Reducing the Need to Drive Is a Win for Both Climate Change and Quality of Life

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The cleanest car trips are the ones that are never taken. Governments at all levels should keep this in mind when formulating strategies for reducing carbon emissions from their transportation sectors. So far, such strategies have focused primarily on electrifying the vehicle fleet. But we can cut total transportation emissions not only by converting to vehicles that do not burn fossil fuels but also by reducing the need to drive so much in the first place.

Enabling people to drive less would confer many other benefits that vehicle electrification alone cannot deliver, such as less traffic congestion, improved pedestrian and bicyclist safety, fewer expenses involved in owning a vehicle (especially important for lower-income households), more free time to spend on activities other than driving, less urban space devoted to parking lots, better public health as a result of more people using more active modes of transportation, and lower per-capita transportation infrastructure needs and the public expenditures they engender.

Changing our development patterns to make travel by automobile less of a necessity is not as intractable a problem as it may initially seem. By reminding us of a time before the car became dominant, New Jersey's many older urban centers, "streetcar suburbs," and other walkable downtowns, with their mix of destinations in close proximity and their well-connected street networks, can point the way to a less car-dependent future.

Ideally, New Jersey's greenhouse gas reduction strategy would be focused not only on reducing the carbon emissions from our vehicles but also on reducing the need for us to use those vehicles so much in the first place. The cleanest car trips are the ones that are never taken. Enabling people to drive less would confer many benefits beyond mitigating climate change.

Transportation: Our Climate-Change Achilles Heel

One of the basic aspects of human civilization is transportation—the need to move people and things from one place to another. Moving people and things from one place to another requires energy. When you walk, bike, ride a skateboard, or use some other means of non-motorized transportation, the energy that moves you comes from the calories in the food you eat, transformed into kinetic energy by muscles and lungs.

Most of our travel takes place in vehicles—the cars, trucks, buses, trains, planes, and ships that carry us and the things we use from one place to another. Moving all these vehicles requires a lot of energy, most of which is derived from the burning of carbon-based fuels, which in turn generates greenhouse-gas (GHG) emissions, along with a variety of air pollutants. The transportation sector accounts for the biggest share of total GHG emissions, both nationally, where it contributes 27 percent[1] of the total, and in New Jersey, where it is responsible for an even higher 34 percent[2] of total emissions.

Figure 1. Projected Greenhouse Gas Emissions for 2020 (GWP$_{100}$)
*In millions of metric tons CO_2e. Total net emissions 91.0 MMT CO_2e.*
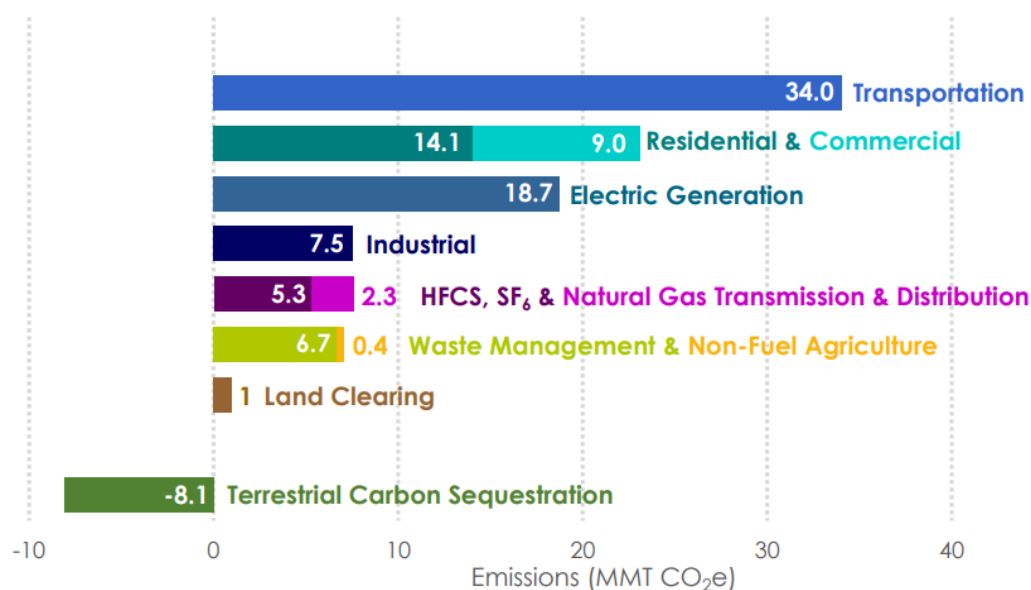
With improvements in other sectors of the economy reducing GHG emissions elsewhere, transportation is looking more and more like New Jersey's Achilles heel in the fight against climate change.

Decarbonizing Transportation vs. Driving Less

Greenhouse gas (GHG) emissions from the transportation sector are a function of both the kinds of vehicles people drive and how much they drive them. Total transportation emissions can be thought

of as the product of 1) the rate of greenhouse gas emissions for each mile of movement (emissions per mile) and 2) the total amount of movement of people and goods, measured by total vehicle miles traveled (VMT):

Transportation greenhouse gas (GHG) emissions = GHG emissions per mile × Total vehicle miles traveled (VMT)
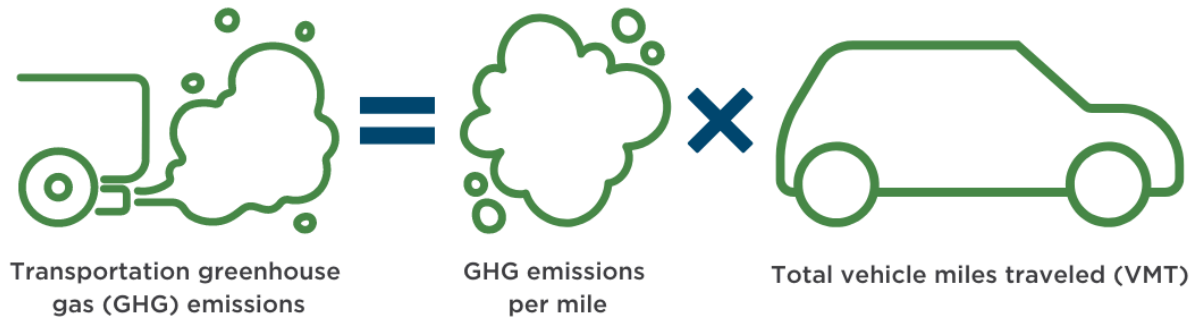
Recent policy discussions and government actions aimed at reducing GHG emissions have largely focused on vehicle electrification, both in New Jersey, nationally, and internationally. Electric vehicles reduce the first factor in the above equation (emissions per mile) by taking advantage of the fact that the energy needed to move a given number of vehicles a given number of miles can be generated more cleanly and efficiently at centralized electric power plants than it can in millions of individual internal combustion engines. This is especially true if we can increase the share of electricity that is generated from power sources like solar, wind, nuclear, and hydroelectric that do not generate carbon emissions.

But electrifying the vehicle fleet is a solution that would do nothing to address numerous other longstanding problems arising from our car-dependent travel behavior. Nor is vehicle electrification alone likely to get us to our GHG reduction goals. Luckily, it is not the only factor in the equation. To reduce total emissions, we can seek to change not only what kind of vehicles we drive, but also *how much* we drive. Driving less can be just as effective a strategy as driving an electric vehicle. For example, a 10 percent reduction in the number of vehicle trips, or in the average vehicular trip length, would produce the same decrease in GHG emissions as replacing 10 percent of the vehicle fleet with electric vehicles that are powered by a zero-emissions energy source—and 100% carbon-free energy is not on the horizon any time soon. And reducing the need to drive would also reduce road congestion, household expenditures on vehicle ownership, government expenditures on road construction and maintenance, and safety risks to non-motorized travelers, among other things – none of which electric vehicles can promise on their own.

Land Development Patterns and Travel Behavior

The amount that the average person drives is a direct function of where and how we build things. Decisions about where to put homes, offices, stores, schools, etc., in relation to each other have

profound effects on travel behavior; the farther apart we build destinations of different types, the more vehicular travel is going to be required to get from one destination to another. Conversely, as the compactness of development increases (as measured by people, jobs, stores, or other indicators of activity per square mile), car trips get shorter, and some trips can be taken without needing a car at all, whether by non-motorized means or by public transportation, which is more fuel efficient on a per-passenger-mile basis than the same number of people driving their own vehicles. For the entire second half of the twentieth century, we developed in a way that seemed designed to maximize the amount of driving people would need to do, putting homes, workplaces, and stores all in separate quadrants. There is no reason we need to keep doing things this way.

One need look no further than New Jersey's own 21 counties to observe the relationship between urban form and travel. Residents of the state's more urbanized counties like Hudson, Essex, Union, Bergen, and Camden, where cities and older suburban downtowns took shape before the automobile became the dominant mode of transportation, drive a lot less, on average, than residents of rural and exurban counties like Warren, Hunterdon, and Salem, where single-use zoning keeps different types of destinations far away from each other, necessitating car travel for just about every trip purpose. Consider the two ends of the spectrum: In Hudson County, with a 2019 population density of 17,077 people per square mile, the average person drives 9.5 miles per day, while in Hunterdon County, with a population density of only 287 people per square mile, the average person drives 44.4 miles per day—nearly five times as much as in Hudson County.[3]
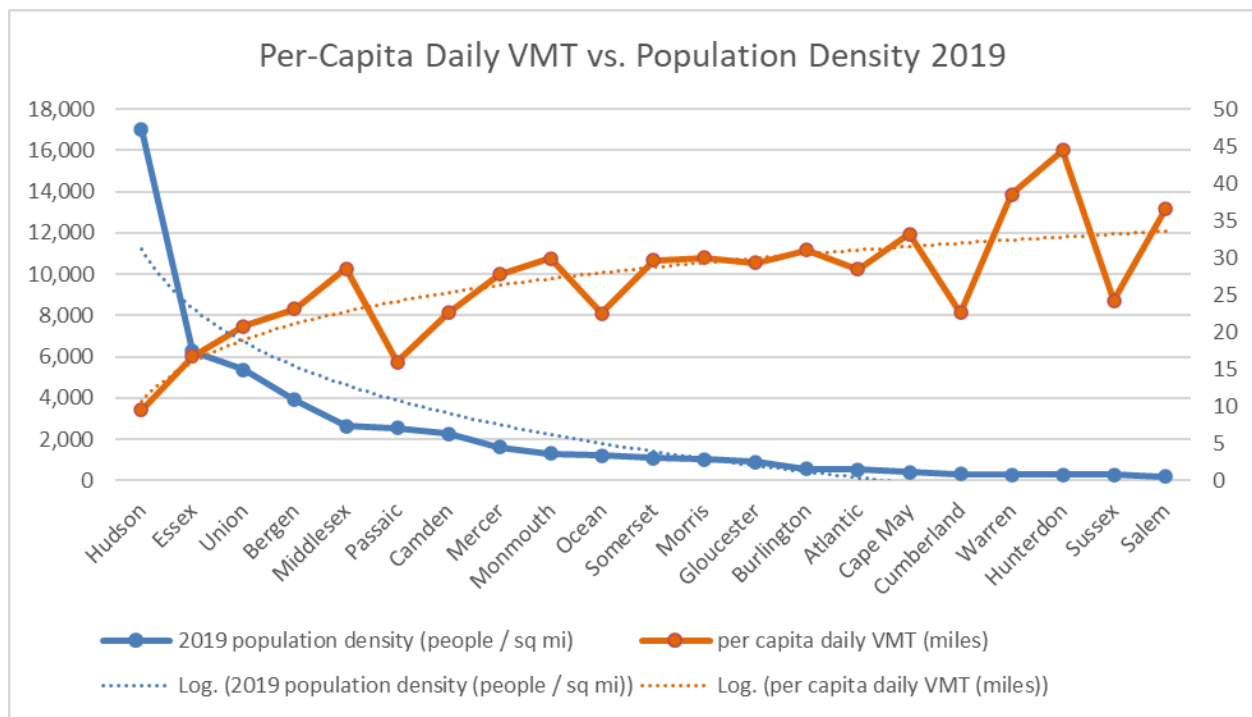
People tend to drive less in counties where destinations are closer together.

A land-use approach to reducing VMT would involve better configuring our building patterns so as to give people and businesses mobility and accessibility options that don't demand so much driving. It would mean building things closer together, reducing the distances required to travel among destinations. It would mean using redevelopment, infill development, and retrofits to create more compact, walkable, mixed-use and transit-connected places, where some trips can be taken on foot or by public transit, and where trip distances are shorter for trips that are still taken by car.

This does not mean that the developed parts of the state all need to look like very dense and transit-intensive Hoboken or Jersey City to realize major gains in GHG reduction. Plenty of smaller centers in all corners of the state offer residents opportunities to get around without needing to drive everywhere. For example, municipalities in which more than one in six commuters get to work by walking, biking, or public transit include Tenafly, Ridgefield Park, Maplewood, Westfield, Metuchen, Red Bank, Frenchtown, Princeton, Collingswood, Ventnor City, and Cape May. In other words, we could make a serious dent in vehicular travel simply by encouraging more growth that looks like the state's existing small cities and dense, walkable suburbs with good local street grids, traditional downtowns, and (sometimes) transit stations. The good news is that this type of development is what the market currently wants anyway, with the Millennial generation showing a distinct preference for living and working in places where they can walk to things. By creating more of it, we will offer more people the opportunity to drive less, emitting fewer heat-trapping gasses in the process.

Enabling Alternatives to Driving

If we want to reduce people's need to drive from one destination to the next, building destinations closer together is a necessary step. But it is not necessarily sufficient. If we want higher concentrations of activity and a greater mix of uses to translate into fewer and shorter vehicle trips, we need to make sure that alternatives to the car are safe and reliable. This means allocating more of our transportation spending to pedestrian, bicycle, and transit improvements and less to building or widening roads.

Transportation planners and traffic engineers tend to see their job as facilitating the unimpeded movement of vehicles—even in areas of high destination density where many trips can easily be taken on foot. A mixed-use downtown with a well-connected street grid may still induce people to use their cars for most trips if pedestrians do not feel safe crossing or walking along the street because the lanes are too wide, or vehicle speeds are too high, or sidewalks are directly adjacent to moving vehicles, or crosswalks are absent, or intersection geometry encourages drivers to make turns without slowing down long enough to look for pedestrians. In downtown areas, densely populated residential neighborhoods, and other activity centers, streets should be oriented primarily toward moving people rather than moving cars. In such environments, transportation professionals

need to design streets in a way that prioritizes pedestrians and other "active" transportation modes (e.g. bicycles, scooters) and de-emphasizes vehicle throughput.

The pedestrian environment is particularly important in areas served by public transportation, since everyone becomes a pedestrian as soon as they step off a bus or train. Transit-oriented development must also be pedestrian-oriented development. Part of the transportation budget needs to be devoted to creating and maintaining connections and amenities that facilitate non-motorized access to transit stations. And of course, public transit itself needs to receive its fair share of transportation dollars if it is to remain a viable alternative to driving.

The Many Benefits of Driving Less

Reducing GHG emissions by reducing the need to drive has the potential to pay dividends on other fronts that electric vehicles do not. Simply electrifying the vehicle fleet while preserving existing travel patterns would change nothing about the number of vehicles on the road, or the amount of space they take up, both while moving and at rest. Building communities that reduce the need to drive while increasing active and shared transportation options, on the other hand, results in less traffic congestion and less taxpayer money spent on expanding and maintaining the road network. It means people can spend less time behind the wheel and more time with family and friends, pursuing activities that improve their well-being. It means improving physical health as well, by allowing people to walk or bike more.

Higher concentrations of activity that allow people to visit multiple destinations in a single trip result in not just fewer cars on the road but less land devoted to storing cars while they sit idle, since each vehicle does not need to be stored anew at each destination. Reclaiming surface parking lots for other uses is a way for built-out towns with little remaining undeveloped land to build new housing and welcome new residents and businesses without needing to displace any existing development. Surface parking can also be converted to urban green space, providing greater opportunities for recreation and relaxation in nature, and better mental health, for urban dwellers.

A reduced need to drive also means a reduced need for vehicle ownership. In densely populated Hudson, Essex, and Passaic counties, more than half of all households are either car-free or car-light, owning at most one vehicle. In more spread-out Somerset, Hunterdon, and Sussex counties, fewer than a third of households get by with one or zero vehicles.

All of these things—less traffic congestion, lower household transportation costs, more housing options, more green spaces in developed cities and towns—are goals worth pursuing in their own right. The fact that they will naturally emerge as byproducts of a strategy to reduce the need for vehicular travel while remaining unchanged by vehicle electrification argues strongly in favor of

elevating VMT reduction to at least the same level of importance as electric vehicles in the broader effort to reduce the state's carbon footprint.

Advancing Equity

These additional benefits of a less car-dependent development paradigm are likely to accrue disproportionately to households near the lower end of the income scale. Reducing the need to own and operate private vehicles would represent an especially welcome increase in disposable income for lower-income households, who also tend disproportionately to be people of color. Transportation is the second-biggest component of household expenditures after housing, and in 2020, transportation costs consumed three times as big a share of household budgets for households in the bottom one-fifth of the income distribution as they did for those in the top fifth—28.8% vs. 9.5%.

As for the largest component of household expenditures—housing—New Jersey is a particularly expensive state. It ranks eighth in the nation in median home value and seventh in median rent, as of the most recent American Community Survey (2021). Taking advantage of redevelopment and infill opportunities to create more housing, and more affordable *types* of housing, in traditional centers that are already walkable or transit-oriented would make these places more accessible to households from all points on the income spectrum. This is especially important as demand for living in these centers ramps up, putting upward pressure on prices. Increasing the supply and diversity of housing options would also guard against lower-income households being priced out of some of the state's older cities as they experience new population growth pressure for the first time in decades.

Spending more of the state's transportation budget on public transit and less on roads would benefit lower-income households disproportionately, since these households are less likely to own a vehicle and more likely to rely on public transportation. The COVID-19 crisis has served to highlight the extent to which many "essential workers" in lower-paying service-sector jobs depend on transit as their only option, as ridership declined less in the areas where these workers live than it did on commuter rail systems serving mainly upscale suburbs or in central business districts hosting concentrations of white-collar office jobs that more easily lend themselves to remote work. In the wake of the pandemic experience, some metropolitan areas are even experimenting with making transit free, in light of its importance to those users of the transportation system who are least able to pay every time they travel. After all, drivers are not asked to pay tolls on every segment of the road network that they use.

How Do We Get There?

Changing our development patterns to make travel by automobile less of a necessity is a more abstract and multi-faceted undertaking than replacing a fleet of gasoline- and diesel-powered

vehicles with electric ones, but it is not as intractable a problem as it may initially seem. After all, compact, mixed-use, walkable towns were the default development pattern before the car came along, so plenty of models already exist. Here in New Jersey, the past winners of New Jersey Future's Smart Growth Awards illustrate a whole range of techniques for making places more walkable and less car-dependent. Whether it is the adaptive reuse of an old non-residential building in an existing downtown for residential purposes, or infill development on surface parking lots near a transit station, or the retrofitting of a suburban shopping center with new housing, or the ground-up construction of a whole new town center, New Jersey has no shortage of examples of how to accommodate new residents and businesses in ways that offer people the option of spending less time in the car. If these strategies were to be adopted at a broad scale, making compact, walkable cities and towns once again the default development model, they could enable New Jersey to meet its GHG reduction goals while yielding a host of other benefits that will not materialize simply from electrifying all of our vehicles.

In general, enabling people to spend less time in the car, reduce their costs of vehicle ownership, and shrink their carbon footprint will involve reconfiguring investment and regulatory policies to make the examples from the Smart Growth Award winners more the rule than the exception. Broadly, the state should pursue the following goals:

- Invest in our existing town centers, improving the pedestrian environment through better street design, so that density and mix of uses actually translate into fewer trips by car.
- Promote greater housing supply and diversity in centers, so that people of all income levels have the option of living in them. This will not only help retain members of the Millennial and Generation Z generations, who are attracted to in-town living but can't find it in New Jersey in places they can afford, but will also allow older generations currently living in car-oriented suburbs to downsize into more walkable environs as they age.
- Reorient transportation system design and spending to prioritize the movement of people over the movement of vehicles, instead of the other way around.
- Remove minimum parking requirements and devote less public space to vehicle storage.
- Ensure an adequate, dedicated funding stream for public transportation, so that transit can remain a viable and reliable alternative to driving.
- Facilitate non-motorized access to transit stations by improving connections to stations and creating amenities for active transportation modes along access routes.

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[1] Sources of Greenhouse Gas Emissions, U.S. Environmental Protection Agency (https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions)

[2] Greenhouse Gas (GHG) Emissions, New Jersey Department of Environmental Protection (https://dep.nj.gov/ghg/nj-ghg-inventory/)

[3] New Jersey's Roadway Mileage and Daily VMT by Functional Classification Distributed by County, Year: 2019 (https://www.nj.gov/transportation/refdata/roadway/pdf/hpms2019/VMTFCC_19.pdf)