



GHG REDUCTION MODELING

2024 RESEARCH & INNOVATION
SYMPOSIUM

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<https://vtrans.vermont.gov/climate/carbon-reduction-strategy>

Why?

VT Global Warming Solutions Act

- Reduce emissions 40% below 1990 levels by 2030
- Reduce emissions 80% below 1990 levels by 2050
- Transportation sector contributes to 40% of reduction

FHWA IIJA Carbon Reduction Program

- Requires each State to develop a Carbon Reduction Strategy
- Describe how new Carbon Reduction Program funding will be used

Technical Analysis — GHG Sketch Tool

A **baseline forecast** of the state's transportation emissions through 2050, considering current adopted policies.

An assessment of the **GHG impacts of AOT's current Capital Program**, related to project construction, mode shift, efficient traffic operations, and clean vehicles funded by the program.

An assessment of the **gap** between projected baseline emissions and emission levels required under the GWSA in years 2025, 2030, and 2050.

Development and evaluation of potential **strategies** to close the gap, including evaluation of potential benefits, costs, and co-benefits.

Transportation Emissions Baseline Forecast

(MT CO₂e)

Source Category	2022	2025	2030	2050
Onroad Vehicles	2,650,367	2,546,692	2,146,801	508,778
Public Transit	15,781	15,781	15,781	15,781
Rail (passenger and freight)	63,453	64,221	65,120	65,171
Aviation	99,502	100,702	102,104	102,188
Marine (navigation)	33,555	33,961	34,434	34,465
Other	29,128	29,480	29,892	29,916
Construction and Maintenance	7,390	7,095	6,686	6,179
Total	2,899,177	2,797,933	2,400,818	762,477

VTrans Capital Program Evaluation

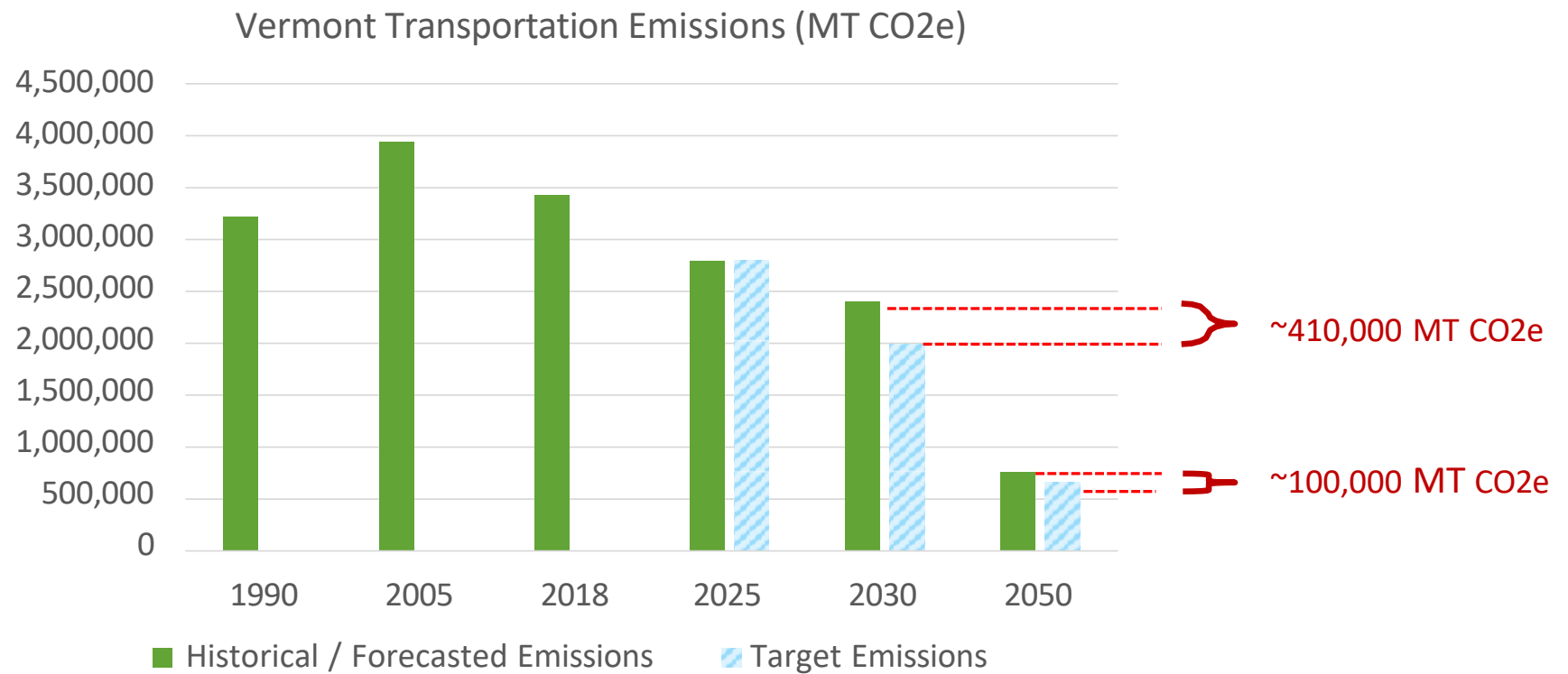
Count of Capital Program Database Projects

Project Type	Count
Aviation	9
Bike & Pedestrian Facilities	29
Interstate Bridges	15
Maintenance	3
Municipal Mitigation	16
Other	1
Park & Ride Lots	3
Paving	76
Rail	55
Rest Areas	6
Roadway Projects	71
State Highway Bridges	56
Town Highway Bridges	24
Traffic & Safety	28
Transportation Alternatives ^a	37
Total	429

GHG Emissions Impact of AOT Capital Program (MT CO₂e)

Project Type	2025	2030	2050
Bicycle and Pedestrian ^a	-560	-425	-68
Roadway Expansion	0	0	0
Traffic Operations	-1,925	-1552	-564
Transit	-19	-23	-4
Travel Demand Management	0	0	0
Park and Ride	-141	-107	-17
Total	-2,654	-2,115	-654

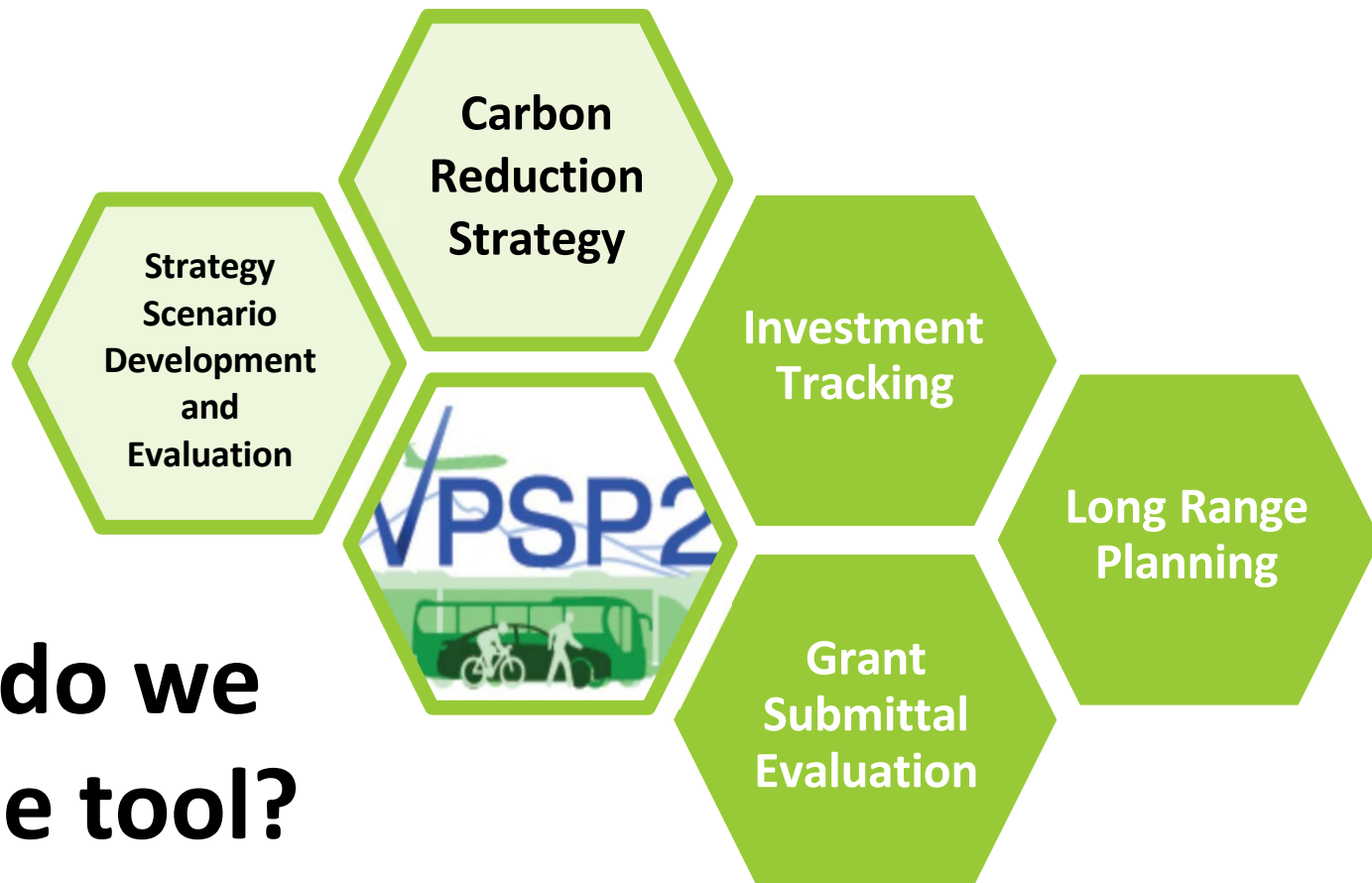
Gap Analysis



GHG Reduction Strategies: 2030 Effects

Strategy	CO ₂ Reduction (2030 MT)	% of 2030 Gap Closed	Estimated Cost Through 2030 (\$M)
Bicycle and pedestrian network expansion	220	0.1%	55.7
Transit service expansion	690	0.1%	44.0
Micromobility	1,420	0.3%	7.9
Travel demand management	80	0.0%	2.8
Transit vehicle electrification	4,260	1.0%	31.5
Land use	5,660	1.4%	NA ^a
Broadband expansion	5,300	1.3%	191.7
Advanced Clean Fleets	35,700	7.7%	79.3
Feebates	19,800	4.8%	NA ^b
Combined Effects			
Transportation investment and services	6,500	1.6%	141.8
Transportation + land use + broadband	17,600	4.3%	333.5
Transportation + land use + broadband + ACF + feebates	73,000	17.8%	412.8

How do we use the tool?





A green rectangular graphic with a light blue border. In the center, the word "Questions" is written in white. Surrounding the text are several white icons: a cement truck, an electric car, a person on a bicycle, a tablet with a graph, a bar chart, a building with nodes, a traffic light, a bus, and a lightbulb.



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