



Climate Change and Transportation Emissions

Materials

Oliver Milman, "Vehicles are now America's biggest CO2 sources but EPA is tearing up regulations," The Guardian, January 1, 2018.	CT - 1
"C40 cities work together to invest in clean buses," C40 Cities, May 11, 2017.	CT - 5
"Our Commitment to Green and Healthy Streets," Global Covenant of Mayors for Climate & Energy, C40 Cities, accessed January 11, 2019.	CT - 8
"Spotlight on the C40 Transportation Initiative Opportunity & Action in C40 Cities," C40 Cities, August 14, 2013.	CT - 9
Pages excerpted from: "Shared, Electric, and Self-Driving: How states and municipalities can encourage autonomous vehicles to be shared and electric," Southwest Energy Efficiency Project, September 2018.	CT - 11
Lia Cattaneo, "Investing in Charging Infrastructure for Plug-In Electric Vehicles," Center for American Progress, July 30, 2018.	CT - 21
Alissa Walker, "Cities, obsessed with electric cars, overlook simple solutions at climate summit," Curbed, September 18, 2018.	CT - 29
Pages excerpted from: "Bus Rapid Transit," C40 Cities, February 2016.	CT - 33
Diane Jones Allen, "Transit and Climate Adaptation = Transit and Equity," Meeting of the Minds, December 4, 2018.	CT - 41
Jonathan Ostar, "Finding Climate Justice in the Fight for Transit Equity," Climate Solutions, February 25, 2015.	CT - 45
"Implementing Accessible Low Carbon Transit," Urban Sustainability Innovation Report, Urban Sustainability Directors Network, January 2018.	CT - 47
Alissa Walker, "Safe streets are the best tool we have to combat climate change," Curbed, October 10, 2018.	CT - 49
Pages excerpted from: "New Mobility Playbook," Department of Transportation, Version 1.0, City of Seattle, WA, September 2017.	CT - 53
Andrew Small, "How Seattle Bucked a National Trend and Got More People to Ride the Bus," City Lab, October 16, 2017.	CT - 63



Pages excerpted from: "Minneapolis Climate Action Plan: A Roadmap to Reducing Citywide Greenhouse Gas Emissions," City of Minneapolis, MN, June 28, 2013.	CT - 67
Pages excerpted from: "Green Fleet Policy," City of Minneapolis, MN, December 2, 2010.	CT - 73
Pages excerpted from: "Energy and Climate Action Plan," City of Oakland, CA, updated March 2018.	CT - 81
"Electric Vehicle Infrastructure Requirements for New Multi-Family and Nonresidential Buildings," City of Oakland, CA, April 25, 2017.	CT - 89
Pages excerpted from: "Sustainable Oakland Report," City of Oakland, CA, 2016 – 2017.	CT - 93
"City Releases CONNECT, Philadelphia's Strategic Transportation Plan," City of Philadelphia, PA, October 10, 2018.	CT - 97



Speakers

Jessica Finn Coven serves as the Director of Seattle's Office of Sustainability & Environment. The Office collaborates with a wide range of stakeholders to develop innovative environmental solutions that foster equitable, vibrant communities and shared prosperity. Jessica previously served as the Washington State Director of Climate Solutions where her work focused on developing legislative and policy strategies to reduce global warming pollution and grow an equitable clean-energy economy in Washington State. Jessica first joined Climate Solutions in 2007 as a policy specialist and worked to further clean energy policy in Washington through the state's Energy Independence Act, Climate Action and Green Jobs law and others. Jessica also worked as the program director for the U.S. Climate Action Network. From 2002- 2005, she was a global warming campaigner for Greenpeace in Washington DC. She also spent several months working in Beijing as a policy advisor for Greenpeace China. Jessica received her MA in economics and energy policy from the Johns Hopkins University School of Advanced International Studies (SAIS) and her BA in Mandarin from Barnard College, Columbia University. She lives in Seattle with her husband and two young children.

Mayor Jacob Frey is the 48th Mayor of Minneapolis, a former Minneapolis City Council Member, a civil rights attorney, an advocate for social justice, and a proud resident of the greatest city in America. Jacob grew up in northern Virginia and went to the College of William and Mary in Williamsburg, VA on a track scholarship. After graduating with a degree in government, he began running professionally while also attending law school at Villanova University in Philadelphia, PA. While practicing employment and civil rights law at Faegre & Benson (now Faegre Baker Daniels) and later Halunen Law, he knew he wanted to apply the same work ethic that made him a successful runner to efforts that increased equity, brought people together, and made a real difference in the lives of fellow Minnesotans. He became an active community organizer. He became involved in advocacy for the homeless, including helping tenants who lost their homes to the North Side tornado. In 2012, the City of Minneapolis honored him with its inaugural Martin Luther King, Jr. Award for his civil rights work. In 2013, he successfully ran for City Council in Minneapolis' 3rd Ward, unseating a long-time incumbent, with a platform that championed constituent services, increasing residential growth, growing the number and variety of small and local businesses, getting affordable housing fully funded, and helping open a new community-based school to serve the growing number of families living near the central riverfront.

Laura Jay serves as a Deputy Regional Director for North America & Head of the New York Office at C40 Cities Climate Leadership Group. In this role, she works with C40's 15 cities in the US and Canada to help them in addressing their city's biggest climate challenges from mitigating emissions to climate risks. Previously, Laura managed the Land Use Planning Network at C40 where she ran a network of urban planners in C40 cities globally to support the development of land use plans and policies to address climate goals to create more compact, connected and resilient cities. Prior to joining the C40, Laura served as a Project Manager at Terrapin Bright Green where she consulted to government agencies, developers and non-profits to create more sustainability policies and designs and the U.S. Green Building Council. Laura has a master's degree in Urban Planning from Columbia University in New York and a Bachelor's degree from Wheaton College in Massachusetts.



Mayor Libby Schaaf was inaugurated into office in January 2015 and launched an agenda to elevate one of America’s most diverse and progressive cities into an equitable and resilient city. She developed Oakland’s “17K/17K Plan” to protect 17,000 low-income households from displacement while producing 17,000 new housing units by 2024. She created the city’s first Department of Transportation, an urban design unit to connect safe streets with housing and transportation. She also championed Measure KK, a \$600-million infrastructure and affordable housing bond, which Oakland voters passed with 82 percent approval. Mayor Schaaf received national attention for launching the Oakland Promise, an education initiative that will triple the number of college graduates from Oakland by 2025. To date, the program has sent 1,000 high-schoolers to college with scholarships, and will soon provide every baby born into poverty in Oakland with a \$500 college savings account. Mayor Schaaf is an Aspen Institute-Rodel Fellow in Public Leadership, a diverse and bi-partisan group of “the nation’s most promising young political leaders.” She is a member of the Bloomberg Harvard City Leadership Initiative for mayors, and has worked with the Rockefeller Foundation to ensure Oakland is among the foundation’s 100 Resilient Cities.

Vehicles are now America's biggest CO2 source but EPA is tearing up regulations

Transport overtook power generation for climate-warming emissions in 2017 but the Trump administration is reversing curbs on auto industry pollution

Oliver Milman

@olliemilman

Mon 1 Jan 2018 00.00 EST

Last modified on Thu 5 Jul 2018 16.47 EDT



Early evening congestion on a Los Angeles freeway. Vehicle emissions are now the biggest source of greenhouse gases in the US. Photograph: Dan Chung for the Guardian

Some of the most common avatars of climate change – hulking power stations and billowing smokestacks – may need a slight update. For the first time in more than 40 years, the largest source of greenhouse gas pollution in the US isn't

electricity production but transport – cars, trucks, planes, trains and shipping.

Emissions **data** has placed transport as the new king of climate-warming pollution at a time when the Trump administration is reviewing or tearing up regulations that would set tougher emissions standards for car and truck companies. Republicans in Congress are also pushing new fuel economy rules they say will lower costs for American drivers but could also weaken emissions standards.

Opponents of the administration fret this agenda will imperil public health and hinder the effort to address climate change.



“This Environmental Protection Agency doesn't seem to have met an air regulation that it likes,” said Mary Nichols, chair of the California Air Resources Board and a former EPA assistant administrator. “I've not seen any evidence that this administration knows anything about the auto industry, they just seem to be against anything the Obama administration did.”

“Vehicle emissions are going up, so clearly not enough is being done on that front. The **Trump administration** is halting further progress at a critical point when we really need to get a grip on this problem.”

The 1970 **Clean Air Act**, signed by Richard Nixon, set standards for a cocktail of different pollutants emitted from new vehicles. New cars and trucks, which **account** for more than 80% of transport emissions, now have to meet fuel efficiency standards and display this information to consumers. This approach has helped cleanse previously smog-laden American cities and tamp down greenhouse gas emissions.

But in 2016, about 1.9bn tons of carbon dioxide emissions were emitted from transportation, up nearly 2% on the previous year, according to the **Energy Information Administration**. This increase means that transport has overtaken power generation as the most polluting sector in the country, and it's likely to **stay that way**.

Cheap gasoline prices have led to a **recent uptick** in vehicle emissions, despite the fuel standards, at the same time that coal is being rapidly displaced by an abundance of cheap natural gas and the steady rise of renewable energy, driving a **sharp decline** in CO₂ emissions from the power grid.



While coalminers have lost their jobs to technological advancement and environmental protesters have thrown their bodies in the path of oil pipelines, there has been far less to disrupt the basic emissions-emitting models of cars, trucks and planes.

Americans are buying larger cars and taking more flights – domestic aviation emissions **grew 10% between 2012 and 2016** – and face little opposition in doing so.

“The change in power generation has been very impressive over the past 10 to 15 years,” said Brett Smith, assistant director of the **Center for Automotive Research**.

“In the automotive sector, there isn’t the same push. There are certainly Americans concerned about global warming but people are driving bigger and bigger vehicles each year. It’s not a priority for them. The cost of fuel is pretty cheap and at the moment there isn’t a better option out there than the internal combustion engine.”

Transport accounts for about a quarter of all US planet-warming emissions but also poses a direct health threat to **about** 45 million Americans who live, work or attend school within 300ft of roads that are shrouded in high air pollution levels.

This pollution can stunt lung growth, trigger asthma attacks, exacerbate heart disease and cause developmental problems. The EPA **estimates** 17,000 schools across the US are located next to roads with heavy traffic, with children from low-income and minority groups

disproportionately put at risk. California is the only state in the US to ban the construction of a school on the cheap land found beside major highways.

US cities haven't emulated the likes of London and Stockholm by charging drivers a congestion fee to coax them on to public transport, cycling or walking; nor does the US feature the comparatively high rates of fuel tax seen in Europe. France's move to **ban sales of petrol and diesel cars by 2040** would be politically unthinkable in the States.

But the air is much cleaner in American cities than it was in the 1970s, and a world away from the fog that now envelops Beijing and Delhi, in part due to vehicle emissions standards that have progressively been ratcheted up by the EPA.

That trajectory has been cast in doubt by the Trump presidency. **In March, the EPA scrapped a deal** struck between Barack Obama's administration and automakers that would require new cars to run 54.4 miles per gallon of fuel, up from 27.5 miles per gallon, by 2025.

The White House said the new rules had been "shoved down the throats" of car makers, with the **main industry lobby group pointing out** that consumers overwhelmingly prioritize safety, driving performance and value for money over fuel efficiency. There are more than 70 car models on sale that achieve 40 miles per gallon and they account for just 1% of total new vehicle sales.

Then, last month, the EPA cited "regulatory overreach" by the previous administration for its **decision to waive clean truck standards** that would have phased out "glider" vehicles that produce 55 times more diesel soot than new trucks. Scott Pruitt, administrator of the EPA, said his predecessors had "attempted to bend the rule of law and expand the reach of the federal government in a way that threatened to put an entire industry of specialized truck manufacturers out of business".

These rollbacks from the executive branch have dovetailed with an effort by Republicans in the Senate and the House to revamp fuel efficiency rules by **replacing state and federal requirements with a single standard**. Environmental groups and previous administration officials fear this will lead to a further weakening of emissions standards.

"America's clean car standards have dramatically improved the fuel efficiency of vehicles, saving consumers billions of dollars and cutting pollution in the process," said Carol Browner, a former administrator of the EPA.

"Instead of rolling back commonsense, successful and popular clean cars standards, we should focus on innovation and technology that will continue the auto industry's growth and the pollution reductions we've achieved since these standards were first established."

In the short term, this new approach risks a flashpoint between the federal government and California, which has a long-held waiver to enact vehicle pollution standards in excess of the national requirements. Twelve other states, including New York and Pennsylvania, follow California's standards, an alliance that covers more than 130 million residents and about a third of the US vehicle market.

Nichols said she had been disturbed by signals coming from Pruitt and other EPA officials that she said show the federal government is looking to end California's waiver.

"We are very concerned because these standards are the bedrock of our whole climate change platform," she said. "Scott Pruitt has made threatening noises about the Californian waiver, saying that we are trying to run the country. It feels like this is going to be the next shoe to drop. If it does, we will litigate and fight for our rights in the political arena with other states and consumer advocates."

With federal regulation set to be pared back, technological advances in electric and gas-powered cars, as well as consumer preferences, are likely to play an increasingly important role in whether vehicle emissions are forced back down.

A flurry of recent optimistic studies have forecast that, by 2040, **as much as 90%** of all cars in the US will be electric. But the current conundrum is that petroleum-fueled vehicles are cheaper and seen as more reliable than their electric counterparts by most new buyers. Affordable gasoline is competing with electric recharging stations that are considered too sparse by many drivers to risk running out of puff, no matter the benefit to the environment.

"It's a challenging position for automotive companies because they are touting electric vehicles but ultimately they have to sell more cars," said Smith. "Consumers in the US aren't pushing for electric vehicles to the extent they are in Europe and unless we take a very different approach as a country, that doesn't look like it will change soon."

"You will need to see a major change in battery technology to make it viable. People are becoming more aware and concerned about global warming, but we aren't there yet. And when you look at the vehicles being put out by the major car companies, you could argue it's not an issue for them, either."



C40 Blog

C40 cities work together to invest in clean buses

May 11, 2017

Travelling up to ten times further than the average passenger vehicle, urban buses are a significant source of pollution, impacting local air quality and global carbon emissions. By 2030, urban bus activity is set to grow nearly 50 percent from today's levels. In addition, buses used for public transit are not replaced as frequently as passenger vehicles, meaning those purchased today can have environmental and health impacts that persist for more than a decade.

Replacing diesel and compressed natural gas (CNG) buses with low emission buses, such as battery electric and hybrid, can generate significant environmental, health and economic benefits in our cities. To date, 27 cities have signed onto C40's Clean Bus Declaration committing to switching more than 45,000 buses in their fleets to low emission buses, saving an estimated 1 million tons of GHG emissions per year. If each of these 27 cities switched their entire fleet to low emission buses, the savings could reach 2.8 million tons of GHG emissions each year. This is the equivalent of taking around 590,000 cars off the road.



For cities to achieve their clean bus goals, we must find new business models to support investment in this innovative but more expensive technology. Clean bus costs vary by city and publicly-available data is limited, but estimates suggest electric buses cost at least 50% more than traditional diesel models, and significantly more for some cities. The price of electric buses and the associated charging infrastructure is a common barrier to cities adopting these buses at scale. C40 and the Greater London Authority brought together 12 leading cities for the C40 Clean Bus Finance Academy to collaborate on possible solutions to overcome this barrier and others in transitioning to electric bus fleets. This event—the first of its kind in a series—forms part of the **Financing Sustainable Cities Initiative**, a partnership between C40 and the WRI Ross Center for Sustainable Cities, funded by the Citi Foundation.

City officials from around the world participate in the 2017 Clean Bus Finance Academy.

Senior city finance and transport officials came together at the C40 Clean Bus Finance Academy to provide peer-to-peer advice based on their experiences with electric buses. The three-day Academy involved candid lesson sharing and collaboration between the cities of Auckland, Buenos Aires, Cape Town, Durban, London, Los Angeles, Mexico City, Oslo, Paris, Santiago de Chile, Seattle and Tshwane. The cities also worked with invited technical experts to explore new funding, finance and procurement options to create new business models for electric buses.

"Many jurisdictions around the world are thinking of moving to an electric bus fleet. But with battery storage cost falling and challenges around the large investment in dedicated infrastructure, the default position is to wait and see. The clean bus academy was the opportunity to shift from thinking to action. In sharing not just what other cities were doing, but also more detailed insights into charging, depots, variability of range and other logistics, the academy has helped provide a catalyst for action and the next level of planning to enable it to happen." – Richard Morris, Chief Financial Officer, Auckland Transport

The cities heard from manufacturers, operators, finance specialists and technology experts in a space designed for close collaboration and open information sharing. Feedback from city delegates highlighted that they also valued collaborating with their finance and transport colleagues from their own cities, as well as peers in equivalent roles in other cities from around the world. All twelve cities left having created new Finance Action Plans, outlining next steps primarily under three common themes:

1. Measuring the costs and benefits of different clean bus technologies
2. Collective actions to reduce the high upfront costs of electric buses
3. Exploring innovative procurement, financing and funding options

Measuring the costs and benefits of different clean bus technologies

The business case improves for clean buses when the operational costs, as well as the environmental, health and economic benefits are also taken into account in the total cost of ownership. Electric buses generally have lower operating costs than traditional buses due to savings from reduced fuel consumption and lower maintenance costs. Some of the delegates highlighted the operational cost savings as a key motivator for adopting electric buses. This was also highlighted during a site visit to the Waterloo bus depot where the Director of Engineering for Go Ahead shared his perspective as an electric bus operator. He shared their positive experience with electric buses, particularly in terms of lower operating costs. During their visit delegates saw some of Go Ahead's fleet of 51 electric buses returning from their shift to plug-in and charge overnight, a clear demonstration that electric vehicles are not just a technology of the future but a technology of the here and now.



City representatives visited a Go Ahead electric bus depot to speak to the depot manager about operating and maintaining the fleet.

Collective actions to reduce the high upfront costs of electric buses

While total cost of ownership models can help to make the business case, for some cities the higher upfront costs of electric buses and their charging infrastructure is a persistent barrier to adoption. During the Academy, cities explored whether collective actions such as joint procurement of common elements of electric buses, such

as batteries or chassis, or an update to **C40's Clean Bus Declaration** could demonstrate strong demand to the market and bring down the upfront costs. Since launching the Declaration, London has seen a reduction of more than 10% in the price of single deck electric buses, which London attributes to the signal cities jointly sent to the market through the Declaration. C40 will continue to work with its member cities and partners to explore new collective actions to help address this cost barrier.



City representatives from Mexico City and Cape Town share insights on clean buses in their cities.

Exploring innovative procurement, financing and funding options

Another challenge for cities that do not own their own vehicles is how to incentivise a private operator to take the risk of investing in a new technology. A session with manufacturers inspired a discussion on business models and how cities can work to develop new contracting approaches that will reduce the costs and risk of adopting new technology, such as battery leasing or shared costs of infrastructure. Just as

cities need to provide a signal to the market that there is demand for their product, manufacturers need to provide a signal to cities that they are working to reduce costs, mitigate technology risks, and improve charging technology standardisation.

C40 and its partners will be working together with technical experts to support these cities in implementing their Finance Action Plans over the next 12 months and bringing together these cities and others through webinars and teleconferences to continue the valuable good practice exchange. At the request of the delegates, C40 will explore an update to the Clean Bus Declaration and the creation of a clean bus information repository for cities, transit agencies and operators to share information on their procurement, trials and financing of clean buses.

If you are interested in working with the Financing Sustainable Cities Initiative and C40 Low Emissions Vehicles Network in taking this critical work forward turning targets into action, please contact: fsci@c40.org.

Our Commitment to Green and Healthy Streets

C40 Fossil-Fuel-Free Streets Declaration

As mayors of some of the world's great cities, we are committed to transforming them into greener, healthier, and more prosperous places to live. Our streets must be safe and accessible for everybody and our air must be clean and free from harmful emissions. This will improve the quality of life for all citizens, and help tackle the global threat of climate change.

We envision a future where walking, cycling, and shared transport are how the majority of citizens move around our cities. This shift towards zero emission mobility will result in less congestion and less pollution, while making our roads quieter and the air we breathe cleaner.

One third of greenhouse gas emissions from C40 cities come from [transport](#) and traffic is the biggest source of air pollution, globally responsible for up to [one quarter of particulate matter in the air](#). As cities continue to grow they are becoming more congested, with people spending more time in traffic. A [study](#) across the US, UK, France and Germany showed that congestion on our roads is costing the economy on average almost one percent of GDP. This is not only holding back our economies through lost time and productivity, but also harming our health and the environment through worsening air pollution. [Recent data](#) shows that dirty air leads to almost 4.5 million premature deaths a year and afflicts many more, particularly children, with illnesses such as asthma.

We are already delivering our vision of greener, healthier and more prosperous cities but we recognise the urgent need for ambitious climate action to achieve the goals of the Paris Agreement. We also recognise the need for a comprehensive, holistic approach to transform the way people travel around our cities that builds on pledges made as part of the C40 Clean Bus Declaration and supports those articulated in the *Global MacroRoadmap: An Actionable Vision for Transport Decarbonization*.

We pledge to transition to Fossil-Fuel-Free Streets by: 1) procuring, with our partners, only zero-emission buses from 2025 and 2) ensuring a major area of our city is zero emission by 2030.

To meet this commitment, we will:

- Transform our cities through people-friendly planning policies.
- Increase the rates of walking, cycling and the use of public and shared transport that is accessible to all citizens.
- Reduce the number of polluting vehicles on our streets and transition away from vehicles powered by fossil fuels.
- Lead by example by procuring zero emission vehicles for our city fleets as quickly as possible.
- Collaborate with suppliers, fleet operators and businesses to accelerate the shift to zero emissions vehicles and reduce vehicle miles in our cities.
- Publicly report every two years on the progress the cities are making towards these goals.



C40 Blog

Spotlight on the C40 Transportation Initiative

August 14, 2013

In this post, Gunjan Parik, Director, C40 Transportation Initiative, highlights the importance of transportation-related climate action in the world's megacities, and shows how C40 Cities are leading the way on this critical issue.

Having recently come on board at C40 as the new Transportation Initiative Director, I am very excited about the opportunities and challenges that lie ahead. Transportation plays a crucial role in cities; since transportation is the key means of accessing education, employment and essential services, it has the potential to hugely impact the quality of people's lives. At the same time, it is the sector where global greenhouse gas emissions are rising most quickly. Demand for oil is set to rise from 84.7m to 105m barrels per day between 2008 and 2030; as the number of road vehicles rises sharply, the transportation sector is predicted to account for the lion's share of this increase on a global basis.

Opportunity & Action in C40 Cities

The opportunity for reducing emissions from transportation rests hugely with the world's megacities. Our **research shows** that C40 Cities collectively emit more than 300 million tonnes of CO₂ per year from the transportation sector. But it also shows that Mayors exercise strong powers over transportation, ranging from control over on-street parking to rail and bus systems to the ability to widen footpaths, create pedestrianized zones or implement networks of bike-paths.

For Mayors, taking action to invest in low carbon, public and non-motorized transportation also contributes to significant co-benefits in cities, such as improved productivity of workers with faster journeys and greater mobility; and improved air local quality, which has positive impacts on citizens' health. By investing in or creating incentives for new transportation systems, Mayors also create new economic and job opportunities. This is why C40 Cities are taking action now. In 2012, the CDP-C40 Cities Global Report, **Measurement for Management** showed that 73% of reporting C40 Cities disclosed that they were taking actions to reduce transport emissions .

Among others, transportation actions in C40 Cities have included:

- New transportation infrastructure: such as bus rapid transit corridors in Bogota, Buenos Aires and Jakarta; and bike sharing programs in Changwon, Mexico City, London, Paris, New York, Washington DC

- Demand management measures: including congestion pricing in London, Singapore, Milan and Stockholm; parking policies in San Francisco; and successful information campaigns used in the London 2012 Games
- Cleaner vehicle programs: including the [Hybrid Electric Bus Test programme in Bogota](#), Rio de Janeiro, Sao Paulo, and Santiago de Chile; Autolib, the electric car sharing program in Paris; and electric taxi programs in Amsterdam and Bogota.

C40 Transportation Networks

While they have accomplished a great deal, cities have the potential to do much more, by learning from each other and working together on common challenges. The C40 Transportation Initiative works with cities to facilitate and accelerate efforts on transportation in three key ways:

- **Reducing the need for journeys** through mixed-use and transit-oriented developments;
- **Moving journeys to more efficient modes of transport** such as public transit and non-motorised transportation (through better facilities, as well as transportation demand management policies); and
- **Improving the efficiency of public and private fleets**, through a shift towards cleaner vehicle technologies.

The Initiative currently has two active networks:

The Bus Rapid Transit (BRT) Network

The Bus Rapid Transit (BRT) Network works with cities to introduce/ transform C40 Cities' BRT systems, resulting in a new paradigm of sustainable mobility for megacities. A BRT system with clean buses, exclusive lanes and state of the art service can provide 'metro-quality' service at a fraction of the cost, generating an enormous shift from private cars to public transportation systems. The network promotes and shares best practice solutions and know-how, as well as providing more detailed technical and policy support from C40 partner organizations, the **Institute for Transportation & Development Policy** and the World Resources Institute's **EMBARQ** program.

The Electric Vehicle (EV) Network

The Electric Vehicle (EV) Network is currently working with almost a third of C40 Cities for which cleaner vehicle technologies are a crucial part of their strategies to reduce transportation-related emissions. By bringing cities together to discuss electric vehicle strategies, and convening and collaborating with key industry stakeholders, the network facilitates and accelerates the implementation of electric vehicle programs.

Further networks under consideration by C40 and its member cities include non-motorised transportation, transit-oriented development and transportation demand management. The Transportation Initiative will continue to evolve to support cities in delivering thoughtful, strategic and integrated transportation solutions that reduce emissions. It is a journey I am very excited to be on, with our C40 Cities.

Gunjan Parik serves as the Director of the Transportation Initiative at C40. In this position she is responsible for driving and delivering C40's global transportation strategy.



Shared, Electric, and Self-Driving:

How states and municipalities can encourage autonomous vehicles to be shared and electric

September 2018



SOUTHWEST ENERGY EFFICIENCY PROJECT

Shared, Electric, and Self-Driving:

How states and municipalities can encourage autonomous vehicles to be shared and electric

**Authored by Will Toor, Mike Salisbury,
and Matt Frommer**

September 2018



I. INTRODUCTION

The transportation sector is now the largest source of greenhouse gas (GHG) emissions in the U.S. economy. Without high levels of vehicle electrification and an accelerated decarbonization of the electricity sector, it is unlikely that the transportation sector, and thus the entire US economy, will be able to attain the significant GHG reductions necessary to reduce the impacts of climate change.

The auto industry is in the middle of multiple transformations in both technology and business. Over the last decade, the emergence of Transportation Network Companies (TNCs), such as Uber and Lyft, introduced unprecedented travel flexibility and raised the prospect of reduced individual car ownership in the future. Autonomous Vehicle (AV) technology has also developed rapidly, with the likelihood of self-driving vehicles becoming commercially available within a few years. Government policies and rapid declines in the cost of batteries also have encouraged a significant shift towards electric vehicles (EVs). However, most vehicles sold today continue to use internal combustion engines (ICE), and in the United States, the Trump Administration is attempting to rollback federal fuel economy standards, which would thwart much of our progress on GHG emissions reductions from the transportation sector.

The advent of AVs¹ brings tremendous promise for increased safety, increased mobility, reduced vehicle ownership, reduced parking demand, and increased levels of carpooling. However, it also has the potential to lead to large increases in VMT by opening up car travel to sectors of the population who cannot currently drive (children, and some elderly and disabled people), decreasing the cost of travel, encouraging urban sprawl, and potentially decreasing vehicle occupancy.

Shared-AV fleets are expected to be highly utilized, with the vehicles used eight to 10 times more hours per day than individually owned vehicles, and driven 80,000 miles or more per year (Fagnant, 2015). Their lifetime mileage is also expected to be significantly higher than conventional individually-owned vehicles. Some analysts project that shared AVs could have lifetimes as high as 500,000 to 1,000,000 miles (Arbib, 2017).

Early evidence from the advent of TNCs shows that these new business models are probably increasing vehicle miles travelled (VMT), congestion, and emissions. A recent analysis found that even shared-TNC rides, where two or more passengers share one vehicle, add to VMT because most users switch from other non-auto transportation modes such as transit, walking, or biking (Schaller, 2018), and because of the amount of time that TNC vehicles spend driving around and waiting for ride requests with no passengers in the vehicle. This experience may be a preview of future trends

¹ Our discussion around AVs focuses on Level 4 “high automation” and Level 5 “full automation” technologies, at which point the vehicles become fully autonomous and would therefore could begin to seriously impact travel behavior and decisions.

unless states and municipalities put in place policies that can minimize the AVs' potential for increases in emissions, congestion, and VMT. Without thoughtful policy and direction, future transportation systems will continue to deliver personal convenience at the expense of system efficiency.

Robin Chase, the founder of Zipcar described this scenario:

In an AV world, where we won't actually need to be doing the driving ourselves, each and every errand whim we might dream of is now a reality. If single-occupancy vehicles are the bane of our congested highways and cities right now, imagine the congestion when we pour in unfettered zero-occupancy vehicles (Chase, 2014).

This paper focuses on some of the policy tools available to state and local governments to try to maximize the benefits and minimize the risks associated with widespread adoption of AVs. In anticipation of AVs, policymakers can introduce legislation and structure economic incentives to encourage more intelligent use of the soon-to-arrive technology.

This paper also covers emerging issues that should be addressed as the California Air Resources Board begins to consider Advanced Clean Car Standards for model years 2026 and later. These standards are especially important because other states can adopt California's standards instead of the federal standard, and because California standards often drive improvements to the federal standards. This paper also addresses other steps that can be taken by state and local governments to reduce emissions and congestion from AVs.

Autonomous Vehicle Policy Recommendations:

- Require or heavily incentivize TNCs and AVs to be zero emission vehicles (ZEVs);
- Invest in the charging infrastructure required to transition TNC and AV fleets to electric vehicles;
- Provide extra credits or incentives in the Low-Emission Vehicle (LEVs) or Zero-Emission Vehicle (ZEV) standards for AVs that achieve high-vehicle occupancy;
- Create vehicle miles travelled (VMT) fees for AVs and TNCs that vary by vehicle occupancy.

We acknowledge that there are substantial uncertainties in how the technologies and the marketplace will evolve, and that any policy tools adopted should be reviewed frequently (and modified if necessary) as we learn more about the actual trajectory of vehicle automation.

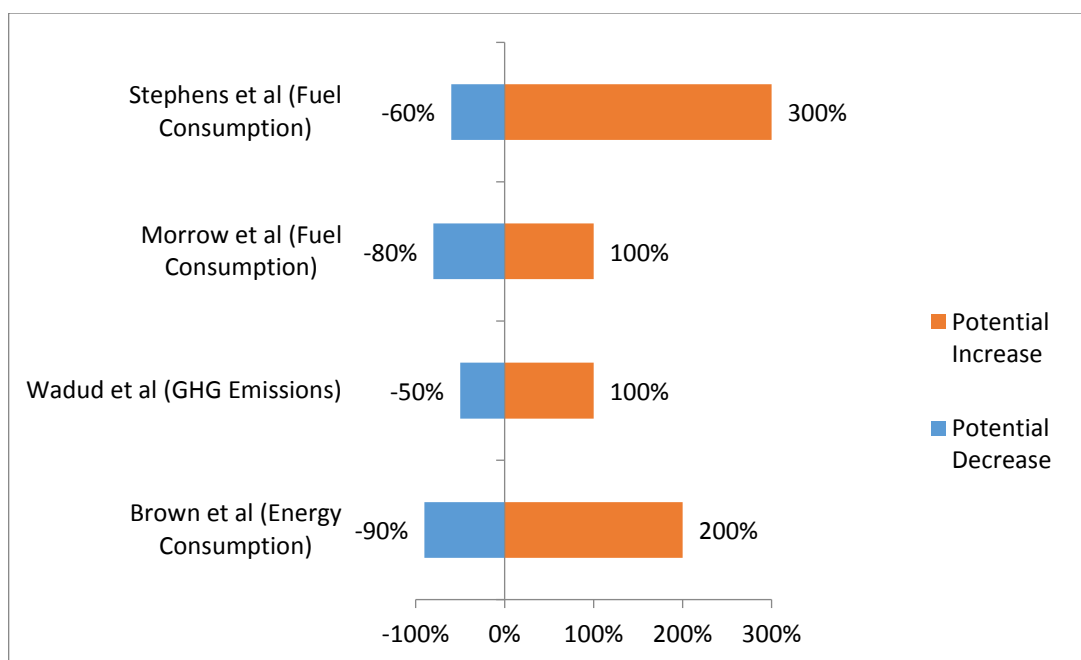
II. AUTONOMOUS VEHICLES SHOULD BE REQUIRED OR HEAVILY INCENTIVIZED TO BE ZERO-EMISSION VEHICLES

What is the projected impact of autonomous vehicles on emissions?

It may make sense to regulate AVs separately because of their potential to generate higher levels of vehicle travel and associated per vehicle emissions. Depending on how they are deployed and what technologies they use, AVs could have a wide array of impacts on the fuel consumption, energy use, and related emissions of light-duty vehicles. AVs could dramatically expand energy use in the transportation sector as they could increase vehicle travel by underserved populations, increase safe vehicle speeds, and increase travel due to their convenience and potential low cost-per-mile. A well-designed policy will support the positive aspects, such as increased equity for elderly and disabled travelers, while minimizing the impact on VMT and emissions.

Several studies have attempted to estimate the range of potential impacts on vehicle travel, fuel consumption, and GHG emissions due to the use of autonomous vehicles. The impacts range from a 50-90 percent decrease to a 100-300 percent increase depending on what type of vehicle (gasoline or electric) and what levels of vehicle sharing are assumed (Stephens, 2016; Brown, 2014; Morrow, 2014; Wadud, 2016).

Figure 1. Range of Potential Impacts from Autonomous Vehicles

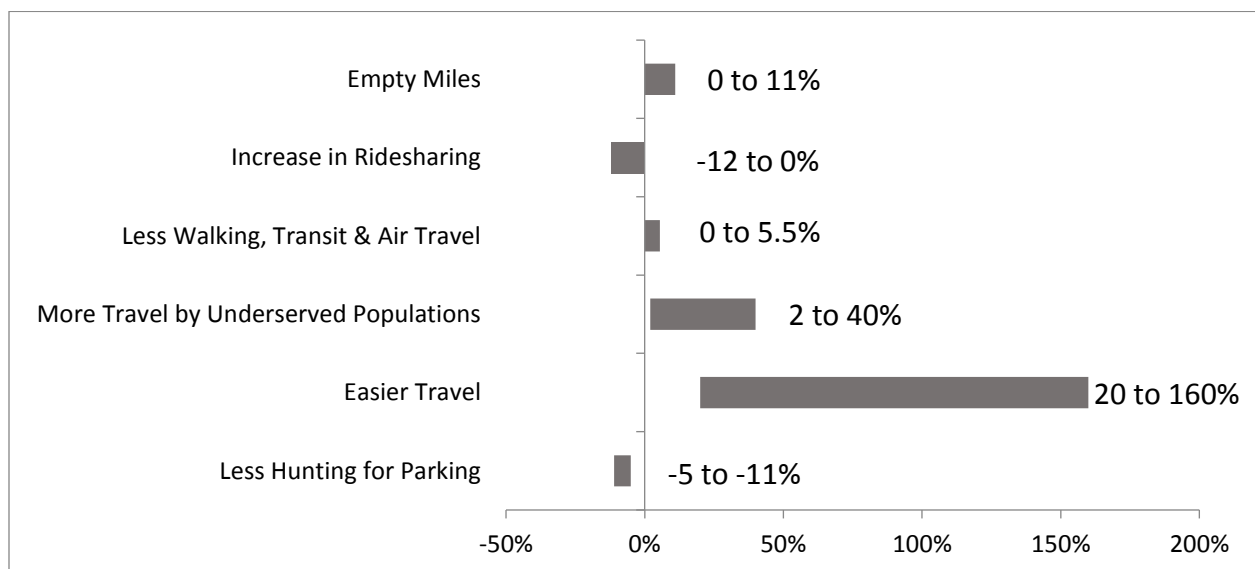


What is the projected impact of autonomous vehicles on travel behavior?

If AVs are individually owned, they may well lead to large increases in vehicle travel due to the convenience of not having to drive. People may choose to live further away from their jobs because the daily commute will be much more pleasant when the human no longer has to concentrate on the road and instead can read, sleep, work, or otherwise make productive use of time previously spent driving. This change could lead to more dispersed land use patterns, which would further increase driving distances. Vehicle owners may also use their AVs for running errands with no human passengers present, potentially adding many miles of zero-occupant travel to the roads. Shared-AVs may also increase mileage as the cars go back and forth between locations to transport different people at different times. Between passengers, AVs may travel a large number of miles “ghosting” without any passengers at all (Fagnant et al, 2015).

A recent study from the National Renewable Energy Labs (NREL) reviewed the literature on the potential impacts that AVs could have on travel demand and VMT. The NREL document provides a range of impacts on several anticipated effects from full vehicle automation.

Figure 2: Estimated Impact of Autonomous Vehicles on Total Vehicle Miles Traveled (VMT)



Some authors (Stephens et al, 2016) have argued that AVs inevitably will be shared and electric. These researchers argue that costs of travel by shared-AVs will be so low compared to owning a vehicle that most people, at least in urban areas, will opt to use shared services rather than pay the costs associated with car ownership. They also assert that these vehicles will be driven so many miles that their operating costs will be dominated by fuel and maintenance, both of which are significantly lower with EVs, making electrification economically appealing.

Why Autonomous Vehicles Should Be Electric:

- AVs likely will be driven more miles than today's cars, so a gas-powered AV will emit more carbon and other pollution;
- Due to EVs lower operating costs, and AVs higher annual mileage, electrified AVs make more sense economically;
- Limited constituency for AVs in early years reduces opposition to new policies.

How is the auto industry planning for autonomous vehicles?

Many automakers agree that AVs will be primarily electric, rather than gas-powered. For example, General Motors plans to deploy fleets of autonomous, fully-electric Chevy Bolts for ridesharing in urban areas in 2019, and senior management said in presentations to investors that GM anticipates that all AVs will be EVs (Wayland, 2017).

Waymo, a self-driving technology company and subsidiary of Google's parent company, Alphabet, is the furthest along in the race to make fully-autonomous vehicles. As of July 2018, their autonomous fleet had driven over 8 million miles on public roads (Hawkins, 2018). Through its 'Early Rider Pilot Program', Waymo is currently offering AV rides to select travelers in the Phoenix metro area and plans to launch the first AV ride-hailing service by the end of 2018. Waymo's new fleet will be comprised of 62,000 Chrysler Pacifica plug-in hybrid (PHEV) mini-vans and 20,000 Jaguar I-PACE all-electric SUVs, rounding out the trifecta of an electric, shared, and autonomous transportation future.

Other automakers, however, are headed in the direction of internal combustion engine (ICE) AVs. For example, Ford has announced that it will develop a hybrid-ICE-AV, which uses a gasoline-powered engine as its primary power source and would be designed primarily for commercial purposes, such as delivering pizza. Ford specifically stated that because the company expects the vehicles to be driven many hours per day, and EVs would need to recharge multiple times per day, a fleet of EVs would not be able to spend as much time on the road (Martinez, 2017).

Hyundai also announced that the company does not intend for its AVs to be electric, reasoning that 1) fully autonomous vehicles would consume very high amounts of electricity 2) the AVs may need 1 to 2 kilowatts (kW) of power *continuously* for the AV systems, 3) and that this energy drain would decrease the range of the vehicles so much as to make EVs impractical (Schweinsberg, 2017).

This scenario, however, does not mean that AVs cannot be electric. Clearly, some automakers are making large investments to achieve an electric and autonomous future. But the fact that other automakers are pushing in the opposite direction implies that, without policy intervention by

government, a significant portion of the AV fleet is likely to run on fossil fuels — carrying serious implications for continued GHG emissions and other air pollution. Peter Slowik at the International Council on Clean Transportation warns that “Without robust policy measures, the future of transportation will be autonomous and still involve burning dead dinosaurs.” (Slowik, 2018)

We argue that because of AVs’ potential to contribute to higher mileage use and emissions, that all AVs should meet:

- A stricter regulatory standard such as a requirement that all AVs be zero-emission vehicles;
- Higher zero-emissions vehicle (ZEV) requirements than conventional vehicles;
- Higher GHG emissions standards than conventional vehicles;
- Or other actions that heavily incentivize AVs to be ZEVs.

California’s Advanced Clean Car Standards 2026-2030: Policy recommendations

Redefining Standards compliance calculations

The California Advanced Clean Car Standards include a Low-emission vehicle (LEV) standard, which governs urban air pollutants and greenhouse gas (GHG) emissions, and a Zero-Emission vehicle (ZEV) standard that requires automakers to gradually increase the market share of EVs among new vehicle sales.

Currently, California bases its GHG standards for light-duty vehicles (such as passenger cars, small trucks, and most sport utility vehicles, or SUVs) on a vehicle’s tailpipe emissions of greenhouse gases per mile, measured in grams of CO₂ per mile. This standard made sense in the past, because California officials reasonably assumed that most light-duty vehicles would have similar uses. These standards, however, do not account for a factor that critically affects a vehicle’s actual GHG emissions: how far the vehicle is driven. In a probable future scenario, where self-driving cars operate on TNC platforms like Uber and Lyft, such high-utilization vehicles may travel upwards of 80,000 miles per year. With today’s GHG standards, the 80,000 mile-per-year shared-AV would be considered in the same category as a 12,000 mile-per-year personally-owned vehicle, despite producing almost seven times the annual GHG emissions. Personally-owned AVs may also be driven far more than traditional personal vehicles. A more suitable metric would categorize each vehicle by annual emissions to more precisely account for its actual impact on air quality.

Policymakers also may need to rethink how ZEV credits are assessed for AVs. Under the current ZEV program, the number of credits is directly related to a vehicle’s range (UCS, 2018). For example, a battery-electric vehicle (BEV) with 150 miles of range would earn two ZEV credits, while a vehicle with 300 miles of range would earn 3.5 credits. In the future, it is possible that shared-AV

business models will rely on lighter, shorter-range vehicles due to their lower cost, and more frequent fast charging.

Amending the ZEV standard for autonomous vehicles

In absence of this stricter regulation, gasoline-powered AVs could significantly increase emissions compared to current levels. As California considers the next generation of Advanced Clean Car Standards, which will govern cars beginning in model year 2026, the state should consider four approaches for regulating AVs:

1. ZEV Mandate for AVs:

The simplest approach would be to require that all light-duty AVs also must be ZEV vehicles. This standard would set a clear expectation for automakers, and would maximize the emission reductions. In this scenario, any automaker that wants to sell AVs in the California marketplace, or the other states that have adopted California's ZEV standards, would have to manufacture ZEV-AVs. Since AVs are not yet widely available in the marketplace, this policy would set the standard at a very early stage, before automakers have invested billions of dollars in factories to build ICE-AVs, and before consumers begin buying ICE-AVs.

We acknowledge, however, that adoption of such strict rules might also slow down the introduction of AVs – and the benefits that the vehicles may bring in high-occupancy ridesharing, decreased parking requirements, increased safety, and increased mobility for underserved populations.

2. Establish a separate ZEV standard for AVs

A related, somewhat less ambitious approach would be to allow some light-duty AVs to be ICE vehicles, but set a separate ZEV standard for AVs that is substantially higher than the standards for non-autonomous vehicles. The policy could require the percentage of ZEVs to rise over time. This incremental approach would address concerns that the potential of a 100 percent ZEV requirement might delay the deployment of AVs.

A less direct approach would be to set a ZEV standard for TNC fleets in anticipation of the industry's transition to AVs. California is currently considering SB-1014, the [Clean Miles Standard and Incentive Program for Zero-Emission Vehicles](#), which would establish GHG emission targets for passenger-miles driven by TNCs (SB-1014, 2018). The standards would go into effect in 2023, ramp up each year, and require all TNCs to develop a GHG emissions reductions plan to meet the goals. An early draft of the proposal included a 100 percent ZEV requirement for TNC fleets by 2030.

3. Apply a multiplier for Zero-Emission AVs

A third approach would not set a separate ZEV standard for AVs, but instead would provide a multiplier for zero-emission AVs to account for the likelihood that they will get significantly more use than other vehicles, and so will contribute a greater share of clean vehicle-miles traveled. ZEV credits for an AV would be calculated as the product of the vehicle model's ZEV credits, which is based on its electric range, and the vehicle's VMT relative to the baseline fleet average. For example, a zero-emissions AV with a 300-mile range (typically worth 3.5 ZEV credits) traveling 72,000 miles per year (or 6 times the fleet average) might be assigned a 6x multiplier, and thus earn 21 ZEV credits. Such a multiplier would make it easier for automakers to comply with the ZEV standard with fewer vehicles, and therefore encourage them to invest in zero-emission AVs. If this approach were taken, policymakers also could consider increasing the ZEV requirements for 2026-2030 to maintain an accelerated production rate for ZEVs.

4. Introduce separate GHG emission standards for AVs

A fourth approach, which could complement any of the first three, would be to address AVs differently than other vehicles in the GHG standards. Policymakers could either set a separate standard for AVs, requiring lower emissions per mile of travel, or by weighting AVs more heavily than other vehicles in recognition of the likelihood that they will travel more miles.

Independent of the upcoming updates to the California Advanced Clean Car Standards, AVs are expected to contribute greater VMT than conventional vehicles, and thus higher emissions, so it is appropriate to impose more stringent emissions requirements.

Policy tools for local and state governments:

Outright ban on fossil-fuel AVs

Some governments may deal with the problem by simply banning AVs that burn fossil fuels. Countries across the world, and some jurisdictions within the United States, are already discussing the idea of banning all internal combustion engines, or have already set a future date when they cannot be sold. Both Britain and France have announced plans to ban the sale of gasoline and diesel vehicles by 2040, while India aims to end their sale by 2030. China has announced plans for such a ban but has not set a date so far (Petroff, 2017). Some California legislators have discussed a similar type of ban, while cities such as Los Angeles and Seattle are pledging to ban gasoline and diesel vehicles by 2030.

Such a ban could be phased in, beginning with AVs. This approach has a number of important advantages. For one thing, AVs are likely to be deployed first in higher-priced vehicles so a phased-in ban probably will not affect low- or moderate-income consumers. For another, AVs also are likely to be introduced first into urban environments where charging is more available. And because the

Investing in Charging Infrastructure for Plug-In Electric Vehicles

How to Accelerate Deployment



By Lia Cattaneo Posted on July 30, 2018, 9:01 am

Getty/Yoon S. Byun

An electric vehicle is charged in Portland, Maine, July 2015.

Introduction and summary

For more than 100 years the internal combustion engine (ICE) dominated vehicle design, bringing with it large increases in greenhouse gas (GHG) emissions. In 2015, the number of fossil fuel-propelled cars in the United States rose to 113 million,¹ up from just 8,000 in 1900.*² Now, plug-in electric vehicles (PEVs) provide a cleaner alternative that not only reduces GHG emissions, but also provides local air quality, noise reduction, and national security benefits. PEVs are an integral component in the suite of technologies that will help meet the United States' commitments under the Paris Agreement—an ambitious 26 percent to 28 percent reduction in GHG emissions by 2025, compared with 2005 levels.³

As with any major technological transformation, transitioning to an electrified transportation system will not be easy nor cheap. A century of public and private development led to the existing fleet of ICE vehicles, complemented by more than 100,000 gas stations,⁴ federally funded roads that connect communities,⁵ and a vast network of service stations and dealerships. With about 800,000 PEVs⁶ and 18,000 charging stations⁷ on the road now, the revolution is just beginning.

Overview of PEVs and charging infrastructure technology

This content relies on language published in a previous CAP report on electric vehicles⁸ and is provided here for background.

“Electric vehicles” (EVs) is a broad category that can mean different things in different situations. To avoid confusion, this report generally avoids using the term “electric vehicle.” It focuses on the benefits of and policies related to the deployment of PEVs. PEVs can be charged in whole or in part by an off-board electric power source. This is distinct from hybrid electric vehicles, which

supplement an ICE with battery power—often charged through regenerative braking—but cannot be plugged in.

TABLE 1

Characteristics of different charging infrastructure

Charging level	Voltage	Estimated charging time to provide 80 miles of range	Typical locations	Vehicle restrictions
Level 1	120 V	16 hours	Home	All vehicles can use
Level 2	240 V (residential) 208 V (commercial)	3.5 hours	Home, workplace, and public	All vehicles can use
Direct current fast charger	480 V	30 minutes	Public	PHEVs cannot typically use; charging connectors vary
Tesla Supercharger	480 V	15 minutes	Public	Only Tesla can use

Sources: Office of Energy Efficiency and Renewable Energy, "Vehicle Charging," available at <https://www.energy.gov/eere/electricvehicles/vehicle-charging> (last accessed April 2018); Mia Yamauchi, "Tesla Charging: The Complete Guide to Charging at Home, in Public and Autonomously," Plugless Power, available at <https://www.pluglesspower.com/learn/tesla-model-s-charging-home-public-autonomously/> (last accessed April 2018); ChargePoint, "Driver's Checklist: A Quick Guide to Fast Charging," available at https://www.chargepoint.com/files/Quick_Guide_to_Fast_Charging.pdf; Office of Energy Efficiency and Renewable Energy, Enabling Fast Charging: A Technology Gap Assessment (U.S. Department of Energy, 2017), available at https://www.energy.gov/sites/prod/files/2017/10/f38/XFC%20Technology%20Gap%20Assessment%20Report_FINAL_10202017.pdf.

CAP

PEVs are further divided into plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs). PHEVs typically run on electricity for shorter ranges—currently up to about 40 miles—then switch over to a gasoline-powered ICE when the battery is depleted. BEVs run only on electricity; they typically travel up to 100 miles on a single charge, and high-end models can reach up to 250 miles.⁹

PEVs can be connected to the electricity grid and recharged through charging infrastructure—sometimes referred to as EV supply equipment. The types or levels of charging infrastructure are commonly defined as Level 1, Level 2, and direct current (DC) fast chargers. As battery technology improves, vehicles will be able to go farther on a single charge. This report focuses on public Level 2 chargers and DC fast chargers.

Tipping the balance of vehicles toward PEVs requires the funds to incentivize the widespread adoption of new vehicles and their charging infrastructure, along with the will to overhaul the existing system. State and federal policymakers need to find new and creative ways to put more PEVs on the road. Policy leaders across the country are spurring investment in charging infrastructure through the use of state financial incentives and funds available through the Volkswagen (VW) settlement, which requires VW to make payments to resolve the federal government’s allegations that the company cheated emissions standards.¹⁰ But current levels of investment are not enough.

This report focuses on what states can do to ensure that adequate charging infrastructure is available. It first provides background on the number of PEVs needed to reduce GHG emissions from the transportation sector. It then discusses the charging infrastructure investment gap and provides policy recommendations to help close it.

The Center for American Progress estimated the number of vehicles and charging stations that the country will need to deploy by 2025 in order to meet its Paris Agreement targets, as well as the capital costs of installing the new public chargers needed. CAP found that:

- The United States needs to add 14 million new PEVs and more than 330,000 new public charging outlets by the end of 2025.
- Many states are well on their way to having the public Level 2 and DC fast charging infrastructure needed by 2025, but the country needs significantly more to meet the Paris Agreement goal. California, Colorado, Connecticut, Hawaii, Maryland, Nevada, Oregon, Vermont, and Washington state are leading the way.
- Existing state and VW funds can provide only about 50 percent of the funding needed to deploy adequate public charging infrastructure through 2025. Additional public resources and private investment are necessary to close the remaining \$2.3 billion gap.

As states spend VW settlement funds, they will need to find new funding sources to continue progress into the midcentury. States should work with their utilities and legislatures to advance new investment mechanisms, as well as apply for federal grants and join or create revenue-generating carbon pricing programs. Additional private investment is also necessary, as is the extension of federal tax credits for EV charging infrastructure—which expired at the end of the 2017 tax year.

Cutting GHG emissions from the transportation sector

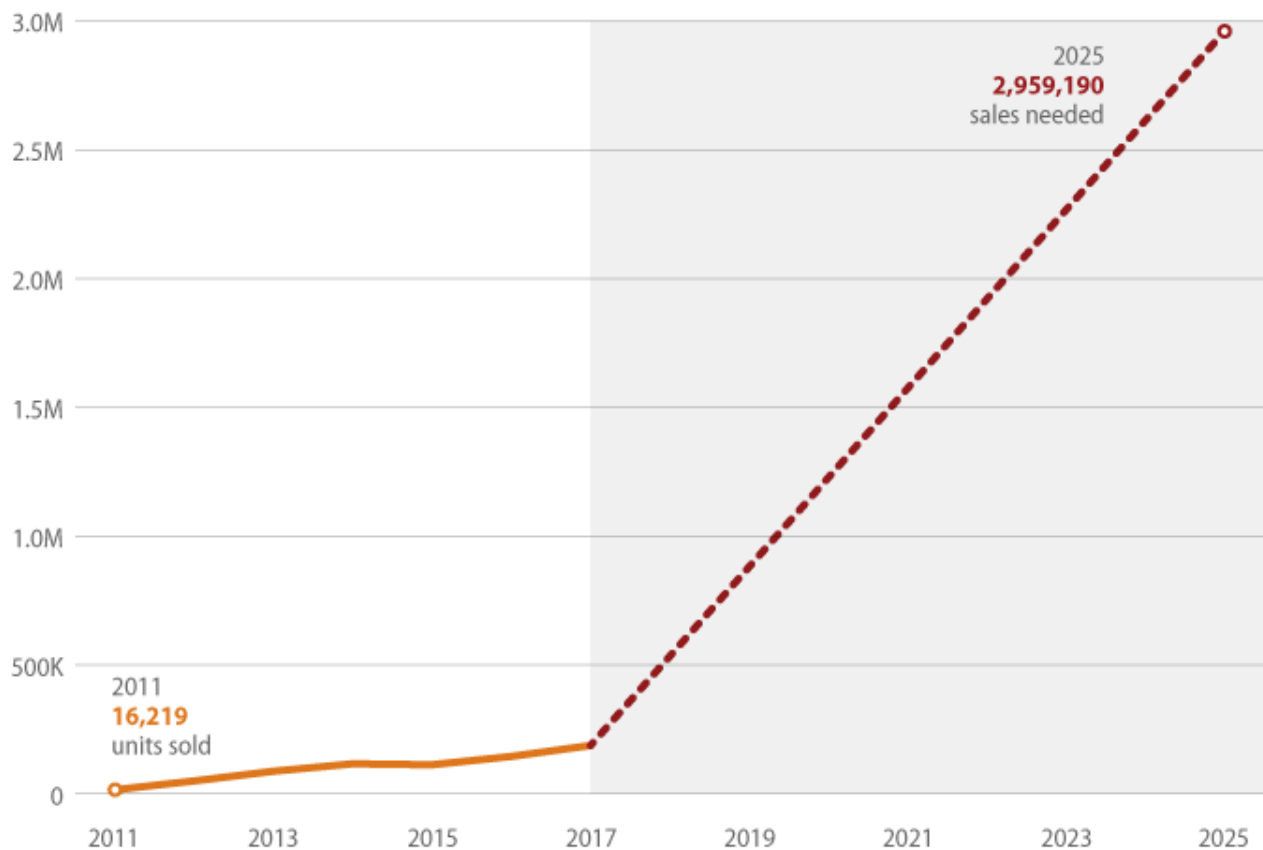
In its 2015 submission to the U.N. Framework Convention on Climate Change in accordance with the Paris Agreement, the United States committed to reducing GHG emissions 26 percent to 28 percent below 2005 levels by 2025.¹¹ In 2005, the transportation sector was responsible for 27 percent of all U.S. GHG emissions, a figure that rose to 28.5 percent in 2016¹²—the first year that transportation surpassed electricity to become the largest source of U.S. GHG emissions.¹³ Light-duty vehicles (LDVs) have consistently made up about 60 percent of the transportation sector's emissions.¹⁴

EVs can help the United States reduce LDV emissions and move the country closer to its climate goals. Reducing LDV emissions by 16 percent below 2005 levels by 2025 would meet an ambitious national goal of a 26 percent reduction in the LDV sector—factoring in the approximately 10 percent reduction from the 2005 baseline that LDVs already achieved.¹⁵ CAP converted this reduction from a percentage to the specific number of vehicles and chargers needed to meet U.S. emissions goals.

Vehicles

Estimating the number of PEVs needed to achieve emissions reduction goals in the LDV sector is a complex calculation that involves many assumptions. CAP’s analysis is based on a 2018 report by the Argonne National Lab¹⁶ that estimated carbon dioxide emission savings from PEVs as compared with those from an ICE vehicle in the 75th percentile for fuel economy in its class size and year—in other words, the ICE vehicle that a PEV would replace. (see Appendix for full methodology) Figure 1 shows the number of PEVs sold in the United States from 2011 through 2017, as well as the number of new PEVs needed through 2025 to achieve intended emissions reductions—assuming a linear increase in vehicles from 2017 through 2025. The United States needs to add nearly 3 million PEVs in the year 2025—and 14 million vehicles cumulatively from 2018 to 2025.

FIGURE 1
Annual plug-in electric vehicle (PEV) sales, showing historic sales and future sales needed to meet emissions goals



Sources: Alliance of Automobile Manufacturers, “Advanced Technology Vehicle Sales Dashboard,” available at <https://autoalliance.org/energy-environment/advanced-technology-vehicle-sales-dashboard/> (last accessed July 2018); U.S. Energy Information Administration, “State Carbon Dioxide Emissions Data,” available at <https://www.eia.gov/environment/emissions/state/> (last accessed July 2018); David Gohlke and Yan Zhou, “Impacts of Electrification of Light-Duty Vehicles in the United States, 2010 – 2017” (Argonne, IL: Argonne National Laboratory, 2018), available at <https://www.osti.gov/biblio/1418278>.



A national target of 14 million new PEVs is on par with existing commitments from states. In 2013, the governors of California, Connecticut, Maryland, Massachusetts, New York state, Oregon, Rhode Island, and Vermont signed a memorandum of understanding (MOU) that set a goal to

have a collective 3.3 million zero-emissions vehicles—PEVs and another EV category, fuel cell EVs¹⁷—in their states by 2025.¹⁸ These states comprised a combined 26 percent of the U.S. vehicle market in 2017;¹⁹ thus, if all other states and Washington, D.C., strive for a similarly ambitious goal, the country could reach the 14 million vehicles needed to meet the Paris Agreement target.

Charging infrastructure

PEVs will require charging infrastructure to support them. The U.S. Department of Energy (DOE) has developed a new tool—EVI-Pro Lite—that uses data on personal vehicle travel patterns, EV attributes, and charging station characteristics to estimate the quantity and type of charging infrastructure necessary to support regional adoption of EVs.²⁰ Based on the cumulative number of PEVs that CAP determined are needed in a given state, the DOE tool provides an estimate of that state's charging infrastructure needs. (see Appendix for more information) CAP found that overall, the United States needs to deploy at least 330,000 new public charging outlets by 2025 to meet PEV demand. Figure 2 and Figure 3 show what percentage of Level 2 and DC fast chargers, respectively, each state already has compared with what CAP determined it will need through 2025. Only public Level 2 chargers and DC fast chargers are considered in this report, though states will need workplace and residential charging as well.

Policy recommendations

Existing state incentives and funds from the VW settlement can only provide about half of the United States' public charging infrastructure needs through 2025. According to CAP's analysis, states need additional public resources and private investment to close the remaining gap of \$2.3 billion. This funding should come from a combination of increased federal, state, and local ambition, as well as the private sector.

Increase state ambition

The easiest way states can fund charging infrastructure is to fully utilize the funds available to them through the VW Mitigation Trust. Combined with planned allocations in final and draft plans, the total cost of necessary investments could be reduced by \$322 million if all states in the predraft phase of their mitigation plans commit all funds available.

Yet, as states spend the VW settlement funds, they need to establish an alternative funding source to continue progress into the midcentury. Even after taking into consideration VW funds and state-level financial incentives, there is still a \$2.3 billion gap by 2025. After 2027—the end of the Electrify America investment cycles and the expiration of Mitigation Trust funds—the country will need to find a new way to fund investments in charging infrastructure deployment.

States could do the following to increase funding for charging infrastructure:

- **Work with state legislatures to provide financial incentives for charging infrastructure.** California, for example, has continually increased ambition and innovated

around charging infrastructure funding and financing. These efforts have resulted in the state already reaching more than 40 percent of the public Level 2 charging it needs by 2025. In fiscal year 2017, California allocated \$17 million to charging infrastructure and about the same in fiscal year 2018. However, after using the DOE's EVI-Pro Lite model to analyze the charging infrastructure needed to match the state's vehicle deployment goals, California plans to invest \$134.5 million in fiscal year 2019—and Gov. Jerry Brown (D) has set ambitious targets for the state's future spending.³³

- **Work with utilities to provide financial incentives for and to invest in charging infrastructure.** Utilities can facilitate the PEV revolution by directly investing in charging infrastructure. States should work to engage utilities and eliminate regulatory barriers that may preclude their investment. Chargers can provide revenue for the utility and at the same time allow for the much-needed deployment of clean transportation solutions. The role of the utility in financing and operating charging infrastructure is being actively debated in states across the country and many public utility commissions are starting to permit the rate-financing of charging infrastructure.³⁴ For example, Ohio regulators approved a rate plan for American Electric Power Company in April 2018 that allows the utility to provide rebates aimed at deploying 300 public Level 2 charging stations and 75 DC fast charging stations.³⁵
- **Join or start a carbon pricing program that generates revenue that could be used for charging infrastructure.** Delaware, for example, is a member of the Regional Greenhouse Gas Initiative (RGGI) and uses a portion of the money it receives from RGGI to fund rebates for chargers and a competitive grant program for DC fast chargers.³⁶ In most existing and proposed programs, states have flexibility in determining how revenue is used.
- **Direct state departments of transportation to consider ways to incorporate charging infrastructure into their investment plans.** State departments of transportation could investigate their use of the Federal Highway Administration's Congestion Mitigation and Air Quality (CMAQ) Program funds—specifically, how they could be used for charging infrastructure. CMAQ provides reliable funding to all states to improve air quality, and the funds may be used to establish charging infrastructure.³⁷ The North Florida Transportation Planning Organization used \$450,000 of its CMAQ funding to expand a network of Level 2 and DC fast chargers.³⁸ State departments of transportation generally choose to use their CMAQ money to fund projects that improve traffic flow and provide transit options,³⁹ but they could dedicate more funding to charging infrastructure instead.
- **Apply for federal grants for charging infrastructure.** The U.S. Department of Transportation's Better Utilizing Investments to Leverage Development (BUILD) Transportation Discretionary Grant program⁴⁰ can be used for charging infrastructure. This program was formerly known as the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant program. Although program funds are limited and competition is fierce, states should consider applying for funds for charging infrastructure projects or for larger projects that include charging infrastructure. The Georgetown Climate Center in Washington, D.C., has compiled a list of federal funds potentially available for use in charging infrastructure deployment.⁴¹

Leverage private investments

The private sector must be an integral partner in order to deploy the EV charging infrastructure needed to meet the United States' carbon goals. Private companies play an active role in building charging infrastructure—from installing it at workplaces to owning and operating it as a core business to installing it for use by the company's vehicles. Most of the state- and utility-sponsored financial incentives are used by private companies.

On the workplace side, businesses outside the EV industry can play an important role in closing the gap, though this report does not fully investigate this. Companies can also help provide other publicly accessible charging infrastructure, such as at malls. Installing charging infrastructure at malls allows PEV owners to charge while shopping, eating, and resting, as well as provides mall owners with an additional marketing tool and a revenue source.⁴² The Simon Property Group, one of the largest outlet mall owners, has an expanding network of 466 chargers in 20 states.⁴³ Like malls, others in the retail industry such as big-box stores and supermarkets are also beginning to see the value in investing in public chargers.⁴⁴ At the end of fiscal year 2017, Walmart had installed more than 300 stations⁴⁵—the same number of stations Kroger had installed by April 2013.⁴⁶ Kroger, Walmart, Sam's Club, Costco, and Safeway were the top big-box stores or supermarkets selling gasoline in 2016,⁴⁷ and it is not hard to imagine these stores profiting similarly from investments in public charging infrastructure. Although the current scale of investments is small, as demand grows, malls and large retailers could be a major source of investment in public charging.

EVgo and other companies that operate charging stations are also building additional stations. EVgo has installed and now operates more than 1,050 DC fast chargers across the country; the company opens a new station every six to eight weeks.⁴⁸

Tesla is somewhat of an anomaly in the EV space. All commercially available PEVs can generally use the same Level 1 and Level 2 charging equipment,⁴⁹ but Tesla has a proprietary plug and DC fast charger called the Supercharger that can only be used by Tesla's vehicles. (see Table 1)⁵⁰ Both Tesla and non-Tesla vehicles and chargers are included in this analysis. Other automakers currently provide just vehicles and rely on others to build the infrastructure; Tesla is installing infrastructure itself for use by Tesla customers.⁵¹ The Union of Concerned Scientists provides an interesting map of Tesla charger locations compared with non-Tesla stations that demonstrates Tesla's strategy of placing chargers across the country, compared with other stations, which tend to be clustered in large metropolitan areas.⁵²

Many states and utilities have financial incentives that are specifically applicable to businesses installing charging infrastructure. Public and private sector entities should work together to close the cost gap.

Extend federal tax credits

Extending the federal tax credits for PEV charging infrastructure is a key way to reduce the public Level 2 and DC fast charging infrastructure funding gap. The Energy Policy Act of 2005 authorized tax credits for the alternative fuel vehicle refueling property credits—known as the 30C tax credits for their location in the U.S. code—which allowed businesses and individuals to receive tax credits for the installation of EV charging infrastructure.⁵³ For individuals, tax credits are 30 percent of the cost of the unit and installation, up to \$1,000; for businesses, they are 30 percent of the cost of the unit and installation, up to \$30,000. The 30C credits were extended in the Tax Cuts and Jobs Act passed in February 2018 but only retroactively for purchases made in 2017. Although the original Senate bill contained an extension for 2018, this was not in the final legislation, and reauthorization for future tax years is uncertain.⁵⁴ If the tax credit were to be extended, a significant portion of the funding gap for 2025 could be eliminated.



Cities, obsessed with electric cars, overlook simple solutions at climate summit

Walking and biking will reduce emissions faster

By [Alissa Walker@awalkerinLA](#) Sep 18, 2018, 5:25pm EDT



Electric vehicles were prioritized at the Global Action Climate Summit over lower-emission solutions like walking, biking, and transit. *AP Photo/Eric Risberg*

California Governor Jerry Brown kicked off the Global Climate Action Summit in San Francisco last week with two jaw-dropping announcements. Not only would California run on **100 percent clean energy within 25 years**, but the entire state would achieve **carbon-neutrality by 2045**, eliminating or offsetting *all* emissions from

manufacturing, agriculture, and the **increasing problem** of transportation.

Brown's announcement was the most **ambitious climate policy** ever proposed—and a total surprise. But it was, in many ways, the perfect opening for a **summit focused on audacious local action**, launched around the idea that national entities have been **too slow to mobilize**. His executive order set the tone for the summit, and new partnerships and expanded commitments were dispatched from every level of government and every sector of industry, proposing to hit even more aggressive targets.

In attendance were many of the 400-plus U.S. "climate mayors," who began a series of collective actions pledging to **honor the Paris agreement** after the federal government backed out last year. It's working: C40, a global coalition of mayors, says that cities have been more **effective at fulfilling commitments** than countries, releasing a report at the California summit that **showed emissions have peaked** in 27 of its member cities.

Over the past year, however, it has become increasingly clear that for U.S. mayors, the greatest climate challenge will be **addressing how Americans get around**—transportation is now the **largest source of emissions** in the U.S.

Yet transportation was not a major focus of the summit's agenda. Transportation was not even listed as one of the “**key challenge**” areas of the summit, although it is **increasing global emissions at a faster rate** than any other sector.

It was a recurring theme across the summit's programming. Instead of simple, actionable, inclusive solutions that focused on strengthening communities while reducing emissions, much of the summit felt like TED Talks of powerful white men getting mad at Trump—Harrison Ford, Michael Bloomberg, Al Gore—sandwiched between high-tech, high-investment proposals.

Ford's speech **snagged more headlines** than an **announcement from C40** that a total of **26 cities worldwide** had committed to designating a majority of their streets “**fossil-fuel free**” by **2030**.

At times, the summit felt more like an auto show. The event concluded with a **cross-country electric vehicle road trip**. There was the hashtag **#CitiesDriveElectric**. The only main stage session completely dedicated to transportation was like a series of car-centric infomercials: Hydrogen fuel-cell SUVs! Charging stations! Batteries!

Especially when compared to their international counterparts, U.S. mayors still are still relying on **electric vehicle promises** instead of making **other dramatic shifts needed** in local transportation.

For comparison, LA Mayor Eric Garcetti and Paris Mayor Anne Hidalgo used the summit's visibility to **announce zero-emission transportation goals** before each city hosts the Olympics (Paris in 2024, LA in 2028).

Garcetti's plan includes **electrifying the city's fleet**, buying **electric buses**, and pledging that **20 to 45 percent of cars** on LA streets will be electric vehicles within 10 years.

Hidalgo returned to a Paris where the **entire city was car-free for the day**, part of a major effort underway to **convert freeways to parks**, **rapidly expand the bike network**, **triple the number of people biking**, and **eliminate gas-powered cars** in the city by 2020.

Advocacy groups at the summit **protested** other U.S. mayors whose on-the-ground transportation commitments did not mirror their climate proclamations.

Divestment—the movement for cities and states to stop investing in oil companies—was one of the **big topics of the summit**, with New York City Mayor Bill de Blasio pledging to double the city's **green investments** in a speech.

Yet **critics rightfully argue** that New York's plan to stop supporting these companies isn't complemented by an effort to prioritize clean transportation modes on streets. Wouldn't the most powerful way for a city to divest from fossil fuels simply be to stop using them?



San Francisco’s bicycle coalition organized a protest meant to highlight the city’s lack of commitment to safe walking and biking infrastructure, the urgency of which was underlined the same morning when a cyclist was **killed in a crash** caused by an **illegally parked truck** on the same street as the protest.

The coalition **called out** Mayor London Breed for preaching climate action yet blocking safety improvements. “San Francisco may be hosting, but we

have yet to make the commitment to increase space for people walking, biking and taking transit,” its op-ed reads. “We’re embarrassed for our city this week.”

Wouldn’t the most powerful way for a city to divest from fossil fuels simply be to stop using them?

Even though it was a global meeting, the conversations all came back to California, with questions at cocktail hours swirling around **whether or not** legislation alone will be enough to help the world’s fifth-largest economy achieve its renewable energy goals—let alone its bigger carbon-neutrality goals. It felt like the gauntlet thrown down at the beginning meant the summit was barreling towards some equally game-changing finale—some coordinated, universal effort to unite a world now following in California’s goalpost-moving footsteps.



At the close of the summit, as a **climate change-boosted** Hurricane Florence churned towards the Carolina coast, Brown made a promise to **launch a satellite** to collect climate data, something he’d originally proposed during the 1970s when he earned the nickname Governor Moonbeam. While Brown’s intentions for launching the satellite are well-founded—worries that NASA could be defunded under the current administration mean that its **climate research would be stifled**—plans for the launch are still several years and a presidential election away.

Still, as predicted, it was the satellite that **made the headlines**, lauded as the “**most audacious**” announcement of the summit. The symbolism was damning. I envisioned the rocket launch on a picturesque stretch of California coast, with everyone’s attention turned toward the spectacle in the sky, when our leaders really should be focusing on the neighborhood, the street, the sidewalk.

GOOD PRACTICE GUIDE

Bus Rapid Transit



EXECUTIVE SUMMARY

Transportation plays a crucial role in cities as it significantly impacts the quality of people's lives and is often the key means of accessing education, employment and essential services. At the same time, transportation is the sector where global greenhouse gas (GHG) emissions are rising most quickly. In 2010, the transport sector accounted for 27% of final energy use, and CO₂ emissions from the sector could almost double by 2050 if steps are not taken to counter this trend.ⁱ As emissions from private motor vehicle use rise, adopting measures to shift these trips to public transit is critical.

As one of the main components of a comprehensive public transportation system that may include motorised and non-motorised elements, Bus Rapid Transit (BRT) delivers significant benefits to cities, while requiring significantly less time and resources to build and begin operation than other comparable alternatives.ⁱⁱ A BRT is a high-quality bus-based transit system that delivers fast, comfortable, and cost-effective services at metro-level capacities at a fraction of the cost. It can be expanded in phases as funding becomes available – allowing costs to be dealt with over time - and is faster to implement than other rapid transit services (metro, light rail, etc.). These projects, programmes and policies not only reduce emissions but also save travel time, reduce local air pollution, improve traffic safety and encourage physical activity.

This Good Practice Guide focuses on the key elements to successfully develop a high-quality BRT system, leading to better economic, social, and environmental outcomes for cities. These good practice approaches include:

- **Adopt holistic planning for a high-capacity BRT corridor**
- **Develop benchmarking and measure the impacts of BRT**
- **Focus on strong stakeholder engagement and communications**
- **Integrate BRT with other means of public transport and urban planning**
- **Utilise innovative financing mechanisms**

The C40 Bus Rapid Transit (BRT) Network was established to support C40 cities' efforts to develop successful BRT programs, incorporating infrastructure, technology, scheduling, and financing solutions. The C40 BRT network currently has 16 participating cities and is led by Buenos Aires and Johannesburg.

The purpose of this Good Practice Guide is to summarise the key elements of BRT good practice for global dissemination, highlighting the success of C40 cities in planning and delivering a high-quality public transit systems.

1 BACKGROUND

1.1 Purpose

The C40 Cities Climate Leadership Group has developed a series of Good Practice Guides in areas critical for reducing greenhouse gas (GHG) emissions and climate risk. The C40 Good Practice Guides provide an overview of the key benefits of a particular climate action and outline successful approaches and strategies cities can employ to effectively scale up these actions. These Guides are based on the experience and lessons learned from C40 cities, and on the findings and recommendations of leading organisations and research institutions engaged in these areas.

The following Good Practice Guide focuses on the key elements necessary to successfully develop a good BRT system, leading to better economic, social, and environmental outcomes for cities. These approaches are relevant for cities engaged in C40's Bus Rapid Transit (BRT) Network as well as for other cities around the world.

1.2 Introduction

Transportation plays a crucial role in cities as it significantly impacts the quality of people's lives and is often the key means of accessing education, employment and essential services. At the same time, global GHG emissions are rising most quickly in the transportation sector, which accounted for 27% of final energy use in 2010. Baseline CO₂ emissions from the sector could almost double by 2050 if steps are not taken to counter this trend.ⁱⁱⁱ

C40 cities alone emit around 336mn tonnes/year from transport (2011).^{iv} Fortunately, this sector also presents many opportunities to reduce emissions. Transport is a key action area for C40 member cities, with mayors exercising strong powers over the sector. In fact, approximately 90% of C40 cities are taking action on transport.^v

2 BUS RAPID TRANSIT (BRT) AND CLIMATE CHANGE

2.1 What is BRT?

Bus Rapid Transit (BRT) is a high-quality bus-based transit system that delivers fast, comfortable, and cost-effective services at metro-level capacities. It does this through the provision of dedicated lanes, with bus-ways and iconic stations ideally aligned to the centre of the road, off-board fare collection, and fast and frequent operations.

Because BRT contains similar features to a light rail or metro system, it is much more reliable, convenient and faster than regular bus services. With the right design, BRT is able to avoid most of the causes of delay that typically slow down regular bus services, like being stuck in traffic or

queuing to pay on board. As a safer, cleaner, and more efficient mode of transport that gives people more time for their personal lives, BRT is a smart solution to cities' urban transport challenges.

As a growing transport solution in both developed and developing countries, BRT and improved bus-way systems already have a combined daily ridership of more than 32 million people in 200 cities around the world.^{vi} C40's own research for Climate Action in Megacities 3.0^{vii} revealed that, following the lead of Latin American cities like Curitiba and Bogotá, 42 C40 cities now have or are planning to develop BRT systems; over half of these are in the northern hemisphere. This analysis supports the scaling up of BRT systems across the globe, in addition to offering recommendations for policymakers, technical experts, and financing bodies to maximize the benefits of BRT.

2.2 What constitutes good BRT system design?

The Institute for Transportation & Development Policy (ITDP)^{viii}, a key C40 partner, has identified a number of crucial design elements that are associated with high-performing BRT systems. As such, when cities wish to implement BRT systems, these elements should be assessed and included in order to deliver systems that maximize the benefits of Bus Rapid Transit. The ITDP standards can be found at:

<https://www.itdp.org/library/standards-and-guides/the-bus-rapid-transit-standard/the-scorecard/>

A basic set of general principles to follow in order to develop a good BRT system and reduce GHG emissions has also been identified within the C40 BRT Network:

- Develop a greater degree of integration between spatial and transport planning to encourage compact development patterns, to reduce car use and promote more sustainable travel patterns;
- Ensure improved alternatives to the use of private car are provided, including more sustainable, higher occupancy modes of transport (e.g. mass transit/public transport and non-motorised transport modes); and
- Establish better management of road space and the transport demand (e.g. via parking policy, congestion pricing, incentives, raising awareness of sustainable forms of travel).

In accordance with the ITDP standards and accepted best practices, the BRT system should include the following key basic elements, to be considered early in the planning process:

Dedicated right-of-way: A dedicated right-of-way is vital to ensuring that buses can move quickly, and are unimpeded by congestion. Physical design is critical to the self-enforcement of the right-of-way. Dedicated lanes matter the most in heavily congested areas where it is harder to ensure buses provide a strong alternative to private cars. In these areas, it becomes even more important to take a lane away from mixed traffic to dedicate it as a busway.

Busway alignment: The busway is best located where conflicts with other traffic can be minimized, especially from turning movements from mixed-traffic lanes. In most cases, a busway in the central verge of a roadway encounters fewer conflicts with turning vehicles than those closer to the curb, due to alleys, parking lots, etc.

Off-board fare collection: Off-board fare collection is one the most important factors in reducing travel time and improving the customer experience. There are presently two basic approaches to off-board fare collection: “turnstile-controlled”, where passengers pass through a gate, turnstile, or checkpoint upon entering the station, where their ticket is verified or fare is deducted, and “proof-of-payment”, where passengers pay at a kiosk and collect a paper ticket that is then checked on board the vehicle by an inspector.

Intersection treatments: There are several ways to increase bus speeds at intersections, all of which are aimed at increasing the green-signal time for the bus lane. Forbidding turns across the bus lane and minimizing the number of traffic-signal phases are the most important.

Platform-level boarding: Having the bus-station platform level with the bus floor facilitates universal access, and is one of the most important ways of reducing boarding and alighting times per passenger. Passengers climbing even relatively minor steps can mean significant delay, particularly for the elderly, disabled, or people with suitcases or strollers.

Other elements to consider: Operating multiple routes along a corridor; operating express BRT services along with local services; operating a central control centre; introducing passing lanes at stations; switching to low emission vehicles; setting stations back from junctions to avoid delays; building safe and comfortable stations with a minimum width of 3m; having multiple doors on buses; using unique BRT branding; providing access for those with mobility needs; integrating the BRT with other forms of public transport; and ensuring a good pedestrian access to and from the BRT.

Whilst cities should aspire to delivering a gold standard BRT scheme, it is accepted that local conditions may prevent the integration of all the elements listed above. However, the more these elements are included within a BRT scheme, the more likely the BRT is to deliver the wide assortment of benefits listed below.

2.3 Benefits of BRT

Research from EMBARQ, *Social, Environmental and Economic Impacts of Bus Rapid Transit Systems* (2013),^{ix} examined global evidence as well as four in-depth case studies of BRT systems in Bogotá, Colombia; Mexico City, Mexico; Johannesburg, South Africa; and Istanbul, Turkey. It concluded that BRT improves quality of urban life in at least four key ways, to which a fifth one has been added:

Travel-time savings: Dedicated bus lanes that separate BRT buses from mixed traffic, pre-paid boarding and level platforms speed up passenger boarding, whilst traffic signal management prioritizes BRT buses. High-frequency bus service also minimizes waiting times to help save travel time for passengers. These features have a significant positive impact in cities where BRT systems operate.

In Johannesburg, BRT users save an average of 13 minutes each way during their daily commutes. In Istanbul, the savings are even greater – the typical Metrobüs passenger saves 52 minutes per day. The TransOeste BRT corridor in Rio de Janeiro has reduced inner city trips from one hour and 40 minutes to 45 minutes^x. With the ‘9 de Julio’ corridor in Buenos Aires, travel time was reduced from 55 minutes to less than 20.^{xi} Mexico City stands to save US\$141 million in regained economic productivity as a result of travel time reductions from Metrobús Line 3.

GHG and local air pollutant emissions reductions: BRT reduces the overall amount of vehicle kilometres travelled (VKT) in a city by shifting commuters to high-capacity buses that can carry up to 160 passengers at a time. Setting up a new BRT system also provides cities with an opportunity to scrap older, more polluting traditional vehicles. The incorporation of modern fuel efficiency technologies into BRT buses and better driver training contributes to lower fuel consumption and emissions. Introducing a new BRT corridor therefore has major implications not just for GHG emissions, but also for air pollution. Around the world, urban buses account for 25% of black carbon emissions from all passenger and commercial goods transport vehicles in 2015.^{xii} Cleaner vehicle technologies and fuels lower the concentration of ambient air pollution and reduce the time passengers are exposed to air pollution at stations or inside the buses.

For example, Metrobús Line 3 in Mexico City is poised to eliminate more than 2,000 days of lost work due to illness, four new cases of chronic bronchitis, and two deaths per year, saving the city an estimated US\$ 4.5 million. In Buenos Aires, the target is to have four additional BRT corridors in 2015, reaching 1.2 million passengers every day over a distance of 56 kilometres, with a reduction of 49,000 tons of CO₂e per year. In Johannesburg, the city aims to move 200,000 passengers per average weekday on the Rea Vaya BRT system by 2018 and is working to ensure that the BRT buses will be low carbon emitters, reducing carbon emissions by 1.6 million tons by 2020.

Traffic safety improvements: Implementing BRT systems contributes to reductions in traffic accidents and fatalities in several key ways. First, an overall reduction in VKT results in fewer drivers on the road and a safer transport environment for drivers, pedestrians, and cyclists alike. Second, dedicated bus lanes reduce interaction between buses and other vehicles, minimizing the risk of accidents. Finally, BRT can change bus drivers’ behaviour by reducing on-the-road competition with other vehicles and providing opportunities to improve driver training.

The case of Latin America showcases BRT's safety benefits: streets with BRT systems experienced a 40% reduction in fatalities and injuries on average. Further evidence suggests that BRT and other forms of sustainable transport are under-acknowledged components of traffic safety planning, with an enormous potential to reduce traffic crashes and save lives.

Increased physical activity: BRT systems also increase physical activity for passengers, thanks to the spacing of BRT terminals, which tend to require longer walking distances than private vehicles and other motorized modes of transport. Despite the distance, shorter overall travel times make BRT worth the walk, with passengers across the world consistently moving through the city faster, even with more time spent getting to the bus terminals. Mexico City's Metrobús passengers walk an average of 2.75 minutes more per day than before the city implemented its BRT system. Users of Beijing's BRT system have added 8.5 minutes of daily walking as a result of the BRT.

Meeting other social aims: BRT projects often have a strong social component, and can enable a city to deliver on its social justice and empowerment objective. For example, Johannesburg is working to empower marginalised groups, and the BRT is supporting this objective – as the largest proportion of BRT users in Johannesburg are low and middle-income groups. By 2020, the city aims to set up at least three bus operating companies that are majority-owned by previously disadvantaged public transport operators.

These findings are supported by multiple case studies and examples emerging from across C40 cities, referenced in Section 3 below.

3 GOOD PRACTICE APPROACHES FOR DELIVERING A SUCCESSFUL BRT

3.1 Categories of best practice

Within the BRT Network, there are a number of different strategies that cities are pursuing to achieve their desired outcomes. Which type of approach a city chooses to deploy to reach its goal depends on:

- Powers that the city Mayor has over transport versus the state or national governments
- The legislative context at a regional and national level
- The asset ownership structure, i.e. who owns buses, stations and other infrastructure
- Relationships with bus operators and other agencies
- Citizen engagement and buy-in
- Availability of project financing

In order to address these issues, and deliver a strong BRT system, a few key best practice approaches that C40 cities have highlighted include:

- **Adopt holistic planning for a high-capacity BRT corridor**
- **Develop benchmarking and measure the impacts of BRT**
- **Focus on strong stakeholder engagement and communications**
- **Integrate BRT with other means of public transport and urban planning**
- **Utilise innovative financing mechanisms**

We have identified the following case studies, which sit in each of these categories and demonstrate best practice for cities in the C40 BRT Network.

3.2 Adopt holistic planning for a high-capacity BRT corridor

Holistic planning for a BRT corridor aims to ensure that two main characteristics of a successful BRT are achieved. First, the corridor is well-designed, and that elements such as dedicated right-of-way, bus way alignment, off-board fare collection, intersection treatments, and platform-level boarding are collectively considered and built into the design of a new system or corridor. Second, the corridor is well integrated, and is ideally linked to high-density areas, promotes seamless transfers between modes, provides pedestrian access, secure bicycle parking, bicycle lanes and bicycle-sharing integration, allowing it to attract and retain a variety of transport users and expand the catchment area of the BRT.

Holistic planning ensures that a BRT system is both well designed and well connected, and is able to function as the centre-piece of a multi-modal transport network. This is crucial to deliver a system that is high capacity and is convenient for people to use, enabling the maximum shift out of private vehicles, thus reducing carbon emissions and ultimately benefiting the highest number of people in a city.



Transit and Climate Adaptation = Transit and Equity

By [Diane Jones Allen](#)

Diane Jones Allen, D. Eng, ASLA, PLA is the Program Director of Landscape Architecture, and Associate Professor at the College of Architecture, Planning and Public Affairs at The University of Texas at Arlington.

Dec 4, 2018



Transportation infrastructure is a significant part of the landscape and shapes human settlement. Transportation is about place, shaping place, and getting from one place to another. Climate adaptation is also about place, and how populations deal with the extreme weather events that occur in particular geographies or places. When the place in which one resides not only lacks the necessary resources, but also lacks the

transportation systems that allow access to resources in other areas and the ability to escape disaster or its aftermath, it renders its inhabitants without transportation vulnerable. As Robert Bullard states in the book *Race, Place and Environmental Justice after Hurricane Katrina*, "When a location lacks access to technology, communication, and transportation, and when the residents of that location lack financial means to overcome these issues, this also renders the location geographically vulnerable." Dr. Bullard is speaking, in this instance, about the thousands of residents who had no means to get out of the City of New Orleans during Katrina, due to the lack of affordable and available transportation. His statement speaks to the reality of many residents who are spatially segregated in Transit Desert communities and suffer place based environmental and transit vulnerability.

Transit Deserts are about place, access, and equity. They are characterized by transit dependent populations, lack of transit access and a particular geographic or physical form. Most urban dwellers assume the availability of transit, not thinking of those in the outer urban neighborhoods, ring suburbs, low lying geographies or other areas of the city that lack efficient public transportation access. Although a substantial number of people in urban areas own a vehicle (Bullard and Wright, 2009), there are also additional forms of public transportation including taxi cabs, ride sharing services, subways, light rail, or other forms of mass transit available in most inner urban areas. These additional forms of transportation are often in the urban core, or are regulated to particular corridors and routes, yet there are many urban, outer urban, and suburban

areas where public transportation is not frequent, easily accessible or even nonexistent, making them vulnerable.

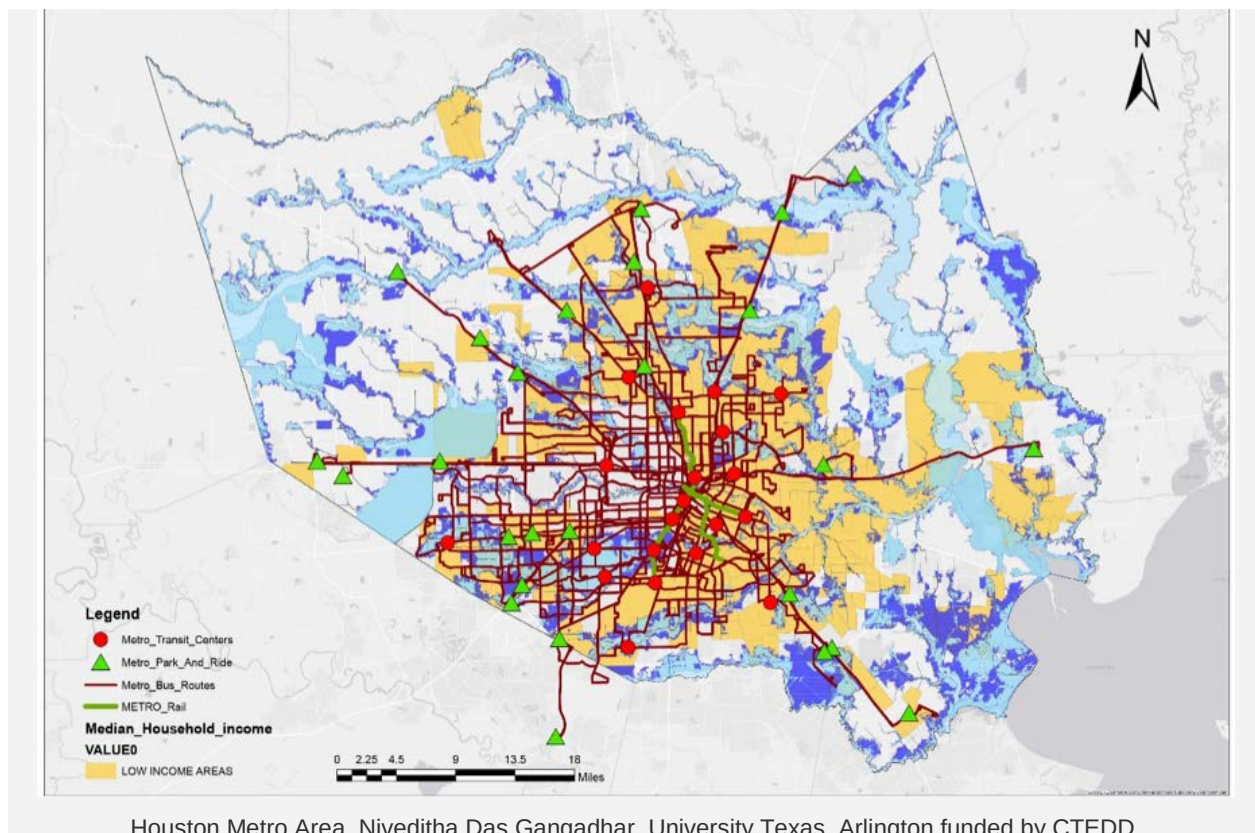
Extreme weather events have severe impacts on vulnerable communities and their transportation infrastructure. In many cases evacuation out of flooded areas is difficult due to lack of adequate transportation infrastructure. Access to transportation is critical or lifesaving before, during and after extreme weather events. Before Hurricane Katrina many people opted to stay, even though a mandatory evacuation was issued. Some of these people remained due to a lack of transportation needed for evacuation. Had there been public transportation linking to train, air and other major routes out of the city, some of those who remained behind may have left even before the evacuation became mandatory. Existing public transit can come to a halt during a storm event, but because areas with existing transit have a form conducive to routing, vehicle access and picking up passengers, these areas can accommodate emergency buses and other forms of transportation much easier during storm events. Transit access is also important for low income families whose cars get damaged during an extreme weather events, and who cannot afford to immediately replace them. This causes difficulty at the time of recovery, and for everyday commuting to reach various services in everyday life.

Communities without transit accessible form, therefore not physically suited to buses and public transportation vehicles, will have difficulty accommodating such modes when needed during emergencies. For communities such as these, a vulnerability assessment should be undertaken.

A vulnerability assessment can be undertaken by combining storm surge and extreme rainfall projections with transit availability characteristics to assess geographic vulnerability in regards to transit access and equity. During floods, in particular geographies, there is no means of evacuation, due to the lack of affordable and available transportation. Thus, there is an urgent need to evaluate the vulnerability of transportation infrastructure and mass transit in relationship to climate change and extreme weather events. For this purpose the following data should be mapped:

- Storm surge and extreme rainfall projections
- Demographic data, including income levels, and vehicle ownership
- Geographic data
- Transit access data, including routes, and stop locations.

The importance of this assessment is to provide information and data that can be used in creating effective policy that impacts transit access for those that are vulnerable during storm events.



Climate change is most evidenced in extreme weather events, and vulnerable communities are most impacted, often due to lack to transportation. Therefore, to address climate adaptation one of the key components is to address transportation equity. Those in vulnerable communities must have additional measures taken to provide equal opportunities for climate adaptation.

The following recommendations come from the American Society Louisiana of Landscape Architecture (ASLA) Blue Ribbon Panel on Climate Change and Resiliency Report and the Transportation Sustainability Guide. These recommendations address policy and planning to address transportation.

- Require transit-oriented development, including affordable housing, with multimodal green and complete streets.
- Provide equitable access to transportation options, including safe, connected pedestrian, bicycle, and transit routes.
- Anticipate, plan, and provide infrastructure to support electric vehicles and new transportation methods and technologies.
- Apply technologies and design strategies to achieve net-zero
- Promote regional transportation planning and development.

The next list of recommendations are also from the ASLA Blue Ribbon Panel on Climate Change and Resiliency Report to address climate adaption and equity for vulnerable communities.

- Assess and address climate impacts on vulnerable communities.
- Focus on environmental justice and equitable access to transportation, housing, jobs, and recreation and open space.
- Develop relocation, retreat, and/or evacuation plans.
- Limit, adapt, or prohibit building in floodplains to protect life, property, and floodplain function.
- Update Federal Emergency Management Agency flood maps and include projections of climate change impacts.
- Promote mixed-income housing and mixed-use development that provides easy access to essential services.
- Establish/increase low-income and new market tax credits.

Priority should be given to policies that address transit access before during and after catastrophic weather events. Access to mass transit will help in the time of evacuation, during the event for emergency purposes and after the event for quick recovery. Priority should be given to build transportation infrastructure in areas with reoccurring flooding making it easier for the people to evacuate. This will only occur and truly be affective if we address equity. To address equity, a transfer of knowledge should occur. This should include:

- Increasing public awareness of storm-water management impacts,
- Providing community residents with information on homeowner resources related to resilience and hazard mitigation in general
- Providing information regarding the communities' geographic vulnerability
- Providing knowledge of transit routes and access.

Finding Climate Justice in the Fight for Transit Equity

by Jonathan Ostar on February 25, 2015

Young people in Oregon care about the environment, and are concerned about their future. But most youth, particularly youth of color and youth from low-income families, are not inspired by the mainstream approach to environmental conservation and carbon reduction. The urgency of the moment is being washed away by the daily struggle to maintain, let alone aspire and advance.

Public transportation is a lifeline to opportunity for many youth in Oregon. Transportation is also the primary source of carbon emissions in the state. The future of our climate movement will depend on cultivating the next generation of transit riders. Youth are making their priorities known. Now it's up to us to recognize and seize this opportunity for transformative change.

Victories to build on



In February of 2011, OPAL Environmental Justice Oregon (OPAL) and Bus Riders Unite! (BRU) launched the [Campaign for a Fair Transfer](#), an effort to increase the time-based fare for cash and single-ticket riders.

OPAL builds power for environmental justice and civil rights in our communities by organizing low-income communities and people of color to achieve a safe and healthy environment where we live, work, play and pray. BRU is a movement by and for transit riders to achieve a more equitable transportation system and hold TriMet accountable to the needs of their most loyal customers. With leadership from transit-dependent riders and a commitment to ensuring access to service and decision-making, BRU adheres to

longstanding Civil Rights and environmental justice principles.

After nearly four hard-fought years, [transit justice advocates and leaders](#) finally secured the TriMet board's support in late 2014 to increase the time-based fare by 30 minutes, effective [March 1, 2015](#).

The Campaign for a Fair Transfer has been a catalyst for several other critical victories along the way:

- A \$1.3M mitigation fund for low-income riders;
- A reduction in youth fares and preservation of the existing YouthPass program;
- Improved bus stops in East Portland and NE Cully;
- Ensuring greater transparency within TriMet's budget process

Lesson for the climate movement: everyone needs to win



The Campaign for a Fair Transfer was a priority for low-income riders, who comprise a majority of cash/ticket riders and were feeling squeezed by unprecedented fare hikes and successive service cuts. An extra thirty minutes goes a long way. Low-income riders, especially “trip-chaining” riders (predominantly women, immigrants, caretakers) using transit to take care of every day needs, will clearly benefit from more time. But it's the potential to attract more "choice riders" that makes transit justice even more transformative and critical to our future climate health.

People with options will [take advantage of the extra time too](#). Minneapolis/St. Paul saw a 9% boost in transit ridership when they extended to 2.5 hours, and there's no reason to think that folks in our metro region won't take advantage too, boosting TriMet ridership, increasing firebox revenue, decreasing vehicle-miles traveled and carbon emissions in the process. TriMet is listening, but increased ridership, especially for short trips that can be completed in under three hours, is the best kind of reinforcement.

The lesson here is that what is good for equity is often what's good for the climate and for everyone. Equity really is a superior growth model, precisely because it's inclusive, with less externalized costs. The key to shifting normative behavior and lasting progress on climate change lies in a more just society, and Bus Riders Unite are leading the charge.

Golden opportunity with YouthPass program

Fortunately there are plenty more creative, equitable strategies within reach. Increased performance efficiency for the bus system (think bus jump lanes and signal prioritization), is key. Keeping prices down and service up, especially on evenings and weekends, is also key. But perhaps the best opportunity we can jump on is to work with emerging youth leadership around a regional YouthPass program that can serve as a model for the rest of the state (and country).

By providing free transit passes and ensuring robust service in and around high schools, we will increase youth access to opportunity, reach diverse working families across the state, save tens of millions in education funding as we shift away from yellow bus service, and activate thousands more choice riders who will take advantage of service enhancements, increasing overall ridership.

And if we're successful, we will have mobilized a new generation of transit riders for future leadership on environmental and climate justice in Oregon. Transportation accounts for 40% of all carbon emissions in the state. There is simply no climate solution without real investments in public transit. We can find this sweet spot and develop a truly broad and diverse movement by serving those most vulnerable to climate impacts while also providing carbon-reducing incentives for everyone. [Let's get behind HB 2979, the Youth Transit Initiative](#), and start building toward our shared goals.



Jonathan Ostar

Executive Director, OPAL

Jon has worked on environmental justice issues since arriving in Portland in 2000 to attend Lewis and Clark Law School. While a law student, Jon worked as an organizer under Jeri Sundvall-Williams for the N/NE Portland community-based Environmental Justice Action Group, where he met OPAL co-founder Kevin Odell. Jon worked as a civil rights and employment discrimination attorney for five years before leaving private practice to help build OPAL, becoming Co-Director in January 2010, and Executive Director in January 2012. Jon continues to practice law, advocating on behalf of disenfranchised communities and developing state environmental justice law and policy, and is currently an Adjunct Professor at both Lewis and Clark Law School and Willamette University College of Law, specializing in Environmental Justice, Sustainability and Civil Rights Law and Policy.

Implementing Accessible Low Carbon Transit

Partners for Places and Peer Learning Exchange scale equitable and healthy transportation options

Developing geographical information systems, complete streets planning, trail network implementation, and EV preparations: all in a day's work for USDN and Partners for Places Grantees.

Climate Planning GIS in New Orleans LA

New Orleans understands the impacts of climate change. It is a place known for history, culture, food, and hurricanes. After Hurricane Katrina hit in 2005, the New Orleans committed to plan for a [Resilient New Orleans](#) and to reduce economic and social disparities that make so many of their neighborhoods vulnerable. New Orleans now has a new continually developing [GIS tool](#) to help the city plan for climate change, thanks to a recent Partners for Places award.



Figure 1: The Trust for Public Land

New Orleans, the Greater New Orleans Foundation, and the Trust for Public Land worked together to develop and launch the tool. It is designed to collect environmental, social, and health outcome data within the City of New Orleans to plan for a climate-resilient future. This data can be used for a variety of purposes. For instance, one can use it to map and plan for carbon-free trails and transit lines that connect residents to essential services, destinations, and each other. It is used to inform the City and developers on how, where, and when to incorporate sustainable infrastructure to increase equitable

livability in the face of a changing climate.

Complete Street Planning in Northampton MA

Partners for Places also supported the City of Northampton MA and Community Foundation of Western MA to reduce GHG emissions and enhance equity by creating a detailed bicycle and pedestrian [Complete Streets plan](#). The 10-year plan details where the city and its collaborators will build trails, sidewalks, and complete streets infrastructure. During this process, disenfranchised residents collaborated with city government and community-based organizations. As a result, the plan is being implemented in their neighborhoods with their support.

Active Transportation for Better Public Health in Tacoma WA

The Russell Family Foundation and the City of Tacoma used a Partners for Places match to improve the health of the Puyallup River watershed and to strengthen the communities with in it. They developed a system of trails, sidewalks, bike lanes and boulevards, local and regional pathways, and public transportation connecting all of the Puyallup River Watershed's communities, parks, schools, cultural sites, business districts, and residential centers. They combined development and maintenance of this system with education and outreach to strengthen community involvement.



Figure 2: PCC Farmland Trust

Implementing Accessible Low Carbon Transit

Peer Learning Bike Share Exchange

USDN's Peer Learning Exchange gathered Sustainability Directors and relevant staff from four small cities: Dearborn MI, Evanston IN, Fayetteville AR, and Northampton MA. These cities wanted to implement bike share programs. Together, they evaluated, explored, and discussed examples of working bike share programs in small cities. The Bike Share Peer Exchange spanned three days, and included explorations into:

- Funding opportunities
- Partnership opportunities
- Building the case for bike share
- Evanston's bike share expansion details
- Divvy bike share system (North Chicago) and the B-Cycle bike share system
- Equity Considerations
- Bike share technology, equipment, and operational models

Participants left with takeaways by topic, returning to their cities better equipped to consider their implementation strategies in each unique urban setting.



*Figure 3: Catherine Hurley
Presentation to Council*

West Coast Electric Vehicle Exchange



Figure 4: Seattle News

Another set of peers gathered to explore the role of government in accelerating electric vehicle (EV) charging infrastructure. Five core USDN member cities presented on the existing nature of EV charging in their cities, and the group dove deep into the challenges and opportunities inherent in this type of infrastructure.

One city learned that as they move forward with EV and EVSE deployments, they need to design programs that help meet vehicle electrification goals while not cannibalizing mode-shift efforts. They decided to embed more all-encompassing transit policies into their decision-making structures as a result. Another city learned that working collaboratively in person for a few hours can sometimes accomplish much more than weeks or months of back and forth with drafts and phone calls.

Two cities (Vancouver and Portland) released an EV strategy following this convening. This meeting in Seattle highlighted the most immediate items cities can work on together, to make sure urban areas are ready to lead the transition of the transportation sector from oil to electricity.



Safe streets are the best tool we have to combat climate change

And we need to act now

By **Alissa Walker**

Oct 10, 2018, 12:34pm EDT

In the 1960s, about half of American kids walked or biked to school. Now it's 13 percent.



Courtesy of the City of Los Angeles

Started in 1997, International Walk to School Day now counts tens of thousands of students in 40 countries—including students at **5,100 schools in the U.S. alone**—who pledge to walk and bike to school on the same day each year. Walk to School Day also brings attention to the dismal conditions under which many students must walk and bike to school every day.

That is, if their parents even allow them to walk or bike. Where I live, in Los Angeles, it's not hard to understand why **most parents don't**. Here, on **streets designed for the fast movement of cars**, traffic crashes are the leading cause of death for kids aged 4 to 15.

At least once a month when I'm talking to fellow parents, I hear a different version of the same sentiment: "I have to drive my kids to school—it's too dangerous for them to walk."

Reverting to cars for **short trips** like the journey to school is one reason that **transportation emissions keep going up** in the U.S.—a third of our vehicular trips are three miles or less. Yet you can see the evidence that people *want* to walk and bike on virtually any weekend in the U.S. People of all ages move through our cities during **open streets events**—in LA's case, its over 100,000 people per event. But the reason those people aren't traveling on foot or bike along the same streets to school or work on Monday? **They don't feel safe.**

The **new reality of our climate crisis** has been outlined in stark detail by a devastating United Nation report published this week; it's clear that unsafe pedestrian and biking conditions in our cities could end up making climate change much, much worse.



Over the past year, more than **400 U.S. mayors**—they call themselves the “**climate mayors**”—have **pledged to reduce emissions**. Yet only about 100 U.S. mayors have **pledged to reduce traffic deaths**.

I find it astounding, actually, that 400 mayors have so confidently signed on to hit these ambitious emissions targets, something for which cities have no real historical precedent, while fewer mayors will

commit to designing safer streets—something we know **exactly how to do** and can see **demonstrated in cities all over the world**.

Yet the most effective solutions for reducing traffic deaths—**walk-first planning, complete streets**—are also essential tools for reducing emissions.

In 2015, a **major study** by the University of California at Davis and the Institute for Transportation and Development Policy looked at how something as simple as a global increase in people biking could impact emissions. Around the world, about 6 percent of urban trips are taken by bike—a percentage that is **far lower in most U.S. cities**. Increasing that figure to 15 percent worldwide by 2050 could slash global emissions, reads the report. “Including the impact from increased public transport use, this figure could be cut in half.”

The most effective solutions for reducing traffic deaths—**walk-first planning, complete streets**—are also essential tools for reducing emissions.

It’s a fairly obvious, localized solution—along with their emissions goals, mayors could easily set goals to double the number of people biking and walking. But **this week’s report** calls for an accelerated timeline—not by 2050, but by 2020. Cities could meet this deadline by helping more kids walk and bike to school safely.

Since 1969, the number of American kids walking to school has fallen from 48 percent to just 13 percent, according to a 2017 **Safe Routes to School study**. This is due to a variety of factors, including the fact that students are **more likely now than they were a decade ago to attend schools** that are not within walking distance of their homes. But 31 percent of U.S. students in kindergarten through eighth grade still live **within one mile of their school**. Only a third of those students currently walk or bike.

Increased walking, biking, and transit are all listed in the recommendations of the **1,000-page UN report**, but “Equal Safe Access to Educational Institutions” is specifically listed as a particularly low-risk/high-reward climate action. “Collaborative efforts need to address safety issues from a dual perspective,” the report says. “First by working to change the existing infrastructure and use of roads to better address the traffic problems that children

currently face walking to school, and then to better site schools and better control the roadways and land uses around them in the future.”

These changes would be transformative, not just for kids and families, but also for people with disabilities and our swiftly growing population of older adults.

Making streets safe enough for all kids to walk and bike to school is something we can do today. **Safe Routes to School** is a national nonprofit with chapters across the country and a **state-by-state report** that provides a roadmap for the improvements that need to be made. These advocates have intimate knowledge of the challenges that kids face in the communities they serve and could advise cities on what changes should be made first.

It would be relatively inexpensive for the climate mayors in those 400 cities to start cordoning off sections of streets around schools with **trees, bollards, and colorful paint** as part of a protected, connected network of safe routes to school.

Cities might turn schools into mobility hubs, with bike share (including **bike share for kids!**), **scooter share**, and other **electric vehicle share**, so parents can drop off their kids and switch to other car-free modes to get to work.

Infrastructural investments could **prioritize dedicated bus lanes** and install **shelters at every bus stop** so those who needed to travel further distances could get to school comfortably and fast.

These changes would be transformative, not just for kids and families, but also for people with disabilities and our swiftly growing population of older adults.

What we choose to do in the **next 15 months** will determine the path we set for our children. Do I want to tell my kids that their neighbors opted to **preserve parking** over their well-being? Do I want to tell my kids that their parents chose the **convenience of an SUV** over their shot at a future?

For city leaders, I ask you: If you claim you are taking climate action to prevent needless deaths, widespread poverty, and human suffering decades from now, it’s inevitable that at some point you will need to take dramatic steps to make more room for zero-emission transportation modes. So why wouldn’t you deploy those same changes immediately, which would start to save lives, create equity, and improve public health within a year?

Call them school zones. Call them zero-emission zones. Call them family zones. Call them green zones. Call them future zones. The challenge to eliminate emissions and eliminate traffic deaths in our cities is now the exact same challenge, and it really doesn't matter what we call it—as long as we do it fast.

Seattle Department of Transportation

NEW MOBILITY PLAYBOOK



Version 1.0

September 2017



Seattle
Department of
Transportation

NEW MOBILITY TRENDS



Information is the new infrastructure.

We tend to think about the transportation system as a set of physical infrastructure—roads, bridges, sidewalks, traffic lights—along with the vehicles that

use the infrastructure. But increasingly the infrastructure is becoming virtual—it's the sensors and control systems that we use to manage flow and movement and the data we collect and use to improve our travel options.

The new information infrastructure includes bike and pedestrian counters, the traffic signal controls that sense and smooth out traffic flow, and the systems that tell us if our bus or train is running on time. It's the internet-connected sensors that track vehicle speed and driver behavior and the ride-hailing apps that track our routes to determine the fare.

The flow of data will only increase as Seattleites continue to navigate the city in new ways. All that data (and the data about the data) will give us a valuable, up-to-the-minute, understanding of how people are getting around Seattle—and how we can improve the experience of getting around. To make the most of the data, we need to invest in information infrastructure: the systems to store and analyze the data, and the people to manage the systems and interpret the findings.



People will share mobility. Whether taking public transit, hailing a ride, or using a car share vehicle, more and more people are choosing

shared mobility services to get around the city. Shared mobility—the services that allow temporary use of a shared vehicle, usually for a fee—allows Seattleites to get a ride or borrow a vehicle at their convenience. Shared mobility includes public and private transportation services that fit varied needs: from a pickup truck to haul furniture to a ridehail limo for a fancy date to the public bus to get to work.

Because shared mobility services require fewer vehicles but serve more trips, they have the potential to reduce the number of vehicles on the road, reduce traffic congestion, and decrease the need to dedicate valuable space to parking.



Clean energy will power transportation.

Transportation pollution is responsible for over two-thirds of

Seattle's carbon footprint, but clean hydroelectric power fuels our electrical grid, and electric vehicle technology continues to improve. New research by Bloomberg New Energy Finance forecasts that electric vehicles could take up 35% of new light duty vehicle sales by 2040.⁶

This creates ideal conditions to electrify the local transportation system. The City's Drive Clean Seattle initiative aims to transition our transportation sector from polluting fossil fuels to clean, carbon-neutral electricity by purchasing and promoting electric vehicles and adding infrastructure to make it easier for Seattleites to go electric.



Automakers are shifting to shared, electric, connected, and automated.

A recent McKinsey & Company report predicted that new mobility services could drive down the volume of car

sales by more than 30% by 2030.⁷ Automakers are adapting to this shift in consumer needs and demands by developing new technologies and positioning themselves as mobility service providers. Automakers and technology firms have invested billions of dollars in the research, development, and deployment of automated vehicles and connected vehicle technology.

While demand for car ownership will likely continue well into the future, the automakers' pivot toward automated vehicle production and shared fleet services will create new mobility options, revenue models, and partnership opportunities.

⁶*New Energy Outlook*. Bloomberg New Energy Finance, 2016.

⁷"How shared mobility will change the automotive industry," McKinsey & Company Automotive & Assembly, April 2017.

THE RAPIDLY CHANGING WORLD OF URBAN TRANSPORTATION

Jan 2007: Apple unveils the iPhone, begins the marketplace for phone apps

Oct 2007: Boston-based Zipcar buys out Seattle based Flexcar, merging the largest car share companies

Dec 2007: South Lake Union streetcar line begins service

Dec 2008: Hertz launches Hertz on Demand to compete with Zipcar

Sept 2008: Google and T-Mobile unveil the first Android device

Dec 2012: Seattle begins its free-floating car share program

Apr 2013: Avis buys Zipcar for \$500 million

Oct 2014: Pronto Cycle Share begins operations

Dec 2014: Google unveils first complete version of its self-driving car

Oct 2015: Amazon launches Amazon Flex, the "Uber" of package delivery

Dec 2015: Uber tests UberHop carpooling service in Seattle

2016: 30% of downtown Seattle commuters drive alone to work

Jan 2016: California authorizes a pilot project to test AVs "not equipped with steering wheels, brake pedals, accelerators, or operators inside"

Apr 2016: BMW launches ReachNow free-floating car sharing service in Seattle

Sep 2016: Ford Motors buys Chariot, a San Francisco-based microtransit startup

Nov 2016: Puget Sound region voters approve the Sound Transit 3 (ST3) ballot measure, a 25-year regional transit expansion program

Dec 2016: Michigan enacts the first statewide AV regulations

Jan 2017: ReachNow begins beta-testing its ride-hailing service in Seattle

Mar 2017: Virginia become first states to legalize robotic door-to-door deliveries

Apr 2017: Marble and Yelp24 introduce automated robot food deliveries

Apr 2017: Citymapper tests "pop-up, tech-enabled" bus routes with Transport for London

Apr 2017: After failing to get new investments, Bridj closes shop

May 2017: San Francisco proposes to ban robotic delivery vehicles on sidewalks

Jul 2017: Seattle begins permit program allowing electric vehicle charging in the public right of way

- **New mobility service or technology**
- **Key SDOT milestone**

Jul 2009: Central Link light rail opens

May 2010: Uber rolls out beta service in San Francisco (full service launches in 2011)

2010: Some 35% of downtown Seattle commuters drive alone to work

2010: Seattle removes all single-space meters and uses only credit card solar multi-space parking technology

Jun 2012: Zimride, a long-distance ride sharing company launches Lyft to compete with Uber

Dec 2012: Daimler launches Car2Go free-floating car sharing service in Seattle

2013: SDOT launches mobile payment for on-street parking

Jun 2014: Bridj launches microtransit service in Boston

Jul 2014: Seattle City Council votes to legalize the operations of Transportation Network Companies (TNCs) like Uber and Lyft

Nov 2014: Seattle voters approve the Seattle Transportation Benefit District (Proposition 1), a \$45 million annual increase in Metro bus service

Jan 2015: Uber hits 1 million daily rides with 160,000 drivers in the U.S.

March 2015: Leap Transit begins operating private transit service in San Francisco

July 2015: Leap Transit files for Chapter 7 bankruptcy and ends operations

Aug 2015: Amazon launches PrimeNow one-hour delivery in Seattle

2015: SDOT makes all parking transactions and other parking APIs available on data.seattle.gov

Nov 2015: Seattle voters approve the 9-year, \$930 million Levy to Move Seattle to implement Move Seattle:10-Year Strategic Vision for Transportation

Jan 2016: First Hill streetcar line begins service

Mar 2016: Link light rail extends to University of Washington through Capitol Hill

Aug 2016: Uber ends UberHop

Oct 2016: Lyft hits 3 million monthly riders, with 315,000 drivers worldwide

Dec 2016: Alphabet's (Google) Waymo unit debuts self-driving trucks

Mar 2017: Pronto Cycle Share ends operations

Mar 2017: Amazon tests delivery by drones

Jul 2017: Seattle begins free-floating private bike share program

PRINCIPLES FOR NEW MOBILITY

As new mobility presents both upsides and downsides, we must guide our actions with clear principles. These principles reflect our city and regional values,¹⁸ aligning the opportunities presented by innovative mobility services with our commitment to serving the public good. Our approach to mobility innovations and shared transportation in Seattle will be driven by the following:

Put People and Safety First	The public right-of-way is our most valuable and most flexible public space. Our streets should prioritize access for people, amplifying the role and value of walking, biking, and transit in Seattle. We respect the desire to retain and use privately owned vehicles but will continue to manage the transportation system to move people and goods safely and efficiently. Safety is paramount, no matter how you get around Seattle. Our streets should be comfortable and intuitive for our most vulnerable travelers (people walking and biking). Shared, automated, and other new mobility models should not only advance our Vision Zero safety goals, they should also maintain consumer protections.
Design for Customer Dignity and Happiness	Transportation happiness is a key indicator of the 21st century Seattle Department of Transportation. We will not only simplify and enhance the user experience of public transit and new mobility services, we will also continue to promote a diversity of transportation choices. Dignified public transit and new mobility services must accommodate people with mobility impairments, non-traditional schedules, and families that need flexible mobility options.
Advance Race and Social Justice	Mobility, whether shared, public, private, or automated, is a fundamental human need. Everyone needs a barrier-free transportation system and affordable transportation options that are understandable and accessible to all who want to use them. New mobility models should also promote clean transportation and roll back systemic racial and social injustices borne by the transportation system.
Forge a Clean Mobility Future	We are committed to climate action. We will transition our transportation sector to one that furthers our climate goals and builds replicable models for the rest of the world. New mobility services should use clean energy and expand human-powered transportation.
Keep an Even Playing Field	Data infrastructure is foundational to understanding, operating, and planning in a constantly changing transportation system. Partnerships and a fair and flexible regulatory environment will nurture and expand new mobility ideas, companies, jobs, and workforce training.

¹⁸We collaborated with King County Metro on these Principles for New Mobility.

PLAY 1:

Ensure new mobility delivers a fair and just transportation system for all



IF WE LEAVE IT TO CHANCE...

There are more transportation choices, but only for those who can afford it. New mobility innovations cannibalize resources and erode support for public transportation. Workers are vulnerable to disruptions. The city becomes disconnected.

IF WE SHAPE IT...

More affordable and better integrated transportation choices make the city and the region more accessible to people with disabilities and the disadvantaged. Public transit flourishes. The transportation workforce earns a living wage and is resilient to disruptions.

We must ensure that shared mobility services provide dignified, reliable, and affordable transportation options that are accessible to all. We will make targeted investments and broker partnerships to integrate new technology and ensure seamless connections to and between shared mobility modes. New services should be attentive to the needs of people of color, low-income, immigrant, refugee and aging populations, women, families, youth, LGBTQ people, and people with disabilities. New mobility options and technology must fight against the displacement of vulnerable communities and develop the living wage transportation workforce of tomorrow. We will:

Strategy 1.1: Advance shared mobility equity programs targeting people of color, low-income, immigrant, refugee, youth, and aging populations, women, LGBTQ, and people with disabilities

Strategy 1.2: Deploy digital equity solutions to ensure everyone has access to app-enabled mobility options

Strategy 1.3: Advance as diverse an array of payment options as possible to improve access to app-enabled mobility options

Strategy 1.4: Ensure new mobility services are ADA accessible across the region

Strategy 1.5: Ensure new mobility complements and enhances the public transit system

Strategy 1.6: Develop integrated shared mobility hubs to seamlessly connect people to and between mobility services



PLAY 2:

Enable safer, more active, and people-first uses of the public right of way



IF WE LEAVE IT TO CHANCE...

Car ownership may go down, but vehicle miles traveled (VMT) increase, leading to more congestion. Ride-hailing services crowd our curbs and e-commerce demands overwhelm our goods delivery system. The urban environment becomes more hostile to people walking, people with disabilities, older adults, and people riding bikes. Overwhelmed by these changes, our streets lose vibrancy.

IF WE SHAPE IT...

We expand the network of pleasant public spaces and people-friendly streets. We can accommodate more green space as our population grows, which encourages more walking and biking. People feel safe walking along and across streets. Serious traffic collisions are eliminated and Seattle attains Vision Zero. The streets function well and goods are delivered efficiently.

New mobility services can potentially move more people using fewer vehicles. This would reduce the need for car storage (parking) and help us align our streets with our right of way priorities: mobility, access for people, and activation first; storage last. We can change the way we use our streets, sidewalks, and curbs. We can provide more space to people, while accommodating urban goods delivery. Managed appropriately, new mobility services can help us fulfill our Transit, Pedestrian, Bicycle, and Freight Master Plans, as well as achieve the goals of our Move Seattle strategy.

We will harness the efficiency benefits of shared mobility to make way for a future with great pedestrian spaces and community places, no fatal and serious traffic collisions, more reliable transit, and safe, convenient routes for people of all ages and abilities to ride their bikes. We will also partner with regional logistics leaders and startups to implement innovative policies and services that facilitate the movement of urban goods and e-commerce deliveries. We will:

Strategy 2.1: Recover street space and expand the public realm as the demands for access shift

Strategy 2.2: Ensure that new mobility advances our Vision Zero goal of ending traffic deaths and serious injuries on city streets by 2030

Strategy 2.3: Support the development of efficient urban goods delivery and new freight technology solutions



PLAY 3:

Reorganize and retool SDOT to manage innovation and data



IF WE LEAVE IT TO CHANCE...

Lack of capacity and knowledge leads the city government to over-regulate in some areas, and is preempted from critical regulatory and auditing functions in other areas. City government stifles innovation or is susceptible to unintended consequences.

IF WE SHAPE IT...

The city becomes a proving ground for innovation, improving transportation options for residents. Our data infrastructure allows us to manage the transportation system in real-time, providing anticipatory responses and strengthening protections against emerging threats.

We will advance innovative, data-driven policies, services, technologies, and projects that create an abundant mobility marketplace with options for all. The Seattle Department of Transportation will be a 21st Century DOT, accommodating changing consumer expectations and leveraging disruption in the mobility industry to meet our desired outcomes. We will engage in a two-way dialogue about new mobility. We will also be transparent as we test and learn about new ideas, daylighting our successes and lessons learned. We will pivot to new funding mechanisms as our gas tax and parking revenue sources deplete over time. This will require data-driven, anticipatory governance and a fresh perspective on organizational structures, staff skills, procurement rules, and partnerships. We will:

Strategy 3.1: Manage risk related to emerging mobility services

Strategy 3.2: Foster a culture of innovation and proficiency in new mobility solutions

Strategy 3.3: Understand the mobility needs of the community

Strategy 3.4: Continuously update citizens about mobility innovations

Strategy 3.5: Pursue nimble regulations that meet the public good while spurring innovation

Strategy 3.6: Establish new transportation funding mechanisms in response to the changing financing landscape

Strategy 3.7: Build strategic mobility partnerships with King County Metro, Sound Transit, and other public and private entities

Strategy 3.8: Attract mobility companies, services, and jobs to Seattle's burgeoning mobility industry cluster

Strategy 3.9: Encourage travel behavior that ensures people can move safely and efficiently

PLAY 4

Build new information and data infrastructure so new services can “plug-and-play”



IF WE LEAVE IT TO CHANCE...

Disconnected systems and lack of interoperability creates new transportation silos. Data asymmetries leave users in the dark and allow private mobility players to game the system. Transportation technologies are vulnerable to cyber attacks.

IF WE SHAPE IT...

We create clear rules for testing new technology, piloting new services and prototyping in the city. The results of prototypes are clearly evaluated against the city's values and goals. Successful prototypes can scale rapidly. Services that don't work can “fail gracefully.” Transportation data is open and interoperable. Finding your way around the city without your own car is easy. Seattleites can purchase transportation services when they need them.

Our streets flow with a rich stream of data generated by traffic sensors, on-vehicle sensors, and mobile data from ride-hailing, car share, and other services. This flow of data could give us more insights into emerging travel patterns and the effects of new mobility services on the way people use transportation. But the flow of data is currently unstructured and our community has concerns about privacy. We will advance solutions that protect publicly identifiable information, while expanding our data infrastructure. We will relay travel information in culturally sensitive and appropriate ways.

Approaching data not just as information, but also as infrastructure, will help us build a better platform for delivering Mobility as a Service: generating abundant shared mobility options, digital mobility marketplaces, seamless fare payment solutions, incentives and subsidies, and access to real-time mobility data.

This data infrastructure will also help us develop clear rules so startups can roll out their prototypes and pilot services in Seattle. We will:

Strategy 4.1: Access relevant data to ensure the public good is served

Strategy 4.2: Facilitate trusted data flows between connected vehicles, sensor infrastructure, personal devices, and community digital devices

Strategy 4.3: Develop analytical tools that model the evolving state of mobility

Strategy 4.4: Establish an open marketplace for Mobility as a Service

Strategy 4.5: Simplify and enhance the fare payment experience

Strategy 4.6: Unlock new opportunities for trip planning

PLAY 5

Anticipate, adapt to, and leverage innovative transportation technologies



IF WE LEAVE IT TO CHANCE...

The transportation system is unable to adapt to or leverage innovations when the city gets locked into dead-end technologies, much like how governments got locked into BlackBerry phones for years even while iPhone and Android were becoming ubiquitous.

IF WE SHAPE IT...

Seattle leads in transportation thinking and practice. New mobility accelerates a virtuous cycle that makes the city safer, more affordable, more livable, more vibrant. Technology adapts to the city and what we want it to be. Quiet, zero emission vehicles that run on clean energy dramatically reduce climate and noise impacts.

In Seattle, we have a long tradition of testing new technology, including the roll out of our mobile parking payment app and pay stations. By establishing a policy framework that anticipates new, potentially disruptive technologies, we will harness new mobility to meet our broader community goals. Our vision for automated mobility focuses on shared transportation, connected movement, and clean vehicle technology. We will pursue these technologies to complement our robust investments in transit. We will manage the negative impacts of single-occupant and zero occupant vehicles. We will also advance innovations in electric mobility and other clean fuels. We will take action to ensure that, by 2030, at least 30 percent of all light duty vehicles registered in Seattle are electric. And, we will collaborate with other cities, experts, and global leaders to exchange successful policy and technological innovations. We will:

Strategy 5.1: Establish a comprehensive set of people-first policy parameters to introduce and manage fully shared, electric, connected, and automated vehicle¹⁹

Strategy 5.2: Use pilots and promotions, to manage the technological and cultural shift to automated technology

Strategy 5.3: Promote the shift toward electric shared mobility services

Strategy 5.4: Support King County Metro in their effort to achieve a zero-emissions fleet by 2034



¹⁹See Appendix C for our preliminary policy framework, which will be updated periodically.



How Seattle Bucked a National Trend and Got More People to Ride the Bus

ANDREW SMALL, OCT 16, 2017

Three experts in three very different positions weigh in on their city's ridership success.

Almost every major U.S. city has seen years of decline in bus ridership, but Seattle has been the exception in recent years. Between 2010 and 2014, Seattle experienced the biggest jump of any major U.S. city. At its peak in 2015, around 78,000 people, or about one in five Seattle workers, rode the bus to work.

That trend has cooled slightly since then, but Seattle continues to see increased overall transit ridership, bucking the national trend of decline. In 2016, Seattle saw transit ridership increase by 4.1 percent—only Houston and Milwaukee saw even half that increase in the same year.

“What's happened with the city of Seattle was an interesting and important experiment.”

Bus service is crucial to reducing emissions in the Seattle region. According to King County Metro, which serves the region, nearly half of all greenhouse gas emissions in Washington state come from transportation and its operation displaces roughly four times as many emissions as it generates, by taking cars off the road and reducing traffic congestion. The public transit authority has been recognized for its commitment to sustainability and its bus fleet is projected to be 100 percent hybrid or electric by 2018.

So what exactly did Seattle do to improve ridership in a city famously clogged by cars? Three people with different positions in the Seattle transit community: Advocate, official, and bus driver, weigh in.

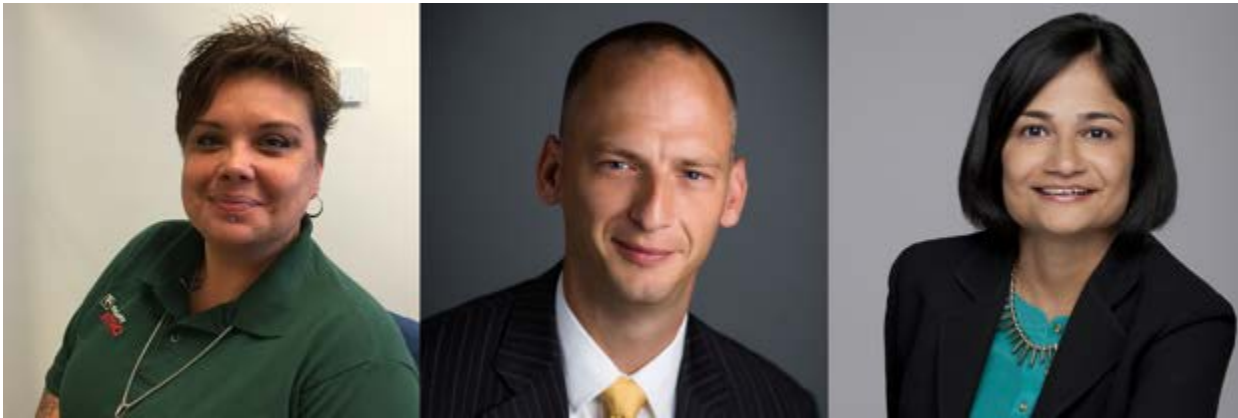
The bus driver: When buses get priority, riders prioritize the bus

On Third Avenue, where Adelita Ortiz's routes usually begin, her only traffic obstacle is a stream of other buses traveling down the road. The street blocks off cars and becomes a transit-only corridor during the morning and afternoon rush hours (private vehicles are supposed to turn off after a block on the street). Third Avenue is one of a few transit malls in the United States that restrict private automobile use. Only the Portland Transit Mall or Boston's Silver Line bus tunnels come close to dedicating as much space to public transit as Seattle's arterial rush hour north-south escapeway.

Ortiz says that not only helps buses to move faster, but it allows drivers to execute a technique called “the weave”—where the buses take turns picking up passengers on the side of the road. Since the buses pick people up at only some stations, they stagger when to yield the right of way, while other buses behind pull over to pick up more people. Without cars in the way, it’s easier for buses to trade off pick-ups.

“There’s a gazillion buses during rush hour,” Ortiz says. “We can’t all stop at every stop, so we alternate taking the right of way as a courtesy to each other.” This priority to buses also has helped expand the city’s RapidRide, a lite bus rapid transit system that makes fewer stops and features off-board payment and all-door boarding.

Ortiz, who has driven for King County Metro for nearly 17 years, remembers a time when things didn’t run so smoothly. “Back in the day, we’d be on Third Avenue making stops with completely full buses and sitting in traffic,” she says. “We’d be at a light for maybe five or six light cycles and before you knew it we’re down twenty minutes on a route where we should have been already uptown dropping people off and coming back to pick up more.”



From left to right: Adelita Ortiz, Scott Kubly, and Shefali Ranganathan.

Since 2010, the city has absorbed an additional 45,000 new workers—47 percent of whom commuted by some form of public transit in 2016 and only 2,225 of those newcomers drove alone to work.

“Over the years I’ve noticed we’ve gotten a lot more people moving through Seattle, a lot more traffic and a lot more passengers,” she says.

Ortiz says that dedicated bus corridors, bus lanes, and other improvements make her job easier. The city is planning its first complete bus rapid transit route to be built in 2018.

“It’s all very helpful,” she says. “We’re picking up hundreds of people per day. They’re depending on us to get them home safely. We do our best to get them there on time.”

The public official: “Small, surgical fixes add up to something big”

As great as it would be to maximize the bus’s reign on the roads everywhere, that’s not always possible. Scott Kubly, the director of Seattle’s Department of Transportation, says making the system better

mostly means spotting small fixes. “We don't just focus on the big corridor projects,” Kubly says. “We are focused on making the small, surgical improvements that add up to something big.”

“There’s not a big communications campaign around ‘hey, we just put in this queue jump and your bus just saved 10 seconds every trip’.”

SDOT and King County Metro have worked together for a spot improvement program, where they identified bottlenecks and slow spots on bus routes. Kubly notes an example at a challenging intersection along Rainier Avenue and Dearborn Street. “That’s a super busy street carrying tens of thousands of cars a day and there was a signal where the bus was experiencing a lot of delay,” Kubly says. They identified a center turn lane that was low enough volume that it could be turned into a transit-only lane for just a block, which allowed buses to pull up to the front of the line at the traffic signal.

With buses moving about a minute and half faster along that road’s one-mile stretch, Kubly says the service improvement speaks for itself.

In other trouble spots, they inject more traditional solutions. They added bus bulbs on the side of the road to pick up passengers without blocking traffic. They introduced queue jumps, where buses get to take a designated lane to the front of the traffic and get a few extra seconds at the light to get a head start on traffic. They put transit islands in busy corridors for easier boarding. All this accumulates into more frequent and faster bus service.

“There’s not a big communications campaign around ‘hey, we just put in this queue jump and your bus just saved 10 seconds every trip’,” Kubly says. “Making small tweaks helps the bus maintain its level of reliability and people are going to choose it because it is producing the results that they want.”

Another example of good coordination is along Westlake Avenue, where a SDOT-owned streetcar lines now share their dedicated transit lane with King County’s RapidRide C line and 40 bus. “That’s right in the heart of Amazon [headquarters],” Kubly says. “So we put buses on the streetcar lane and went from having a streetcar every 10 minutes to a bus or streetcar every two and a half to three minutes. By not getting bogged down in disputes about ownership, we were able to really improve the customer experience.”

The advocate: Seattle funded better bus service by being straight with voters

“What's happened with the city of Seattle was an interesting and important experiment,” says Shefali Ranganathan, the executive director of Transportation Choices Coalition. Ranganathan has led the organization for nearly a decade, advocating for better transit, biking, and walking infrastructure across Washington state. “For years, the county has known what its unmet needs are in terms of frequency and reliability to provide high quality [bus] service. But the issue around funding was that there were never enough resources to allow for [planning] flexibility.”

King County relies on a sales tax to fund about half of the bus system’s operating budget. When the recession hurt revenue, the system eventually faced a funding gap. A ballot initiative was proposed to increase the sales tax and a car-tab fee.

And Ranganathan says people voted to pay more for transit because of the clear and expansive picture provided by the city of just what a budget shortfall would do their service. King County Metro released guidelines calculating route productivity and equity for low-income communities where some 74 routes would be cut and another 107 routes would be revised for reduced service. That transparency made Ranganathan's job of conveying information to the public easier—her organization was able to use that city data to build a campaign around transit accessibility. “Data-based decision making has been really essential,” says Ranganathan. “Because some questions [about transit] are hard for voters to understand and it's important for the public to understand how service is distributed.” While a county-wide vote to halt those route cuts in April 2014 failed, the city voted to expand bus service that November in the Proposition 1 campaign.

With Proposition 1 in 2014, nearly 60 percent of Seattle voters approved a sales tax increase and a car-tab fee increase (a vehicle license fee) to raise an additional \$45 million annually for more bus service hours in Seattle. That meant a 15 percent expansion in bus service over the last three years that reduced overcrowding and increased reliability and frequency. Just last year, Seattle voters approved another \$54 billion expansion of numerous public transit systems across the region called Sound Transit 3—raising the sales tax in King County another 0.5 percent and increasing the car tab-fee again.

Ranganathan says the victory came down to persuading voters they would personally benefit. “At the end of the day, when you're at the ballot box and you're wondering if you're willing to pay these taxes, it's very much a question of: “do I see myself taking the bus?”” she says. “When service gets better and it's a pleasant experience that gets you where you need to go, transit becomes your first choice because it's the most reliable and frequent option.”

CORRECTION: A previous version of this story incorrectly stated that King County voters had approved Proposition 1, which the county rejected. Seattle voters approval a similar but separate Proposition 1 in their city. The details of the policy have been changed to reflect that error.

About the Author

Andrew Small

Andrew Small is a freelance writer in Washington, D.C., and author of the CityLab Daily newsletter ([subscribe here](#)). He was previously an editorial fellow at CityLab.



Climate Action Plan

A roadmap to reducing citywide greenhouse gas emissions



and extended droughts impact the Minneapolis tree canopy. Most public trees in Minneapolis are overseen by the Minneapolis Park and Recreation Board (MPRB). The City will have to work with the MPRB and private property owners to increase tree canopy on public and private property.

- 7. Improve interdepartmental and interagency collaboration on transportation issues, and track progress.** City policy already instructs staff to work across departments on transportation and land use issues; it also recommends both formal and informal collaboration between the City and partners like the Metropolitan Council and Hennepin County. Add accountability to this policy direction by regularly reporting to the public and policymakers on the successes of recent collaborations, and challenges that may be hindering these important partnerships.

Transit and Car Sharing

- 1. Address gaps in the existing transit network and level of service.** The *Access Minneapolis* plan identifies existing needs in terms of routes of service frequency, as well as passenger facilities and amenities. As the final alignments of regional transit lines (see Transit & Car Sharing, Strategy #2) mature, additional gaps may emerge. Special attention should be given to low-income and transit-dependent populations when identifying needs. Working with Metro Transit and Hennepin County, and with feedback from impacted communities, continue to address gaps in service.
- 2. Support the build-out and upgrade of regional and local transit lines.** The City should support and implement local and regional transit improvements consistent with the *Access Minneapolis* plan in order to reduce VMT and provide more transportation options. The planning and build-out of these lines should incorporate the feedback of low-income and transit-dependent populations to increase transit options and quality of life. Regional transit facilities in the planning or construction phase include Central Corridor LRT, Southwest LRT, Bottineau and 35W Bus Rapid Transit (BRT). Local improvements to the Primary Transit Network (PTN) include streetcar and arterial BRT lines. Transit improvements should include clear, accessible and easy-to-use pedestrian routes to transit stops.
- 3. Advocate for an increase to the dedicated funding stream for transit construction and operations at the local, state, and regional level.** The current funding level for transit projects through the Counties Transit Improvement Board (CTIB) utilizes a quarter-cent sales tax to fund transit improvements. The original legislation proposed a half-cent sales tax. Increasing the amount that counties can opt in to use would speed



development of regional transit projects. Local governments could also benefit from additional tools for funding transit construction and operations like value capture along transit corridors.

4. **Work with Metro Transit and property owners to improve capacity and use of transit during special events.** Many attendees of major events at the Metrodome, Target Field, the Convention Center and other locations in Minneapolis use transit, but the City should continue to work to further increase the use of transit and non-auto modes for these events.
5. **Complete the downtown east-west transit spine improvements.** The *Access Minneapolis* plan calls for the upgrade of transit service in the vicinity of Seventh Street. This corridor is the second-busiest in terms of weekday boardings in downtown. This improvement may be similar to the “Marq2” project, which improved travel times and provided dynamic signage to improve user experience and convenience along Marquette and Second Avenues.
6. **Expand car sharing services to on-street spaces.** Parking staff will soon begin the process to bring car-sharing services to on-street spaces in the city. Continue to expand these services as demand and feasibility permit.
7. **Make car sharing convenient and affordable by reducing sales tax on car sharing services.** Currently, car sharing transactions in Minnesota are taxed at an additional rate (approx. 14 percent) in addition to the regular sales tax rate. Support changes to state law which would separate and reduce car sharing tax rates from traditional car rental service tax rates.

Active Transportation

1. **Achieve the City’s adopted targets for bicycle mode share and bicycle counts and adopt a stretch goal of 15 percent for 2025.** The City has adopted targets for bicycle mode share of six percent by 2012 and seven percent by 2014. In addition, the City has adopted a target to increased cyclists in annual counts by 60 percent over 2008 by 2014. Consider a mode share goal for 2025 of 15 percent.
2. **Revisit minimum bicycle parking requirements to support the City’s bicycle mode share targets.** The City is investing in on- and off-street bicycle facilities, and has set targets for bicycle use. Providing sufficient parking that is convenient and safe will be a key in meeting these goals. Existing standards, such as the Association of Pedestrian and Bicycle Professionals parking guide and the City’s adopted workplace access and parking guidelines could be reviewed for consistency with current code. Bicycle parking demand may also vary more based on geography than auto parking. More data on local parking demand is needed.
3. **Construct 30 miles of on-street, protected bike facilities (cycle tracks) by 2020 to allow safe and efficient travel for all types of cyclists.** Bicycles are a zero-emissions form of transport. Increasing the perception of safety of on-street bicycle facilities will attract more cyclists to Minneapolis’ network of facilities and help to meet mode share goals. Work to ensure that neighborhoods with little existing bicycle infrastructure are part of the discussion on what type of bicycle infrastructure would work for their communities, and receive equitable funds for implementing those projects.
4. **Support implementation of the Pedestrian Master Plan and Bicycle Master Plan.** When walking and biking are safe, efficient, and

comfortable, the benefits are felt community-wide and reduce dependence on automobiles. Monitoring and following up on the Pedestrian and Bicycle Master Plans' recommendations will be integral to meeting greenhouse gas reduction goals across the transportation and land use sectors.

- 5. Increase walking as a percentage of trips.** The City should adopt an aggressive goal for increasing the pedestrian travel mode share and the numbers of pedestrians observed in annual counts. The City should work to meet this goal by filling the identified sidewalk gaps in the Pedestrian Master Plan, improving sidewalk snow clearance, improving accessibility for people of all ages and abilities, and increasing the safety of pedestrian crossings.



- 6. Support the efforts of special service districts to improve streetscapes and encourage walking and bicycling.** The efforts of special service districts to clear snow, improve and maintain streetscape amenities (like sidewalks and bike parking) and clean litter should be supported. These initiatives will lead to a more inviting pedestrian environment in the City's commercial areas.
- 7. Continue "Safe Routes to School" efforts.** The City's Safe Routes to Schools program encourages children to adopt healthy habits of walking and biking. This is done by improving safety near schools through infrastructure projects, as well as fostering a culture of walking and biking in the schools through educational programs.
- 8. Adopt a Complete Streets policy.** A Complete Streets policy will demonstrate a commitment to providing adequate pedestrian, transit and bicycle facilities during every road improvement project. While the City already has adopted many elements of Complete Streets work, such as Bicycle and Pedestrian Master Plans and a multi-modal transportation plan, a Complete Streets policy may be necessary to best position the City to compete for outside funding.

Parking Management

- 1. Investigate demand-based parking pricing strategies for metered areas.** The city's new parking meters allow for variable pricing. Vary pricing on metered streets, with a goal of achieving one empty spot per block, in order to reduce "cruising" for spots and improve traffic flow.
- 2. Continue to adjust minimum parking requirements to better promote alternative modes of transportation.** For example, developers

of multi-family housing currently qualify for a 10 percent reduction in required parking stalls if the parcel is within 300 feet of a transit stop, even though one-quarter mile (1,320 feet) is typically accepted as the distance an average rider will walk to a bus stop.

3. **Support the development of new information technology to reduce “cruising” for parking and make more efficient use of curb and ramp space.** Parking staff are developing new approaches, such as a mobile phone app, which will provide more information to drivers on the location of vacant parking spaces. These types of applications can reduce cruising for parking, which contributes to traffic congestion.
4. **Support the development of a citywide framework for curb space use.** Parking staff will be developing a framework plan to understand how to best use curb space, both for parking, valet services, active transportation and other uses. Climate Action Plan goals for increasing active transportation and holding VMT flat should be considered during this process.
5. **Require or incent parking “unbundling.”** Adopt requirements or incentives for developers that parking be separated from commercial space and residential units in lease and sale agreements.

Transportation Demand Management and Intelligent Transportation Systems

1. **Support the Downtown Transportation Management Organization’s goal to reduce 4.8 million drive alone trips by 2015.** The Downtown TMO helps commuters get into downtown with less reliance on single-occupancy vehicles. Their efforts are aimed at increasing transit use, ridesharing, biking, and walking.
2. **Explore changes to signal timing to reduce idling, improve traffic flow and accommodate non-auto modes.** City staff are currently reviewing

signal timing on a citywide basis. Potential changes to reduce emissions could include “green waves” for cars or cyclists, and changing lights to flashing red/yellow late at night and early in the morning.

3. **Support the expansion of congestion pricing, dynamic signage and other traffic management techniques on regional highways.** Demand-based pricing can help reduce congestion while encouraging carpooling and transit use. Other techniques that have proven beneficial are dynamic signage which can help reroute drivers, and rapid crash response.
4. **Encourage employers to embrace alternative work arrangements for employees.** Results-Only Workplace Environments (ROWE), variable work schedules, telecommuting, and teleconferencing all have the potential to reduce overall trips or spread trips from rush hour into less-congested times. The City can collaborate with the downtown TMO, Downtown Council, and other organizations to provide businesses of all sizes with information and expertise on these practices.

Clean Fuels

1. **Explore regulatory incentives to increasing electric vehicle charging infrastructure.** The inclusion of electric vehicle charging could be incentivized through the zoning code or other city regulations for large multi-family and commercial buildings. As technology and adoption rates of electric vehicles change, the city should revisit these incentives and consider requirements for EV charging in parking code for multi-family and commercial buildings as appropriate based on demand.
2. **Provide electric vehicle charging stations and other alternative fueling options at City-owned facilities where feasible.** Continue to investigate the feasibility of vehicle charging stations at

public facilities. Closely monitor electric vehicle technology to ensure investments are appropriate. Investigate the feasibility of compressed natural gas (CNG) fueling stations where appropriate for City operations and for use by the public or government and industry partners.

3. **Increase the fuel efficiency of the city's licensed taxi and car service fleet.** The current requirement for taxi vehicles is to achieve 23 miles per gallon (MPG) or better in city driving. As the City updates this policy, achieve a higher MPG and/or lower carbon intensity of the fleet through requirements or incentives. Given that taxis are high-mileage vehicles, better fuel efficiency can pay off more quickly than in other applications.
4. **Support the new federal fuel efficiency standards.** On-road vehicle fuel efficiency has a significant impact on the transportation sector emissions in Minneapolis. Changes to the federal CAFE standards will increase the fuel efficiency of vehicles on the road.
5. **Support increased fuel efficiency in public fleets.** Minneapolis has adopted a green fleets policy which calls for fuel efficiency improvements in City-owned vehicles and equipment. Support the efforts of entities like the Metropolitan Council and the State of Minnesota to improve the fuel efficiency of their fleets. In particular, hybrid, fully electric, or natural gas buses have the added benefits of reducing noise pollution and localized air pollutants like particulates in high-traffic areas. Work with Metro Transit to incorporate the use of all cost-effective alternative fuels in their fleets.
6. **Support State efforts to adopt a low-carbon fuel standard.** As outlined in the Minnesota Climate Change Advisory report, support the adoption of

a statewide Low-Carbon Fuel Standard, with a goal of reducing the lifecycle carbon intensity of transportation by 12 percent by 2025 from 2007 levels.

7. **Support the development of alternative jet fuels and ensure Minneapolis-Saint Paul International Airport (MSP) is prepared for their increased use.** Most emissions attributable to MSP are produced by jet aircraft. Domestic and foreign airlines have successfully trialed a variety of biofuels, which have been approved for use in commercial flights since July 2011. As production chains mature, the Metropolitan Airports Commission (MAC) and its airline partners will need to be sure MSP facilities are adequately prepared to store and dispense biofuel-blended jet fuel. Minneapolis should also support future regulatory actions designed to accelerate the switch to cleaner-burning jet fuels.

Other Strategies

1. **Continue to shift to LED streetlights.** Replacing conventional bulbs with LEDs can net up to a 50 to 60 percent reduction in energy use. As capital costs come down, continue to replace older bulbs with more efficient LEDs, with a long term goal of



Flickr user redlegsfan21

CITY OF MINNEAPOLIS GREEN FLEET POLICY



TABLE OF CONTENTS

- I. Introduction
 - Purpose & Objectives
 - Oversight: The Green Fleet Team
- II. Establishing a Baseline for Inventory
- III. Implementation Strategies
 - Optimize Fleet Size
 - Replacement Vehicles
 - Reduce Vehicle Size
 - Increase Use of Alternative-Fuel Vehicles and Equipment
 - Vehicle Maintenance
 - Operation of Alternate Fuel Vehicles
 - Reducing Other Environmental Impacts of Vehicles
- IV. Implementation Procedures
 - Guidelines
 - Exemptions
 - New Vehicle Justification Form
- V. Annual Reporting
- Appendix 1: Definitions

I. INTRODUCTION

PURPOSE & OBJECTIVES

This policy defines and documents the process for purchasing, oversight, operation, and management of the City's diverse vehicle fleet, which includes both vehicles and heavy equipment. As such, this policy covers all Departments and Divisions under the City Council that have vehicles or metered equipment that operate on gasoline, diesel, electricity, or other types of fuel or energy.

This policy sets guidelines to minimize greenhouse-gas (GHG) emissions of current and future fleet vehicles. Implementation of this policy will help the city meet its GreenPrint goals while reducing the short- and long-term costs of purchasing, maintaining, and operating city vehicles.

The overall objectives of this policy are to:

1. Inventory and report fleet-wide GHG emissions.
2. Optimize the fleet size, by eliminating or reassigning un- or under-used vehicles while promoting car-pooling across departmental lines.
3. Encourage and educate city staff in eco-driving best practices (*e.g.*, reduced idling).
4. Reduce tailpipe emissions (*e.g.*, through advanced emissions controls).
5. Purchase, when necessary, new vehicles that provide the best available net reduction in vehicle fleet emissions, considering life-cycle economic and environmental impacts (*e.g.*, by purchasing more efficient or alternative fuels vehicles)¹.

OVERSIGHT: THE GREEN FLEET TEAM

The Green Fleet Team shall oversee refinement and implementation of the Green Fleet Policy. The Green Fleets Team shall be composed of representatives from:

1. Fleet Services Division
2. Environmental Services
3. Sustainability Initiative
4. Selected rotation of Using Departments

A primary function of the Green Fleet Team will be to monitor purchasing of City vehicles, metered equipment, and sustainable maintenance products and services in accordance with the goals and objectives of the Green Fleet Policy. Progress toward these goals shall be measured against the Base Year. Beginning in 2011, the Green Fleet Team shall present annual reports of findings and progress to the City of Minneapolis Environmental Coordinating Team and to Results Minneapolis.

The Green Fleet Team will recommend acceptable initial incremental costs for improved environmental performance based on fuel savings and emissions reductions over the service life of a vehicle. The Green Fleet Team will conduct comprehensive life-cycle cost analyses (including fuel, maintenance, and operational costs, as well as factors specific to emergency vehicles) prior to purchasing fleet replacements or additions. The corresponding bid process will

¹ See "Exemptions" (pg 7) re: emergency vehicles.

reflect this analysis. In addition, the Green Fleet Team will pursue funding from external sources, such as regional, state, and federal grants, to offset any incremental initial costs.

II. ESTABLISHING A BASELINE INVENTORY

The City of Minneapolis will establish and maintain an inventory of the vehicles in its fleet. The inventory will also be used for the City's broader GHG-reduction initiatives and to monitor specific emissions parameters that have been captured since then.

The baseline year for the inventory and for the Green Fleet Policy will be Fiscal Year 2005.

The City's Director of Fleet Services Division shall develop this baseline inventory. The Director will thereafter provide updated inventory information on an annual basis, in a reliable and verifiable manner, to the Green Fleet Team and the Environmental Coordinating Team.²

The baseline inventory metrics should include, for each vehicle class and fuel or energy type the following information:

1. Number of vehicles.
2. Annual miles driven (or annual hours of metered equipment).
3. GHG emissions (*i.e.*, carbon dioxide equivalent).
4. Non-GHG tailpipe emissions (*i.e.*, EPA criteria pollutants).
5. Quantity of fuel consumed by fuel type.
6. Cost of fuel consumed by fuel type.

Thus, the baseline inventory will include the above Metrics 1 - 6 for each vehicle class rating for City of Minneapolis on road fleet or metered-equipment class, and fuel or energy type, including but not limited to:

1. Gasoline
2. E-85
3. Diesel
4. Biodiesel
5. Compressed natural gas
6. Electricity (*i.e.*, kWh taken from the grid)

This information will allow the Green Fleet Team to derive or request additional relevant information, including each of the above Metrics 1 - 6 for the City's fleet

² See "Annual Reporting" (pg 8) for additional information.

(calculated by summing each metric across all classes of vehicles and metered equipment) or on an average per-vehicle basis (calculated by dividing Metric 1 into Metrics 2 - 6).

III. IMPLEMENTATION STRATEGIES

OPTIMIZE FLEET SIZE

The Fleet Services Division will provide utilization reports to the Using Departments and make recommendations about possible fleet reductions including using alternative transportation modes.

Replacement Vehicles

Replacement vehicles will achieve the greatest level of emission reductions possible while still meeting the operational needs of the City and being cost-effective. Alternative fuel replacement vehicles should be procured only when there is fueling infrastructure in place at City operated or local commercial fueling stations to support the operation of these vehicles.

1. The City shall make every effort to obtain the vehicles that are the most efficient and emit the lowest pollutants as possible as measured by available emissions certification standards and those published by the manufacturers:
 - a) Light Duty Vehicles: The City shall purchase or lease only models of passenger vehicles and light duty trucks that are U.S. EPA Smartway certified, where service levels are not negatively impacted.
 - b) Medium Duty Vehicles: The City shall purchase or lease only Medium Duty Vehicles whose engines are EPA certified as low-emission when available for the given application and where service levels are not negatively impacted.
 - c) Heavy Duty Vehicles and Equipment: The City shall purchase or lease only Heavy Duty Vehicles or Equipment whose engines are EPA certified as low-emission, when available for the given application and where service levels are not negatively impacted.
2. Emission and GHG-reduction targets shall be reviewed initially on an annual basis, using the current and future EPA formula, by the Green Fleet Team and modified based on vehicles available for that model year and anticipated fleet purchases. Once a meaningful baseline measurement is established, three year and five year target goals will be

identified. Updates on target progress will be reported annually or at more-frequent intervals as determined by the Director of Fleet Services.

3. Vehicle purchase requests shall be reviewed and minimum emission reduction targets will be employed when possible. Fleet Services Division will work with Using Departments to identify the most fuel-efficient vehicle with maximum emission reduction available that can meet the operational needs of the department, while taking into account the vehicle life-cycle costs and fuel availability.
4. Request for exemptions to the Green Fleet Policy shall be submitted in writing to the Fleet Services Division. The Director of Fleet Services Division will determine if there is sufficient justification to award an exemption.

Reduce Vehicle Size

Encourage the selection of vehicles of a smaller class size whenever possible in order to achieve increased miles per gallon and lower emissions. Requests for new vehicle purchases must be supplemented with written justification addressing the need for a class or type. Fleet Services Division shall work with the Using Departments to determine whether a proposed vehicle could be downsized and still fulfill its required function within the department.

Increase Use of Alternate-Fuel Vehicles and Equipment

1. Alternate-Fuel Vehicles and Equipment will be considered for procurement, when appropriate to the application, as new environmentally - friendly technology becomes available that fits the organizational need and the life-cycle cost analysis demonstrates the procurement and utilization of the vehicle to be economically feasible.
2. Fuels with lower emissions (such as compressed natural gas, ethanol, electricity, and biodiesel) shall be used when feasible. Vehicles using these fuel types will be strongly considered when evaluating vehicle replacement.
3. Fleet Services Division shall provide a summary list of alternative fuel vehicles (by fuel type) in the City's fleet to the Environmental Coordinating Team as part of its Green Fleets Annual Report.

Vehicle Maintenance

1. Emission systems shall be inspected annually as part of the Fleet Services Division Preventive Maintenance program.
2. Environmentally friendly products, such as recycled coolants and re-refined oils, shall be used where available when cost effective and when it will not void the manufacturer's warranty. Re-treaded tires shall be purchased for large-wheeled or slow-moving vehicles, when applicable.

Operation of Alternate-Fuel Vehicles

All alternate-fuel vehicles owned by the City of Minneapolis shall bear notice of the type of fuel source to be used in one or more locations that are plainly visible to the vehicle operator.

Reducing Other Environmental Impacts of Vehicles

In addition to tailpipe emissions, motorized vehicles and equipment may have other negative environmental impacts that can occur in their production, operation, and eventual disposal. Radiator fluids and other substances used in vehicles can have harmful consequences for the environment. Of particular concern are persistent, bio-accumulative, and toxic materials such as mercury, lead, and arsenic, which can be released at the end of the life of a vehicle. When possible Fleet Services Division will continue to reduce the life cycle environmental impacts of the vehicles.

City vehicles that are identified for retirement shall be evaluated on age, mileage, and emissions in order to determine the most appropriate disposal option in accordance with Federal, State, City, and Local rules and regulations.

IV. IMPLEMENTATION PROCEDURES

The Director of Fleet Services Division is responsible for performing the analysis and making decisions regarding vehicles that are most appropriate for the city to purchase, with input from the Using Department. The Fleet Services Director will base the decision for a new or replacement vehicle on the purchasing values described below. While consideration will be given to the type of vehicle requested by the Using Departments, Fleet Services Division will exercise its authority to purchase vehicles that follow the City of Minneapolis Green Fleet Policy and the desire to create a more fuel efficient, cost-effective, and environmentally responsible city fleet.

GUIDELINES

Prior to the acquisition of any new or replacement vehicle, the following purchasing values will be considered and carefully examined:

- Justification for the vehicle
- Frequency of use (utilization)
- Suitability for intended job
- Fuel efficiency and vehicle size
- Environmental impact
- Initial and long-term cost
- Safety and repair record
- Impact on technicians workload
- Hybrid or alternative fuel vehicle availability or preference

Fleet Services Division shall make every effort to purchase and use the lowest emission vehicle or equipment item possible, while taking into account the vehicle's lifecycle costs, life cycle environmental impacts, and ability to support City of Minneapolis operation and services.

EXEMPTIONS

Fleet Services Division may grant an exemption from the requirements of this Policy under any one of the following circumstances:

1. Where the analysis demonstrates to the satisfaction of Fleet Services Division of the following:
 - a. That any amortized additional incremental cost of purchasing a lower emission vehicle that complies with the requirements of this Policy cannot be recovered over the operational life of the vehicle or metered equipment through a reduction in fuel, maintenance, and other costs incurred during the operating life of such vehicle or equipment; and
 - b. That Fleet Services Division, or another City department, has unsuccessfully applied for grant funding for the purchase of the vehicle or motorized equipment that complies with the requirements of this policy. In such cases, Fleet Services Division will refer back to "a".
2. New emergency vehicles purchased under this Policy must provide comparable performance, safety, and fuel availability during emergencies as conventionally powered emergency vehicles.

NEW VEHICLE JUSTIFICATION FORM

Using Departments seeking additional vehicles for their fleet must submit a “New Vehicle Justification” form. The series of questions on the form provides needed information for the Director of Fleet Services Division to complete business need analysis. The Director of Fleet Services Division will then work in conjunction with the Using Department to reach a decision about expanding the fleet. The completion and filing of this form with the Director of Fleet Services Division does not guarantee that an additional vehicle will be purchased, nor does it imply that the customer will receive the vehicle of their choice.

A “New Vehicle Justification” form shall also be completed by the Using Department if they wish to purchase a vehicle that is significantly different from the one being replaced, as determined by Director of Fleet Services Division.

V. ANNUAL REPORTING

Fleet Services Division shall provide a Green Fleet Annual Report. This report shall include updated fleet-inventory information (metrics 1-6 on page 3), along with an update on progress toward the emissions reduction goal, the percentage of Alternate-Fuel Vehicles in the City Fleet, and year-by-year performance for each of these. It will also include reporting on the number of exemptions, which departments and justification.

The Green Fleet Annual Report shall be reviewed by the Environmental Coordinating Team, the Green Fleet Team, and Fleet Services Division. The annual report shall be used to determine program effectiveness.

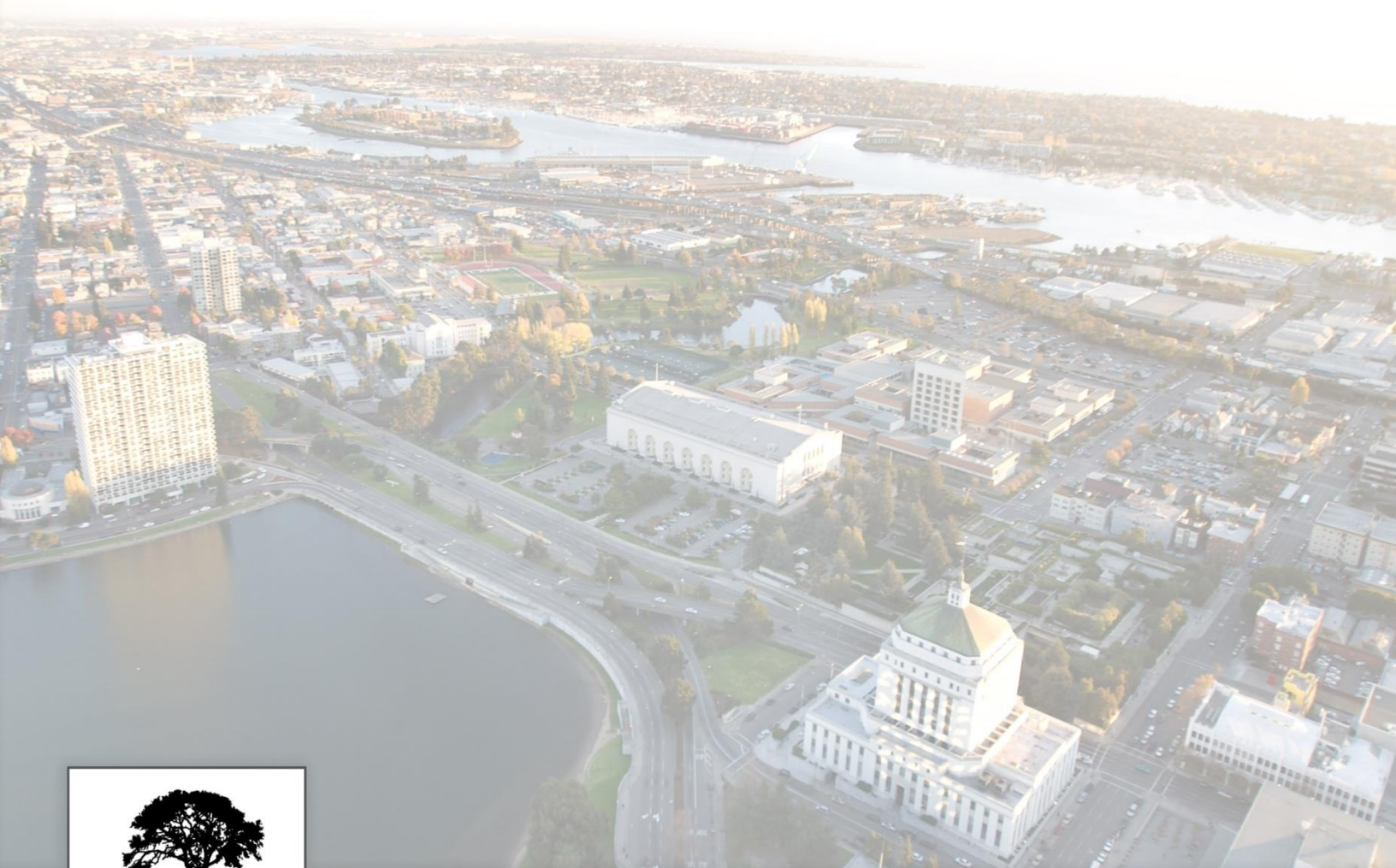
Annual Fleet Services Division purchasing plans shall be developed using the options listed above, recommendations from the Environmental Coordinating Team and in accordance with other applicable City Policies.

City of Oakland

Energy and Climate Action Plan

December 4, 2012

(Updated March 2018)



Supporting Resources

Supporting resources are summarized for each Priority Action. The total cost associated with implementing all proposed Three Year Priority Actions supported by existing resources is projected to be approximately 5.5 staff FTE per year, 0.5 fellow time per year, and an additional \$ 9.10 million for related expenses (e.g., consultant support).

Transportation and Land Use

Combustion of fossil fuels for transportation is a major source of GHG emissions associated with Oakland, and all of California. This includes people moving to and from home, work, school, shopping, recreation, and other destinations, as well as the transport of goods. Other local air pollutants linked to increased incidence of health problems such as asthma, heart disease, and cancer, many of which disproportionately affect Oakland's low income and vulnerable populations, also result from use of transportation fuels.

Addressing transportation emissions presents a tremendous opportunity to simultaneously reduce GHG emissions and improve the health and safety of Oakland residents. Efforts to reduce GHG emissions from the transportation sector also present opportunities to create a more equitable, sustainable, affordable, and healthy Oakland, by addressing the interconnections between land use and transportation. How and where housing, jobs, shopping, and other opportunities are located has a fundamental effect on both GHG emissions and the choices that people have for meeting their daily needs.

A number of tools are available to help the City reduce GHG emissions associated with transportation and land use. These include: land use and transportation planning; providing interconnected bicycle and pedestrian options; tailoring parking policies to reduce vehicle trips; supporting affordable, safe, and reliable public transportation options; promoting fuel-efficient vehicles and low- or zero-carbon fuels; partnering with the Port of Oakland to reduce Port-related emissions; engaging employers to reduce commute and business trips; promoting urban forestry; and improving the City vehicle fleet.

Between 2012 and 2017, Oakland has made progress in a number of these areas, embracing a variety of climate-friendly development principles in the City's General Plan, focusing new development around transit hubs, adopting forward-thinking Bicycle and Pedestrian Master Plans and significantly expanding the city's bikeway network, and adopting a Clean Fleets policy aimed at improving the fuel efficiency of the City's vehicle fleet.

A number of other ongoing actions are recommended for completion during the next three years. These actions include:

- Expand and Develop a Sustainable Funding Plan for the Downtown Shuttle (operational since 2013)
- Advance Bus Rapid Transit in Oakland (under construction since 2017)
- Plan for Electric Vehicle Infrastructure (ongoing implementation since 2012)

The following Transportation and Land Use priority actions are supported by existing resources. Some were completed as one-time actions, while others will require ongoing investment. Although funds have already been allocated, implementation of these priority actions will cost an average of 0.7 FTE per year and \$ 7.43 million for expenses throughout the next three years. Following are descriptions of each of these actions, along with information on implementation status.



Priority Actions

PA 1. Launch and Develop a Funding Plan for the Downtown Shuttle

(TLU-13) Launch and sustain a downtown free shuttle to increase transit use in the downtown area. Explore options to expand the shuttle up the Broadway corridor.

Description: The City launched a new downtown shuttle serving the Broadway corridor from Jack London Square to the Uptown area in 2010, and in 2014, ridership surpassed three million. Rides on the shuttle are free to the public. The shuttle is projected to create a net reduction in GHG emissions by reducing the need for private automobile trips; the City estimates that the shuttle reduces vehicle miles driven by 3.3 million each year, eliminating over 800 tons of CO² emissions annually. The shuttle also benefits downtown merchants.

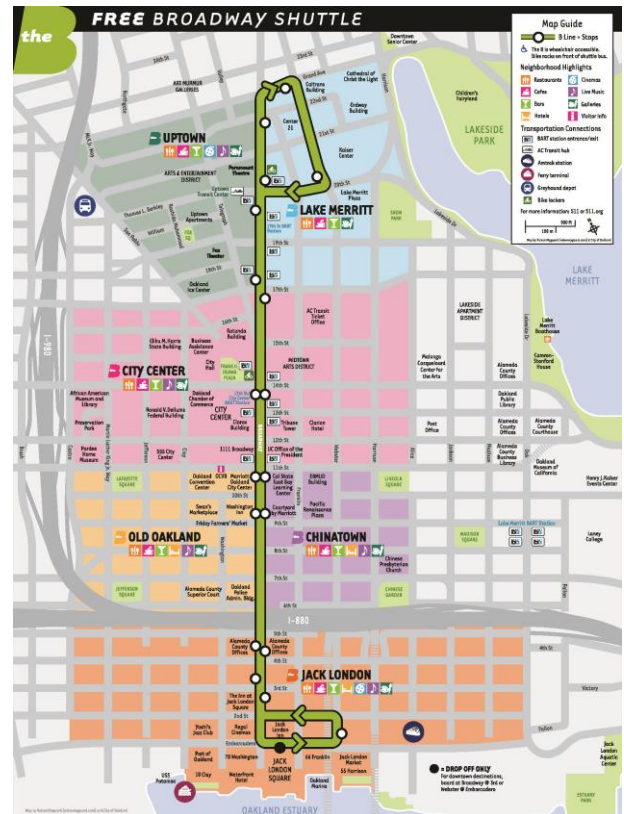
The launch and initial operating phase of the shuttle was supported by a grant from the Bay Area Air Quality Management District. Funding is in place to support the operation of the shuttle for a two-year period. During this time, the City will work to develop a long-term funding strategy to sustain the shuttle beyond the grant period, including development of a “fair share” methodology for assigning a portion of the costs to new development.

Existing staff resources are sufficient to support the launch of the shuttle. Additional resources may be needed to perform urban economic analysis, outreach and strategy development to create an ongoing sustainable funding stream beyond the grant period.

Responsibility: Economic and Workforce Development

Status: The Broadway Shuttle is fully operational, providing 685,229 individual trips in 2016, running until 10-pm on weekdays and 1am on Friday and Saturday nights. Each year, approximately \$910,000 is raised from private property owners and public transit agencies to cover the shuttle’s annual operating costs. Currently, the City is studying the feasibility and potential for an expansion to the Broadway Shuttle to enhance the local and regional transit systems' efficiency, improve connectivity between the corridor's neighborhoods, and spur economic development on and adjacent to Broadway. The Study Area includes Broadway, the city’s central downtown corridor, from Jack London Square to Kaiser Permanente Medical Center, and 40th Street from Broadway to MacArthur BART.

Costs: 0.5 FTE per year plus \$900,000 of expenses per year
Cost Total: \$980,000 annually



PA 2. Advance Bus Rapid Transit in Oakland

(TLU-14) Support implementation of bus rapid transit (BRT) in Oakland along the Broadway and International Boulevard corridors while minimizing short-term potential impacts to neighborhoods and businesses.

Description: Establishing new fixed guideway transit service will be critical to reaching our emissions goals and fostering shifts from automobile travel to transit. Bus Rapid Transit (BRT) offers a significant opportunity to make transit easier, faster, safer, more reliable, and more convenient. The City is working with AC Transit to establish a 9.5 mile BRT system on these routes, from the San Leandro BART station to Oakland's Uptown. Service will run as fast as every five minutes during peak hours, and vehicles will be powered by hybrid electric or clean diesel.



City staff and consultants provide services on an as-needed basis to support, facilitate, and oversee the BRT project construction and operations. These resources are sufficient to support and oversee the BRT construction and operations from the City's standpoint.

Based on its experience with this initial BRT project, the City should consider other opportunities to advance BRT as a local and regional strategy.

Responsibility: Oakland Public Works

Status: The project is under construction and is being phased through various zones to minimize impacts to the community. Portions of project work are also being staged and scheduled over the next year and a half. Revenue service is expected to begin by late 2018.

Costs: The City's construction phase costs include \$1,450,000 reimbursable from AC Transit plus an additional \$230,000 in funding for staff in at least three different departments and technical consultants plus \$2,500,000 for business sustainability programs.
Cost Total: \$4,180,000

PA 3. Establish Alternative Mechanisms for Meeting Parking Requirements

(TLU-28) Develop regulations that would permit parking requirements to be met through alternative approaches demonstrated to reduce parking demand and GHG emissions.

Description: The City will seek resources to conduct a comprehensive review of parking policy regulations for new development. New regulations will be developed for parking requirements in the planning code pertaining to new development on private property. These regulations would permit parking requirements to be met through alternative approaches demonstrated to reduce parking demand and GHG emissions. These approaches may involve a range of transportation demand management strategies, including on-site car-share vehicles, secure bicycle parking and showers, and subsidized transit passes.

Responsibility: Department of Transportation, Planning and Building Department

Status: In 2016, the City amended its minimum parking requirements to reduce parking in most new developments. The new regulations removed minimum parking requirements and imposed parking maximums and mandatory car share spaces for all new developments in downtown; further reduced parking minimums in transit-oriented development zones; and adjusted requirements for nearly all other development and zoning types, including special requirements for affordable housing. In addition to these changes, in 2017 the new Department of Transportation launched a

three-year Demand Responsive Parking and Transportation Demand Management initiative, designed to maximize efficient use of parking through active management of the supply as part of a multi-modal approach to developing neighborhood transportation infrastructure and mode-shift.

Within the next five years, the City plans to conduct a study on the effectiveness and impacts of the 2016 parking regulations, and consider overhauling the residential parking program based on the results of that study.

Costs: 0.08 FTE for two years plus \$250,000 of expenses
Cost Total: \$285,000

PA 4. Plan for Electric Vehicle Infrastructure

(TLU-33) Participate in regional electric vehicle (EV) infrastructure planning and develop new processes to support local use of electric vehicles.

Description: The City will seek resources to address EV infrastructure planning and develop new processes to facilitate community adoption of EV technologies. The City is already partnering with other Bay Area cities and other partners in an effort to make the Bay Area the EV capital of the United States.

Achieving this vision will require planning and implementation of EV charging infrastructure in publicly accessible locations throughout the community, including industrial zones and transit village areas where infrastructure improvements are being contemplated. It will also require increased institutional capacity and changes, such as new permitting processes to enable private residents and businesses to install charging infrastructure.

The City will also seek to add EVs, plug-in hybrid vehicles and supporting charging infrastructure to the municipal vehicle fleet.



Responsibility: Oakland Public Works, Department of Transportation

Status: In 2014, the City hired an Energy Policy Analyst whose duties include securing resources to expand the City's electric vehicle infrastructure. Activities to date have included securing over \$250,000 in grants to install public EV chargers at City-owned public parking facilities; updating the City's building code to require enhanced EV charging infrastructure in all new construction; pursuing additional funding opportunities to advance a transition to EVs for hard-to-reach sectors including low-income residents, multifamily buildings, and medium-duty truck fleets; participating in regional working groups to advance EVs across the Bay Area; and working with local stakeholders to identify solutions for expanding the network of EV chargers.

Costs: 60 hours staff time per year
Cost Total: \$9,000 annually

Resource Needs: 48 hours staff time per year
Cost Total: \$7,000 annually



PA 18. Accelerate Completion of Bicycle and Pedestrian Plans

(TLU-16) Accelerate the completion of bicycle and pedestrian networks as noted in the Bicycle and Pedestrian Master Plans and other General Plan policies to provide safe, healthy transportation choices for all residents.

Description: The City is seeking resources to accelerate the completion of bicycle and pedestrian networks as noted in the Bicycle and Pedestrian Master Plans and other General Plan policies to provide safe, healthy transportation choices for all residents.

Improvements that would increase access to transit, transportation linkages, jobs, and commercial activity in disadvantaged neighborhoods are prioritized. The Pedestrian and Bicycle Plans already include processes for updating priorities to include new infrastructure opportunities.

Project development and personnel costs are largely funded by external grants. Additional external grants are available to support additional FTEs. The level of increased staff capacity recommended below would enable the City to double the amount of bicycle facilities it currently produces annually.

Over time, full implementation of the Bicycle Master Plan is projected to cost approximately \$38 million.^{xii} Full implementation of the Pedestrian Master Plan is projected to cost approximately \$109 million.^{xiii}

Status: As of late 2016, over 150 miles of bike lanes have been completed in Oakland, and nearly four percent of Oaklanders commute to work primarily by bicycle. The City is also welcoming the East Bay expansion of Bay Area Bike Share, with the installation of bike share stations and 850 bikes installed in Oakland in spring and fall 2017. The Draft Pedestrian Master Plan was released in April 2017, with Council adoption expected in June 2017. The City will initiate an update to the 2007 Bicycle Master Plan in 2017.

Responsibility: Department of Transportation

Resource Needs: Creation of 2.5 FTE positions offset by external funds to accelerate implementation, \$22,576,750 for the Bicycle Master Plan implementation through the end of 2019, and \$109,000,000 for Pedestrian Master Plan implementation
Cost Total: \$520,000 annually plus \$131,600,000 for implementation of the Bicycle Master Plan and the Pedestrian Master Plan

PA 19. Optimize Street Design to Support Transit, Bicycling, and Walking

(TLU-17) Optimize the design of streets to support transit, bicycling, and walking (e.g., via bulb outs, traffic signal synchronization, transit and emergency signal priority)

★ **Description:** The City will implement Oakland's Complete Streets Policy through a corridor development program that prioritizes pedestrians, bicyclists, and transit riders, to improve the safety and livability of key corridors across the city. This program will be cross-functional, including both planners and engineers, to develop, design, and implement complete streets projects. Supporting these efforts, the City will develop design guidelines and technical guidance on optimizing street design for transit, bicycling, and walking, including policy guidance on mode shift goals. The City will also establish a Signal Operations Unit and create a signal operations plan that prioritizes safety for all modes, including implementing pedestrian signal policy

To complete this item, a multidisciplinary team of six planners and engineers is needed to oversee planning, outreach, and project development. Additionally, four traffic engineering staff dedicated to managing the operations of traffic signals in Oakland to prioritize transit, biking, and walking will be needed.

- Status:** This action was added to the priority list in 2017. A project development team is proposed as part of the FY 17-19 Department of Transportation budget. The Department has initiated the development of design guidelines and anticipates completion by the end of 2017. A signal operations unit is also proposed as part of the Department's FY 17-19 budget.
- Responsibility:** Department of Transportation
- Resource Needs:** 10 FTE per year
Cost Total: \$1,740,000 annually

PA 20. Expand and Enhance Public Transit Service and Amenities

(TLU-19) Collaborate with regional partners to expand and enhance public transit service, interconnections, vehicle amenities, and associated facilities.



- Description:** In partnership with regional transit agencies (e.g., AC Transit, BART, shuttles, Amtrak, taxis, San Francisco Bay Ferry), the City will seek resources to expand and enhance public transit services and amenities. This may include smaller transit shuttles to underserved areas of the community, improved connection timing, and more.
- Status:** This action was added to the priority list in 2017. The City is already pursuing several projects that will enhance and/or improve linkages with regional public transportation infrastructure, including the Free Downtown Shuttle (see PA-2 / TLU-13), Bus Rapid Transit (PA-3 / TLU-14), and enhanced amenities along key BART stops. In 2016, the City's new Department of Transportation published its Strategic Plan, which lays out goals for a sustainable, responsive, and equitable transportation ecosystem including ensuring that Oaklanders feel safe walking and waiting for the bus at all times of day or night, creating a Complete Streets Corridor system, and planning and implementing fast, frequent and reliable transit.
- Responsibility:** Department of Transportation
- Resource Needs:** 240 hours staff time per year
Cost Total: \$33,000 annually

PA 21. Expand Car Sharing

(TLU-25) Explore potential strategies for increasing the availability of car share vehicles throughout the city (e.g., consider providing priority car share locations in high trafficked areas to car share companies willing to make car share vehicles available and accessible in less trafficked or underserved areas).



- Description:** The City of Oakland is working with car sharing organizations to make the public right of way and municipally owned parking lots and garages available for car sharing services as the City deems appropriate and in a manner that balances all modes of transportation. The City has established basic requirements to operate a car sharing service, and monitor feedback from Oakland residents about car sharing services. In planning and permitting car sharing services, the City has considered current and projected parking and accessibility conditions in both residential and commercial districts. The goal is to ensure that all residents, including seniors, people with disabilities, and disadvantaged residents, are served by this environmentally beneficial mode of transportation. The City intends to work with car sharing organizations so that all neighborhoods and communities have equitable access to car sharing services. The financial impact of administering a car sharing program should be cost neutral to the City.

Status: Oakland City Council amended the Municipal Code to include car share permits in support of the pilot program. The first free-floating car share operation was launched in April 2017, with the introduction of 250 car share vehicles by American Automobile Association's new Gig Car Share venture.

Responsibility: Department of Transportation

Resource Needs: 1 FTE per year plus \$439,769 in grant funding from MTC
Cost Total: \$210,000 annually plus \$450,000

PA 22. Impose Parking Maximums and Develop Strategies to Minimize Parking Need

(TLU-30) Impose parking maximums on new development and assist developers, lenders, property owners, and tenants in preparing strategies to minimize parking demand and encourage shifts to transit and other transportation modes.



Description: The City will continue to seek resources and study possible strategies to expand the areas where parking maximums are imposed, and work with multiple stakeholders to identify additional strategies to reduce the need for parking.

Status: This action was added to the priority list in 2017. In 2016, the City imposed parking maximums in Downtown of 1.25 spaces per residential unit. A suite of additional strategies have been applied in Downtown to reduce the need for parking, including requiring building owners to provide transit passes for tenants in all new developments, unbundling the cost of parking from residential rent, and requiring car share spaces in all new residential parking facilities. Parking minimum requirements were also lowered throughout the City, particularly in Downtown and along major transit corridors.

City Council asked staff to study the effects of the parking reductions on parking behavior, including how residential neighbors are being impacted by the changes. Council also directed staff to update the residential parking permit program, which does not currently address spillover from major corridors resulting from the new policies. In addition to pursuing these directives, the City will continue to explore ways of reducing the need for personal transportation, and the need for parking, throughout the City, including through parking regulations, incentives for alternate transportation modes, and enhancing strategic partnerships with regional transit agencies and others.

Responsibility: Planning and Building Department - Strategic Planning, Department of Transportation

Resource Needs: 0.08 FTE for two years plus 2 hours staff time per year
Cost Total: \$32,000 plus \$250 annually

PA 23. Call for Climate Action by Port of Oakland Tenants

(TLU-39) Call upon the Port of Oakland to establish GHG inventories and reduction goals associated with tenant activities, and plans for achieving those goals with appropriate tenant commitments, potentially including requiring specific high-impact GHG reduction measures (e.g., electrification of land-based aviation equipment and low-carbon electricity purchase for leased spaces).

Description: Beyond the Port's own operations, GHG emissions associated with tenant activities at the Port can be significant. Through relationships with its tenants (e.g., lease agreements), the Port can advance additional GHG reductions associated with tenant activities.

Status: The City and Port maintain dialogue on these issues via the City-Port Liaison Committee and peer-to-peer staff level discussions. While discussions have occurred at the staff level, no formal goal has been established.

Responsibility: City Council members and Departmental Staff

Resource Needs: 16 hours staff time
Cost Total: \$3,000

Electric Vehicle Infrastructure Requirements for New Multi-Family and Nonresidential Buildings



As of March 22nd, 2017, builders are required to provide the following levels of plug-in electric vehicle (PEV) infrastructure in all new multi-family and nonresidential buildings, including design for compliance with state Americans with Disabilities Act (ADA) requirements for PEV infrastructure. The new requirements are designed to accelerate the installation of vehicle chargers to address demand.

Table 1. New multi-family buildings with 3 or more units or non-residential buildings

	1 parking space	2-10 parking spaces	11-15 parking spaces	16-20 parking spaces	More than 20 parking spaces
Full Circuit	1 parking space	2 parking spaces	2 parking spaces	2 parking spaces	10% of parking spaces (rounded up)
Inaccessible Conduit Installed	Not applicable	Not Applicable	1 parking space	2 parking spaces	Multi-Family Buildings: Remaining 90% of parking spaces
					Non-Residential Buildings: Additional 10%
Electric Panel Capacity	Sufficient to supply 1 parking space	Sufficient to supply 2 parking spaces	Sufficient to supply 3 parking spaces	Sufficient to supply 4 parking spaces	Sufficient to supply 20% of spaces*

*Note: Full circuits are counted towards the panel capacity requirement. Panel capacity may be dispersed among up to 100 percent of spaces at lower amperage (see Definitions below) with a voluntary load management system.

Definition of Terms

Full Circuit — Full circuits are “ready to go” with the addition of an EV charging station. Full circuit installations include 208/240V 40-amp panel capacity, conduit, wiring, receptacle, and overprotection devices. The endpoint of the system must be near the planned EV charger location.

Inaccessible Conduit— Conduit that will be difficult to access or alter after construction (e.g. enclosed within walls or pavement, etc.). Accessible conduit must be installed during new construction to avoid expensive and intrusive retrofits when additional EV charging capacity is needed in the future.

Electric Panel Capacity — Panels must have space and electrical capacity to accommodate simultaneous charging on a 40-amp circuit per the required number of EV parking spaces in Table 1.

Load Management Technology — Whether via hardware or software, can be used to efficiently allocate electric current drawn by multiple electric vehicle charging stations (EVCS) by either directing full current to each EVCS in use (i.e., 40 amps per vehicle) or, when more vehicles than the maximum that can be served at 40 amps each are charging simultaneously, reducing the current drawn by each vehicle.

Plan Check

The City of Oakland does not require an Electrical Plan to be prepared; however, it is advised that the builder request a **Plan Check Review** to ensure compliance with the new PEV requirements and ADA design requirements before construction begins.

Labeling

Clear and permanent labeling is necessary to complete additional projects with full circuits in the future.

- Service panels must identify full circuits available for EV charging as **"EV Ready"**
- Service panels designated for future additional EV charging must be identified as **"EV Capable"**
- Conduit endpoints must be marked as **"EV READY"** (for full circuits) and **"EV CAPABLE"** (for empty conduit)

Four Levels of EV preparedness



Required Documentation

Construction documents for all projects must contain the following:

Electrical Panel:

- Verify panel allowable capacity
- Verify electrical system (including an on-site transformer if applicable) has sufficient capacity for charging

Conduit:

- Wiring schematics
- Conduit type
- Conduit termination point
- Proposed location of future EV spaces and EV charging stations

ADA Design:

- Plan for ADA-accessible parking spaces as required per standards in Table 2 (See below)

Exceptions

Case-by-case basis if EV charging infrastructure is not feasible due to:

Residential:

- If the requirements will result in modifications to the local utility infrastructure, and the costs borne by the homeowner or developer are more than \$400 per dwelling unit and \$400 per parking space, the building must maximize EV charging infrastructure compliance while remaining below the cost threshold.

Non-Residential:

- Insufficient electrical supply
- Utility-side cost increases by more than \$400 per parking space

If your facility qualifies under these exceptions, contact the Planning & Building Department for further consultation.

ADA Design Requirements

Beginning January 1, 2017, per section 11B-812 of Title 24 of the California Energy Code, Chapter 11B, new EVCS in buildings that are subject to Chapter 11B (Accessibility to Public Buildings, Public Accommodations, Commercial Buildings and Publicly Funded Housing) must comply with specific accessibility requirements.

Oakland code requires that original construction designs address key aspects of accessibility for future EVCS.

Builders must show that spaces equipped with full circuits are constructed to meet Chapter 11B **slope, accessibility, and path of travel requirements** at the time of construction. The number and type of spaces are shown in Table 2:

Table 2. Electric Vehicle Charging Stations for Public Use and Common Use

Minimum Number of EVCS Required to Comply with Section 11B-812**	Vehicle Type	1 - 4	5 - 25	26 - 50	51 - 75	76 - 100	101 and over
	Van Accessible	1*	1	1	1	1	1, plus 1 for each 300, or fraction thereof, over 100
	Standard Accessible	0	1*	1	2	3	3, plus 1 for each 60, or fraction thereof, over 100
	Ambulatory	0	0	1*	2*	3*	3, plus 1 for each 50, or fraction thereof, over 100

* Accessible EVCS designed for accessibility, but not reserved for exclusive use by disabled persons

**Where an EV charger can simultaneously charge more than one vehicle, the number of EVCS provided shall be considered equivalent to the number of electric vehicles that can be simultaneously charged

Questions & Contact Information

Do you believe your facility will be better served with Level One Chargers or DC Fast Chargers? Have any questions about the new ordinance? Need assistance complying with the requirements? Contact the City of Oakland Planning & Building Department:

Code Enforcement Services Complaint Submittals: (510) 238-3381

Inspection Scheduling: (510) 238-3444

Sustainable Oakland Report

2016 - 17



City of
Oakland

City Successes

BY THE NUMBERS

Oakland accomplished the following

4.5
miles of additional
bikeway were
constructed in 2016

3.3%
of all trips were made
by biking as of 2016

4.9%
of all trips were made
by walking in 2013

78%
of all trips to public
transit were made on
foot in 2015



1. Gig Car Share on the streets of Oakland | Photo: City of Oakland



2. Aerial view of Telegraph Ave | Photo: Joe Ferrera, Bike East Bay

1. Launch of the Bay Area's First Free-Floating Car Share Pilot Program

Oakland and Berkeley have made car sharing history with the pilot launch of the Bay Area's first free-floating car sharing service, and the nation's first one-way car sharing service that crosses multiple cities. Unlike typical round-trip car share services, the new Free Floating One-Way Car Share pilot program allows drivers to pick up a car in one place and drop it off in any other location within a designated "home zone." The inaugural permit-holder under this pilot is Gig Car Share, operated by AAA Northern California, which launched services on April 30, 2017 with 250 hybrid electric vehicles. The program is intended to improve transportation choice and flexibility, decrease the need for vehicle ownership, lower transportation costs, and expand public access to shared transportation options, all while lowering greenhouse gas emissions.

2. Planning Policies Expected to Facilitate Sustainable Development

The City of Oakland approved two major sustainable development policies that will promote the reduction of greenhouse gas emissions, enhance the City's multimodal transportation networks, and encourage efficient infill development. First, the City eliminated or reduced parking requirements for Downtown developments and along major transit corridors. These changes will considerably reduce the costs of development and discourage vehicle ownership, ultimately encouraging walking, biking, and use of public transit. Second, the study of potential environmental impacts related to transportation for new developments will now be based on the amount of driving people would need to do to access services or other destinations. Transit-oriented, infill development projects would be presumed to have no impact, while auto-oriented or suburban-style development would be required to mitigate impacts by increasing access to public transit, adding bikeways, or relocating to a more transit-rich location.

Secondary Unit Regulations Address Housing Shortage

In February 2016, Oakland City Council adopted revised Secondary Unit regulations to reduce the regulatory barriers to the development of Secondary Units, an important step in addressing the city's housing shortage and rising costs. In the nine months after the revised regulations became effective, the City issued planning approvals for 111 new Secondary Units, compared with only 26 in the preceding nine months. Subsequent changes to State law, aim to provide additional housing units through infill development along transit corridors to help reduce vehicle miles traveled per housing unit through increased transit usage.

Oakland Launches Department of Transportation

OakDOT was approved as a Department by City Council in FY 15-17, and began to coalesce in July of 2016 under interim leadership. The new department consolidated transportation-related functions from Oakland Public Works, the Department of Planning and Building, and the Oakland Police Department's Traffic Enforcement Division. OakDOT now has responsibility for a broad range of activities: street design and paving, sidewalks and stairs, pedestrian safety programs, bikeway design, parking management, shared mobility services (car share and bikeshare), lighting, street maintenance, signals, signs, parking meters, and meter enforcement.

The OakDOT's Strategic Plan focuses on achieving a more equitable, safer, vibrant, and sustainable city through a responsive and trustworthy government. Oakland voters recognized the need for significant street improvements, and in November of 2016 generously approved Measure KK (known as the Infrastructure Bond). This bond provides \$350 million to fund Citywide transportation projects, with a clear emphasis on meeting Oakland's paving needs. Delivery on the promise of this bond is the Department's number one objective.



Community Successes



1. Scraper Bike Team at the Ford GoBike Launch | Photo: Carissa Lee 2. Mural outside the recently purchased mixed-use building on 23rd Ave

1. Making Bike Share Accessible to All

In late 2016, nonprofit TransForm and the City of Oakland partnered to develop a shared mobility community engagement strategy called Oakland Mobility 101 (OakMob 101) – a collective approach to understand Oaklanders' initial perceptions of the City's forthcoming bike share and car share programs, slated to launch in summer 2017. OakMob 101 focused on engaging residents in East and West Oakland, the city's lower-income areas, where car share vehicles are virtually non-existent. TransForm was tasked with informing Oakland residents about new shared mobility services and how the City is working with outside companies to increase transportation options. TransForm also collected critical feedback from residents on barriers to accessing bike share and car share, to help the City understand how to best respond to community needs through its shared mobility programs. TransForm published its findings to inform ongoing efforts to bring the benefits of shared mobility services to those who need them most.

2. Oakland Community Land Trust Successfully Purchase Mixed-Use Space

Four local organizations cooperatively purchased a mixed-use building on 23rd Avenue in the first commercial real estate purchase by the Oakland Community Land Trust (OakCLT). The organizations are The Bikery, a community bike shop; Sustaining Ourselves Locally, a queer and trans people of color food justice co-op; Shaolin Life, a martial arts studio; and Liberating Ourselves Locally, a people of color-led makerspace. The groups partnered with OakCLT to create a financing package, with support from the POC Sustainable Housing Network, Sustainable Economies Law Center, and the Northern California Community Loan Fund. In addition to commercial space, the building contains eight residential apartments, all of which will become permanent affordable units.

Affordable Transit-oriented Housing Being Constructed

Currently under construction, Civic Center 14 TOD (transit-oriented development) is an eight story, 40-unit, permanently-affordable apartment community in Downtown Oakland. The new development is on a 6,800 square-foot formerly vacant lot at 632 14th Street. Western Community Housing, Inc. ("WCH") will coordinate services for the community, including English-as-a-Second Language classes, afterschool programs, individual case management, employment and training programs, and health services. WCH will partner with LifeLong Medical Care to provide a robust, permanent supportive housing program to improve the quality of life for homeless and special-needs adults. The LifeLong Supportive Housing Program (SHP) brings health and social services into subsidized affordable housing, so that tenants with histories of homelessness can achieve housing stability and improve their quality of life.



For more highlights and performance data, visit www.sustainableoakland.com

IN THE WORKS

SAN PABLO GREEN STREETS

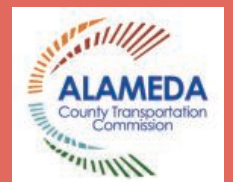
The San Pablo Green Streets Project will upgrade the bikeway on a portion of San Pablo Ave, installing Oakland's first bike lanes adjacent to back-in angle parking. Project features such as bioswales and other streetscape-enhancing filtration devices will clean stormwater runoff before it hits the Bay.

PEDESTRIAN MASTER PLAN

The City of Oakland has updated its Pedestrian Master Plan to reflect Oakland's changing conditions, needs, and priorities. The 2017 Pedestrian Master Plan Update was adopted by Council in June.

BIKE SHARE

The long-anticipated East Bay expansion of the regional Bike Share Program, Ford GoBike, launched in Summer 2017. A total of 850 bikes will be installed at 70 Oakland stations by the end of 2017. Bike Share is partly funded by grants from the Transportation Fund for Clean Air, a Bay Area Air Quality Management District program administered by the Alameda County Transportation Commission.



Find a station near you at bayareabikeshare.com



City Releases CONNECT, Philadelphia's Strategic Transportation Plan

For immediate release: October 10, 2018

Published by: [Office of Transportation, Infrastructure and Sustainability](#), [Office of Sustainability](#), [Office of the Mayor](#)

Contact: Kelly Cofrancisco, kelly.cofrancisco@phila.gov (215) 686-6210

PHILADELPHIA — On Walk to School Day at Gideon Elementary School, a City of Philadelphia designated Community School, City officials and partners today announced the release of the City's Strategic Transportation Plan, **CONNECT**.

Over the next seven years (2018-2025), CONNECT will set priorities for implementation and serve as the Administration's transportation framework. Informed by insights from data analysis and community engagement, CONNECT is based on the fundamental values of Safety, Equity, Opportunity and Access, Sustainability, and Health.

"Philadelphia has the highest poverty rate among the ten largest U.S. cities," said Mayor Jim Kenney "If we are to thrive as a City, we must take steps to ensure that growth benefits the lives and daily experiences of all of our residents — especially those who have been historically underserved and live in neighborhoods that have been disconnected from jobs and opportunities for far too long."

CONNECT contains five goals and accompanying strategies to reach its vision of a transportation system that benefits everyone:

- **Goal 0: Vision Zero** – Working toward the goal of zero traffic deaths by 2030.
- **Goal 1: Transit First** – Moving people equitably, affordably, and reliably around a growing city.
- **Goal 2: Great Streets** – Investing in well-maintained streets to serve people using all modes of transportation.
- **Goal 3: A Competitive City** – Supporting communities and commerce with a reliable and efficient transportation system.
- **Goal 4: Efficient Government** – Delivering transportation services and projects efficiently and transparently for residents.

As Philadelphia's population and economy continue to grow, driving new housing and commercial development to more parts of the city, our technology, travel and transit preferences are changing. In this dynamic environment, the time is right to reconsider the role of transportation in shaping the future of Philadelphia as a competitive, inclusive world class city.

"We have listened to the concerns of Philadelphians and have evaluated the data to better understand the transportation challenges and opportunities facing the City," said Deputy Managing Director for Transportation Michael Carroll of the Office of Transportation and Infrastructure Systems (oTIS). "CONNECT provides a framework for oTIS and our partners to save lives, connect residents to opportunity, reduce greenhouse gas emissions, build livable communities with great streets, strengthen the economy, and increase the efficiency of government."

"Philadelphia's new Transportation Plan embodies my vision for how we move people and goods on our statewide highway, transit, bicycle and pedestrian systems," said PennDOT Secretary Leslie Richards. "The early stakeholder involvement both in the City of Philadelphia and across the state is now the norm for my PennDOT Connects program whenever we initiate new projects with our local governments."

"Improved mobility benefits everyone," said SEPTA General Manager Jeffrey D. Knueppel. "SEPTA plays a key role in keeping the City moving by serving the residents and jobs that are here today, and we look forward to supporting more growth and economic activity in the future. The CONNECT plan is a crucial step in Philadelphia's continued progress, and SEPTA will be an integral part of this initiative."

"Accessible, affordable, and inclusive transportation is critical to the way our city moves, but also to our growth individually and collectively," said State Representative Donna Bullock. "Transportation initiatives like the Connect Plan isn't just about smart and targeted investments in infrastructure. It's also about a community-driven process that focuses on equity, inclusion, and economic growth. Affordable bike share programs, extended bus lines, and more frequent trains can connect residents to family, recreation, better jobs and schools, medical care and other resources."

CONNECT Week

During CONNECT Week, October 15-19, a series of announcements related to Philadelphia's Strategic Transportation Plan will be unveiled. Follow #ConnectPHL on Twitter for updates.

###