

Rural & Urban Challenges

TRB 100th Annual Meeting

Workshop 1011: A Marriage of Convenience: Partnering Greenhouse Gas and Air Quality Management, Lessons Learned and Future Research Needs

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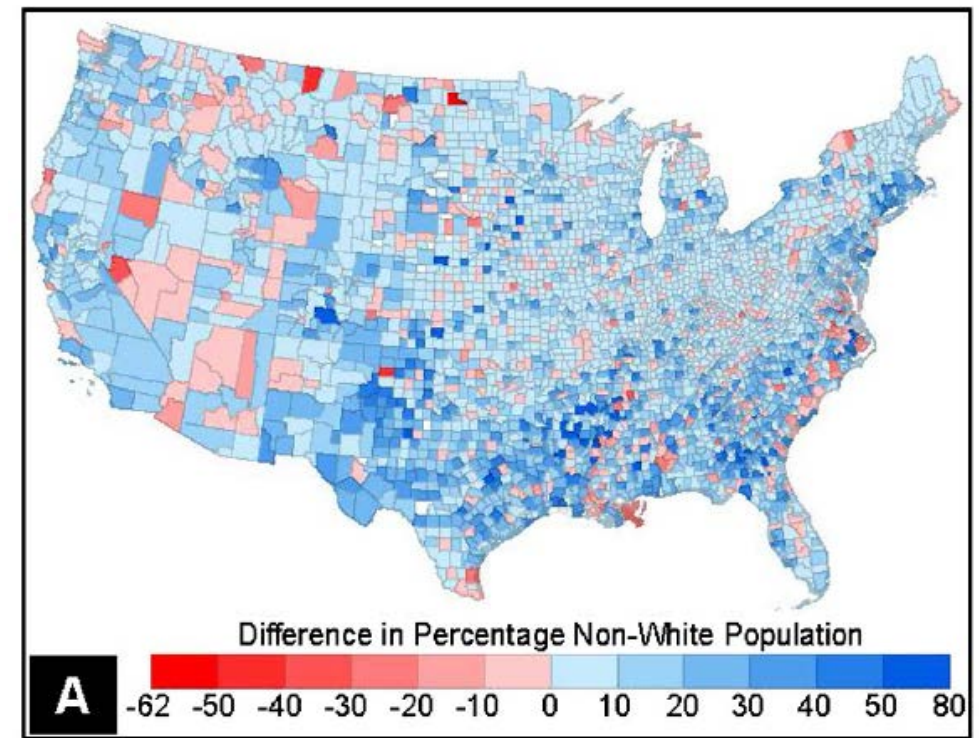


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Rural & Urban have a lot in common...

- Vehicle travel produces criteria and toxic air pollutants and GHG emissions,
- GHG emissions from urban and rural places contribute to climate change,
- Exposure to criteria and toxic air pollutant emissions cause a range of negative health outcomes in urban and rural populations, and
- Low income and minority communities in urban and rural communities are more likely to be exposed to higher levels of vehicle emissions

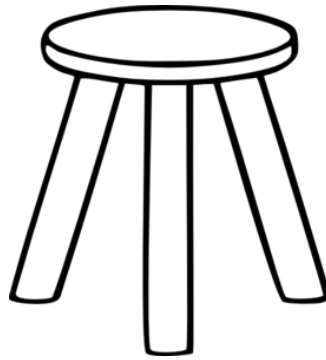


County level disparities in near roadway populations*

* Figure from: Rowangould, G. (2013). A census of the US near-roadway population: Public health and environmental justice considerations. Transportation Research Part D: Transport and Environment, 25, 59–67. Difference in percentage of non-white population between the lowest and highest traffic density quintile for each US county.



Common Challenges and Common Solutions



Reduce Travel Demand + Increase Energy Efficiency + Reduce Emission Intensity

...and consider strategies to reduce **exposure** to air toxics



The Challenge

Concluding remarks of the **Transportation Research Board of the National Academies** 2nd Strategic Highway Research Program study[†] on GHG mitigation decision making:

“By far, and not surprisingly, most of the research on GHG emissions reduction strategies has focused on metropolitan areas or at the national and state levels.” and that “...very little attention has been given to nonurban areas.”

The same can be said for research on other mobile source air pollutant emissions.

[†]TRB. *Incorporating Greenhouse Gas Emissions into the Collaborative Decision-Making Process*. Transportation Research Board of the National Academies, Washington D.C., 2013.

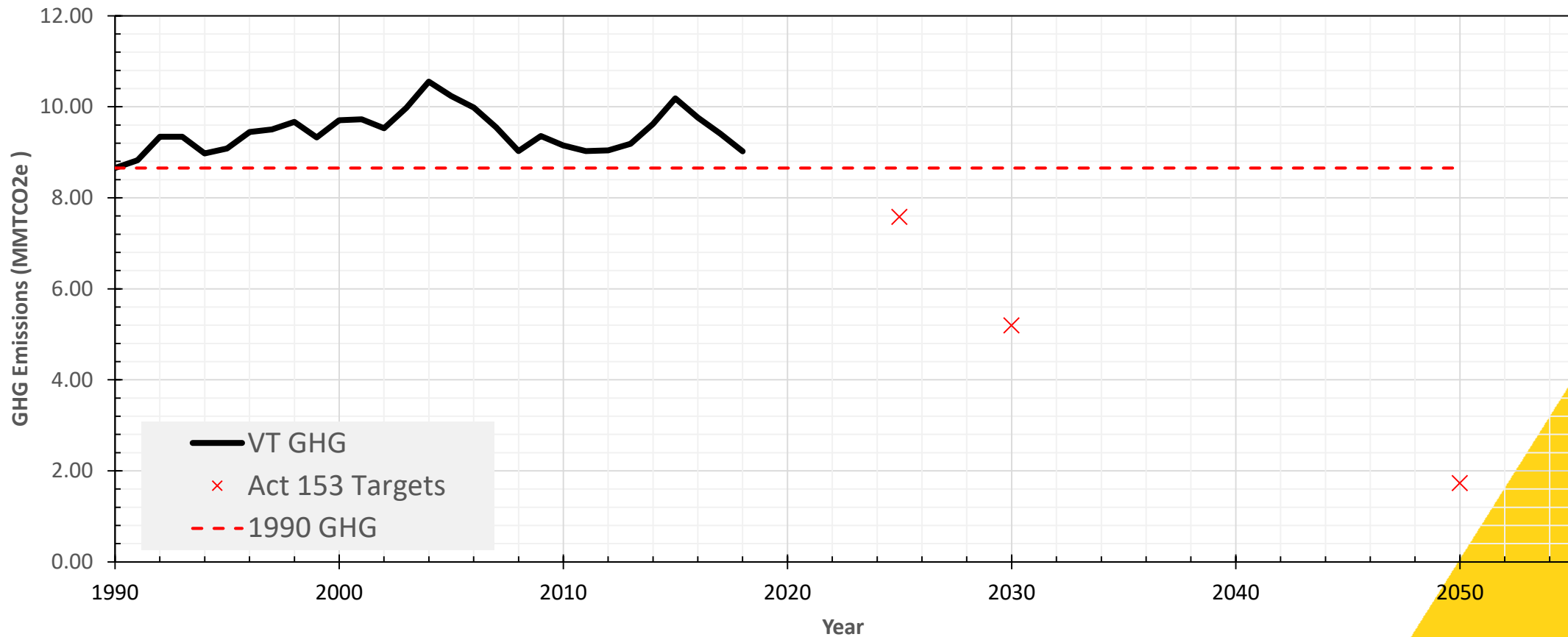


No Data. No Research. No Models.

No Progress?



VT GHG Emission Trends

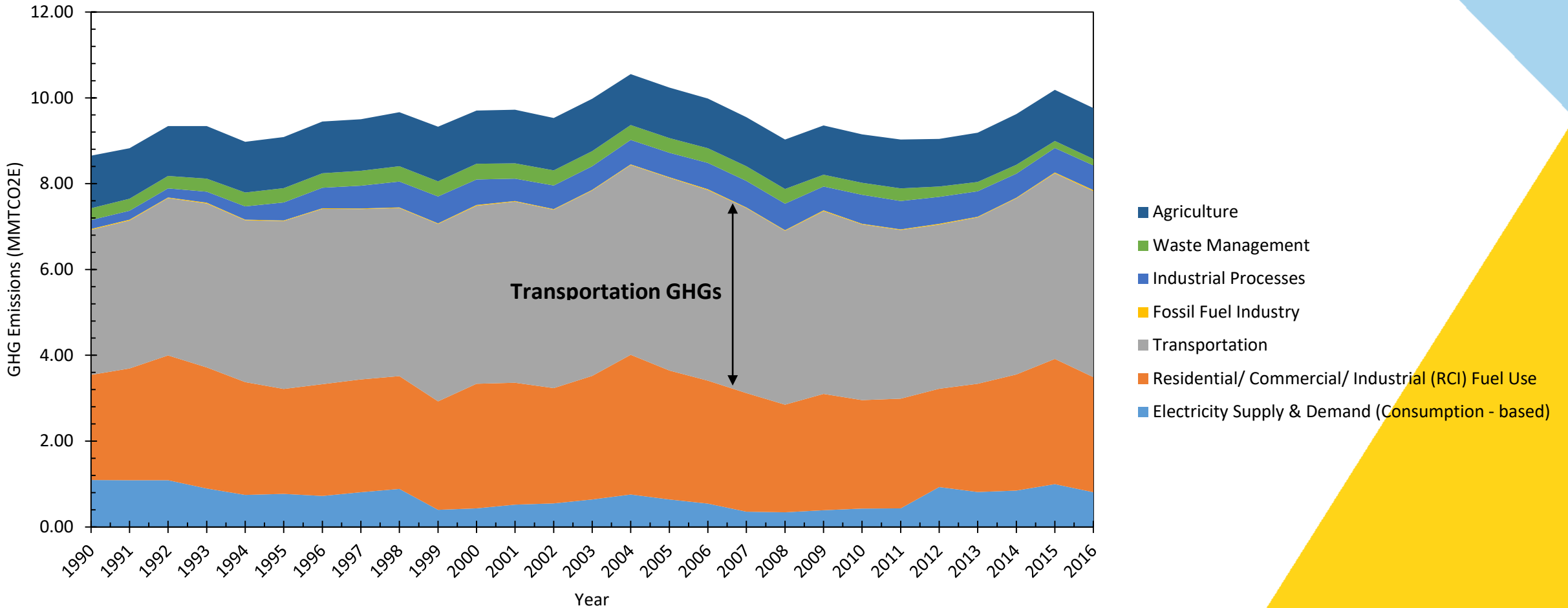


Data from Vermont Agency of Natural Resources GHG Inventory and Forecast 1990-2016
Targets calculated by UVM-TRC



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VT GHG Emission Trends

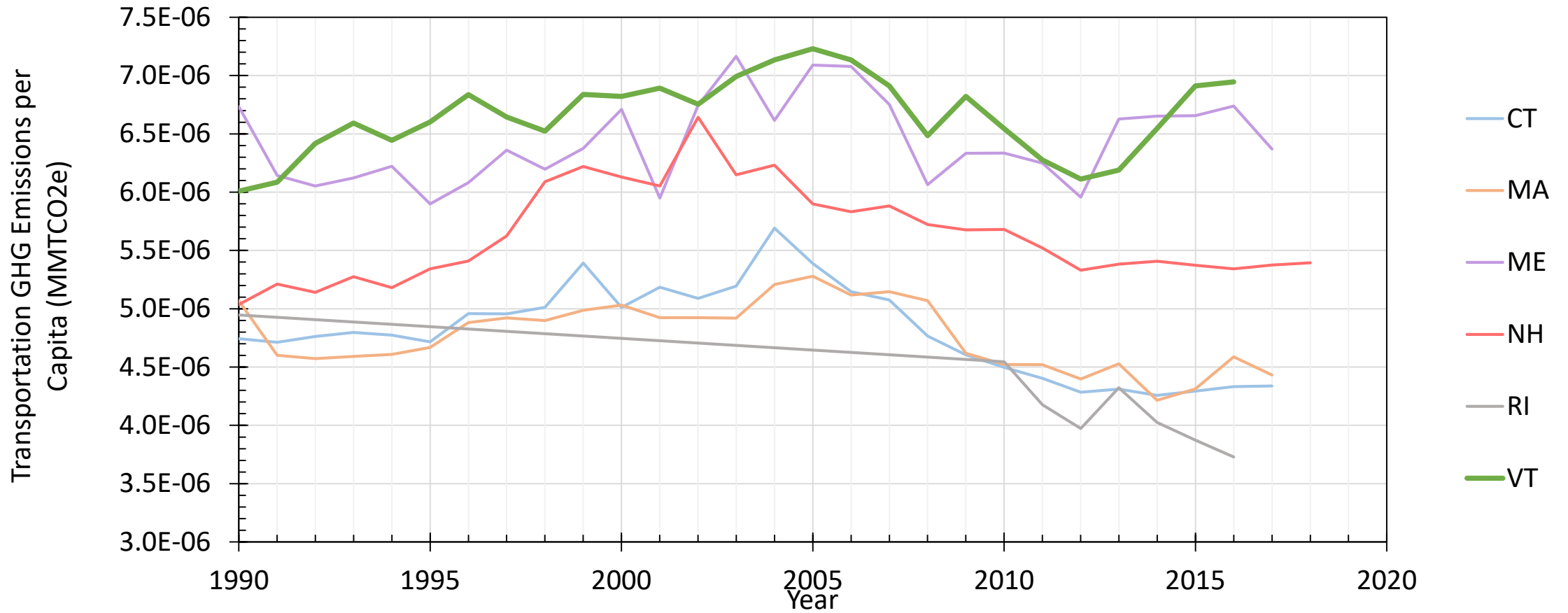


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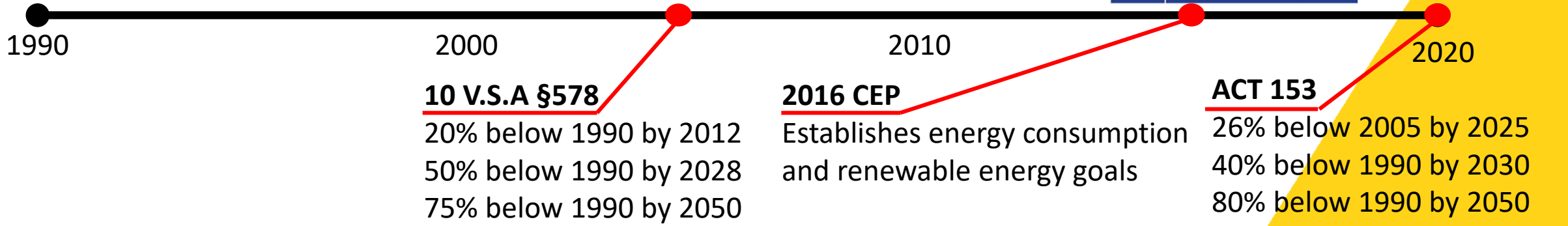
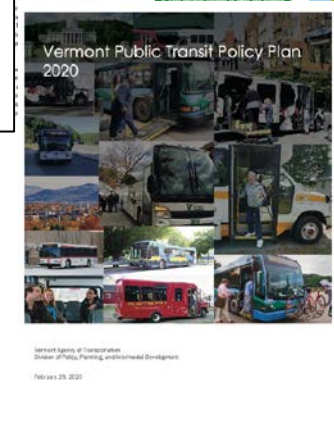
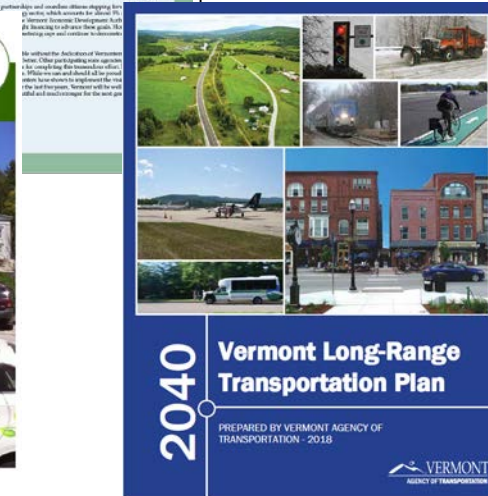
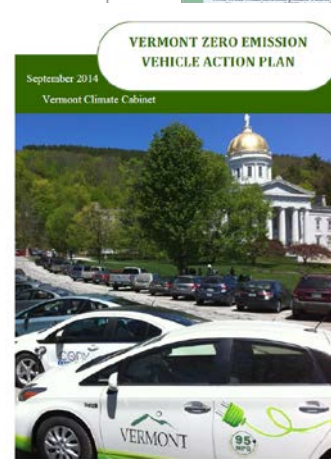
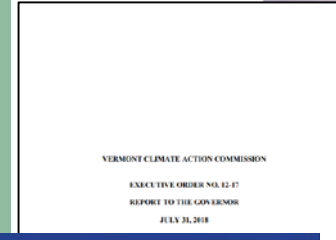
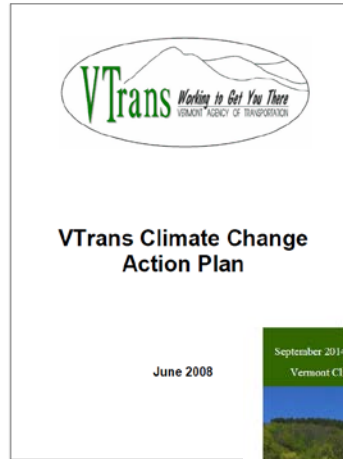


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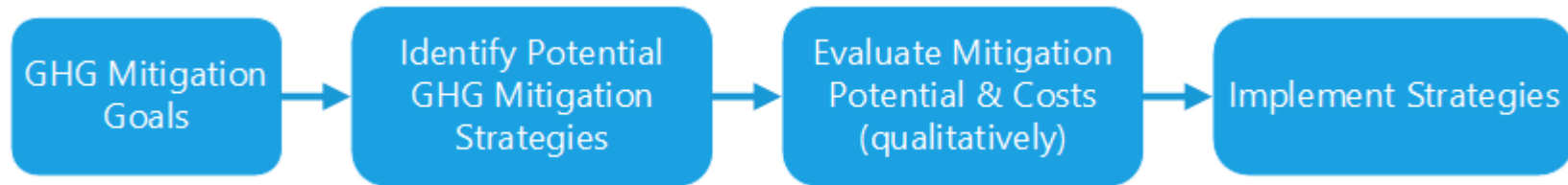
Trends in Neighboring States



GHG Mitigation Goals & Plans



Current Process in Vermont (simplified representation)



Key Mitigation Strategy and Policy Questions

- Effectiveness – tons of GHGs mitigated/on path to reach climate goals
- Efficiency – cost effectiveness (\$/ton of GHG mitigated)
- Equity – distribution of costs and outcomes (good and bad) across regions (urban/suburban/rural) and socioeconomic groups (income, BIPOC, age, etc.)

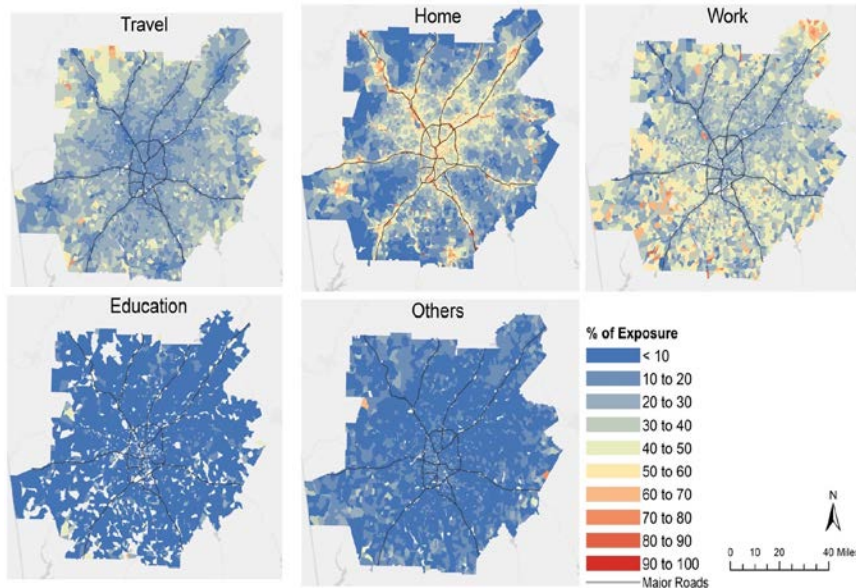
Current Analysis Limitations

- Rural travel behavior data (e.g., price responsiveness, factors affecting vehicle, mode and housing location choice and travel demand, etc.)
- Models for evaluating potential strategies and forecasting their mitigation potential, efficiency and equity implications.



There are unique challenges in Urban area too...

- Trade-offs between reducing GHG emissions and exposure to air toxics
- Exposure can occur far from home
- Uber, Lyft and other TNCs



Los Angeles Times Freeway Pollution Risks of the freeway How close are you? Tell us your story

f t e

L.A. keeps building near freeways, even though living there makes people sick

Are you one of the 2.5 million Southern Californians already living in the pollution zone?

By TONY BARBOZA AND JON SCHLEUSS
MARCH 2, 2017, 3 A.M.

Hollywood & East Hollywood
33,000 people

Boyle Heights
42,000 people

1 dot = 1 person living within 1,000 feet of a freeway in 2010

Figures from: Tayarani, M., & Rowangould, G. (2020). Estimating exposure to fine particulate matter emissions from vehicle traffic: Exposure misclassification and daily activity patterns in a large, sprawling region. *Environmental Research*, 182, 108999. <https://doi.org/10.1016/j.envres.2019.108999>



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