



ZEV Commission Meeting

June 25, 3 pm

Online webinar

Agenda

- ▶ Welcome and introductions
- ▶ Presentation by Dr. Gaurab Basu, *co-director of the Center for Health Equity Education & Advocacy at Cambridge Health Alliance*
 - ▶ Discussion / Q&A
- ▶ Updates on ongoing initiatives:
 - ▶ MOR-EV
 - ▶ Accelerate Clean Transportation Now (ACTNow)
 - ▶ VW Settlement funds and MassEVIP
 - ▶ Transportation and Climate Initiative
 - ▶ Discussion / Q&A
- ▶ Suggestions for new programs to address transportation pollution
 - ▶ Discussion / Q&A

A clean transportation system for my patients

Gaurab Basu, MD, MPH

Co-Director Center for Health Equity Education & Advocacy (CHEEA)

Cambridge Health Alliance

Instructor, Harvard Medical School



HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL



CHEEA
Center for Health Equity
Education and Advocacy

OPINION

A clean transportation system is the prescription my patients need

Transforming our dirty transportation system has long been an urgent public health issue.

By **Gaurab Basu** Updated May 25, 2020, 11:00 a.m.



Healy Report

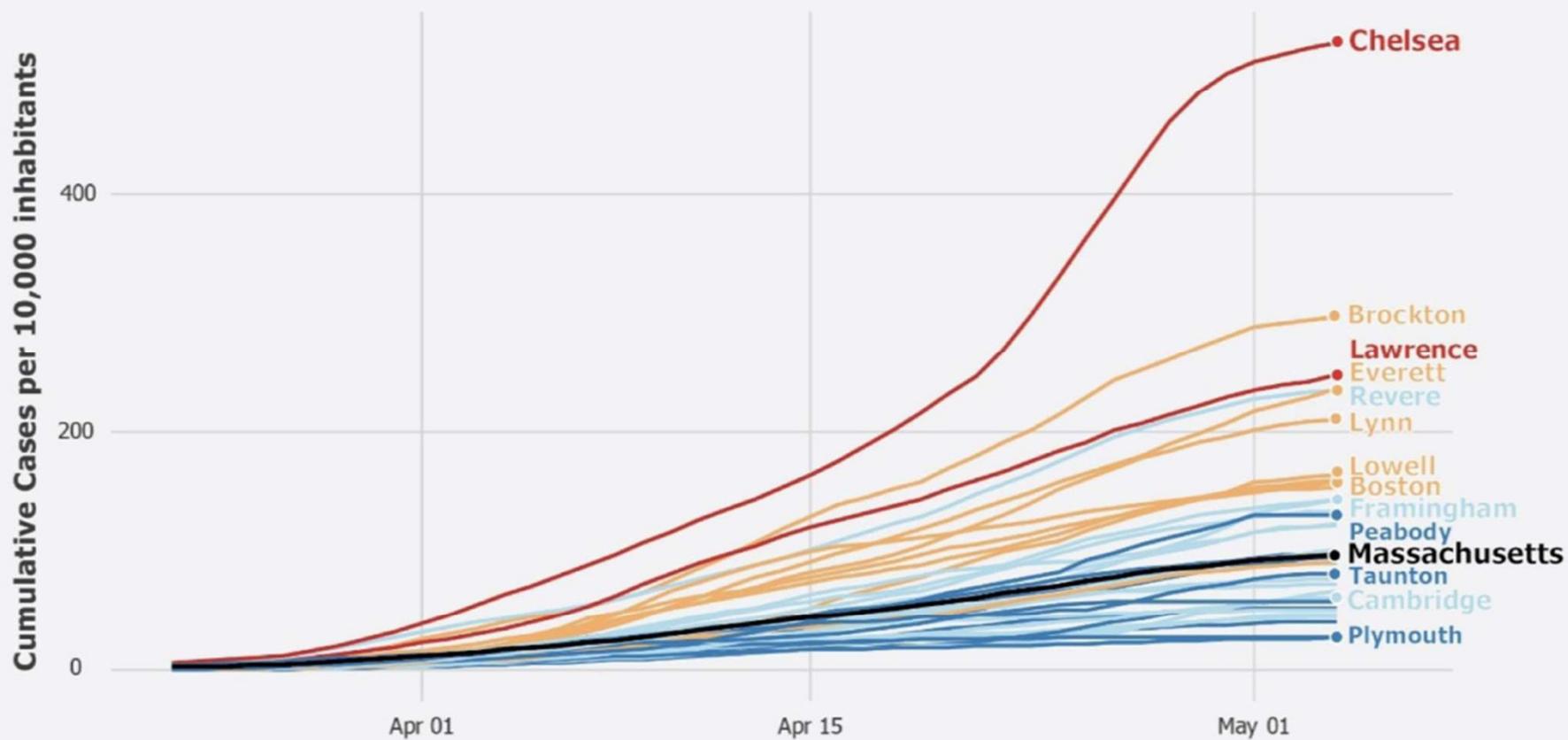
**UNEQUAL
EFFECTS IN
MASSACHUSETTS**

REMEDYING THE LEGACY OF ENVIRONMENTAL INJUSTICE & BUILDING CLIMATE RESILIENCE

Updated data: May 4

Confirmed COVID-19 Cumulative Cases per 10,000 Inhabitants*

Percent Minority — < 25% — 25% - 50% — 50% - 75% — >75%



* Graph shows 7-day moving average of rate

Figure by: Koen F. Tieskens, PhD, Raquel Jimenez Celsi, MSc., Boston University School of Public Health
Information provided by the Massachusetts Major City Chiefs of Police and compiled by the Massachusetts Attorney General's Office, US Census, 2010

Air Pollution

COVID-19 PM_{2.5}

A national study on long-term exposure to air pollution and COVID-19 mortality in the United States

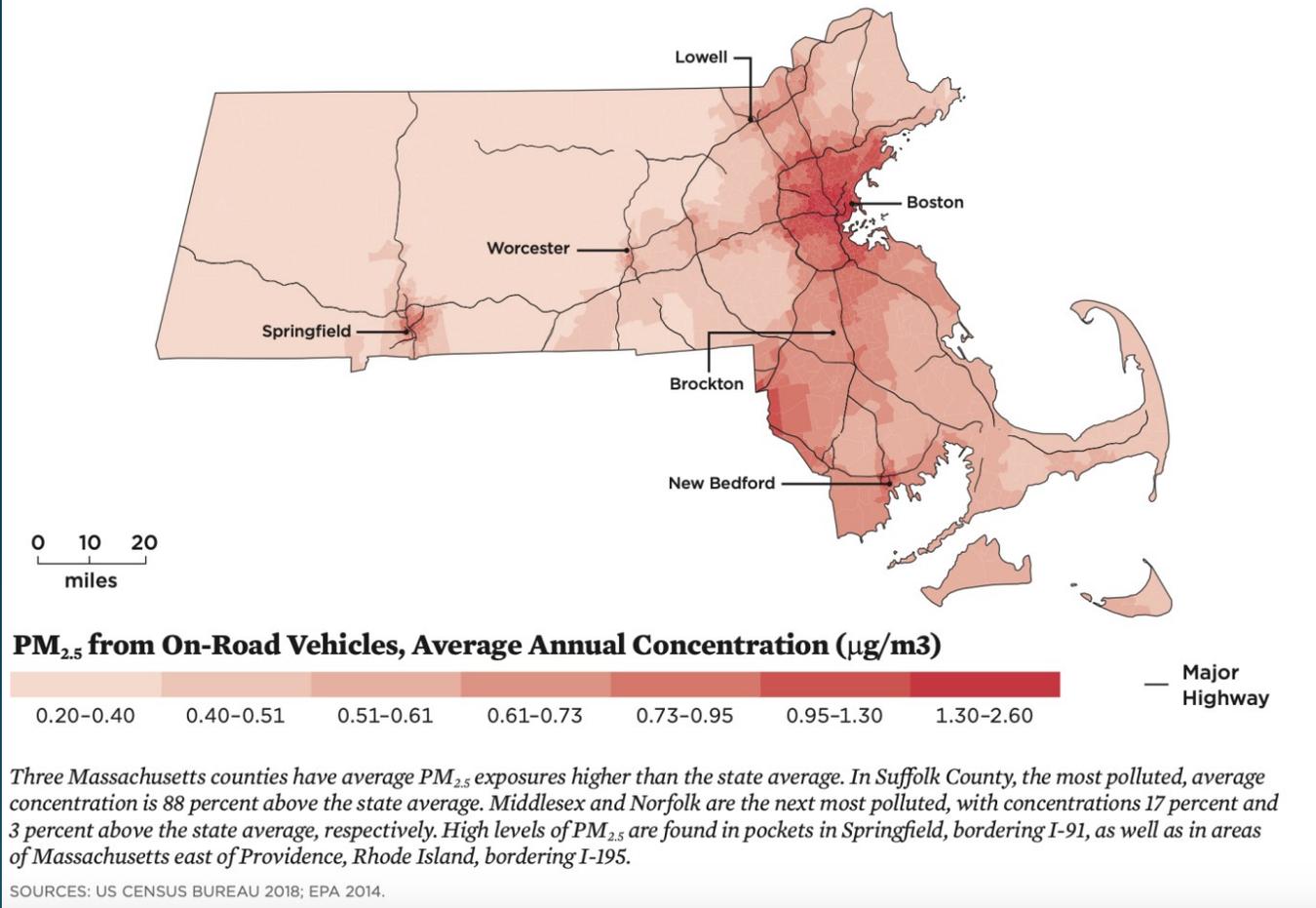
Results: We found that an increase of only 1 $\mu\text{g}/\text{m}^3$ in PM_{2.5} is associated with an 8% increase in the COVID-19 death rate (95% confidence interval [CI]: 2%, 15%). The results were statistically significant and robust to secondary and sensitivity analyses.

Conclusions: A small increase in long-term exposure to PM_{2.5} leads to a large increase in the COVID-19 death rate. Despite inherent limitations of the ecological study design, our results underscore the importance of continuing to enforce existing air pollution regulations to protect human health both during and after the COVID-19 crisis. The data and code are publicly available so our analyses can be updated routinely.

Air pollution

- Increase in heart attacks
- Childhood asthma exacerbations
- Strokes
- Premature deaths
- Premature birth, low birth weight, stillbirths

FIGURE 1. High Variation in Exposure to PM_{2.5} Pollution from On-Road Vehicles in Massachusetts



UCS study June 2019

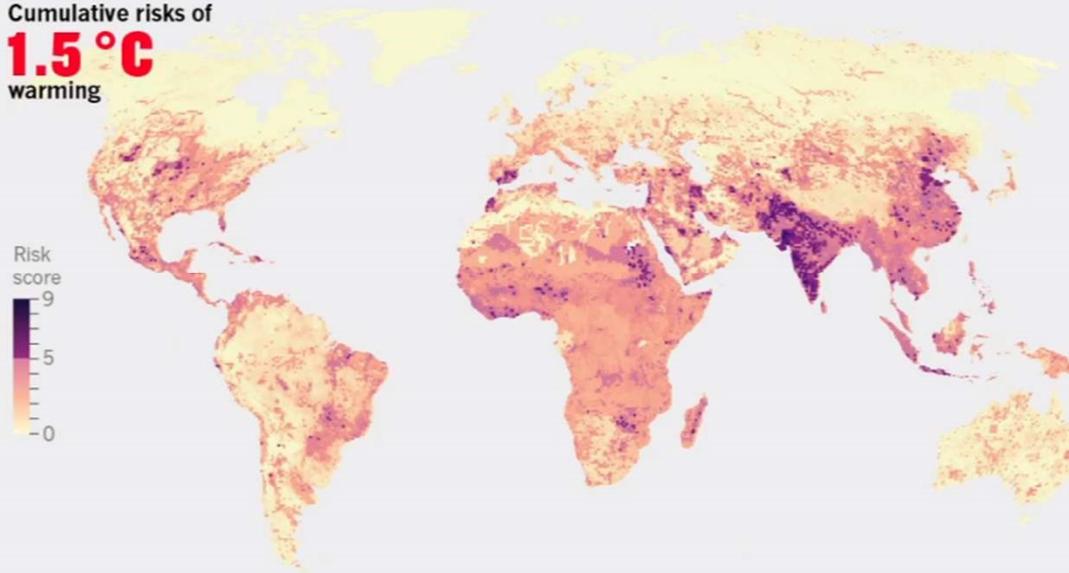
Intergovernmental Panel on Climate Change 2018

- We have warming to 1 deg above pre-industrial levels
- Warming to 1.5 C is likely to happen between 2030-2052 at current rate
- To limit climate change to 1.5 deg C, we must decrease greenhouse emissions 45% from 2010 levels by 2030 and reach net zero by 2050
- 2019 UN Environmental Program - decrease emissions by 7.6% a year from 2020-2030

Climate change's heavy toll

As global temperatures rise, they put billions of people at risk of heatwaves, water shortages and a range of other problems. And these impacts fall hardest on the poorest and most vulnerable people. The map below shows the cumulative risks from major climate impacts with 2 °C of warming; the chart estimates how many people would be affected by a selection of those risks.

Cumulative risks of
1.5 °C
warming



Population affected by various risks (millions of people)

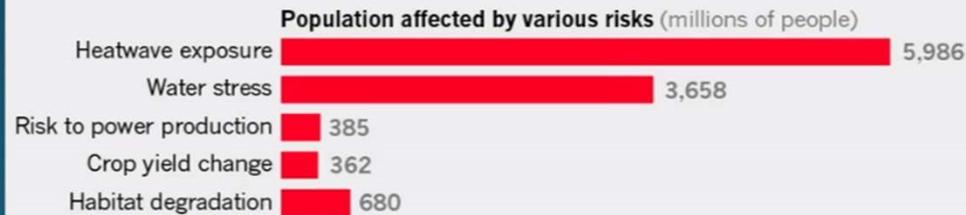


Source: IPCC/E. Byers et al. *Environ. Res. Lett.* 13, 055012 (2018).

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Cumulative risks of **2°C** warming

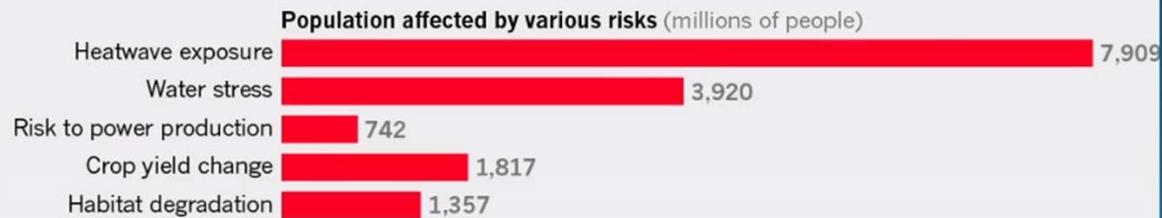
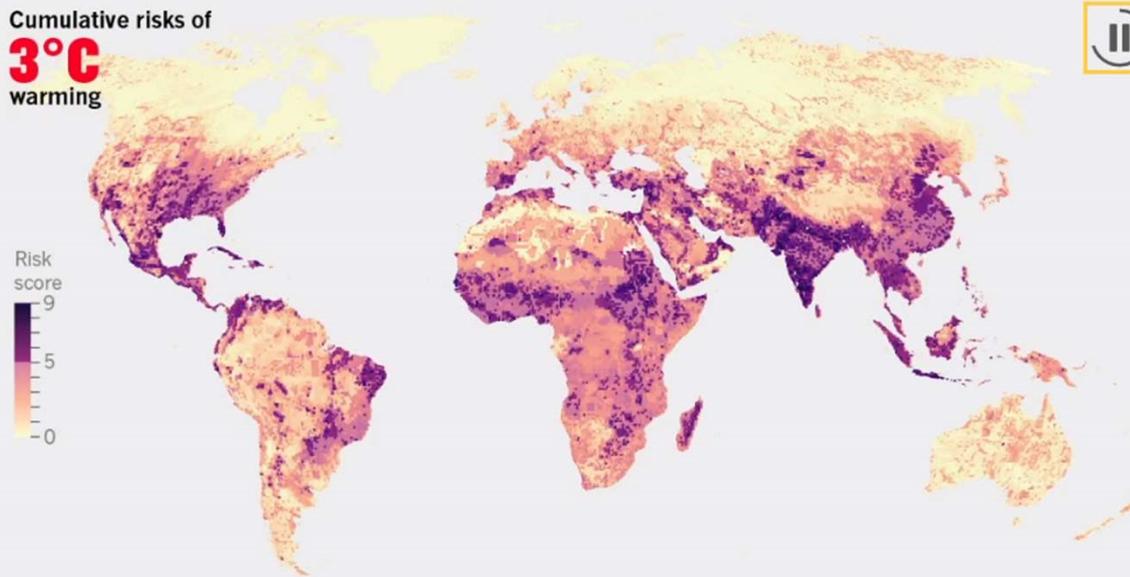


Source: IPCC/E. Byers et al. *Environ. Res. Lett.* 13, 055012 (2018).

Climate change's heavy toll

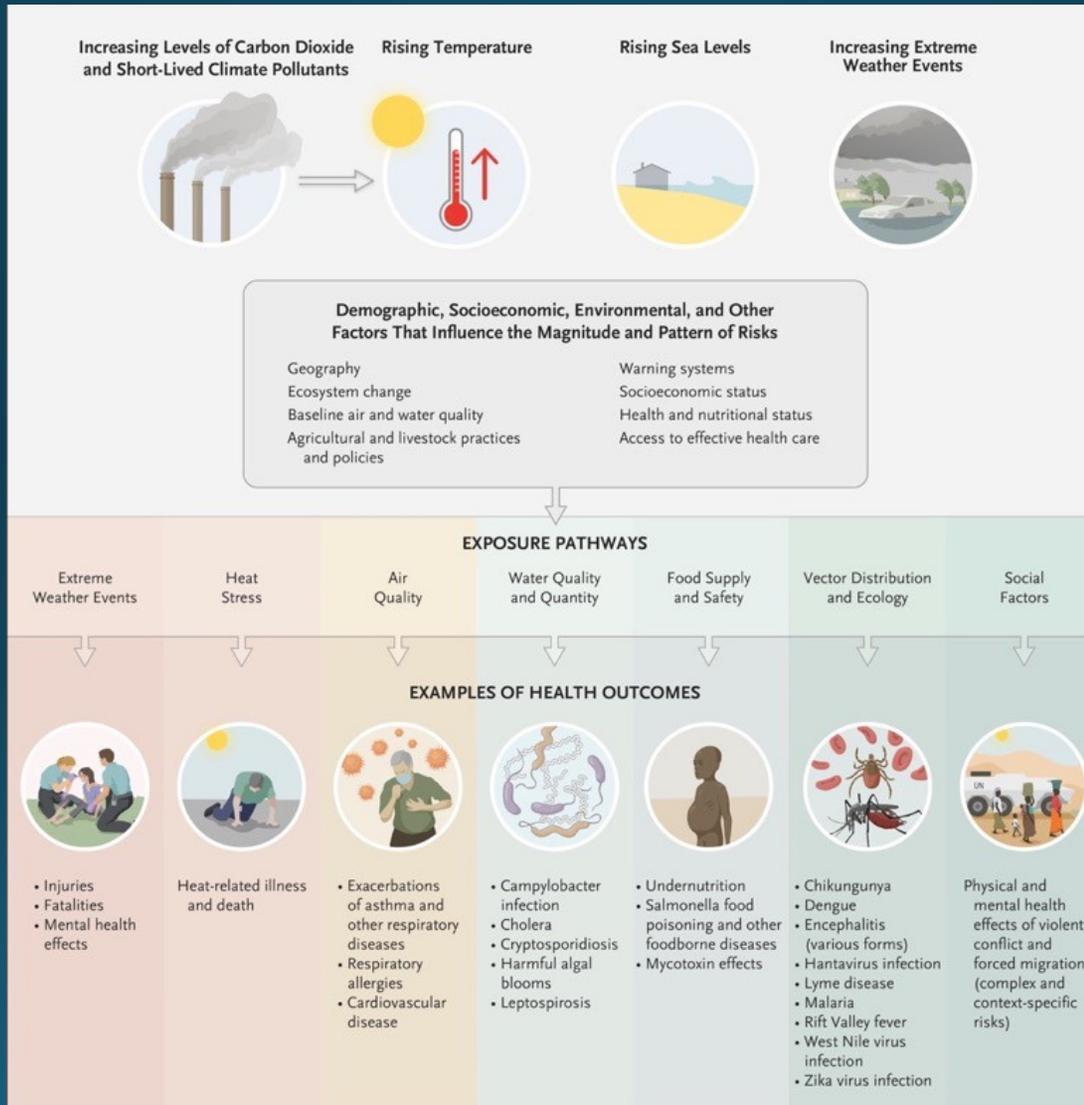
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Cumulative risks of
3°C
warming



Source: IPCC/E. Byers et al. Environ. Res. Lett. 13, 055012 (2018).

Major Health Risks Associated with Climate Change

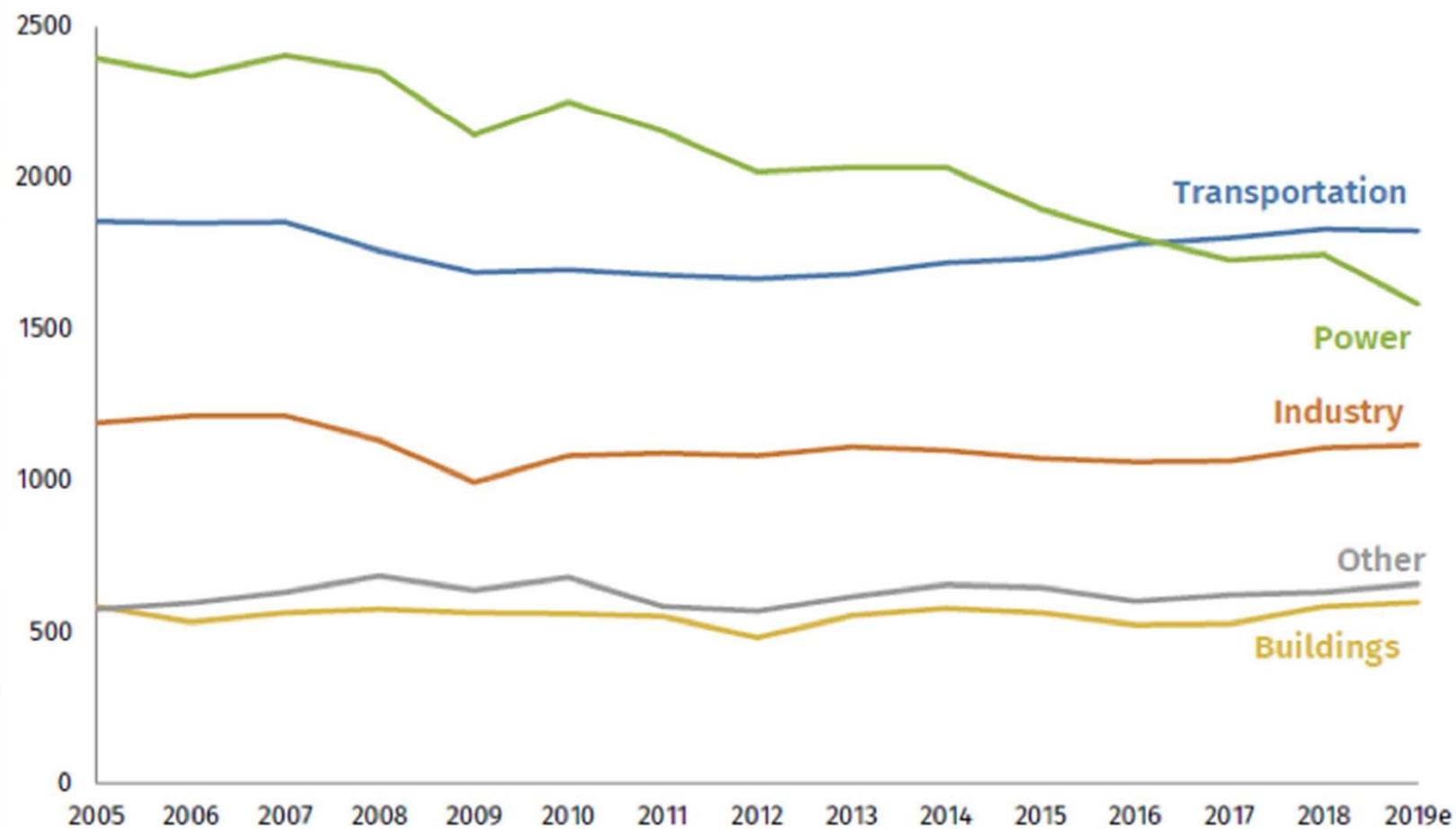


Haines and Ebi,
NEJM, 2019

FIGURE 2

Net US GHG emissions by sector

Million metric tons CO₂e, IPCC definitions, excludes international bunkers



Source: Rhodium Climate Service

ALLOW
ME TO HAVE
A FUTURE

MAKE HUMANS
GREAT AGAIN

WATER
IS
LIFE



Suggestions for new programs to address transportation pollution

- ▶ Incentives for urban delivery truck electrification
- ▶ Electrification of ride-hailing fleets
- ▶ EV Affordability programs for low and moderate income consumers
- ▶ Pilot projects and community grants for environmental justice communities.



Urban delivery trucks





A
PROGRAM
OF CALSTART

DRIVING GLOBAL TRANSFORMATION IN COMMERCIAL VEHICLES

Massachusetts ZEV Commission

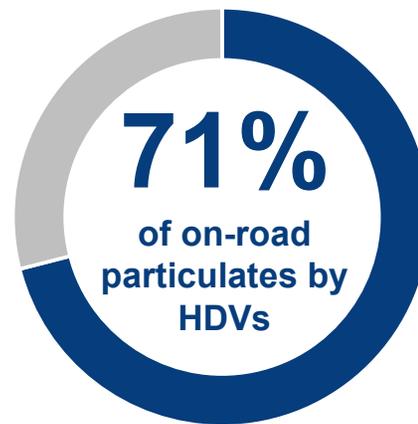
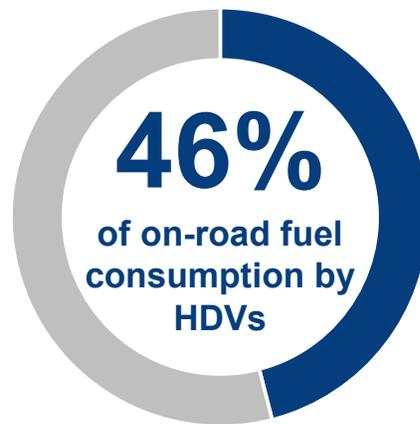
JUNE 25, 2020

Commercial vehicles represent a small share of the global on-road fleet but contribute a disproportionate share of fuel consumption and emissions

G20 nations:

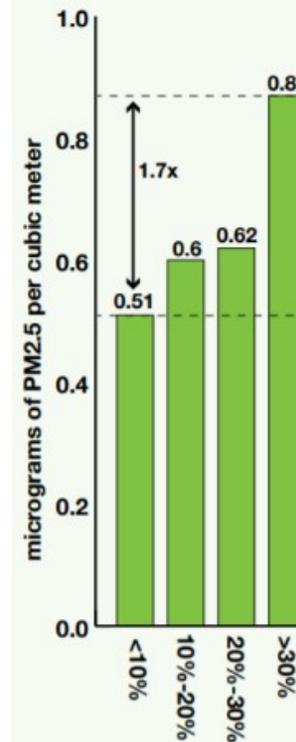


Data: [ICCT \(2015\)](#)

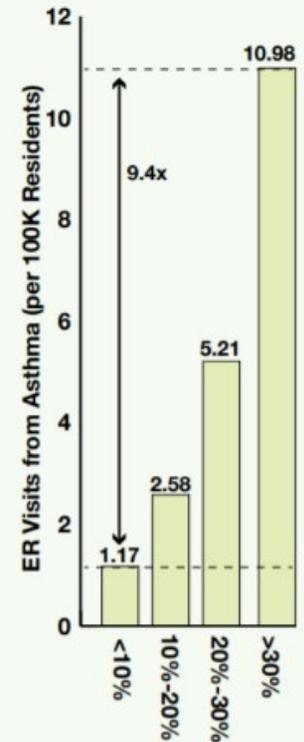


NYC exposures and impacts:

PM2.5 Exposure due to Trucks & Buses



PM2.5-Attributable Health Impacts due to Trucks & Buses

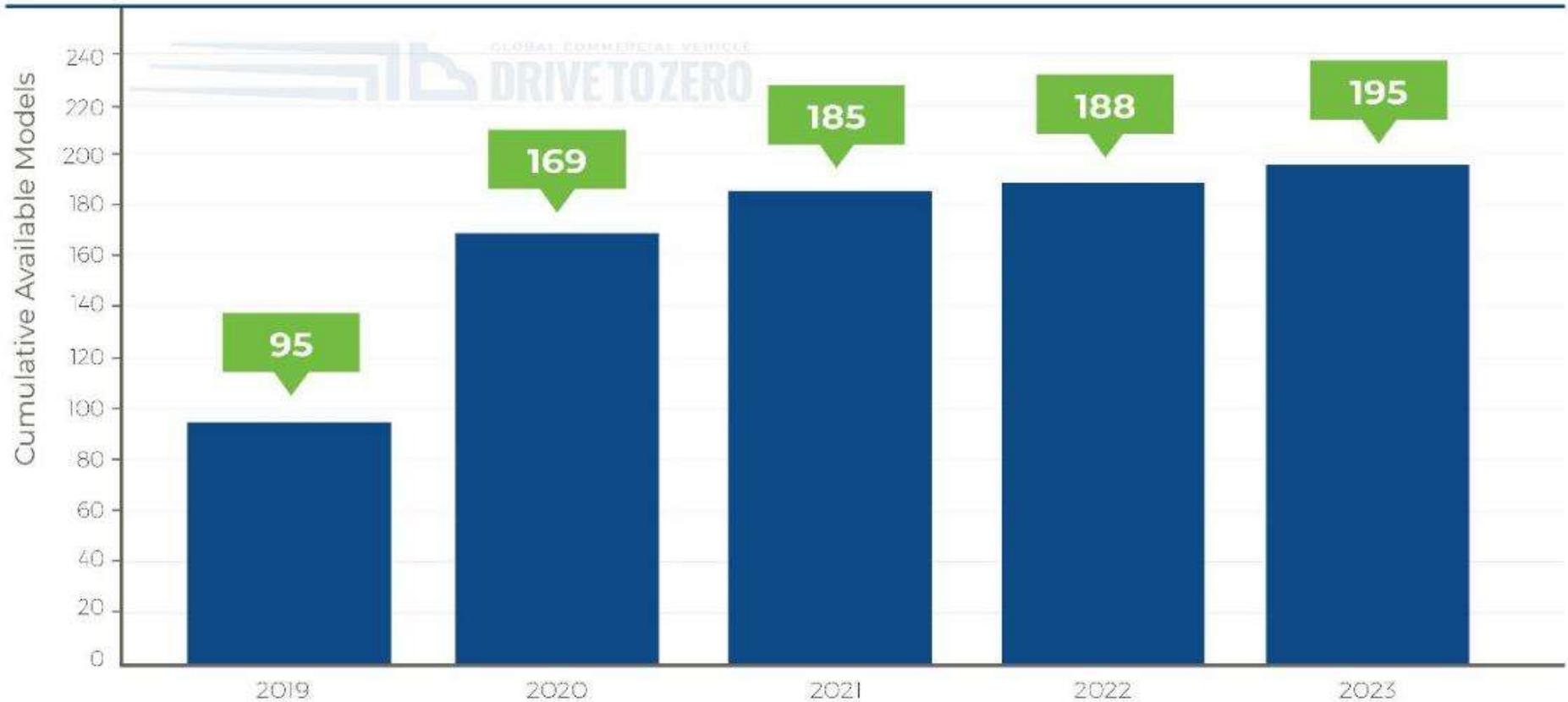


Percent of Residents Below Federal Poverty Level

Graphic: [NYC's Roadmap to 80x50 at 80](#)
Study: [Kheirbek et al \(2016\)](#)

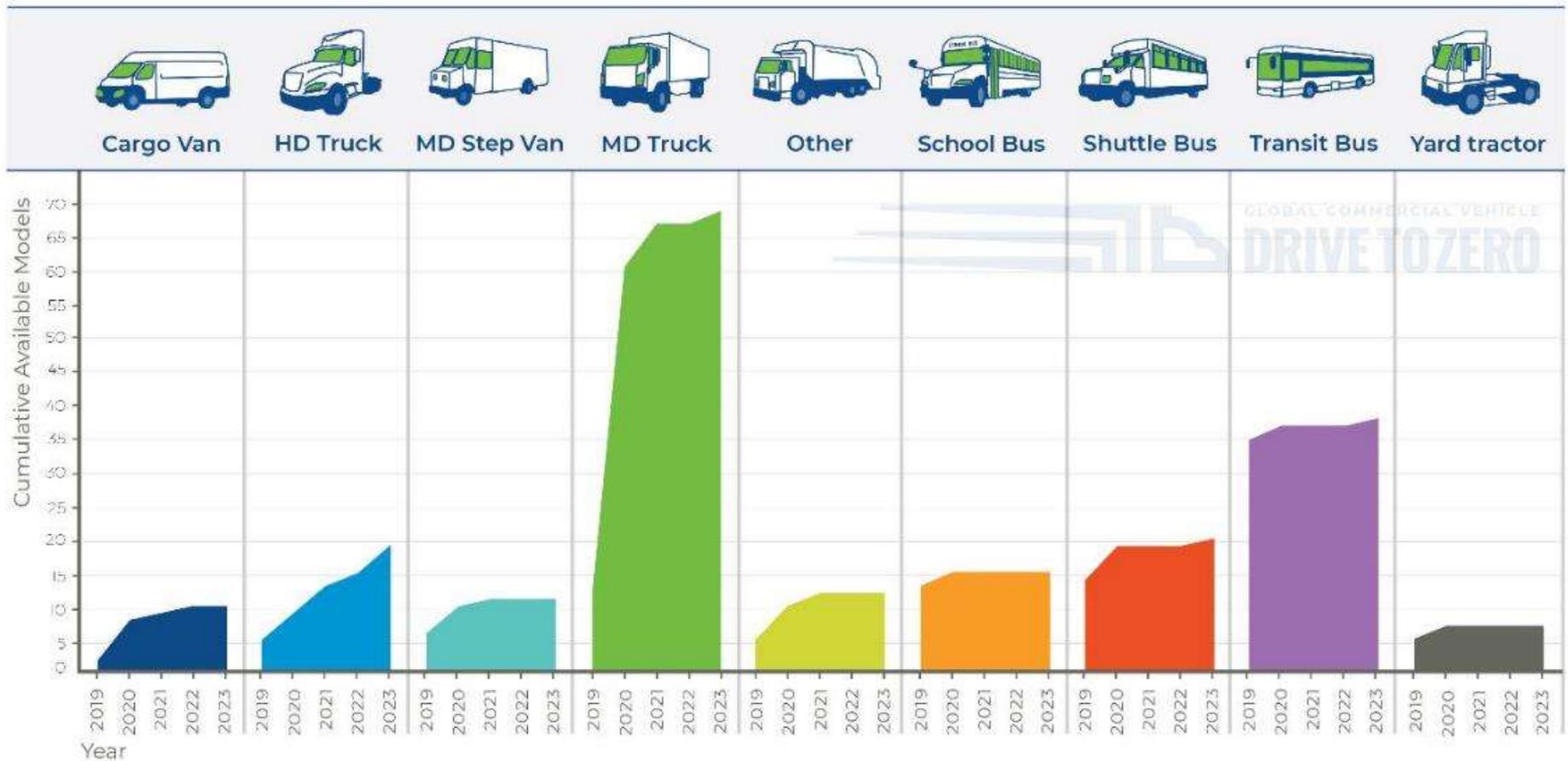
Model availability to double by 2023

Total cumulative vehicle models, U.S. & Canada

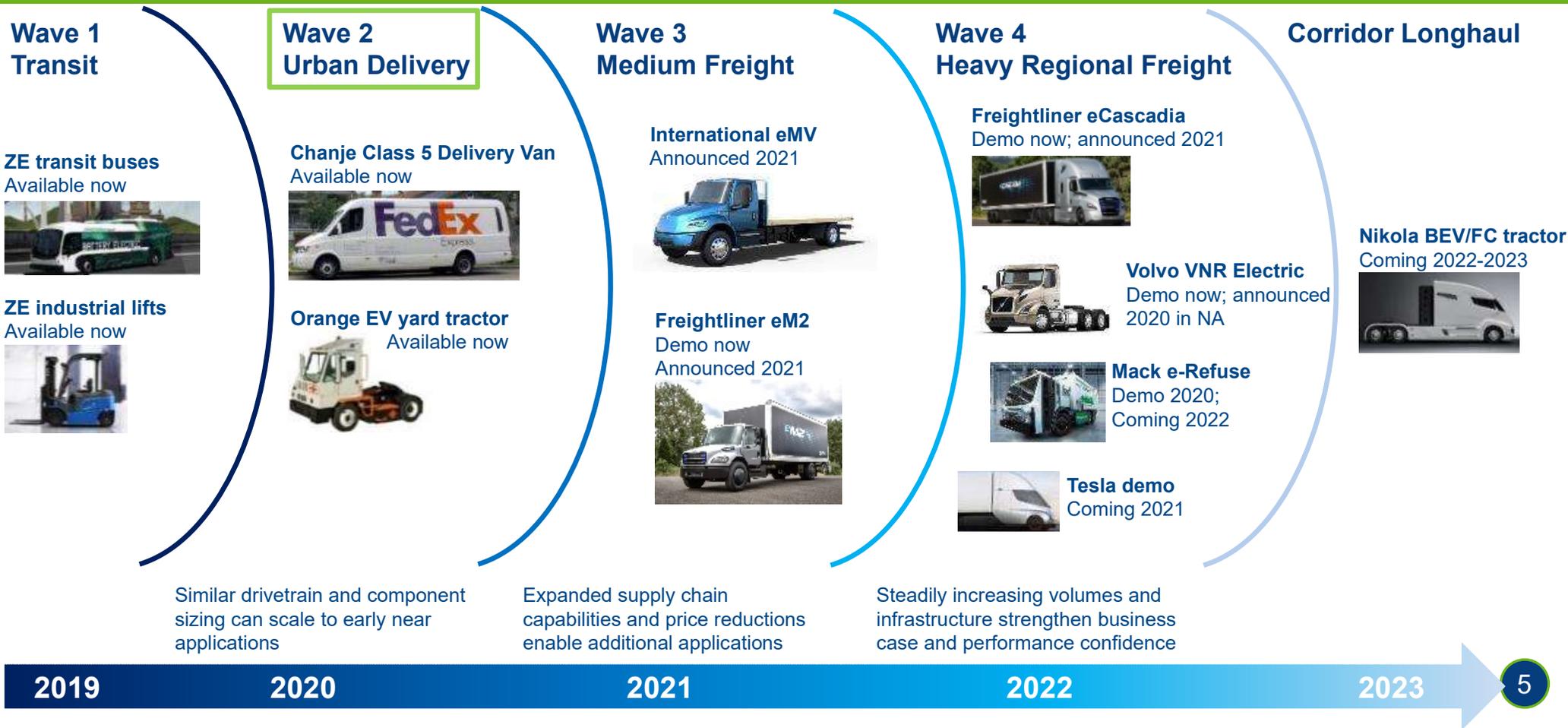


M/HD ZEV model availability growing

Total cumulative vehicle models by vehicle type and year, U.S. & Canada



Zero-emission vehicles will come in waves, and our “beachhead” strategy targets applications where zero-emission technology is likely to succeed first



CALSTART designs and manages incentive programs to accelerate markets in leading regions of the US

Chicago had \$11.3M electric/hybrid truck voucher program; \$1.425M NG/Elec infrastructure; \$1.275M Green Taxi (NG)



NEW YORK
STATE OF
OPPORTUNITY

**Truck Voucher
Incentive Program**

Program for hybrid, electric and NG trucks since 2014, \$14.5M disbursed to date; new round launched late 2019, \$35M now available



California has invested over \$500M for hybrid and electric trucks and low-NOx engines. CALSTART helped design, and has managed for >10 years



A
PROGRAM
OF CALSTART

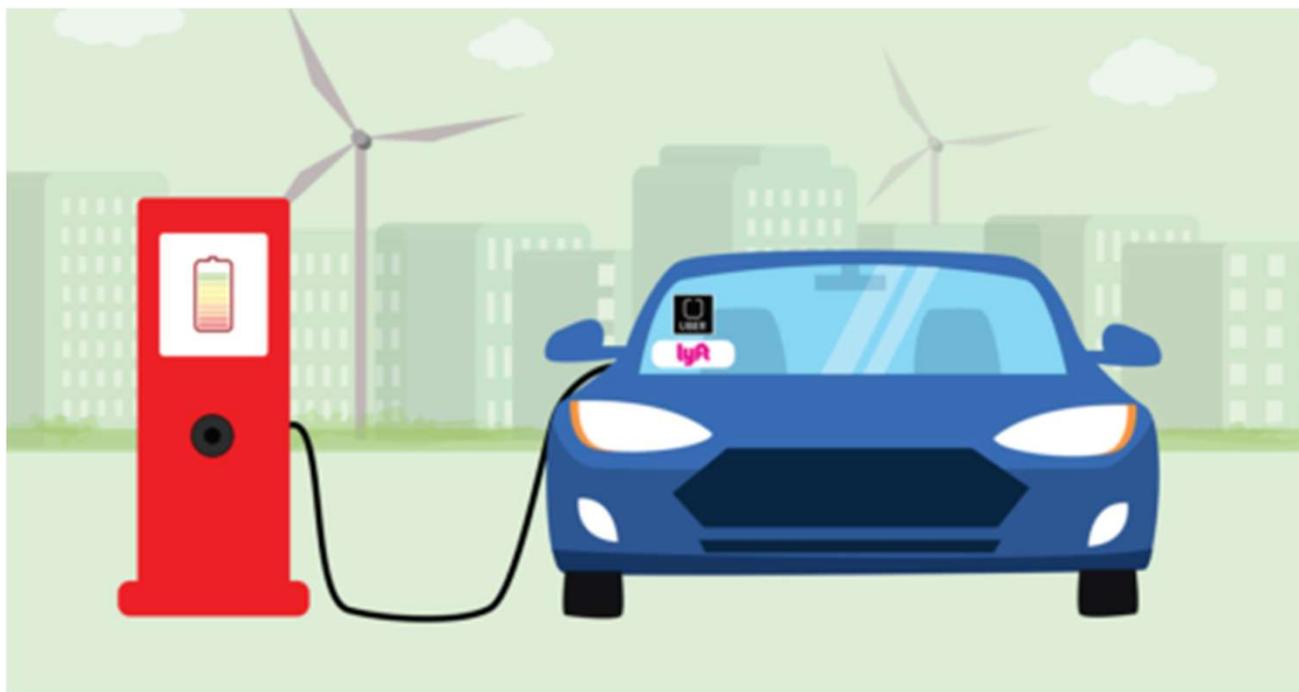
Thank you!

Benjamin Mandel
Northeast Regional Director
CALSTART

bmandel@calstart.org

For more information visit: www.globaldrivetozero.org

Ride Hailing fleets



Making EVs affordable for low and moderate income residents

- ▶ Used EV rebate program
- ▶ Subsidized financing assistance modelled after Mass Solar Loan program
- ▶ Increased incentives for means-targeted households
- ▶ Targeted incentives towards high mileage, low-income workers (such as home health care workers)
- ▶ Considering point of sale rebate



Pilot projects targeting low income and/or environmental justice communities

- ▶ Electrification of port vehicles, such as drayage trucks or port equipment.
- ▶ An incentive or community project on ebikes.
- ▶ Carsharing electric vehicle projects.
- ▶ Electrification of school buses.
- ▶ Increased incentives and outreach to rural drivers.
- ▶ Targeted incentives based on zip code.
- ▶ A pilot project on long haul tractor-trailers.
- ▶ Electrification of vehicles around Logan Airport.

Thank you!

- ▶ For more information, to view this webinar, and to submit questions or comments, follow our work at <https://www.mass.gov/service-details/zero-emission-vehicle-zev-commission>
- ▶ You can contact us at:
 - ▶ Daniel Gatti, Director of Clean Transportation Policy, daniel.gatti@mass.gov
 - ▶ Rishi Reddi, Director of Environmental Justice, rishi.p.reddi@mass.gov
 - ▶ Judy Chang, Undersecretary for Energy and co-chair, judy.chang@mass.gov
 - ▶ Dan Sieger, Undersecretary for Environment and co-chair, dan.sieger@mass.gov

ZERO-EMISSION TECHNOLOGY INVENTORY



SELECT A VEHICLE PLATFORM TO EXPLORE



SELECT A REGION



© 2020 Mapbox © OpenStreetMap

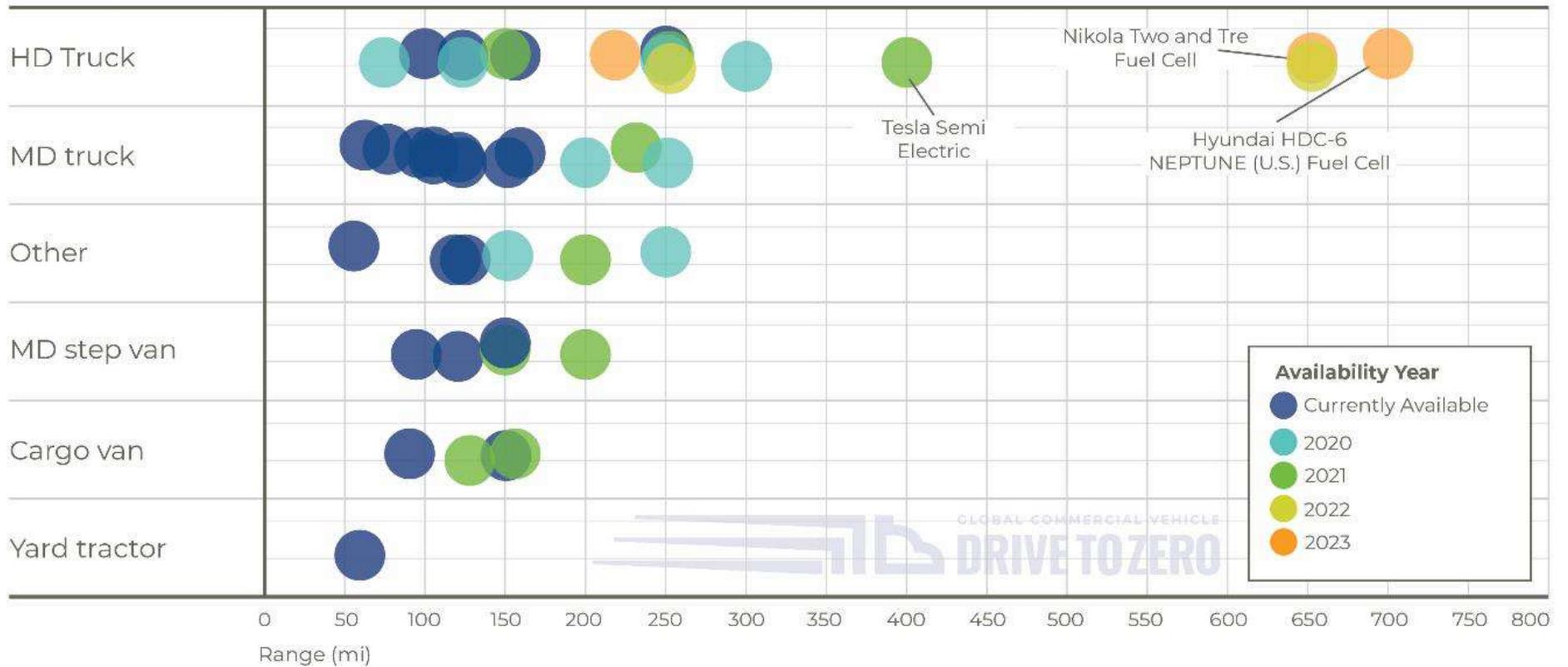


SELECT A VEHICLE MANUFACTURER



Many duty cycles show extensive coverage—extreme ranges coming

Truck range by vehicle type and availability year, U.S. & Canada



Ecosystems of change can enable and accelerate the transition towards zero-emission commercial vehicles

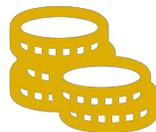


POLICIES

- Exclusion zones
- Access restrictions
- Procurement requirements
- Sales requirements
- Fuel efficiency/GHG regulations
- Low-carbon fuel standards

INFRASTRUCTURE INVESTMENTS

- Depot charging
- Public infrastructure
- Corridor charging



FINANCIAL INCENTIVES

- Voucher purchase incentives
- Tax purchase incentives
- Congestion pricing
- Favorable electricity rates
- Battery production/purchase

PILOT PROJECTS

- Vehicle
- Infrastructure
- Business models

