.

R E D E S I G N

Develop parking management systems that stimulate adoption of high efficiency mobility options

- Encourage parking management systems using the city's "SUMP" (Shared, Unbundled, Managed, & Paid) principles.
- Create parking districts with enhanced mobility options e.g. car share, bike share, transit hubs.

Integrate mobility enhancements in land use planning

- Continue complete streets planning to provide safe and convenient travel options.
- Integrate mixed use development close to neighborhoods to provide walkable destinations for daily needs (15 minute neighborhoods).

Movers and Shakers

Creating a clean mobility system requires a collective effort. Boulder is fortunate to have many leaders and partners working together to achieve transformative change.



UCAR

Boulder Valley
School District



The University of Colorado has an extensive program to significantly reduce the use of single occupancy vehicles and provide viable options in transit, biking and walking. The University provides full service bus passes to all 30,000 of its students through student fees along with over 13,000 bike parking spaces (more than cars!), has a vanpool service for employees and is actively planning for the development of an EV charging infrastructure for both staff and students.

Boulder County has invested in low-emissions transportation alternatives throughout the county, and was lead sponsor, along with the City and CU, in a countywide electric vehicle adoption assessment. That assessment explored electric vehicle charging infrastructure needs as well as how building codes, transportation programs and employee commuting incentives could promote EV ownership. The County is currently helping to coordinate the Boulder County Electric Vehicle Workplace Charging Challenge to encourage other employers to actively support EV adoption by the over 50,000 daily in-commuters to Boulder and Boulder County.

Boulder Valley School District has initiated a wide range of programs to reduce emissions from its bus and administrative fleet, including initiatives to increase walking, biking, transit and carpooling as well as efforts to lower emissions through hybrid buses, alternative fuels and efficient routing schedules. Through an internally developed "Trip Tracker," over 2,000 participating students in 17 schools cut an estimated 75,000 car trips in a single school year. The District is also exploring the expansion of its current EV fleet and charging infrastructure to provide more opportunities for both students and staff to use EVs.

The University Corporation for Climate Research (UCAR) and its other federal lab partners in the Boulder area provide van pool and ride sharing support for employees, and free bicycle check outs, complementary Bike Share membership, and EcoPasses for all employees. Recently, the labs secured funding to install an EV charging network for employees, and has been an active partner with the City, County, CU, and BVSD in developing a community-wide EV adoption plan.

The Path to 2050

The combined efforts of local transportation strategies and federal fleet efficiency standard improvements can have a significant impact in reducing the emissions generated by the transportation sector.



Total Projected Emissions Reduction = **318,000mt or 16%**