

Cutting Transportation Emissions by 2030 and Beyond: Smart Land Use and Travel are Essential



Climate Actions Needed for an Equitable, Livable,
and Sustainable Greater Washington

March 2021



Coalition for Smarter Growth

DC • MD • VA

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Acknowledgments

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Executive Summary

Cutting Transportation Emissions by 2030 and Beyond: Smart Land Use and Travel are Essential

Transportation is the largest source of greenhouse gas (GHG) emissions in the Washington, DC region (42 percent), and key decisions will be made this year on whether our transportation plans and projects and our housing and land use policies will sufficiently cut emissions to reach our adopted climate targets. These actions must go beyond strategies for widespread adoption of electric cars and trucks and also include strategies to reduce the need to travel by car. GHG reduction strategies should also have co-benefits that make the region more equitable and livable.

To fight climate change and meet our region's 2030 GHG reduction target, we need to reduce how much we drive in addition to the transition to electric vehicles. This fight requires cities, suburbs and towns to do much more to foster walkable, inclusive, transit-oriented communities and address the east-west housing-jobs imbalance.

Our leaders need to tackle climate change in decisions this year that include: the regional Transportation Planning Board's Visualize 2045 plan update, Maryland's decisions regarding the Beltway and I-270/495, Northern Virginia's TransAction 2040 plan, Mid-Atlantic and Northeastern states Transportation Climate Initiative, implementation of adopted Metropolitan Washington Council of Governments (COG) regional housing targets, local climate action and transportation plans, and in Virginia and Maryland state legislative and administrative actions.

Specific Actions Needed:



1. Set GHG, Auto Vehicle Miles Traveled (VMT), and Non-Auto Mode Share Goals – Ensure that all regional transportation and land use plans and related major infrastructure projects quantify how they will reduce GHG emissions and automobile VMT consistent with adopted climate targets. Include mode share targets for boosting non-auto travel by transit, walking, biking or rolling. The region will need to reduce per capita VMT 15-25% and increase non-auto mode share 15-20% relative to 2019 levels by 2030 to 2045.



2. Prioritize Transit Station Areas for Development and Services – Prioritize high-capacity and high-frequency transit station areas in walkable regional activity centers for housing and job growth, accessibility of services, and public investments.



3. Make Affordable Housing in Transit-Accessible Locations a Climate Strategy – Implement adopted regional housing targets and prioritize locations near frequent transit for affordable housing production and preservation.



4. Optimize and Leverage Transportation Pricing – Enact pricing strategies to address transportation equity, reflect the true cost of driving and parking, and recognize sustainability – e.g., commuter benefit cash-outs, reduced transit fares, parking pricing and unbundling, usage-based car insurance, and congestion pricing on existing lanes.



5. Broaden Vehicle Electrification Strategies with Shared Mobility and Micromobility – Include electric bikes, scooters, mopeds, buses, shared mobility, and mobility hubs in a broader "e-mobility" strategy that includes equity provisions.



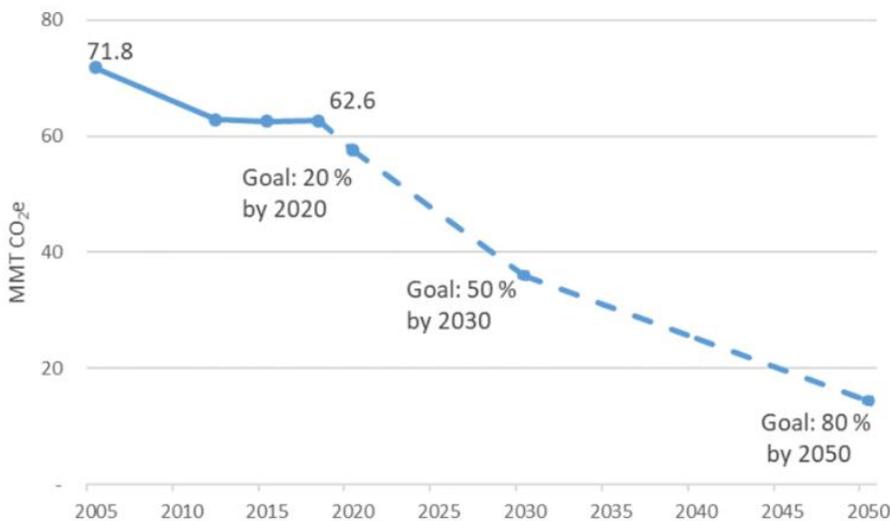
6. Track Local and Regional Progress – Establish clear integrated regional benchmarking and performance tracking of transportation, housing, and land use metrics related to GHG emissions (e.g., housing and jobs near transit, affordable housing, VMT, and mode share for work and non-work trips), at local, sub-regional (core, inner suburbs, outer suburbs), and regional levels.

Where We Are Now

Major regional and local decisions are taking place now regarding how we address our climate emissions in transportation. There have been recent positive steps, but a common and critical shortfall in the current and past efforts has been the failure to fully address a major greenhouse gas (GHG) emissions source – how much we drive.

This issue brief focuses on strategies to address our transportation-related climate pollution through land use, housing and travel demand strategies. These strategies receive less attention than fuel economy and electric vehicle (EV) strategies but are just as essential and also have major co-benefits for equity, sustainability, health, and livability.

Figure 1: Metropolitan Washington Greenhouse Gas Trends and Goals



Source: Image from the [COG 2030 Climate and Energy Action Plan](#), page 3

Regional Climate Target, Significance of Transportation

The region's leaders adopted a 2030 climate target in October 2020,¹ and several local governments have similar targets – reducing GHG emissions 50 percent by 2030 compared to 2005 levels. This goal is consistent with current climate science, such as the landmark 2018 *IPCC Special Report on Warming of 1.5°C*, which showed we need to make significant emissions cuts this decade to avoid catastrophic warming. While targets for deeper reductions or carbon neutrality by 2050 are also important, we need to focus on the 2030 target and the immediate policy changes needed if we are to set in place the patterns and practices that will be required to achieve these long-term goals.

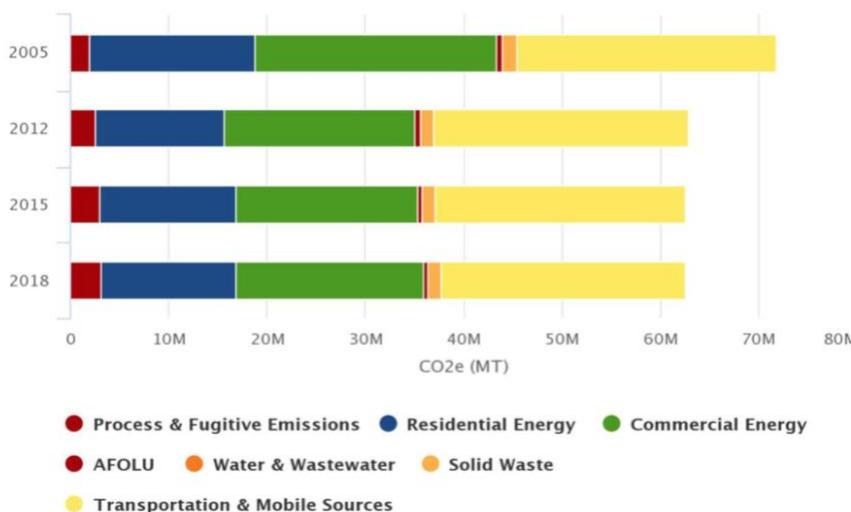
Transportation Is the Region's Largest Source of Climate Pollution, and Most of these Emissions are from Cars

The Washington, DC region needs to do significantly more to reduce GHG emissions from the transportation sector, which is now our largest source of climate pollution. Forty-two percent of Metropolitan Washington's GHG emissions are from transportation. Most of these emissions (60 percent) come from cars, SUVs, and trucks.²

The Region Has Made Progress on Electricity Sector Emissions; Now Let's Tackle Transportation

In recent years, the region has made significant strides in enacting policies to reduce the climate impacts of the electricity sector, passing statewide legislation in Maryland, the District of Columbia and Virginia. These achievements will help us reach Metropolitan Washington's adopted goal of reducing greenhouse gas emissions 50 percent below 2005 levels by 2030. Now it's time to focus on the transportation sector. However, progress in reducing transportation emissions has slowed in the DC region in recent years,³ with similar trends in the majority of U.S. states.⁴

Figure 2: Metropolitan Washington Greenhouse Gas Emissions by Activity



Source: Image from the [COG 2030 Climate and Energy Action Plan](#), page 4

Need to Address Driving and Land Use, as well as Cleaner Vehicles, to Meet Targets

Multiple studies and experience from other regions have shown that vehicle electrification and improved fuel economy, while essential strategies, are not sufficient to meet our climate targets. These studies conclude that reducing auto vehicle miles traveled (VMT) by making better land use policies that reduce the need to drive and by investing in more sustainable and equitable transportation modes is an essential component of lowering our transportation-sector GHG emissions.

National-Level Studies Showing Need to Reduce Driving

Electrification of light-duty vehicle fleet alone will not meet mitigation targets (Milovanoff, Posen, and MacLean, Sep. 2020)⁵

A recently published landmark academic study in the journal *Nature Climate Change* finds that reducing U.S. transportation-sector GHG emissions through vehicle electrification is not feasible without reducing driving and car ownership and major increases in fuel economy standards for conventional vehicles.

“We’ll never reduce emissions or create livable and equitable communities if we don’t find ways to allow people to get around without a car...Electric cars are key to reducing emissions. But it’ll take decades for every car in the U.S. to be electric. We need to do more to reduce our emissions.”

– Smart Growth America, Driving Down Emissions

Decarbonizing US passenger vehicle transport under electrification and automation uncertainty has a travel budget (Alarfaj, Griffin, and Samaras, Sep. 2020)⁶

Another study shows that ride sharing and travel demand policies must complement electric cars and clean electricity to increase the likelihood of meeting our climate targets.

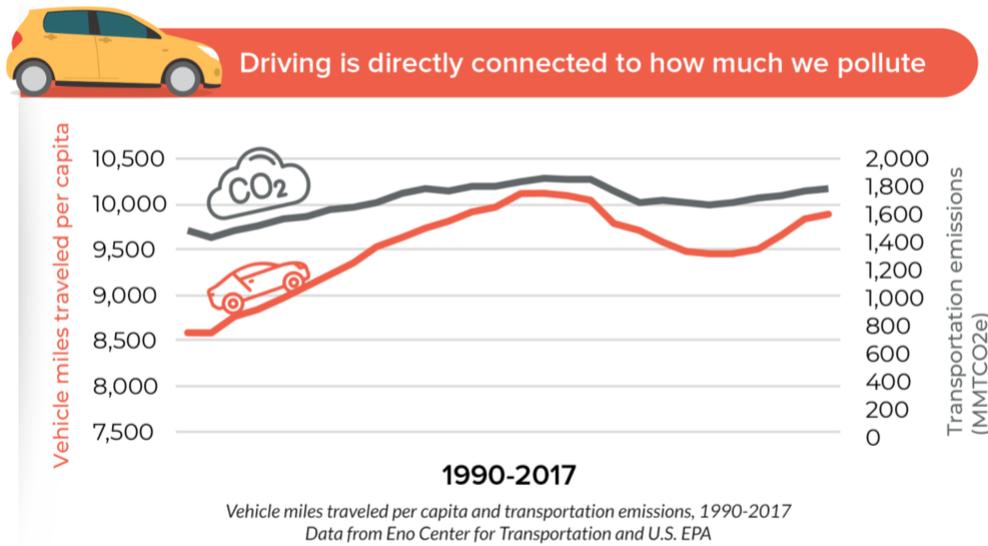
Driving Down Emissions: Transportation, land use, and climate change (Smart Growth America and Transportation for America, Oct. 2020)⁷

Smart Growth America’s report shows in plain terms why sprawling development leads to more driving, GHG pollution, and other negative consequences.

The report recommends that we:

1. Meet the demand for homes in walkable, compact neighborhoods
2. Build safer, walkable streets
3. Set targets for VMT and GHG emissions reductions
4. Provide transportation options and make transit a priority
5. Prioritize connecting people to destinations

Figure 3: U.S. Transportation GHG Emissions and Per Capita Vehicle Miles Traveled



Source: Image from Smart Growth America and Transportation for America. [Driving Down Emissions](#), page 8

*Accelerating Decarbonization of the U.S. Energy System, Consensus Study Report (National Academies of Sciences, Engineering and Medicine, February 2021)*⁸

The National Academies convened a panel of experts to investigate how the United States can best decarbonize its energy system by midcentury. The report focuses on the critical first ten years of this effort and identifies five categories of “no regrets” actions. The first is to “Invest in Energy Efficiency and Productivity.” For transportation, this means “...encouraging shifts in transportation from single-occupancy light-duty vehicles (LDVs) to multi-occupancy vehicles, public transit, cycling, and walking...” and also to “reduce travel through telework and mixed-use development.” The strategy also includes fuel economy improvements. While noting past challenges in achieving significant travel mode shifts in the U.S., the report cites previous studies that estimate it can reduce energy use by 10 to 30 percent.⁹ Transportation efficiency is identified as a priority alongside electric vehicles, not as an afterthought.

20 Percent Reduction in Per Capita VMT and 70 Million EVs Needed by 2030 (Rocky Mountain Institute, January 2021)^{10, 11}

Rocky Mountain Institute’s (RMI) forthcoming analysis has determined that the U.S. will need to reduce its transportation sector emissions 45 percent from 2005 levels by 2030 to meet a climate target consistent with limiting emissions to 1.5 degree Celsius. RMI identified a reachable nationwide EV deployment goal of 70 million EVs on the road (roughly a quarter of today’s passenger vehicle fleet) by 2030. This goal would mean that the vast majority of new cars sales in 2030 would need to be EVs, and it assumes that our electricity is mostly decarbonized by that time. However, there is still a gap in reducing transportation emissions sufficiently to meet our climate targets, which is why RMI found that the U.S. also needs to reduce its per capita VMT in cars, SUVs and pickup trucks by 20 percent from 2019 levels by the year 2030.

State-Level Studies Showing Need to Reduce Driving

California Air Resources Board 2017 Scoping Plan and SCS Targets

Multiple air quality and climate planning studies by the California Air Resources Board (CARB)^{12, 13} have found that VMT reduction is essential to meeting the state’s greenhouse gas reduction targets – even with the most aggressive state-level strategies in the country to improve fuel economy and introduce EVs.

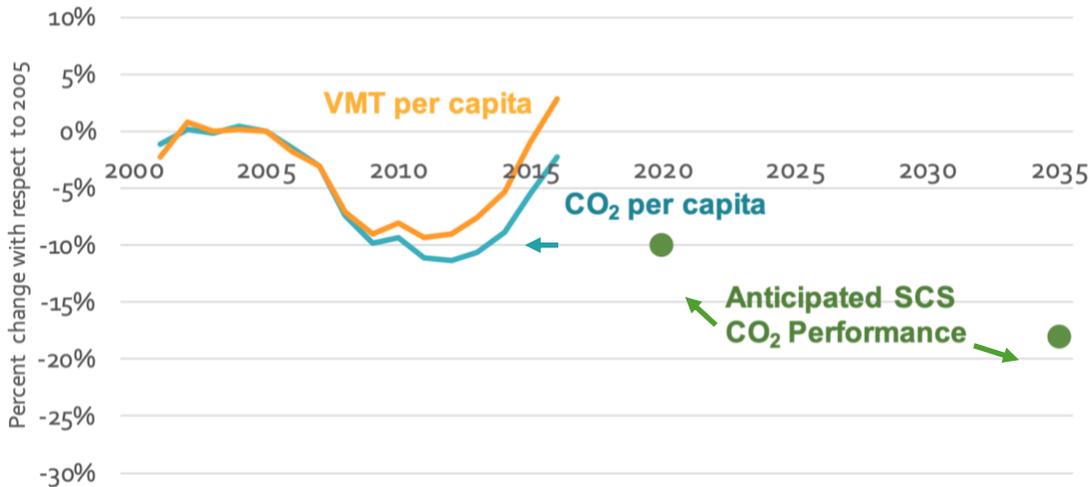
Per capita VMT of passenger cars must go down 16.8 percent by 2050 from pre-pandemic levels to meet the state’s climate target. Half of this decrease needs to happen by 2030.¹⁴

The state’s major metropolitan areas must reduce per capita passenger vehicle GHG emissions 19 percent below 2005 levels by 2035 from measures *on top of* state vehicle emissions and fuels standards (green dots in Figure 4). These state-required SB 375 Sustainable Communities Strategies (SCS) integrate transportation and land use planning to reduce VMT and also include some expanded local EV charging infrastructure strategies.¹⁵

Analysis of Emissions Reduction Pathways for North Carolina's Transportation Sector

This study found that reducing VMT had the greatest potential among modeled strategies for mitigating the transportation sector’s carbon emissions to meet the state’s near-term 2025 climate target.¹⁶

Figure 4: California Statewide Trends and Targets for Vehicle Miles Traveled and CO₂



Note: SCS = Sustainable Communities Strategy, a state-mandated GHG planning requirement in regional transportation plans.¹⁷

Source: Image from CARB. [2018 Progress Report: California's Sustainable Communities and Climate Protection Act](#), page 4.

Land Use and Mode Shift Strategies Help Lower VMT and GHG in the Washington Region, but More Progress Is Needed, Especially in the Suburbs

National Best Practices and Local Leadership

The American Cities Climate Challenge recognizes reducing automobile VMT as one of two major pathways for reducing transportation emissions in urban areas – the other pathway being vehicle electrification. The District of Columbia is one of 25 leadership cities that were awarded assistance through the program, which is sponsored by Bloomberg Philanthropies. The award announcement highlighted DC’s ambitious green building programs and also its climate-friendly transportation plans and policies, which include “encouraging residents and commuters to use alternative transportation by improving service, adding new mobility options, and expanding bicycling and pedestrian infrastructure.”¹⁸

In addition to these types of actions, the Challenge’s *Climate Action Playbook Brief*¹⁹ also recommends the following strategies for cities to reduce transportation emissions from VMT:

- Build More Housing Near Transit Through Upzoning Near Transit Stations, and Eliminating Parking Requirements

- Promote Commuter Incentives to Reduce Driving
- Provide Incentives and Behavioral Nudging for Use of Low-carbon Mobility Modes
- Utilize Parking Management and Pricing to Encourage Low-carbon Travel
- Implement Congestion Pricing and/or Low Emissions Zones for Priority Areas

The District of Columbia was named one of 25 climate leadership cities by the American Cities Climate Challenge, due to its climate-friendly policies and programs in transportation and other areas.

Smart Land Use and Travel Policies in the Region’s Core Jurisdictions Have Reduced Driving – and Can Do the Same in the Suburbs

Core areas of the Washington region have inherent proximity benefits and historic compact centers that make driving less necessary. But importantly, these places also have enacted policies and made recent investments in transit, biking and walking. This work has successfully enabled residents and workers in the region’s core jurisdictions to shift travel to more

sustainable and affordable travel modes over the past decade, as shown in Figure 5 below.

Meanwhile, progress in the suburbs has mostly stalled due to continued policies that emphasize auto-dependent land use and roadway expansion, and the *share* of trips by car remains very high.²⁰ Trip *distances* by car in auto-

oriented suburbs are also typically much longer than those in more walkable areas.²¹

Figure 5: Washington Region Mode Share for All Weekday Trips

Travel Mode	TPB Region 2007/08	TPB Region 2017/18	Core 2007/08	Core 2017/18	Inner Suburb 2007/08	Inner Suburb 2017/18	Outer Suburb 2007/08	Outer Suburb 2017/18
Drive Alone	41.2	41.0	33.1	27.9	42.7	43.7	44.0	45.6
Drive Others and Auto Passenger	38.6	38.0	26.2	25.5	40.2	39.7	44.9	44.5
Rail Transit	4.5	3.6	9.9	8.3	4.0	3.2	1.2	0.8
Bus Transit	1.8	2.0	5.2	5.1	1.2	1.4	0.4	0.5
Walk	9.1	9.3	21.9	24.6	6.9	6.3	4.0	3.4
Bicycle	0.6	1.3	1.3	3.8	0.5	0.9	0.2	0.3
Taxi/Ride-Hail	0.3	1.0	0.8	2.8	0.2	0.6	0.1	0.1
School Bus	3.8	3.5	1.2	1.2	4.1	3.8	4.9	4.6
Other	0.3	0.4	0.4	0.7	0.2	0.4	0.4	0.2

Notes: Highlighted data points (by original author) indicate differences (negative = yellow; positive = green) at 95% confidence level. Sub-Regional Areas as defined by National Capital Region Transportation Planning Board (TPB) and COG:

- Core: Arlington County and City of Alexandria, VA; District of Columbia.
- Inner Suburbs: Fairfax County, City of Fairfax, City of Falls Church, VA; Montgomery County, Prince George’s County, MD.
- Outer Suburbs: Loudoun County, Prince William County, City of Manassas, City of Manassas Park, VA; Frederick County and Charles County, MD.

Source: Image from TPB 2017-2018 Regional Transportation Survey Briefing, [TPB Board presentation, January 21, 2021](#)

Core areas of the region (Arlington, Alexandria, DC) reduced the share of car trips (alone, shared, taxi/ride-hail) by 4% over the last decade, with only 56% of all trips taken by car in 2018.

Inner suburbs and Outer suburbs meanwhile had no change during this time, with 84% and 90%, respectively, of trips in these areas made by car.

– TPB 2017-2018 Regional Travel Survey

Suburban Retrofit

Suburban officials can retrofit areas to be more walkable, compact, and transit-friendly. For example, households in the Mosaic District of Fairfax County are estimated to drive on average 15,500 miles per year and generate 5.9 metric tons of CO₂ emissions compared to an average of almost 20,000 miles per year and 8.4 metric tons of CO₂ for households in Fairfax County overall and other inner suburban counties.²²

Inner suburban and core transit station areas can be a focus of our climate strategy: focusing new development in the ones that are already walkable and have a mix of uses, retrofitting others that have the potential to transform into walkable compact activity centers, and balancing jobs and housing regionally, east-to-west, in activity centers and underutilized Metro station areas.



The Mosaic District, adjacent to the Dunn Loring-Merrifield Metro Station, Fairfax County

Photo credit: [BeyondDC](#), licensed under [Creative Commons](#)

Illustrating the Land Use-VMT Connection

This graphic on the following page from *Driving Down Emissions* shows how land use, travel options, and proximity play a major role in how much we drive and contribute to GHG emissions.



Clustered development allows drivers to take fewer, shorter trips

Every day Jane drops her granddaughter off at daycare, drives to work, and picks up groceries on the way home. Walking, biking, rolling, or transit are usually safe and convenient options.

Sprawling development requires drivers to take more trips—and longer trips.

Like Jane, every day Jeremy drops his daughter off at school, drives to work downtown, and picks up groceries on the way home. Walking, biking, rolling, and transit are not safe or realistic options.



Development patterns and Vehicle Miles Traveled (VMT)

Image courtesy of Smart Growth America and Transportation for America, from [Driving Down Emissions](#), page 15

Regional Activity Centers, High-Capacity Transit Station Areas and Climate Emissions

The COG region has designated Regional Activity Centers as places to target housing and job growth and focus public infrastructure investments. These Activity Centers vary in terms of proximity to the region’s core, quality of transit service, walkability, and compactness and mix of uses. The degree to which these Activity Centers are a climate mitigation strategy depends on which activity centers – and smaller areas within activity centers – are prioritized for growth and investments.

Table 1 shows how designated Activity Centers in both suburban and urban parts of the region that focus development around transit stations and with walkable, mixed-used development allow households to drive significantly less and generate much less climate pollution. In contrast, Activity Centers that are low-density and auto-centric can actually result in higher-than-average household driving-related GHG emissions compared to the surrounding jurisdictions.

Table 1: Variation Among Regional Activity Centers in Transportation Emissions

Sub-Area	Annual Greenhouse Gas Emissions per Household from Driving		
	Outer Suburbs	Inner Suburbs	Core
Jurisdiction Average (grouped by COG sub-areas)	10K metric tons Loudoun Co., Prince William Co., Manassas, Manassas Park, Frederick Co., Charles Co.	8K metric tons Fairfax Co., Fairfax City, Falls Church, Montgomery Co., Prince George’s Co.	5K metric tons Arlington Co., Alexandria, District of Columbia
Sprawling Activity Centers Examples with <i>limited</i> transit, walkability and compactness	11K metric tons Gainesville, Urbana	9K metric tons Chantilly, Fairfax Center, Clarksburg, Gaithersburg, Westphalia, Konterra	
Compact High-Capacity Transit Station Areas Examples with <i>good</i> transit, walkability and compactness	8K metric tons Manassas VRE station; Frederick MARC station	6K metric tons Dunn-Loring Merrifield, Seven Corners, Wheaton, Prince George’s Plaza, Silver Spring, Takoma-Langley	3K metric tons Rosslyn, Shirlington, NoMA, Fort Totten, Union Station, Anacostia, Downtown DC

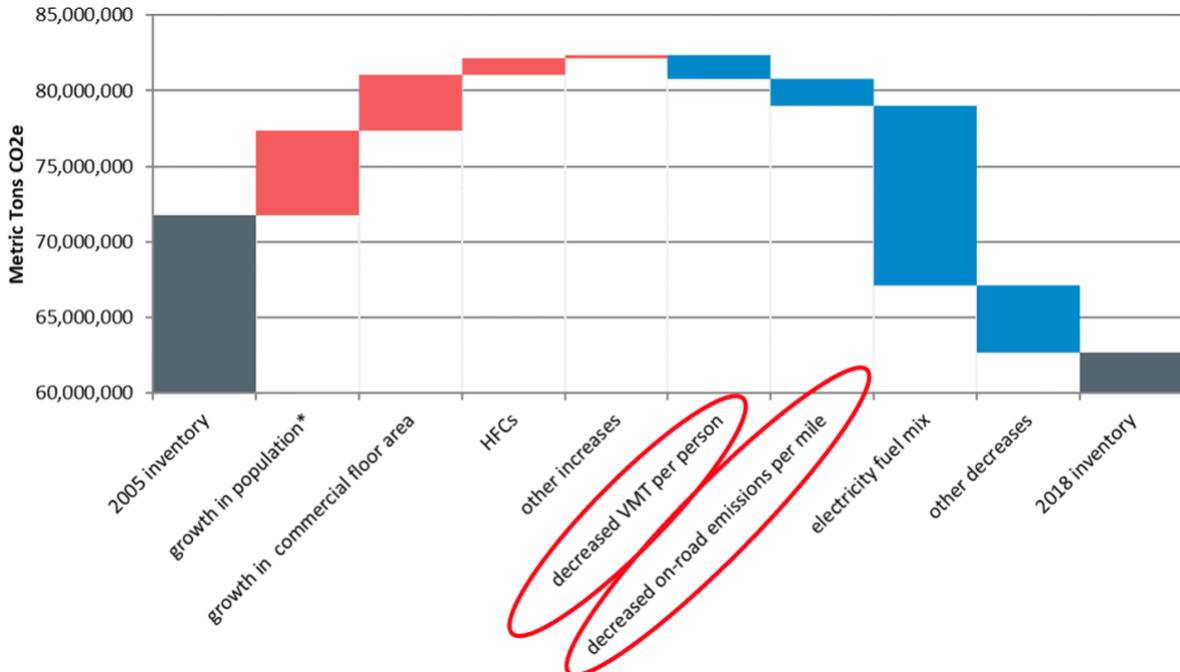
Source: Coalition for Smarter Growth analysis using data from the [Center for Neighborhood Technology. Housing + Transportation Index](#) based on geographic areas in the COG HCT Station Areas [map tool](#) October 2020.

Reducing VMT has Already Helped the Region Reduce GHG Emissions

Between 2005 and 2018, the decrease in per capita VMT in our region helped reduce GHG emissions almost as much as cleaner fuels and fuel economy improvements reduced on-road emissions during this time, as shown below.²³

We need to do more of this to help get the dark gray bars in the chart down to 35 million annual metric tons of carbon dioxide equivalent (CO₂e) by 2030, our adopted climate target.

Figure 6: Drivers of Metropolitan Washington GHG Changes, 2005-2018



*Includes effects of population on residential energy, VMT and waste generation.

Note: "electricity fuel mix" refers to electricity sector energy sources, not vehicle fuels.

Source: Image from [COG 2030 Climate and Energy Action Plan](#), page 4 (red ovals added to highlight transportation changes)

Our Region's Transportation Studies Have Shown that Addressing Land Use Can Significantly Reduce Driving and Provide Many Other Benefits

The National Capital Region Transportation Planning Board (TPB) and WMATA have shown that land use strategies, combined with travel demand strategies and transit investments have the greatest potential to reduce VMT while providing many other benefits.

capita VMT by 6 percent by 2040. Other strategies like the Express toll lanes network, highway operational and spot improvements, and a new Potomac River highway bridge each increased per capita VMT by 1-2 percent.^{24, 25}

In 2017 TPB conducted scenario planning for the Regional Transportation Policy Plan, which showed that land use and travel demand strategies (tested individually) each reduced per

WMATA's *ConnectGreaterWashington* policy alternatives study showed that policies to concentrate the future growth in housing and jobs near our transit stations and address the east-west jobs-housing imbalance would have major benefits for the region. The land use

scenario could decrease VMT by 12 percent by 2040 compared to conditions under the region's adopted transportation plan and anticipated future land use, and would provide additional benefits for job accessibility, Metrorail revenues, and roadway congestion relief.²⁶

Equity, Livability, and Economic Co-Benefits of Land Use, Mode Shift and Housing Strategies

To meet our climate protection goals, our region must reduce the need to drive for basic needs. Automobile-dependent land use and transportation networks place significant burdens on low-income households and workers in accessing daily needs. If we make it easier to use transit, or bike, and walk to get to work, school, shopping and services, our climate strategy will not just reduce GHG emissions, it will also improve equity and livability in the region. Co-benefits from reducing the need to drive include the following:

Total Externalities of Auto Vehicle Miles Traveled (VMT)

Every vehicle mile traveled in the United States costs society on net 18.38 cents per mile in 2017, accounting for congestion, crashes, and local air pollution as well as GHG emissions.²⁷

Equity

Reducing Transportation Costs and Improving Affordability

Auto-oriented land use prevents walkable, transit-accessible neighborhoods. With a shortage of affordable housing in urban areas, many low-to-moderate income households are pushed to more distant auto-oriented suburbs that entail high personal transportation costs. Building more housing in cities and near transit can help expand job access and lower household transportation costs for families.²⁸

What are "Co-Benefits"?

Many strategies to mitigate climate change have other societal benefits, such as improved health from reducing air pollution. These are referred to as "co-benefits". A transportation-sector climate strategy focused just on electric cars will have much fewer co-benefits than a holistic approach that also addresses the need to drive for everyday needs.

A recent study found that “Households in location-efficient places spent significantly less on household transportation, enough to offset high housing costs. Walkable blocks and good transit especially contribute to these savings.” Although for the lowest-income families, the transportation savings were not enough to completely offset the housing costs. The authors recommend investments in housing and transportation and additional support for very low-income households: “Expanding location affordability regionally will also help to address climate change and expand access to job opportunities, goods, services, and other amenities.”²⁹

Climate strategies that emphasize broader mobility options, affordable housing, healthy and safe built environments, universal mobility, and more balanced regional job growth are consistent with the “Equitable Development” framework defined by the Local and Regional Government Alliance on Race & Equity.³⁰

Washington Region Housing Location, Transportation Costs and GHG Emissions

See Figures 7 and 8 on page 14, which show this relationship between housing location, household transportation costs, and GHG emissions from driving in the Washington region.

Disproportionate Air Pollution Impacts

Air pollution from cars and trucks disproportionately burdens low-income households and people of color and has been linked to covid-19 susceptibility.^{31, 32} Deployment of cleaner cars and trucks, especially electric vehicles, can significantly reduce air pollution and provide billions of dollars in health benefits to DC, Virginia and Maryland.^{33, 34} Reducing VMT, in addition to addressing tailpipe air pollution emissions, also addresses non-tailpipe emissions, which primarily consist of particulate matter from tires and brakes and are a concern even with electric vehicles.^{35, 36}

California's Experience

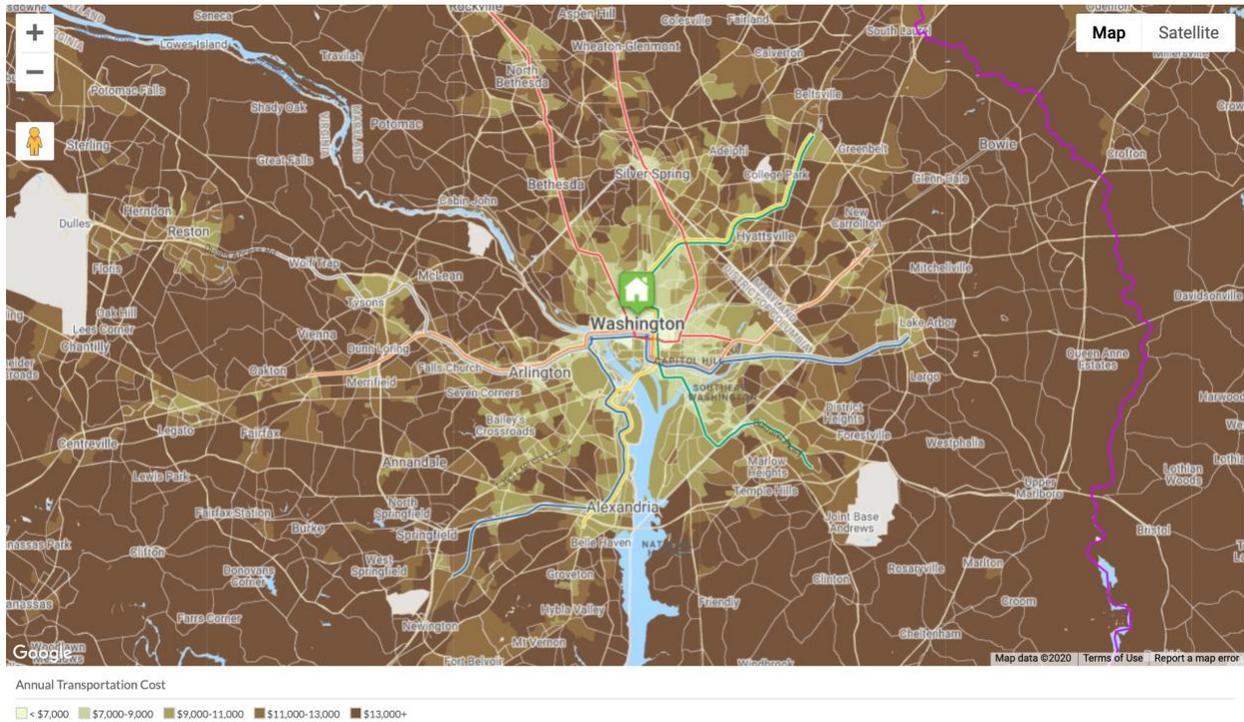
The State of California recognizes that more equitable land use and transportation policies are consistent with GHG mitigation strategies: “Notably, many of the same policy responses to address transportation injustices and systematic racism in land use and transportation planning can simultaneously make communities stronger and more resilient, while reducing VMT impacts. These include affordable housing, safe, reliable transit, a range of affordable mobility options, and access to quality public education, medical care, and jobs all within the same community.”³⁷

In addition to climate benefits, building more housing in cities and near transit can help expand job access and lower household transportation costs for families:

- *The average household in Gainesville, VA on the outer fringe of the region, can expect to spend about **\$15,000** per year in transportation expenses.*
- *Meanwhile, a household in the transit-oriented Mosaic District of Fairfax County or within walking distance of the Wheaton Metro in Montgomery County can expect to spend roughly **\$10,000** per year.*
- *Across the District of Columbia, the average is even lower, under **\$9,000** per year.*

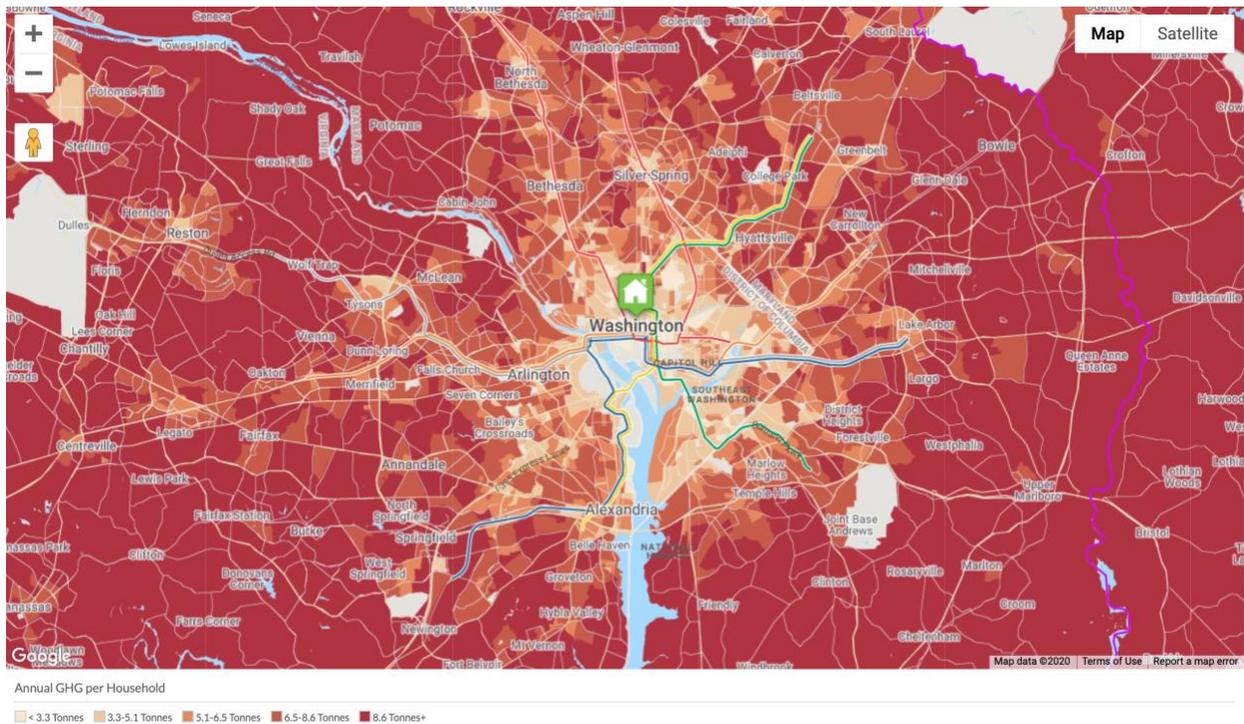
Source: Coalition for Smarter Growth analysis using Center for Neighborhood Technology H+T Index data

Figure 7: Washington Region Average Household Transportation Costs



Source: Image from the CNT Housing + Transportation Index. December 2020 <https://htaindex.cnt.org/map/#>

Figure 8: Washington Region Average Household Greenhouse Gas Emissions from Driving



Source: Image from the CNT Housing + Transportation Index. December 2020. <https://htaindex.cnt.org/map/#>

Safety

Per capita VMT correlates with per capita traffic deaths, and the U.S. leads developed countries in both of these measures. Newer traffic safety approaches look at auto travel demand management and the safety of all travel modes on our roadways.³⁸ For example, cities with high rates of bicycling also tend to be safe for all roadway users.³⁹ Traditional roadway designs that favor high-speed car travel over other travel modes endanger pedestrians and bicyclists, with many low-income and people of color particularly at risk.^{40, 41}

Other Environmental Impacts

The report *Driving Down Emissions* lists the other negative environmental impacts of automobile-focused transportation and land use, illustrated in the graphic on the right. A future of auto-dependence, even with EVs, will not address these other impacts.⁴² Non-tailpipe vehicle pollution has recently received more attention.⁴³

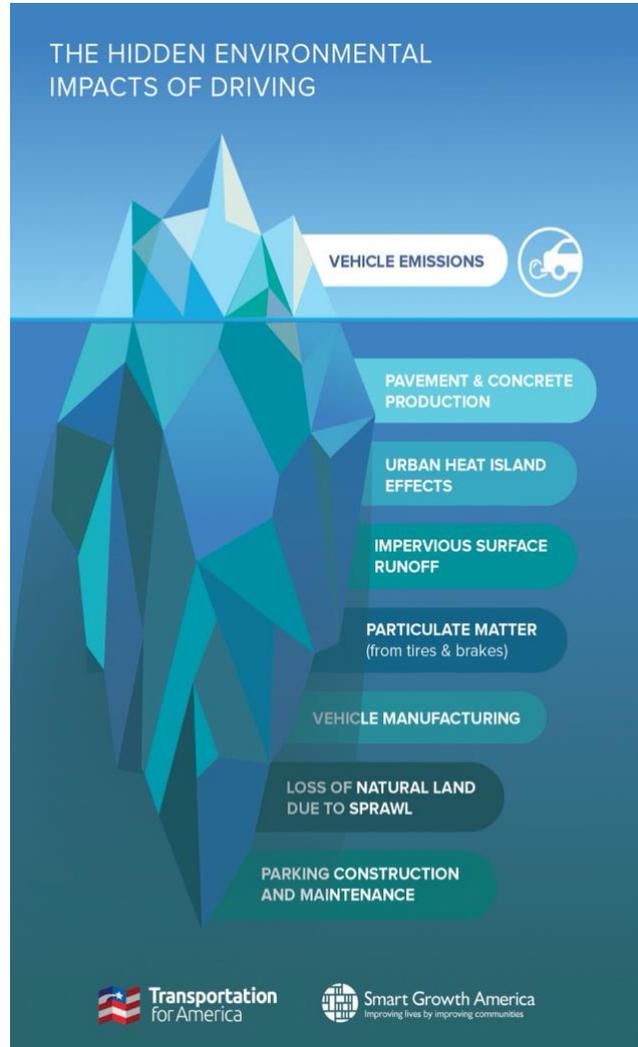
Travel Time, Traffic Congestion

Simply electrifying every vehicle and continuing costly roadway expansions will not reduce travel times and congestion. New and expanded highways and arterials lead to more driving and eventually more congestion. This is a well-documented phenomenon called “induced demand.”⁴⁴ Here in the DC region, TPB showed that travel demand management and regional land use strategies were most effective at reducing hours of vehicle delay.^{45, 46}

Land Use

Tackling the sprawl caused by decades of auto-centric transportation and land use policies will reduce VMT and have many other benefits for open space preservation, public infrastructure and service costs, household affordability and resilience, improved transportation options

(mobility for non-drivers), congestion and travel time impacts, traffic safety, economic opportunity and resilience, social problems (poverty, crime, mental illness), public fitness and health, energy consumption, pollution emissions, and economic development.⁴⁷



Source: Image from [Driving Down Emissions](#), page 9

Increased Telework, while Good, Will not Address the Bulk of Our Travel

Most trips in the region (74.3 percent) are non-work trips and most of these are done by car (79.6 percent). If higher rates of telework continue post-pandemic and eliminate some car commuting, that will help reduce congestion and emissions, and reduce the need to widen highways since most highway and arterial expansion has been designed to handle peak hour volumes. However, increased telework by itself does not address the need to drive for non-work purposes.

The proximity provided by close-in, compact development and availability of non-auto travel options help lower the need to drive for non-work purposes in our region’s inner areas and activity centers. Eighty-nine percent of non-work trips in the outer ring suburbs are made by car (drive alone, with passenger, tax/ride-hail) compared to 56 percent in core jurisdictions. In activity centers across the region, 69 percent of non-work tips are made by car compared to 83 percent in areas outside of activity centers.⁴⁸

Figure 9: Washington Region Non-Commute Mode Share for All Weekday Trips

Non-Commute Mode	Core	Inner Suburb	Outer Suburb	Not in Activity Centers	Activity Centers
Drive Alone	24.6	38.0	38.5	36.9	31.1
Drive Others and Auto Passenger	28.6	45.3	50.5	45.6	36.2
Rail	6.5	1.8	0.7	2.0	4.1
Bus	4.3	1.3	0.3	1.4	2.4
Walk	28.3	7.4	4.1	8.0	19.3
Bicycle	2.9	0.8	0.2	0.9	1.6
School Bus	1.4	4.4	5.4	4.3	3.2
Taxi/Ride-Hail	2.9	0.6	0.2	0.7	1.7
Other	0.5	0.2	0.1	0.2	0.4

Notes: Yellow highlights (by original author) indicate sub-area with significantly higher mode share.

Sub-Regional Areas as defined by TPB and COG:

- Core: Arlington County and City of Alexandria, VA; District of Columbia.
- Inner Suburbs: Fairfax County, City of Fairfax, and City of Falls Church, VA; Montgomery County, Prince George’s County, MD.
- Outer Suburbs: Loudoun County, Prince William County, City of Manassas, and City of Manassas Park, VA; Frederick County and Charles County, MD.

Source: Transportation Planning Board. *2017-2018 Regional Transportation Survey Briefing: Initial Findings of Observed Daily Trips*. Image from [TPB Board meeting presentation Oct. 21, 2020](#).

Autonomous Vehicles Could Significantly Increase VMT and Wipe Out GHG Reductions

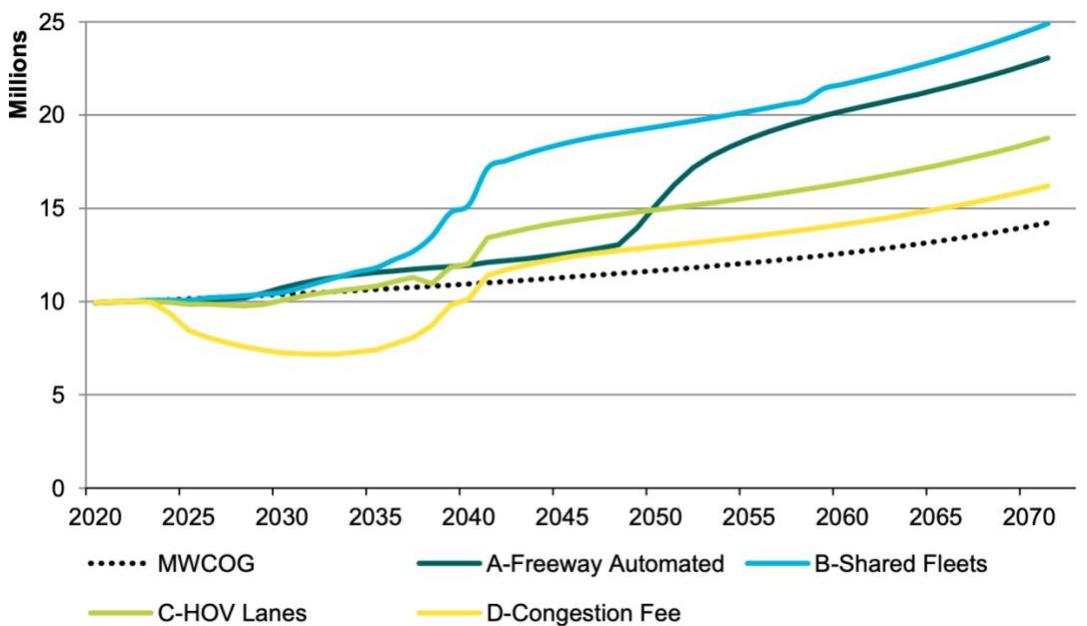
Driverless autonomous vehicles (AVs) could lead to huge increases in auto travel from “zero-passenger” car trips – that is, empty cars shuttling home after dropping off their passenger and later returning to pick them up. These “empty” or “zero passenger” miles – even if from electric cars – would significantly increase congestion and energy use from driving.^{49, 50, 51, 52} This is yet another reason why we need to reduce the overall need for car travel to get to work and access basic services.

The San Francisco Bay Area conducted scenario planning for the region’s long-range vision, Plan Bay Area 2050. The results showed that AVs, absent policies to limit zero-passenger miles, would not only cancel out forecast VMT reductions from smart growth and transit improvement scenarios, but would also lead to significant increases in per capita and total VMT above current levels.⁵³

A scenario planning study of AVs in the District of Columbia showed similar results (see Figure 10). Although AVs provided some benefits, such as more affordable and safer travel in the scenarios, VMT increased in all four scenarios compared to COG forecasts, and per capita VMT increased from 12 percent to 47 percent in three of the scenarios. Only the scenario with a congestion fee kept VMT in check.⁵⁴

The same outcomes would likely happen across the Greater Washington metropolitan area, showing the need to address the need to drive, especially using personal vehicles, in advance of the roll-out of AVs that could swamp our streets – and make our climate goals harder to achieve without the right policies in place.

Figure 10: DC Autonomous Vehicle Scenarios, Vehicle Miles Traveled



Source: Image from [DC AV Study, Final Report](#) (2020), prepared by AECOM and DC Sustainable Transportation for DDOT, page 5

Recent Efforts, Challenges and Opportunities

The adoption of the COG 2030 Climate and Energy Action Plan comes as the Greater Washington region addresses specific needs in housing, transportation, and recovery from the COVID-19 pandemic, and as local governments prepare their own climate action plans. These recent and ongoing efforts show where we can strengthen policies to make renewed and urgent progress in meeting our 2030 climate goal while also addressing equity and livability.

Visualize 2045

The 2018 Visualize 2045 plan would reduce transportation GHG by only 23 percent from 2005 to 2045 (at which point on-road GHG would begin to rise again due to continued VMT growth). This small reduction stands in contrast to our region's adopted goal of reducing GHG 80 percent by 2050 and even more in contrast to stronger carbon neutrality goals adopted by localities and other regions and proposed by the Biden administration.

The National Capital Region Transportation Planning Board (TPB) is beginning the process of updating Visualize 2045, which will continue through 2021, with final adoption in 2022. The updated plan will need to demonstrate that it can achieve significant GHG emissions by 2030 and by 2045 under a range of scenarios that take into account uncertainty regarding factors such as the uptake of electric vehicles by the region's households and workers.

Regional Housing Targets

Currently, the region has a shortfall of 264,000 affordable housing units,⁵⁵ which is projected to grow. In September 2019, the region's leaders adopted the following housing targets based on COG's *Future of Housing in Greater Washington* report:

1. *Amount* – At least 320,000 housing units should be added in the region between 2020 and 2030. This is an additional 75,000 units beyond the units already forecast for this period.
2. *Accessibility* – At least 75% of all new housing should be in Activity Centers or near high-capacity transit.
3. *Affordability* – At least 75% of new housing should be affordable to low- and middle-income households.⁵⁶

Making sure that our region has enough affordable housing and that much of it is located near transit and within close-in activity centers is both an equity strategy and a climate strategy.

*The TPB Board of elected and agency officials in December 2020 took a promising first step in the Visualize 2045 update by voting to **require** that project submissions "...prioritize investments on projects, programs, and policies to reduce greenhouse gas emissions, prioritize the aspirational strategies, and achieve COG's land use and equity goals..."*

COVID-19 Impacts to Public Transit

Public transit is an essential part of moving essential workers around the region, getting everyone back to work during our economic recovery, and reducing the climate impacts of our transportation system.⁵⁷ Federal, state, regional and local support for transit must be maintained and further strategies to provide high-quality, effective transit must be supported. For example, a high-level analysis of the Biden transition plan to provide every American city with 100,000 or more residents with high-quality, zero-emissions public transportation options, found it to be realistic and relatively low cost compared to massive highway spending.⁵⁸

Transportation & Climate Initiative

Mid-Atlantic and Northeastern states, including DC, Virginia and Maryland, have negotiated a Memorandum of Understanding to create a regional cap-and-trade program for greenhouse gas emissions related to wholesale motor vehicle fuel sales. So far DC, Massachusetts, Connecticut and Rhode Island have signed on. The program, if joined by all states, is expected to produce significant revenues (up to \$7 billion annually) from pollution allowances that can be used for clean transportation investments in the 13 participating jurisdictions. In addition, the jurisdictions have committed to equity measures and to considering complementary policies to achieve stronger emissions reductions.^{59, 60}

The cap-and-trade scenario developed by the 13 jurisdictions would produce a 25 percent reduction in greenhouse gas emissions from combustion of on-road gasoline and diesel fuels. However, the reference case scenario (of no TCI policy) is forecast to reduce emissions by 19 percent over the time period, meaning the TCI program would result in a net decrease in emissions of 6 percent without additional complementary policies.⁶¹

Local Climate Action Planning

Local climate action plans are under preparation across the region. Like regional plans, these local plans need specific, measurable and monitored VMT reduction and mode share policies and strategies. These planning efforts include:

- Fairfax County – Community-Wide Energy and Climate Action Plan (CECAP)
- Alexandria – Energy and Climate Change Action Plan (ECCAP)
- Montgomery County – Climate Action and Plan (CAP)
- Prince George's County – Climate Action Plan
- Frederick County – Climate Emergency Mobilization Work Group

To produce more significant emissions reductions than 6%, it is critical that jurisdictions participating in the TCI program, such as DC (and possibly Maryland and Virginia) adopt strong complementary policies related to land use, mode shift, affordable housing near transit, as well as vehicle electrification. The contributions of metropolitan transportation agencies and local governments are also critical for an effective TCI Program.

Residents Overwhelmingly Want Climate Action in Transportation

A recent survey of a statistically representative sample of the region’s residents by TPB found that 84 percent agree with the statement that “elected officials need to consider the impacts of climate change when planning transportation in the future.”⁶²

In contrast, when asked about traffic congestion, less than half of respondents (44 percent) indicated that traffic congestion is a significant concern that impacts their lives, and 25 percent said congestion was somewhat a concern that impacted their lives a little.

The survey asked “What transportation investments should we make today that future generations will thank us for tomorrow?” and allowed respondents to provide their own open-ended answers. The majority of the answers involved clean transportation, public transportation and biking compared with much fewer for more or wider roads:

- 259 combined responses mentioned expanding areas served by rail transit or bike infrastructure;
- 172 mentioned clean transportation (electric vehicles, buses, charging infrastructure, lower emissions);
- 134 responses mentioned more or wider roads or more lanes; and
- 72 responses mentioned improving the condition of (fixing and making more resilient) existing roads and bridges.

Climate action in our transportation decisions is clearly a priority – evidenced by these survey results of residents as well as by elected official representatives on the TPB Board voting to prioritize projects that reduce GHG emissions.

The survey had additional significant results suggesting that residents overall want to walk and bike more and drive less, and that they strongly support more street space for pedestrian areas, cafes, bike lanes, and bus lanes. While many residents expect to use transit less than they did before the pandemic, they also cited a number of factors, like frequent and reliable service, that would make them more likely to ride transit post-pandemic.⁶³

84 percent of the region’s residents want elected officials to consider the impacts of climate change when planning transportation.

Of the residents under 30 years of age, those who will be most affected by climate change and our long-range transportation plans, the percentage is 92 percent.

– TPB Voices of the Region Survey results

Action 1

Set Targets for Reducing Greenhouse Gas Emissions and Auto Vehicle Miles Traveled, and Increasing Non-Auto Mode Share

Ensure that all regional transportation and land use plans and related major infrastructure projects quantify how they will reduce greenhouse gas (GHG) emissions and automobile vehicle miles traveled (VMT) consistent with adopted climate targets. Include mode share targets for boosting non-auto travel by transit, walking, biking or rolling (i.e., scooters and other micromobility).

Per capita VMT reductions needed to achieve our climate targets are in the range of 15 to 25 percent by the 2030-2045 timeframe compared to pre-pandemic levels. Likewise, the share of trips by non-auto modes must increase by 15 to 20 percentage points in this same timeframe.

For each of these targets, the region's officials need to ensure that major plans and projects 1) measure recent year baselines, 2) set quantified goals consistent with overall GHG reduction targets for a year in the 2030 timeframe and a later year, 3) develop and commit to actionable strategies that can achieve the targets, and 4) incorporate a tracking mechanism and regular update schedule.

Specific Action Recommendations

Transportation Planning Board

The Visualize 2045 Update must prioritize reducing vehicle miles traveled and associated greenhouse gas emissions. This guidance was adopted by the TPB Board at its meeting on December 14, 2020.

- a. Visualize 2045 draft update (conformity technical inputs) by June 2021 needs to be consistent with TPB guidance, which requires member agencies to prioritize projects, programs and policies

that reduce GHG emissions, increase non-auto travel mode share and reduce VMT. This means that the updated Visualize 2045 plan must be substantially different from the previous 2018 plan, which did not adequately support the region's climate targets and help reduce VMT.

- b. TPB needs to more precisely estimate the total and per capita VMT reductions needed to achieve 2030 and 2050 adopted climate goals under a range of scenarios and this analysis needs to be completed expeditiously¹ to shape the Visualize 2045 plan due to be adopted in 2022. Scenarios need to include:
 - o Varied Electric Vehicle adoption rates by 2030.
 - o Update of regional climate target to 2050 carbon neutrality goal, consistent with Biden administration proposal and long-term GHG targets of other major metropolitan regions.
- c. In the meantime, regional officials should assume that metropolitan Washington will need to reduce per capita VMT 15 to 25 percent and increase non-auto mode share 15 to 20 percent by the 2030 to 2045 timeframe compared to 2019 levels.
- d. Establish baselines and targets for VMT and non-auto mode share for each sub-area of the region: Core (DC, Arlington, Alexandria), Inner Suburbs (Fairfax, Falls Church, Montgomery, Prince George's), and Outer Suburbs (Loudoun, Prince William, Manassas, Manassas Park, Charles, Frederick).
- e. Visualize 2045 Update and other regional plans must include GHG, VMT and mode share performance measures that include targets for 2030 and 2045 or similar medium- and long-term timeframes (see Action Step #6).
- f. Incorporate in the Visualize 2045 Update the Mode Shift and Travel Behavior strategies from the COG 2030 CEAP and strengthen them to meet the VMT and non-auto mode share targets.

Other Regional Agencies and Local Governments

- g. Ensure that other transportation and comprehensive plans at the local and regional levels, such as the Northern Virginia Transportation Authority's TransAction 2040 Update, include GHG, VMT and non-auto mode share targets as performance measures (see Action Step #6).
- h. Consider VMT measures and non-auto mode share, rather than vehicle Level of Service, for evaluating and mitigating the transportation impacts of new development.

¹ TPB announced at its [December 4, 2020 Technical Committee meeting](#) that it will conduct an analysis over the course of 2021 to assess what types of actions in the transportation sector could lead to attaining the interim goal of reducing GHG emissions in 2030 by 50% relative to 2005 levels. However, the GHG scenario analysis is scheduled to be completed by the end of the 2021 calendar year with results provided to the TPB Board in spring 2022, which would be too late to shape Visualize 2045. TPB has long known of the need to reduce VMT; therefore, jurisdictions should from the outset begin identifying which projects and programs contribute to reducing VMT and associated GHG emissions and remove projects inconsistent with regional climate goals.

Justification

What each type of target shows

GHG Targets for On-Road Transportation

These show the connection with our climate mitigation goals and demonstrate whether the transportation plan or project is consistent with the scale of emissions reductions needed. The Rocky Mountain Institute (RMI) estimates that the U.S. needs to reduce transportation emissions by 45 percent by 2030 relative to 2005 to achieve its overall GHG target for all sectors.⁶⁴

Auto Vehicle Miles Traveled (VMT) Targets

VMT targets show that transportation projects and plans do not just rely on assumptions of fuel economy improvements or electric vehicle sales in how they plan to reduce GHG emissions. Auto VMT shows how transportation plans and projects reduce the need to drive and travel distances.

Non-Auto Mode Share Targets

These show that people can conveniently access jobs and services by non-auto transportation modes. Projects and plans cannot just rely on assumptions for future telework that reduce overall VMT; they also need to show that people can conveniently travel by non-auto modes (transit, walking, biking and scooting) for non-work as well as work trips. Including non-work trips is essential as these account for three quarters of our region's daily trips.

How Much Does Our Region Need to Reduce VMT?

As detailed in pages 3-5, even with ambitious adoption of electric vehicles and a clean electricity grid, we cannot meet our climate targets without also reducing VMT. The range of per capita VMT reduction needed is likely in the range of 15-25 percent by sometime during 2030 to 2045.

GHG mitigation studies have identified needed per capita VMT reduction targets ranging from 15 percent by 2050 for California⁶⁵ (which already has a relatively clean vehicle fleet and electrical grid) to 20 percent by 2030 for the entire U.S.⁶⁶

Urban Area VMT Reductions Will Need to Help Offset Rural Area Travel

These targets cited in the RMI study and for California are for both urban and rural areas, meaning that much of the shift in travel modes and reduction in trip distances will need to occur in metro areas where that is more feasible. Nationally, 70 percent of VMT is from urban area travel while 30 percent occurs in rural areas.⁶⁷ For the Greater Washington region to help Virginia (34 percent rural VMT) and Maryland (18 percent rural VMT) sufficiently reduce transportation emissions, its urban area VMT reductions will need to be higher than state or national level targets. Many suburban areas in particular may need to do more, for example, taking advantage of untapped transit-oriented development opportunities rather than focusing on more road expansion.

If our region can set a bold goal for a third of the cars on the roads to be electric by 2030, it can also set bold, necessary and achievable goals to reduce VMT and increase non-auto mode share. Addressing VMT and mode share also provides many co-benefits to the region that electric cars by themselves do not.

Bold VMT Goals Need to Accompany Bold EV Goals

The uncertain pace of EV adoption by motorists is even more rationale for why our regional leaders need to set bold VMT reduction goals and enact policies accordingly. RMI's decarbonization scenario aims for a high adoption rate of 70 million EVs on the road nationally by 2030, about a quarter of the fleet. Likewise, COG's 2030 climate scenario depends on a high rate of EV adoption, setting a goal to have a third of the region's passenger vehicles be electric by that time.

Our Transportation and Land Use Studies Have Demonstrated VMT Reduction

The *ConnectGreaterWashington* study by WMATA found a per capita VMT reduction of 24 percent from 2010-2040 (or 12 percent below the 2040 status quo) from a combination of travel and land use policies.⁶⁸

Similarly, TPB's 2016 Multi-sector GHG reduction study modeled a land use scenario that by itself reduced total VMT 12 percent below forecast 2040 levels and a parking pricing and commute incentive scenario that reduced total VMT by up to 5 percent; additional individual strategies in the study decreased VMT by incremental but meaningful amounts.⁶⁹

Post-Pandemic Telework Could Play a Key Role But for Only Some Travel

Anticipated sustained increases in telework rates compared to pre-pandemic conditions could help accelerate these VMT reductions. However, the larger share of non-work trips and travel needs of residents who cannot work from home also need to be considered in strategies to reduce VMT – which is why we also need a mode share target.



Some of the existing alternative modes to auto travel in our region

Photo credit: [Adam Fagen](#), licensed under [Creative Commons](#)

How much Does Our Region Need to Increase Non-Auto Mode Share?

Pre-pandemic, about 80 percent of all trips were made by car across the region, with 10.6 percent by walking and biking and 5.6 percent by transit (note that the share of commute trips by transit was 24.1 percent).^{70, 71}

Boosting the share of walking and biking trips by 5 to 10 percentage points and transit and telework/teleservices by about 10 percentage points by 2045 compared to pre-pandemic levels is feasible.

If our region focuses new development in walkable, mixed-use activity centers and underutilized Metro station areas, prioritizes investments in pedestrian and bicycle infrastructure, mobility hubs and transit services over highway expansion, and prices travel more efficiently and equitably, this mode shift can happen and bring benefits to all travelers.

Transportation and Land Use Studies Have Demonstrated Mode Shift

The *ConnectGreaterWashington* regional land use and transit policy scenario increased the mode shares of transit to 15 percent and walk and bike trips to between 18 and 23 percent.⁷²

The San Francisco *Plan Bay Area 2050* scenario study found that proposed land use and transportation strategies would increase the non-auto mode share from 9 percent up to 21 percent for all trips under various future scenarios of the region.⁷³

The Denver, CO region *2050 Metro Vision Transportation Plan* likewise analyzed various packages of proposed strategies and found that infill development combined with transit and active transportation strategies resulted in six times the number of transit trips and triple the number of walk and bike trips compared to the future baseline scenario.⁷⁴

All of these strategies also significantly improved regional travel times and relieved congestion.



Multi-modal transportation on 14th St, NW, District of Columbia

Photo credit: [BeyondDC](#), licensed under [Creative Commons](#)

Local Jurisdictions Are Already Setting Bold Mode Shift Goals

This goal would also be consistent with what some local jurisdictions are already planning. For example, Montgomery County, which reflects the broader region's mix of urban and suburban areas, has set a goal in its draft Climate Action Plan to double the share of transit and bicycle trips by 2035.⁷⁵

TPB's New Guidance Requires Prioritizing GHG Reduction

On December 17, 2020, the TPB Board voted to change the Visualize 2045 guidance document for project submissions by member agencies:

"...TPB requires its member agencies to prioritize investments on projects, programs, and policies to reduce greenhouse gas emissions, prioritize the aspirational strategies, and achieve COG's land use and equity goals as they submit their inputs for inclusion in the TPB's LRTP and TIP."

Member agencies must now describe how their project submissions (including projects included in the previous Visualize 2045 plan) contribute to

Examples

Actions Taken and Policy Tools in Greater Washington

- District of Columbia *MoveDC* transportation plan set a goal that 75 percent of commute trips will be made without a car, up from the 2018 rate of 58.5 percent.⁷⁶
- City of Alexandria *Environmental Action Plan* sets a performance target of reducing VMT one percent per year by FY2023 and requires documentation of the amount of carbon reduction from the transportation sector.⁷⁷

meeting the region's adopted 2030 GHG reduction target and whether they contribute to non-auto travel or reduce VMT.

TPB will compile the project submissions into a draft network along with other policy assumptions during March through June 2021. Following June approval, the draft plan will enter the conformity testing process, which lasts until early 2022. TPB typically makes no significant changes to the plan after it goes into the conformity analysis. Thus, it is critical that our region's leaders, transportation officials and planners prepare an initial draft plan during spring 2021 that is consistent with TPB guidance to prioritize GHG and VMT reduction.

Few of our Current Plans and Projects Have Targets For These

Few of our region's plans set specific baselines and goals for these essential indicators. For example, the 2018 Visualize 2045 regional transportation plan sets no quantified goals or performance measures for GHG, and includes a non-auto mode share goal that seeks an insignificant increase of 0.6 percent over four years, buried in Chapter 6 of the plan.

Examples from Other Regions

GHG Emissions Targets for Transportation

- Portland, OR metro area has a target to reduce per capita GHG emissions from passenger vehicles 20 percent by 2035 and 25 percent by 2040 (relative to 2005).⁷⁸
- California metro areas must reduce per capita GHG emissions from passenger vehicles 19 percent by 2035 (relative to 2005) *on top of* GHG reductions anticipated from statewide policies.⁷⁹
- Denver region *Metro Vision* plan sets a performance measure for 60 percent

reduction in surface transportation emissions between 2010 and 2040.⁸⁰

Vehicle Miles Traveled (VMT) Targets

- Denver region *Metro Vision* plan sets a per capita VMT reduction goal of 10 percent by 2040, included in an online dashboard of indicators, and as a performance measure in current regional transportation planning processes.⁸¹
- Each of the Twin Cities, MN set strong VMT reduction goals in their transportation and climate plans. Minneapolis, MN aims to reduce total VMT 1.8 percent per year, and St. Paul aims to reduce per capita VMT by 2.5 percent per year.^{82, 83, 84, 85}
- Portland, OR regional transportation plan includes a VMT performance measure.⁸⁶
- California is working to reduce its total statewide VMT 7.5 percent below the 2035 baseline to achieve its 2030 greenhouse gas reduction target.⁸⁷ This number is lower than we need for metropolitan areas because it includes California's extensive rural areas.
- Minnesota Department of Transportation's Sustainable Transportation Advisory Council recommended a 20 percent reduction in VMT by 2050 to help the state to achieve its adopted climate target.⁸⁸



Takoma Park farmers market

Photo credit: [Jordan Barab](#), licensed under [Creative Commons](#) (Greater and Lesser Washington group)

Mode Share Targets

General Mode Share

- City of Boston climate plan and transportation plan set coordinated goals for a four-fold increase in biking rates by 2030 and 50 percent increase in walking rates by 2030.^{89, 90}
- Portland, OR regional transportation plan sets tiered mode share targets for the different sub-areas of the region.⁹¹
- San Francisco Bay Area *Horizon Initiative* scenario plan includes a mode share performance measure for all trips (auto, active, transit, telecommute).⁹²
- Los Angeles *Green New Deal Plan* sets mode share goals of 35 percent by 2025 and 50 percent by 2035 for all trips made by walking, biking, micro-mobility/matched rides or transit.⁹³

Commute Mode Share

- San Francisco region's *Plan Bay Area 2050 Final Blueprint* decreases the drive-alone commute share from 51 percent in 2015 to 36 percent in 2050.⁹⁴
- City of Boston climate plan and transportation plan have coordinated mode share goals to cut the drive-alone commute rate by half and increase the public transit commute rates by a third by 2030.⁹⁵
- Denver region *Metro Vision* plan sets non-SOV commute mode share goal for 2040; it is being used as a performance measure in the current regional transportation planning process.^{96, 97}
- Ann Arbor's recently adopted climate action plan sets 2030 commuting targets of 25 percent of regional commute trips into the city by transit, and car commute trips into the city reduced by 25 percent.⁹⁸



Action 2

Prioritize Transit Station Areas for Development and Services

Prioritize high-capacity and high-frequency transit station areas in walkable regional activity centers for housing and job growth, accessibility of services, and public investments.

In our region COG defines high-capacity transit as Metrorail; commuter rail (MARC and VRE); light rail (e.g., Purple line); and Bus Rapid Transit (BRT)/Streetcars. While there is no standard Washington region definition for high-frequency transit, one simple indicator is an average frequency of 15 minutes or less averaged across day and evening (CNT AllTransit Index).

Specific Action Recommendations

- a. Provide additional metrics in the Visualize 2045 Update to evaluate how well the transportation system serves high-capacity station areas and major bus transfer centers, including equity measures.
- b. Identify more fine-grained housing and jobs target areas and develop goals for future development occurring in these new sub-areas, which would complement, not replace, the current COG activity centers. Use numerical benchmarks to identify these sub-areas based on:
 - High-capacity and high-frequency transit station areas
 - Walkable mixed-use areas
 - Locations with high regional accessibility
 - Balancing the east-west jobs-housing divide
 - Other important built environment or demographic criteria identified in the literature for activity centers that improve non-auto travel and reduce VMT
- c. Incorporate these stronger land use targets in regional plans like Visualize 2045 and TransAction.
 - Prioritize transportation projects that support transit-oriented land use; and

- For Transaction 2040 do not compile project lists and model first, and then later apply a transit-oriented development (TOD) scenario. Instead, start with the TOD scenario from the beginning.
- d. Implement these policies at the local level through updated comprehensive and small-area plans, zoning ordinances, capital improvement plans, housing programs, and other growth policies.

Justification

Importance of Land Use in Reducing Transportation Emissions

Land use, including the locations of jobs and housing and how community design supports transit and walkability, plays a major role in transportation emissions. Efficient land use and community design enable proximity to destinations and facilitate walking, biking and transit use to reach them – and significantly reduces transportation greenhouse gas emissions. For example, the WMATA study *Connect Greater Washington* showed the significant transportation and climate benefits of building out TOD at all of our Metro stations, especially those on the east side of the region - its scenario to help balance land use and travel reduced VMT by 12 percent.⁹⁹

The Importance of High-Capacity Transit Stations in Regional Activity Centers

Metropolitan Washington uses its designated “Regional Activity Centers” (RACs) as the targeted locations for most of our future jobs and housing growth. While many regional activity centers have compact, mixed-use, walkable areas with robust transit, there are also many that consist of dispersed office parks and poorly connected apartment and shopping complexes, with little or no transit – and where residents have to drive even more than the suburban average. Meanwhile, when looking specifically at high-capacity transit station areas in RACs, we find many where households drive significantly less, especially in the inner suburbs and core communities. The analysis by the Coalition for Smarter Growth in [Table 1](#) shows the kinds of places in the region that will provide a

successful transportation-land use-climate strategy.

Building on Our Regional Housing Target

COG’s 2030 Climate and Energy Action Plan recommends putting 75 percent of our new housing in RACs with high-capacity transit stations (based on Regional Housing Target #2), which is a good start. But to really capture the proximity and efficient benefits of good land use and transit, our region needs to set further policies to prioritize walkable and compact areas with good transit and regional accessibility for development in the region.

Suburban officials can retrofit areas to be more walkable, compact, and transit-friendly. For example, households in the Mosaic District of Fairfax County are estimated to drive on average 15,500 miles per year and generate 5.9 metric tons of CO₂ emissions compared to the Inner Suburb average of almost 20,000 miles per year and 8.4 metric tons of CO₂.

Coalition for Smarter Growth analysis using CNT H+T Index data

What factors make an activity center ideal for efficient proximity and travel?

This land use strategy of “polycentric” development, identifying and prioritizing a network of activity centers for new development in addition to the central business district, is being used in a number of metropolitan regions as well as in metro Washington. Recent analyses by Reid Ewing and other researchers show how this land use framework can significantly reduce VMT by encouraging walking trips and facilitating efficient travel patterns. However, to do this, they found that activity centers need to meet the following minimum thresholds:

- Activity density (jobs + population) of at least 10,000 to 25,000 per square mile (depending on center type);
- Job-population balance of at least 0.2 to 0.5 (depending on center type);
- Intersection density of at least 150 to 300 intersections per square mile (depending on center type);
- Share of four-way intersections at least 60 percent; and
- Share of regional employment accessible within 30 minutes by transit at least 5 to 35 percent (depending on center type).¹⁰⁰



US 29 Flash BRT and Capital Bikeshare station, Burnt Mills, Montgomery County
Example of type of location suitable for transit-oriented redevelopment

Photo credit: [BeyondDC](#) licensed under [Creative Commons](#)

Examples

Actions Taken and Policy Tools in Greater Washington

- Our region's activity centers with high-capacity transit and good accessibility support average household GHG emissions from auto use in the range of 3-6 metric tons of CO₂ per year, while those on the outer fringe without good transit have household emissions that can average over 11 metric tons per year.¹⁰¹
- CSG's 2016 *GreenPlace* study found that TOD projects in the region's core averaged 17 to 25.5 daily VMT per household and 16-25 lbs of daily carbon output per household, compared to regional household averages of 45 daily VMT and 69.4 lbs daily carbon output from driving.¹⁰²
- CSG's 2010 *Cool Communities* study compared the locations of small area plans and large-scale developments and demonstrated the benefit of areas with high walkability, mix of uses, and frequent transit service. For example, the New Carrollton TOD plan generates 11.2 percent fewer travel-related carbon emissions compared to relocating the same planned development to the Konterra area next to I-95 and the Intercounty Connector.¹⁰³

Examples from Other Regions

- The Chicago region vision plan measures community walkability and sets goals for growth in walkable areas.¹⁰⁴
- The City of Los Angeles *Green New Deal Plan* has a goal for 75 percent of new housing to be within 1,500 ft. of transit by 2035, including provisions for on-site affordable units.¹⁰⁵
- The San Francisco Bay Area regional plans have multiple tiers for concentrating new regional job and housing growth, including transit priority areas and high resource economic opportunity areas served by transit, as well as more general priority development areas in urban centers and demarcated conservation areas where growth is significantly restricted.^{106, 107}
- The *Thrive MSP* vision plan for the Twin Cities, MN region has an online dashboard of indicators, including one for the percentage of transit station areas with housing options.¹⁰⁸



Action 3:

Make Affordable Housing in Transit-Accessible Locations a Climate Strategy

Implement adopted regional housing targets and prioritize locations near frequent transit for affordable housing production and preservation.

Specific Recommendations

- a. Set a housing goal and affordable housing goal for each jurisdiction to accommodate 75 percent of household growth in high-capacity transit station areas.
- b. Leverage [HAND Housing Indicators Tool](#) to track affordable housing policies and production for each area jurisdiction.
- c. Track affordable housing in transit station areas and high-frequency transit corridors.
- d. Establish programs to prioritize affordable housing investments in transit station areas and high-frequency corridors with good access to jobs; programs should address both production and preservation goals for affordable housing.
- e. Update zoning ordinances to allow more housing options in our urban and suburban communities served by transit but currently restricted solely to single-family detached zoning.
- f. Improve the safety and convenience of walking and biking in transit station areas and corridors with significant numbers of low- to moderate-income and zero-car households.
- g. Protect areas of affordable housing from the already occurring effects of climate change that disproportionately threaten their residents.

Justification

Providing affordable housing in close-in, regionally accessible locations near transit is both a social equity strategy and a climate strategy.

Lessons from our Region

Within our region the benefits of affordable housing near jobs and transit are evident:

- Housing Leaders Group of Greater Washington: “The prospects for upward economic mobility and self-sufficiency depend critically on the availability and affordability of housing that is connected to jobs, transit, and other amenities and services.”¹⁰⁹
- Although low- and medium-income households have less access to personal cars and use transit more to get to work,¹¹⁰ they are currently underrepresented in neighborhoods around Metrorail stations compared to higher income households – in both DC and surrounding jurisdictions.¹¹¹
- Transit-accessible locations not only improve job access, they also save households money in transportation costs. Average household transportation costs are significantly lower in the core jurisdictions and inner suburban activity centers of our region, as shown in Figure 7. These locations have good transit, walkable neighborhoods and regional accessibility compared to auto-oriented inner suburban areas or most outer suburban areas. For example, a household living near the Takoma-Langley Transit Center in Maryland would expect to spend about \$9,000 per year on transportation costs, in contrast to the average Prince George’s County household, which would spend about \$13,000 – or a household in the Westphalia area, which would spend \$15,000 per year.¹¹²
- Achieving the COG Regional Housing Targets will provide other benefits for the whole region. TPB estimates that it would reduce congestion by 20 percent.¹¹³

Lessons from Other Regions

Experience in other parts of the country shows the benefits of this strategy, in particular California. For example, an analysis of statewide travel data by the organization TransForm showed that “Lower Income households drive 25-30% fewer miles when living within 1/2 mile of transit than those living in non-TOD. When living within... 1/4 mile of frequent transit they drove nearly 50% less.” As a result, investing 10% of state cap-and-trade program revenues in the state’s TOD Housing program over three years would yield 15,000 transit-accessible affordable homes. These locations would result in a total decrease of 105 million VMT every year, which, over the life of the housing development, equate to 1.58 million metric tons of GHG reductions, even considering advances in cleaner cars and fuels.¹¹⁴

Additional Policies Needed to Improve Safe Accessibility of Transit, Destinations

Supportive policies to improve accessibility and safety within transit-station areas and along transit corridors that serve high proportions of low-to-moderate income households and workers are also needed.

- Urban and suburban communities of low-to-moderate income individuals and people of color are often especially at risk from poor street design and the lack of safe walking access to transit stops, as documented in the recently published book *Right of Way: Race, Class and the Silent Epidemic of Pedestrian Deaths in America* by Angie Schmitt.¹¹⁵
- Locating affordable housing near transit by itself is not enough to reduce VMT. Other neighborhood factors (walkable street design, availability of services) are also important to reduce the need for low-to-moderate households to drive.¹¹⁶

Housing Security and Climate Change

Low-to-moderate income households are already more at risk of displacement due to the

impacts of climate change, so housing security needs to be a key element of both our climate mitigation and climate resiliency efforts. A recent review of studies on the relationship between climate change and displacement found that “Low-income groups and communities of color,

particularly African American and Hispanic communities, are often more likely to experience financial hardships related to climate hazards and physical displacement in the wake of extreme weather events.”¹¹⁷



The Wren, near U Street/African-Amer Civil War Memorial/Cardozo Metro station, 132 affordable units provided for DC public land disposition of parcel

Photo credit: Cheryl Cort

Examples

Actions Taken and Policy Tools in Greater Washington

- Montgomery County adopted a Metro Station Development 15-year Tax Abatement for projects on WMATA land, tied to strong affordable housing requirements (12.5 percent and in some cases 15 percent moderately priced dwelling units).¹¹⁸
- District of Columbia Housing Framework for Equity and Growth ¹¹⁹
 - The District has a goal of producing 36,000 more homes by 2025, with 12,000 of them affordable. Each part of the District served by bus and rail is to have 15 percent of its homes be affordable by 2025 under the proposed Comprehensive Plan.
 - Public land disposition (sale of District of Columbia-owned property) requires that new housing development on sites near transit set aside 30 percent of units as affordable housing, compared to 20 percent on sites farther from transit.

Photo of example project above,
The Wren, 965 Florida Ave NW.

- The City of Alexandria and Montgomery County both adopted resolutions endorsing the COG Regional Housing Targets. They each set local targets to increase housing production above their forecasts with 3,000 and 10,000 additional units, respectively.^{120, 121}
- The Urban Institute found that modest changes in zoning scaled up across the region could result in significant new housing near Metro stations and in activity centers. They conducted an illustrative exercise that assumed a 20 percent increase in density in such areas (and no increase in already dense areas) in DC, Arlington, Fairfax, and Montgomery Counties and found that it would accommodate approximately 50,000 to 60,000 new homes.¹²²
- Enterprise Green Communities Certification Program for affordable housing includes “Location + Neighborhood Fabric” criteria that require projects to meet minimum transit accessibility thresholds and award additional points for proximity to community resources and dedicated bicycle facilities. This is a national program but a number of local projects have been implemented in our region. In DC the program is required under the Green Building Act for projects that receive over 15 percent of their funding from public sources. 46 projects comprising 4,087 units have been registered in DC to date.^{123, 124}
- Local toolkits and policy resources for implementing affordable housing in accessible, transit-served locations:
 - Housing Leaders Group of Greater Washington, [Guidebook for Increasing Housing Affordability in the Greater Washington Region](#), 2017.
 - NVAHA, [Building Northern Virginia's Future: Policies to Create a More Affordable, Equitable Housing Supply](#), 2019.
 - Urban Institute, [Meeting the Washington Region's Future Housing Needs](#), 2019.
 - The Case Made, [A New Narrative for Housing: Playbook for the Greater Washington Region](#), 2020.



Wheaton Metro station with MetroPointe mixed-income apartments in the background

Photo credit: [Dan Reed](#), licensed under [Creative Commons](#)

Examples from Other Regions

- The Commonwealth of Massachusetts now requires municipalities to allow multi-family housing within ½ mile of transit stations and created a \$50 million transit-oriented affordable housing program.^{125, 126}
- California Affordable Housing and Sustainable Communities program has used greenhouse gas cap-and-trade revenues to provide 11,317 dedicated affordable homes near transit, with lifetime GHG reductions of 3.0 million metric tons and annual VMT reductions of 269 million since inception. The program also enhances transit services, access to transit stops, and active transportation infrastructure in the vicinity of funded housing developments.^{127, 128}
- Chicago is establishing an Equitable Transit-Oriented Development (eTOD) Policy Plan to ensure that the benefits of TOD are widely and equitably distributed to city residents.¹²⁹
- Los Angeles, CA “Transit-Oriented Communities” program and Austin, TX provide density bonuses and have higher affordability requirements near transit. The LA program has tiers for type and frequency of transit.¹³⁰
- The BeltLine transit and multi-use trail corridor in Atlanta, GA has a zoning overlay district with inclusionary zoning for affordable housing.¹³¹ Recently a partnership of finance companies and the metro area’s main transit agency, MARTA, created a \$100 million Greater Atlanta Transit Oriented Affordable Housing Preservation Fund.¹³²
- Denver, CO is developing a citywide zoning incentive program to create affordable housing near transit as a

result of its *Blueprint Denver and Comprehensive Plan 2040*.¹³³

- Transit agencies in a number of cities have affordable housing goals, programs and requirements for joint development on their station area properties. These include Sound Transit in Seattle, BART and VTA in the San Francisco Bay Area, Los Angeles Metro, and a draft policy by RTD in Denver, CO. Some of these agencies have revolving loan funds.^{134, 135}
- The Twin Cities, MN region maintains a regional indicator of the percentage of transit station areas with affordable housing options on its web-based dashboard that tracks progress in reaching regional vision goals.¹³⁶
- The Chicago region's vision plan sets targets for not just housing affordability, but the combined affordability of housing and transportation costs, which take into account locations with walkable proximity to transit and daily needs.¹³⁷



Tenley View Apartments, near Tenleytown-AU Metro station, affordable units provided to meet DC inclusionary zoning requirements

Photo credit: Cheryl Cort



Action 4

Optimize and Leverage Transportation Pricing

Enact pricing strategies to address transportation equity, reflect the true cost of driving and parking, and recognize sustainability – for example, commuter benefit cash-outs, reduced transit fares, parking pricing and unbundling, usage-based car insurance, and congestion pricing on existing highway lanes.

Specific Recommendations

- a. Reduce fares or make transit free, especially for low-income users.
- b. Decouple pricing from proposed highway expansions. Additions to the region’s express highway toll network should only include repurposing existing travel lanes and not expand highway capacity.
- c. Eliminate free parking for employees and establish market rate parking pricing for commuters.
- d. Require commuter benefit and parking subsidy cash-out options.
- e. Continue studying congestion pricing for the region’s core.
- f. Require that usage-based, or “pay-as-you-drive,” car insurance products are offered as options in the region by insurers, and educate regional stakeholders on their advantages.

Justification

Best Practices

The American Cities Climate Challenge *Climate Action Playbook Brief*¹³⁸ recommends the following pricing strategies for cities to reduce transportation emissions from VMT:

- Promote Commuter Incentives to Reduce Driving.
- Provide Incentives and Behavioral Nudging for Use of Low-carbon Mobility Modes.
- Utilize Parking Management and Pricing to Encourage Low-carbon Travel.
- Implement Congestion Pricing and/or Low Emissions Zones for Priority Areas.

Specific types of strategies that are mentioned as being effective in these areas are:

- Cordon pricing, which charges drivers a fee to enter a specific area; low-emissions zones, charging vehicles extra if they are not low or zero-emission; and reinvestment of revenues in sustainable and equitable transportation options such as transit service improvements.
- Eliminating off-street parking requirements and incorporating other transportation options in urban development.
- Charging market rates for curb parking and reinvesting parking revenues in the neighborhood.
- Unbundling parking, by making landlords charge for parking separately

so people do not have to pay for parking they may not want or need.

- Using gamification and incentives to educate travelers on the benefits and availability of travel options.

An additional pricing strategy not included in the *Playbook Brief* is usage-based (“pay-as-you-drive” or “pay-as-you-go”) car insurance. These products exist in many places, offer drivers financial savings, and incentivize less driving (2.7 percent estimated by one study) compared to traditional fixed-cost insurance.¹³⁹ DC, Maryland and Virginia could expand availability of these products in the region by requiring that insurers offer them.

These types of market-based reforms that price transportation modes efficiently and fairly, if implemented together, could significantly reduce VMT, with estimates of 35 to 50 percent.¹⁴⁰



Employee parking, Danish Embassy, District of Columbia

Photo credit: [Payton Chung](#), licensed under [Creative Commons](#)

Local Guidance from the COG Climate Plan

The COG 2030 Climate and Energy Action Plan (CEAP)¹⁴¹ includes the following Mode Shift and Travel Behavior strategies with pricing elements:

- MSTB-1: Invest in Infrastructure that Increases Transit, Carpooling, and Non-motorized Travel
- MSTB-3: Enhance Options for Commuters

While these are good strategies and the plan lists some examples of specific actions that can be taken in these areas, the 2030 CEAP's recommendations are incomplete, leaving goals and well articulated strategies up to transportation agencies and localities.

Good potential strategies included, but more can be done

For example, the CEAP asks local member jurisdictions to “Discontinue free parking at employment sites within Activity Centers and near high capacity transit stations,” and expand commuter transit benefits for workers, which are both good strategies. But metro areas are doing much more, like decoupling parking costs from housing rents and homeowners fees, requiring that employees have the option to cash out commuter benefits and parking, and bringing up the monetary value of commuter benefits for non-drivers to be on par with those of drivers so everyone can benefit.

For example, following a Coalition for Smarter Growth campaign, the District of Columbia adopted flexible commuter benefits that allow DC workers to “cash-out” employer-provided parking benefits if they walk, bike or take transit to work. The Commonwealth of Virginia and the State of Maryland could adopt similar measures to ensure that workers have these options for fair and flexible commuter benefits.

Express toll lane strategy does not differentiate highway expansion and pricing

The CEAP lists this aspirational strategy from the region's 2018 transportation plan, Visualize 2045, but does not clarify that expanding the express highway toll network is only an effective GHG reduction strategy if it is used on existing travel lanes and does not expand highway capacity.

Heavy focus on commuters and telework, but most trips are for non-work purposes

Strategy MSTB-3: Enhance Options for Commuters sets a 20 percent telework rate goal that may happen regardless due to long-term shifts accelerated by the pandemic. For example, the Denver region is already *assuming* a 20 percent telework rate going forward beyond 2023. Thus, a mode share target for non-SOV commuting needs to be articulated so we make sure that sustainable, convenient and low-cost travel modes are available for the remaining 80 percent of workers. Land use and travel options that support commuting by walking, biking and transit will also facilitate more climate-friendly *non-work* trips, which comprise three quarters of the trips made in our region. Creating 15-minute walkable mixed-use neighborhoods, including in the suburbs beyond our transit station areas, is key to reducing VMT and emissions for non-work trips.

Express Toll Lanes Strategy has Been a Highway Expansion Strategy

Our region's roadway pricing strategy has really been a highway expansion strategy, with projects like the Intercounty Connector and added High-Occupancy Toll lanes on the Beltway that lock in and reinforce patterns of single-occupant auto travel and car-oriented land use. Past TPB modeling has shown that increasing highway capacity, even with express toll lanes and added transit, does not reduce GHG emissions:

Past TPB Studies

The 2010 Aspirations Scenario included a regional network of tolled lanes and transit investments. 2030 VMT increased in this scenario (with no meaningful change in per capita VMT) and also had a significant 56% increase in VMT at speeds of 65mph and greater.¹⁴² Likewise, the 2017 TPB Long-Range Plan Task Force study showed that the Express Travel Network strategy did not reduce GHG emissions.¹⁴³

Proposed MD I-495/270 Expansion

This approach – highway capacity expansion through toll lanes with bus transit and modest

land use clustering – does not meaningfully shift travel to more sustainable modes and reduce trip distances. A recently completed study by Smart Mobility Inc. of the Maryland I-495/270 toll lane proposal, including a look back at the Virginia 495 toll lanes, confirms this.¹⁴⁴

The Balanced Land Use, Demand Management, and Transit Network strategies from the 2017 TPB Long-Range Plan Task Force study all performed better than the Express Travel Network, and would be even more effective in combination.



MD Intercounty Connector

Photo credit: [Doug Kerr](#), licensed under [Creative Commons](#)

Examples

Actions Taken and Policy Tools in Greater Washington

- The District of Columbia Transportation Benefits Equity Act¹⁴⁵ requires employers who provide free or subsidized parking to employees to

offer, with some exemptions, these alternatives:

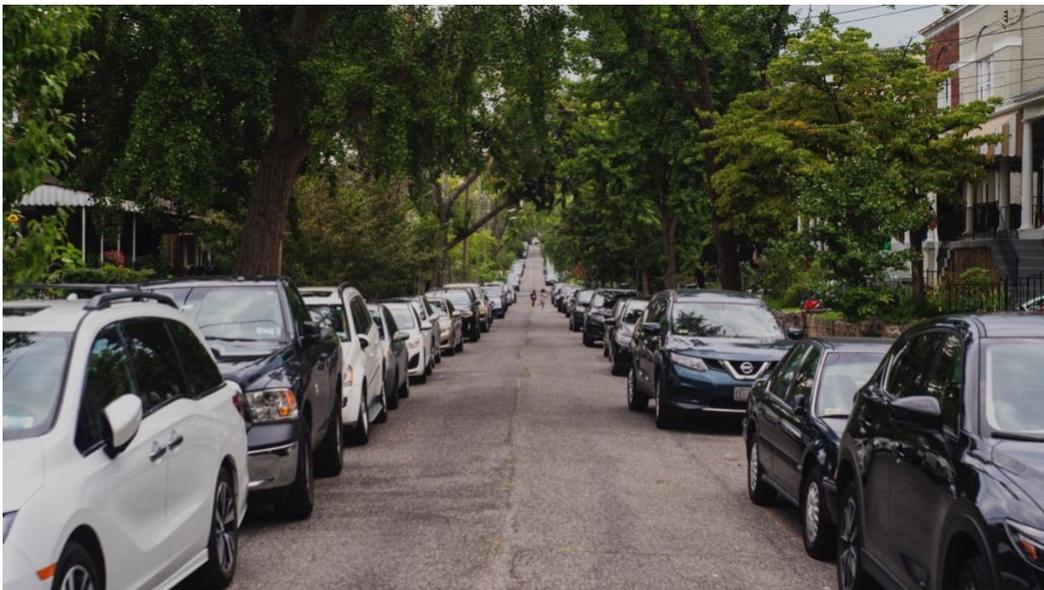
- Employer-paid transit benefits
- Taxable cash for employees who walk, bicycle, or ride in a carpool to work, or who take transit (where cash would make up any difference

- between the value of the parking and transit cost)
- Increased employer contribution to an employee's healthcare benefit
- The State of Maryland Commuter Tax Credit program applies to parking cash-out programs offered by employers.¹⁴⁶
- A Decongestion Pricing Study is underway for the region's core, testing potential alternative pricing strategies for District of Columbia streets and highways and evaluating outcomes, including impacts on vulnerable users. The study is being undertaken by the organization D.C. Sustainable Transportation.¹⁴⁷
- Multiple jurisdictions have instituted changes in parking policies and piloted projects for pricing of on-street parking and curbside use and requirements for off-street parking facilities in new development. Arlington County has developed a program to pilot variable

pricing in the Rosslyn-Ballston corridor, and the District of Columbia has used a similar program in part of its downtown area.¹⁴⁸

Examples from Other Regions

- The San Francisco region *Plan Bay Area 2050* has set a strategy to implement per-mile tolling on congested freeways where transit alternatives exist, with discounts for low-income residents and carpools and with revenues invested in corridor transit services.¹⁴⁹
- Seattle is studying congestion pricing for the region's core.¹⁵⁰
- Vancouver, BC is planning to implement a congestion charge for vehicles to enter the metro area core, as part of its recently approved Climate Emergency Action Plan.¹⁵¹



On-street parking, Somerset Place, NW, District of Columbia

Photo credit: [Mike Maguire](#), licensed under [Creative Commons](#)

Action 5

Broaden Vehicle Electrification Strategies with Shared Mobility and Micromobility

Include electric bikes, scooters, mopeds, buses, shared mobility, and mobility hubs in a broader “e-mobility” strategy that includes equity provisions.

Specific Recommendations

- a. Prioritize shared e-mobility solutions and non-auto electric modes and focus on electrifying those vehicles that get the most use (e.g., transit and school buses, institutional fleet vehicles, car share and ride hailing vehicles).
- b. Implement “mobility hubs” (defined below) in activity centers, at high-capacity transit stations, and in other locations with community mobility needs.
- c. Set targets for electrifying the region’s fleets of transit buses, school buses, and other local government vehicles and reducing overall medium- and heavy-duty fleet emissions.
- d. The ZEV strategies should also include equity-focused implementation metrics to ensure that incentives, charging infrastructure and other EV programs benefit all communities.

Justification

Shared Mobility

Shared e-mobility solutions, micromobility, and electric transit buses and shuttles can substitute for many short distance or commute car trips by personal vehicles.¹⁵² Travel on these alternative modes has many more co-benefits (i.e., other societal benefits in addition to reducing GHG emissions) compared to electric cars (see page 12). In the case of e-micromobility (electric-assist bikes, electric scooters), these modes

have much smaller batteries and are much more affordable than electric cars. In the case of shared-use electric vehicles (i.e., carshare), these vehicles are used more frequently than a personally owned car, providing more bang-for-the-buck in terms of reducing carbon emissions and other environmental impacts when replacing a conventional gas-powered car with an electric one.^{153, 154} For example, in California, the shift to an EV for a ride hailing worker reduces GHG emissions three times as much as for a typical car owner not engaged in ride hailing.¹⁵⁵

Shared mobility is viewed as the critical third piece of the major technological revolution occurring in personal transportation, the others being electrification and automation. Without shared mobility, traffic congestion and the parking and energy needs of our transportation system will grow much more significantly.¹⁵⁶

More Equitable E-Mobility

Many households, including low-to-moderate income households, without good transit access and difficult-to-reach job locations will continue to rely on personal automobiles for some of their transportation needs. Efforts to speed up the transition to EVs need to incorporate programs that allow car-dependent lower-income households to have clean mobility options that meet their needs. For example, many multi-family dwellings lack access to vehicle charging outlets, and the high up-front cost of EVs (lack of a used car market in most places) put them out of reach of most lower-income households, even with rebate programs.¹⁵⁷ Even some places ahead of the curve in adopting EVs and installing charging infrastructure are finding that 90 percent of chargers are currently in single-family homes. Most EVs are sold to owners in detached homes (80-90 percent in some cities), and less than half of apartment dwellers having access to home charging.^{158, 159} Ride hailing workers with EVs also depend much more heavily on publicly available charging stations compared to average EV owners, due to their driving patterns as well as availability of charging at home.¹⁶⁰

Local governments need to expand access to charging infrastructure for multi-family residents through public charging stations and EV-ready development ordinances for new residential construction. States and localities also need to create EV purchase, trade-in, leasing, charging equipment, and carshare programs geared toward lower-income households and those in multi-family housing, in addition to general EV purchase rebate programs available to all buyers regardless of income. State-level EV equity policies (including the District of

Columbia) are evaluated by the [ACEEE State Electrification Scorecard](#).¹⁶¹

Mobility Hubs

The Shared-Use Mobility Center defines a mobility hub as “a place where people can seamlessly connect with multiple modes of transportation in a safe, comfortable, and accessible environment...mobility hubs provide physical integration among modes by co-locating carsharing, bikesharing, and other shared-mobility services close to public transit stops and large residential developments.” The Mobility Hub concept is widely used in Europe and now expanding in the U.S. The Shared-Use Mobility Center has a [guide](#) of best practices, essential features, and context typologies for successful hubs.¹⁶²

“[Mobility hubs] offer visibility to and connection between public transit and shared mobility services that in turn support multimodal living and reduced dependence on personal cars and solo driving.”

Shared-Use Mobility Center

Other mobility hub concepts being explored by the New Urban Mobility Alliance (NUMO) incorporate co-location with other community services, such as food, retail, package pick-up/drop-off, broadband, and co-work locations. While mobility hubs are typically located at a transit stop, some locations may serve community centers not directly on a fixed-route transit line, helping extend the reach and accessibility of the transit service and offer other mobility services.¹⁶³

A Broader Electric Mobility

While the COG 2030 Climate and Energy Action Plan's Zero Emission Vehicle strategies set ambitious and well-articulated electrification targets for passenger cars and associated charging infrastructure, none of the strategies mention electric-assist bicycles, electric scooters or electric mopeds. These e-mobility options are more sustainable, more affordable and offer more co-benefits from their GHG reductions than electric cars.

Successful shared mobility and e-micromobility strategies can broaden the availability of clean

vehicles compared to the up-front personal expense and the typical government incentives for electric cars. A rebate to incentivize purchase of a micromobility device would be a fraction of a typical EV rebate incentive provided by many states for new car purchases, covering many more potential buyers for the same amount. For example, New Jersey which has an ambitious EV program, provides rebates of up to \$5,000. In Virginia, the General Assembly study commission recommended a standard rebate for a new EV of \$2,500.¹⁶⁴



Electric-assist shared bikes, Dupont Circle Metro station

Photo credit: [angela n.](#), licensed under [Creative Commons](#)

Examples

Actions Taken and Policy Tools in Greater Washington

- District of Columbia’s Carbon Free DC 2050 initiative proposes to track the share of zero-emission VMT (out of total VMT) to better assess and maximize the emissions impact of its vehicle electrification efforts.¹⁶⁵
- Multiple transit agencies have started to electrify their bus fleets, including the DC Circulator and Alexandria DASH. WMATA has conducted a study of infrastructure and energy needs for fleet electrification and is currently conducting a battery electric bus pilot project.¹⁶⁶ The Sierra Club has published a report showing the significant climate and other benefits of an eventual transition to all electric buses in the Metrobus system.¹⁶⁷
- In January 2021, the District of Columbia adopted the Electric Vehicle Readiness Amendment Act of 2020, which will help expand EV charging to multi-family housing, requiring new developments with off-street parking to provide EV charging infrastructure for 20 percent of parking spaces.¹⁶⁸ The District Department of Environment and Energy is convening a Stakeholder Equity Feedback Group for its Transportation Electrification Roadmap project underway in 2021.

Examples from Other Regions

- Over ten localities, two states and several European countries have electric bicycle purchase incentive programs.¹⁶⁹
- *San Diego Forward* regional transportation plan and the Sacramento region *Green Region Plan* make mobility hubs key elements. These serve the full suite of mobility options, with an emphasis on shared, electric and active mobility, including e-bikes, scooters, and transit as well as carshare and charging stations for personal cars. Both regions incorporate strategies to ensure that disadvantaged communities benefit.^{170, 171}
- City of Boston climate action plan EV deployment strategy includes permitting action steps for electric micromobility, e-bikes and e-scooters; and for passenger cars sets clear equity-based policies and has metrics to locate charging infrastructure in every neighborhood by 2023 and to ensure that 100 percent of residents are within a 10-minute walk of public EV chargers or EV carshare facilities.¹⁷²
- Minneapolis has created 25 mobility hubs as part of a pilot project, which are being coordinated with an electric car share program. The hubs are distributed throughout the city based on a data-driven approach that prioritizes equity. The hubs provide transit, bikeshare, and electric scooter services and additional amenities and have volunteer community ambassadors.^{173, 174}
- Santa Monica, CA is launching a zero-emission delivery zone in February 2021 that will use only small electric vehicles for food and package deliveries.¹⁷⁵
- Sacramento Air Quality Management District has an EV carshare program directed to affordable housing residents that provides up to nine hours of free driving time a week per household. The program has helped many households avoid the need to purchase a second

car. The city subsidizes the program with state GHG cap-and-trade revenues and is looking into ways to create a longer-term funding model.¹⁷⁶

- The State of California runs an array of clean transportation equity programs, comprising car-ownership programs and multimodal clean mobility programs. A “One Stop Shop” webtool and outreach program has been piloted and will expand to connect lower-income residents with the relevant mobility assistance programs and facilitate the application processes.¹⁷⁷
- The Twin Cities Electric Vehicle Mobility Network is creating a combined EV charging network and car share program. The siting guidelines take into account density of renters, public housing, one- or zero-car households, and other factors.¹⁷⁸
- Grant programs and partnerships with utility companies can help make EV charging equipment accessible for existing multi-family and affordable housing developments. For example, the San Diego Gas and Electric “Power Your Drive” program coordinates reduced-cost installation of charging stations at multi-family developments and awards fully subsidized charging stations to program applicants in low-

income communities.¹⁷⁹ The Washington State “Electrification of Transportation Systems” grants program similarly provides state-level grants for EV charging infrastructure, with priority for communities impacted by climate change and transportation-related pollution and to low-income or communities of color.¹⁸⁰



ART Bus and Bird scooters, Arlington County

Photo credit: [BeyondDC](#), licensed under [Creative Commons](#)
(original image cropped to fit column)



Action 6

Track Local and Regional Progress

Establish clear integrated regional benchmarking and performance tracking of transportation, housing, and land use metrics related to greenhouse gas emissions (e.g., housing and jobs near transit, affordable housing, VMT, and mode share for work and non-work trips), at local, sub-regional (core, inner suburbs, outer suburbs), and regional levels.

Specific Action Recommendations

- a. Visualize 2045 needs to further demonstrate the linkage between projects and performance by incorporating shared regional goals into the Performance Based Planning and Programming measures, with targets set for 2030 and 2045. In this way, priority regional measures like greenhouse gas emission reductions, VMT, access to transit, mode share, and equitable access to jobs and services will be clearly incorporated.
 - o These measures, targets and implementation metrics must be presented in a clear chapter of the plan and should also be available in a convenient online dashboard, with actual performance, baseline level, and future targets compared.
 - o Some of the measures like mode share should include sub-regional targets.
- b. Other regional and local transportation, comprehensive, and climate plans need to set targets for and track similar priority measures, including greenhouse gas emission reductions, VMT, mode share, access to jobs and services, and access to transit.

Justification

Few of the region's plans and projects have established quantified goals to reduce GHG emissions and even fewer actively track these and the related performance measures needed to monitor progress and hold agencies accountable.

For example, the COG 2030 Climate and Energy Action Plan includes Strategy MSTB-1: Invest in Infrastructure that Increases Transit, Carpooling, and Non-Motorized Travel and lists

implementation metrics related to reducing transit headways and fares. To really measure progress, our transportation plans need to also set targets and commit to action steps like miles of dedicated bus lanes built, bus network redesigns completed, and set targets for bus frequency, accessibility, ridership, and active transportation and transit mode shares. Mode share goals should be set for sub-areas (core, inner, outer) with a need to make significant

progress in the suburbs. Regional travel surveys show that suburban areas have not meaningfully shift their mode shares over the last decade.¹⁸¹

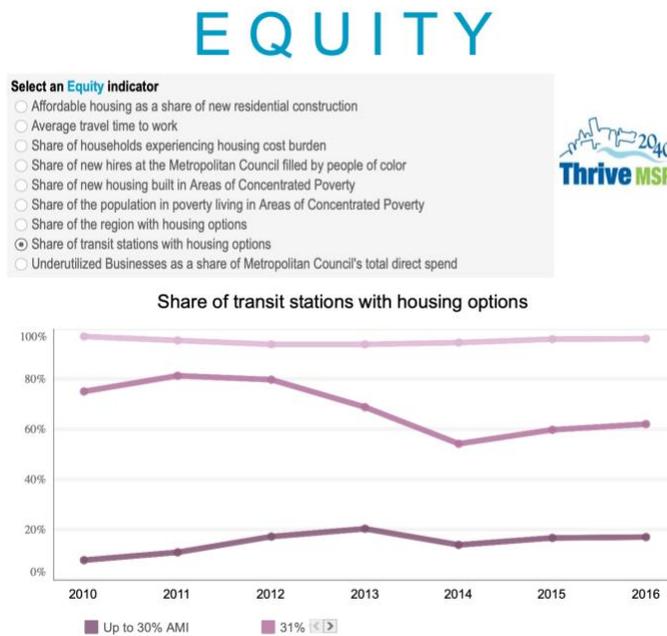
Visualize 2045 includes mandated federal measures for tracking progress, but most of these are not meaningful to the public or

stakeholders, focusing mostly on highways and setting minor, incremental goals over four-years that are not connected to regional priorities. Critically, these performance measures say nothing about how the region’s transportation system is addressing climate change.

Examples from Other Regions

- Denver region transportation performance measures from its Vision Plan are incorporated into convenient online trackers of [mobility goals](#) and [regional status updates](#).¹⁸²
- Twin Cities, Minnesota regional vision plan has an indicator [dashboard](#) (example below).¹⁸³

Figure 11: Thrive MSP Online Dashboard, Equity Indicators Example



Source: Metropolitan Council. Thrive MSP 2040. [Indicators website](#). Accessed December 7, 2020.

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