

Vermont Transportation Carbon Reduction Strategy Update

HOUSE TRANSPORTATION COMMITTEE

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Project Team



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Agenda

- **Project Objectives & Overview**
- **Capital Program Evaluation**
- **Gap Analysis**
- **Public /Stakeholder Engagement & Carbon Reduction Strategies**
- **Next Steps**

Project Objectives

Support Vermont's aggressive requirements for GHG emissions reduction

- Reduce emissions 26% below 2005 levels by 2025
- Reduce emissions 40% below 1990 levels by 2030
- Reduce emissions 80% below 1990 levels by 2050
- Transportation sector contributes to 40% of reduction

Support U.S. DOT requirements for each State to develop a Carbon Reduction Strategy

- Describe how new Carbon Reduction Program funding will be used

Project Overview

Phase 1

Estimate GHG emissions impact of the VTrans' Capital Program

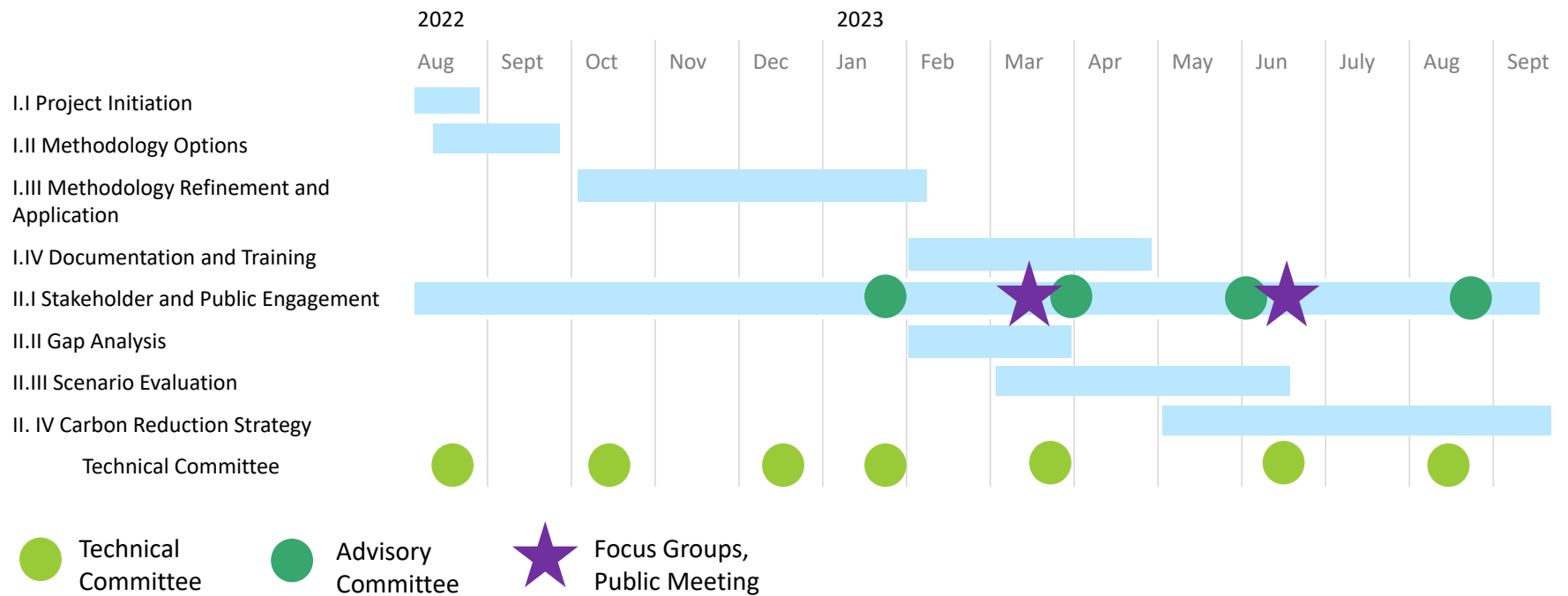
- Methodology Options Evaluation and Recommendation
- Application to the SFY 2024 Capital Program
- Documentation and Training

Phase 2

Develop Carbon Reduction Strategy

- Stakeholder and public engagement
- Gap analysis
- Strategy and scenario development and evaluation
- Carbon Reduction Strategy

Project Timeline



Phase 1 – VTrans Capital Program Evaluation



VTrans' Capital Program



*Depicts the number of programmed projects, by project type, in the capital program

GHG Effects of the Capital Program



Construction and Maintenance

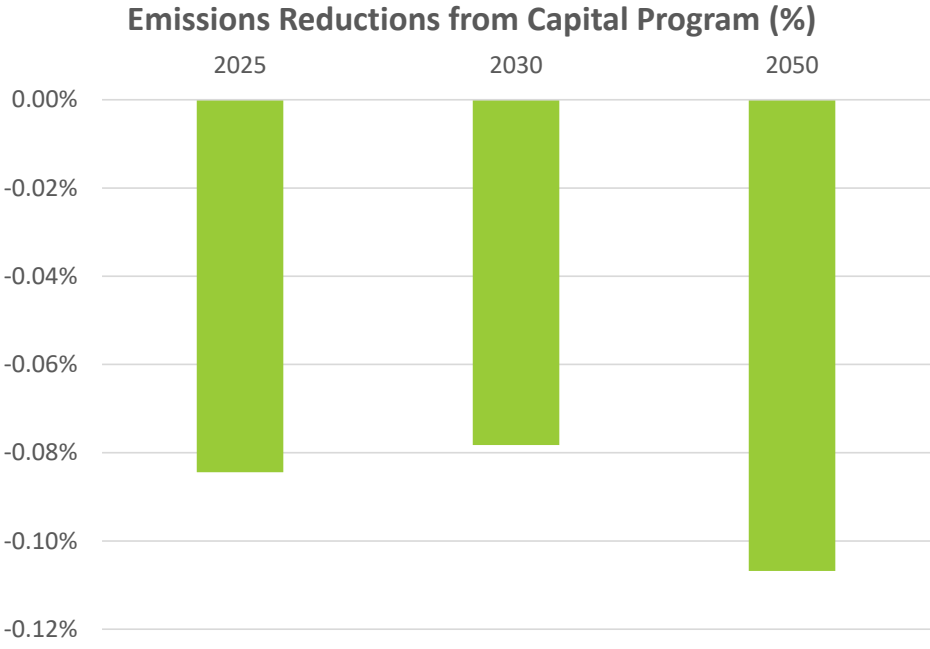
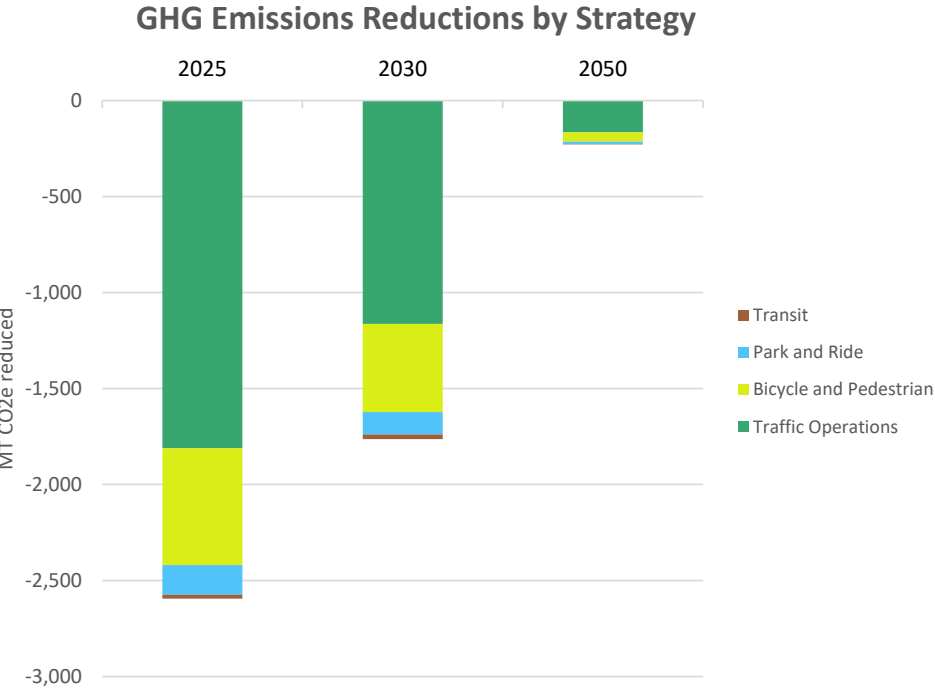


Transit and Rail Operations



**Changes in System User Emissions
(Cars and Trucks)**

Emissions Summary – Impact of Capital Program



Gap Analysis



Key Assumptions

Coordinating with ANR to ensure consistency with Climate Action Plan baseline

Key revisions from previous model runs:

- Lower VMT in 2020/2021 to be calibrated towards highway traffic data (pandemic effect)

	2019	2020	2021	2022	2023	2024	2025
VMT (million miles)	7,346	6,008	6,630	6,752	6,880	7,015	7,153
Change from 2019		-18%	-10%	-8%	-6%	-5%	-3%

Key Assumptions

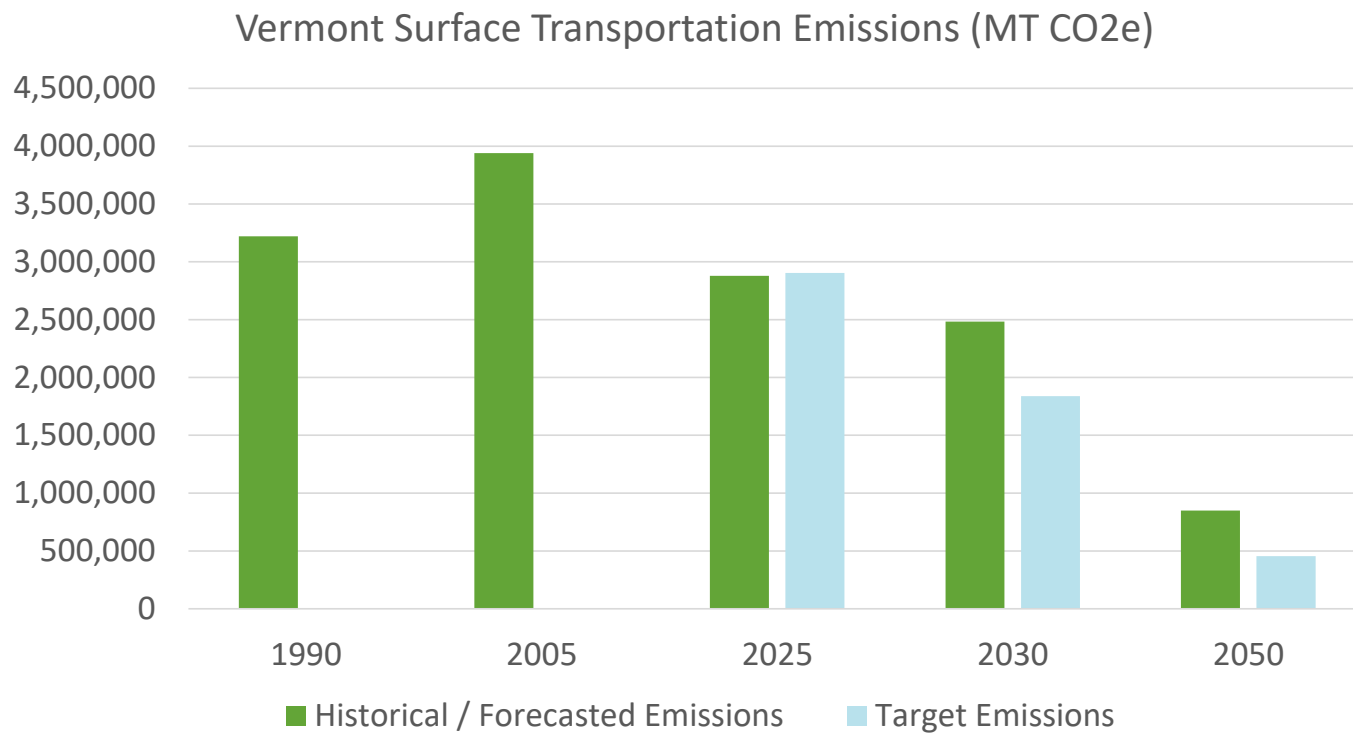
Advanced Clean Cars 2, Advanced Clean Trucks

- ACC: 100% EV sales for LDV by 2035
- ACT: 75% MDV EV sales, 40% HDV EV sales by 2035

Electrification levels (% vehicle stock):

	2022	2025	2030	2050
Passenger Car	2.8%	5.1%	20.4%	91.8%
Light Duty Trucks	0.5%	3.3%	17.5%	82.5%
Medium Duty Trucks	0.1%	1.7%	10.9%	60.8%
Heavy Duty Trucks	0.0%	0.3%	2.9%	31.3%

Gap Analysis - Findings



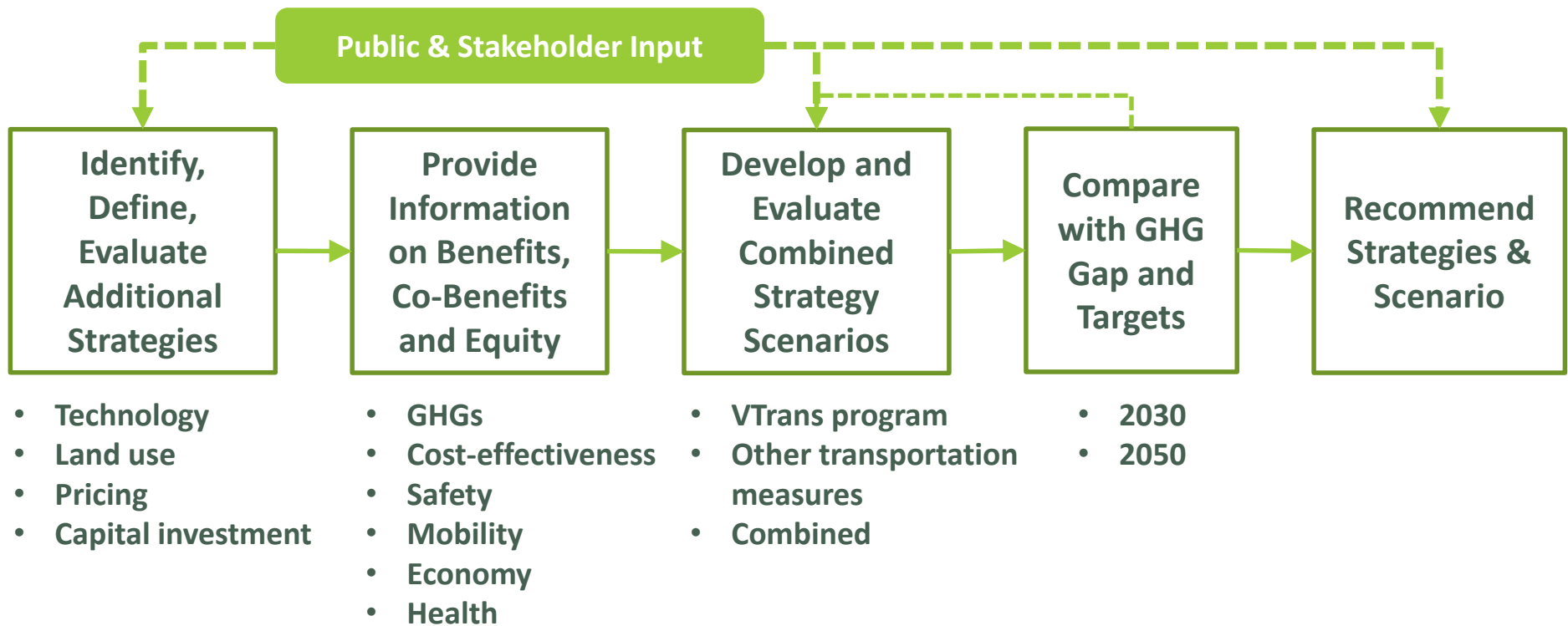
Gap Analysis - Findings

	1990	2005	2025	2030	2050
Transportation Emissions	3,220,000	3,940,000	2,879,137	2,482,975	848,606
Target Emissions			2,903,120	1,837,600	455,200
Gap (#)			-23,983	645,375	393,406
Gap (%)			-0.8%	26%	46%

Engagement & Carbon Reduction Strategies Analysis



Strategies and Scenario Analysis



Possible Strategies to Close Gap

Mode Shift



Land Use & Tele-Travel Strategies



Clean Car/Truck Incentives and Requirements



Carbon Management Strategies



Traffic and Roadway Strategies



	Business	Freight/ Rail	Environment	Regional	Equity / EJ	Electeds	Public
Bike/ Ped			Interest, Suggestions	Interest, Suggestions	Interest, Suggestions	Interest, Suggestions	Interest, Suggestions
Transit	Interest, Suggestions		Interest, Suggestions	Interest, Suggestions	Interest, Suggestions	Interest, Suggestions	Interest, Suggestions
Freight Rail		Interest, Suggestions					
Land Use			Interest, Suggestions	Interest, Suggestions	Interest, Suggestions		Interest, Suggestions
Tele-travel					Interest, Suggestions		Interest, Suggestions
EV Passenger Vehicles and Charging	Mixed		Mixed		Mixed	Interest, Suggestions	Interest, Suggestions
EV Freight Transition	Interest, Suggestions	Mixed	Interest, Suggestions				
Other Clean Car/Truck	Mixed	Concerns	Interest, Suggestions		Interest, Suggestions	Interest, Suggestions	
Carbon Management	Concerns	Concerns	Interest, Suggestions		Concerns	Interest, Suggestions	Interest, Suggestions
Traffic and Roadway							Interest, Suggestions

Interest, Suggestions
 Concerns
 Mixed

Mode Shift



Strategies

- Pedestrian/bicycle infrastructure
- Transit (scheduled, on-demand/microtransit)
- Micromobility services/incentives
- Travel demand management
- Freight rail

Current Activities

- Shared use paths
- Complete Streets & shoulder widenings
- Public transit operating support
- Micromobility demonstrations
- Go! Vermont
- Rail improvements

Additional Opportunities

- Increased levels of Capital Program investment
 - Ped/bike and rail infrastructure
 - Public transit & micromobility
 - TDM programs
- Requires additional funding sources

Public & Stakeholder Input



- High support, especially for transit, and a desire for state investment to reflect this as a state priority
- Importance of co-benefits for these strategies (e.g., equity, workforce/economic development, health)
- Microtransit could provide better connections and serve the rural areas surrounding towns and cities
- Freight interests expressed skepticism about viability of significantly increased freight via rail
- Suggestions for educational opportunities and promotion ("culture shift")
- Need for increased coordination and investment in complete streets, traffic calming with roadway maintenance projects especially along state routes
 - Clarity on additional costs, and opportunities for outside funding
 - Public meeting participants stated that improved walking/biking routes would most help them reduce the amount they drive

Cost-Effectiveness & Co-Benefits



Strategy	GHG %	GHG tons/\$M	PM2.5	New non-SOV trips	Health benefits
Bicycle investment	+	++	++	+++	+++
Pedestrian investment	+	+	+	+++	+++
Travel demand management	+	++	++	+++	++
Bus service expansion	+	+	-	++	+
Electric microtransit	+	+	+	+++	+
Micromobility	+	++	++	+++	++
Freight rail	+	+	-	-	+

Benefits Range	GHG %	GHG tons/\$M	PM2.5 lbs/\$M	New non-SOV trips per \$M	Value of health benefits per \$M
-	<0.1%	<10	<1	<1,000	<\$0.1M
+	0.1-1%	10 – 100	1 – 10	1,000 – 50,000	\$0.1 – \$0.25M
++	1-3%	100 – 1,000	10 – 100	50,000 – 250,000	\$0.25M - \$2.5M
+++	>3%	>1,000	>100	>250,000	>\$2.5M

Land Use & Tele-Travel



Strategies

- Land use/Smart Growth
- Tele-travel Substitution

Current Activities

- Downtown and Village Center tax credits & sales tax reallocations
- Go! Vermont (telework resources)
- Broadband initiatives
- Better Connections program

Additional Opportunities

- Expanded broadband
- Smart Growth zoning incentives
- Reduce barriers to development in Smart Growth locations

Public & Stakeholder Input



- High support
- Land use goes hand-in-hand with mode shift strategies
- Concerns about road design standards that limit ability to make road designs more community-friendly
- Most public meeting participants (68% at 12pm and 70% at 6pm) already tele-travel as much as they can
- Affordability concerns with village centers and downtown areas

Cost-Effectiveness & Co-Benefits



Strategy	GHG %	GHG tons/\$M	PM2.5	New non-SOV trips	Health benefits
Land Use/Smart Growth	+ (2030) +++ (2050)	+++	++	-	++
Tele-travel	+++	+++	+++	-	-

Clean Car/ Truck Strategies



Strategies

- Electric vehicle incentives
- EV charging infrastructure/incentives
- Other low-carbon fuels incentives
- Feebates
- Advanced Clean Fleets
- Phase out internal combustion engine sales

Current Activities

- ACC2 and ACT rules
- Drive Electric Vermont
- EV incentives (new, used, RYR)
- EVSE grant program
- NEVI program
- Utility incentives & EV rates

Additional Opportunities

- Advanced Clean Fleets
- Expanded incentives
- Expanded public charging investment
- Fleet transition support
- Make-ready funding
- Feebates

Public & Stakeholder Input



- Adoption levels set in new rules will not be achieved without significant investment
 - Need a reliable EV charging network , including more Level 2 and Level 3 fast chargers
 - Effective placement is critical for freight to minimize potentially long stops
- Business and freight concerns:
 - Preferences for incentives rather than standards or requirements
 - Need for multi-state collaboration on incentives or standards
- Equity concerns related to affordability

Cost-Effectiveness & Co-Benefits



Strategy	GHG %	GHG tons/\$M	PM2.5	New non-SOV trips	Health benefits
Light duty EVs	+++	+++	+++	-	++
Electric transit buses	++	+++	+++	-	++
Electric school buses	+	+++	+++	-	+++
Electric trucks	+++	+++	+++	-	++
Hydrogen trucks	+++	+++	+++	-	++

Carbon Management



Strategies

- Cap-and-invest
- Cap-and-trade
- Clean Transportation Standard (clean fuels)

Current Activities

- Proposed VT programs
- NY developing expandable cap-and-invest program

Additional Opportunities

- Create or join cap-and-invest or cap-and-trade
- Establish Clean Transportation Standard

Public & Stakeholder Input



- Participants suggested a regional (multi-state) approach
- Of public meeting participants, 46% at 12pm and 100% at 6pm said they would be somewhat or very likely to support increased fees on fossil fuels to incentivize reducing emissions if the revenue was reinvested
- Mixed reactions from stakeholders regarding interest and perceived effectiveness of cap-and-invest programs and carbon pricing

Cost-Effectiveness & Co-Benefits



Strategy	GHG %	GHG tons/\$M	PM2.5	New non-SOV trips	Health benefits
Cap-and-invest	+++	+++	+++	+ / +++	+ / +++
Cap-and-trade	++ / +++	+++	+++	-	-
Clean Transportation Standard	+++	+++	+++	-	-

Traffic and Roadway Strategies



Strategies

- Traffic efficiency/smooth flow
- Advanced-technology rideshare/high-occupancy vehicles/CAVs
- Low-carbon infrastructure (construction & maintenance)

Current Activities

- Capital Program – signal and intersection improvements

Additional Opportunities

- Incentives/fee structures to promote high-occupancy ridesourcing
- Shared all-electric CAV pilots
- Low-carbon materials specs
- Clean construction fleets

Public & Stakeholder Input



- Very few comments on traffic and roadway strategies

Cost-Effectiveness & Co-Benefits



Strategy	GHG %	GHG tons/\$M	PM2.5	New non-SOV trips	Health benefits
Traffic flow improvements	+	+++	-	-	-
Advanced technology rideshare/HOV-CAV	TBD	+++	+++	+++	-
Low-carbon infrastructure (materials)	+	TBD	-	-	-
Low-carbon infrastructure (fleets)	+	+++	+++	-	++

Scenarios

Scenario	Mode Shift	Land Use & Tele-travel	Clean Vehicles	Carbon Management	Traffic & Roadway
VTrans Capital Program expansion & priorities	<ul style="list-style-type: none"> • Ped/bike • Transit • TDM • Micromobility 		<ul style="list-style-type: none"> • Additional public EVSE funding 		<ul style="list-style-type: none"> • Traffic operations • Clean materials & fleets
Non-VTrans: regulatory actions			<ul style="list-style-type: none"> • Advanced Clean Fleets 	<ul style="list-style-type: none"> • Cap-and-invest • Clean Trans. Standard 	
Non-VTrans: incentives		<ul style="list-style-type: none"> • Expanded broadband • Smart Growth zoning incentives 	<ul style="list-style-type: none"> • Feebates • EV/EVSE incentives & transition support 		<ul style="list-style-type: none"> • HOV ridesource incentives & demos
Combined					

Next Steps

- **Strategy modeling**
- **Scenario creation and modeling**
- **Comparison against gap**
- **Draft Carbon Reduction Strategy**
- **Technical & Advisory Committee reviews**
- **Public & stakeholder input round 2**



Questions & Comments

Thank You!



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

Contact:

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Stakeholder List

Business	Freight/ Rail	Environment	Regional	Equity / EJ	Electeds
VT Petroleum Assoc	All Earth Renewables	T4VT Meeting	Rutland RPC	VT Housing Finance Agency	Climate Solutions Caucus
VT Vehicle and Auto Distributors Assoc	NE Central Railroad	VNRC	Central VT RPC	Capstone Community Action	
Statewide Chambers of Commerce	Vermont Rail System	Conservation Law Foundation	Mt Ascutney RPC	Rights & Democracy	
King Arthur Bakery	VT Truck and Bus Association	Green Mountain Transit	Addison County RPC	Environmental Justice VT	
Dairy Farmers of America	Seventh Generation	Vital Communities	Two Rivers-Ottawquechee RPC	Chittendon County RPC	
Northeast Logistics	Omya	Chittendon Area TMA	Northeastern VT Development Assoc	The Root Social Justice Center	
Ben & Jerry's	Agri-Mark (Cabot)	VT Energy Education Program	Chittendon Area TMA	VT Racial Equity Assoc	
Lake Champlain Chamber	J&T Trucking Co.	Champlain College	+RPCs, TMAs	VPIRG	
Ski VT	JP Carrara	CarShare VT	VT League of Cities and Towns	Migrant Justice	
VT Lodging Assoc		Sierra Club		NAACP (Rutland)	
		Vbike			
		Energy Action Network			
		VT Clean Cities Coalition			
		UVT			
		VPIRG			