



Climate Benefits of Transit in Northern Virginia

Commission Meeting, April 4, 2024

Xavier Harmony, PhD
Senior Program Manager

Study Outline

- 1. Overview of how transit generally benefits the climate**
 - Different types of emissions
 - National transportation trends
 - Trends in the transit industry
- 2. Summary of Northern Virginia policies that intersect transit and the environment.**
- 3. Climate benefits of transit are quantified.**
- 4. Concludes with recommendations for the region.**



Why is this topic important for NVTC?

- Transportation is the greatest source of US emissions
- Northern Virginia's share of transportation emissions is ~10% higher than the average for the Washington, DC region
- Transit can help mitigate transportation emissions
- Transit ridership has recovered slower than driving and this has potentially significant climate impacts



“Metro’s core business—moving people on public transportation—is inherently sustainable. Every trip taken with Metro instead of a car reduces the region’s carbon footprint.”

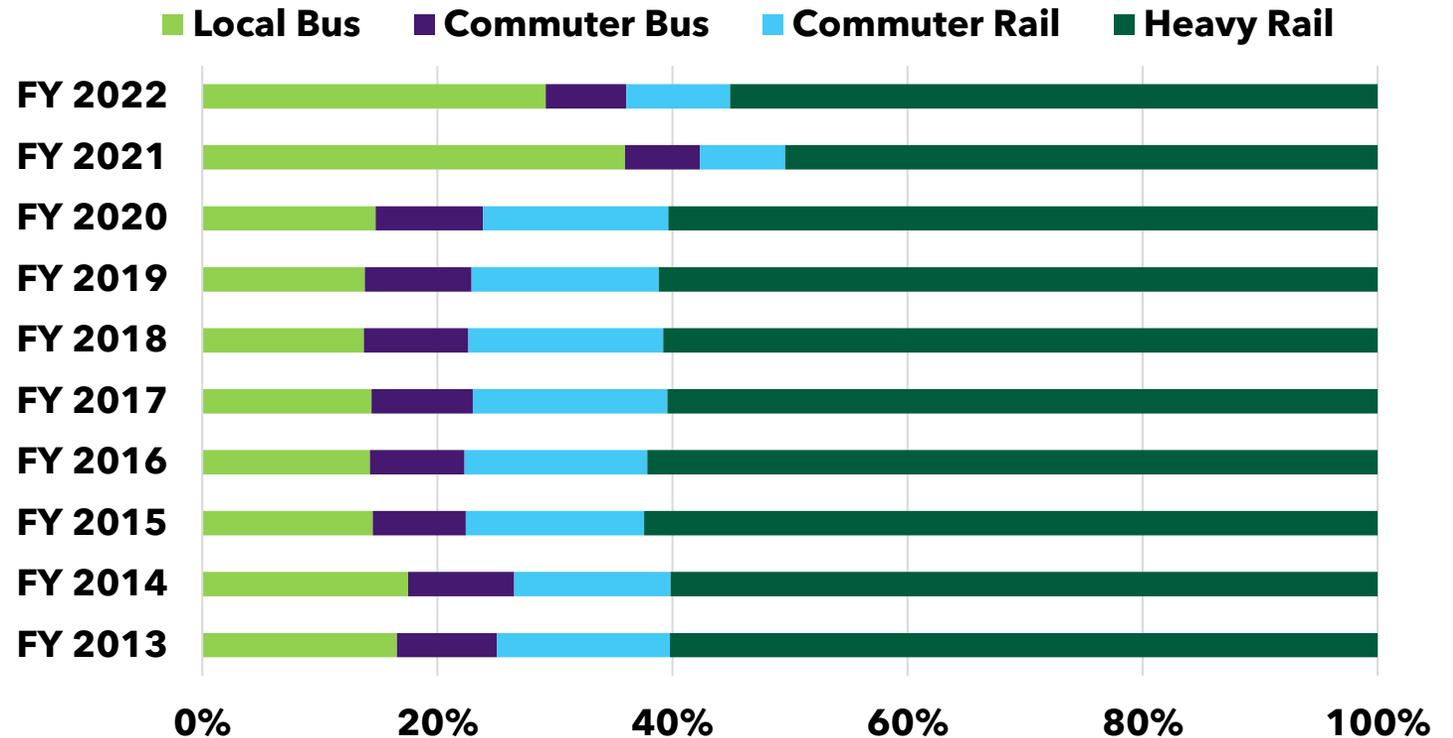
– Metro 2020-2021 Sustainability Report

Key Finding #1

The use of public transit in Northern Virginia reduces 120,000 to 160,000 Metric tons of CO₂ annually¹.

- Commuter bus and commuter rail disproportionately benefit emissions
- Pandemic has had a big impact to emissions

Proportion of CO₂ emissions avoided by transit mode in Northern Virginia



¹2017 numbers, which is when latest MWCOG data was available

Key Finding #1

The use of public transit in Northern Virginia reduces 120,000 to 160,000 Metric tons of CO₂ annually¹.



13,500,000 gallons of gasoline



27,000 cars driven for one year

(cars end-to-end would go from Washington, DC to Richmond, VA)



33 wind turbines running for a year



Over **15,000** homes' energy use for one year



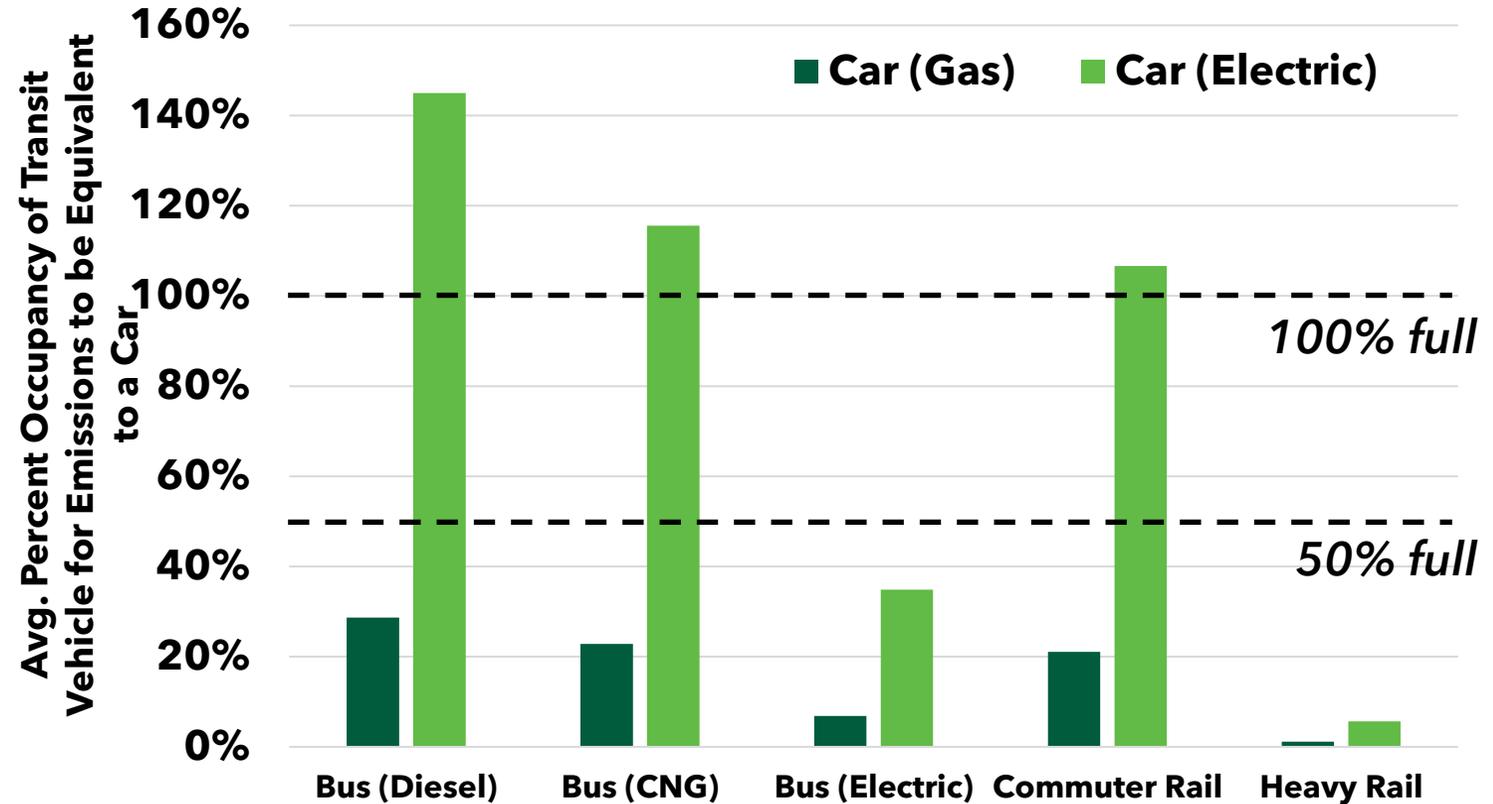
Almost **2,000,000** tree seedlings grown for 10 years

Key Finding #2

All bus fuel types, even diesel buses, are a much greater environmental option than using cars.

- Transit vehicles can operate less than half full and still have lower emissions than gasoline cars
- The *more* a bus is used, the *lower* the number of bus passengers required to replace a gasoline car
- Electric cars are more competitive when it comes to reducing emissions

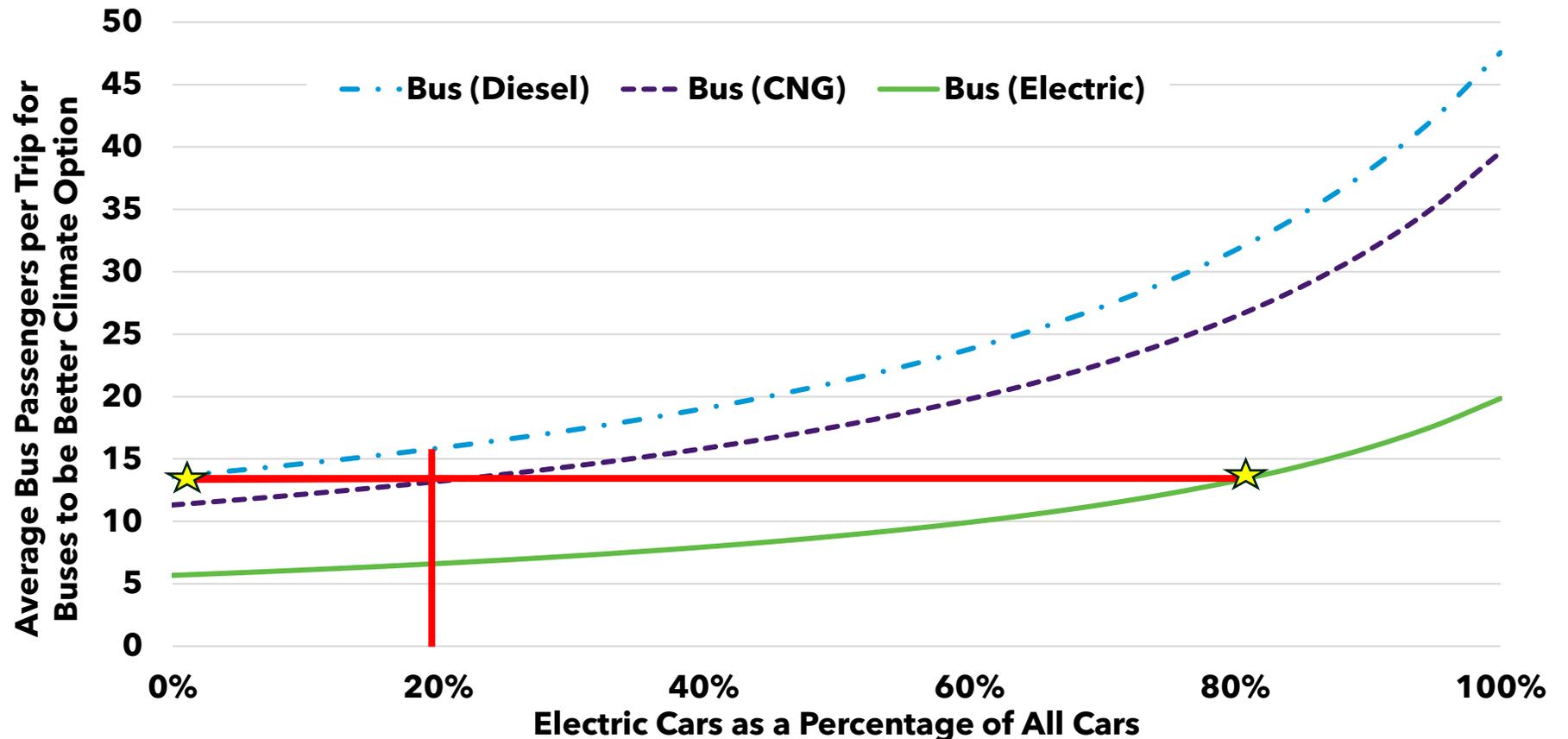
CO₂ emissions per passenger mile breakeven analysis



Key Finding #3

Electric cars need to make up a much larger proportion of on-road vehicles before other bus fuel types become better options.

Breakeven analysis considering EV car composition



- If electric cars increase from 1% to 20% of all cars, an average diesel bus needs only to carry 2 additional people to be a better environmental option
- 85% of all on-road cars need to be electric for electric buses to be as good for the climate as diesel buses are today

Key Finding #4

There are opportunities for the region’s jurisdictions and transit agencies to learn from each other’s policies.



- 27 transit-environmental policy documents were reviewed
- Content was categorized in three ways:
 - Environmental Goals
 - Transit Actions
 - Performance Measures
- Very little overlap between jurisdictions

#	Transit Actions	Examples
1	Increase Ridership	Improve equity, improve rider experience, incentivize TOD
2	Vehicle	ZEB, electric paratransit or staff vehicles, renewable natural gas
3	Operations	Increase service, utilize regenerative braking
4	Facilities	Energy efficient lighting, solar panels, control stormwater runoff
5	Other Infrastructure	Bus priority infrastructure, on-route charging
6	Studies	ZEBs, transit facilities, alternative fuels
7	Other	Increase education, energy audits

Recommendations

- 1. Increase ridership** (*shorter-term*)
- 2. Reduce miles and hours when a transit vehicle is not taking passengers ("deadheading") where possible** (*shorter-term*)
- 3. Increase the amount of transit in the region** (*medium-term*)
- 4. Speed up buses using bus priority infrastructure and policies** (*medium-term*)
- 5. Transition to zero emission buses** (*longer-term*)

"...the environmental benefits of transit only arise from many people riding the bus rather than driving, taking a taxi, or otherwise getting a ride in a private vehicle."

- Alexandria Transit Vision Plan



Thank You!

Xavier Harmony, PhD

Senior Program Manager



2300 Wilson Boulevard, Suite 230, Arlington, Virginia

www.novatransit.org | [@novatransit](https://twitter.com/novatransit)