Mayor
Suzanne Jones

Council Members
Aaron Brockett
Cindy Carlisle
Jill Grano
Lisa Morzel
Mirabai Nagle
Sam Weaver
Bob Yates
Mary Young

Council Chambers
1777 Broadway
Boulder, CO 80302
October 23, 2018
6:00 PM

City Manager
Jane Brautigam

City Attorney
Thomas A. Carr

City Clerk
Lynnette Beck

STUDY SESSION
BOULDER CITY COUNCIL

Revenue Needs and Potential Funding Sources for Climate Commitment Work (1 hour)

Transportation Master Plan update including Vision Zero/Safety (2 hours)

Discussion of Housing Advisory Board Work Plan for the Next Three Months (30 min)

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CITY COUNCIL AGENDA ITEM COVER SHEET

MEETING DATE:
October 23, 2018

AGENDA TITLE
Revenue Needs and Potential Funding Sources for Climate Commitment Work (1 hour)

PRIMARY STAFF CONTACT
Kimberlee Rankin, Sustainability Coordinator

REQUESTED ACTION OR MOTION LANGUAGE
Revenue Needs and Potential Funding Sources for Climate Commitment Work

BRIEF HISTORY OF ITEM
The Climate Action Plan (CAP) Tax is set to sunset in 2023. Staff will present to Council the range of recommended options for updating the CAP Tax and seek direction on the options around which to further explore and engage the community

ATTACHMENTS:

Description

- **Memo and Attachments**

STUDY SESSION MEMORANDUM

TO: Mayor and Members of City Council

FROM: Jane S. Brautigam, City Manager
Jim Robertson, Director of Planning and Sustainability
Kendra Tupper, Chief Sustainability and Resilience Officer
Chris Hagelin, Senior Transportation Planner
Kimberlee Rankin, Sustainability Coordinator

DATE: October 23, 2018

SUBJECT: Study Session for October 23, 2018
Revenue Needs and Potential Funding Sources for Climate Commitment Work

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EXECUTIVE SUMMARY

When created in 2007, the Climate Action Plan (CAP) Tax was envisioned as an initial revenue mechanism to reduce greenhouse gas (GHG) emissions, in line with the Kyoto Protocol targets.[1] While this goal was achieved by providing critical funding for climate strategies described in the Boulder Climate Action Plan (2005), climate science evolved, and it became apparent that much larger emissions reductions were required. The more urgent and aggressive goals adopted in the 2016 Climate Commitment were reflective of current climate science and projections, including an 80 percent reduction in community wide GHG emissions. Since the adoption of the new climate and energy goals, staff has conducted detailed modeling of what is required to achieve these targets and how much funding is needed. CAP Tax rates have not been increased since 2010, and since then, revenues have gradually declined as city-sponsored climate programs have matured and per capita energy use (and total residential electricity use) has declined.

To maintain the progress toward Boulder's current climate targets, staff has evaluated the long-term solvency of program funding and explored a number of potential funding alternatives for future consideration. The overall goals of restructuring the revenue sources for climate commitment efforts are to:

- ✓ Provide a sufficient, long-term revenue stream to fund climate mitigation and adaption programs;
- ✓ Encourage sustainable behavior and purchasing choices and discourage use of natural gas and petroleum;
- ✓ Tax all major sources of carbon emissions (electricity, natural gas, vehicles) equitably; and
- ✓ Apply climate taxes or fees equitably across sectors and ensure residents with low-income are not unfairly burdened.

[1] A 7 percent emissions reduction compared to 1990 levels

In the midst of this analysis, new reports and studies have been released indicating that the targets set under the Paris Agreement, and even aggressive goals like Boulder's Climate Commitment, are not going far enough fast enough. Just a few weeks ago, the International Panel on Climate Change (IPCC) issued a landmark report that paints a far more dire picture of the immediate consequences of climate change than previously thought and says that avoiding the damage requires transforming the world economy at a speed and scale that has "no documented historic precedent." The report describes a world of worsening food shortages, drought, wildfires and a mass die-off of coral reefs as soon as 2040, and states that a price on carbon is central to prompt mitigation. Finally, the report clearly states that the emissions targets set under the Paris Agreement are not sufficient to limit global temperature rise to 1.5 degrees.

The purpose of the study session is to:

1. Raise awareness that recent climate analysis reveals a far more dire and urgent climate crisis than previously believed;
2. Acknowledge that based on current climate science and analysis, the world isn't acting at the levels or speed necessary to achieve climate stabilization;
3. Identify an interim action (the Vehicle Efficiency Fee) that can get the city started on accelerating efforts; and
4. Lay the groundwork for revisiting these issues and exploring new revenue options in more detail following the 2020 vote on municipalization.

Staff is in the *early* phases of evaluating various approaches, including taxes and fees, that would not only generate revenue needed to reduce greenhouse gas emissions, but also send a price signal to encourage the behavior modification and purchasing choices needed to achieve the community's goals. Council's feedback and guidance from this study session will inform staff's next steps. If encouraged to move forward with any of the options being explored, staff will proceed into the analysis phase shown in the figure below.

Exploration (current phase)	**Analysis** (pending council guidance)	**Implementation** (pending council guidance)
• Develop initial options • High level evaluation and feasibility assessment • Targeted stakeholder engagement • **Seek guidance from council**	• Perform a fee for vehicle efficiency fee (perhaps jointly with neighboring cities who are pursuing similar fees) • Present results of fee study to council for further direction	• Community engagement on specifics for vehicle fee (rates, use of funds, etc.) • Determine what systems and processes are necessary with external partners • Bring final proposed fee to council for vote

The City of Boulder has adopted aggressive Climate Commitment goals, including an 80 percent reduction in greenhouse gas (GHG) emissions by 2050 from a 2005 baseline and 100 percent renewable electricity by 2030. The programs and initiatives underway to support progress toward these goals are funded by the city's voter-approved (with over 80 percent support) Climate Action Plan (CAP) tax, as well as the Trash Tax, Utility Occupation Tax (UOT) and Energy Impact Offset Fund. More information is provided on each of these in the background section. Figure 1 shows the

progress the city has made towards these goals, and annual progress is measured and reported via the community wide GHG Inventory.

Following this study session topic, the Transportation Division will present an update on the Transportation Master Plan (TMP) including a funding policy review, evaluation of investment priorities and a funding needs assessment. Their analysis will focus on how to prioritize investments to operate and maintain a safe transportation system while meeting community expectations, federal and state requirements, best practice standards and enhancing the system to meet current and future travel needs. Staff will also identify potential optional funding mechanisms that could provide the necessary revenue to meet current and future funding needs. Transportation-related carbon taxes are being analyzed and evaluated as part of this effort to further fund Climate Commitment work, in close coordination with the Transportation Division.

Based on the initial evaluation of a variety of options, staff recommends the following:

1. **Near Term**: Pursue further analysis of a Vehicle Registration Efficiency Fee
    a. Nationally, vehicles are the top contributor to greenhouse gas (GHG) emissions and their share of Boulder's emissions is growing as the grid becomes cleaner. This fee would help to counter the disincentives for electric vehicles that are part of the current registration process.
2. **Post-November 2020**: Re-evaluate funding needs; consider whether revising the CAP Tax or pursuing other options is advisable
    a. Staff recommends waiting until after the 2020 vote on the local electric utility (the "Go/No-Go Vote") to understand if the city is on the pathway to 100 percent renewable electricity, as well as if the local utility could serve as a revenue source for some of this climate work.
    b. To cover the revenue gaps between 2020 and 2024 (when the local electric utility might be in operation), the additional amount needed could be included in the Separation/Start-up funding that the city must borrow between the Go/No-Go Vote and the operation of the municipal utility.[2]

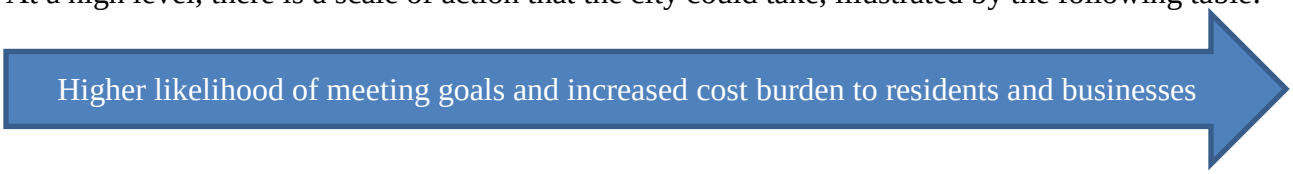
[2] This would only be possible if this doesn't impact the charter requirement that electricity rates must be the same as Xcel Energy's rates on day one.

KEY ISSUES IDENTIFIED

Research and analysis conducted over the past year has identified a range of potential funding options to support and expand the city's Climate Commitment work beyond what is already funded. Strategic choices must be made about timing and prioritizing what to bring to the community, particularly when considering the upcoming 2020 electric utility municipalization vote, as well as the existing and potential tax and fee increases imposed on the business community (e.g. the linkage fee).

Based on the initial evaluation of a variety of options, staff recommends exploring a vehicle efficiency fee in the short-term. At this time, staff does not recommend revising the CAP Tax rates or exploring the addition of a natural gas consumption tax or fee until post-2020. Staff is seeking council feedback on these recommendations, as well as guidance on the proposed timeframe (Figure 11) for the analysis and implementation phases.

At a high level, there is a scale of action that the city could take, illustrated by the following table:



Operate with Declining Revenues – focus more on regulation and state/federal policy change	Pursue supplemental taxes/fees that minimize cost impact (Recommended)	Set a carbon price high enough to drive change and reflect social cost of carbon
• Likely fall behind on goals • Consider more stringent energy regulation, including setting carbon emissions caps for existing buildings, to stay on track[3] • Reduce rebates available to community • Reduce staff and reallocate remaining staff time to efforts that could have a big impact (but don't require much funding), like advancing the legislative agenda (acknowledging that these efforts are largely out of our control)	• Pursue a vehicle efficiency fee, but set the rates to minimize cost impact • Including short term (2020-2024) supplemental funding for climate work as part of the 2020 local utility startup costs if financially feasible • Post 2020: Revise CAP Tax and consider a natural gas tax or fee, but set rates to minimize cost impact • This option could generate the needed revenue for the "fiscally constrained" scenario	• Would align with current climate analysis • Would generate enough revenue to have significant impact and even fund large capital projects like transit electrification • Would create a revenue source for dealing with the future costs of climate change (a "climate reserve" fund) • Would result in an extremely high cost impact to residents and businesses (especially industrial facilities with large energy loads)

[3] New York City has announced that they will mandate carbon emissions reductions for existing commercial buildings over 25,000 ft^2. The recent announcement cited an example of market rate apartment buildings, which would be permitted to use 50,000 B.T.U.s of fossil fuel per square foot per year requiring a 25% energy reduction compared to today's baseline.

Questions for City Council

1. Does Council agree with the recommended options (Figure 10)?
2. Does Council agree with the proposed timeline (Figure 11)?
3. Does Council have any feedback to inform the next phase of analysis?
    a. Should staff continue to balance cost impacts and not set rates high enough to reflect the true cost of carbon emissions?

BACKGROUND

Although CAP Tax (adopted in 2007) was never intended to fully fund the achievement of the city's current climate and energy goals (adopted in 2016), it has been a successful initiative. CAP Tax has generated $17.3 million in revenue which has funded policies, programs, direct advising services and rebates to homes and businesses. While it's nearly impossible to determine what avoided load growth and emissions savings can be directly attributable to CAP Tax programs and staff efforts, the community has accomplished the following:

- Surpassed the original Kyoto target of 7 percent emissions reduction compared to 1990 levels;
- Since 2005, reduced GHG emissions overall by more than 300,000 metric tons (MT) – a 13 percent reduction even with the addition of 7,500 jobs and a 49 percent increase in gross domestic product (GDP); and
- Consumed far less energy since 2007 than was predicted by the utility.

Staff estimates that CAP Tax is directly responsible for avoiding ~500,000 cumulative metrics tons (MT) of GHG emissions since 2007.[4] See **Attachment A** for more details on what CAP Tax currently funds and how the range of possible GHG savings was calculated.

Due to success of the city's efficiency programs in decreasing electricity consumption in the community, revenues from the Climate Action Plan (CAP) Tax are declining while fixed costs[5] increase each year. As such, it was determined that an evaluation of funding needs was necessary to identify potential options that could create a sustainable and sufficient revenue stream to meet the Climate Commitment goals. Since spring 2017, staff has conducted research, analysis and key stakeholder engagement that has informed the development of funding options to support Climate Commitment work.

Current Revenue Sources for Climate and Energy Work

There are four taxes/fees currently collected that provide funding for the city's Climate Commitment efforts:

1. Climate Action Plan (CAP) Tax: A 2007 voter-approved tax on electricity consumption. This generates approximately $1.8 million per year and funds the city's climate and energy efforts (except for municipalization).
2. Trash Tax: A 1994 voter-approved tax on residential and commercial waste. This generates approximately $1.8 million per year, which funds the city's Zero Waste efforts.
3. Utility Occupation Tax (UOT): A 2010 voter-approved tax on the utility (Xcel Energy), which, after a voter-approved increase in 2011, includes an allocation to fund the city's efforts to develop a local electric utility (i.e. municipalization).[6] This tax was renewed and increased by voters in 2017 and will collect ~$6 million in 2018, ~$5 million in 2019, and ~$2 million in 2020-2022 for the municipalization effort. The remainder of the tax is allocated to the general fund and is collected to replace the franchise fees that were previously collected by Xcel on customers' bills and passed through to the city. The city does

[4] On the low end, staff estimates direct emissions reductions from just Energy Smart and energy codes to be 150,000 MT. On the upper end, as much as 1 million MT of avoided emissions could be attributed based on energy load growth projections from Xcel Energy.
[5] Salaries, benefits and cost allocation (covers the cost of our office space and use of citywide support services like IT, Finance and Human Resources).
[6] While this is a tax on the utility, Xcel Energy passes the costs through to the customers.

not currently have a franchise agreement with Xcel for natural gas. Please see **Attachment B** for a detailed fact sheet on the UOT and how this relates to Franchise Fees.

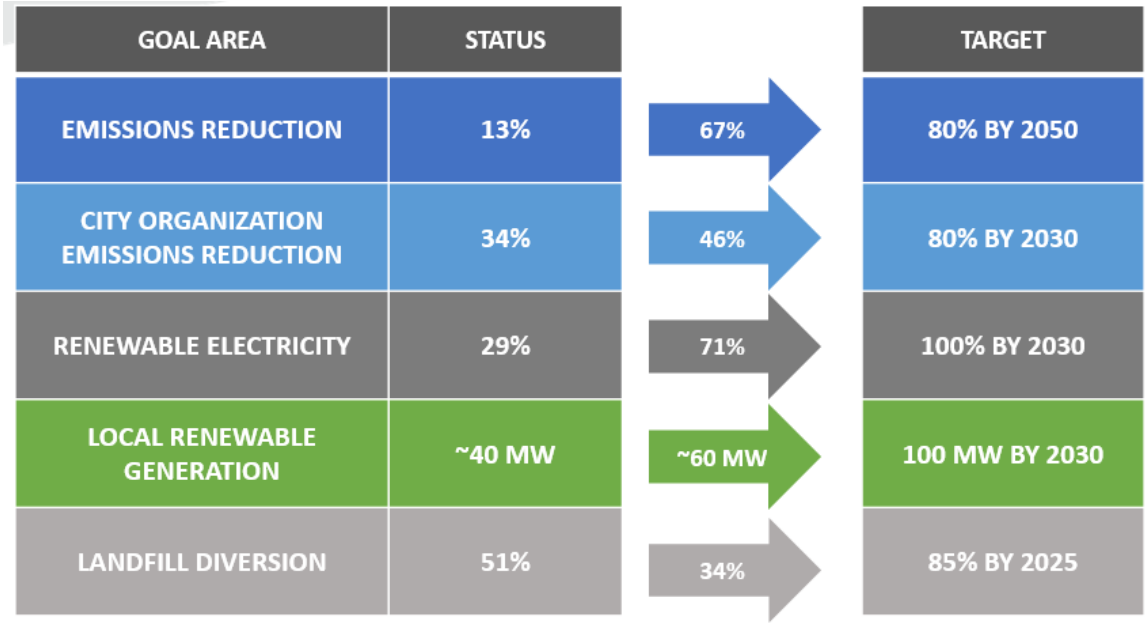
4. Marijuana Electricity Offset: Since 2012, all licensed marijuana facilities are required to offset 100 percent of their electricity use through renewable energy. In 2016, a new option for compliance was added that allows licensees to pay into a local Energy Impact Offset Fund (EIOF) at an initial rate of $0.0216/kWh (equates to $36/MT CO_2). This fund collected ~$500,000 in its first year and the revenues will be used primarily to develop new local renewable energy projects. Since these facilities also pay the CAP Tax commercial rate, the EIOF rate was adjusted to $0.0207/kWh in 2018 (the original rate minus the $0.0009/kWh CAP Tax).

In addition to these taxes and fees, a portion of Transportation's dedicated sales tax (roughly 0.2 cents per dollar) goes to fund Vision Zero and climate-related transportation efforts: encouraging alternative mobility modes (bus, biking, walking, transit, carpooling, etc.) and striving for zero traffic fatalities and serious injuries (Vision Zero).

The Problem

Since adopting the CAP Tax, the City of Boulder has adopted aggressive Climate Commitment goals including an 80 percent reduction in greenhouse gas (GHG) emissions by 2050 from a 2005 baseline, and 100 percent renewable electricity by 2030. Figure 1 shows the progress the city has made towards these goals. While significant progress has been made in some areas such as landfill diversion (funded by Trash Tax) and local renewable generation (supported by primarily by CAP Tax with contributions from the Solar Grants program and soon, the EIOF), the city needs to significantly increase its efforts to achieve the overall GHG emission goal.

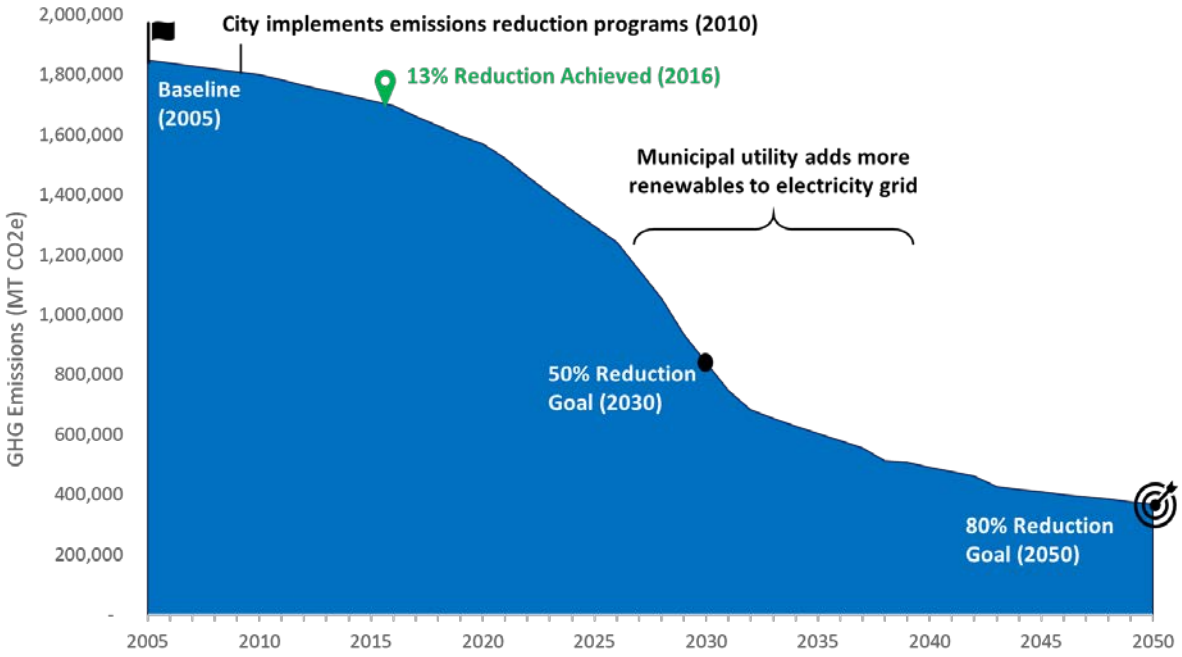
Figure 1. Climate Commitment Progress (based on 2016 GHG Inventory)[7]



[7] 2017 GHG Inventory will be released by December of 2017 in an Information Packet to council.

While the city is currently on track to meet a modest interim target of 15 percent emissions reductions by 2020, the target for 2030 is a **50 percent** emissions reduction.[8] When setting these targets and modeling how to meet them, staff acknowledged that with current resources, it would be infeasible to achieve more than a 15 percent reduction by 2020. But the 2030 target was set to reflect what was necessary to avoid climate catastrophe and assumes a 100 percent renewable electricity supply by 2030. As shown in Figure 2, the rate of reduction must drastically increase from 2020 onward. Additional revenue is needed between 2020 and 2030 to implement the additional rebates, programs and services that were modeled to achieve these goals (see **Attachment C** for more details on this model). In addition to the need to accelerate the rate of reduction, much of the "low hanging fruit" has been captured, and the remaining work will be increasingly difficult and more complex.

Figure 2: City of Boulder GHG Reduction Targets



In summary, there are two main issues with the current revenue sources for climate and energy work:

1. Current revenues are insufficient to fully meet the city's climate commitment and resilience goals; and
2. The CAP Tax is not a true carbon tax, and there is currently no tax on natural gas or petroleum consumption, which is not aligned with strategic objectives.

Current revenues are insufficient to fully meet the city's climate commitment and resilience goals.

- The annual revenue from the CAP Tax (~$1.8 million) was never intended to fully fund the achievement of the city's climate and energy goals. The original purpose of the CAP Tax was to fund implementation of city programs to reduce local GHG emissions to meet the Kyoto Protocol target (only 7 percent emissions reduction for the U.S. from 1990 levels). As climate science has matured, the world has realized what kind of GHG reductions are necessary and cities have set much more aggressive targets.

[8] The city has surpassed the original Kyoto target of 7 percent emissions reduction compared to 1990 levels.

- Since the adoption of the CAP Tax, the city has adopted ambitious Climate Commitment goals that far exceed the initial Kyoto Protocol target. A detailed projection tool that models potential pathways to the 80 percent GHG emission reduction target by 2050 has revealed the following: ***Achieving a 100 percent renewable electricity supply will result in about half of the necessary GHG reductions***[9] – the rest must come from other efforts aimed at more distributed solar and energy efficiency, reducing transportation emissions and electrifying vehicles and most of the space and water heating loads in buildings.
- While the future local electric utility could provide revenues to support some of these efforts as soon as 2024, the October 2018 IPCC report on climate change has made it clear that the world cannot wait to act. Avoiding $54 trillion in catastrophic effects (as soon as 2040) requires transforming the world economy within just a few years.
- The city now recognizes the need and importance to fund efforts that go beyond just GHG reductions and address issues like energy resilience, natural resource consumption, carbon sequestration, ecosystem health and social equity across all climate efforts.
- Climate change is already occurring, and local municipalities and community members are paying the costs related to climate change impacts, such as increased air conditioning costs and more frequent and severe weather events like floods and wildfires.
- Funds for the city's climate and energy programs are declining. CAP Tax rates have not been increased since 2010, and the revenues are declining as fixed costs (salaries, benefits, cost allocation, etc.) increase. Additionally, in 2017, two of the larger federal labs "opted out" of paying into the CAP Tax, because they are not governed by municipal ordinances.

CAP Tax is not a true carbon tax, and there is currently no tax on natural gas or petroleum consumption, which is not aligned with strategic objectives.

- A true carbon tax is a tax or fee on the carbon content of fossil fuels. CAP Tax is charged on a per kilowatt hour (kWh) basis (rather than on metric tons of carbon emissions), and does not address GHG emissions from other fuels, such as natural gas or petroleum (i.e. gasoline used for ground transportation).
- Because electricity is the only energy source with commercially viable renewable alternatives, the city is encouraging residents and businesses to switch existing natural gas and petroleum-consuming equipment to electricity (e.g., switching to electric vehicles and electric space heating).[10] Stated another way, the current CAP Tax is imposed upon the very energy source that Boulder is seeking to incentivize.
- As the electricity grid becomes cleaner, the majority of the city's GHG will come from natural gas and petroleum consumption.[11]

[9] The Climate Commitment Projection tools shows that this will result in an emissions reduction of 43% (the overall goal is an 80% reduction).
[10] Modeling shows that to meet the city's 80% GHG emission reduction target, at least 80% of the residential natural gas load and 30% of the commercial and industrial gas load must be electrified.
[11] This trend can be seen in annual greenhouse gas emission tracking, shown on Boulder Measures at https://bouldercolorado.gov/boulder-measures/community-greenhouse-gas-emissions

Goals

The overall goals of restructuring the revenue sources for climate commitment efforts are to:

Provide a sufficient, long-term revenue stream to fund climate mitigation and adaption programs

Encourage sustainable behavior and purchasing choices and discourage use of natural gas and petroleum

Tax all major sources of carbon emissions (electricity, natural gas, vehicles) equitably

Apply climate taxes or fees equitably across sectors, and ensure residents with low-income are not unfairly burdened

Current Climate Action Plan Tax

On Nov. 7, 2006, 60 percent of Boulder voters approved Initiative 202, CAP Tax, marking the first time in the nation that a municipal government imposed an energy tax on its residents to directly combat climate change. The tax levels were set at their maximum amount allowable under the associated ordinance in 2010, and the most recent renewal of the CAP Tax in 2015 was passed by over 77 percent of voters, which extended the tax to March 2023.

The CAP Tax is levied on city residents and businesses and is based on the amount of electricity they consume in kilowatt hours (kWh). During the creation of the tax, there was considerable discussion by council and the community that the intended purpose of the tax was to generate revenue sufficient to meet the 2012 Kyoto target of reducing emissions 7 percent below 1990 levels. The levied amounts were not intended to be set high enough to serve as a direct disincentive to consumption.

Figure 3 shows the differing tax rates for each of three sectors along with the current equivalent dollar rate per metric ton of carbon dioxide equivalents (MT CO_{2e}), and typical annual bill impacts. As illustrated, the CAP Tax is not a true carbon tax because there is not a single, consistent value of \$/MT CO_2 that is driving the rate and the tax is not applied to the carbon emissions, but instead to the kWh consumption. For reference, the social cost of carbon for 2018 from the Environmental Protection Agency (EPA) is \$36/MT CO_{2e} for 2015 and \$42/MT CO_{2e} for 2020.[12]

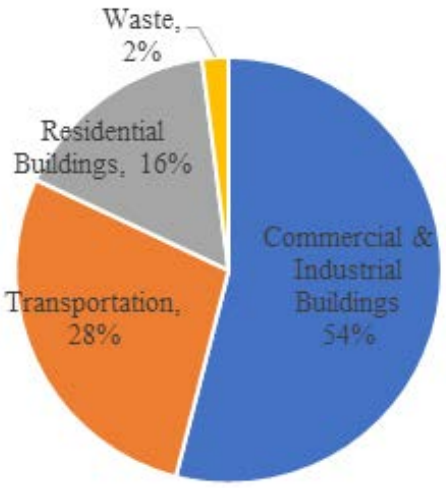
Figure 3. Climate Action Plan Rates

	Rates ($/kWh)	Effective rate in $/MT CO_2	% of Residential Rate	Average Increase to Annual Electricity Costs ($/year)
Residential	$0.0049	$8.26	-	$25[13]
Commercial	$0.0009	$1.52	18%	$120 (5,000 ft^2 office)[14] $350 (15,000 ft^2 office)[6] $700 (30,000 ft^2 office)[6]

[12] Assumes a 3 percent discount rate: https://19january2017snapshot.epa.gov/climatechange/social-cost-carbon_.html
[13] Based on an average of 5,000 kWh per household per year (from Boulder's 2017 GHG Inventory)
[14] Based on an average energy use intensity of 89 kBtu/sf-year from the city's Building Performance Program.

Industrial	$0.0003	$0.51	6%	$9,600[15]

Figure 4. City of Boulder 2016 GHG Emissions

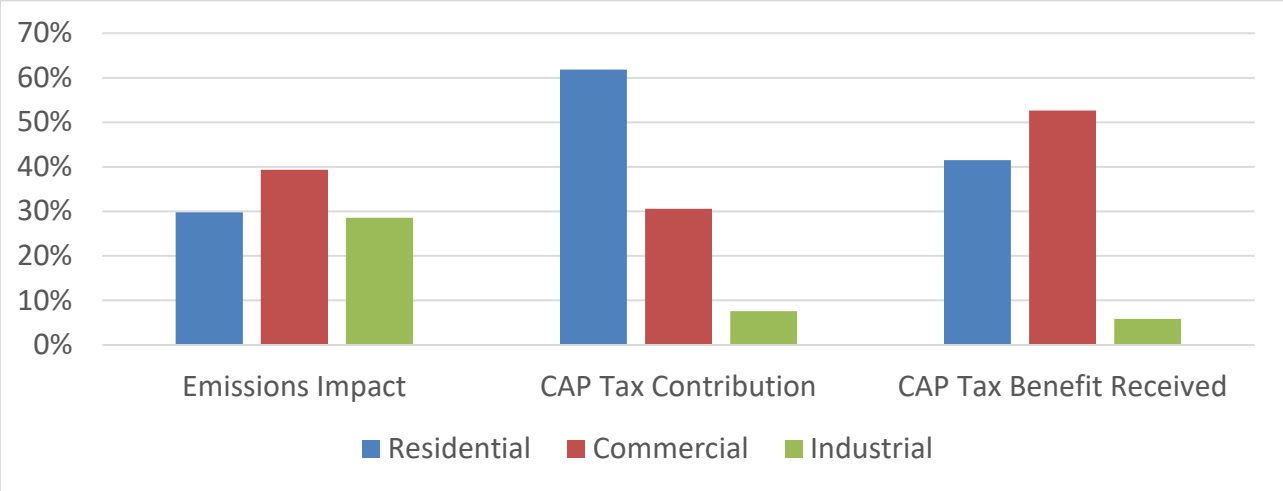


Boulder is unique from other places that have carbon taxes because many industrial facilities are located within city limits. It's also important to note that staff is assuming that 50 percent of the transportation emissions come from residents of Boulder.[16] While the commercial and industrial sectors are responsible for a higher proportion of GHG emissions (as shown in Figure 4), the rates were set this way for the following reasons:

- Power of the Vote: Only the residential sector can vote on proposed taxes;
- To Maintain Economic Vitality: Boulder businesses are subject to a significant amount of taxes and fees, higher than in neighboring communities. Further, the energy use in the industrial sector is extremely high--applying a CAP Tax rate closer to the commercial or residential rates could lead to primary employers moving their businesses to neighboring towns;
- To Reflect Allocation of Funds: Industrial energy systems are much more complicated and not able to take advantage of the CAP Tax rebates and programs as much as other sectors can. For these reasons, most of the funding is allocated to the commercial and residential sector (see Figure 5). While this was the rationale in 2007, future considerations might include increasing the rate to provide funds for a dedicated program, particularly as technology options continue to emerge for this sector.

[15] Based on a facility that consumes 3,200,000 kWh/year – but this varies greatly across the industrial sector and the city does not have access to data on individual industrial businesses or facilities.
[16] Assuming that ~60% of VMT from passenger vehicles and SUVs comes from residents, and that some portion of delivery vehicles are caused by residential deliveries.

Figure 5. CAP Tax – Impact and Benefit by Sector[17]



Current Revenue and Funding Allocations

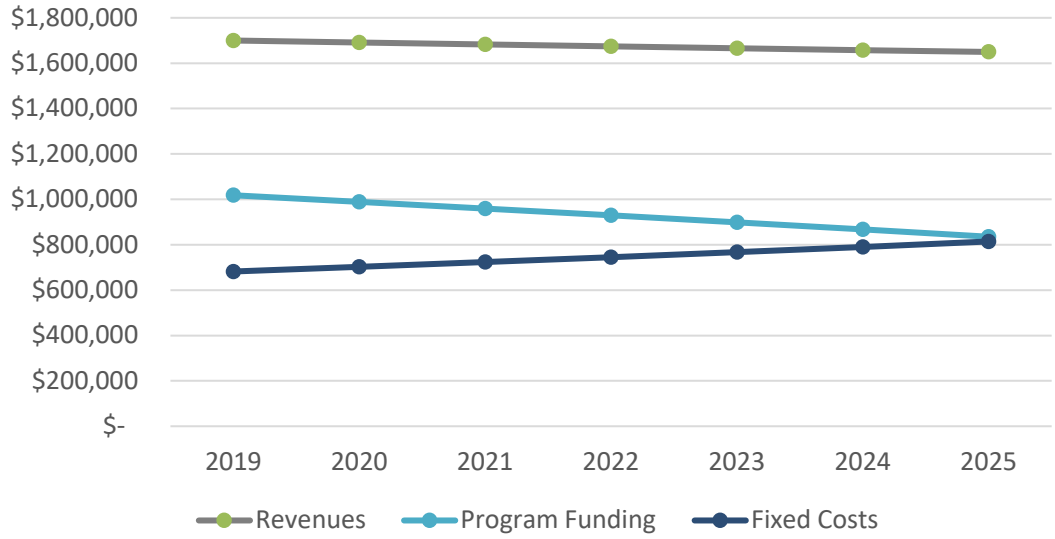
The revenue produced by the current CAP Tax is projected to be $1.75 million in 2019. Approximately 65 percent of that goes directly to program funding (rebates, advising services, etc.), with the remaining 35 percent funding staff and other overhead (office space, office expenses, use of citywide services such as the City Attorney's Office and Finance Department, etc.). While the city continues to look for savings on overhead, the programs could not be developed and implemented without staff time and staff reductions are not being considered at this time. Further, some key efforts such as partnering with influential local, national and international partners, and lobbying for state and federal legislative and regulatory change, would not be possible without dedicated staff time.

Since 2010 (the last time rates were increased), declining revenues and rising fixed costs[18] have resulted in 11 percent less funding available for community programs and rebates. With declining sales tax revenues across the city, the CAP Tax now funds some broad climate work and staff time that were previously supported by the General Fund.

While total electricity consumption may stay flat or even slightly increase over time as buildings and vehicles become electrified, the CAP Tax is not charged on any distributed renewable energy generation (i.e., rooftop solar, subscriptions to solar gardens, or subscriptions to remote utility renewable energy programs such as Renewable Connect[19]), which is rapidly rising. Due to these factors, staff estimates that available revenue for climate programs and rebates will decrease to about $800,000 (from over $1 million) by 2025 (see Figure 6).

[17] Residential includes emissions from residential buildings and 65 percent of the emissions from transportation. The remaining transportation emissions were assumed to be split equally between commercial and industrial.
[18] Salaries, benefits and cost allocation (covers the cost of our office space, and use of citywide support services like IT, Finance and Human Resources).
[19] Renewable Connect is a 50 MW, large-scale, solar system in Deer Trail. Xcel customers can subscribe to the program and pay an agree fee to support this solar energy.

Figure 6: Declining Program Funding through CAP Tax



The Need for Alternatives

To deliver robust city programs that maximize the potential of achieving our goals, staff estimates that an additional $4.45 million/year is needed. These estimates were developed by estimating the costs required to be on track for the 2025 Climate Commitment targets. Please see **Attachment C** for more detailed information, which shows this covers unfunded needs for all climate work (which spans multiple departments), including work primarily driven by the Transportation Division and some ecosystem and Urban Tree Canopy work driven by Planning and Open Space. These revenue estimates are in addition to all existing revenue sources previously mentioned (CAP Tax, Trash Tax, EIOF and the portion of sales tax that goes to Transportation efforts to reduce vehicle miles traveled).

The revenue needed to meet the 2025 targets is entirely separate from the efforts to operate a local electric utility, which is funded by the Utility Occupation Tax, and likely will not be in operation until the beginning of 2024 at the earliest. While this crucial effort offers the best, fastest and most viable path to a 100 percent renewable electricity supply, these additional revenue needs account for everything else that is necessary to stay on track to meet our climate goals. Figure 7 summarizes the additional revenue and unfunded needs for a fiscally constrained scenario (i.e. this does not include full capital funding for projects such as the development of large solar farms or networks of fast chargers for electric vehicles and seeks to leverage outside investment). If staff receives guidance to pursue any funding options, community engagement will inform the use and distribution of these funds.

Figure 7. Additional Climate Commitment Funding Needs (Fiscally Constrained Scenario)

Revenue Need ($/year)	Unfunded Needs*
Electricity: $1,483,000	• More rebates or performance incentives for efficiency and solar, especially for residents with low-income and minority owned businesses** • Dedicated rebate funds for entities for other governmental entities that have a presence in Boulder (e.g. CU Boulder, Boulder County, federal labs)*** • New programs targeted at residential energy use, such as home energy ratings, solar bulk purchasing, energy storage, or a next generation version of SmartRegs • Staff time and funding to develop large scale solar within Boulder County (could include bulk purchasing, buying down land costs or offsetting loss of land productivity, etc.) • New rebates and project support for energy resilience (energy storage, microgrids, etc.) • Rebates and advising services to encourage electrification (switching from natural gas to electric equipment) • Incentives for going above and beyond the city's energy code
Natural Gas: $1,168,000	
Petroleum (for ground transport): **$1,791,000**	• Restore previous transit service levels and full-time employees (FTEs) working on pedestrian and bicycle programs • Transit electrification (staff time and some matching funding for HOP electrification)[20] • New rebates for electric vehicles and e-bikes • Matching funds and staff time to develop network of fast charging stations • Staff time to develop regulation/fees for transit network companies and autonomous vehicles
Total: $4,442,000	

* Includes ~$115,000/year for ecosystem work (carbon sequestration, urban tree canopy, etc.), education and outreach around local food and food choice, and climate resilience. These costs are spread equally among the three categories.

** In recent years, EnergySmart has run out of rebates about midway through the year.
*** To discourage "opting out" of the tax and generate revenue for key community partners

Please note: This additional revenue need addresses only a small portion of the Transportation Department's investments. It accounts for funding needs specifically related to decarbonization of transportation: electric vehicle adoption/vehicle efficiency and staff time (not capital) to work on the electrification of public transit. The comprehensive view of Transportation funding priorities and investment needs, including new service delivery models for public transit, will be covered in the TMP update that is sharing this study session. About 80 percent of current transportation funding goes to operations and maintenance (O&M).

Natural Gas Market in Colorado
While electricity operates in a regulated market in the state of Colorado, the natural gas market is deregulated and has open competition. This means that while Xcel Energy operates the natural gas distribution system in Boulder, natural gas customers can choose between many gas providers, or "suppliers." Including Xcel, there are 16 suppliers to choose from currently and it is difficult to

[20] Only HOP electrification was included in this fiscally constrained scenario, as the city partially owns the HOP buses. Large amounts of capital would be needed to electrify the entire transit system.

monitor which suppliers are participating in the Boulder market as it changes over time. It is important to note that while both residential and commercial customers can select a natural gas supplier other than Xcel Energy, currently only commercial customers are using third-party suppliers, as there is little incentive for residential customers to transition to third-party suppliers. Any tax on end user consumption would require coordination with all suppliers like the Sugar Sweetened Beverage Tax.

Current Annual Vehicle Fees and Taxes
At the time of vehicle registration (first time and annual renewal), a car owner pays the following in Boulder County:

- Registration fee (based on vehicle weight and license plate type);
- Ownership tax (based on the year, the original taxable value and the purchase date of the vehicle); and
- Plug-in vehicles only (electric vehicles and plug-in hybrids): An additional $50 fee
    - $30 of the fee goes to the Highway Users Tax Fund. The other $20 goes to the Electric Vehicle Grant Fund, which pays for things like charging stations.

Community and Board Feedback
Staff has conducted initial engagement (Phase 1) with a variety of stakeholders, including those heavily involved in the development and campaigning of the initial CAP Tax. Internal engagement has been focused around coordination with the City Attorney's Office, the Transportation division, and the Energy Future team working on the development of a local electric utility.

Phase 1 - Key Stakeholder Discussions
Phase 1 of the engagement process was to solicit feedback on the preliminary list of options, review the list of criteria against which each option would be reviewed and solicit community feedback on the overall concept. Initial stakeholder engagement included a meeting with the Environmental Advisory Board (EAB), a meeting with the "Decarbonization Tech Team" (a volunteer group of parties in the community interested in climate issues) and a facilitated working session with key stakeholders in the community including large energy users, governmental and non-governmental organizations and large property managers. Detailed feedback is available in **Attachment D**, with a very brief summary of feedback here:

- EAB supported the immediate exploration and implementation of a vehicle and natural gas tax or fee, to prevent the city from falling behind on its climate goals.
- Tech Team members oppose any new carbon taxes or fees, particularly in advance of the 2020 decision on the municipalization effort.
- The business community feels overburdened by so many various taxes and fees. If new fees are put in place, they need rate predictability and would like the majority of funds to go back to the businesses that pay the tax/fee in the form of rebates.

Phase 2 - Broad Community Outreach
Staff will not begin broad community engagement on this topic until guidance is received from Council on options to pursue further (if any) and timing for possible ballot measures. If staff is encouraged to pursue any of these funding options, community outreach will focus on the specific rate structures, the use of the additional funds and the mechanisms to ensure social equity.

ANALYSIS: WHAT ARE OTHER CITIES OR COUNTRIES DOING

Regulation

Recognizing the urgency to act, and that regulation can often have the broadest and fastest results with the lowest administrative costs to governments, many cities have recently adopted, or pledged to adopt, the most aggressive and impactful climate and energy regulation in history.

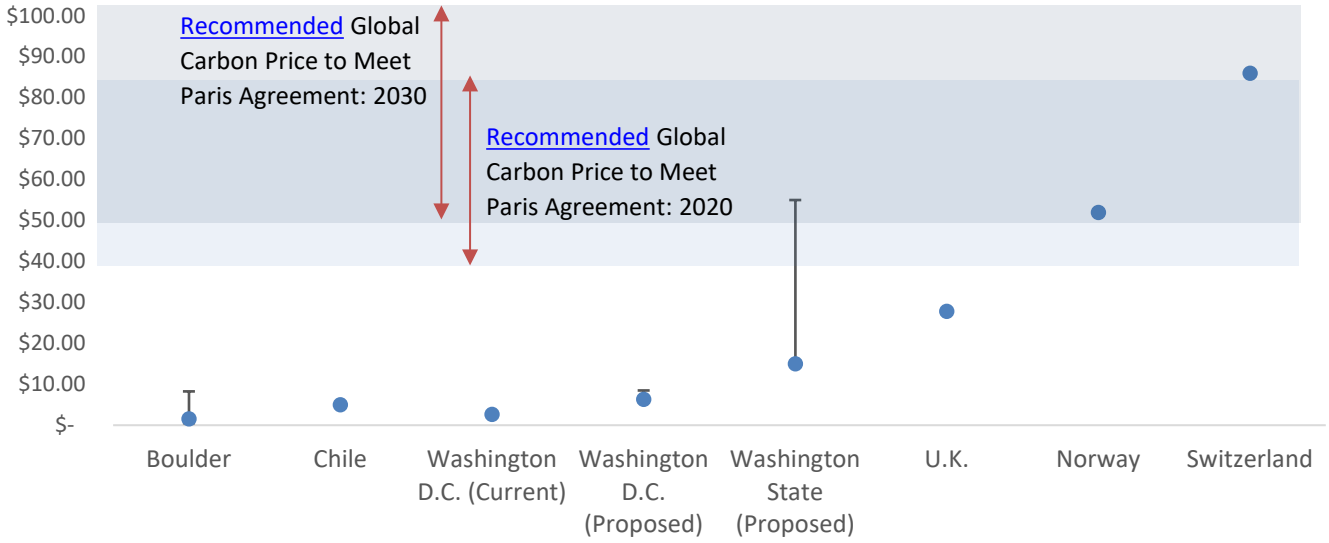
In August of 2018, the mayors of 19 cities—including New York, London, Tokyo and Johannesburg—declared that they will enact regulations that will make all new buildings carbon neutral by 2030 and all existing buildings carbon neutral by 2050. Many cities have enacted, or are planning to enact, bans on vehicles. Norway will prohibit domestic sales of new diesel and gasoline-powered cars as of 2025 - the earliest date for any such ban in the world. Paris voted to ban petrol and diesel burning vehicles by 2030, and France and Britain will stop selling fossil fuel cars altogether by 2040. Countries planning to set similar targets include China (the world's largest auto market) and India, and the mayors of Madrid, Athens and Mexico City announced plans to ban diesel cars and vans from their roads by 2025.

There are many related examples spanning from waste-related actions, with bans on straws and single-use plastics, to coordinated actions driving state-wide Renewable Portfolio Standard (RPS) requirements of 100 percent by 2040 or sooner. France has taken a lead in addressing food waste by becoming the first country in the world to ban supermarkets from throwing away or destroying unsold food, forcing them instead to donate it to charities and food banks.

Some Form of Carbon Tax or Fee

Boulder was the first city to pass a voter approved climate mitigation tax. Since 2007, many other cities, states and provinces have passed some version of a carbon tax or fee to generate necessary revenue to fund climate efforts and to create a pricing mechanism that accelerates the market shift to clean, renewable energy systems. The figure below shows that the majority of carbon taxes (current or proposed) are significantly higher than Boulder's CAP Tax, especially when considering that many of these apply to all fossil fuel sources, not just electricity.

Figure 8: Comparison of Carbon Prices ($/MT CO_{2e})



The chart above also shows that most of these carbon prices are insufficient to meet global climate goals. The Report of the High-Level Commission on Carbon Prices (PDF) (2017) estimated that the appropriate carbon price across the world will need to be $40–80/MT CO_2e by 2020, and $50–100/MT CO_2e by 2030, to be consistent with meeting the goals of the Paris Agreement. A 2018 study published in Nature Climate Change, "Country-level social cost of carbon", estimates the social cost of carbon (SCC)[21] in the US to be $180 to $800 per ton (median $417/MT CO_{2e}). Finally, the previously mentioned 2018 IPCC report emphasizes that a price on carbon is central to prompt mitigation. It estimates that to be effective, such a price would have to range from $135 to $5,500 per ton of carbon dioxide pollution in 2030, and from $690 to $27,000 per ton by 2100.

Forty countries and 24 sub-national regions (states, provinces, etc.) have a national or regional price on carbon, and many more are actively considering this. Together, these carbon pricing initiatives cover about 7 gigatons of carbon dioxide equivalent ($GtCO_2e$), or about 13 percent of annual global GHG emissions.

Figure 9:Examples of Recent and Proposed Carbon Taxes around the World

Carbon Tax (Date Enacted)	Sectors Covered	Rates	Estimated Annual Revenues $/year)
Boulder CAP Tax (2007)	Tax on electricity consumption except for the utility's renewable energy programs (Windsource. Renewable Connect, etc.)	$0.0003 - $0.0049/kWh $0.51 - $8.26/MT CO_{2e}[22] (rates vary by sector)	$1.8 million *(declining)*
U.K. Carbon Price Floor (2013)	Tax on fossil fuels used to generate electricity	$27.79/MT CO_{2e}	$1.3 billion
Minneapolis Franchise Fee (2018)	An additional 0.5% added to electric /natural gas franchise fee to fund climate mitigation efforts	Varies by sector, depending on energy costs	$8.5 million
Washington State Ballot Initiative 1631 (on 2018 ballot)	Fee that charges large polluters for the carbon content of fossil fuels used or sold and electricity generated or consumed within the state	$15/ MT CO_{2e} (w/ $2 inflation up to $55/ton in 2035)	$459 million (average for first 5 years)
Washington D.C. Sustainable Energy Trust Fund (2008)	Electricity and gas surcharge; exempts low income residents and electricity from renewable sources covered by RECs under the Renewable Portfolio Standard	$0.0015/kWh $0.014/therm Electricity: $3.28/MT CO_{2e} Natural Gas: $2.63/ MT CO_{2e}[23]	$20 million

[21] The SCC is a measure, in dollars, of the long-term damage done by a ton of CO_2 emissions. This dollar figure also represents the value of damages avoided for a small emission reduction (i.e., the benefit of a CO_2 reduction).
[22] Based on current emissions factor from Xcel energy (0.5930 MTCO2/MWh)
[23] Based on emission factors or 0.000457 MTCO2/kWh and 0.005317 MTCO2/therm from District of Columbia Greenhouse Gas Inventory Update 2012-2013, Table D. Government Operations Emissions Summary 2006-2016

Carbon Tax (Date Enacted)	Sectors Covered	Rates	Estimated Annual Revenues $/year)
Washington D.C. Clean Energy DC Act 2018 (Proposed Oct 2018)	Would double current electricity surcharge and triple current natural gas surcharge; maintains exemptions for low income and renewables	Electricity: $6.35/MT CO_{2e} Natural Gas: $8.49/ MT CO_{2e}[24] * natural gas rate reduced each year until it plateaus at $2.63/ton in 2032	$26 million

Some credit the majority of the United Kingdom's (UK) progress on emissions reduction to its carbon tax, priced at $25/MT CO_{2e}. In 2012, the UK ranked 20th out of a list of 33 rich countries in terms of low-carbon electricity use. A carbon tax was introduced in 2013, which caused a rapid reduction in coal-generated electricity. In 2017, the UK's rank for low-carbon electricity use had jumped to 7– no other country has ever climbed up the rankings so quickly, according to a study by Imperial College London.

Other examples of unique carbon taxes or pricing schemes are summarized below:

The California Carbon Market: The CA cap-and-trade program, enacted in 2013 and enforced by the California Air Resources Board, is a state policy that is used to limit GHG emissions. The regulations apply to industrial plants, electric power plants and fuel distributors that emit ≥ 25,000 tons of CO_2 per year. Emission allowances are distributed by allocation and auction and vary by industry and facility efficiency

Norway's Car Fees: Electric vehicles (EVs) are encouraged through an array of benefits; no national taxes or fees on the purchase, free access to toll roads, free parking, free transport, free use of chargers and ability to use bus and taxi lanes. Results: 20% EV ownership in Oslo; EV + PHEV purchase rate reached 50%

Seattle's Congestion Pricing: Two-thirds of Seattle's GHG emissions came from road transportation. They are currently studying how to implement congestion pricing, which would establish tolls to drive on select Seattle streets, perhaps with differing charges depending on the time of day. The aim is to discourage people from driving cars around town as the population grows. A handful of cities currently use congestion pricing, such as London, Singapore and Milan.

South Africa's Carbon Tax: To incentivize large emitters to reduce their greenhouse gas emissions and meet its nationally-determined contribution commitments to the 2015 Paris Agreement, South Africa has announced a January 2019 implementation date for a carbon tax. The tax, set at a rate of $10/MT Co_{2e}, includes provisions to increase the rate each year in line with reduction goals. The National Treasury indicated the tax is expected to reduce emissions by 13 - 14.5% by 2025, and 33% by 2035. Revenue collected is intended in part to act as a tool of economic redistribution to narrow income inequalities.

[24] ibid

ANALYSIS OF OPTIONS

Staff analyzed several potential funding options for viability and evaluated these against the following criteria:

- Legal feasibility[25]: *Is this allowed under current laws and regulation?*
- Technical feasibility: *How difficult is this to implement?*
- Social equity: *How easy is it to structure this to reduce the burden to residents with lower incomes?*
- Administrative time/ease: *What are the one time and recurring costs and staff time required for the city?*
- Impact on local business: *What is the impact to local economic vitality? Does this option ensure that businesses do not bear an inequitable burden?[26] Can rate stability and predictability be provided?*
- Alignment with strategic objectives: *Will this encourage efficient and sustainable behavior and purchasing choices and discourage use of natural gas and petroleum?*
- Revenue stability: *Will this provide revenue diversity and longevity? Is it possible for state or federal buildings to refuse to pay this local tax or fee?*
- Political/Public Support: *What will the voter/community support likely be?*

These options and the criteria for evaluating them were further discussed during the initial stakeholder engagement process. The table below lists the options that were considered and whether they were:

- Eliminated – nonviable for various reasons (please see **Attachment E** for more details on why each option was nonviable);
- Not recommended - viable and evaluated against the criteria, but not recommended at this time; or
- Recommended - viable and scored high enough against the criteria to be recommended and have additional analysis performed.

Please see **Attachment E** for more details on each option and an evaluation matrix showing how each option fares against the criteria. The results of the evaluation matrix informed which options were recommended.

[25] If an option was not legally feasible for the City of Boulder to implement it was automatically excluded from further analysis.

[26] Special consideration was given to the fact that Boulder houses industrial facilities with very high energy use that are very important to the local economy, and that businesses do not get to vote for these taxes.

Figure 10: List of Options Considered

Option	Evaluation Status
Vehicle Registration Efficiency Fee (Flat Rate): A fee that applies a percentage rate to value of car[27]. EVs would be exempt, and the rate for hybrids will be a fraction of the gasoline vehicle fee. Commercial vehicles would have a separate fee. Fees would be determined through a fee study. ** Scores well against criteria – this pricing signal is needed regardless of whether a local utility is in operation*	Recommended for further analysis
Adjust CAP Tax Rates: Set the rate in terms of $/MT CO_{2e} and apply to the grid emission factor. Update rates every 5 years to increases $/MT to approach Social Cost of Carbon (SCC), and to update the grid emissions factor as the grid gets cleaner. ** Scores well against criteria and is recommended for future consideration, but should be re-evaluated following the 2020 Go/No-Go Vote*	Re-evaluate after 2020 Go/No-Go Vote
Tax Natural Gas Consumption: Set a rate in $/MT CO_{2e}, convert to $/therm and apply this to end user consumption. Rate will increase every 5 years to approach Social Cost of Carbon. OR **Natural Gas Franchise Fee Adder**: Negotiate a natural gas franchise agreement with Xcel, set the standard 3 percent Franchise Fee, and increase that by a small percentage (varying by sector) to fund climate efforts. ** Scores well against criteria and is recommended for future consideration, but should be re-evaluated following the 2020 Go/No-Go Vote*	Re-evaluate after 2020 Go/No-Go Vote
Revenue Neutral Option: Reduce CAP Tax rates (or eliminate altogether), but add in Natural Gas option, so roughly the same total amount of revenue is collected per sector (i.e. taxes do NOT increase overall.) ** Could be a strategy if the local utility moves forward and electricity revenues fund the electricity efforts currently funded by CAP Tax*	Re-evaluate after 2020 Go/No-Go Vote
Status Quo: Keep CAP Tax as-is, no new taxes or fees ** Does not align with strategic objectives or address long term funding needs*	Not recommended
Pay at the Pump: Gasoline/diesel tax ** Eliminated due to legal infeasibility*	Eliminated
Methane Natural Gas Tax/Fee: tax or fee on natural gas consumption or production based on the social cost of methane ** Eliminated due to technical infeasibility and unreasonably high rates*	Eliminated

[27] The bill impact on a customer will be dependent upon the value of the owner's vehicle, which results in a more "progressive" assessment.

Option	Evaluation Status
Vehicle Efficiency Tax/Fee based on MPG or VMT: Based on the specific fuel efficiency (miles per gallon – MPG) or on vehicle miles traveled (VMT) ** Eliminated due to technical infeasibility*	Eliminated
County-wide vehicle efficiency tax/fee: Tax or vehicle imposed by Boulder County ** Eliminated due to legal infeasibility*	Eliminated
Congestion Pricing: an automated system that charges cars for entering certain zones ** Eliminated due to nonviable revenue potential*	Eliminated
Tax Natural Gas Production: Apply a tax on the natural gas utility (must be set as a percentage of revenue), which would be passed through to natural gas suppliers and customers. ** Eliminated due to unreasonable burden on commercial and industrial customers*	Eliminated

Social Equity

The city's current climate and energy related taxes and fees (the CAP Tax, the Utility Occupation Tax (UOT), and the Trash Tax) are regressive taxes[28] and do not adequately address social equity concerns. Any future changes to current taxes or fees, or proposed new taxes or fees, will ensure this issue is addressed. The CAP Tax is a fixed rate per kWh used, regardless of income level. The Trash Tax is a fixed monthly fee per household and a fixed rate per cubic yard of trash for businesses. The UOT is a tax levied on the electric and natural gas utility, who then passes this through to its customers with no variation for income level. Possible ways to address this in future tax/fees or revision to current taxes/fees are:

- Applying any vehicle tax/fee as a percentage applied to the value of the vehicle;
- Setting a minimum consumption level for electricity and natural gas before a tax/fee is triggered; and/or
- Allowing residents with lower incomes to receive an energy tax/fee rebate, similar to the Food Tax Rebate program offered by the city.

Timing Considerations

Staff is seeking council guidance on the timing of these potential options. Key dates to consider are:

- November 2020: Go/No-Go Vote for Municipalization – the voters will be asked to approve the city taking on debt to acquire the assets required to operation a local electric utility. The outcome of this vote will shed light on many questions such as:
  - Is the city on a path to 100 percent renewable electricity?
  - What services will Xcel Energy continue to provide in Boulder?
  - If the city can operate a local electric utility, how much will the local utility invest in climate and energy programs, and which programs should be funded this way?

[28] A regressive tax is a tax applied uniformly, taking a larger percentage of income from low-income earners than from high-income earners.

- March 31, 2023: CAP Tax is set to expire
- 2024: The earliest the city may be operating a local electric utility and could fund some of the unfunded climate commitment needs through electricity rates.
- 2030: The deadline for achievement of many of the city climate commitment goals or key interim targets.
    - 50 percent reduction in community GHG emissions
    - 80 percent reduction in city organization GHG emissions
    - 100 percent renewable electricity supply
    - 100 megawatts (MW) of local renewable energy installed
    - 90 percent landfill diversion
    - Net-Zero Energy Building Codes (2031)

It's also important to note that it will likely take 9 to18 months of analysis and community engagement before any of these proposed options would be ready to be brought to the voters, and another one to two years to set up the systems necessary to collect the new revenue sources.[29]

The recommended approach is to incorporate the unfunded needs for Climate Commitment work (from 2020 to 2024) as one of the first operational functions of the municipal utility. Analysis could be completed to assess if the additional amount needed could be included in the Separation/Start-up funding that the city must borrow between the Go/No-Go Vote and the operation of the municipal utility. By 2024, the local electric utility should be in operation and staff will have been able to pursue any new electricity and/or natural gas taxes/fees, if deemed necessary and recommended.

Once the local utility becomes operational and is generating revenue, the climate-related electricity efforts (electrical energy efficiency, local solar, electricity policy work and some vehicle electrification) could then become part of the utility's regular budget. The remaining climate and resilience funding needs (climate and resilience policy work, natural gas efficiency and replacement, alternative modes of transportation, resource conservation and circular economy, ecosystem health, carbon sequestration and climate adaptation) would need to be covered by the Trash Tax and any of the new carbon tax options that council would like to see pursued.

Because of the urgency associated with the climate crisis, and the difficulty in reducing transportation relate GHG emissions, staff recommends immediately pursuing the Vehicle Efficiency Fee. Affordable, convenient and widely available charging infrastructure and alternative modes of transportation are needed as soon as possible. If Boulder achieves its goal of a 100 percent renewable electricity supply, transportation will make up 55 percent of the city's GHG emissions.

Aside from the funding needs and the outcome of the Go/No-Go decision, the city should have a franchise agreement with Xcel Energy for its natural gas services that lays out the use of the city streets and right of way. With all of this in mind, staff recommends the following:

[29] The vehicle efficiency option will require working with Boulder County and, to some extent, the Department of Revenue – the county is a willing partner, which should streamline this process. Any new natural gas option will require working with all supply and transport natural gas providers to modify their billing systems, and to create a process for the city to collect these funds. Even adjusting the CAP Tax rate structure would require working with Xcel to modify the current process in place.

Figure 11. Recommended Timeline

	Proposed Timeline
Vehicle Registration Efficiency Fee (would not require community vote)	• **2019**: Coordinate with neighboring cities pursuing similar fees; Conduct fee study and community engagement • **Late 2019/early 2020**: Bring to council for further consideration and vote • **2020**: Work with Boulder County, Department of Revenue, and city finance team to set up systems and processes • **2021**: Implementation/collection of revenues
Adjust CAP Tax Rates AND **Natural Gas Consumption Tax** OR **Natural Gas Franchise Fee Adder**	• **2021**: Re-evaluate pending outcome of 2020 Go/No-Go Vote *IF the local utility does not move forward, the following timeline could be considered:* • **Late 2020**: Determine how to handle "gap years" before new revenue could be generated; If the General Fund can't support this, staff and program reductions will be necessary, and it will be extremely challenging to meet the city's climate and energy goals • **2021**: Community engagement • **Nov 2021**: Ballot measures o to change CAP Tax rates starting in 2023 o to add new natural gas tax or fee in 2024 • **2022-2023**: Work with Xcel, all third-party natural gas suppliers and the city finance team to set up systems and processes • **2023:** Implementation/collection of revised CAP Tax • **2024:** Implementation/collection of new natural gas tax or fee

Detailed Analysis of Potential Options

After evaluating against these criteria and to further understand potential cost impact of these future options, the feasible options were grouped into three scenarios to analyze revenue potential and household/business impact. A Carbon Tax Revenue Model (Model) was created to help model the cost impacts to residents and businesses, and the revenue generated by various options. The original version of the model was created by a team of Duke graduate students as part of a capstone project, and was then modified, expanded and improved by Raftelis, a consulting firm hired by the city to help with this analysis. This modeling was to understand the magnitude of impact of various funding mechanisms and is available for review in **Attachment F**.

Since only the Vehicle Efficiency Option is being recommended for further analysis at this time, these scenarios and the associated modeling would need to be revisited should the city decide to pursue a revision to the CAP Tax or a new natural gas tax or fee, following the 2020 Go/No-Go Vote.

NEXT STEPS

Council's feedback and guidance from this study session will inform staff's next steps. If encouraged to move forward with the recommendation of analyzing a vehicle registration efficiency fee before the 2020 municipalization vote, staff will proceed into the analysis phase, with a focus on answering the outstanding questions identified.

Exploration (current phase)	**Analysis** (pending council guidance)	**Implementation** (pending council guidance)
• Develop initial options • High level evaluation and feasibility assessment • Targeted stakeholder engagement • **Seek guidance from council**	• Perform a fee study for vehicle efficiency fee (perhaps jointly with neighboring cities who are pursuing similar fees) • Present results of fee study to council for further direction	• Community engagement on specifics for vehicle fee (rates, use of funds, etc.) • Determine what systems and processes are necessary with external partners • Bring final proposed fee to council for vote

For all options, additional research, analysis and community engagement is needed to determine specific rates, the best approach for ensuring social equity and the use of funds. Aside from that, outstanding questions and issues are summarized below.

Outstanding Questions for Near Term Recommendation: Vehicle Efficiency Registration Fee
The state registration system, DRIVE, has limited capabilities. The city would need to work with both the Department of Revenue and Boulder County to fully implement this option.

Outstanding questions remain:

- Within the DRIVE system, can this be structured as a percentage applied to the value of the car?
    - If not possible within DRIVE, the city and county will have to develop an alternate process for this and determine a cost for this new process.
- How should the rates differ for commercial vehicles?
- The city is still waiting for detailed vehicle registration data by vehicle type from Boulder County.

Outstanding Questions/Issues for Options for Post 2020 Consideration

<u>Natural Gas Consumption Tax</u>
This option would require coordinating with all of the third-party gas suppliers in the Boulder market (currently 16) to collect and remix this tax to the city. The city would need a method of being notified when a new supplier enters the market. This would require significant support and involvement from the city's finance team.

<u>Franchise Fee Adder</u>
Xcel Energy will continue to be the City of Boulder's natural gas provider, so having a franchise agreement with Xcel Energy is prudent at some point in the future

Outstanding questions remain:

- Can the city set the "adder" fee to vary by sector?

- Minneapolis has done this in their Franchise Agreement with Xcel Energy, and recently Minneapolis also increased the amount of the fee to dedicate funds for climate and sustainability programs. More research is needed to determine how Xcel Energy in Colorado would need to change their billing systems to accommodate that.

Next Steps
If council would like to see the vehicle efficiency fee move forward, staff will prioritize that option, including the fee study.

If council does not feel that this is the right time to pursue any options, staff will continue to seek outside grant funding, evaluate what impact low-cost energy regulations could have and will engage the community around the use of the limited CAP Tax funds and how to prioritize as revenues decline.

Climate + Sustainability staff will return to council at a January 2019 study session to present a status update of progress on the Climate Commitment with a focus on natural resources and ecosystems. The work presented here, outlining what is required to achieve the community's climate and energy goals and what funding is required to support this, will be reiterated, but the focus will be on the areas of the Climate Commitment that typically receive less attention; preservation of natural resources and ecosystems. Staff will also develop a Budget Policy Issue for the 2020 Budget highlighting that if the 2020 Go/No-Go Vote does not pass, there will be a funding gap that will make it extremely challenging for the city to stay on track with the Climate Commitment goals.

ATTACHMENTS
Attachment A: CAP Tax Revenue Allocation
Attachment B: Utility Occupation Tax Fact Sheet
Attachment C: Savings Projections and Revenue Needs
Attachment D: Feedback from Stakeholder Engagement
Attachment E: Detailed Analysis of Options
Attachment F: Detailed Description of Scenarios and Revenue Model

ATTACHMENT A: CAP TAX BUDGET

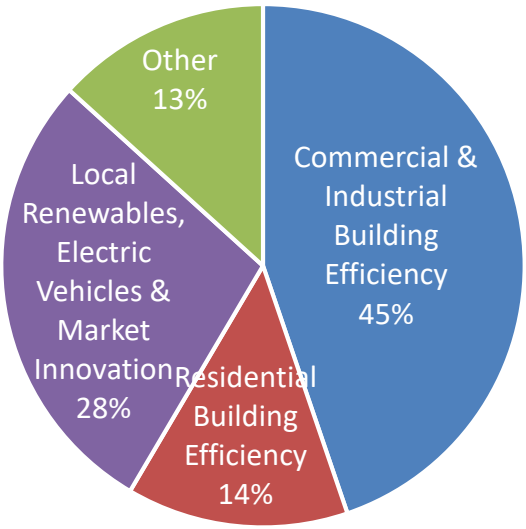
Although CAP Tax (adopted in 2007) was never intended to fully fund the achievement of the city's current climate and energy goals (adopted in 2016), it has been a successful initiative. CAP Tax has generated $17.3 million in revenue which has funded policies, programs, direct advising services and rebates to homes and businesses. While it's nearly impossible to determine what avoided load growth and emissions savings can be directly attributable to CAP Tax programs and staff efforts, the community has accomplished the following:

- Surpassed the original Kyoto target of 7 percent emissions reduction compared to 1990 levels;
- Since 2005, reduced GHG emissions overall by more than 300,000 metric tons (MT) – a 13 percent reduction even with the addition of 7,500 jobs and a 49 percent increase in gross domestic product (GDP); and
- Consumed far less energy since 2007 than was predicted by the utility.

Staff estimates that CAP Tax is directly responsible for avoiding ~500,000 cumulative metrics tons (MT) of GHG emissions since 2007.[30]

The annual estimated CAP Tax revenue for 2018 is approximately $1.8 million, and is allocated as follows:

Figure 12. 2018 CAP Tax Allocation



C&I Building Efficiency

- **EnergySmart and Partners for a Clean Environment (PACE):** In partnership with Boulder County, these programs provide rebates and one-on-one energy advising services to businesses.

[30] On the low end, staff estimates direct emissions reductions from just Energy Smart and energy codes to be 150,000 MT. On the upper end, as much as 1 million MT of avoided emissions could be attributed based on energy load growth projections from Xcel Energy.

- **Building Performance Ordinance:** Requirements for all large (> 20,000 ft2) commercial and industrial buildings to rate and report their energy usage and perform cost effective efficiency actions over time.
- **Clean Energy Finance**: Work with Boulder County to expand utilization of the Colorado Commercial Property Assessed Clean Energy (C-PACE) financing program, and to create other low interest financing options for energy projects.
- **Net Zero Energy Codes (Commercial)**: Every three years, update energy codes to ensure the city is on pathway to the goal of net zero energy codes for all new buildings by 2031. Continuous implementation, evaluation and improvement of energy codes.

Residential Demand Side Management

- **SmartRegs:** Requirements for energy efficiency (equivalent to the 2000 International Energy Conservation Code) in rental housing units, which account for over half of the Boulder's housing stock. In 2018, most of these program costs are being covered by the city's general fund, due to CAP Tax revenue shortages.
- **Residential EnergySmart**: Provides homeowners with energy advising services and rebates.
- **Residential Electrification Pilot**: Boulder has initiated a collaborative effort with 20 U.S. cities and major heat pump manufacturers to accelerate the transition from natural gas furnaces and water heaters to electric heat pumps that can be powered by renewables. Boulder has launched two pilot projects locally in partnership with the County:
  - Comfort365: Targeted advising and additional rebates for all electric air source heat pumps.
  - Roadmap to Renewable Living: Provides homeowners with a comprehensive roadmap that displays financing strategies for bundling efficiency, electrification and rooftop solar photovoltaic (PV) system.
- **Net Zero Energy Codes (Residential)**: Every three years, update energy codes to ensure the city is on pathway to the goal of net zero energy codes for all new buildings by 2031. Continuous implementation, evaluation and improvement of energy codes.

Local Renewables, Electric Vehicles and Market Innovation

- **Local solar programs:** Our programs include providing grants for low-income residents and non-profits, as well as solar rebates (through EnergySmart) and a solar bulk purchasing program in partnership with Boulder County. Staff is now working on new strategies to develop more large scale solar within the city.
- **Marijuana Energy Requirements:** Continued tracking and enforcement of the requirements for marijuana business to offset 100% of their electricity consumption with renewable energy. Development of a new Energy Impact Offset Fund to use the offset payments to develop local renewable projects.
- **Electric vehicle programs:** Subsidizing electric vehicle charging stations and creating bulk purchasing programs for electric vehicles and bikes.
- **Boulder Energy Challenge (BEC):** BEC was launched in June 2014 to support the development and commercialization of innovative emission-reducing technologies and strategies in Boulder. In that initial launch, the BEC funded all six finalist projects, totaling $337,500. The program was relaunched in 2017, and the challenge funded four projects, with $157,600 in total funding.
- **Policy Work**: Promoting legislative and regulatory changes necessary to achieve the city's climate and energy goals.

- **Energy Resilience**: Implementing resilient energy systems to power the community's critical energy needs.

Other

- Administrative and overhead costs
- External communications and outreach to the community and other key stakeholders
- Program tracking and evaluation (including annual GHG Inventories)
- Memberships in professional organizations, regional/national/international coalitions, etc.

ATTACHMENT B: FACT SHEET FOR UTILITY OCCUPATION TAX

What is a franchise agreement?
A franchise agreement, which Xcel has with some incorporated cities and towns, grants Xcel Energy the right to use streets, alleys, rights of way and other public property for the purpose of providing utility service to the residents and businesses.

What is a franchise fee and how is it collected?
As part of each franchise agreement, Xcel Energy pays cities and towns a fee for the use of the alleys, streets and rights-of-way where electric or natural gas equipment is located. This "franchise fee" is 3 percent of the total electric and natural gas revenue and is contributed to the city's general fund. This fee is passed on to city ratepayers, appearing as a line item on customers' Xcel bills. Since the fee is based upon revenue, if a person's or a business's monthly bill increases, the person or business also pays a larger portion of the franchise fee. Similarly, as the total amount the community spends on electricity and natural gas increases or decreases, the total amount collected increases or decreases.

When Boulder and Xcel had a franchise agreement, how much money did the city collect from the franchise fee? How was that funding used?
Prior to 2010, the city collected an average of $3.9 million annually from the franchise fee. This supported General Fund municipal services such as police, fire, snow removal and the library.

When did the franchise with Xcel Energy expire?
The city's franchise agreement with Xcel Energy expired at the end of 2010. The city no longer collects a franchise fee from Xcel Energy.

What is the Utility Occupation Tax (UOT)?
The UOT was originally created to recover the loss in franchise fee revenue. The tax is a flat amount charged to Xcel Energy as an annual lump sum. The utility then applies a formula to convert that flat amount into a percentage of Xcel Energy's revenue. The percentage is applied to all customers' bills, regardless of customer class (residential, commercial, etc.). Because the UOT is set at an amount intended to replace the franchise fee, the result is that customers pay Xcel Energy and Xcel Energy remits to the city an amount that is roughly equivalent to the original 3% franchise fee.

When did voters approve the UOT?
To maintain critical city services that were funded by the franchise fee, Boulder voters approved the collection of a utility occupation tax in 2010 and extended approval in 2015 through 2022. The portion of the UOT that replaces the franchise fee provided $4.3 million to the general fund in 2017 (see Figure 14 for historic collection information as well as projections of future revenue). In November 2011, Boulder voters elected to raise the utility occupation tax to fund the exploration of a municipal electric utility, creating two uses of the UOT revenue. In 2017, Boulder voters approved an extension and increase of this portion of the UOT through 2022 or "when the city decides not to create a municipal utility or commences delivery of municipal electric utility services." (Boulder Municipal Code Section 3-13-2(c).

How is the UOT calculated and collected?
In October of each year, the city sends a letter to Xcel Energy specifying the total amount of UOT to be collected the following year. Xcel then calculates the tax percentage based on its estimate of city electric and natural gas revenue for the following year and applies that percentage to each customer's bill. At the

end of the year, if there is an under- or over-collection, Xcel adjusts the tax percentage up or down for the following year[31].

Figure 13: Utility Occupation Tax Revenue Allocation 2011-2022

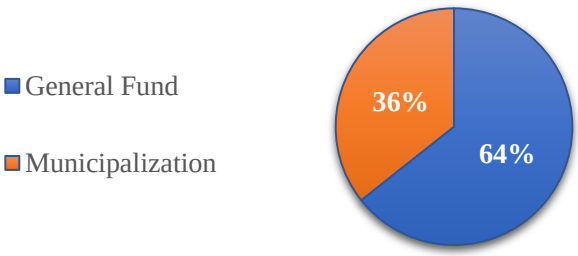


Figure 14: Detailed Utility Occupation Tax Revenue Allocation 2011-2022

Year	Total Franchise Fee Collected	Total UOT Collected	General Fund	Municipalization
2002	$ 2,585,881	$ -	$ 2,585,881	$ -
2003	$ 2,997,411	$ -	$ 2,997,411	$ -
2004	$ 3,157,376	$ -	$ 3,157,376	$ -
2005	$ 3,676,000	$ -	$ 3,676,000	$ -
2006	$ 3,910,000	$ -	$ 3,910,000	$ -
2007	$ 3,702,000	$ -	$ 3,702,000	$ -
2008	$ 4,347,000	$ -	$ 4,347,000	$ -
2009	$ 3,912,000	$ -	$ 3,912,000	$ -
2010	$ 4,678,000	$ -	$ 4,678,000	$ -
2011	$ -	$ 4,100,000	$ 4,100,000	$ -
2012	$ -	$ 6,000,000	$ 4,100,000	$ 1,900,000
2013	$ -	$ 6,000,000	$ 4,100,000	$ 1,900,000
2014	$ -	$ 6,180,000	$ 4,223,000	$ 1,957,000
2015	$ -	$ 6,365,400	$ 4,349,690	$ 2,015,710
2016	$ -	$ 6,365,400	$ 4,349,690	$ 2,015,710
2017	$ -	$ 6,365,400	$ 4,349,690	$ 2,015,710
2018	$ -	$10,556,362	$ 4,480,181	$ 6,076,181
2019	$ -	$ 9,556,362	$ 4,540,652	$ 5,015,710
2020	$ -	$ 6,556,362	$ 4,540,652	$ 2,015,710
2021	$ -	$ 6,556,362	$ 4,540,652	$ 2,015,710
2022	$ -	$ 6,556,362	$ 4,540,652	$ 2,015,710
2011-2022 TOTAL	**-**	**$81,158,010**	**$52,214,859**	**$28,943,151**

[31] see sheet 126 in Xcel Energy's published tariff schedule for a full description of the Utility Occupation tax calculation

ATTACHMENT C: SAVINGS PROJECTIONS AND REVENUE NEEDS

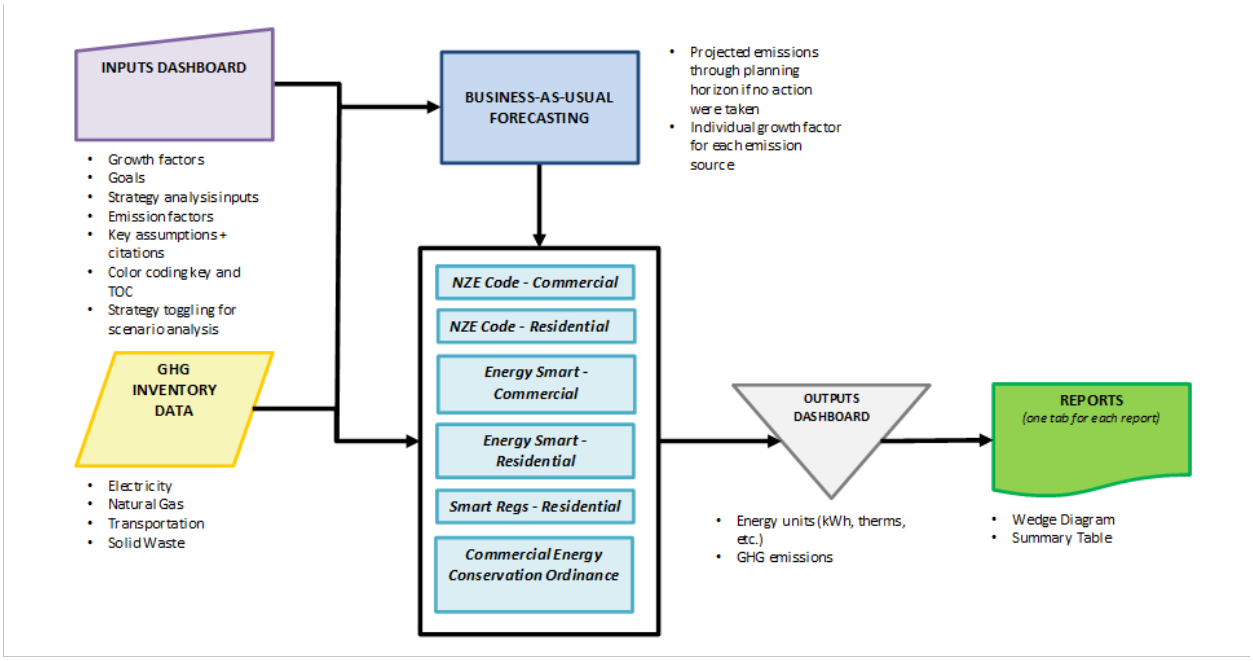
Climate Commitment Projection Tool

As part of the process that led to adopting the 80 percent GHG reduction goal, staff and consultants developed a detailed climate commitment projection tool that quantifies emission reductions associated with existing (such as SmartRegs, updates to building energy codes, etc.) and planned future programs (e.g. commercial building electrification programs) and projects them out to the proposed milestone dates. The tool incorporates both historical and projected emissions reductions by year, from 2005 through 2050 and was crucial in showing that, while not easy, there was a pathway to achieving this goal.

The tool helps capture the interplay between different programs and projected trends. For example, while energy efficiency efforts in existing and new buildings will help reduce electricity use in buildings, the electrification of natural gas appliances and gasoline vehicles will increase electricity use in buildings. Also, in the near-term, vehicle electrification will only reduce vehicle emissions modestly (~30 percent) due to the carbon intensity of Boulder's current electricity supply. However, with increasing renewable electricity on the grid, emissions through vehicle electrification will drop significantly (>50 percent). Perhaps most importantly, the tool supports ongoing analysis of various program efforts, emerging trends and potential new strategies—reflecting the dynamic nature of a rapidly changing energy world and the many factors that will affect Boulder's ability to meet its climate goals.

As illustrated in the wireframe in Figure 15, the work flow for the tool begins with the two inputs tabs: Inputs Dashboard and GHG Inventory Data. The inputs tabs are used to calculate a business-as-usual (BAU) forecast and the programs tabs use these inputs to automatically calculate assumed energy and emissions savings, which are ultimately displayed in the Outputs Dashboard and the two reporting tabs: Wedge Diagram and Summary Table.

Figure 15. Analysis Tool Wireframe



For the full methodology, including assumptions, inputs and reporting, please see Attachment C of the [December 6, 2016 City Council Memo].

Revenue Needs Analysis

To complete the near-term funding needs assessment, staff first identified the savings required by 2025 to be on track to meet the key 2030 climate commitment goals:

- 50 percent reduction in community GHG emissions
- 80 percent reduction in city organization GHG emissions
- 100 percent renewable electricity supply
- 100 megawatts (MW) of local renewable energy installed
- 90 percent landfill diversion
- Net-Zero Energy Building Codes (2031)

Once the emissions, electricity and natural gas savings by program were identified, staff summed and allocated program savings by effort (Figure 16)

Figure 16. 2025 Savings Targets from Climate Program Projection Tool

Effort	2025 Target	Unit for 2025 target
Reduction in C&I Electricity (Regulatory)	104,000,000	kWh
Reduction in C&I Electricity (Voluntary)	43,900,000	kWh

Effort	2025 Target	Unit for 2025 target
Reduction in C&I Natural Gas from Efficiency	2,190,000	therms
Reduction in C&I Natural Gas from Fuel Switching	660,377	therms
Reduction in Residential Electricity (Regulatory)	21,100,000	kWh
Reduction in Residential Electricity (Voluntary)	5,690,000	kWh
Reduction in Residential Natural Gas from Efficiency	1,670,000	therms
Reduction in Residential Natural Gas from Fuel Switching	1,122,642	therms
Reduce Emissions from City Operations	34,000	metrics tons of GHG emissions
Electrify Vehicles and Reduce Vehicle Miles Traveled	23,960	metrics tons of GHG emissions
Local Renewable Electricity Generation (beyond rooftop rebates covered under electricity reduction)	10	MW Installed
Policy work (PUC and state and federal policy)	57,200	metrics tons of GHG emissions reduced

With the energy and emissions savings needs identified from the tool, staff then estimated the program costs required each year based on historical achievements and implementation costs, and future full-time employee (FTE), resources and incentives needed. These cost estimates by effort are shown in Figure 17.

Figure 17. Program Effort Cost Estimations

Effort	Annual Cost ($/year)	Programs and Activities Requiring Funding
Reduction in C&I Electricity (Regulatory)	$373,144	* Commercial EnergySmart (efficiency and solar rebates, custom rebates and rebates for energy assessments) * Energy Codes (net zero by 2031, outcome based codes, stronger refrigerant regulation, etc.) * Building Performance Ordinance (BPO) – full implementation plus consideration of energy use intensity requirements by building type starting in 2030 * Marijuana electricity offsets (tracking energy use and collecting offset payments * Future new rebates for CU Boulder, BVSD etc.
Reduction in C&I Electricity (Voluntary)	$878,000	
Reduction in C&I Natural Gas from Efficiency	$127,750	
Reduction in C&I Natural Gas from Fuel Switching	$154,088	

Effort	Annual Cost ($/year)	Programs and Activities Requiring Funding
Reduction in Residential Electricity (Regulatory)	$75,705	* Residential EnergySmart (including solar rebates) * Electrification pilots and rebate programs * Mid-stream incentives for electric heat pumps * Energy Codes (net zero by 2031, outcome-based codes, stronger refrigerant regulation, etc.) * SmartRegs 2.0 * Consider future policy for owner occupied homes * Future neighborhood outreach efforts paired with bulk purchasing to encourage solar
Reduction in Residential Electricity (Voluntary)	$132,767	
Reduction in Residential Natural Gas from Efficiency	$97,417	
Reduction in Residential Natural Gas from Fuel Switching	$312,932	
Reduce Emissions from City Operations	$81,667	* Pilot new and innovative strategies on city facilities for proof of concept and case studies (e.g. electric heat pump water heaters with natural refrigerant, building materials that absorb $C0_2$, etc.) * Ensure new building are net zero energy * Develop facility and fleet standards for sustainability and resilience
Electrify Vehicles and Reduce Vehicle Miles Traveled	$1,655,916	* Rebates for electric vehicles, e-bikes and public charging in key locations * Staff time to work on policy change to enable electrification of transit * Develop network of fast charging stations * Incentives for city fleets to shift to electric vehicles * Capital investment to electrify HOP transit route * TMP efforts around walk/bike/transit/ride share (includes restoring resources that were reduced in the 2018 budget reductions)
Local Renewable Electricity Generation (beyond rooftop rebates covered under electricity reduction)	$485,416	* Use of Energy Impact Offset Fund to develop more solar * Use city land for community solar development * Work with partners to support more local development * Performance Based Incentives * Expand bulk purchasing program that is being piloted for city facilities
Policy work (PUC and state and federal policy)	$0	* Influencing key state and federal legislation, intervening in key proceedings at the PUC * No additional resources needed, currently partially funded by UOT – this will be a funding gap if the 2020 Go/No-Go Vote does not pass and UOT expires in 2021
Energy Resilience	$132,916	* Pilot behind-the-meter energy storage solutions * Consider future policy and energy codes * Micro-grid potential study
Ecosystems work (carbon sequestration, Emerald ash borer, pollinators), Climate Resilience	$289,583	* Carbon sequestration and soil health programs * Soil sequestration payments (@$10/ton) * Urban Canopy Support
Circular Economy	$22,916	* Staff time to pilot efforts are creative resource reuse

Effort	Annual Cost ($/year)	Programs and Activities Requiring Funding
Food consumption (food choice and reducing food waste)	$31,250	*Education and outreach
Total	***$5,492,094***	

These cost estimates include the need for an additional 3-5 FTE to support unfunded program development and implementation across a variety of departments and divisions: Planning + Sustainability, Transportation, and Open Space and Mountain Parks (OSMP). These estimated costs were summed by fuel source (electricity, natural gas and vehicles) and the total electricity revenue needs then subtracted out the current CAP Tax revenue so that the final revenue needs identified were *in addition* to the current revenue collected from the existing CAP Tax. The revenue estimates by programmatic sector are listed below in Figure 18.

Figure 18. Total Annual Revenue Needs by Source

Revenue Needs	$/year
Electricity	$1,480,000*
Natural Gas	$1,170,000
Vehicles	$1,800,000
Total	**$4,450,000**

**Excludes current CAP Tax revenues*

ATTACHMENT D: FEEDBACK FROM STAKEHOLDER ENGAGEMENT

Tech Team

Staff met with a local group of community members on July 13, 2018, the Tech Team, who were instrumental in developing the initial CAP Tax and campaigning for its passage. This group also played a major role in advocating for creating a local electric utility as a necessary means for the city to meet its climate goals.

The intent of this meeting was to gather initial feedback and understand the Tech Team's perspective on the revenue needs and potential funding solutions. The Tech Team agreed that:

a) there is value in the CAP Tax and the programs and initiatives it funds;
b) the current CAP Tax revenue is insufficient; and
c) the city needs to redistribute the tax so that we are encouraging electrification and discouraging natural gas and petroleum use.

However, the general consensus was opposition to the exploration of additional funding through taxes or fees, especially prior to the 2020 Go/No-Go Vote on the electric utility development. The Tech Team is very supportive of municipalization and does not want to distract from, or lose voter focus or support, for that effort.

This feedback factored into staff's careful consideration of the timing of any further exploration or analysis and is reflected in the recommendation to pause any revisions to CAP Tax or analysis of new natural gas taxes/fees until after the 2020 vote.

Environmental Advisory Board (EAB)

Staff met with the EAB on Aug. 1, 2018, to get feedback on the options under review and criteria to support analysis. The EAB members had the following feedback:

- Revenue Needs:
  - The board suggested that staff should have a version of funding needs that is a "fiscally constrained option," such as what would be necessary to achieve 80% of the desired results. Staff added this option with Scenario 1 (shown in **Attachment E**).
- Criteria for evaluation of carbon tax/fee options:
  - EAB agreed with the criteria but felt it would be helpful to indicate the driving force or weight these criteria against each other. Specifically, is it to create revenue to meet climate commitment goals or to affect consumer behavior? Staff addressed this by creating deal breaker criteria (i.e. legal infeasibility) and then weighting everything else equally.
  - Make it clear that revenue stability means longevity of revenue.
  - Add "attribution" – the proximity of the tax/fee to actual reduction you want to see. Staff address this by adding the criteria "Alignment with Strategic Objectives".
- Options:

    - Separate from this effort, the board would like to see staff pursue voluntary contributions to the Energy Impact Offset fund. This is slated for the 2019 workplan.
    - The board supported the addition of natural gas tax/fees as options to investigate further.
    - Vehicle Options:
        - The board cautioned against the overly simple one-time Title fee that had a flat rate for all cars but excluded EVs – this would be a social equity issue.
        - The board would like Vehicle Miles Traveled (VMT) to be in the formula somehow, even if people are simply asked to voluntarily report their annual mileage like you do for insurance rates.
    - The tax/fee should be tied to the behavior we want to see – so very important to also tax vehicles and natural gas (not just electricity)
    - CAP Tax/Natural Gas Options: The board would like to see a block charge where you get charged much higher rates for going over "reasonable usage". Staff will pursue this if council wants to move forward with any of these options.
- Timing:
    - The board would like this to be addressed sooner rather than later, so the city doesn't fall behind on its goals and targets.
    - The board does not think we need to wait until after the 2020 Go/No-Go Vote because the community overwhelmingly supports carbon taxes, as shown by how much the CAP Tax has passed by, even with very little campaigning in 2015
- Other:
    - The board suggested focusing on the industrial sector if the biggest concern is revenue.
    - The board expressed general concern about fees or taxes being in line with social equity issues, so the wealthy aren't receiving all the breaks.

Key Stakeholders from Business Community
On Sept. 18, 2018, staff met with a group of key members of the business community that are traditionally high energy users. These community members included:

- Boulder Chamber of Commerce,
- University of Colorado,
- Boulder Valley School District,
- Boulder County,
- Large property managers and owners of commercial buildings and
- Owners of large industrial campuses.

The goal of this meeting was to involve key stakeholders early on in this effort and define the problem, goals, objectives and analysis the city is undertaking around climate funding options. Because the business sector does not have the opportunity to vote on such mechanisms, but may be significantly impacted as large energy users, staff wanted to

gather perspectives, concerns and ideas from the business community to ensure these key stakeholders were accurately reflected and considered in the evaluation process.

Staff presented the main options under consideration for funding climate and energy programs that would directly impact businesses, specifically the electricity and natural gas options.

Summary of Feedback:

- Any new tax or fee should be evaluated within the overall context of the price of doing business in the community. Attendees want to ensure staff evaluate each option from a wholistic perspective of what businesses face today (i.e. commercial linkage fee increases, Trash Tax, Utility Occupation Tax, etc.).
- The need for rate predictability: if the city moves to a tax that is based on metric tons of carbon, the price per kWh (which will vary depending on the electricity grid mix) must be laid out clearly so that business can forecast costs.
- Adjusting the existing CAP Tax rates was preferable to most businesses because the community is already familiar with the existing CAP Tax, rather than trying to implement a new tax.
- Natural gas options:
    - Electrifying commercial buildings is such a challenging and expensive effort, a natural gas tax is unlikely to change behavior unless the tax (and revenues) are high enough to drive behavior change and provide significant rebates to offset the costs of electrification.
    - It would be impossible to set rates high enough to drive change *and* keep rates reasonable. Therefore, a natural gas tax seems more like a penalty.
- Attendees requested detailed information on CAP Tax revenues currently collected and how they are allocated across programs and sectors in the community. Attendees stressed that continued engagement, transparency and fair consideration was necessary. This information was provided to attendees within one week of the meeting.

ATTACHMENT E: DETAILED ANALYSIS OF FUNDING OPTIONS

The following options were eliminated from further consideration because they were deemed nonviable for the reasons described here.

Figure 19: Nonviable Options

Option	Reason for Nonviability
Pay at the Pump: Gasoline/diesel tax ** Eliminated due to legal infeasibility*	This is pre-empted by state law because the state already applies a gasoline tax that is designed to the cover the impact of vehicles. Further, if only Boulder had this tax, people would likely choose to fuel their vehicles in neighboring towns.
Methane Natural Gas Tax/Fee: Tax or fee based on the social cost of methane ** Eliminated due to technical infeasibility and unreasonably high rates*	The social cost of methane is relatively new, not well understood and has extremely high rates (28x higher than the social cost of carbon). This would be difficult for voters to understand and would place a high economic burden on residents and businesses.
Vehicle Registration Efficiency Tax/Fee based on MPG or VMT: Based on the specific fuel efficiency (miles per gallon – MPG) or on vehicle miles traveled (VMT) ** Eliminated due to technical infeasibility*	Rated MPG is not included in the info stored within the state registration software system, DRIVE, and the system does not have the capabilities to use formulas or look-up tables calculate this from other info. There is no way to collect reliable VMT info without changing the entire annual registration process and requiring the car to be present to determine the fee.
County-wide vehicle efficiency tax/fee: Tax or vehicle imposed by Boulder County ** Eliminated due to legal infeasibility*	The county does not have the authority to do this, as a statutory political sub-division. The need to change this is addressed in the city's 2018 Legislative Agenda.
Congestion Pricing: an automated system that charges cars for entering certain zones ** Eliminated due to nonviable revenue potential*	Boulder's traffic volumes are not high enough to justify the current initial and on-going costs for these systems – these wouldn't generated significant revenue unless the prices were set extremely high. Boulder is closely watching Seattle's development of their congestion pricing scheme and will continue to re-evaluate costs in future years.
Tax Natural Gas Production: Apply a tax on the natural gas utility (must be set as a % of revenue), which would be passed through to natural gas suppliers and customers. ** Eliminated due to unreasonable burden on commercial and industrial customers*	When a tax is applied to the utility as a percentage of their revenue, the utility (Xcel in this case) then applies that same percentage to all customers regardless of rate class. This results in commercial and industrial customers paying the same rate as residential customers, which could jeopardize the ability of some major primary employers to retain business operations within Boulder.

Evaluation of Viable Options
The following tables summarize the pros and cons of the viable options and evaluate each option against the previously defined criteria.

Figure 20: Pros and Cons of Viable Options

	Pros	Cons/Items requiring further study
Option 1: Adjust CAP Tax Rates *Adjust the tax rates currently set on consumption to a value that would represent both the carbon intensity of the grid and the Social Cost of Carbon (SCC) impact. While the SCC rate would increase over time, the carbon intensity of the grid would decrease.*	✓ Existing widespread voter support for CAP Tax. ✓ Sets electricity rates in a metric directly tied to the city goals. ✓ Acknowledges improvements in the grid over time. ✓ Sets a more constant revenue stream compared to current decreasing rates tied to consumption. ✓ Social Equity: Able to set a minimum level of kWh consumption before tax is triggered or create an Energy Tax Rebate for lower income residents.[32]	– Some unpredictability of rates. The SCC and grid emissions factor must be fixed for some length of time, such as 5 years, and future SCC rates published. – State and federal entities could demand that they are exempt from this city tax. – Requires collaboration with Xcel to ensure that we can exempt new forms of off-site renewables, like Renewable Connect.[33]
Option 2: Tax Natural Gas Consumption *Set a rate in $/MT CO2e, convert to $/therm and apply this to end user consumption. Rate will increase every 5 years to approach SCC.*	✓ Aligns with city's efforts to encourage a switch from natural gas to electricity and creates a revenue source for currently largely unfunded electrification work ✓ Administrative requirements to add line item would be minimal for the residential sector. ✓ Social Equity: Able to set a minimum level of therm consumption before tax is triggered or create an Energy Tax Rebate for lower income residents. [34]	– Large admin burden with taxing the commercial sector; natural gas is an open market in CO, with multiple (currently 16) transport gas providers ("suppliers"). – Difficult to monitor which suppliers are participating in the Boulder market as it changes over time. – State and federal entities could demand that they are exempt from this city tax.

[32] Similar to the city's current Food Tax Rebate
[33] The city must also determine if virtual purchase power agreements (PPAs) should be excluded as well.
[34] Similar to the city's current Food Tax Rebate

	Pros	Cons/Items requiring further study
Option 3: Natural Gas Franchise Fee Adder *Negotiate a Franchise Agreement with our natural gas provider, Xcel Energy. Remove the natural gas franchise fee replacement portion of the existing Utility Occupation Tax (UOT) and replace this with the standard 3% franchise fee, plus a % adder to generate dedicated funds for climate commitment efforts.* *Even if the city doesn't pursue this "adder", the city should consider negotiating a standard Franchise Fee Agreement.*	✓ Aligns with city's efforts to encourage a switch from natural gas to electricity and creates a revenue source for currently largely unfunded electrification work ✓ State and federal entities could not demand that they are exempt from this. ✓ Xcel would pass costs thru to all third-party natural gas suppliers, easing admin burden to city. ✓ Reduces confusion and increases transparency around UOT by separating out natural gas franchise fees. ✓ The city should have a Franchise Agreement with its long-term natural gas provider.	– Requires negotiations with Xcel Energy, during municipalization negotiations. – May requires changes to existing UOT, which could create voter confusion. – May result in slight revenue volatility as the price of natural gas passed through by Xcel and other providers fluctuates daily – The "adder" rate may not be able to be varied across sectors, which could jeopardize the ability of large industrial facilities with high gas loads to retain business operations within Boulder.[35]
Option 4: Vehicle Registration Efficiency Fee *Add an annual fee to registration to reduce GHG emissions from transportation and drive the market toward electric vehicles (EVs). This would be a fixed % rate applied to the value of the car (EVs exempt, hybrids charged half the rate of gasoline vehicles).* *The county administers the vehicle registration system as an arm of the state pursuant to state motor vehicle registration laws.*	✓ Aligns with strategic objective to drive the market towards EVs and creates a revenue source for unfunded EV work. ✓ Many other neighboring cities are interested in this and it's highly replicable. ✓ Boulder County is willing and able to collect and remit this tax or fee for the city. ✓ Well suited to a fee (vs a tax) because of the clear link to how the funding would be used. This would allow future adjustment of rates as DRIVE (the state registration system) evolves, without going back to the voters. ✓ Would level the playing field a EV owners who are charged an extra $50 registration fee.[36]	– DRIVE has limited capabilities. Need to confirm that is has the basic functionality of applying a percentage rate to the value of the car so the tax/fee is not regressive. – The city would need to work with both state and Boulder County partners to fully implement, and contacts at the state offices have been less than responsive thus far.

[35] Minneapolis recently implemented this franchise fee adder to fund their climate efforts. They were able to vary rates by sector, but staff has not been able to get confirmation from our Xcel contacts if this is possible in Colorado.
[36] To compensate for the fact that they don't pay gasoline tax, which funds road maintenance.

	Pros	Cons/Items requiring further study
Option 5: Revenue Neutral Option *Reduce the rates of CAP Tax on each sector and add a natural gas tax or fee (with varying rates by sector. Collect approximately the same overall amount of revenue as the existing CAP Tax but from different fuel sources that better reflect spending, community goals and strategic objectives*	✓ Ensures that multiple carbon-based fuels are taxed while causing no net increase in what utility customers currently pay. ✓ Palatable way to add natural gas tax now and allows for future rate increases.	– Does not address declining revenues or the funding gaps identified to meeting climate commitment and resilience goals. – The city would have to eliminate and/or reduce programs and rebates, and risks not meeting climate commitment goals unless the community achieves this all through voluntary, unsupported action.
Option 6: Status Quo *Keep the current rates in place until CAP Tax sunsets in 2023*	✓ Does not change rates, processes or systems as it already exists.	– Not aligned with strategic objectives to electrify vehicles and buildings. – Results in a continually declining revenue stream for CAP program implementation. – All of the cons from the Revenue Neutral Option.

The figure below compares each option against the evaluation criteria for viable options.

- Administrative time/ease: *What are the one time and recurring costs and staff time required for the city?*
- Impact on local business: *What is the impact to local economic vitality? Does this option ensure that businesses do not bear an inequitable burden?*[37] *Can rate stability and predictability be provided?*
- Technical feasibility: *How difficult is this to implement?*
- Social equity: *How easy is it to structure this to reduce the burden to residents with lower incomes?*
- Alignment with strategic objectives: *Will this encourage efficient and sustainable behavior and purchasing choices and discourage use of natural gas and petroleum?*
- Revenue stability: *Will this provide revenue diversity and longevity? Is it possible for state or federal buildings to refuse to pay this local tax or fee?*
- Political/Public Support: *What will the voter/community support likely be?*

[37] Special consideration was given to the fact that Boulder houses industrial facilities with very high energy use that are very important to the local economy, and that businesses do not get to vote for these taxes.

Figure 21: Evaluation of Viable Options Against Criteria

	Admin Time/ Ease	Impact on local business	Technical feasibility	Social Equity	Alignment with Strategic Objectives	Revenue Stability	Political/ Public Support
Option 1: Adjust CAP Tax Rates							
Option 2: Tax Natural Gas Consumption							
Option 3: Natural Gas Franchise Fee Adder*							
Option 4: Vehicle Registration Efficiency Fee**							
Option 5: Revenue Neutral Option							
Option 6: Status Quo							
KEY							
= Fully achieves goal = Fails to achieve goal							
** Assumes that it will be possible to vary % adder by sector and to set a minimum therm consumption for residential before this is triggered. Need to confirm with Xcel.* *** Assumes that it will be possible to apply a % rate to the value of the car. Need to confirm with the Department of Revenue and Boulder County.*							

This evaluation matrix shows that Options 1 through 4 should be considered and further analyzed.

ATTACHMENT F: DETAILED DESCRIPTION OF SCENARIOS AND REVENUE MODEL

Revenue Model

A Carbon Tax Revenue Model (Model) was created to help model the cost impacts to residents and businesses, and the revenue generated by various options. The original version of the model was created by a team of Duke graduate students as part of a capstone project, and was then modified, expanded and improved by Raftelis, a consulting firm hired by the city to help with this analysis. The key components and assumptions of the Model include:

Energy Consumption Projections

- Based on Xcel Energy's load growth projections and projected reductions. This comes from the city's Climate Commitment Projection Tool which models out GHG emissions to 2050, including all current and planned efforts to reduce emissions (from city efforts, utility programs, market transformation, state and federal requirements, etc.).
- Typical annual energy usage for a variety of customers (residential, industrial and differently sized commercial customers) comes from the city GHG Inventory and Building Performance Program data.

Figure 22: Assumed Energy Usage Levels for "Typical" Customers

Description	Electrical Usage (kWhr / yr)	Natural Gas Usage (therm / yr)
Residential	5,000	641
Commercial [1]		
5,000 sq. ft.	130,417	4,450
15,000 sq. ft.	391,417	13,350
30,000 sq. ft.	782,500	26,700
Industrial [2]	32,040,000	84,240

[1] Assumes 26.08 kWhr / sq. ft. / yr and 0.89 therm / sq. ft. / yr.
[2] Xcel assumes a typical Large Commercial customer uses 7020 therms / month.

Electricity

- Sales of electricity through Xcel's renewable programs (Windsource, Renewable Connect) which are exempt from CAP Tax are held constant at 2017 levels.
- Elasticity for electricity is assumed to be -0.2.[38]

[38] Elasticity is a measure of how demand changes in response to price changes. Estimates of elasticity are usually presented as a range of values that frequently vary from study to study. The values used in the model were chosen as commonly cited within the range of short-term elasticity estimates.

- Annual rate increases for electricity are projected to be 2.84 percent in 2019, 2.38 percent in 2020, and 1.42 percent in 2021, and 3.1 percent annually thereafter.[39]

Natural Gas

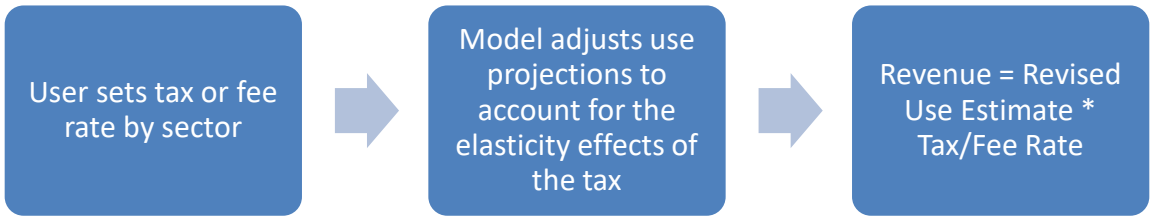
- City does not know the extent of Industrial consumption separate from Commercial. Industrial usage is assumed to be the same relative amount to Commercial as it is in electrical usage. This should be further refined in subsequent steps prior to implementation.
- Elasticity for natural gas consumption is -0.15.
- Natural gas rates are held constant through 2020, before annual rate increases between 2021 and 2025 range from 0.5% to 2.7%.

Vehicles

- The current count of vehicles in the city is provided by Boulder County as of 2018.
- The current number and mix of vehicles in the city is held constant through the study period. Projections should be further refined in subsequent steps prior to implementation.
- The assumed average car value is held constant though the study period and is based on average 5-year depreciation (provided by Edmunds.com) of the 2018 Average Transaction Price of a new car (provided by Kelley Blue Book).
- Vehicle efficiency registration rates are assumed to increase by 3.5% each year.

Using these data and estimates, the Model allows rates to be developed for several variations of carbon taxes and fees. The Model calculates the annual bill impacts (for a typical residential home, commercial business, and industrial facility) of the various taxes and fees. The Model also estimates the total revenue that would be generated by each option, as well as cash flows for the three "sub-funds" (electricity, natural gas and vehicles) and a cash flow for the total fund.

Method for Electricity and Natural Gas Taxes/Fees



Additional features of the model allow different methodologies of charging carbon taxes to be tested. For instance, the user can define the electric tax rate as either a consumption tax (e.g., charged on a per kWhr basis) or a carbon tax that is responsive to the projected grid intensity.

Method for Annual Vehicle Efficiency Fee

[39] 2018 to 2021 rates are provided by Xcel's 2018 – 2021 Integrated Resource Plan (IRP), later years' rate increases were estimated by city staff

In this calculation, there are no elasticity effects as it is not expected that an annual fee would measurably reduce car ownership levels, and the model is fairly simple:

There is no fee charged for electric vehicles, a fixed percentage rate (applied to the value of the car) for hybrids, and higher rate for gasoline vehicles. The annual revenue is calculated based on the number of vehicles by type (gasoline, hybrid, or electric), the assumed average value of vehicles, and defined tax/fee rates.

Annual Vehicle Efficiency Tax/Fee Revenue = $Number_{gas}$* % $Rate_{gas}$ * $AverageValue_{gas}$ + $Number_{hybrid}$* % $Rate_{hybrid}$ * $AverageValue_{hybrid}$

The total revenue generated by this fee is dependent upon the value of the vehicle fleet in the city. Only the total number of registered vehicles by type (e.g., gas, diesel, hybrid, electric, etc.) has been provided by the county at this time. This study assumed a typical vehicle value of $13,420, which is based on an Average Transaction Price of $36,270[40] for new vehicles as of January 1, 2018, and the retention of 37% of a five-year old vehicle's original value[41]. A more accurate estimate of typical bill impacts and total revenue generation is recommended if additional analysis and potential implementation of this source is considered.

Scenarios

It should be emphasized that the rates, revenues and bill impacts that are presented are only preliminary estimates. All metrics are based upon future projections of energy production, energy use (some of which is highly weather dependent) and vehicle ownership. Additionally, the city does not have access to Xcel Energy customer data and the current exact electric and natural gas demands for the Residential, Commercial and Industrial customer sectors. These estimates, in many cases, should be refined with better information if council would like to pursue these options.

All Scenarios include the three recommended options:

- Adjust CAP Tax Rates
- Natural Gas Consumption Tax (chosen for the modeling exercise, the Natural Gas Franchise Fee Adder could be substituted and structure to collect revenue in the same way)
- Vehicle Registration Efficiency Fee

The analysis here is based upon two basic scenarios.

- **Scenario 1: Minimum Cost Impact** is based upon limiting the bill impacts to customers, compared to what they currently pay in total CAP Tax (~$25/year). For instance, a typical Residential household will pay only about $65/year in all carbon related taxes and fees. Uses the current ratio of CAP Tax rates between

[40] Kelley Blue Book, https://mediaroom.kbb.com/2018-02-01-Average-New-Car-Prices-Rise-Nearly-4-Percent-For-January-2018-On-Shifting-Sales-Mix-According-To-Kelley-Blue-Book

[41] https://www.edmunds.com/car-buying/how-fast-does-my-new-car-lose-value-infographic.html

Residential, Commercial and Industrial customers in the new electric and natural gas rates.

- **Scenario 2: Full Funding** sets rates to generate the revenue need to achieve the city's Climate Commitment goals. Identified spending totals $6.8 million per year, including the projected $1.75 million for 2019 CAP Tax. Scenario 2 is split into two sub-scenarios.
    - **Scenario 2A** uses the current ratio of CAP Tax rates between Residential, Commercial and Industrial customers in the new electric and natural gas rates.
    - **Scenario 2B** assumes that "all carbon is created equal" and should be taxed as such. A uniform carbon tax rate is applied across electricity and natural gas and all customer classes.

The electricity and natural gas rates were set in terms of $/MT CO_{2e}. Likely, these rates would be set for a period of 5 years, and incrementally increased every 5 years up to cap – with this method, the carbon price would slowly approach the social cost of carbon over time. In all scenarios, a fixed average grid emissions rate of 0.55/MT CO_{2e}-MWh was used. This will be readjusted every 5 years, so there can be rate predictability while still reflecting the "greening" of the grid.

Figure 23: Scenarios Modeled

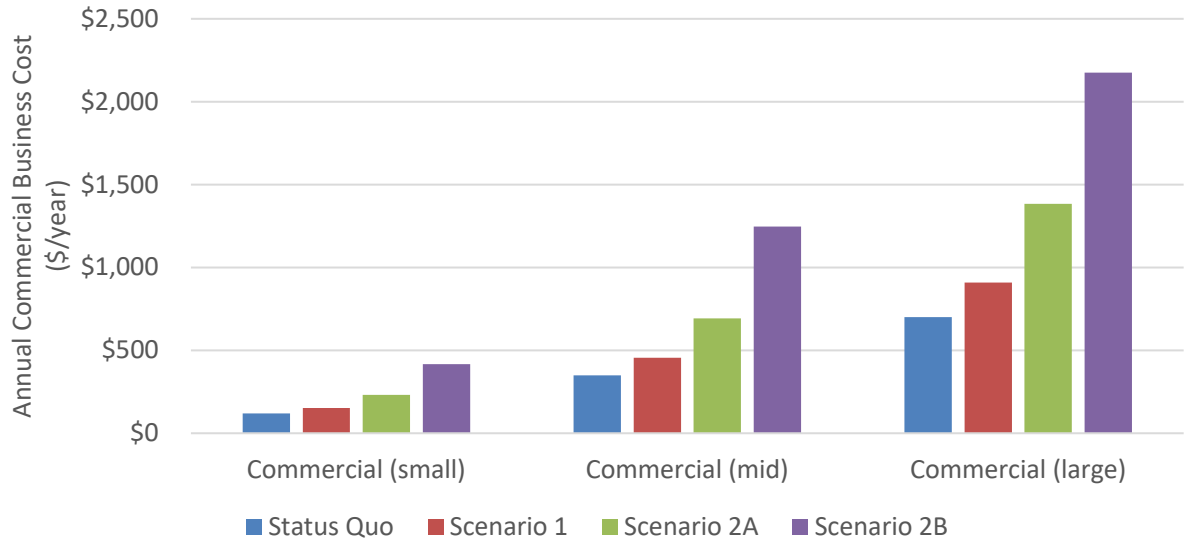
Scenario	Modeled Rates
Scenario 1: Minimum Cost Impact (vary rates by sector) Designed to minimize cost impact to residents and businesses. Will generate $3.9 million/year in 2020, grows to $4.3 million/year in 2025. • Maintains the differentiated rates between customer classes from current CAP Tax • Natural gas rates set to initially have the same bill impact as the CAP Tax[42] • Vehicle efficiency fee applied to value of car and set to be roughly $15/year (for average car)	CAP Tax – Similar to current rates, but in $/MT CO_{2e} • Residential: $9.10/MT ($0.0050/kWh) • Commercial: $1.67/MT ($0.0009/kWh) • Industrial: $0.56/MT ($0.00031/kWh) Natural Gas Tax or Fee • Residential: $7.05/MT ($0.0389/therm) • Commercial: $1.29/MT ($0.0071/therm) • Industrial: $0.43/MT ($0.0024/therm) Vehicle Registration Efficiency Fee • 0.11% fee for gasoline vehicles, 0.055% for hybrids • No tax for EVs • Fee increases 3.5% every year

[42] For example, residential customers' annual bill impacts are approximately $25 for CAP Tax and $25 for natural gas.

Scenario	Modeled Rates
Scenario 2A: Full Funding (vary rates by sector) Designed to fully fund the needs identified ($6.5 million/year in 2020, grows to $7 million/year in 2025). • Maintains the differentiated rates between customer classes from current CAP Tax • Vehicle efficiency fee is set to recover vehicle-related spending programs • Natural gas rates are set to be higher than CAP Tax rates to encourage transition to electricity	CAP Tax – Rates are set in terms of $/MT • Residential: $12.37/MT ($0.0068/kWh) • Commercial: $2.27/MT ($0.00125/kWh) • Industrial: $0.76/MT ($0.00042/kWh) Natural Gas Tax or Fee • Residential: $15.00/MT ($0.08275/therm) • Commercial: $2.76/MT ($0.0152/therm) • Industrial: $0.92/MT ($0.00507/therm) Vehicle Registration Efficiency Fee • 0.20% fee for gasoline vehicles, 0.10% for hybrids • No tax for EVs • Fee increases 3.5% every year
Scenario 2B: Full Funding (with uniform rates across sectors) Designed to fully fund the needs identified ($6.5 million/year in 2020, grows to $7 million/year in 2025). • A uniform carbon tax rate is set across electricity and natural gas and across all sectors • Vehicle efficiency fee is set to recover vehicle-related spending programs	CAP Tax – Rates are set in terms of $/MT • All rates are $4.32/MT ($0.0024/kWh) Natural Gas Tax or Fee • All rates are $4.32/MT ($0.0238/therm) Vehicle Registration Efficiency Fee • 0.20% fee for gasoline vehicles, 0.10% for hybrids • No tax for EVs • Fee increases 3.5% every year

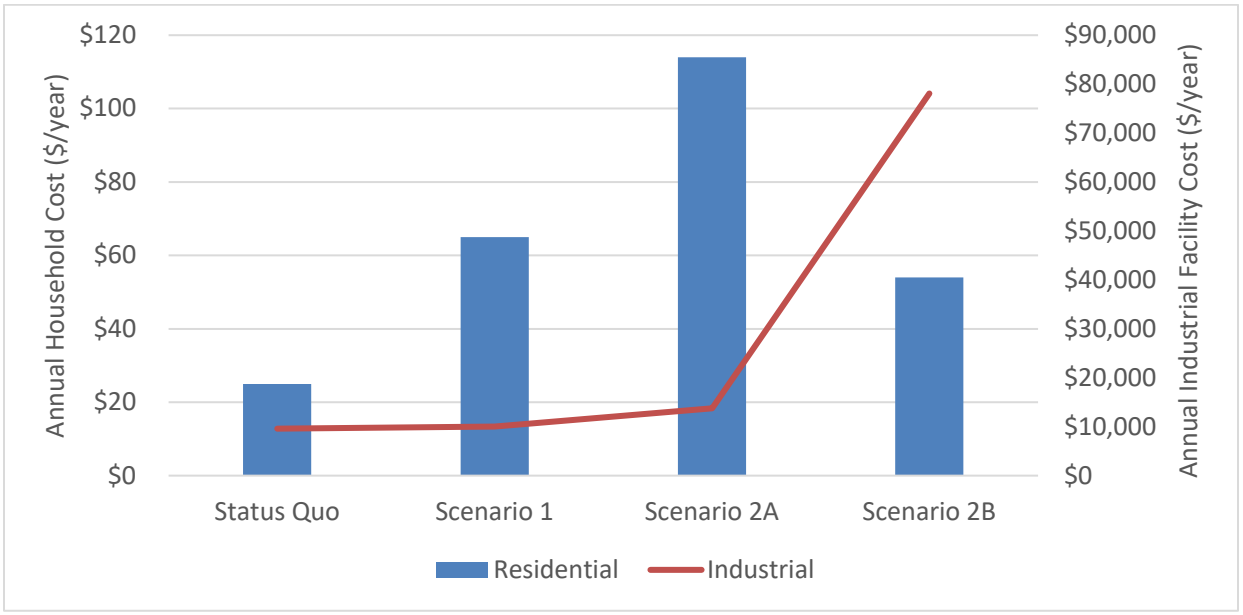
The rates impact for typical household and businesses are show in the figures below. For commercial businesses, office buildings of various sizes were modelled (small = 5,000 ft^2, mid = 15,000 ft^2, large = 30,000 ft^2).

Figure 24. Rate Impact for Various Commercial Businesses



The rate impacts for a typical household and industrial facility are shown below. This illustrates the impact of setting a consistent price for carbon across sectors (Scenario 2B) for industrial facilities.

Figure 25. Rate Impact for a Typical Household and Industrial Facility



Rate Analysis

Scenario 1

The rates developed in Scenario 1 are developed with the intent of limiting the bill impact on typical Residential customers, not to exceed $65 annually. The current CAP Tax charges the Residential customer class the highest rate, Commercial customers are charged

approximately 18% of the rate of Residential customers and Industrial customers are charged at one-third the rate of Commercial customers. This ratio is continued in the new CAP Tax rates and is also applied to the natural gas consumption tax.

Scenario 2A

The rates developed in Scenario 2A are developed with the intent of funding $6.8 million of identified annual spending needs. The spending needs were allocated according to whether they were electric, natural gas, or vehicle-related. The rates in this scenario were selected such that the vehicle revenue roughly equals the vehicle-related costs. However, natural gas rates were set to be generally higher than electricity rates, such that it may incentivize the transition to electricity. The current CAP Tax ratio is maintained in the new CAP Tax rates for both the electric and the natural gas consumption tax.

Scenario 2B

The rates developed in Scenario 2B are developed with the intent of funding $6.8 million of identified annual spending needs. Unlike previous scenarios, this scenario takes a "carbon is carbon" approach in which emissions are taxed equally between electricity and natural gas, as well as between customer classes. In effect, a single carbon tax rate is developed. The vehicle efficiency fee in this scenario maintains the Scenario 1 approach in which an average annual fee of $15 per vehicle is set. In this manner, Scenario 2B presents the highest carbon tax necessary to meet funding needs given the two presented levels of vehicle efficiency fee revenues.

The CAP Tax rates developed under each scenario are shown below.

Figure 26: Rates for CAP Tax and Natural Gas Tax by Scenario

	Customer Class	CAP Tax ($ / MT)	CAP Tax ($ / MT)	Natural Gas Tax ($ / MT)	Natural Gas Tax ($ / therm)
Scenario 1	Residential	9.10	$0.01	7.05	0.04
	Commercial	1.67	0.00092	1.29	0.0071
	Industrial	0.56	0.00031	0.43	0.0024
Scenario 2A	Residential	12.37	0.01	15.00	0.08
	Commercial	2.27	0.00125	2.76	0.0152
	Industrial	0.76	0.00042	0.92	0.0051
Scenario 2B	Residential	4.32	0.00	4.32	0.02
	Commercial	4.32	0.0024	4.32	0.024
	Industrial	4.32	0.0024	4.32	0.024
(1) Assumes an average electric grid intensity over the study period of 0.55 MT/MWhr. (2) Assumes a natural gas emissions rate of 0.0055 MT/therm.					

The annual vehicle efficiency registration rates are contained in Figure 27, showing the tax rates at the beginning (2020) and end (2025) of the study period, reflecting the annual fee

increase of 3.5 percent. Under Scenarios 2A and 2B, the vehicle registration rates remain with the utility rates as the differing values.

Figure 27: Vehicle Efficiency Registration Rates by Scenario

	Engine Type	2020 Tax Rate (%)	2025 Tax Rate (%)
Scenario 1	Gas / Diesel	0.11%	0.13%
	Hybrid	0.06%	0.07%
	Electric	0.00%	0.00%
Scenario 2A	Gas / Diesel	0.20%	0.24%
	Hybrid	0.10%	0.12%
	Electric	0.00%	0.00%
Scenario 2B	Gas / Diesel	0.20%	0.24%
	Hybrid	0.10%	0.12%
	Electric	0.00%	0.00%

(1) Assumes all vehicle types have an average value of $13,420.
(2) Hybrid: 50% of gas / diesel rate.

Bill Impacts

The table below presents the bill impacts on typical customers under each scenario.

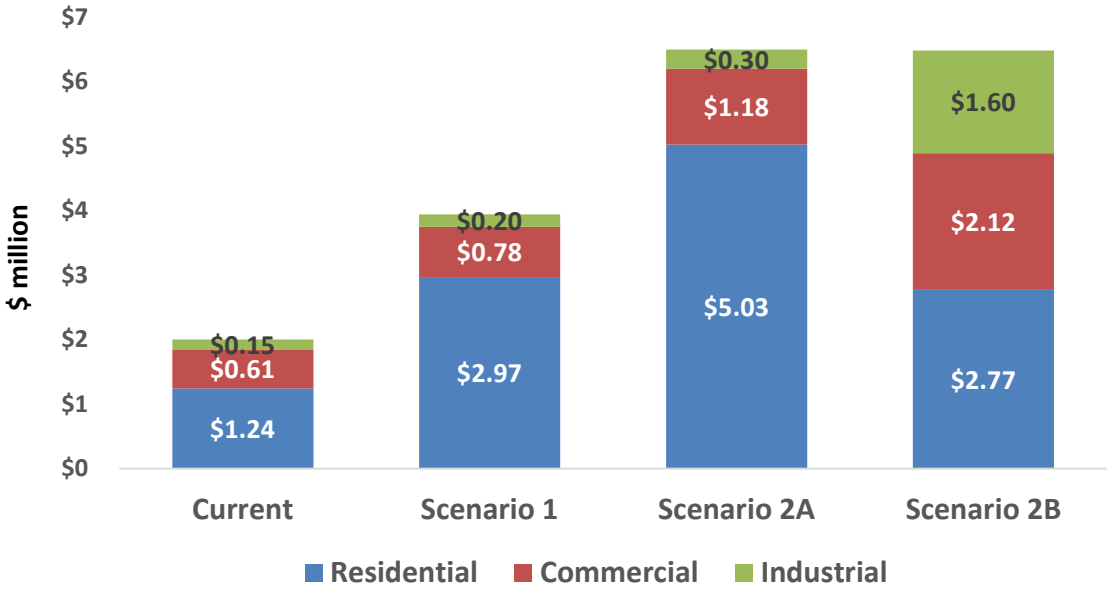
Figure 28: Scenario Based Bill Impacts (2020-2025)

	Description	Bill Impact ($ / yr)	Natural Gas Bill Impact ($ / yr)	Vehicle Efficiency Registration Fee ($ / yr)	Total Bill Impact ($ / yr)
Current CAP Tax	**Residential**	21	n/a	n/a	21
	Commercial	94	n/a	n/a	94
	Industrial	9,600	n/a	n/a	9,600
Scenario 1	**Residential**	25	25	15	65
	Commercial				
	5,000 sq. ft.	120	32	varies	152
	15,000 sq. ft.	359	95	varies	454
	30,000 sq. ft.	719	191	varies	910
	Industrial	9,808	201	varies	10,009
Scenario 2A	**Residential**	34	53	27	114
	Commercial				
	5,000 sq. ft.	163	68	varies	231
	15,000 sq. ft.	489	203	varies	692
	30,000 sq. ft.	977	406	varies	1,383
	Industrial	13,339	427	varies	13,776
Scenario 2B	**Residential**	12	15	27	54
	Commercial				
	5,000 sq. ft.	310	106	varies	416
	15,000 sq. ft.	929	318	varies	1,247
	30,000 sq. ft.	1,858	636	varies	2,494

	Industrial	76,083	2,008	varies	78,091

Figure 29 presents a comparison of revenue collected by sector under the current CAP Tax and for the three scenarios presented in this memo.

Figure 29: Projected Revenue by Sector (millions)



CITY COUNCIL AGENDA ITEM COVER SHEET

MEETING DATE:
October 23, 2018

AGENDA TITLE
Transportation Master Plan update including Vision Zero/Safety (2 hours)

PRIMARY STAFF CONTACT
Randall Rutsch 303-441-4270

BRIEF HISTORY OF ITEM
Further discussion on Transportation Master Plan Update including: Analysis and Options including Complete Streets: Vision Zero, Transit Planning, Bike and Pedestrian Low Stress Network; Pedestrian Plan and Funding, Regional, and TDM Focus Areas

WHAT PRIMARY SUSTAINABILITY FRAMEWORK OUTCOME IS BEING SUPPORTED?
Safe Community, Accessible & Connected Community, Economically Vital Community

ATTACHMENTS:

Description

- **Memo + Attachments**

STUDY SESSION MEMORANDUM

TO: Mayor and Members of City Council

FROM: Jane S. Brautigam, City Manager
Mary Ann Weideman, Deputy City Manager/Interim Director of Public Works
Michael Gardner-Sweeney, Director of Public Works for Transportation
Kathleen Bracke, GO Boulder Manager
Chris Hagelin, Senior Transportation Planner
David Kemp, Senior Transportation Planner
Amy Lewin, Senior Transportation Planner
Randall Rutsch, Senior Transportation Planner
Jean Sanson, Senior Transportation Planner
Natalie Stiffler, Senior Transportation Planner
Bill Cowern, Principal Traffic Engineer
Michelle Melonakis, Transportation Operations Engineer
Mark Shisler, Transportation Engineer

DATE: Oct. 23, 2018

SUBJECT: **Study Session on Transportation including Vision Zero initiative and the Transportation Master Plan Update**

EXECUTIVE SUMMARY

This memo provides an update to City Council on the city's Vision Zero travel safety initiative and key elements of the Transportation Master Plan (TMP). The purpose of this update is to share work to date and seek feedback on the following priority areas:

- **Vision Zero/Travel Safety –** ongoing implementation of travel safety initiatives, sharing initial results of the collision analysis in the upcoming 2018/19 Safe Streets Report, and seeking council input on Vision Zero draft guiding principles;
- **Transit Service Study –** analysis of funding and governance models seeking council input on proposed options to pursue;
- **Advanced Mobility –** sharing national best practices research and seeking council input on draft Advanced Mobility guiding principles;
- **Funding Update –** including review of current TMP investment policies and priorities, existing conditions, and trend assessment.

This memo builds upon the prior TMP update memo provided to City Council for the April 24, 2018, study session.

BACKGROUND

The 2018 Transportation Report on Progress identified key issues and provides the context for this TMP update. The report identifies where Boulder is making progress on a wide array of transportation areas and highlights growing challenges to the community's transportation and broader sustainability goals.

While Boulder residents continue to increase their walking, biking and transit riding, Boulder has not achieved the Vision Zero travel safety goal of eliminating serious injury and fatal collisions. Vehicle traffic has also increased in the Boulder Valley, leading to increasing vehicle miles of travel (VMT) and increasing greenhouse gas (GhG) emissions. Transportation funding is experiencing challenges at the local, regional, state and federal levels.

The 2018-19 TMP update is an opportunity to affirm the community's transportation vision and values, refine transportation policies and identify new strategies to achieve the TMP's goals and objectives. Feedback from council and the Transportation Advisory Board (TAB) is guiding ongoing public engagement and technical work in each of the TMP update focus areas.

COMMUNITY ENGAGEMENT

Following the city's Engagement Strategic Framework, staff is conducting broad community outreach for each phase of the TMP update, with engagement strategies structured around the nine steps to good engagement. Importantly, TAB is playing an active role by hosting the public engagement process and having representation at all major community events. The TMP Engagement Plan focuses on both in-person events and online engagement opportunities through the TMP update website and Be Heard Boulder, the city's new digital engagement platform to maximize participation from diverse groups and individuals. Since the TMP launch event in March 2018, staff has been engaging in numerous outreach activities designed to share information about the TMP update and receive input on key topics, including:

- Summer outreach using information booths and interactive maps at Boulder's Walk and Bike Month events and the Farmers Market, as well as bus stop surveys. This fall, the city has hosted back to school events with CU and BVSD and has had ongoing engagement with the city's Youth Opportunity Advisory Board and Growing Up Boulder.
- In-person and online forums, including question of the month via Be Heard Boulder, to seek feedback on transportation hopes and concerns as well as questions related to walking, biking, access to transit, advanced mobility (transportation trends and technologies) and traffic signals. A summary of the input and common themes is available on the TMP update website and is being synthesized and mapped to inform the Pedestrian Plan, the Bike Plan, and related TMP policy updates. Future questions will focus on transportation funding and other TMP policy areas.
- The Pedestrian Advisory Committee (PAC), which held its first meeting on August 30, 2018. The PAC is made up of a broad cross section of community members and is

examining issues and opportunities related to walking in Boulder and will help shape the Pedestrian Plan update.

Moving forward, staff and TAB will be continuing conversations with the community to inform the development of TMP policy options and technical analysis. These activities will include:

- Scheduling small group meetings with civic organizations, stakeholder groups and neighborhood organizations to share information about the TMP and receive community input.
- Recruiting Plan Ambassadors to help schedule community meetings, share information via social media networks and review project materials through each phase of the process.
- Begin meeting with a funding community working group of stakeholders to work with staff on investment priorities and to identify potential local funding mechanisms.
- Continued participation in community events and coordination with other city departments and partner agencies.

ANALYSIS

Topic 1: Vision Zero

As stated in the 2014 TMP, the city is committed to achieving the Vision Zero safety goal of eliminating collisions that result in serious injury or fatality (referred to as severe collisions).

Vision Zero is a top priority and uses a people-focused, action-oriented, data-driven approach to implement comprehensive safety initiatives based on collision types and high collision locations. In addition, the city is committed to reducing all collision types in the city and to designing and operating a transportation system where people feel safe, comfortable and secure using all modes of transportation.

Based on national best practice, the city's Vision Zero program employs a holistic four E's (Engineering, Education, Enforcement, and Evaluation) and Safe Systems approach. As the cornerstone of the Vision Zero Evaluation efforts, the city updates the Safe Streets Report (SSR) every three years to assess crash trends, measure progress toward the Vision Zero goal, and determine strategies to improve safety.

The following section provides an overview of progress to date in each of the four E's, shares the initial results of the SSR collision analysis for the years 2015-17, and provides the draft Vision Zero guiding principles for review and feedback by council.

Ongoing Implementation

Engineering

Since the adoption of Vision Zero, the city has implemented 141 distinct mitigation strategies at a total of 83 locations. The location and type of mitigation can be found on the engineering tab of the interactive maps located on the city's Safe Streets website. Additional significant capital

projects identified through the 2016 Safe Streets Boulder Report are budgeted for construction using Federal Highway Safety Improvement Project (HSIP) funding:

- Colorado Avenue and Regent Drive: experiment with a curb separated bike lane intersection, sometimes called a protected intersection design;
- 29th Street and Baseline Road: realignment to provide a better line of sight for travelers;
- Broadway and Rayleigh Road: construction of a southbound right turn lane and possible changes in signal timing to avoid conflicts with bikes on the multi-use path.

These projects are in the preliminary design and public process phase and scheduled for construction in 2019. The recently completed traffic signal at the intersection of 29th Street and Valmont was funded through the same federal grant program.

In reviewing fatal and serious injury collisions over the past decade, engineering design, traffic control devices, operations and maintenance of the transportation system are all important. In addition, many non-engineering factors are also important to influence behaviors of motorists, bicyclists, and pedestrians.

Education

The Vision Zero work plan also includes safety education throughout the year. The city hosts the Vision Zero Community Partnership Committee to leverage resources and expand outreach. Current education efforts include:

- Partnering with University of Colorado (CU) Athletics for 2018-2019 school year to display safety videos on the scoreboard during home football games and provide additional safety messaging for students, staff and faculty through social media. Staff is pursuing additional local partnerships—for example, with the Century Theatre—to display safety videos and expand reach in the overall community.
- Ongoing promotion of safety messaging through digital communications, including the website, social media, Channel 8 and through a series of safety videos. Safety messaging is focused on the common causes of collisions in Boulder. Since the December 2017 launch of the Vision Zero education campaign, there has been a steady increase in visits to the city's Vision Zero web pages.
- Launching the Vision Zero dashboard as part of the Boulder Measures effort. This provides another opportunity to share information with the community on the Vision Zero goals and efforts to increase safety in the community.
- Conducting the 2018 Heads Up Crosswalk Safety Campaign during the weeks of Aug. 6, Aug. 27, and Sept. 17. Funded through a Colorado Department of Transportation (CDOT) Office of Traffic Safety grant, this program includes in-person and social media outreach, such as crosswalk safety interviews. The city also did a month-long advertising campaign on the social media platform SnapChat to target 18- to 23-year-olds within two miles of CU Boulder. The static ad was viewed almost 90,000 times and was shared 1,300 times, and the video ad was viewed almost 270,000 times (note that users likely had the opportunity to view the ads more than once). This reach far exceeds most of the city's other social media outreach to date.

- Implementing new Safe Routes to School programs at three pilot schools: Mesa, University Hill, and Whittier. This program is funded through a CDOT grant to provide hands-on educational opportunities with students and includes walking and bicycling audits for the school areas.
- Continuing the city's Way of the Path safety and etiquette program for multi-use paths, which is also being updated to connect and reinforce city-wide Vision Zero educational messages.

Enforcement

The city's Transportation Division and the Police Department, along with CU police, routinely collaborate on traffic enforcement and share experience and insight from both a citation and collision perspective. Through this collaboration, staff uses a safety focus to identify locations that would benefit from additional targeted enforcement. This enforcement is accomplished through officer patrols and the use of the city's photo radar program. Enforcement is also a key component of the City's Heads Up Boulder safety education programs.

For over two decades, the city has used photo red-light technology to prevent serious right-angle collisions. Intersection approaches with photo red-light enforcement technology have seen significant reductions in red-light running collisions since their installation. With the technology now in place at six intersections (eight approaches), staff continues to evaluate new photo red-light camera deployment locations and plans to construct two new locations in 2019.

The city also tracks state and federal legislation related to travel safety goals. Specific examples include supporting state legislation to retain ability for local governments to deploy photo red-light technology, legislation to prohibit the use of mobile phones while driving, and monitoring new legislation passed in 2018 that allows local jurisdictions to opt in for bicyclists treating stop signs as yield signs.

Evaluation and Initial Results from the Safe Streets Report

Evaluation is the key for ongoing continuous improvement. The Vision Zero Safe Streets Report (SSR), updated every three years, is the primary evaluation tool for the city's comprehensive Vision Zero safety initiatives.

The upcoming SSR builds upon previous reports, and findings from the current technical analysis are being used to guide ongoing action items and to update the city's Vision Zero action plan for 2019-21. The findings also inform the update to the TMP polices and investment priorities. The 2018/19 SSR is currently in the technical analysis phase: staff is analyzing collision data from 2015 through 2017 and comparing this information with data from 2009 through 2014.

The SSR technical analysis uses collision data provided by the City of Boulder Police Department's Record Management System (police accident reports). Based on this initial analysis:

- Total collisions have increased by approximately 1.5 percent per year over the study period of 2009 through 2017, while the number of severe collisions has remained approximately the same (50 to 60 collisions per year). Consequently, the percentage of total collisions that result in serious injury or death has decreased from 2.1 percent to 1.8 percent.
- Cyclists and pedestrians continue to be over-represented in severe injury collisions. Collisions involving people walking or biking account for approximately 8 percent of total collisions and approximately 62 percent of severe collisions.
- The number of collisions involving people walking has increased approximately 4 percent annually (2 collisions per year) over the study period, though severe collisions involving people walking has not increased during the same time period.
- From 2009 to 2013 the annual number of collisions involving a person suspected of or charged with a DUI was steady. From 2014 to 2017, the total number of annual collisions involving impairment has increased at approximately 11 collisions per year, or 10% annually.

Please see **Attachment A** for more details on the initial Vision Zero Safe Streets analysis.

Vision Zero Goals and Guiding Principles

The update of the TMP provides an opportunity to review and refine the city's Vision Zero travel safety policies. Recognizing that "Vision Zero" reflects a community-wide commitment with the city serving as a primary stakeholder and catalyst for change, staff is working to increase greater community understanding of and commitment to Vision Zero and empower local and regional stakeholders to help make Boulder's streets safer.

Below are proposed draft goals and guiding principles intended to refine the purpose and commitment to travel safety. When finalized, these will be incorporated into the updated SSR and TMP:

Vision Zero Goals

- Eliminate fatal and serious injury collisions by 2040.
- Reduce other types of collisions for people using all modes of travel.
- Improve travel conditions for people walking and bicycling by addressing travel comfort and security.

Vision Zero Guiding Principles

- To improve travel safety for people using all modes, Boulder uses a people-focused, data-driven, action-oriented, and interdisciplinary approach of complementary strategies through the 4 E's (Engineering, Education, Enforcement and Evaluation).
- Boulder proactively employs effective collision countermeasures, with a focus on continuous improvement.
- Boulder practices a Safe Systems approach and is based on the following principles:
    - people make mistakes that lead to road crashes;

- the human body has limited physical ability to tolerate crash forces;
- the responsibility for making the mobility system safe is a shared responsibility across all stakeholders and requires personal responsibility;
- all parts of the system must be strengthened to multiply the impact of interventions and provide a safety net when any one part of the system is deficient.

Next Steps

The initial findings of the traffic collision analysis confirm that continued work is needed by the city, community and agency partners to achieve the Vision Zero goals and create a safer community for people traveling by all modes of transportation. This additional work will include:

- Completion of the Vision Zero Safe Streets Report, which will include an evaluation of the effectiveness of existing mitigation measures, a more detailed analysis of severe collision trends and the development of a Vision Zero Action Plan, with both short- and long-term implementation strategies;
- Completion of the update to the city's traffic signal operations practices to ensure alignment with the city's TMP goals, including Vision Zero, and corresponding modifications to the operations of traffic signals in the city. This effort focuses on left-turn phasing, right-turn-on-red restrictions and pedestrian head-start signals (also known as leading pedestrian intervals). Staff anticipates changes to a considerable number of traffic signals and will begin prioritizing those changes this year;
- Expansion of the city's red-light camera program to include two additional locations in 2019;
- Development of signing and striping standards and expanded use of treatments such as green pavement markings and signing and striping at right-turn bypass islands.

Following staff's technical work on the Safe Streets Report and input from the Vision Zero Community Partnership Committee, TAB, and council, staff will prepare the report in first quarter 2019.

Questions for Council:

1. Does council have feedback regarding ongoing Vision Zero implementation of the 4 Es?
2. Does council have feedback regarding the Vision Zero Safe Streets Report initial results and next steps?
3. Does council have suggestions regarding the draft Vision Zero guiding principles?

Topic 2: Transit Service

The TMP includes Boulder's Renewed Vision for Transit, which is a comprehensive plan for enhancing the local and regional transit system, including increasing frequency of service, extending routes where needed and developing mobility hubs. To implement these

enhancements, the transit investment would need to more than double. The current 2018-19 TMP update process is an opportunity to integrate new opportunities and address future trends in support of full implementation of the Renewed Vision for Transit.

One of the key action items from this vision is to develop new methods for delivering local and regional transit system improvements, recognizing that relying solely on the Regional Transportation District (RTD) is unrealistic. The city currently works with multiple agency partners, using several delivery models, to provide local and regional/inter-regional transit. These models are used to deliver increased transit service beyond RTD constraints and include:

- Standard RTD service model: Local transit service, such as the 200-series routes and the regional Flatiron Flyer route, are provided exclusively by RTD without city subsidy.
- HOP model: The HOP is the flagship route of Boulder's Community Transit Network (CTN) and is operated by the city through a contract with Via Mobility Services. The HOP service is co-funded by the city, CU students and RTD.
- RTD service "Buy-Up" model: Over the years, the city has paid RTD to provide more frequent service on key CTN routes, such as the JUMP and BOUND. In 2018, RTD stopped accepting service buy-ups due to their driver shortage and inability to resource higher frequency service. Given this position, the service buy-up model is no longer considered a viable option for future transit service expansion.
- FLEX model: Inter-regional transit service from Fort Collins to Boulder is provided through a shared-cost model using grant funds from the Denver Regional Council of Governments (DRCOG) with the local matching funds provided by the city, Boulder County, Longmont, Berthoud, Loveland and Fort Collins. The FLEX service is operated by the City of Fort Collins/Transfort.

The need to identify additional models is increasingly urgent. With limited resources and competing priorities, RTD has been pulling from base service funds to backfill shortfalls in the FasTracks (RTD's multi-billion-dollar transit expansion plan approved by voters in 2004) budget and to pay for regional rail and bus service in other areas of the district. Boulder continues to see bus service cuts from RTD. These factors, and the increasing need to provide high-capacity travel options to move people throughout Boulder and to and from the surrounding region, mean that the city and county need to develop new service delivery models to achieve the TMP goals of increasing transit ridership, reducing single occupancy vehicle (SOV) travel, and increasing transportation alternatives.

To address these growing concerns, the city has been conducting a multi-phase study to identify and assess service delivery options. The following information highlights the work to date in each phase, including financial assessment, national research of applicable transit systems, potential governance models, and funding options.

Phase 1

Phase 1 of the study was conducted in 2017 and included developing refined cost estimates for the Renewed Vision for Transit, assessing Boulder's current return on investment for transit service from RTD, and national research of service delivery models.

The financial assessment found the following:

- Current and Forecasted Operating Costs: Currently, the annual operating cost to provide local and regional transit service in Boulder is approximately $50.4 million. With implementation of Boulder's long-term Renewed Vision for Transit, annual operating costs will more than double to $117.7 million.
- Return on Investment for Base Bus Service: Based on 2015 data[1], for every $0.94 the Boulder community pays to RTD in sales tax dollars, the Boulder community gets back approximately $1.00 in bus service.
- Return on Investment for FasTracks: Boulder contributes approximately $9 million per year in designated FasTracks sales tax revenue to RTD while receiving approximately $2 million per year in Flatiron Flyer operating service.

National research was focused on examples of localized transit service being operating by individual municipalities within a larger, regional transportation district context. The research found there are two viable operating models for Boulder:

- a separate local service operating within a larger metro area provider's service area, such as is found in Santa Monica, California; Alexandria, Virginia; and Los Angeles, California; and,
- the Seattle, Washington, model where the city contracts with the regional transit agency to provide local service.

Each of these models was considered in Phase 2 of the study.

Phase 2

In Phase 2 of the study, currently underway, staff has coordinated with policy and technical stakeholder committees to evaluate a range of potential governance models and funding options:

Model 1. Maintenance of Current Service Model (Status Quo): The city would continue the HOP and FLEX routes based on the existing multi-agency funding partnerships; and continue to rely on RTD to directly provide the majority of local and regional service, recognizing that Boulder will continue to see a degradation in service quantity and quality.

Model 2. Incremental Expansion of City of Boulder Transit Program (Buy-Ups): The city would fund service improvements through buy-ups of routes operated by RTD for local Community Transit Network (CTN) routes such as the BOUND and JUMP.

Model 3. City of Boulder as Local Transit Provider: The city would provide the local CTN routes (HOP, SKIP, BOUND, STAMPEDE, etc.) that operate within the city limits. Under this model, the city would expand the HOP model and operate transit service directly and/or contract with an operator to provide local CTN services. This model can be implemented incrementally. The city would continue the FLEX route based on the existing multi-agency funding partnership.

Model 4. Intergovernmental or County Mass Transit Agency: The city and Boulder County would jointly provide local and regional transit service. The partnership would focus on providing service within Boulder County, including the JUMP, DASH, and possibly new bus

[1] 2015 is the most recent cost data available from RTD

regional Bus Rapid Transit (BRT) service. A city/county model could be structured through an Intergovernmental Transit Agency (Model 4A) or through a County Mass Transit Agency (Model 4B). RTD would continue to operate longer-distance regional routes such as the Flatiron Flyer and AB airport service.

Model 5: Boulder County Regional Transportation Authority (RTA): The city would partner in the formation of a RTA with Boulder County and county-wide communities. The RTA could act solely as a funding mechanism (Model 5A), or it can both fund and operate transit service within Boulder County (Model 5B). RTD would continue to operate longer-distance regional routes, such as the Flatiron Flyer and airport service.

Model 6: Boulder County RTA (Secede from RTD): Like Model 5, the city would partner in forming a county-wide RTA, and would also secede from RTD, which requires approval by the Colorado state legislature. RTD would likely no longer serve the county, so alternative routes would need to be provided to and from Denver and the airport.

More detailed information about each governance model and service scenario is provided on the Transit Service Delivery Study web page.

In Phase 2 of the study, all scenarios were evaluated for their ability to meet a set of evaluation criteria. Examples of key questions considered included:

- Can the models help Boulder deliver local and regional service?
- What is the feasibility of implementing each model from a legislative and legal perspective?
- What are potential funding sources and how predictable are they?
- How much does each service model cost?
- How supportive is RTD likely to be?
- Which models best support implementing shared ride mobility options like micro-transit?

This evaluation resulted in the following models **being eliminated** for further consideration:

- Model 1 (status quo): Boulder would not achieve its Renewed Vision for Transit as RTD will continue to degrade transit service.
- Model 2 (buy-ups): Due to current transit driver and vehicle limitations, RTD has indicated that it will likely no longer be able to provide significant increased transit service via buy-ups. The city should continue to monitor this situation for changing conditions and RTD policies.
- Model 5A (RTA as funding mechanism only): A Regional Transportation Authority as a funding mechanism only relies on RTD for added transit service and is therefore not feasible for the reasons stated for models 1 and 2.
- Model 6: Seceding from RTD is not feasible for multiple reasons:
    - Formation of an RTA would require support from RTD. Secession is not likely to be supported by RTD, and legislative changes are very challenging and time intensive.
    - RTD FasTracks bonding is based on revenue from Boulder County, rescinding this funding may not be possible.

- The ability to acquire RTD capital assets, including vehicles and facilities, is unclear and would be costly.

At this time, acknowledging the factors mentioned above and political sensitivities of this model, staff is recommending that the city not move forward with secession from RTD, but should monitor conditions with agency partners and potentially reconsider at a future time.

Models **recommended** for further consideration and more in-depth analysis:

- Model 3 (city as local transit provider) – The city would negotiate with RTD for reallocation of funds collected by RTD to support city operation of routes formerly operated by RTD. The greatest challenge of this option is the need for increased funding for implementation. The city could incrementally expand the HOP model to increase the city's role over time as funding is available, providing local CTN service by either directly operating or contracting with a transit service operator (current HOP model is contracted to Via Mobility Services). This locally focused model would operate in an incremental, and complementary way with a county-wide or regional model.
- Models 4A and 4B (Intergovernmental or County Mass Transit Agency) – A new city/county transit agency could be formed through intergovernmental agreements and would assume responsibility for operating CTN routes in Boulder County. RTD would continue to operate regional services. Like Model 3, additional local funding sources and funding agreements with RTD and local municipalities would be needed. If a county mass transit sales tax option is pursued, it would require support from RTD, legislative action, and voter approval of the sales tax. This may be a feasible option for long-term implementation.
- Model 5B (RTA Funding and Operating): – A Regional Transportation Authority to fund and operate transit services would require participation of Boulder County municipalities to achieve the required level of funding. This may be a feasible option for long-term implementation and would require support from RTD, participation of multiple local governments, voter approval of the RTA, and voter approval of the RTA funding.

Summary of Governance Model Findings			
Governance Model	**Recommendation to Carry Forward**	**Advances Local Transit Service Goals**	**Advances Regional Transit Service Goals**
1: Maintenance of Current Governance	No	No	No
2: Incremental Expansion (Buy-ups)	No	No	No
3: City Provider	Yes	Yes	No
4A: Intergovernmental Transit Agency	Yes	Yes	Yes
4B: County Transit Agency w/Mass Transit Tax	Yes	Yes	Yes
5A: RTA Funding Only	No	Yes	Yes
5B: RTA Funding and Operating	Yes	Yes	Yes
6: RTA Secede from RTD	No	Yes	Yes

Next Steps

More work is needed to pursue this narrowed set of options (3, 4A and B, and 5B) to deliver local and regional transit service for the Boulder community, recognizing that these remaining models are not mutually exclusive and can be done in concert and phased over time. Immediate and near-term action items include:

- Incorporate findings of this study into the TMP update transportation funding analysis, which will include a more detailed analysis of potential funding sources for transit service, capital and programmatic elements.
- As funding allows, move forward with new mobility solutions for underserved areas, planned HOP route extensions and city-led operation of other local CTN routes. An example of project sequencing could include: (1) pilot new micro-transit, (2) extend HOP service (change current HOP loop route into three longer, more direct local routes) and (3) pilot Model 3 (city as local transit provider) with the BOUND route.
- Continue coordinating with Boulder County, RTD, Via, CU, other transit service providers and agency partners to determine level of interest and support for the recommended regional service delivery models.
- Coordinate with other Transportation Master Plan updates, including those of the University of Colorado, Boulder County and Boulder County communities, to gauge interest for county-wide service delivery models.
- Work with City and County of Denver to determine potential for coordinated approaches to transit service delivery.

Question for Council:

1. Does council have feedback regarding the proposed narrowed set of local and regional transit service delivery options recommended for further exploration?

Topic 3: Transportation Demand Management: Advanced Mobility

Existing Conditions

Since the 1996 TMP, Transportation Demand Management (TDM) has played a key role in enhancing mobility while managing the impacts associated with growing vehicle traffic. TDM is generally defined as policies, programs and services designed to maximize the efficiency of the current transportation system by changing the time, mode or route of travel. TDM measures have been widely applied in Boulder, including incentive programs to promote walking, biking and transit and the very successful business, neighborhood, and college Eco Pass programs that are provided to over 80,000 people in Boulder.

The city recognizes that new technologies and trends in transportation are expanding the range of potential TDM strategies and options for expanding electric vehicles (EVs) for personal and fleet use. The Advanced Mobility Forum in October 2017 started this conversation, and speakers at the TMP launch event confirmed the importance of shaping new technologies to community

values and protecting the public right of way for the public good. The TMP update is an opportunity to enhance Boulder's policies and strategies to integrate new technologies and mobility on demand under the umbrella of "Advanced Mobility."

The goal of new Advanced Mobility policies is to ensure that any new options serve Boulder's community values of sustainability, environmental preservation, economic vitality, equity and great public spaces and neighborhoods. The city is already working to support new mobility options and shape them to community values, including converting the HOP fleet to electric buses, deploying electric vehicle charging stations, developing the recent dockless bike share ordinance and permit program, and researching best practices on e-scooters. Other activities include partnering with CU to host events showcasing new mobility options including electric vehicles (EVs), e-bikes and autonomous shuttles; and coordinating with the National Renewable Energy Laboratory (NREL) and CU on research potential pilots. In addition, the city is partnering with private sector transportation network companies (TNCs) to create the next generation of the "Door 2 Downtown" program, referred to as "D2D2", for downtown commuters.

Since the 2003 TMP policies have supported expanding the use of clean fuel vehicles and the role of the city as being a leader in demonstrating EVs. The city fleet currently includes 11 plug-in electric vehicles (EV), 43 hybrids and 133 biodiesel vehicles. City policy requires purchase of alternative-fueled vehicle unless an exemption is granted by the city manager and the city is hiring a consultant to provide a plan for full flee conversion to clean fuels. The city has also installed and operates 46 public level-2 EV charging plugs and has updated the city code to support EV charging in new multifamily and commercial construction. The city also actively supports EV and e-bike promotions aimed at residents and commercial fleets, as well as regulation and legislation supporting EVs.

Existing Advanced Mobility Policy Review

While the 2014 TMP recognizes the potential for Advanced Mobility, it does not include policies specific to this area and needs to be strengthened to support new trends and technologies, including EVs. On state and federal regulatory and legislative activity relative to autonomous vehicles (AVs), the city has supported the US 36 Mayors and Commissioners Coalition policy statement on AVs. This statement is included in **Attachment B** and contains these major points:

- The coming transformation has potential benefits and risks;
- Local government needs to be part of state and national legislation discussions; and
- Clean-fueled, safe and shared deployments should be consistent with local policies.

The city recognizes that these policies, while helpful, are not comprehensive, and more thorough Boulder-specific policies and strategies are needed and will be identified as part of the 2018-19 TMP update process.

Draft Advanced Mobility Guiding Principles

City staff from multiple departments has been conducting national research on Advanced Mobility to support the community's sustainability and transportation goals. This work has included a literature review, learning from leading communities, hosting the city's Advanced

Mobility Forum in October 2017, the TMP launch event in March 2018, and a legal review of Colorado law. Numerous national organizations have published recommendations and hosted conferences, including the American Planning Association, Shared Use Mobility Center, National Association of Transportation Officials (NACTO), and international EcoMobility Alliance's Mobility Principles for Livable Cities.

Many experts have observed that every major historic change in transportation has produced unintended consequences as well as benefits. Existing studies show that the Transportation Network Companies (CTNs) increase vehicle miles traveled by 60 to 80 percent and pull trips from the non-auto modes (such as public transit). Both of these outcomes are directly contrary to TMP goals, and it is likely that autonomous vehicles (AVs) will have the same effect if privately owned. If predictions are correct that electric AVs will reduce the cost of travel and remove the burden of driving for the commute, longer distance commutes and an increase in AV vehicle trips for a variety of purposes will increase vehicle miles traveled and congestion on the existing road system.
At the same time, with appropriate planning, shared, electric, autonomous vehicles can significantly reduce emissions and improve local air quality compared to the current transportation fleet, accelerate economic growth and improve safety and equitability. It is also possible that connected vehicles paired with policy solutions such as congestion pricing, could result in reduced congestion and improved traffic flows. The key is to continue planning and community engagement to establish a policy framework well in advance of the deployment of these vehicles.

The following draft guiding principles are suggested based on this research. The relationship of these principles to the city's Sustainability Framework is indicated by the icons following each.

Safety is the top priority

- Reflecting Vision Zero, prioritize the safety of all users, including the most vulnerable such as bicyclists, pedestrians and people with disabilities.

Access and equity

- Support equitable, affordable access and mobility for all users.

Connected infrastructure

- Anticipate the need and funding for advanced communication systems to support shared, electric, connected, and autonomous vehicles, include principles of universal design and interoperability, and recognize technology change over time.

Sustainable system

- Fulfill Boulder's Renewed Vision for Transit to provide a high-capacity mobility backbone for rapid cross-town and intercity travel, with local multimodal links for first and final mile connections.
- Advanced Mobility solutions should be shared, electric, supported by advanced communications and powered by renewable energy to the extent possible.
- Leverage public, private, and non-profit partnerships.

Place-making

- Support the creation, appeal and safety of great public places for community gathering.
- Manage public curbside space dynamically to provide safe, designated zones to support passenger and freight loading and unloading.
- Support the transition of parking areas to community-serving land uses over time.

Freight and delivery services

- Facilitate the safe and efficient transfer of goods and services while minimizing neighborhood impacts.

Privacy and security

- Encourage open source, non-proprietary technologies.
- Ensure the privacy and security of users as well as the reliability of systems.

Monitor and reporting

- Require data sharing by private and public sector providers to comprehensively measure and evaluate the results relative to the city's transportation and overall sustainability goals.

Next Steps

Based on council feedback, the staff working group will refine the draft Advanced Mobility guiding principles and policies and continue to seek community input. This will be supported by

an Advanced Mobility white paper being prepared by staff, summarizing the ongoing literature review, pilots by the city and others and the basis for policy recommendations.

The city will also launch a curb management planning process in early 2019 that will comprehensively look at how and where to manage curb space for both existing and future uses. The city also continues to explore opportunities for pilots or demonstrations of Advanced Mobility systems with the transportation network companies, shuttle providers, CU Boulder and the NREL.

Question for Council:

1. Does council have feedback regarding the draft Advanced Mobility guiding principles?

Topic 4: Funding

Funding is a critical focus area of this TMP update, as the city's ability to build, operate and maintain Boulder's transportation system and associated multimodal programs is facing considerable pressure. Challenges include flattening sales tax revenue, decreasing state and federal funds and declining purchasing power as costs continue to rise. The TMP update and community engagement process is an opportunity to refine investment priorities and create a new fiscally constrained financial plan for 2020 and beyond and evaluate potential new funding mechanisms to ensure the city meets existing and future transportation investment priorities.

Policy Review

Investment Priorities

Since the 1996 TMP, transportation investment has been guided by the plan's investment policies and priorities, as well as the city's annual budgeting process including the Capital Improvement Program (CIP). The TMP states that the city shall generally give priority to transportation investments as follows, and within each priority level, all items are given equal weight:

- Highest priority: system operations, maintenance and travel safety
- Next priority: operational efficiency improvements and enhancements of transit, pedestrian and bicycle system
- Next lowest priority: quality of life improvements, such as sound walls and traffic mitigation
- Lowest priority: automobile capacity additions, such as new lanes and interchanges

Specific budget guiding principles noted in Boulder's current TMP include:

- Budget Guiding Principles—Credible, Clear and Consistent
- As top priority, maintain and operate the existing valuable multimodal system, including investments in safety
- As additions are made to the system, address ongoing operation and maintenance needs

- Continue to advance innovations in the design, construction, operation and maintenance of the system
- Strategically enhance the Complete Street Network, prioritizing projects that have maximum impact improving safety, mobility, and efficiency
- Advance corridor studies, integrating the city's Sustainability Framework and Resiliency Strategy
- Leverage external funds extending the ability of local dollars to implement city goals
- Continuously strive for efficiency and effectiveness in how work is accomplished
- Assure budget decisions are sustainable over time
- Keep in mind the goal of identifying long-term, sustainable funding that is tied to vehicle use

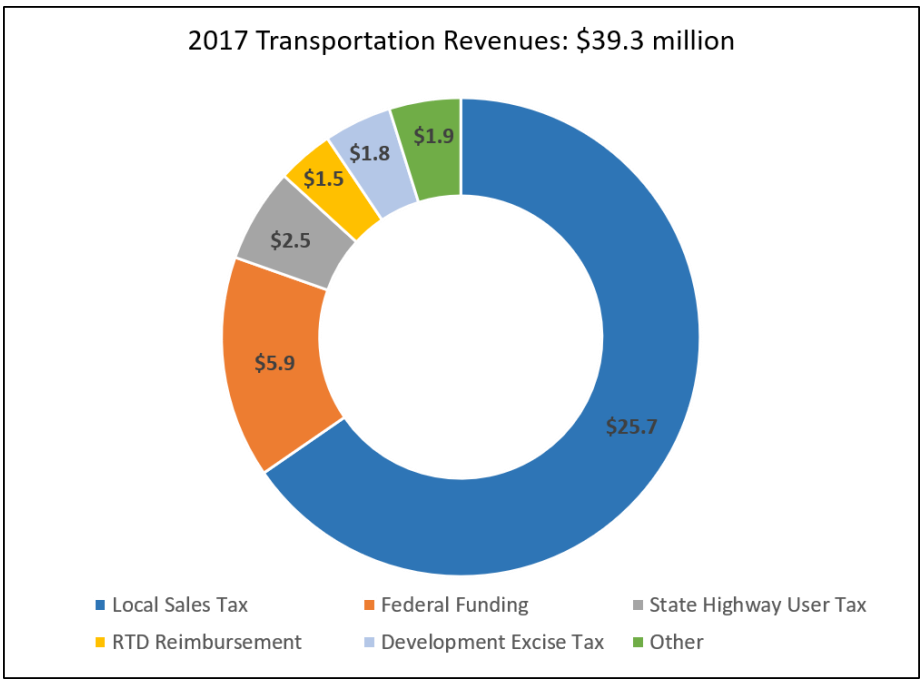
The 2014 TMP also provides the following policy language to guide transportation investment priorities:

- Investment in modal enhancements will be integrated between all modes, focused on designated multimodal corridors, and prioritized by the ranked multimodal corridor segments;
- As the street network is the primary infrastructure for all modes, it will be managed and expanded to balance its use by all the modes. Roadway capacity will not be added at the expense of the non-auto modes.
- The city's transportation system includes all the modes and the resources needed for the sustainable operation of the system. Any consideration of the share of system funding allocated to future growth will be based on this system.

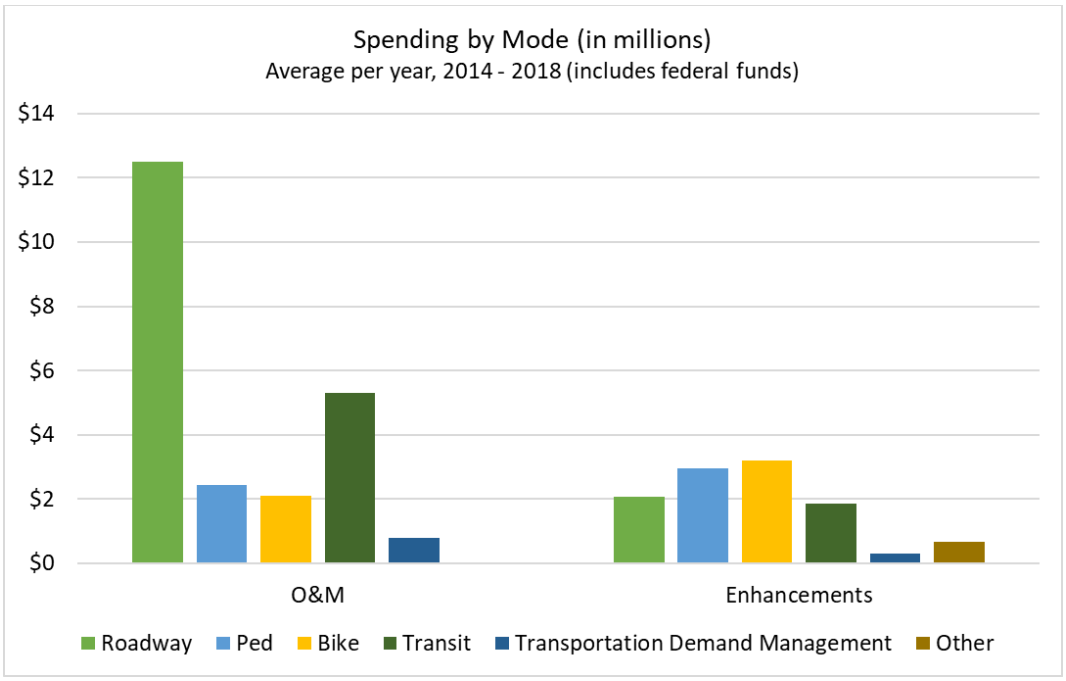
As part of the policy review, staff is evaluating the city's investment priorities for core services, which includes activities from snow and ice removal to pavement maintenance. Through community surveys and Be Heard Boulder, staff is seeking feedback from the community to rate city performance in providing core services, ease of traveling to and around Boulder using various modes, and operations and maintenance. Feedback on core service priorities will also be sought from the funding working group. Together, this information will be used to formulate the 2020 budget as well as inform how the city prioritizes the use of funds that may come from a successful "Let's Go Colorado" proposition 110 ballot initiative.

Existing Conditions

The city's Transportation Division receives revenue from a variety of sources but is predominantly dependent on the city's dedicated transportation sales tax, which was established in 1967 at 0.6 cents and increased to 0.75 cents in 2013 through a reallocation of an Open Space and Mountain Parks sales tax. The 0.15 cent sales tax is scheduled to sunset at the end of 2029. As the chart below illustrates, the dedicated transportation sales tax raised approximately $25.7 million in 2017.



As the transportation system has grown, programs have expanded, and costs have escalated, a greater portion of city revenue is spent on operations and maintenance, leaving less available funding for enhancements and capital projects. Today, about 80 percent of city revenue, excluding federal funds, is dedicated to operating and maintaining the system. As the chart below shows, since 2001, the percent of funding allocated to core operations and maintenance services has increased from 59 percent of the budget (not including federal funds) to 78 percent. As the chart below illustrates, the majority of O&M spending is on roadway maintenance and transit operations.



The city's transportation revenue has grown over the years with the increased dedicated sales tax, a new transportation impact fee and an increase in the development excise tax. However, revenue has not kept pace with the rise in material costs. Since 2012, the city's purchasing power has declined by 23 percent. For example, between 2012 and 2018, the cost of concrete has increased by 35 percent, an annual rate of 5.2 percent. Asphalt is increasing at even a higher rate at 7.5 percent annually. These cost increases mean that a typical CIP project that cost $10 million in 2012 now costs approximately $14.5 million in 2018. Continuing increases in operations and maintenance costs is impacting the ability to enhance the infrastructure, services and programs needed to meet Boulder's TMP objectives.

Current and Future Trends

In addition to flattening sales tax and declining purchasing power, the city is facing challenges with external revenue from the region, state and nation. At the national level, it is very likely that the locally required match will increase significantly, meaning our ability to leverage federal money will decrease. Statewide, less funding is available for local municipalities as the state's gas tax revenue is decreasing.

Meanwhile, the state transportation funding initiative known as proposition 110/Let's Go Colorado would increase funding to the city by approximately $2.8 million per year if passed by voters in November 2018. This new funding would provide an opportunity for the city to enhance safety, operations, maintenance, capital projects, and programs based on TMP priorities.

In general, the trends in state and federal funding, along with the potential for increased funding needs to address Advanced Mobility and other new technologies, mean the city will need to solve unmet funding needs locally, as well as continue to work with agency partners.

What's Next?

Staff is continuing technical work to understand funding needs across all areas of the Transportation Division and developing a scenario analysis. This analysis examines current expenditures for operations, maintenance, planning and capital projects in relationship to industry standards, federal requirements, best practices and community expectations. Staff is conducting an extensive internal assessment that will prioritize how existing revenue is allocated, evaluate the city's performance of core services, and identify unmet funding needs to ensure that performance meets standards, best practices and requirements. In conjunction with the internal assessment, staff will seek community feedback using a survey linked to Be Heard Boulder and an evaluation of past and current Community Survey results related to transportation core services. (The Community Survey is a national survey that asks residents to rate current travel options, assess the city's performance in providing core services, and rank funding priorities.)

Based on the needs analysis, staff will identify a set of potential local funding scenarios and mechanisms that could be used to meet existing and future funding needs. Funding scenarios will be aligned with the city's TMP investment programs and establish options for our current, fiscally constrained, action, and vision investment programs. Ideally, any new funding mechanisms will provide reliable, sustainable, predictable and scalable funding. Staff will also specifically be evaluating potential funding mechanisms and scenarios to support the city's

Renewed Vision for Transit as described in a prior section of this memo. This financial analysis will also be used to update the TMP investment priorities and city-wide Capital Improvement Program.

Staff presented at the Boulder Chamber's Community Affairs Council meeting on Oct. 11 as part of the TMP public engagement process, and stakeholder meetings will begin in October with the Transportation Funding community working group and continue through mid-2019.

Questions for Council:

1. Does council have suggestions regarding refinements for TMP investment policies and priorities?
2. Does council have feedback regarding the Transportation Funding existing conditions and funding analysis approach?

Additional TMP Topic Updates

Updates on other TMP work areas updates are included in **Attachment C**.

COMMENTS FROM THE TRANSPORTATION ADVISORY BOARD

The Transportation Advisory Board (TAB) included the TMP update at its October 8, 2018 meeting. The Board was asked to provide responses to the study session questions as well as provide suggestions to improve the PowerPoint. Major comments from the Board for each of the priority work areas.

- Regarding Vision Zero, the Board requested visual refinements to the presentation slides regarding the initial results of the Safe Streets Report. The Board had questions pertaining to the collision rate, that is, comparing the growing or declining individual mode shares relative to the frequency of collisions (staff informed the Board that an exposure analysis will be included in the final Safe Streets Report). The Board asked staff to include metrics in the presentation regarding the on-going implementation of the 4 E's. The Board requested staff modify the draft guiding principles to include active statements and asked how the new Vision Zero goals would be measured over time.
- Relative to the Transit Service Delivery Study, board requested refinements to the presentation to simplify the cost and revenue slides associated with each model. The board also requested that staff emphasize why finding an alternative transit service delivery structure is important and urgent.
- For Advanced Mobility, the Board agreed with the draft principles for Advanced Mobility and suggested some streamlining of the presentation. The discussion noted that success in this area would be achieving our TMP goals and objectives as well as having most seats full and greatly reducing the parking needed in the community.
- In the Funding area, the Board questioned the need to list "automobile capacity additions" as the lowest priority given that no such projects are included in the city's

current Capital Improvement Program and there are no plans to add additional vehicle lanes anywhere in the city.

NEXT STEPS

Following the discussion with council on these topics, staff will incorporate feedback to refine work on the TMP update. Staff will provide updated information to TAB, council and the community at key milestones through meetings, the project website, and the city's Be Heard Boulder online engagement platform. The next council study session regarding TMP draft policy options and funding scenario analysis is anticipated in the first quarter of 2019. For more information and updates regarding the TMP update and the Transportation Master Plan, please visit: www.bouldertmp.net.

Attachments:

A. Vision Zero Safe Streets Initial Analysis Results
B. POLICY AGENDA US36 Mayors & Commissioners Coalition and Commuting Solutions
C. Additional TMP Topic Updates

Attachment A – 2018 Safe Streets Report
Draft Initial Results Summary

Total number of collisions is increasing; however, the total number of severe crashes has remained steady.

TOTAL COLLISIONS (where a police officer responded)

- The total number of annual collisions has been increasing at a rate of about 44 collisions per year, or approximately 1.5 percent annually, from 2009 to 2017.
    - 2,887 total collisions in 2017
    - 2,720 avg. annual crashes in 2009-11
    - 2,850 avg. annual crashes in 2012-14
    - 2,963 avg. annual crashes in 2015-17
- The total number of annual collisions involving only motorists has been increasing at the rate of about 42 collisions per year, or approximately 1.5 percent annually, from 2009 to 2017.
    - 2,641 total motorist collisions in 2017
    - 2,490 avg. annual motorist crashes in 2009-11
    - 2,596 avg. annual motorist crashes in 2012-14
    - 2,711 avg. annual motorist crashes in 2015-17
- Based on the variance in this data, the presence of an overall upward or downward trend in collisions involving a person riding a bicycle cannot be concluded.
    - 176 total bike collisions in 2017
    - 178 avg. annual bike crashes in 2009-11
    - 192 avg. annual bike crashes in 2012-14
    - 185 avg. annual crashes in 2015-17
- The total number of annual collisions involving a person walking (pedestrian) has been increasing at a rate of about 2 collisions per year, 4 percent annually, from 2009 to 2017.
    - 70 total pedestrian collisions in 2017
    - 52 avg. annual pedestrian crashes in 2009-11
    - 63 avg. annual pedestrian crashes in 2012-14
    - 67 avg. annual pedestrian crashes in 2015-17
- From 2009 to 2013 the annual number of collisions involving a person suspected of or convicted of a DUI was steady. From 2014 to 2017, the total number of annual collisions involving impairment has increased at approximately 11 collisions per year, or 10 percent annually.
    - 139 total impaired collisions in 2017
    - 115 avg. annual impaired crashes in 2009-11
    - 112 avg. annual impaired crashes in 2012-14
    - 126 avg. annual impaired crashes in 2015-17

TOTAL SEVERE COLLISIONS

- Based on the variance in this data, the presence of an overall upward or downward trend in severe collisions cannot be concluded. Total severe collisions have fluctuated between

39 and 76 annually 2009 to 2017. There was a peak in severe accidents between 2011 and 2014 (67 on average), and severe accidents in the last three years has decreased (2015-2017).
    - 62 total severe collisions in 2017
    - 57 avg. annual severe crashes in 2009-11
    - 67 avg. annual severe crashes in 2012-14
    - 54 avg. annual severe crashes in 2015-17
- Based on the variance in this data, the presence of an overall upward or downward trend in severe collisions involving only motorists cannot be concluded. Total severe collisions have fluctuated between 14 and 30 collisions per year between 2009 and 2017.
    - 28 total severe motorist collisions in 2017
    - 21 avg. annual severe motorist crashes in 2009-11
    - 27 avg. annual severe motorist crashes in 2012-14
    - 20 avg. annual severe motorist crashes in 2015-17

TOTAL BICYCLIST AND PEDESTRIAN SEVERE COLLISIONS

- Together, bicycle and pedestrian severe collisions account for more than half (62 percent average from 2015-2017) of the total severe collisions.

- Based on the variance in this data, the presence of an overall upward or downward trend in severe collisions involving a bicyclist cannot be concluded. 2014 had the highest number of bicycle collisions (35), while 2015 and 2017 had the lowest number of bicycle collisions (18)
    - 18 total severe bicycle collisions in 2017
    - 22 avg. annual severe bicycle crashes in 2009-11
    - 27 avg. annual severe bicycle crashes in 2012-14
    - 21 avg. annual severe bicycle crashes in 2015-17

- While the total number of pedestrian collisions has been increasing, the presence of an overall upward or downward trend in severe pedestrian collisions cannot be concluded (is remaining constant). 2014 had the lowest number of severe ped crashes (7), while 2017 was the second highest (16). The average remains the same (13 collisions/year) between 2009 and 2017, or between 2015 and 2017
    - 16 total severe pedestrian collisions in 2017
    - 14 avg. annual severe pedestrian crashes in 2009-11
    - 13 avg. annual severe pedestrian crashes in 2012-14
    - 13 avg. annual severe pedestrian crashes in 2015-17

- Based on the variance in this data, the presence of an overall upward or downward trend in severe impaired collisions involving a bicyclist cannot be concluded. Impaired collisions include collisions involving driving under the influence of alcohol or drugs, whether they were cited or suspected
    - 8 total severe impaired collisions in 2017
    - 8 avg. annual severe impaired crashes in 2009-11
    - 8 avg. annual severe impaired crashes in 2012-14
    - 7 avg. annual severe impaired crashes in 2015-17

COLLISION DETAILS

- General location of collisions has not changed, approx. 48 percent of collisions occur at an intersection, 28 percent non-intersection (along a roadway), 10 percent in a parking lot, 6 percent driveway-access related, 12 percent other locations
- Distribution of collisions by crash type has overall remained the same
    - Rear ends are the most common collision type, accounting for 37 percent of crashes 2015-17, but only 7 percent of severe crashes 2015-2017
    - Severe collision breakdown: Bicycle (39 percent), pedestrian (23 percent), followed by approach turn (9 percent), fixed object (8 percent), rear end (7 percent), right angle (6 percent).

POLICY AGENDA

US36 Mayors & Commissioners Coalition
and
Commuting Solutions

Approved on November 2, 2017

The U.S. 36 Mayors & Commissioners ("MCC") and Commuting Solutions (CS) support federal, state and regional policy that is consistent with the positions identified in this Policy Agenda. These positions are mostly informed by the 2014 consensus achieved during the Northwest Area Mobility Study (NAMS) which was considered a realistic and equitable approach to furthering the will of the voters that in 2004 approved the FasTracks ballot measure. The agreement was captured in an April 7, 2014 "NAMS Local Stakeholder Consensus Document" (**Attachment A**) which should be read in conjunction with this Policy Agenda in order to understand the specifics on funding sources, projects, timing and order of priority in which they are each supported.

The Policy Agenda provides representatives of the US 36 MCC and CS with the authority to advocate on behalf of the coalition for the stated positions as opportunities arise be they before legislative, regulatory or administrative bodies and individual leaders. Any potentially controversial or high-profile policy communication made on behalf of the MCC and CS should receive prior-approval from the full MCC and CS, when possible. Regardless, all such communications should subsequently be brought to the attention of the full MCC and CS at the earliest opportunity.

The Policy Agenda is approved by each of the individual governing bodies of the members that make up the MCC. It may be revisited and revised at any time to reflect changing circumstances or to provide specific interpretation of these positions as they apply to any one policy question.

- **Arterial Bus Rapid Transit (BRT)/ Enhanced Bus Service Projects -** Seek non-FasTracks funding and support for capital and operating improvements necessary to implement an arterial BRT/Enhanced Bus Service network, including supportive multimodal system enhancements. State Highway 119 from Longmont to Boulder is the highest priority arterial BRT corridor. The remaining corridors, listed below, should be implemented based on further refinement of regional priorities, project scopes funding availability and leveraging opportunities:

    - State Highway 7 connecting North I-25/North Metro Park–n-Ride/Northglenn, Broomfield, Erie, Lafayette and Boulder
    - State Highway 287 connecting Longmont, Lafayette, Erie and Broomfield to the US 36 Corridor
    - South Boulder Road connecting Lafayette and Louisville to Boulder
    - 28th Street/Broadway (connecting US 36 BRT and South Boulder Road BRT to Boulder Junction/14th & Walnut)
    - Improved transit connection from Louisville/Lafayette/Superior/Broomfield to US 36 via SH 42/95th Street
    - 120th Avenue between US36 & Broomfield Station and Adams County Government Center
- **Connected and Autonomous Vehicle Deployment -** A range of connected and autonomous vehicles are soon expected to be available to the public. While this raises the prospect of new

POLICY AGENDA

US36 Mayors & Commissioners Coalition and Commuting Solutions

Approved on November 2, 2017

and exciting mobility options, it also means that once these vehicles become commonplace they will dramatically transform every aspect of livability in the communities in which they are driven – for better or for worse. While AVs bring the possibility of improved safety, reduced congestion, reduced parking demand and a route to faster adoption of electric vehicles, recent studies have suggested that these benefits could be undermined by widespread individual ownership of AVs and dramatic increases in vehicles miles travelled.

Legislation is being considered at the federal and state levels that will set in motion a series of decisions that will be difficult to later revisit. Unfortunately, these bills are being shaped almost exclusively by the future manufacturers and commercial users of these vehicles. It is essential that local government voices be part of these discussions.

The MCC will advocate for legislation that enables and encourages the deployment of connected and autonomous vehicles in Colorado where such vehicles are clean-fueled and safe and the deployment furthers local government policies. Specifically, such legislation should include a framework that encourages deployment for shared purposes (be that for public and private transit use or shorter, first and final mile connections), results in increased accessibility, leads to a decrease in parking demand, increases safety for all modes of travel and decreases vehicle miles driven. Conversely, the MCC will oppose legislation that either does not further these goals or that denies local government authority to pursue these goals on its own.

- **Northwest Rail** – Support full completion of the Northwest Commuter Rail Project to Longmont.
    - Support creative and alternative rail implementation strategies (including level of service phasing) as circumstances effecting feasibility, such as change in BNSF position, costs, ridership, and funding sources, evolve.

- **I-25 Bi-Directional Managed Lanes -** Seek funding and support for the construction of additional managed lanes between US 36 and downtown Denver to facilitate bi-directional service to benefit the broader region (both North I-25 and US36 connections to/from Denver) and interim measures, including bus on shoulder service.

- **Managed Lanes** – Support implementation of permanent congestion-free managed lanes as a practical, cost effective, long term strategy for improving corridor mobility for all users, including drivers and transit users, be they in managed or general-purpose lanes. These managed lanes should be allowed to remain uncongested through variable pricing of single occupant vehicles resulting in drivers choosing to use the lane at a level that ensures unrestricted travel in the managed lane by all users, provides incentives for energy efficient travel, and benefits all travelers using the entire facility.

    - Support the free-flowing operation of managed lanes while opposing the imposition of arbitrary deadlines for converting from HOV-2 to HOV-3 not tied to either protecting performance of these lanes or to previously-executed agreements.

POLICY AGENDA

US36 Mayors & Commissioners Coalition
and
Commuting Solutions

Approved on November 2, 2017

  - Support funding for education and incentives to promote full utilization of the HOV lanes.

  - Support increased transparency and public involvement in decisions to create future managed lanes, especially those involving private partners.

  - As a general policy, support the requirement that any significant new highway (freeway/expressway) lane-capacity (public or private) built with state or federal funds be required to be managed (priced/tolled) to maximize the person-carrying capacity of the facility and to encourage free HOV and transit usage unless reasonable exceptions apply.

- **Rail/Transit Stations –** Support funding and implementation of station investments and First and Final Mile infrastructure and programs that serve both BRT and future rail.

- **Railroad Crossing Quiet Zones** – Support flexibility in, and funding for implementation of, quiet zones along the length of the Northwest Corridor, with a priority on crossings that benefit the greatest number of residents in the most cost-effective manner.

- **Transportation Funding** – Support state or regional transportation funding that includes a commitment for a substantial percentage of multimodal (i.e., transit, bicycle and pedestrian) investment (e.g., MCC supported MPACT 64's previous proposal to allocate 33 percent of new statewide transportation funding for transit purposes).

  - Support new bonding or other borrowing for transportation projects only if there are new or existing designated sources of funding identified to pay off those obligations.

- **US 36 Bus Rapid Transit System** – Seek funding and support for the full implementation of the US 36 BRT system as committed to in the 2004 FasTracks ballot measure, the US 36 Environmental Impact Statement and Record of Decision, the TIGER and TIFIA funding applications and additional elements approved by the RTD Board on September 17, 2013, including relocation of the Church Ranch boarding platforms, improvements to the Westminster Center pedestrian bridge and structured parking in Broomfield.

  - Support Flatiron Flyer BRT service improvements and station area enhancements to more fully serve existing and new Transit Oriented Development in each of the US36 MCC communities.

  - Seek funding for implementation of the US 36 First and Final Mile study recommendations that provide a tangible benefit to residents, employees and commuters in the corridor.

  - Support RTD authority to authorize bus-on-shoulder use on limited corridors to expedite local bus service.

NAMS LOCAL STAKEHOLDER CONSENSUS DOCUMENT

US36 Mayors and Commissioner Coalition
36 Commuting Solutions

April 7, 2014

The local stakeholders thank RTD and our other regional partners for working with us through Northwest Area Mobility Study (NAMS) on this challenging consensus process. Collectively, we believe that the priorities reached through this consensus approach are realistic and equitable, while respecting the will of the voters in 2004.

Local stakeholders actively participating in the NAMS have spent significant effort working together to develop a path forward on transit investments in the Northwest Corridor. Following much discussion, debate and deliberation we have come to a consensus predicated on the information received to date through the NAMS that regional transit operating and infrastructure improvements in the Northwest region should include the following elements.

- **Completion of the US 36 Bus Rapid Transit (BRT) System:** Completion of the US 36 BRT system as committed in the 2004 FasTracks, US 36 Environmental Impact Statement and Record of Decision, TIGER and TIFIA funding applications and additional elements approved by the RTD Board on September 17, 2013, including relocation of the Church Ranch boarding platforms, improvements to the Westminster Center pedestrian bridge and structured parking in Broomfield. Local stakeholders also support implementation of the US 36First and Final Mile study recommendations that provide a tangible benefit to residents, employees and commuters in the corridor. In order to leverage these capital improvements and show a true net FasTracks benefit to the corridor, service enhancements and a robust operating plan that includes increased bus frequencies must be implemented.

- **Arterial BRT/ Enhanced Bus Service Projects:** Arterial BRT/Enhanced Bus Service system capital and operating improvements should be implemented as soon as feasible. No FasTracks funds should be utilized for these arterial BRT investments.

    - State Highway 119 from Longmont to Boulder is the highest priority arterial BRT corridor.

    - The remaining corridors should be implemented based on further refinement of regional priorities, project scopes funding availability and leveraging opportunities.

    - State Highway 7 connecting North I-25/North Metro Park–n-Ride/Northglenn, Broomfield, Erie, Lafayette and Boulder

    - State Highway 287 connecting Longmont, Lafayette and Broomfield to the US 36 Corridor

    - South Boulder Road connecting Lafayette and Louisville to Boulder

    - 28th Street/Broadway (connecting US 36 BRT and South Boulder Road BRT to Boulder Junction/14th & Walnut)

    - Improved transit connection from Louisville/Lafayette/Superior/Broomfield to US 36 via SH 42/95th Street.

    - 120th Avenue between Broomfield Park-n-Ride and Adams County Government Center

- **I-25 Bi-Directional Managed Lanes**: Construction of two additional managed lanes between US 36 and downtown Denver to facilitate bi-directional service that will benefit the broader region (both North I-25 and US36 connections to Denver). Identified interim measures should be implemented as quickly as possible, including bus on shoulder service and downtown Denver circulation improvements, with long term measures to follow.

- **Railroad crossing quiet zones** should be implemented along the length of the Northwest Corridor, with a priority on crossings that benefit the greatest number of residents in the most cost effective manner.

- **Early Action Rail/Transit Stations:** Station investments and US 36 First and Final Mile infrastructure and programs that serve both BRT and future rail should be implemented. $17 million has already been identified from EAGLE P3 savings for the Downtown Longmont station that will serve both BRT and future rail. Similar investments should be made at other stations that will serve both future rail and BRT/Enhanced Bus Service such as Boulder Transit Village, Gunbarrel, East Arapahoe, Downtown Louisville, Broomfield at Flatirons Crossing and 116th, and Westminster at 104th/Church Ranch and at 88th Avenue.

- **Northwest Rail**: The local stakeholders recognize the commitment made to voters in the 2004 FasTracks election and the ongoing public expectation that rail will be built in the corridor from FasTracks revenue. Local stakeholders support full completion of the Northwest Commuter Rail Project to Longmont. Considering costs, lack of revenues, ridership projections, uncertainty with Burlington Northern Santa Fe (BNSF) and other challenges, completion of Northwest Rail is a longer term goal. Local stakeholders support periodically exploring creative and alternative rail implementation strategies (including phasing) as circumstances effecting feasibility, such as change in BNSF position, costs, ridership, and funding sources, evolve.

Re-evaluation of Priorities: We believe that the public expects and deserves visible cost effective mobility improvements in the short term that form the foundation of our long term transportation system while honoring the vision of rail connecting the corridor communities to each other and the Denver region expressed in the 2004 FasTracks plan approved by the voters.

To that end:

- We support regular monitoring of the factors influencing the costs, revenue and feasibility of the implementation options identified above, including phasing, and, should they significantly change, the reconsideration of investments priorities.

- We recognize that FasTracks funding should be targeted towards those Northwest corridor improvements identified in the FasTracks system approved by the voters in 2004. FasTracks funding should therefore be used to build and operate the US 36 BRT system as well as those improvements that are consistent with implementation of Northwest Rail from Westminster to Longmont and other, nonFasTracks funding sources should be targeted toward those improvements that are not consistent with the FasTracks plan.

- We also firmly believe that the RTD should focus any further FasTracks investments in the Northwest Corridor prior to using FasTracks funds for improvements, or equipment replacement, in any other corridor.

Additional TMP Topic Updates

The following section provides informational updates on additional TMP topics. More information is available on bouldertmp.net.

Pedestrian Plan

The Pedestrian Plan is the community's blueprint for improving walking conditions in Boulder. It is currently undergoing its first update since 1996 and will include a detailed Action Plan for implementing improvements. Recent work includes gathering community input, mapping and documenting existing conditions, doing best practices research, and establishing a diverse 20-member Pedestrian Advisory Committee (PAC) of Boulder residents. The PAC held its first meeting in August and will have additional meetings in the Fall. Supporting the city's engagement framework to build relationships and establish inclusive community participation throughout the process.

Next steps for the Pedestrian Plan include drafting a vision, goals, and objectives, as well as strategies to achieve the goals and performance measures to monitor progress. Elements of the Pedestrian Plan will be integrated into the TMP, and the entire Pedestrian Plan document will be an appendix to the TMP. An update to the City's Pedestrian Crossing Treatment Installation Guidelines will also accompany the development of the Pedestrian Plan.

The Pedestrian Plan includes an assessment of the city's compliance with Americans with Disabilities Act (ADA) and a transition plan for identified improvements.

Walk and Bike Network

The Walk and Bike Network Plan will provide a safe, comfortable, and connected network of walking and biking facilities for people of all ages and abilities. Developed from a combination of technical analysis and community input, the draft bicycle "vision" network includes a connected set of corridors and multi-use paths that families will feel comfortable using and is currently available for community review and input. The walk network is being developed based on the "15-minute neighborhood" assessment of a person's ability and comfort to walk to a variety of destinations. Key outputs will include a map of the planned corridors and any projects needed to help complete gaps and improve safety and comfort; The projects identified through this effort will be folded into the Pedestrian Plan, Bicycle Plan, the TMP's investment programs, and the city's Capital Improvement Program process.

Downtown Boulder Station Study

Staff is in the early stages of the planning enhancements for current and future transit access for downtown and the Civic Area at the Downtown Boulder Station, located at 14th and Walnut streets. Use at the station has outgrown its size and capacity; while it is less than one-eighth of the size of Denver's Union Station, it serves nearly the same number of bus routes. Peak demand could double over the next 20 years, as Boulder and surrounding communities plan for increased transit service and ridership.

In addition to serving increased bus operations for the Flatiron Flyer Bus Rapid Transit (BRT) service in 2016, Boulder's Transportation Master Plan (TMP) and RTD's Northwest Area

Mobility Study both call for increased local and regional transit service to and from the Downtown Boulder Station.

In fall 2016, as part of the Canyon Boulevard Complete Street Study, city staff embarked on the most recent feasibility study for transit improvements at the Downtown Boulder Station, which builds on the recommendations from the prior 2006 FasTracks Local Optimization Study. Technical studies were developed in 2016-17 to get an updated understanding of existing conditions at the Downtown Boulder Station and future needs for the site based on the TMP's Renewed Vision for Transit. The Existing Conditions and Future Needs reports are available on the project website.

In mid-2017, the project team, which includes staff from City of Boulder, Boulder County, RTD, and Via Mobility Services, began exploring and identifying potential sites that could accommodate future needs. The site on the 1400 block of Canyon, originally identified in the FLO Study as a potential future site, rose to the top for more in-depth analysis. Through late 2018, staff will continue to develop a strategy and work plan for more detailed study of this site.

The vision to relocate the downtown station is a long-term solution that could take 10-20 years to realize and would require funding from multiple sources. In the interim, to accommodate existing needs for additional capacity, 14th Street south of Canyon is being studied as a transit street that would provide additional bus stop and layover space on street. This would act as an extension of the existing transit street on 14th Street north of Canyon. Staff is further developing designs and will be considering the project for the Denver Regional Council of Governments Transportation Improvement Program application in early 2019.

In addition to the 14th Street expansion, staff is working on creating on-street transit stop improvements on Canyon as part of the design of the Canyon Corridor Complete Street plan. These stops can serve local and regional routes to expand capacity in the near and mid-term.

Regional Corridor Planning

In support of the TMP regional travel initiatives, current work continues through the US36 Mayors and Commissioners Coalition (MCC) on Diagonal/SH 119 and East Arapahoe/SH 7. The city is also working with Boulder County communities and other partners to pursue funding through DRCOG and state sources and co-hosting community engagement for various regional initiatives in fourth quarter 2018.

Integrate with Sustainability Initiatives

The 2014 TMP added this Focus Area to emphasize the integration of the Community Sustainability Framework and the extensive analysis performed on the transportation portion of the Climate Commitment. The 2017 Boulder Valley Comprehensive Plan included an emphasis on resilience and equity, and these themes will be integrated into this update of the TMP. The Access Management and Parking Strategy (AMPS) principles will be incorporated into the TMP policies and Action Plan, and parking code and TDM plan requirements are being reviewed related to new development. Staff is also coordinating with the Open Space Master Plan process related to trailhead access/parking issues.

CITY COUNCIL AGENDA ITEM COVER SHEET

MEETING DATE:
October 23, 2018

AGENDA TITLE
Discussion of Housing Advisory Board Work Plan for the Next Three Months (30 min)

PRIMARY STAFF CONTACT
Jeff Yegian, Senior Project Manager

REQUESTED ACTION OR MOTION LANGUAGE
Discussion of Housing Advisory Board Work Plan for the Next Three Months

ATTACHMENTS:

Description

No Attachments Available