

Vermont Transportation Carbon Reduction Strategy

VERMONT CLIMATE COUNCIL

CROSS SECTOR MITIGATION SUBCOMMITTEE

MAY 18, 2023

U.S. DOT Carbon Reduction Program

Infrastructure Investment and Jobs Act (IIJA)

\$32 million

\$6.3 million annually over 5 years

- Public Transit
- Transportation Alternatives
- Congestion Mitigation
- Efficient Street and Traffic Lighting
- Travel Demand Management Strategies
- Deployment of Alternative Fuel Vehicles and related Infrastructure
- Carbon Reduction Strategy

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

Strategy Steps

Phase 1

Estimate GHG emissions and reductions associated with VTrans' Capital Program

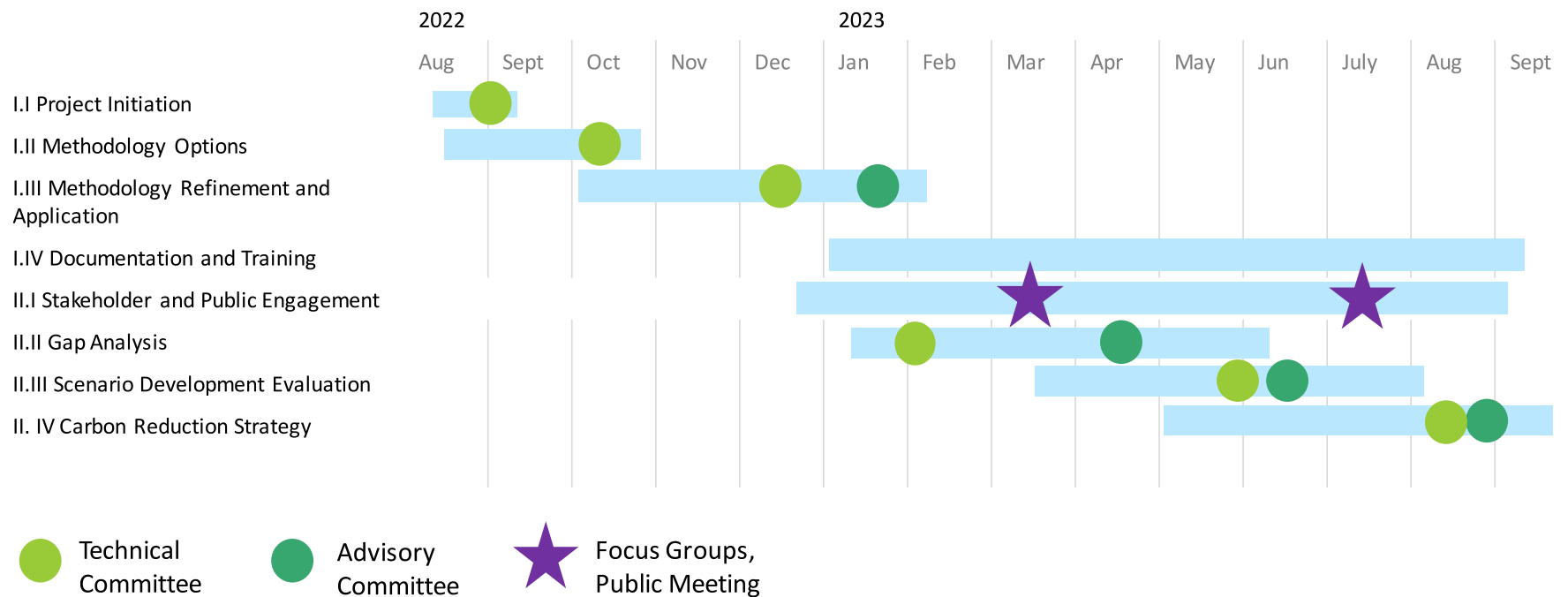
- Baseline projection
- Construction & maintenance
- Transportation system user emissions

Phase 2

Develop Carbon Reduction Strategy

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

Project Timeline



Stakeholder & Public Engagement - Round 1

- Focus groups
 - Community-based organizations, including equity/environmental justice groups
 - Business community
 - Transportation and freight industry
 - Environmental groups
 - Regional planning and public transportation
 - Elected officials
- Virtual public meetings – March 23
- Website & comment form



Gap Analysis

Key Assumptions

Key revisions from previous LEAP model runs:

- Lower VMT in 2020/2021 to be calibrated towards HPMS 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

Coordinated with ANR/Climate Action Plan

Advanced Clean Cars 2, Advanced Clean Trucks

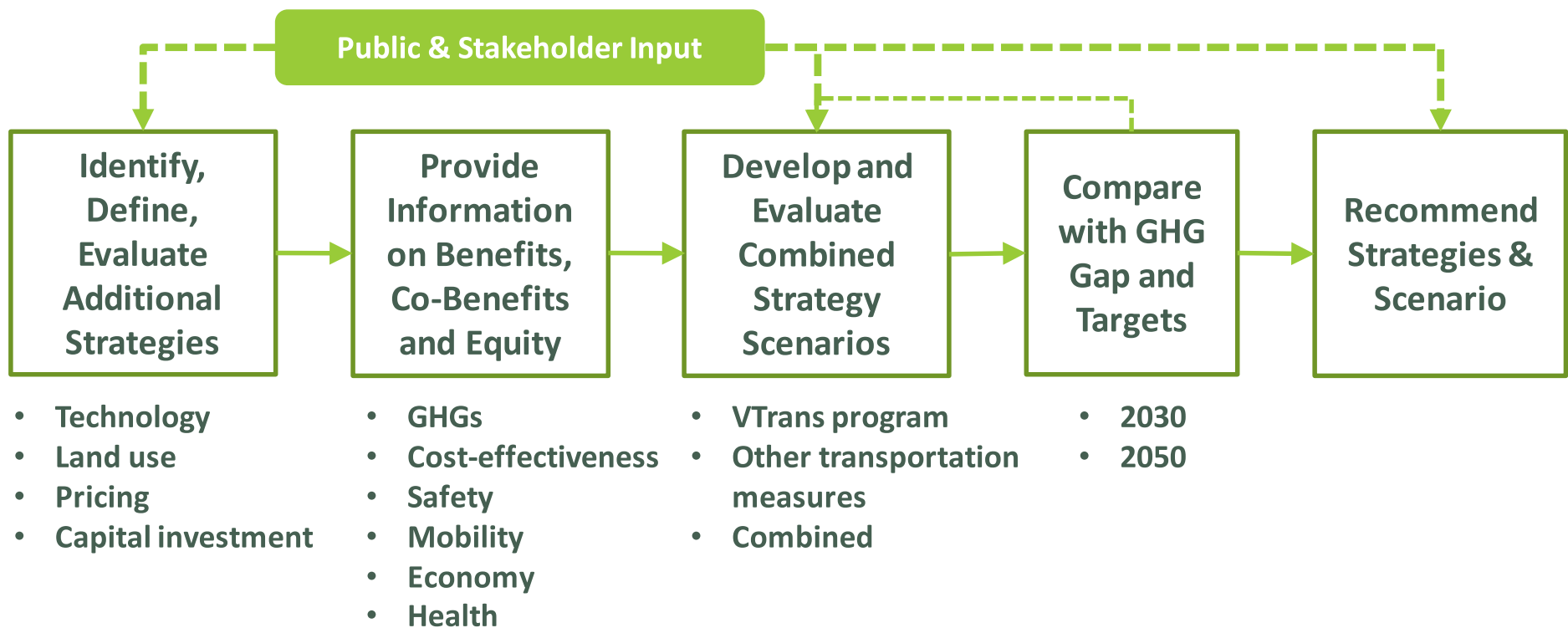
- ACC: 100% EV sales for LDV by 2035
- ACT: 75% MDV EV sales, 40% HDV EV sales by 2035

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%

Strategies & Scenarios

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							
Transit							
Freight Rail							
Land Use							
Tele-travel							
EV Passenger Vehicles and Charging							
EV Freight Transition							
Other Clean Car/Truck							
Carbon Management							
Traffic and Roadway							



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
- Importance of co-benefits for these strategies (e.g., equity, workforce/economic development, health)
- Microtransit could serve rural areas surrounding towns and cities
- Industry skepticism about viability of significantly increased freight via rail
- Suggestions for educational opportunities and promotion ("culture shift")
- Need for increased investment in complete streets & traffic calming and coordination with roadway maintenance projects

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
- Neighborhood Development Areas
- 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 roads more community-friendly
- Most public meeting participants 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
	+ (2030) +++ (2050)	+++	++	-	++
Land Use/Smart Growth					
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
- Curb management

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>

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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	Capstone Community Action	
VT Lodging Assoc		Sierra Club		NAACP (Rutland)	
		Vbike		Migrant Justice	
		Energy Action Network			
		VT Clean Cities Coalition			
		UVT			
		VPIRG			

Committees

Technical Committee

Agency of Transportation
Agency of Natural Resources
Chittenden County Regional Planning
Commission
University of Vermont
Vermont Climate Council
Environmental Action Network

Advisory Committee

Agency of Transportation
Agency of Natural Resources
Agency of Commerce and
Community
Development
Department of Health
Regional Planning Commissions
VT Public Transit Association
VT Natural Resources Council
Equity Liaison
Federal Highway Administration