



Climate Change Objectives Follow-up



We Lead on Addressing Climate Change



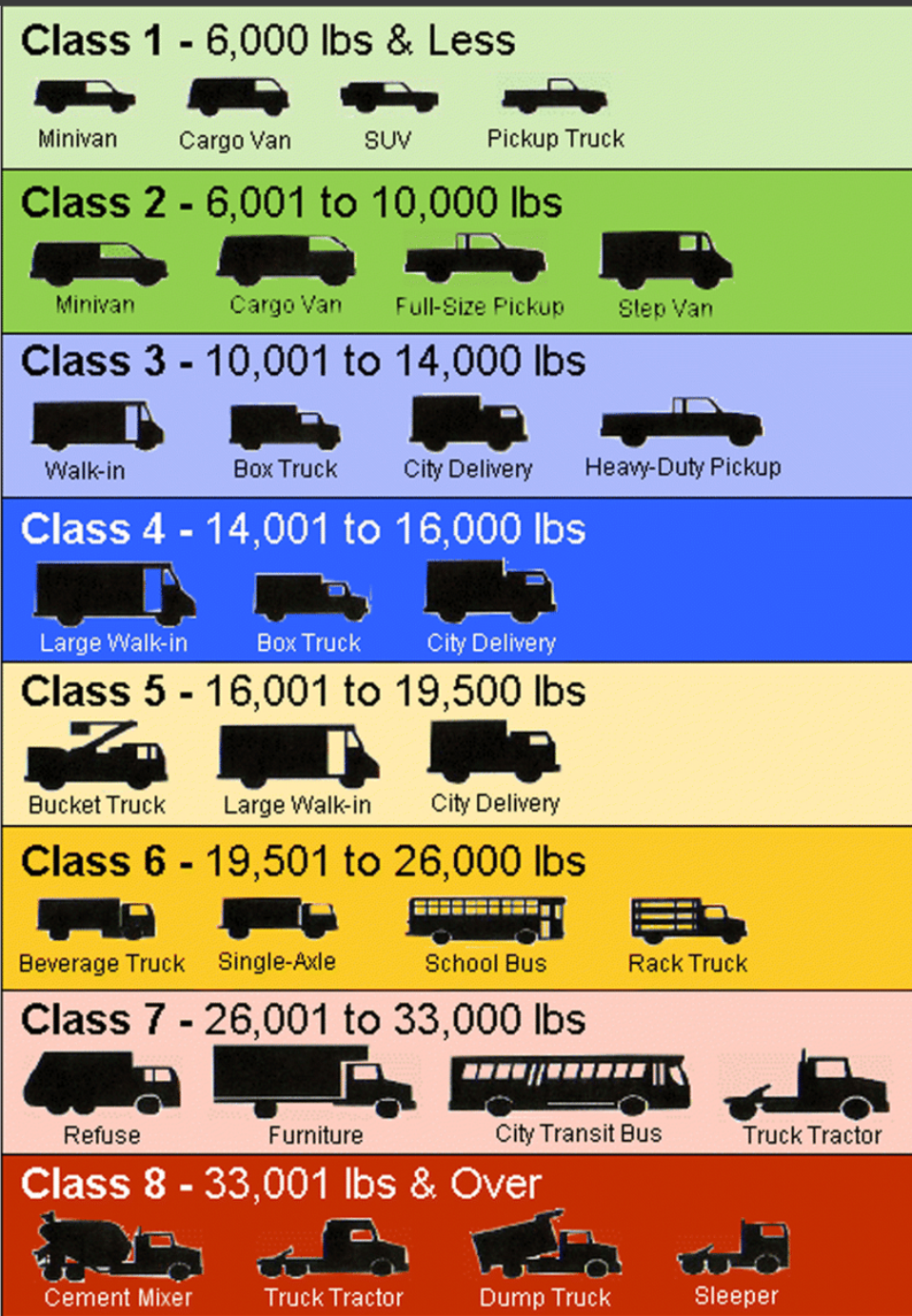
Objectives

- The region's transportation system minimizes its contributions to climate change.
- By 2035, 100% of new, light-duty vehicles registered are zero emissions, and 45% of all light-duty vehicles registered are zero emissions.
Or **People have more access to and trust in zero emissions vehicle infrastructure.**
- By 2050, the region reduces vehicle miles traveled by 20% per capita below 2019 levels.
Or **The region reduces vehicle miles traveled per capita.**

Electric Vehicles



What are light-duty vehicles?



	Transportation GHGs in MN	Definition	Prime target for electrification
Passenger cars	18%		X
Light-duty trucks (including SUVs)	37%	<10,000 pounds, Classes I & II	X
Heavy-duty trucks	19%	>10,000 pounds, Classes 3+	
Aviation, railroad, marine, buses, motorcycle, RVs, etc.	26%		

Figure from: https://www.researchgate.net/figure/Vehicle-weight-classes-as-defined-by-the-Federal-Highway-Administration-FHWA-in-the-US_fig2_351978718

Source: <https://public.tableau.com/app/profile/mpca.data.services/viz/GHGemissioninventory/GHGsummarystory>

Why EVs? (1)



- Reduce GHGs 78% below gasoline vehicles given today's electricity mix in Minnesota
- Mitigate anticipated impacts in Minnesota and beyond
 - Storms and flooding
 - Rising temperatures
- 57% lower fueling costs
- Half of maintenance costs

Sources: https://afdc.energy.gov/vehicles/electric_emissions.html
<https://www.pca.state.mn.us/air-water-land-climate/climate-change-impacts>
<https://www.nrdc.org/stories/electric-vs-gas-cars-it-cheaper-drive-ev#:~:text=Without%20spark%20plugs%20to%20replace,repair%20as%20gas%2Dpowered%20cars.>
<https://advocacy.consumerreports.org/wp-content/uploads/2020/10/EV-Ownership-Cost-Final-Report-1.pdf>

Why EVs? (2)



Driving to Clean Air:

Health Benefits of Zero-Emission Cars and Electricity

June 2023

Health Benefits

- “if all new passenger vehicles sold are zero-emission by 2035” and the “nation’s electric grid [is] powered by clean, non-combustion renewable energy replacing fossil fuels by 2035”

2020-2050	United States	Minnesota
Public Health Benefits	\$978 Billion	\$12.3 Billion
Fewer premature deaths	89,300	1,130
Fewer asthma attacks	2.2 Million	30,100
Fewer lost work days	10.7 Million	141,000

- “a person of color is...3.7 times more likely to live with the most polluted air in the United States”

Source: <https://www.lung.org/getmedia/9e9947ea-d4a6-476c-9c78-ccc7d49ffe2/ala-driving-to-clean-air-report.pdf>

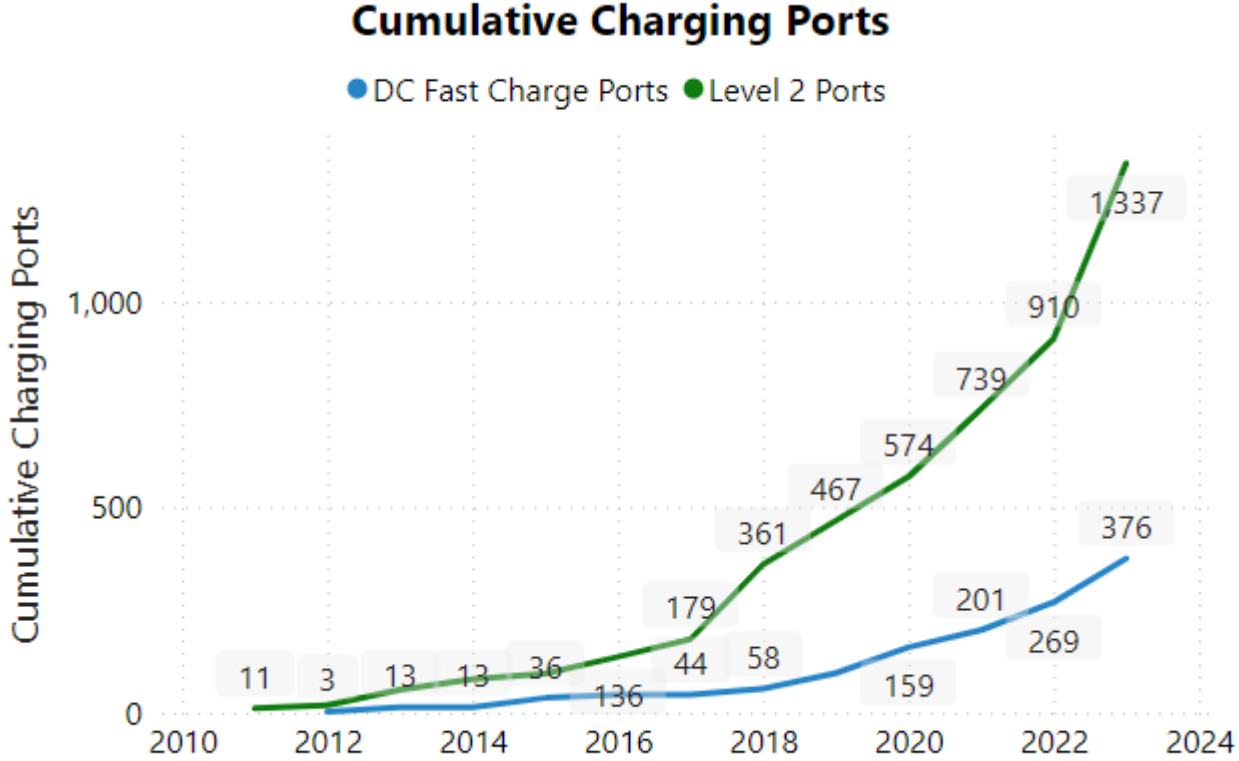
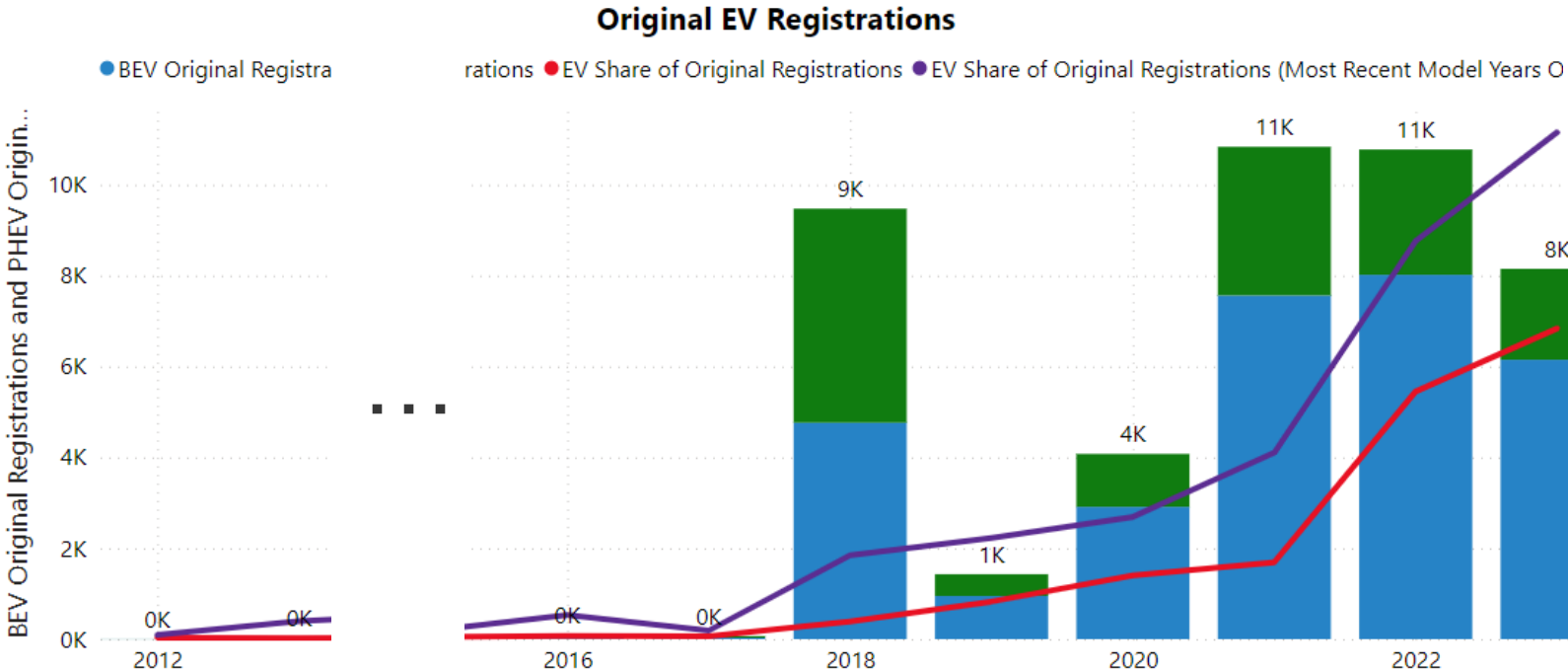
Equity in Electrification



- Underrepresented communities are most susceptible to public health and climate impacts of burning fossil fuels
- Affordability comes as more vehicles sold, technology matures, automakers move beyond early adopters and more used vehicles become available
- Areas of emphasis for an MPO long-range plan
 - Public charging
 - Near multi unit housing
 - Gap analysis
 - Education and engagement with underrepresented communities
- **Other key considerations?**

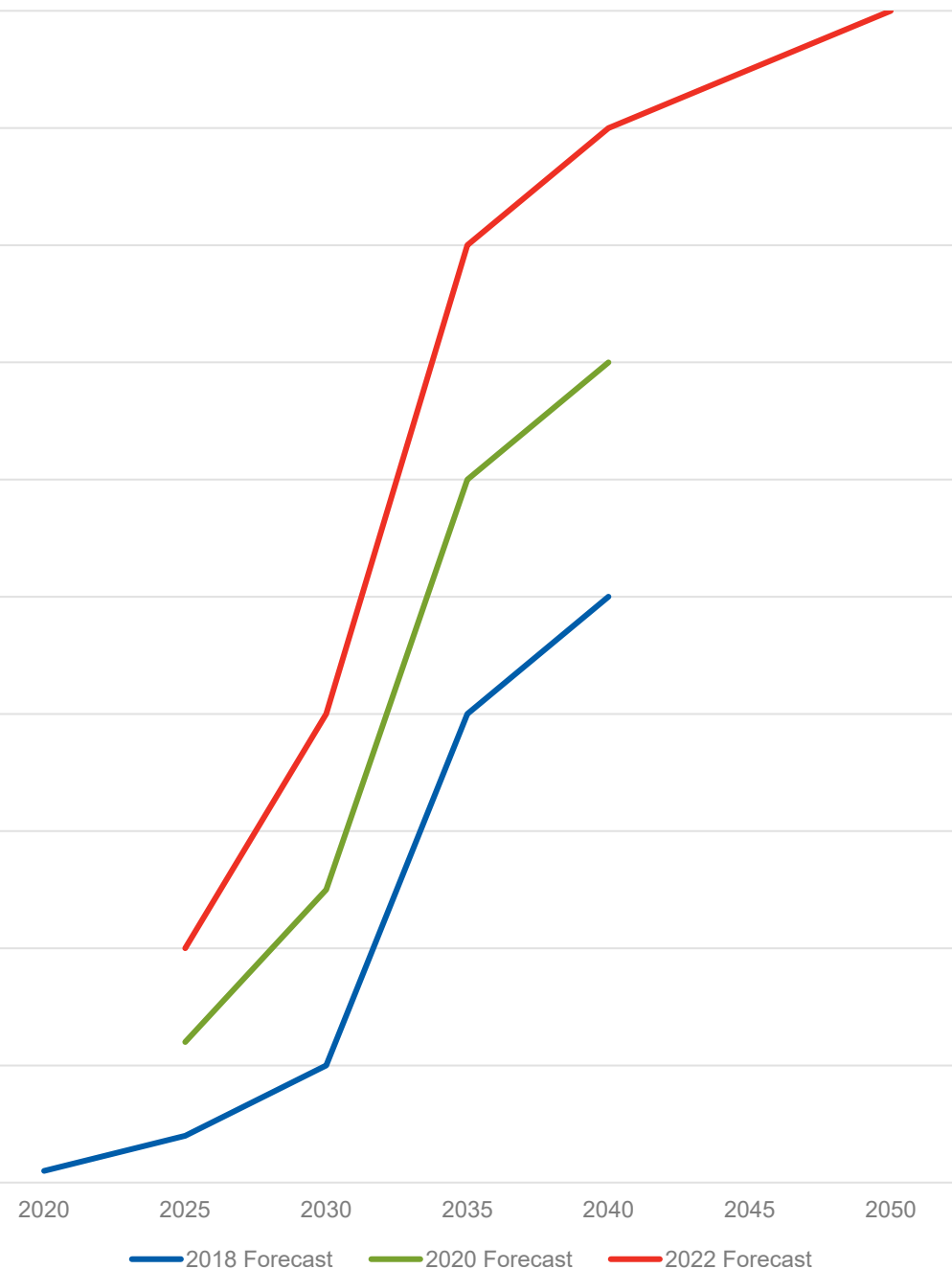
EV Sales and Public Charging in MN

- Supply chain issues during COVID
- New federal investments/competition across nations, private sector investments/competition, improving technologies, etc.



Source: <https://atlaspolicy.com/evaluatemn/>

EV Projections



International Energy Agency

- Global sales from 5% in 2020 to 14% in 2022, 18% anticipated in 2023
- China, Europe and US are largest markets
- US sales grew 55% from 5% in 2021 to 8% in 2022

Cox Automotive

- US sales grew 65% from 3.2% in 2021 to 5.8% in 2022

Boston Consulting Group

- New projections continue to beat past projections

Source: <https://www.iea.org/news/demand-for-electric-cars-is-booming-with-sales-expected-to-leap-35-this-year-after-a-record-breaking-2022>
[New Car Sales Fell in 2022, But New Electric Car Sales Rose Dramatically - Kelley Blue Book \(kbb.com\)](#)
[EV Adoption, Trends & Statistics: US Electric Cars in 2023 \(recurrentauto.com\)](#)

ZEV plans by automakers



- Tesla valued at more than next 8 automakers combined
- Ford expects 40% to 50% of its global vehicle volume to be fully electric by 2030.
- General Motors committed to selling only zero-emission cars and trucks by 2035.
- Honda aims to make its entire lineup zero-emissions in major markets by 2040. The company wants to offer 30 EV models by 2030.
- Nissan wants EVs to make up 40% of its U.S. sales by 2030
- Toyota expects its sales of all-electric vehicles to reach 3.5 million by 2030, and will introduce 30 EV models by that time.
- Volkswagen plans for half of all vehicles sold in the U.S. and China and 70% of all vehicles sold in Europe to be electric by 2030.

Electric Vehicles are changing



- Purchase costs falling as production volume and experience grows, price parity as soon as 2025
- Audience moving beyond early adaptors
- Broader selection of vehicles types
- Batteries with fewer rare earth/scarce metals, lighter, lower costs, greater capacity
- Charging networks growing

Clean Electricity Generation



- From 2010 – 2019 cost of solar energy and wind energy dropped 85% and 55% respectively
- Xcel Energy
 - Electricity today is 50% clean than 2005
 - Net-Zero Energy Provider by 2050 (2018)
 - EVs in 2021 55% cleaner, in 2030 80% cleaner
 - 20% EVs by 2030 (~60% of sales)
- 2023 MN Legislation requires 80% carbon-free electricity by 2035, 100% by 2040*
- If 80% of all passenger cars become electric, this would lead to a total increase of 10-15% in electricity consumption.

Sources: <https://impact.economist.com/sustainability/net-zero-and-energy/data-point-clean-energy-costs-are-falling>
<https://mn.my.xcelenergy.com/s/our-commitment/carbon-reduction-plan>
<https://www.virta.global/blog/myth-buster-electric-vehicles-will-overload-the-power-grid>

MPO role in encouraging EVs



Doing some:

- Ongoing coordination
- Regional Solicitation funding to EV Spot Network (2022)
- Electric Vehicle Planning Study (2021)
- Charging and Fueling Infrastructure grant (2023) application
- Electric Vehicle Public Charging Needs Analysis (2023)
- Electric Vehicle Public Engagement and City Support (2023)

Opportunities to do more:

- Coordinate with public, private and non-profit actors
- Fund public charging stations
- Public engagement and education
- Technical support for cities and other partners

Electric Vehicles in MN

Climate Action Framework

- Reach 20% EVs on Minnesota roads by 2030.

State Multimodal Transportation Plan

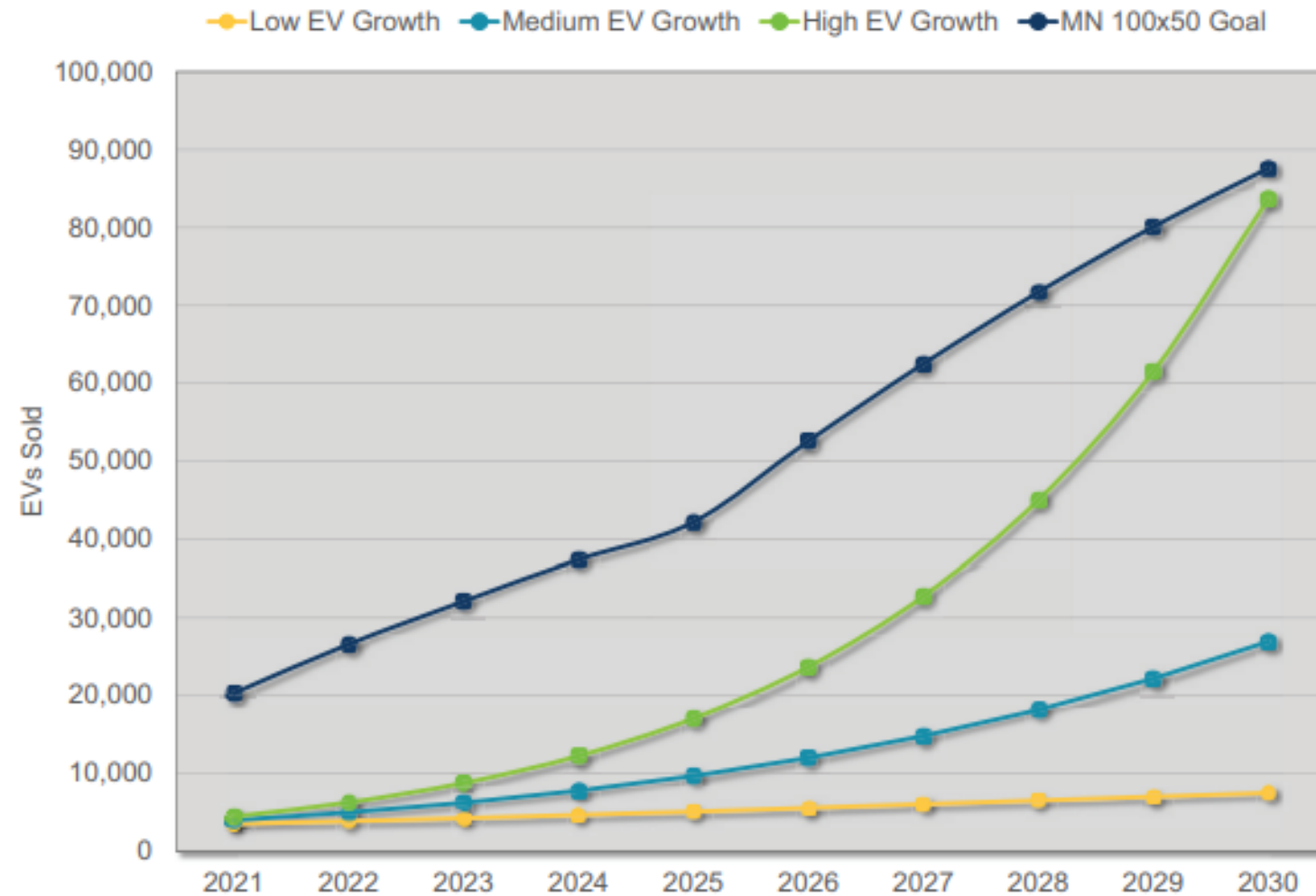
- Targets for new light-duty EVs registered in MN (% of all):
 - 20% by 2025 (5%)
 - 60% by 2030 (20%)
 - 100% by 2035 (45%)

TPP Objective

- By 2035, 100% of new, light-duty vehicles registered are zero emissions, and 45% of all light-duty vehicles registered are zero emissions.
- Or **People have more access to and trust in zero emissions vehicle infrastructure.**

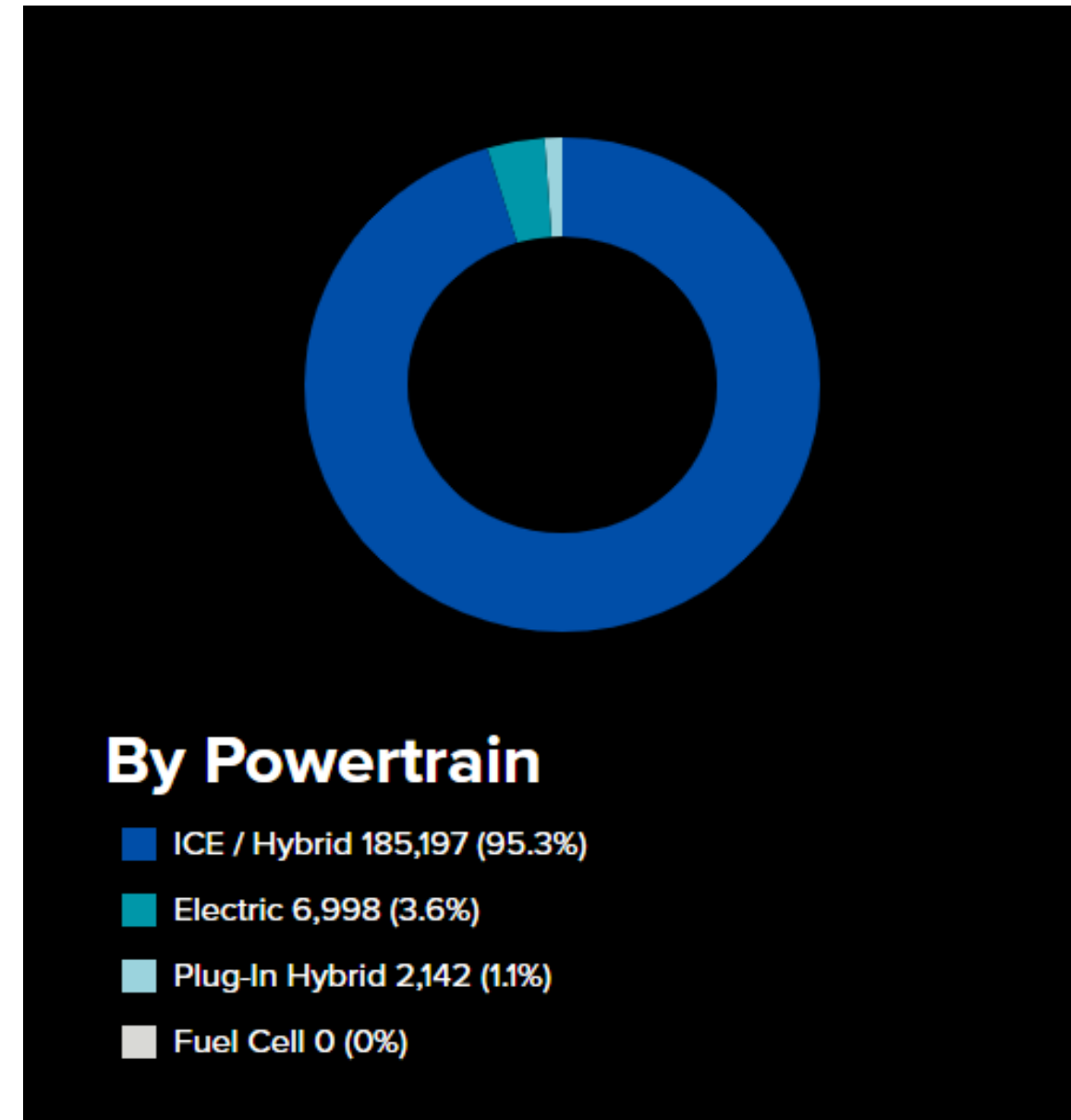
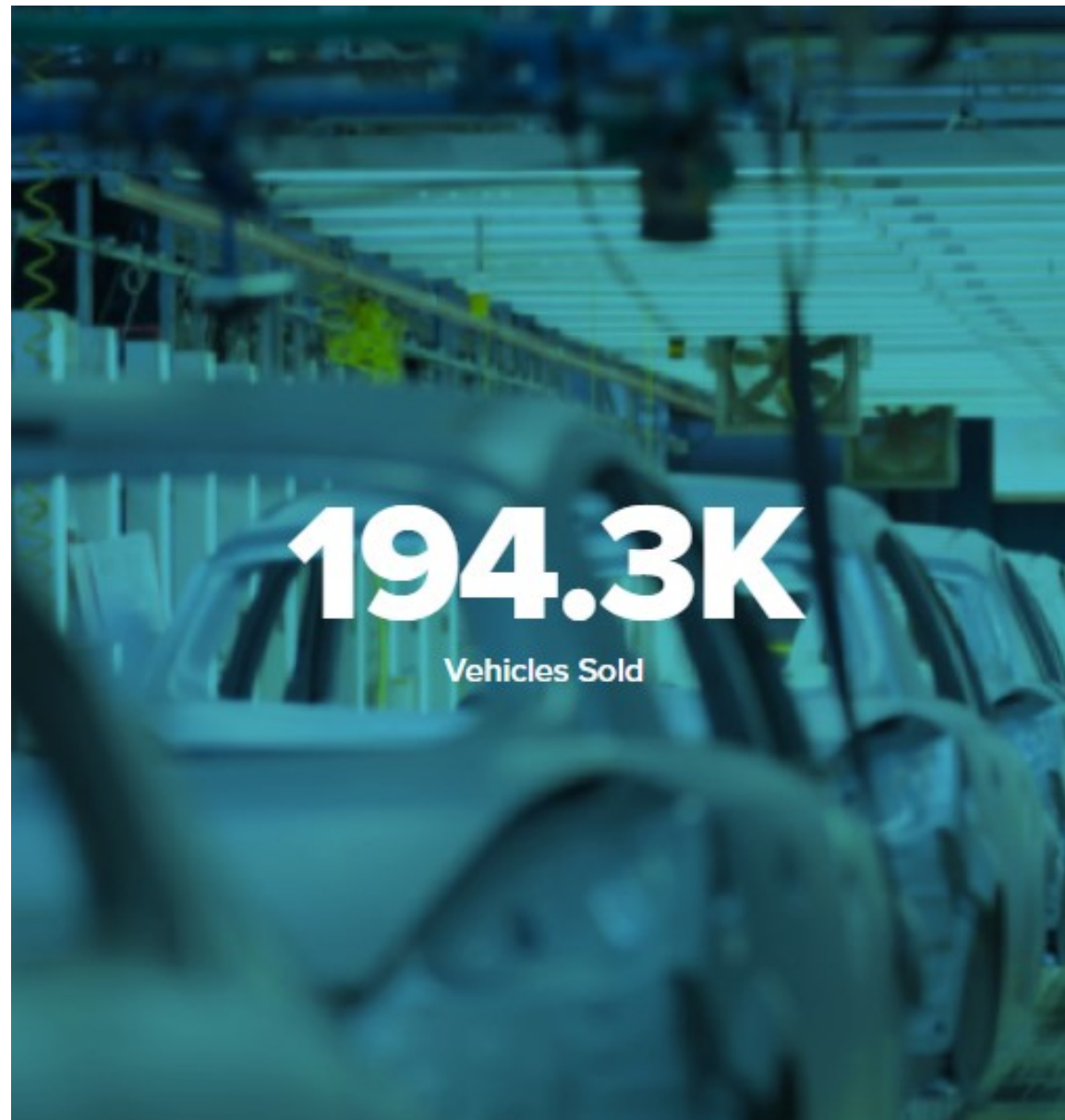
2021 EV Assessment

Figure 3-8. Annual EV sales in Minnesota by scenario



Note: The MN 100x50 goal aligns with the modeled EV sales required for adoption levels identified in the *Pathways to Decarbonizing Transportation in Minnesota* report, published in 2019.

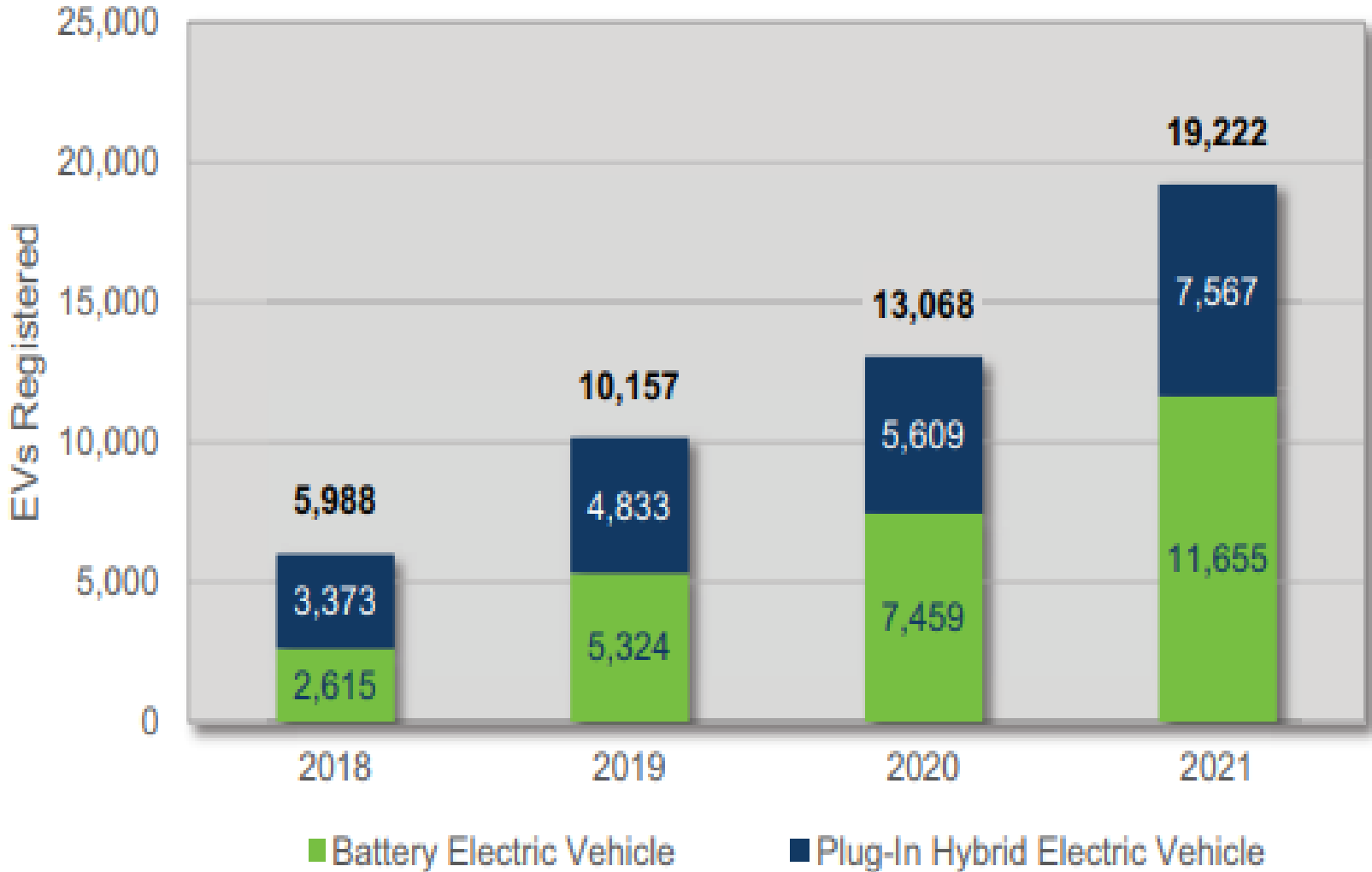
Vehicles sold in MN 2022



Source: <https://www.autosinnovate.org/resources/insights/mn>, accessed 9/13/2023
Figures compiled by Powerbase Associates with data provided by S&P Global Mobility as of December 31, 2022

EV Registrations in MN

Figure 3-3. EV registrations in Minnesota, 2018-2021





Source: Minnesota Department of Public Safety, data snapshots for EV registrations from January 2018, April 2019, February 2020, and April 2021.

MnDOT EV Dashboard

Electric Vehicle Dashboard

This dashboard shows the distribution of plug-in electric vehicles (EVs) and charging stations throughout the state of Minnesota. The dashboard is not able to provide an accurate breakdown by utility service territory and is only a high level estimate. Utilities should refer to the [Public Utilities Commission](#) electric vehicle dataset for more accurate information.

- [View downloadable data.](#)

	41,417 EVs on the Road	7.30 EVs per 1k People	1,332 Level 2 Ports	375 DCFC Ports		7/1/2023 Last Updated	Launch EValueMN
---	---------------------------	---------------------------	------------------------	-------------------	---	--------------------------	---------------------------------

Electric Vehicles in MN SMTP



State Multimodal Transportation Plan

- Targets for new light-duty EVs registered in MN:
 - 20% by 2025
 - 60% by 2030
 - 100% by 2035
- Based on growth scenario in [Minnesota EV Assessment](#)
- Aspirational based on assumptions
 - Market trends
 - New policies and programs supporting EVs
- Position MN to reach 80% GHG reduction by 2050

VMT Reduction



VMT Reduction in MN

Climate Action Framework

- Decrease vehicle miles traveled 20% per capita by 2050.*

State Multimodal Transportation Plan

- -4% by 2025 (2019 base)
- -8% by 2030
- -11% by 2035
- -14% by 2040

TPP Objective

- By 2050, the region reduces vehicle miles traveled by 20% per capita below 2019 levels.
- Or **The region reduces vehicle miles traveled per capita.**

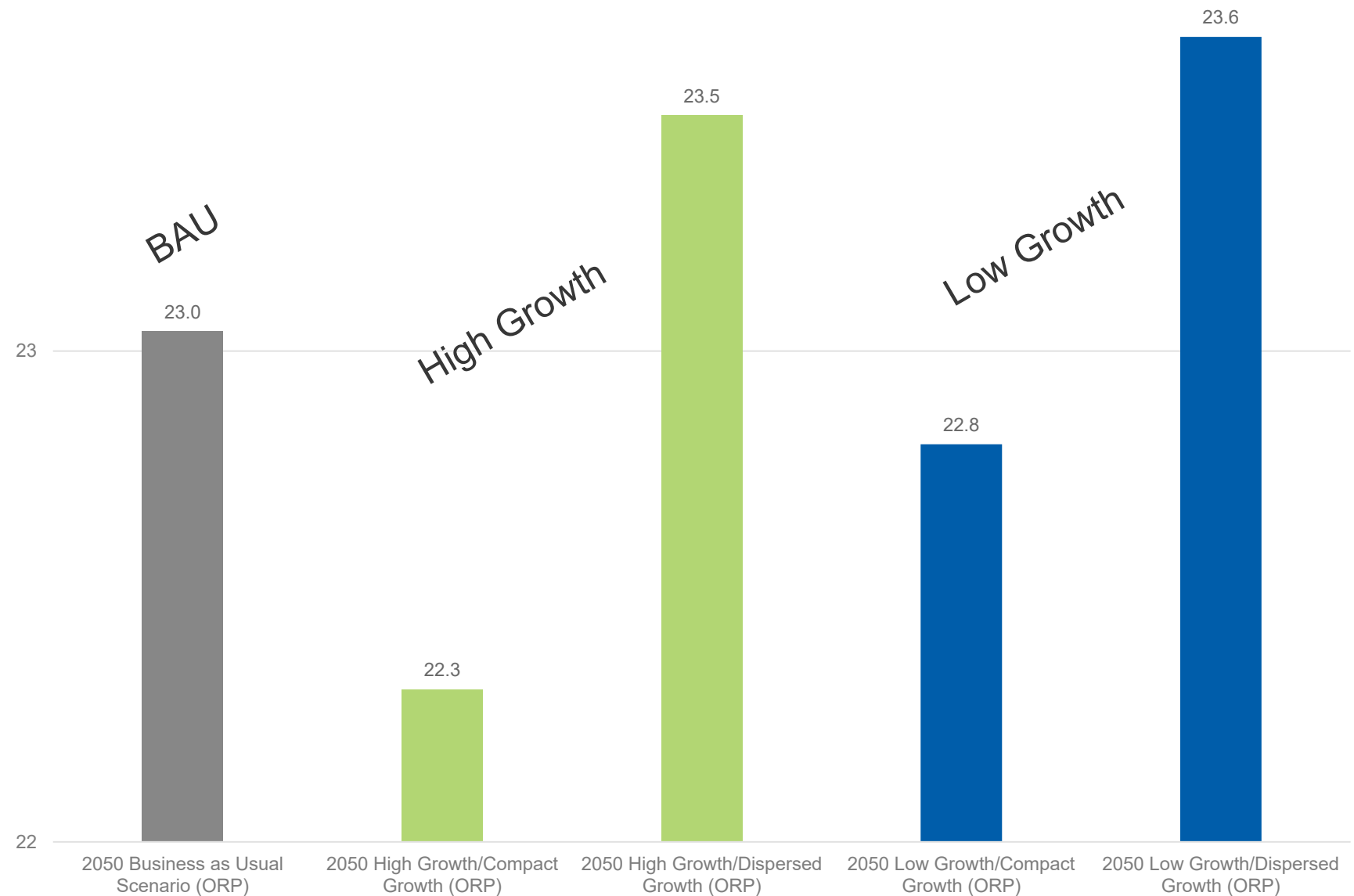
Scenario Planning, VMT from Land use

VMT per Capita in Various Scenarios

- Business as usual 23.0
- High Growth 22.3 – 23.5
 - 1.2 difference
- Low Growth 22.8 – 23.6
 - 0.8 difference
- 3.6 – 4.1 million people in 2050

Note: Graph begins at 22 VMT per Capita to highlight differences

24





Thank you

Tony Fischer, MTS Planning

Kristina Heggedal, MnDOT

Beth Croteau-Kallestad, MnDOT

