



Exploring Climate Solutions Webinar Series

Brought to you by the Governor's Council on Climate Change (GC3)

Archive: <https://portal.ct.gov/DEEP/Climate-Change/GC3/Webinars>

Special series:

Equity and Environmental Justice in Climate Solutions



Transportation Equity and Climate Justice

Tony Cherolis, Transport Hartford Coordinator, Center for Latino Progress

Taylor Mayes, Connecticut Roundtable on Climate and Jobs

Maria Cecilia Pinto De Moura, Union of Concerned Scientists

October 1, 2020

2017 Connecticut Greenhouse Gas Emissions Inventory [\(link\)](#)

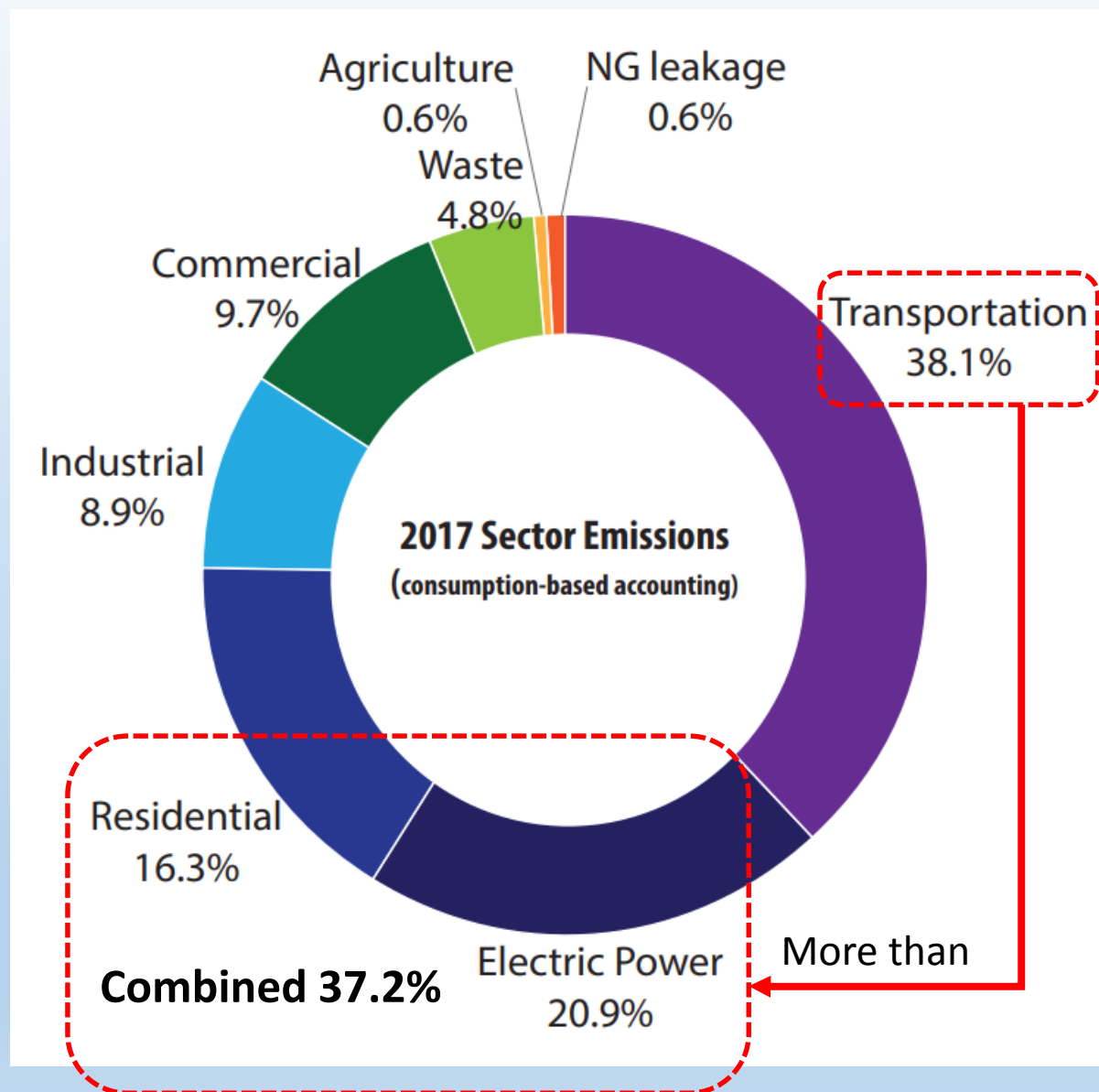
Transportation is the highest emitting sector

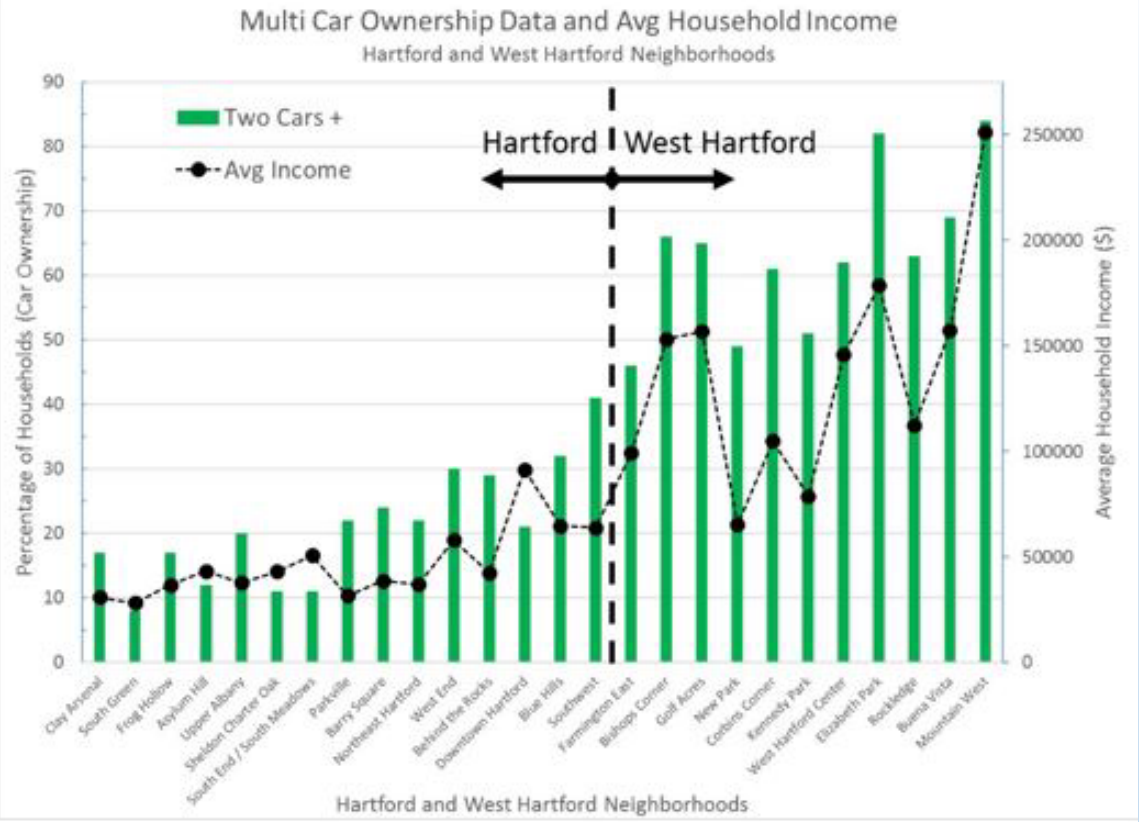
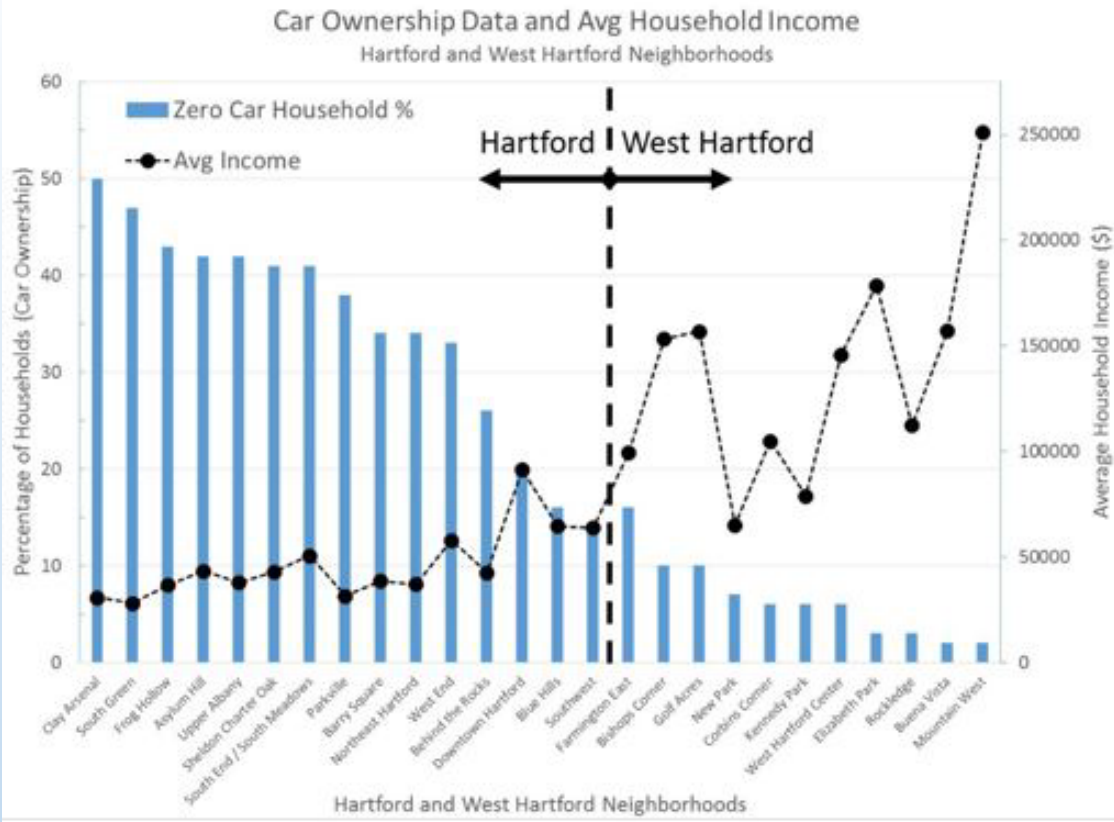
Since 1990, Connecticut has not made progress in reducing greenhouse gas emissions from this sector

How can this sector reduce emissions while reducing inequity?

Connecticut Emissions by Sector (MMTCO₂e)

	1990	2001	2016	2017
Transportation	15.6	17.8	15.4	15.5





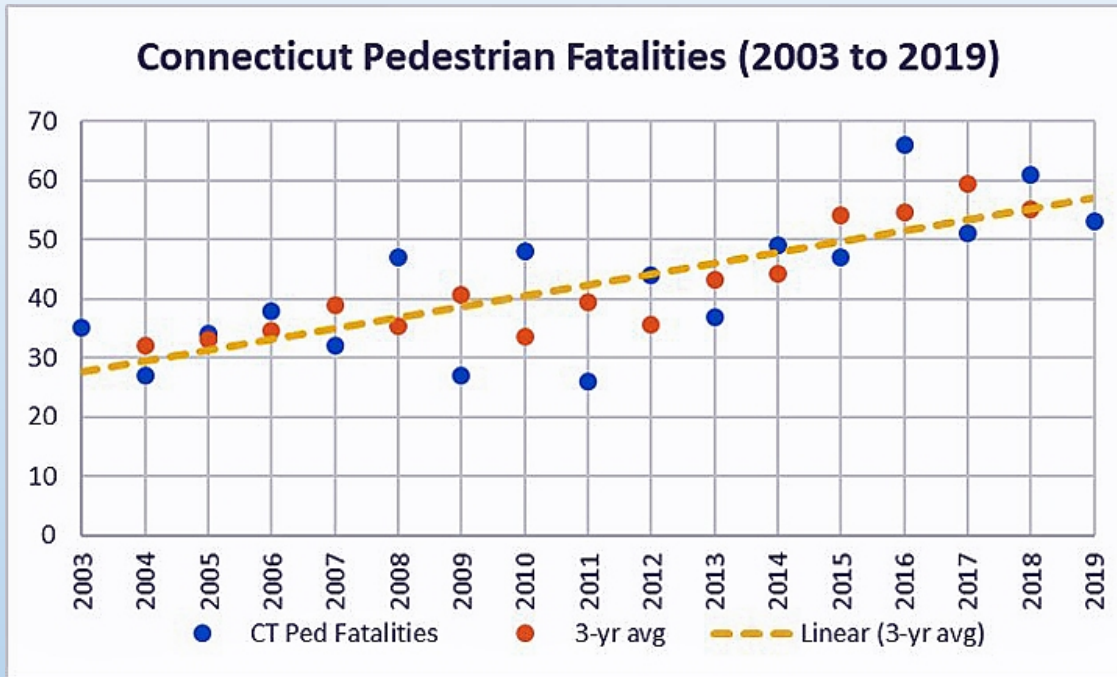
Note – Car ownership (or zero car ownership) tracks with average income. Surprisingly high % of zero car households in many Hartford neighborhoods.

Low Car Ownership Rate in Hartford Lines up With Resident Transportation Mode

- Hartford Walking Mode Share 8-9%
- Hartford Transit Mode Share 17% (bus riders have walking component)
- Hartford Bike Mode Share 1%

Safety for those outside of cars must be a priority

Connecticut has seen a steady rise in pedestrian fatalities



Crash fatalities in cities disproportionately impact pedestrians

Priority for speed and flow of cars results in less safety for those on foot




Frog Hollow Traffic Calming Pilot

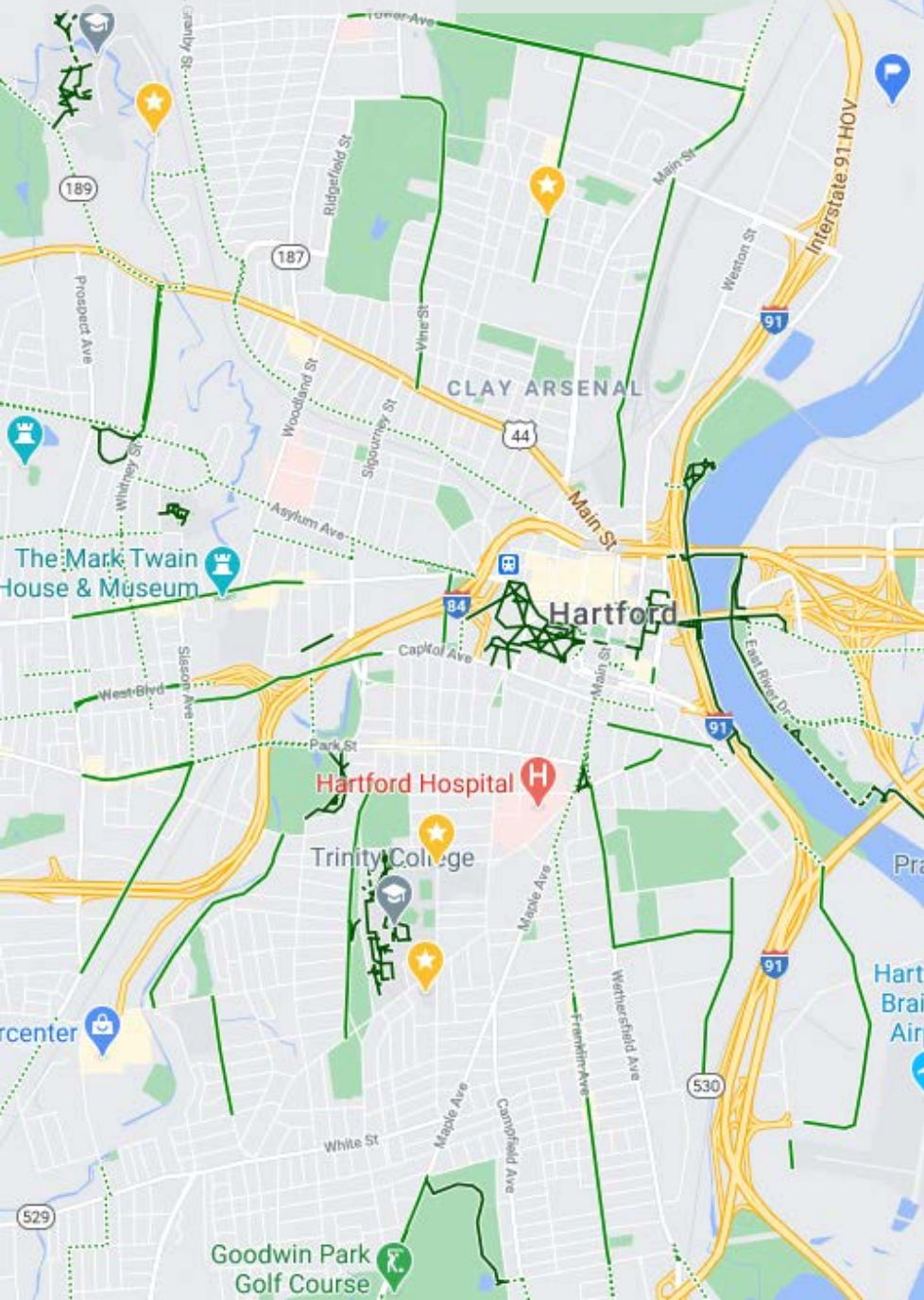
The City of Hartford Department of Public Works (DPW) will be testing traffic calming devices in Frog Hollow. The devices will be placed at the corners of Russ and Lawrence Streets, and Russ and Babcock Streets, in an attempt to make neighborhood streets safer.

NEW TRAFFIC PATTERNS

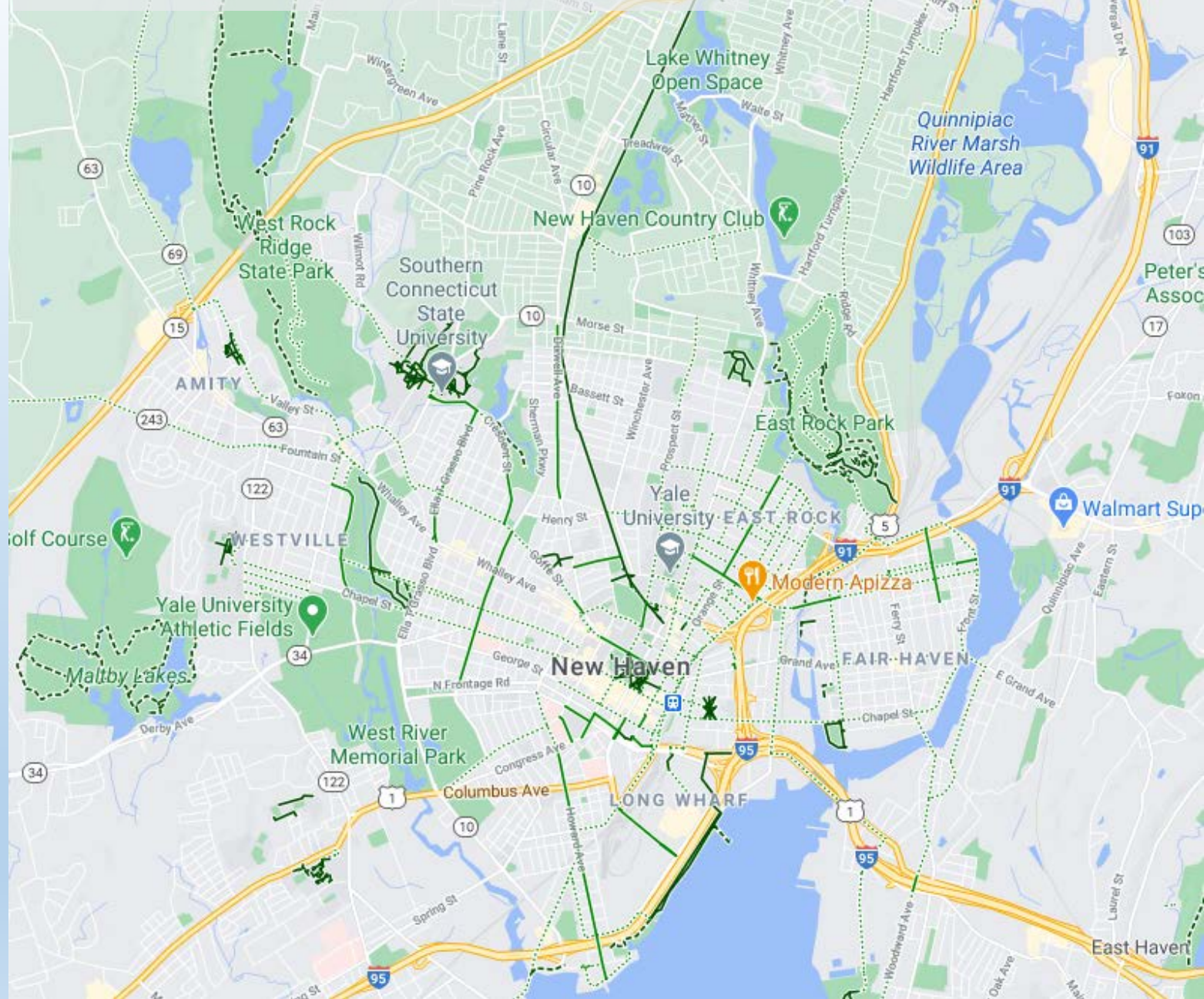
- Russ Street will become a one way from Broad to Putnam
- Drivers heading south on Lawrence Street from Capitol Avenue will have to turn right at Russ Street
- Drivers heading north on Babcock Street from Grand Street will have to turn left onto Russ Street
- Drivers heading west on Russ Street from Broad Street will have to turn left onto Lawrence Street
- Drivers heading west on Russ Street from Lawrence Street will have to turn right onto Babcock Street

43% of Households in Frog Hollow are Zero-Car

 **Hartford, 32% of Households with Zero Car**



New Haven, 29% of Households with Zero Car

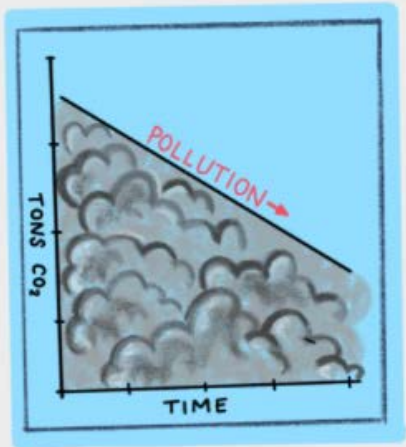


CT's lowest car ownership cities don't have connected bike route networks

Transportation and Climate Initiative

Cap-and-invest to reduce emissions from gasoline and diesel

1 CAP POLLUTION



2 POLLUTERS PAY



3 COMMUNITIES BENEFIT



35% of revenue (minimum) dedicated to projects that *benefit* overburdened and under served communities

Equity Advisory Body in each state, including residents

Annual reports will include equity projects and level of investment

[Get more info here](#)

Under the proposed policy, suppliers of fossil fuels will be required to both cut and pay for their pollution. States will invest these payments in clean transportation solutions that benefit communities.

CT CHEAPR Electric Vehicle Rebates

Focusing on EV cars is inequitable and not accessible by low income households

CT's electric vehicle rebate program provides state-level incentives to those purchasing electric vehicles.

Current Funding: \$3 million per year from a \$5 emissions reduction fee on vehicle registrations through 2025

Proposals to Update CHEAPR Rebates in 2021:

- Add low- and moderate-income (LMI) additional incentive for households making less than \$75k, or individuals making less than \$50k
- Add rebate for used EVs, but only applying to low- and moderate-income households
- Considering temporarily higher stimulus rebates in 2021 in response to reduced EV sales during the pandemic and underspending the 2020 budget

E-Bike Rebates – An [e-bike rebate pilot was proposed for 2021](#), but CT DEEP has defined an e-bicycle as “not a battery electric vehicle”





Equity considerations in the transportation section ([LINK](#))

- Labor and community-based organizations were at the forefront of the process
- Not a car-centric report, the recommendations are multimodal
- Benefits to low income households and overburdened communities throughout
- Detailed section on the Transportation and Climate Initiative (cap-and-invest)

Opportunity to review and comment on the draft report

- [Transportation topics are on pages 77 through 117](#) of the [Mitigation Strategies](#) report
- Email comments to deep.climatechange@ct.gov, **Due by Wednesday, Oct 21st**
- **Questions?** - Email tony_cherolis@ctprf.org, call 860-247-3227 ext 20

What is your vision for CT's Transportation Future?

TAKE THIS SURVEY



**TRANSPORT
HARTFORD**

CENTER FOR LATINO PROGRESS

[Learn more about Transport Hartford](#)

We need to understand what residents think, post pandemic

Air pollution from vehicles: who bears the burden?

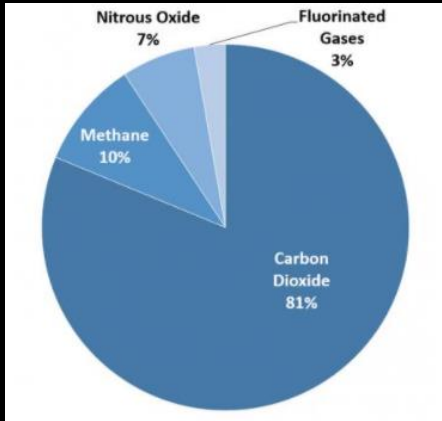


Maria Cecilia Pinto de Moura
Senior Vehicles Engineer

October 1, 2020

Climate and local emissions

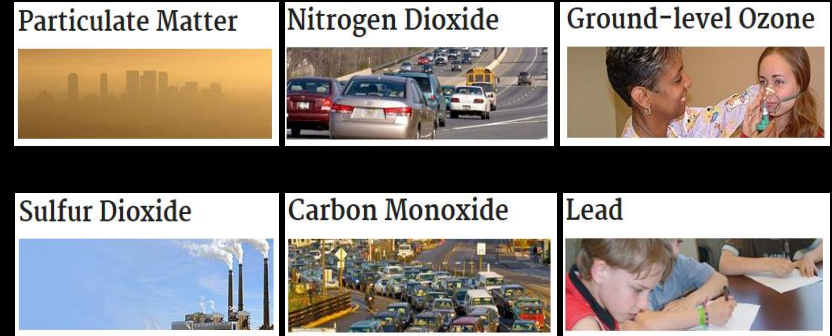
Greenhouse gases



Complex interactions



Criteria air pollutants



Greenhouse effect and global warming

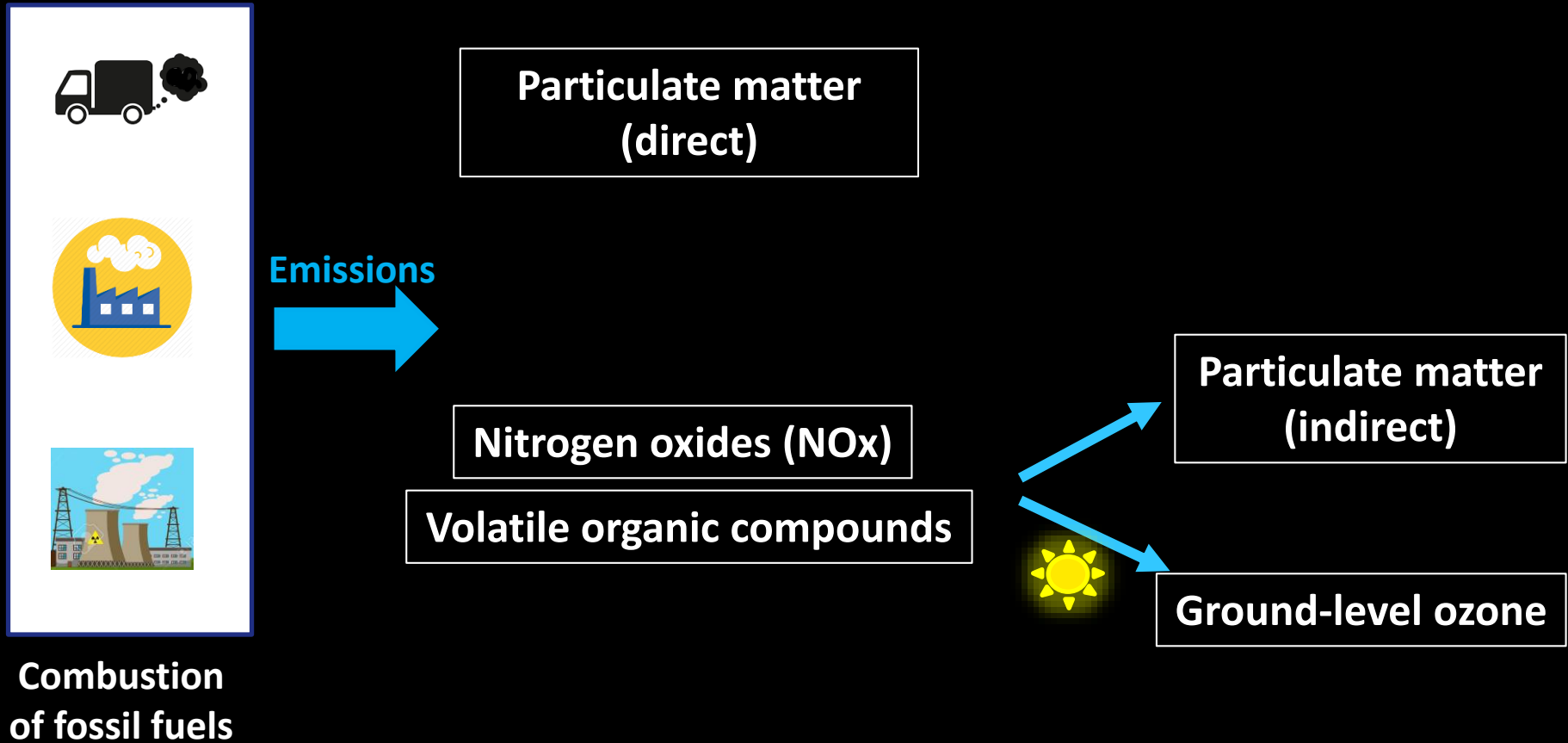
Local air pollution and health impacts

<https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

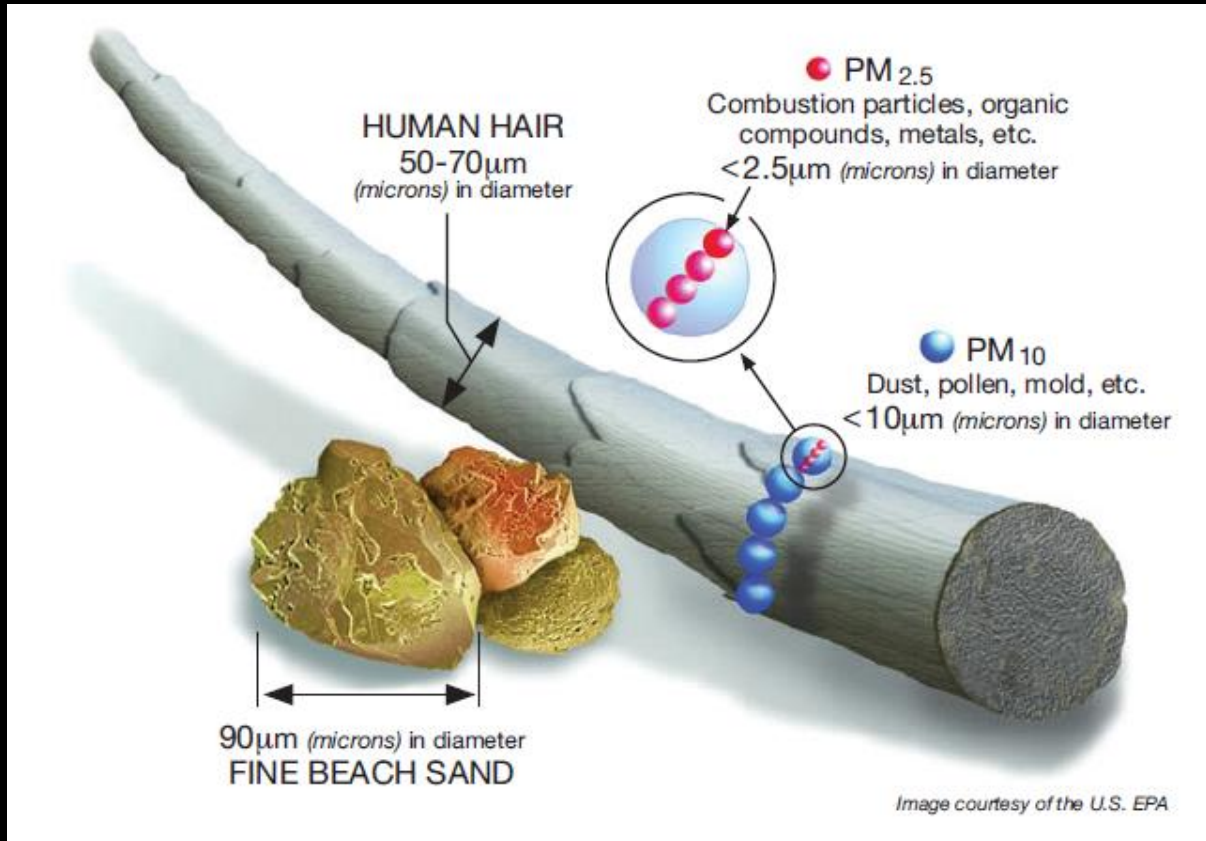
<https://www.epa.gov/criteria-air-pollutants>

Global warming is making it harder to protect human health

Air pollution creates more air pollution



Size matters



PM_{2.5} is about 30 times smaller than the diameter of a single human hair

- *The particles are small enough to penetrate deeply into the lungs*
- *The smallest can even enter the bloodstream*

PM2.5 pollution is responsible for:

- Almost all of the **3 to 4 million annual deaths** attributed to air pollution worldwide
- About **95 percent** of the global public health impacts from air pollution



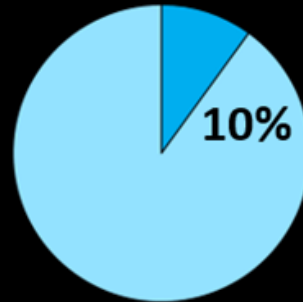
In the U.S., it is the largest environmental health risk factor, responsible for **63 percent of deaths** from environmental causes

- Increased risk of death from cardiovascular and lung diseases, including slow lung function in children.
- ✓ Increased risk of lower birth weight and infant mortality
- ✓ Link between prenatal exposure and autism
- ✓ Damage to nervous system, including cognitive effects

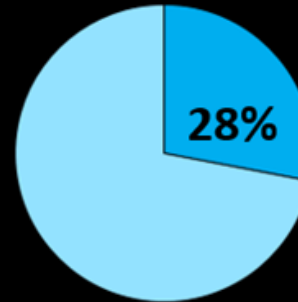
An increase of **1 $\mu\text{g}/\text{m}^3$** in long-term exposure to $\text{PM}_{2.5}$ is associated with an **8 % increase** in mortality from COVID-19 in the U.S

Emissions from heavy-duty vehicles in the U.S.

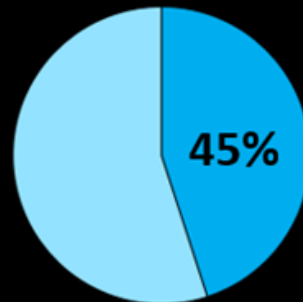
Vehicle population



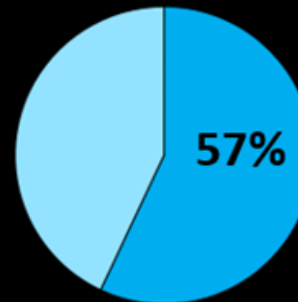
Vehicle GHG



Vehicle NO_x



Vehicle PM_{2.5} (primary)



Most major sources of diesel emissions, such as ships, trains, and trucks operate in and around ports, rail yards, and heavily traveled roadways. These areas are often located near highly populated areas.

<https://ucsusa.org/resources/ready-work>

<https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health>

Inequitable Exposure to Air Pollution from Vehicles in the Northeast and Mid-Atlantic

Who Bears the Burden?

HIGHLIGHTS

This analysis explores the significant contribution of cars, trucks, and buses to particulate matter air pollution in the Northeast and Mid-Atlantic and its disproportionate impact on communities of color. Clean transportation policies—such as those that encourage vehicle electrification, cleaner fuels, and reduced driving—will help lower these emissions. Additionally, policymakers should evaluate investments in clean transportation and other clean transportation solutions for their ability to reduce inequities in exposure to vehicular air pollution. Quantitative evidence of such inequities in the region's air pollution helps to inform such evaluations.

In the Northeast and Mid-Atlantic region, transportation is a significant source of both global warming emissions and air pollution (EPA 2019). The region contains four of the 20 US metropolitan areas that are most polluted by year-round fine particulate matter. This air pollution has a significant impact on the health of the region's residents, and varies greatly geographically and across different types of community. This analysis from the Union of Concerned Scientists (UCS) quantifies the formation of fine particulate matter from on-road vehicles in the Northeast and Mid-Atlantic, covering the District of Columbia and 12 states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia. The analysis identified the locations and populations most exposed to fine particulate matter by measuring its annual average concentration using a 2014 estimate of emissions as input data (EPA 2014).

Research links exposure to particulate matter smaller than 2.5 micrometers in diameter (PM_{2.5})—20 times smaller than even fine human hair—to increased illnesses and deaths, primarily from heart and lung diseases. The use of vehicles that burn fossil-based fuels in the Northeast and Mid-Atlantic directly produces PM_{2.5} and, at the same time, produces gases that lead to the formation of additional PM_{2.5}.

The UCS analysis of annual average PM_{2.5} concentrations due to cars, trucks, and buses in the Northeast and Mid-Atlantic finds that:



Millions of residents in the Northeast and Mid-Atlantic live near major highways and urban centers, and are exposed to high levels of vehicular air pollution; in certain New York City neighborhoods, pollution levels are 1.7 times higher than the regional average. People of color are disproportionately exposed to more of this pollution.

Union of Concerned Scientists

SEARCH

[BLOG] UNION OF CONCERNED SCIENTISTS

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Air Pollution from Cars, Trucks, and Buses in the US: Everyone is Exposed, But the Burdens are not Equally Shared

DAVE REICHMUTH, SENIOR VEHICLES ENGINEER | OCTOBER 16, 2019, 12:44 PM EDT

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Air pollution has significant impacts to public health and the cars, trucks, and buses on America's roads contribute to this problem. While we are all exposed to this pollution, there are significant differences in the average exposure to this air pollution by different racial groups in the U.S. and exposure also varies greatly depending on where in the U.S. you live.

Earlier this year, UCS modeled the exposure to vehicular air pollution in California and the Northeast and Mid-Atlantic region. We've now looked at the contiguous U.S. and we find similar trends for which people are most burdened by the most prevalent and harmful type of air pollution, fine particulate matter (known as PM_{2.5}). Our model results show that Asian Americans are, on average, exposed to

[TOPICS]

- Biofuel
- Energy
- Food and Agriculture
- Global Warming
- Nuclear Power
- Nuclear Weapons
- Science and Democracy
- Science Communication
- Scientific Integrity
- Tropical Forests

DAVE REICHMUTH is a senior engineer in the Clean Transportation Program, focusing on oil savings and vehicle electrification.

[READ DAVE'S POSTS >](#)
[MEET OUR OTHER BLOGGERS >](#)

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¿Quién respira el aire más contaminado por emisiones de vehículos en California?

MARIA CECILIA PINTO DE MOURA, SENIOR VEHICLES ENGINEER | FEBRUARY 5, 2019, 12:09 PM EDT

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Es bien sabido que los residentes de muchas ciudades grandes y los que viven cerca de autopistas principales respiran aire contaminado. ¿Quién no ha visto un bus o camión botando humo negro en el medio del tráfico urbano o en una carretera, o no ha oído aire sucio al caminar por las calles de una ciudad?

Coches, camioneros y autobuses emiten partículas finas que son lo suficientemente pequeñas como para penetrar profundamente en los pulmones e incluso en el torrente sanguíneo. Estas partículas pueden causar enfermedades cardiovasculares, ataques cardíacos, y el cáncer de pulmón, entre otras enfermedades. Se ha estimado que la contaminación del aire por partículas finas es responsable de la gran mayoría de las 3 a 4 millones de muertes anuales atribuidas a la contaminación del aire en todo el mundo.

[TOPICS]

- Biofuel
- Energy
- Food and Agriculture
- Global Warming
- Nuclear Power
- Nuclear Weapons
- Science and Democracy
- Science Communication
- Scientific Integrity
- Tropical Forests
- Vehicles
- Water

MARIA CECILIA PINTO DE MOURA is senior vehicles engineer for the Clean Vehicles program.

[READ CECILIA'S POSTS >](#)
[MEET OUR OTHER BLOGGERS >](#)

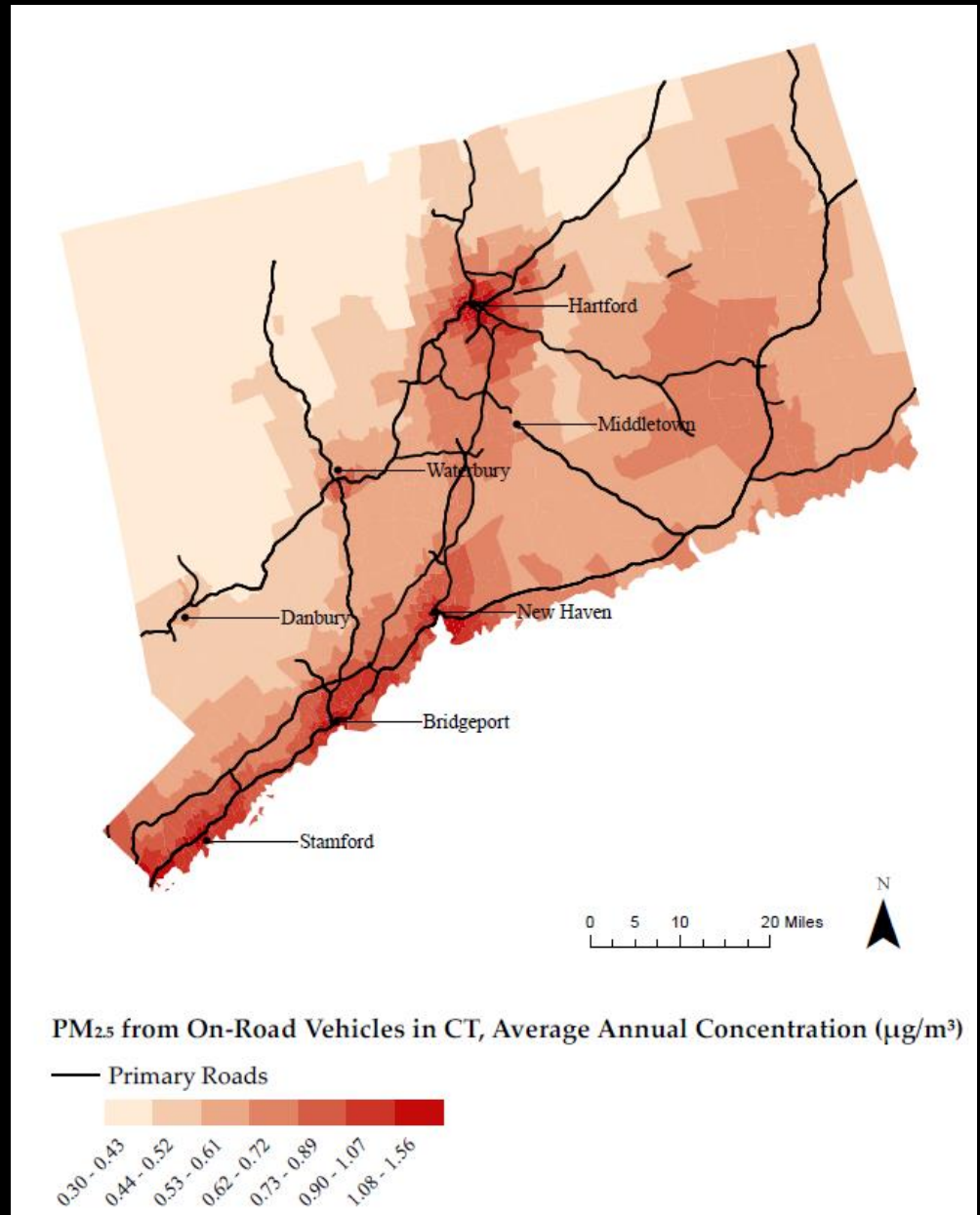
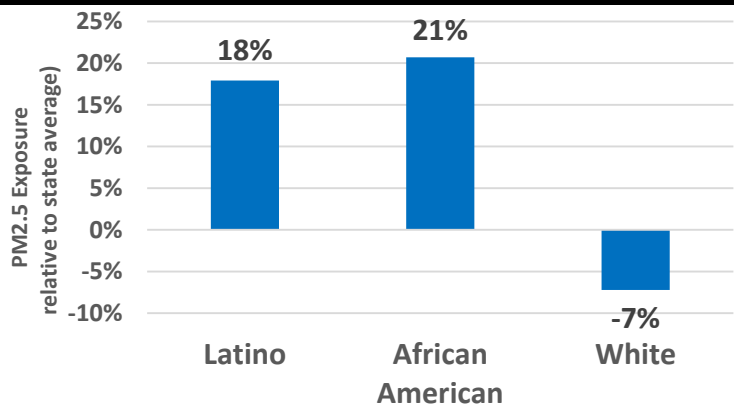
<https://www.ucsusa.org/sites/default/files/attach/2019/06/Inequitable-Exposure-to-Vehicle-Pollution-Northeast-Mid-Atlantic-Region.pdf>

<https://blog.ucsusa.org/dave-reichmuth/air-pollution-from-cars-trucks-and-buses-in-the-u-s-everyone-is-exposed-but-the-burdens-are-not-equally-shared>

<https://blog.ucsusa.org/cecilia-moura/quien-respira-el-aire-mas-contaminado-por-emisiones-de-vehiculos-en-california>

PM_{2.5} exposure in Connecticut

Disproportionately high exposure for people of color



What are some of the drivers of air pollution inequity?

➤ Residential segregation

- Housing market dynamics

➤ Other segregation

- Communities and individuals have distinct vulnerabilities and adaptation responses
- Impact of pollution on particular individuals

➤ This is a very complex subject!

CO₂ mitigation policies reduce local air pollution and have many other benefits

Union of
Concerned Scientists

FACT SHEET

Reducing Emissions from Transportation in the Northeast and Mid-Atlantic

HIGHLIGHTS

Our transportation system—how we move people and goods around—is outdated, inefficient, costly, and unhealthy. Our gasoline- and diesel-burning vehicles are not only a major source of air pollution but also the largest source of climate pollution in the Northeast and Mid-Atlantic, responsible for almost 40 percent of regional emissions. By investing in three proven technologies—vehicle efficiency, electric vehicles, and clean fuels—the region can reduce spending on petroleum-based fuels by more than \$1 trillion by 2050 while dramatically reducing pollution, improving public health, and saving consumers money. Together with ambitious efforts to provide better transportation options and affordable housing near transit, clean vehicles and clean fuels can help create the clean, equitable, and modern transportation system needed in the Northeast and Mid-Atlantic.

We can cut oil use, reduce climate and air pollution, lower costs for consumers, and strengthen our regional economy by investing in three proven strategies: increasing vehicle efficiency; transitioning to electric cars, buses, and trucks; and shifting to cleaner fuels. According to a new analysis for the Union of Concerned Scientists (UCS) by M.J. Bradley and Associates,¹ the states in the Northeast and Mid-Atlantic region can:

- Cut climate-damaging carbon dioxide (CO₂) pollution from on-road transportation by 37 percent in 2030, relative to 1990 levels, and by 78 percent in 2050.
- Reduce consumer spending on gasoline and diesel fuel by more than \$125 billion by 2030 and more than \$1 trillion by 2050.²
- Improve air quality, leading to more than \$3 billion in cumulative avoided health impacts by 2030 and more than \$30 billion by 2050.²
- Save almost \$25 billion in environmental damages region-wide by 2030 and almost \$195 billion in 2050, by diminishing the risk of property damage from extreme climate events, preserving ecosystems, and avoiding climate-related changes in agricultural productivity, among other benefits.

Together with efforts to provide residents with more transportation options through investments in public transportation, walking and biking infrastructure, and affordable housing near transit, these investments in clean vehicles and fuels can put the region on track to build a clean and modern transportation system. Furthermore, by directing investments toward the communities that need them the most, the region can make its transportation system more equitable (see the box, p. 2).



Massachusetts' Pioneer Valley Transit Authority is just one of a growing number of companies turning to electric vehicles in their fleets. These vehicles not only cost less to operate compared with their conventional counterparts, but also play a major role in reducing carbon emissions and air pollution in the region.

Climate target in study:
40% reduction in CO₂ by 2030
80% by 2050
(relative to 1990)

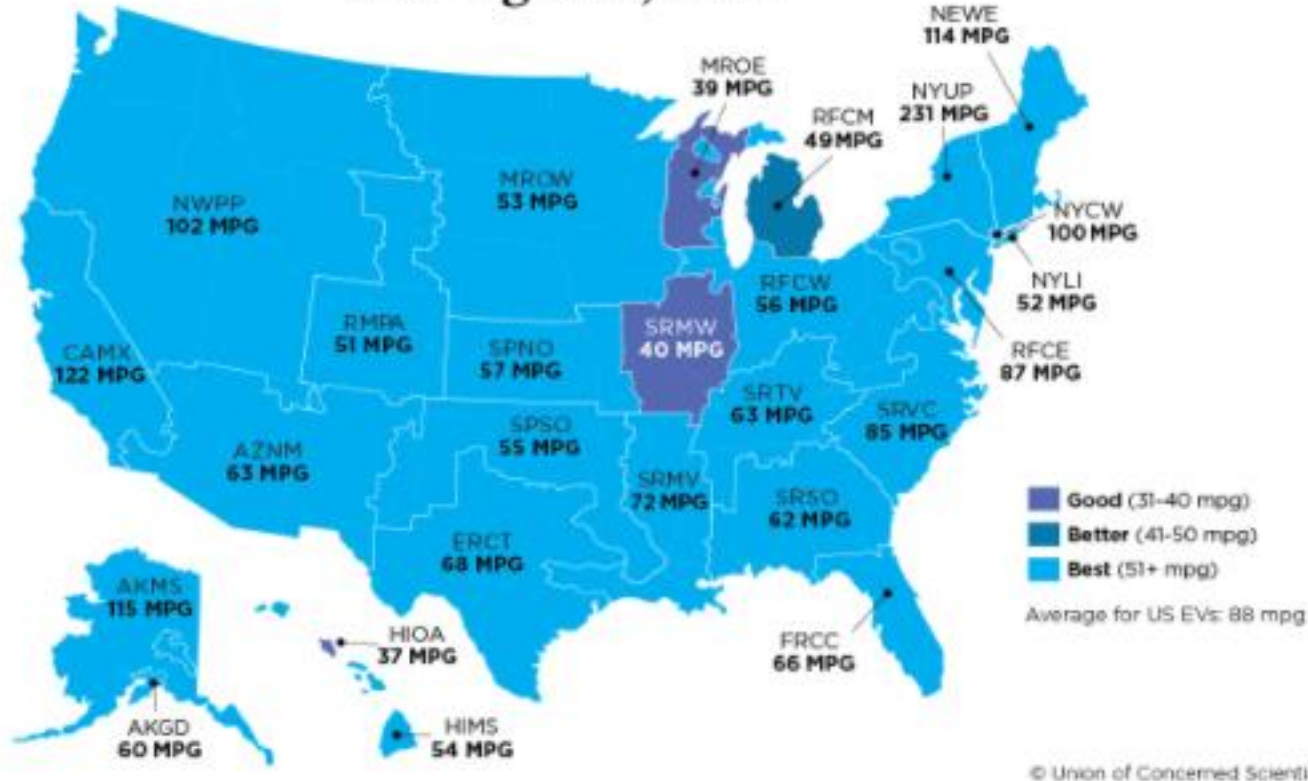
Benefits of a climate policy in CT

		CLIMATE MITIGATION STRATEGY	2030	2050
Investments		Vehicle technology	-\$2.91	-\$12.60
		Charging infrastructure	-\$1.19	-\$9.20
		Incremental electricity cost	-\$3.64	-\$27.28
		Low carbon fuel standard	-\$1.09	-\$3.06
		Low carbon grid	\$0.02	\$0.69
Revenue		Gasoline and diesel savings	\$6.66	\$53.78
		Utility net revenue from EV charging	\$1.15	\$7.19
		Monetized GHG mitigation	\$1.29	\$10.09
		Monetized NOx reduction	\$0.06	\$0.60
		Monetized PM2.5 reduction	\$0.10	\$0.90
		Net investment	-\$8.81	-\$51.46
		Net revenue	\$9.25	\$72.56
		NET FINANCIAL + ENVIRONMENTAL BENEFITS	\$0.44	\$21.10

Are EVs really better for the climate?

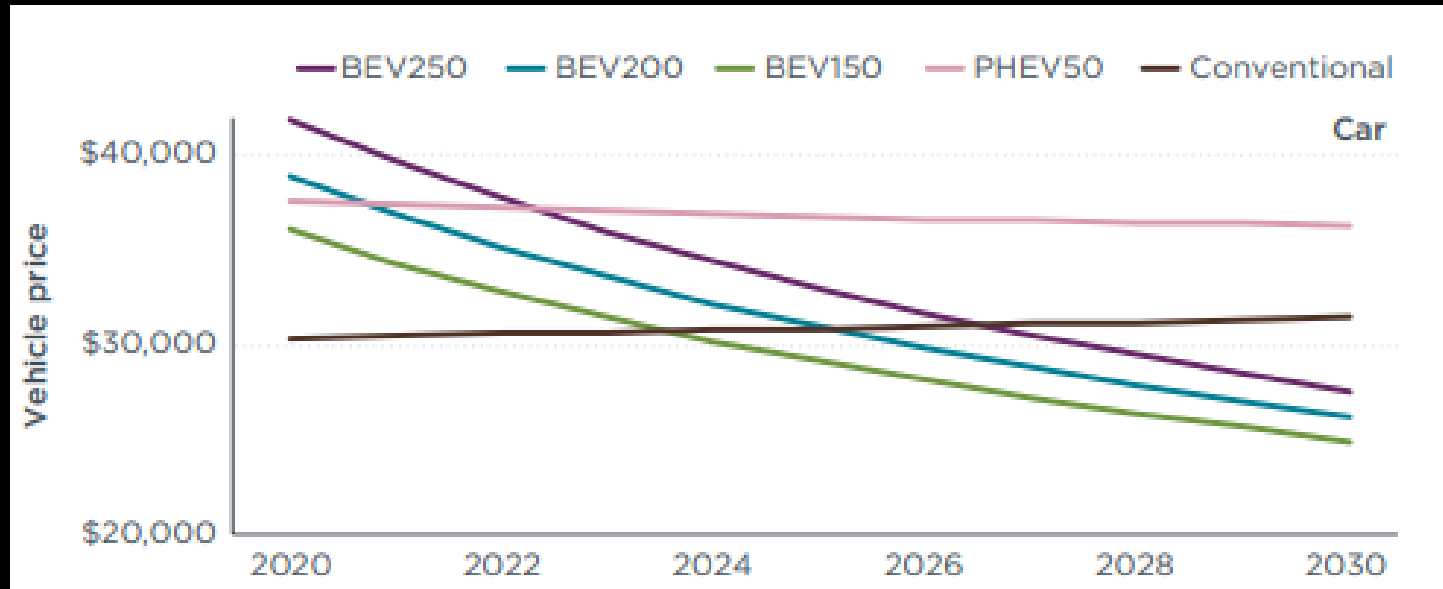
94 percent of people in the US live where driving an EV produces less emissions than using a 50 mpg gasoline car.

EV Emissions as Gasoline MPG Equivalent Average EV, 2018



Are EVs affordable for everyone?

EVs will see big cost reductions



EVs are much cheaper to fuel and maintain:

- Even with today's relatively low gasoline prices, every electricity provider surveyed in the 50 largest US cities offers a rate plan that would save the average EV owner on fuel costs, with median annual savings exceeding \$770.

Should we be concerned over used EV batteries?



Used batteries, once removed from a vehicle, are considered hazardous waste

Recycling and second use are beneficial for the environment

In order to enable widespread reuse of EV batteries, policy will play an important role in reducing barriers and ensuring responsible, equitable, and sustainable practices.

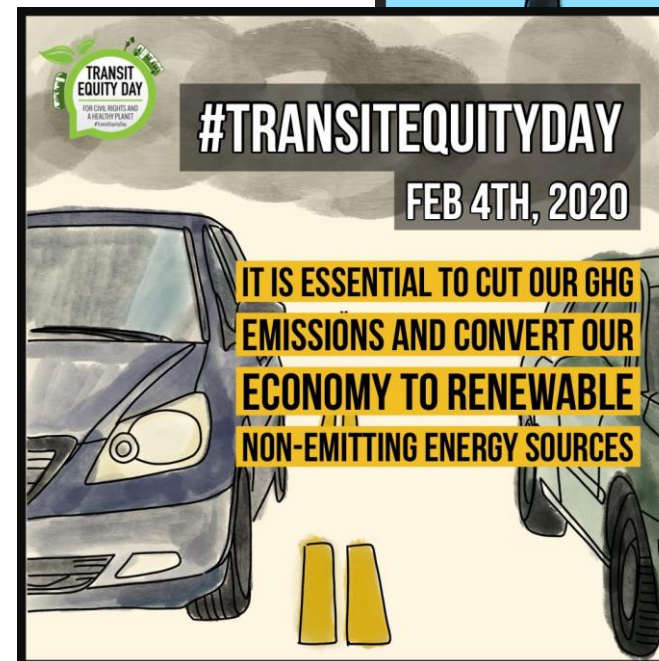
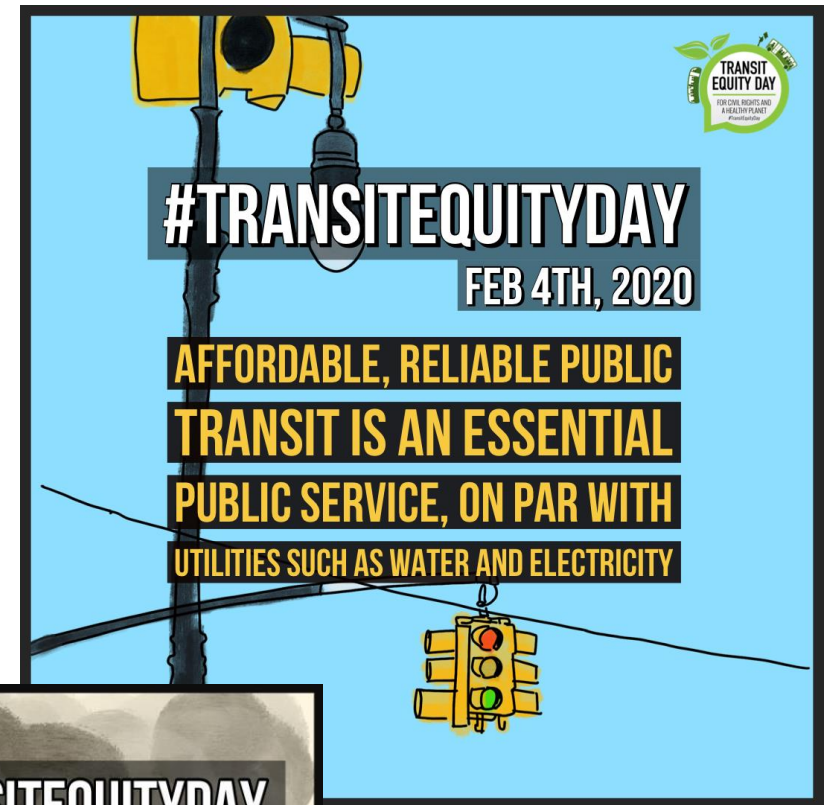
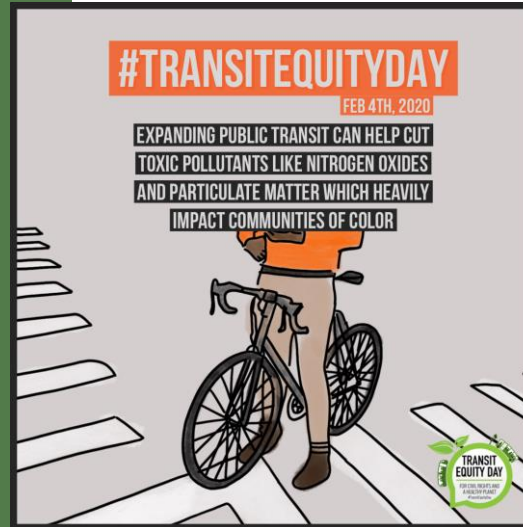
<https://blog.ucsusa.org/hanjiro-ambrose/a-quick-guide-to-battery-reuse-and-recycling>

<https://blog.ucsusa.org/hanjiro-ambrose/the-second-life-of-used-ev-batteries>

Thank you!

Essential Workers and Transportation Justice

Presentation by Taylor Mayes,
Communications Coordinator for CT
Roundtable on Climate and Jobs



Connecticut Roundtable
on Climate and Jobs

About the Roundtable

The Connecticut Roundtable on Climate and Jobs seeks to build alliances among diverse constituencies to combat climate change, create jobs and promote racial, economic and environmental justice.

Our primary focus areas regarding climate have been around the expansion of Offshore Wind and Transportation Equity (and of course you will all know that John was actively involved in the GC3).

You can learn more about our work and partners at <https://ctclimateandjobs.org/>



**Protect the Climate
Work for Justice**

Our Platform

Climate change is a global crisis that is affecting people's lives and livelihoods and threatens the health and economic stability of Connecticut's communities.

The Connecticut Roundtable on Climate and Jobs builds alliances among diverse constituencies to combat climate change.

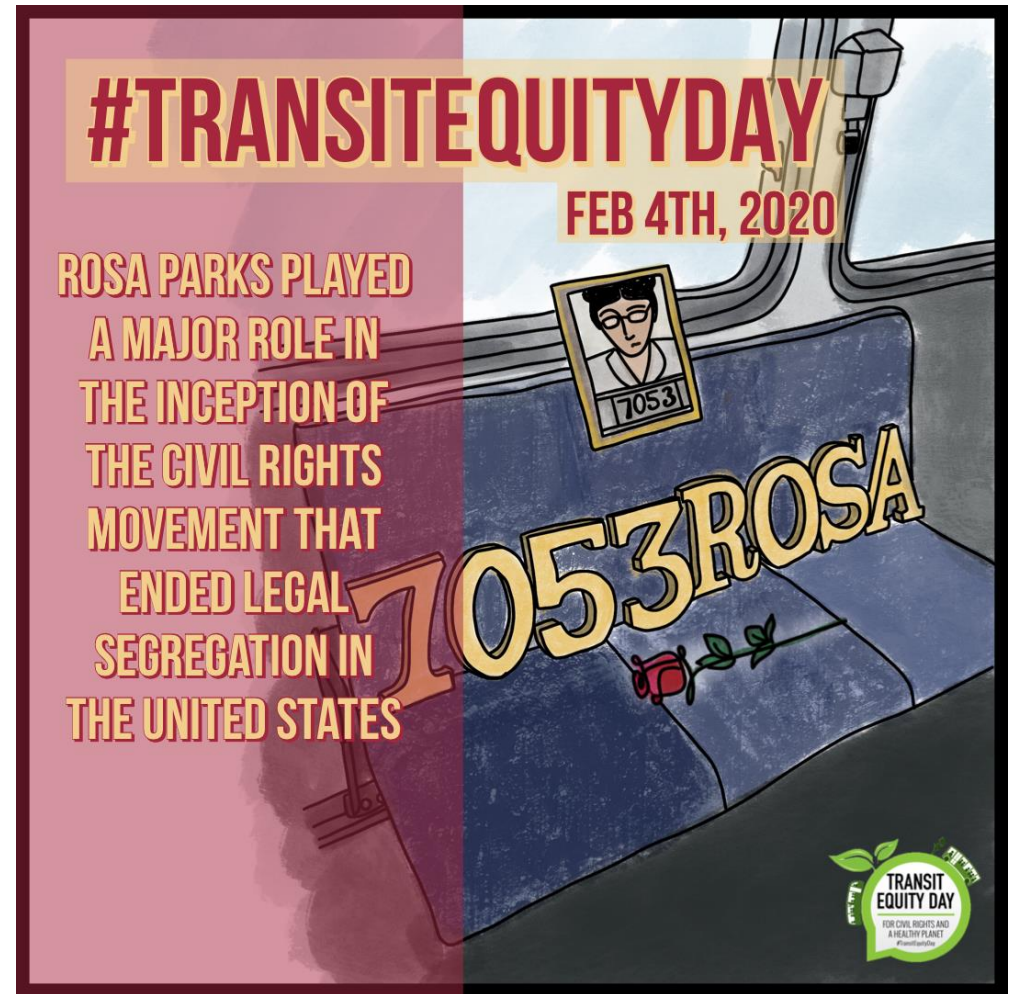


**Connecticut Roundtable
on Climate and Jobs**

Major Take-Away

(From Two Years of Organizing Transit Equity Day Events)

- Transportation is an issue of **Civil Rights**.
- We need to think *holistically* about the impacts transportation has on access to employment, healthcare, polling sites*, education opportunities, libraries, green spaces...
- Which is part of the reason why we continue to highlight and celebrate Rosa Parks as a key figure in the modern-day movement for Transportation Equity.



Transportation / Jobs Apartheid [New Haven]

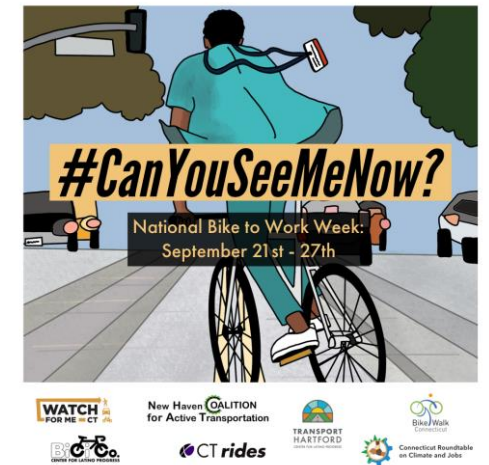


**BLACK
LIVES
MATTER**

We know that transportation provides access to opportunity and serves as a key component in addressing poverty, by providing avenues to good paying jobs and employment opportunities

Greater New Haven NAACP 2013 Report on Urban Apartheid:

- *The lack of reliable public transportation, combined with the sprawling distribution of jobs across our metropolitan area, may be the largest barrier that residents face in accessing employment.*
- *In New Haven County, African-American workers are 6X more likely to rely on public transportation than non-minority workers. A very large share of our younger residents and low-income families are unable to afford a reliable vehicle, and many elderly or disabled residents are unable to drive.*
- *To illustrate, a recent Brookings Institution analysis showed that the average resident of the New Haven Metropolitan Area was able to reach only 27% of the area's jobs within a 90 minute commute by public transit.*



Underfunded Bus Transit

Connecticut continues to fail to invest in a robust bus transit system but instead continues to funnel resources into expanding interstates and state routes.

Completed but Not Funded Recommendations:

- **Hartford** - [Hartford transit improvement plan](#) from 2016/2017.
- **New Haven** - The [Move New Haven transit plan](#)

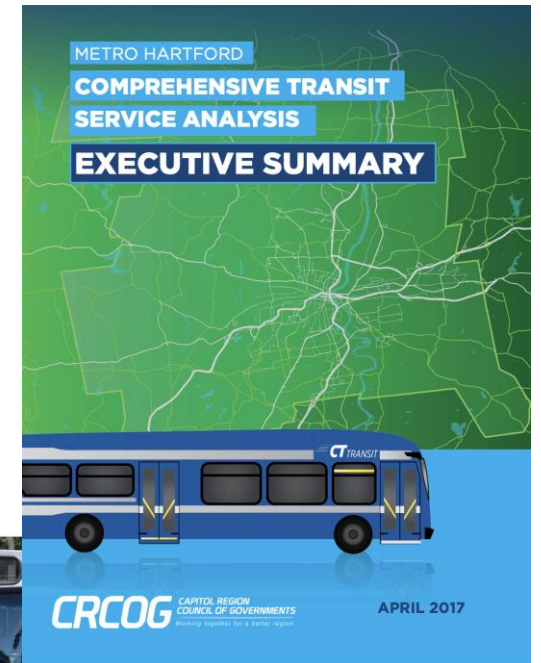
While skipping transit system investments, the state is still planning expensive interstate widening projects for I-84 and I-95, along with converting Rt 9 through Middletown to a full speed interstate.



NEW HAVEN COALITION FOR ACTIVE TRANSPORTATION



TRANSPORT
HARTFORD
CENTER FOR LATINO PROGRESS



MOVE NEW HAVEN TRANSIT MOBILITY STUDY
FINAL REPORT

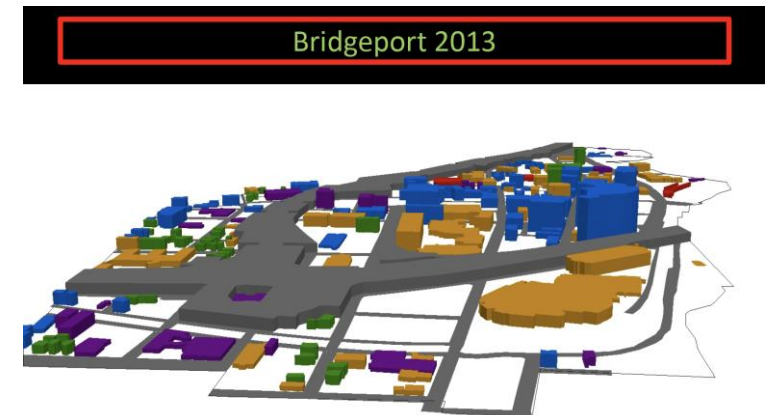
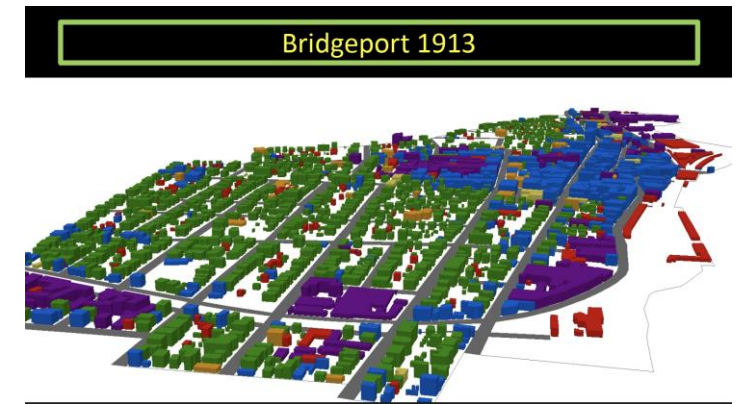


SEPTEMBER 2019

Historical Impact of Highways on Black Communities

The growth and expansion of highways has its own significant history and impact on Black Community

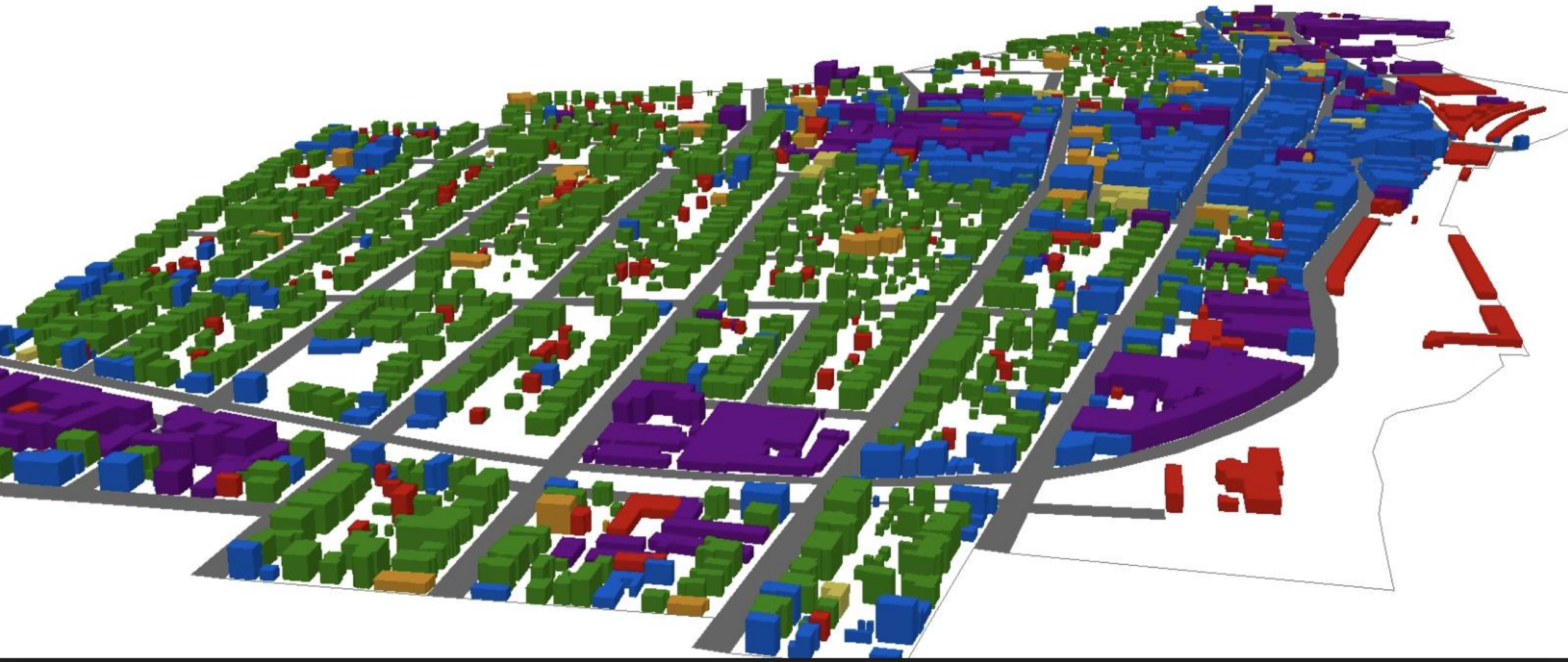
- *Urban Renewal* (which took place in the 50's - 60's) was a nationwide federally supported program that gave cities massive federal grants to rebuild their downtowns
- After the Housing Act of 1954, cities could use federal money to pay private developers to erect highways
- Many have pointed out that the program amounted to "Negro removal" because of the way it destroyed sometimes thriving Black communities



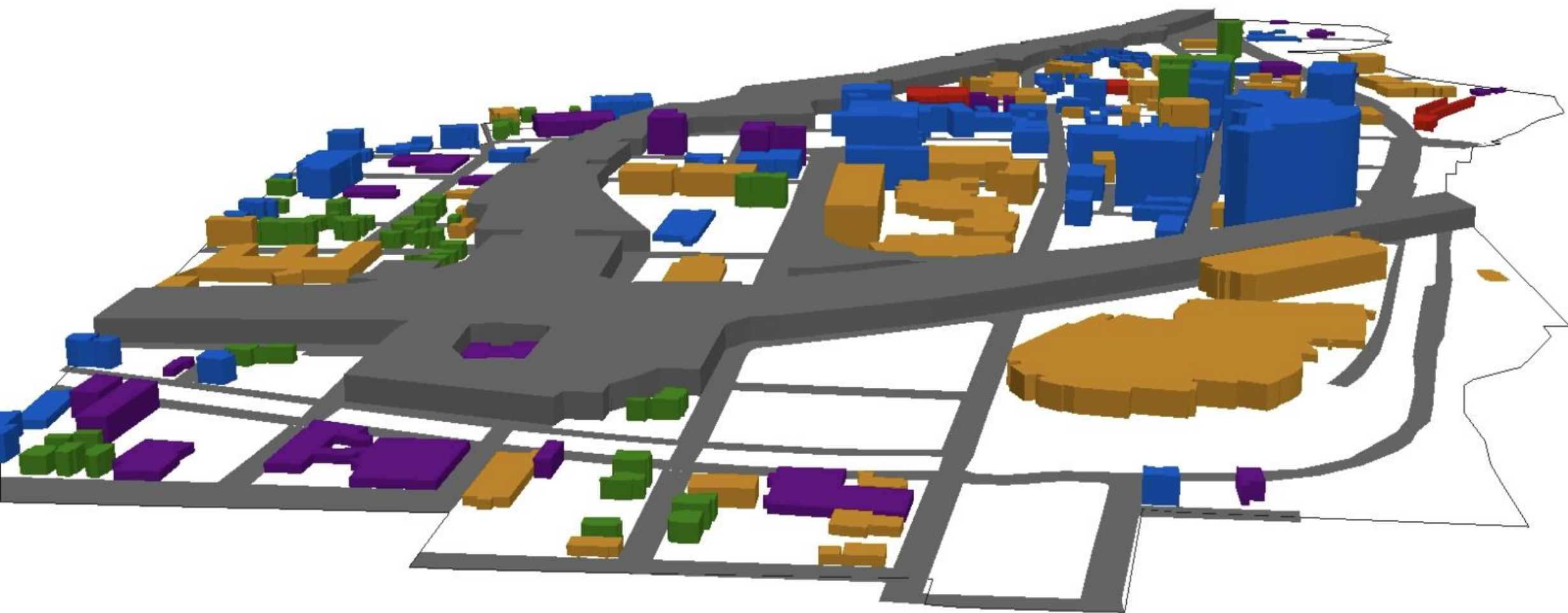
“Many neighborhoods, predominantly Black, were wiped out and turned into surface parking and highways” Norton says noting Black Bottom Paradise Valley in Detroit, historical neighborhoods that were torn down to make way for I-375”

- Peter Norton, a historian at the University of Virginia

Bridgeport 1913



Bridgeport 2013



Bus Electrification Goals

Transit goals in the GC3 have been updated

- Last year, General Assembly committed to electrifying 30% of Transit Buses in CT by 2030
- 50% of School Transportation to be ZEVs by 2030 (New Goal)

ZEV = Zero Emissions Vehicle

Most likely that these will be “Battery Electric” but technology and affordability for Hydrogen Fuel Cells could advance

Current progress toward these goals is starting, but very slow

September 29, 2020

CT debuts first electric buses



PHOTO | OFFICE OF GOV. NED LAMONT/TWITTER
The first battery-electric public transit bus in Connecticut.

“State officials say each replacement of a diesel bus with an electric bus will avoid 230,000 pounds of carbon dioxide annually, which is equivalent to planting 5,000 trees.”

The Impact on Essential Workers



The responsiveness of CT's transit systems to rider and bus driver health and safety during the pandemic has been inadequate to say the least. Transit advocates and bus driver unions have played an important role in making sure the transit system safety is a priority.



"I was asked to join the Action Committee with Milford Transit. ATU was making demands to the bus company around safety protocols, and I joined because safety was important with the coming of this pandemic... I was concerned not only with our clientele (I was in the paratransit unit, so mostly I'm dealing with folks who were going to chemotherapy or dialysis) ... [but also] the drivers ourselves, we mostly were older and had underlying conditions ourselves."

- Wilbert Elliott, Bus Driver, ATU Local 1336



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