Vermont Road Usage Charging Advisory Committee

September 29, 2021

Agenda

2PM   Welcome, Roll Call and Review of the Agenda (Chair, Michele Boomhower, VTrans)

2:10   Stakeholder engagement
- Presentation of outreach results (Mark Fowler and Jonathon Slason, RSG)

2:25   MBUF system definition
- Presentation of MBUF system definition (James Whitty and Matthew Dorfman, CDM)
- Preliminary MBUF system definition recommendation

3:25   Per kWh fee system definition
- Presentation of per-kWh fee system definition memo (James Whitty, CDM)
- Preliminary Per kWh system definition recommendation

4:20   Fee structure and rate setting
- Presentation of fee structure (Scott Wilson, CDM)

4:50   Public Comment

4:55   Next Steps and Agenda for third meeting
- Topics for third meeting (James Whitty, CDM)

5PM   Adjournment

Review: Vermont's road usage charge concept

Flat Fee

MBUF

Per kWh

Vermont's Road Usage Charge Concept

Applicability	Fee Mechanisms	Possible Eligible Vehicles

VT Registered Vehicles	• Flat Fee, with
	• Optional Mileage-Based User Fee
	    • Without location
	    • With Location
		• All Electric
		
		• Plug-in Electric Hybrid
		
		• High efficiency vehicles

Out of State Vehicles	Per-kWh Transportation Fee at Public Charging Stations	• All Electric • Plug-in Electric Hybrid

What determines feasibility for a Vermont RUC program

- A workable system design compatible with existing systems
- Consistency with guiding principles
- Manageable costs
- Adequate net revenues
- Political acceptance

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Flat Fee / MBUF for VT Registered Vehicles

Basic elements and Key Considerations

Flat Fee

MBUF

Annual Registration fee – Typical functions

Identify subject vehicle and its owner/lessee–connect with vehicle registry

Provide invoice to owner/lessee–notice of the charge

Collect payment–a way or ways to pay

Issue acknowledgement of payment–a receipt

Enforce payment–mechanisms for ensuring everyone pays

Remit net revenues to road fund–integrate revenue collection with financial systems

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Annual Flat Fee – Key considerations

Identify subject vehicle and its owner/lessee–connect with vehicle registry

Identify vehicle's engine type* – collect data directly or connect with VIN decoding service

Integration with external systems* – integration with MBUF system

Provide invoice to owner/lessee–notice of the charge

Collect payment–a way or ways to pay

Issue acknowledgement of payment–a receipt

Enforce payment–mechanisms for ensuring everyone pays

Remit net revenues to road fund–integrate revenue collection with financial systems

Refund* – flat fee refunds

Enhanced registration functions and new functions* to administer annual flat fee

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Annual Flat Fee – Key considerations

Policy & systems questions

Identify subject vehicle and its owner/lessee–connect with vehicle registry

Identify vehicle's engine type* – collect data directly or connect with VIN decoding service

Integration with external systems* – integration with MBUF system

Provide invoice to owner/lessee–notice of the charge

Collect payment–a way or ways to pay

Issue acknowledgement of payment–a receipt

Enforce payment–mechanisms for ensuring everyone pays

Remit net revenues to road fund–integrate revenue collection with financial systems

Refund* – flat fee refunds

Which vehicles are covered? Which rates to apply?

Which mechanisms to identify eligible vehicles?

Allow flat fee payers to opt into MBUF?

Which refund mechanisms for payers who opt into MBUF?

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MBUF – Key considerations

Identify subject vehicle and its owner/lessee–connect with vehicle registry

Generate distance traveled data for subject vehicle over designated time*–report data

Access distance data*–receive reporting of distance data

Apply distance charge rates*–data process to determine amount of charges

Provide invoice to owner/lessee–notice of the charge

Collect payment–a way or ways to pay

Issue acknowledgement of payment–a receipt

Enforce payment–mechanisms for ensuring everyone pays

Remit net revenues to road fund–integrate revenue collection with financial systems

Process refunds* – MBUF refunds

Enhanced registration functions and new functions to administer MBUF*

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MBUF – Key considerations

Policy & systems questions

Identify subject vehicle and its owner/lessee–connect with vehicle registry

> Vehicles covered and applicable rates?

Generate distance traveled data for subject vehicle over designated time*–report data

> Which mileage reporting choices?
> Support inhouse, outsource or hybrid?

Access distance data*–receive reporting of distance data

> How to protect privacy?

Apply distance charge rates*–data process to determine amount of charges

> Cap annual MBUF at flat fee value?

Provide invoice to owner/lessee–notice of the charge

Collect payment–a way or ways to pay

> Offer prepay or post-pay?
> Which payment means?
> Mechanisms to report MBUF revenue

Issue acknowledgement of payment–a receipt

Enforce payment–mechanisms for ensuring everyone pays

> Which mechanisms and policies to detect and enforce MBUF violations?
> Considerations for adjudications

Remit net revenues to road fund–integrate revenue collection with financial systems

Process refunds* – MBUF refunds

> Which refund mechanisms for users without GPS reporting?

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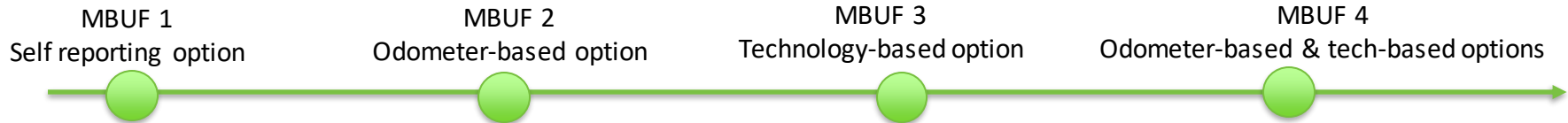# Flat Fee & MBUF system design options

Flat Fee

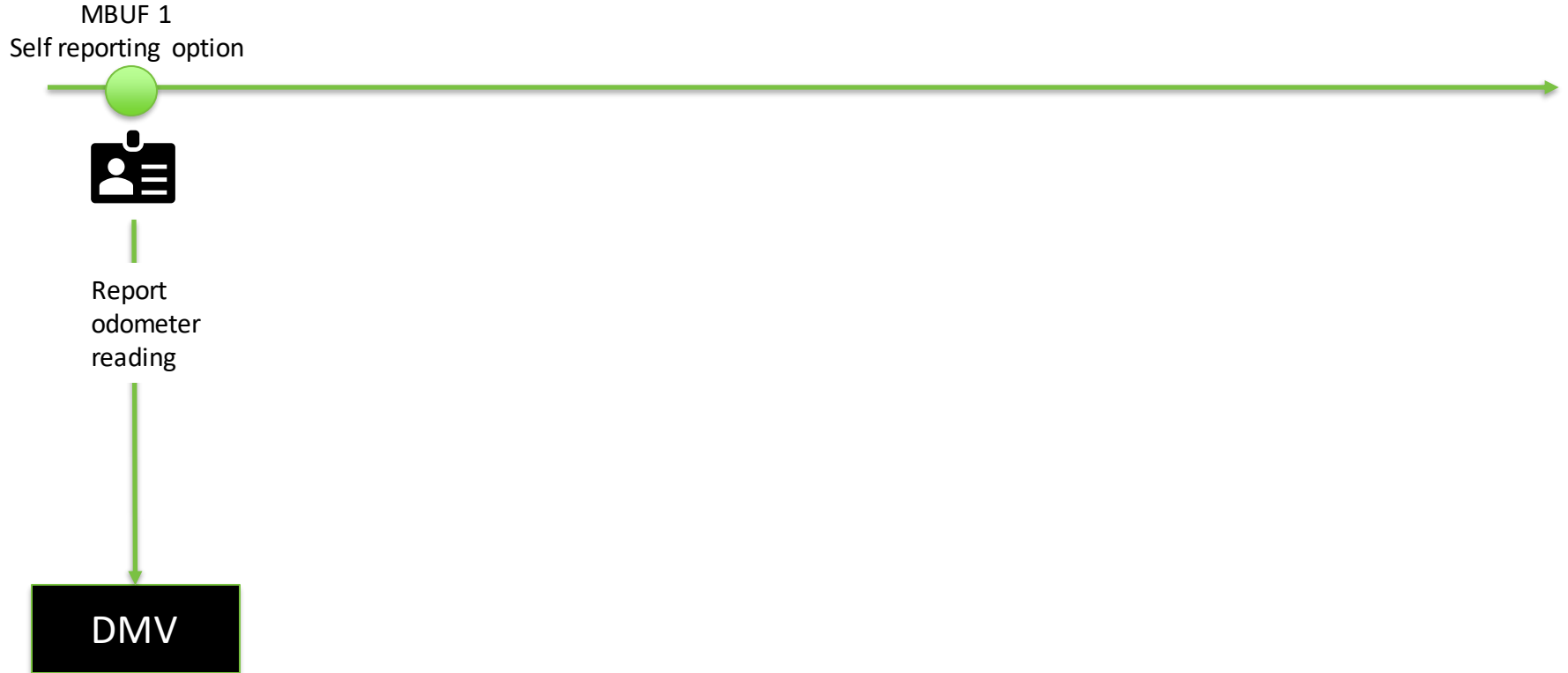MBUF 1 Self reporting option

MBUF 2 Odometer-based option

MBUF 3 Technology based option
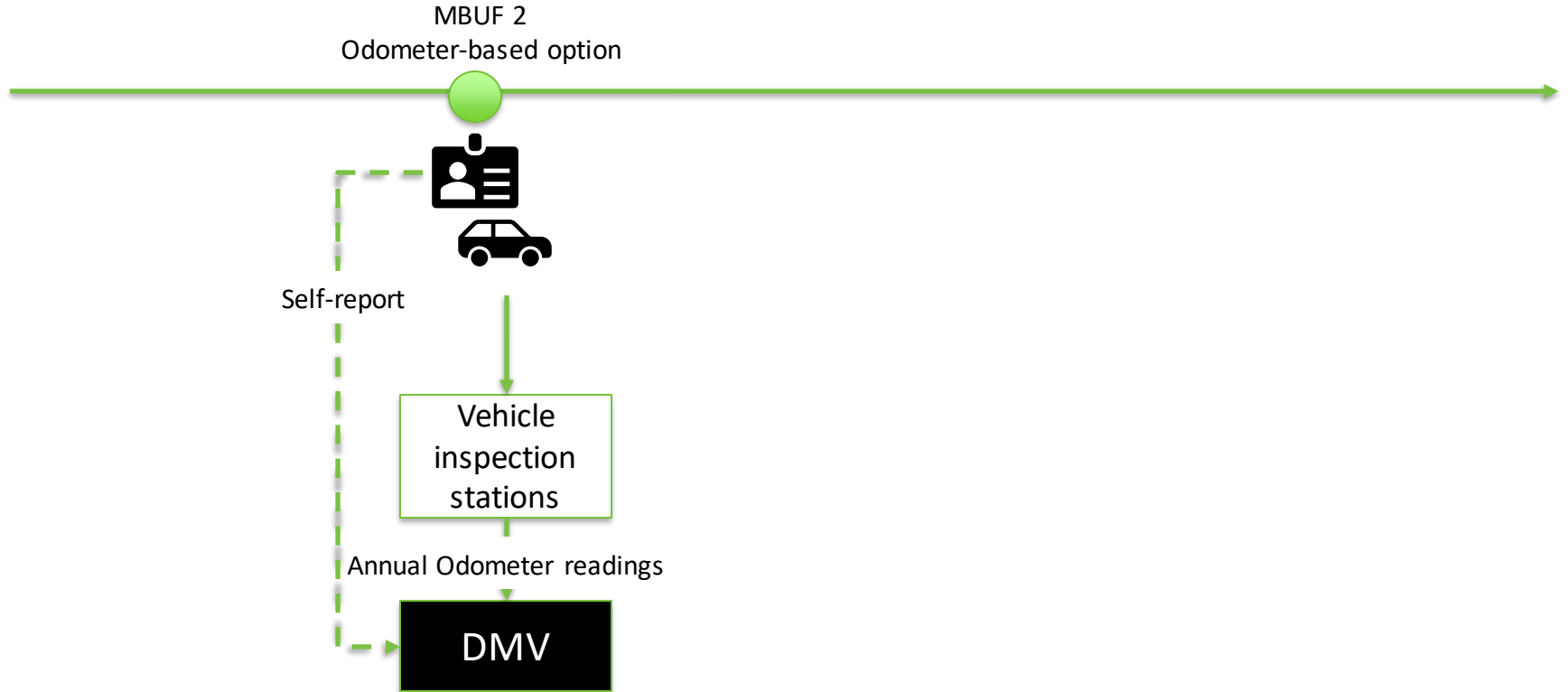
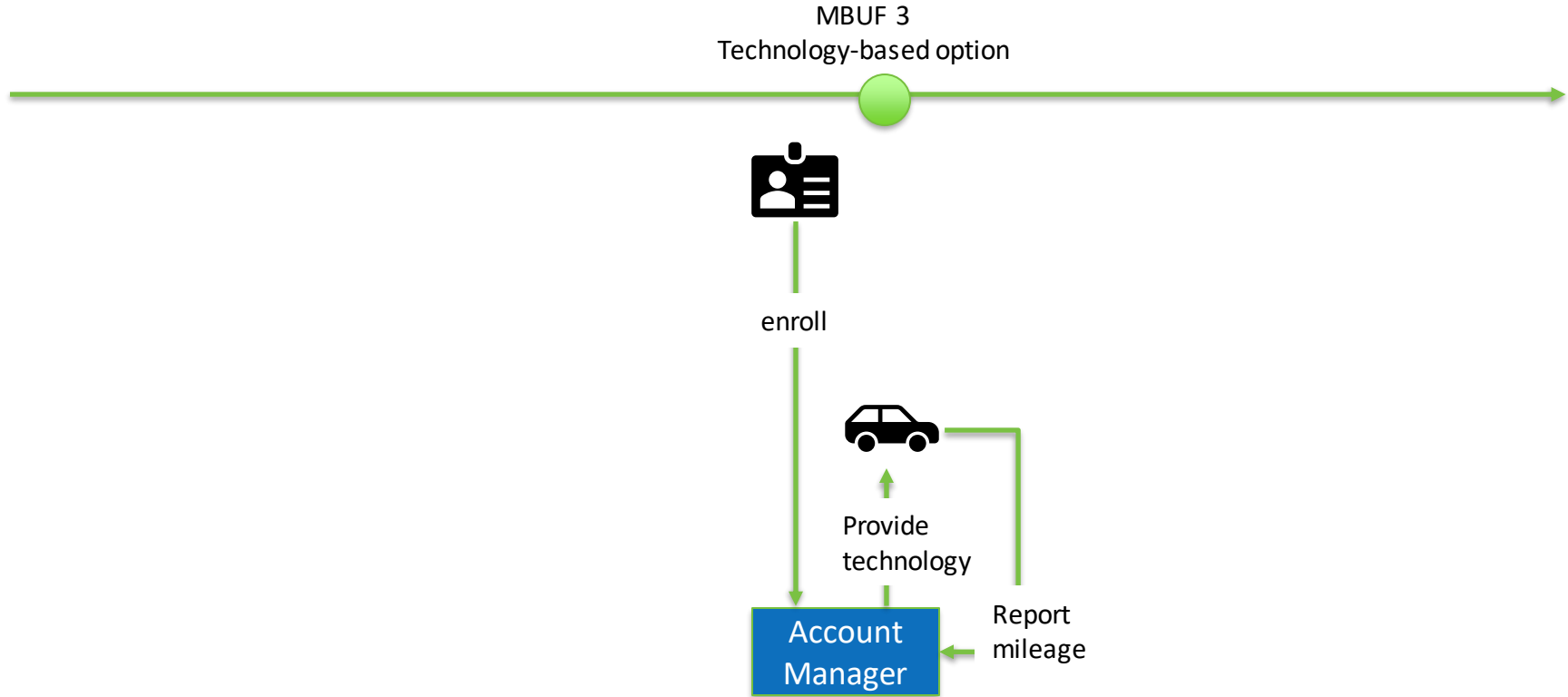MBUF 4 Odometer-based and tech-based options

MBUF options

MBUF 1
Self reporting option

MBUF 2
Odometer-based option

MBUF 3
Technology-based option

MBUF 4
Odometer-based & tech-based options

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MBUF options

MBUF 1
Self reporting option

Report
odometer
reading

DMV

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MBUF options

MBUF 2
Odometer-based option

Self-report

Vehicle inspection stations

Annual Odometer readings

DMV

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MBUF options

MBUF 3
Technology-based option

enroll

Provide
technology

Report
mileage

Account
Manager

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MBUF options

MBUF 4
Odometer-based & tech-based options

enroll

Vehicle inspection stations

Provide technology

Report mileage

Annual Odo readings

Account Manager

DMV

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Summary of MBUF options
Odometer-based & Account-based reporting options
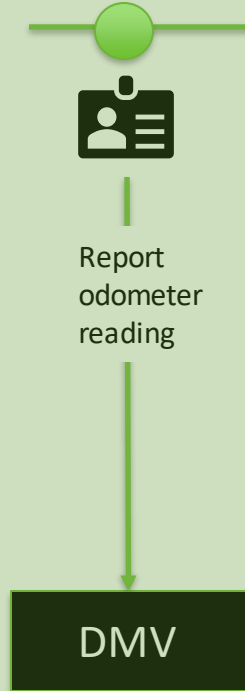
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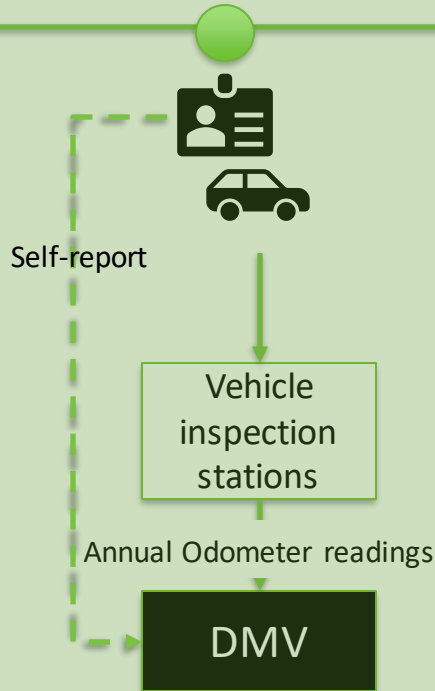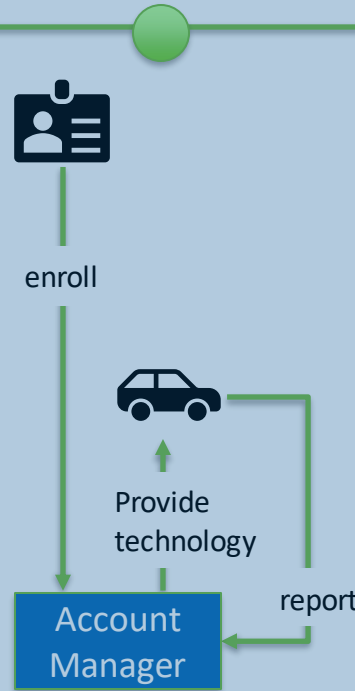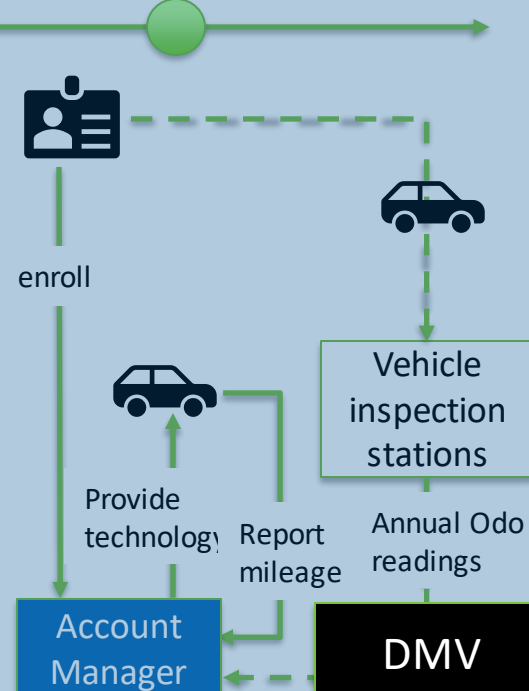
FF & MBUF cost considerations

MBUF system design options (odometer or account-based)

MBUF delivery strategy (inhouse, outsource, hybrid)

Rate setting (flat fee rate and MBUF rate)

MBUF system design options – reporting methods

- Odometer reporting
  - Self-reporting
  - Use of data reported at annual vehicle inspection
  - Odometer image capture
- Automated reporting
  - ODB-II Plug-in devices
  - Native automaker telematics
  - Smartphone app

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MBUF delivery strategy

- There are three MBUF reporting paradigms for estimating costs:
1. **Odometer.** The state only offers odometer reporting.
2. **Automated.** The state offers only automated mileage reporting.
3. **Hybrid.** The state offers a hybrid between odometer and automated reporting

For each reporting paradigm, the state may apply different delivery strategies:

- Support inhouse

- Outsource to private vendors

- Hybrid solution (Administer odometer-based methods inhouse and outsource automated methods)

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Key policy decisions impacting cost of collection for FF&MBUF

***Flat fee rate**.*

- The relative rates at which the flat fee is set will impact the choice drivers will make between the flat fee and the mileage-based user fee.

- For example, if the flat fee is equal to the amount that the median vehicle would pay in MBUF, then we would expect half of vehicles to choose MBUF and the other half to choose the flat fee.

- Those choosing MBUF would be the 50% who reason to save money by driving less than average and, therefore, saving money compared to the flat fee.

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Annual cost estimation for FF/MBUF operating scenarios

Cost of operations \ Operating scenarios	Scenario 1: Flat fee $209 Hybrid	Scenario 2: Flat fee $278 Odometer	Scenario 3: Flat fee $139 Odometer	Scenario 4: Flat fee $139 Hybrid	Scenario 5: Flat fee $209 Automated
Flat fee (% of Average MBUF)	150% ($209)	200% ($278)	100% ($139)	100% ($139)	150% ($209)
MBUF system design choices	Odometer & Automated	Odometer	Odometer	Odometer & Automated	Automated
MBUF delivery strategy	State	State	State	State CAM	CAM
% Choosing MBUF over flat fee	83%	97%	50%	50%	83%
% Choosing Odometer MBUF over Automated	80%	100%	100%	50%	0%
% of revenue collected	2030: 15% 2040: 10%	2030: 6% 2040: 2%	2030: 6% 2040: 1%	2030: 20% 2040: 16%	2030: 27% 2040: 22%

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Annual cost estimation for FF/MBUF operating scenarios

Cost of operations / Operating scenarios	Scenario 1: Flat fee $209 Hybrid	Scenario 2: Flat fee $278 Odometer	Scenario 3: Flat fee $139 Odometer	Scenario 4: Flat fee $139 Hybrid	Scenario 5: Flat fee $209 Automated
Flat fee (% of Average MBUF)	150% ($209)	200% ($278)	100% ($139)	100% ($139)	150% ($209)
MBUF system design choices	Odometer & Automated	Odometer	Odometer	Odometer & Automated	Automated
MBUF delivery strategy	State	State	State	State CAM	CAM
% Choosing MBUF over flat fee	83%	97%	50%	50%	83%
% Choosing Odometer MBUF over Automated	80%	100%	100%	50%	0%
% of revenue collected: 2030 → 2040	2030: 15% 2040: 10%	2030: 6% 2040: 2%	2030: 6% 2040: 1%	2030: 20% 2040: 16%	2030: 27% 2040: 22%

Key takeaways

- Odometer-based methods most cost efficient to operate.
- Major driving costs is the number of vehicles choosing automated reporting
- Lower costs of collection as more users join MBUF program

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Assess feasibility for Flat Fee/MBUF options

System compatibility & needs

Consistency with Guiding Principles

Manageable costs

Adequate net revenues

Political acceptance

Guiding principles for policy and system design

- **Do No Harm**
  - Revenue neutrality
  - Sustained EV uptake

- **Equitable & Fair**
  - User pay system
  - Users have choices
  - Privacy and security data protected
  - Equitable cost distribution (rural/urban, income)

- **Feasible & Efficient**
  - Ease of administration/minimal government burden
  - Enforceable
  - Simplicity of compliance and ease of use
  - Accurate and system performance

- **Transparent and Accountable**
  - Open system
  - Open to competing vendors
  - Accountable oversight

- **Adaptive for the future**
  - Integration with other state policies
  - Interoperability with other state systems
  - Flexible, secure, and scalable

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Feasibility Assessment: Consistency with Guiding Principles

MBUF options / Guiding Principles	Annual Flat fee	MBUF 1 Self reporting option	MBUF 2 Odometer-based option	MBUF 3 Tech-based reporting options	MBUF 4 Odometer based & tech-based reporting options
Do Not Harm	Medium	High	High	High	High
Equitable & Fair	Low	High	High	High	High
Feasible & Efficient	High	High	High	Medium	Medium
Transparent & Accountable	High	Low	High	High	High
Adaptive for the Future	Low	Low	Low	High	High

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Feasibility Assessment: Systems compatibility & needs

MBUF options / Systems compatibility	Annual Flat fee	MBUF 1 Self reporting option	MBUF 2 Odometer-based option	MBUF 3 Tech-based reporting options	MBUF 4 Odometer based & tech-based reporting options
Vehicle registry system (DMV)	Existing	Enhanced	Enhanced	n/a	n/a
Odometer-based system (Safety inspection)	n/a	n/a	Existing	n/a	Existing
Account-based system	n/a	n/a	n/a	New	New

System exists to support MBUF option(s)
Enhancement required to existing system to fully support MBUF option
New system required to support MBUF option

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Feasibility Assessment: Manageable costs

MBUF options / Costs	Annual Flat fee	MBUF 1 Self reporting option	MBUF 2 Odometer-based option	MBUF 3 Tech-based reporting options	MBUF 4 Odometer based & tech-based reporting options
Relative system costs (as a % of revenue collected)	Minimal	Minimal	Low (2-6%)	High (22-27%)	Medium (15-20%)

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Key decisions & recommendations for FF/MBUF implementation

Vermont Road Usage Charging Advisory Committee September 29, 2021

Key policy decisions impacting system design for FF&MBUF

Policy decisions	Options
Which vehicles are covered?	- EV/PHEV only - All alternative fuel vehicles - High mpg liquid fuel vehicles - All vehicles

Key policy decisions impacting system design for FF&MBUF

Policy decisions	Options
Rate considerations	• Allow flat fee payers to opt-in to MBUF? • Cap annual MBUF at flat fee value?

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Key policy decisions impacting system design for FF&MBUF

Policy decisions	Options
Refunds or exemptions for vehicles without GPS reporting	• Standard exemption (e.g., 3,000 miles) • Variable exemption (based on registration location) • Manual refunds • No refunds

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Key policy decisions impacting system design for FF&MBUF

Policy decisions	Options
Privacy	• non-location based MBUF reporting • require private companies to process location data • guarantee privacy rights in law • offering further privacy rights in user agreements

Key organizational decisions for FF&MBUF

Policy decisions	Options
Account Management structure	• Implement a state operated system • Implement a private sector operated system • Implement a hybrid system operated by state and private sector

Separation of roles between state and private sector	• Typical private sector functions
	    • Account management
	    • Technology distribution and management
	• Typical state managed functions
	    • RUC Accounting (System to compile data on MBUF usage)
	    • Enforcement (Detection and penalization of MBUF violations)
	    • Adjudication (Civil appeal of any assigned penalties)

Procurement strategy for RUC operations	• Single vendor or open market with multiple vendors

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Future system design decisions for FF&MBUF – Roadmap

Future Need	State activities to meet the need
Interoperability with other states	• Sign agreements with other states. • Create an interoperability hub with other states.
Integration with automakers	• Encourage automakers to support MBUF. • Integrate automaker support when its available.
Transition MBUF to all light vehicles	• Plan transition (technical, financial, operational) • Execute plan
Support of commercial fleets	• Ensure DMV and/or account manager have fleet supporting interface
Inclusion of heavy vehicles	• Consider if and if so, when, to include heavy vehicles • If they will be included, plan policies, technologies, and operations as both will differ from those for light vehicles • Execute plan

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Flat Fee/MBUF recommendations

Short term

1. Begin with a small, flat fee/MBUF option program.
2. Use vehicle inspection odometer records as a basis for MBUF for most vehicles.
3. Use self-reporting or odometer image capture to get odometer records in cases of vehicles exiting the state or leaving the program.

Longer term

4. If enough Vermonters show interest in location-based reporting, the MBUF program should eventually include a Commercial Account Manager offering OBDII plug-in devices for vehicles that do not want to pay for out-of-state or off-road miles driven. This service need not be in place when the system starts.
5. If a Commercial Account Manager is used, employ an open system (open specifications) from the start. When the market is large enough to support multiple account managers, create an open market.
6. Include privacy protection and enforcement provisions in any law creating an MBUF.
7. Consider program expansion after launch and evaluation.

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Key considerations for per-kilowatt hour fee for EV charging at public charging stations

Per kWh

Vermont's per-kilowatt hour fee concept

A **per kilowatt hour fee** is a volume-based fee on the amount of energy transferred to an electric vehicle over one hour.

Per kilowatt hour fee would be assessed on electricity recharging at public charging stations and paid by non-resident electric vehicles drivers travelling on Vermont roads.

Vermont resident EV drivers would not bear the burden of paying the per-kWh fee.

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Per kWh – system functions

Identify subject vehicle and its owner/lessee – EV owner presents as payer at PCS

Generate kWh data – Recharge subject vehicles at public charging stations

Measure consumption data (kWh or Time of Use) – PCS accurately measures kWh data

Apply per-kWh fee rate to consumption data – Calculate fee amount owed

Provide invoice to owner/lessee – notice of the charge

Collect payment – support way(s) to pay

Issue acknowledgement of payment – provide receipt for payment

Enforce payment – mechanisms for ensuring everyone pays

Remit net revenues to road fund – integrate revenue collection with financial systems

Refunds – refund mechanisms

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Per kWh – key considerations

Identify subject vehicle and its owner/lessee – EV owner presents as payer at PCS

> How to identify non-resident drivers?

Generate kWh data – Recharge subject vehicles at public charging stations

> How/where EVs recharge batteries?

Measure consumption data (kWh or Time of Use)– PCS accurately measures kWh data

> Pricing mechanisms for collecting per-kWh fee?

Apply per-kWh fee rate to consumption data – Calculate fee amount owed

> How to ensure accuracy?

Provide invoice to owner/lessee – notice of the charge

> What details to include? How to protect privacy?

Collect payment–support way(s) to pay

> Where to collect payment? How to protect residents from paying?

Issue acknowledgement of payment–provide receipt for payment

Enforce payment–mechanisms for ensuring everyone pays

Remit net revenues to road fund–integrate revenue collection with financial systems

Refunds – refund mechanisms

> Which options to protect Vermonters from paying the fee?

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Challenges for a per-kWh fee

- Which business processes for collecting the per-kWh fee?

- How to ensure only nonresident EV drivers are responsible for per-kWh fee?

- How to ensure the accuracy of kWh measurement?

- How to recover the added cost of new data collection and billing system upgrades per kWh measurement and fee collection?

- How to maintain a low cost of collection?

- How to protect the privacy of sensitive information?

Many of these questions do not have answers due to the use of emerging technology, lack of standard practices across the industry for data collection, measurement and pricing.

Preliminary findings and key questions to answer

Vermont Road Usage Charging Advisory Committee September 29, 2021

Charge Vehicles – How EVs recharge batteries

Three levels of EV charging:

- **Level 1**: Alternative-Current (AC) 120 volt. A typical electric outlet at home.
- **Level 2**: Alternative-Current (AC) 208 volt to 240 volt for clothes dryer etc.
- **Level 3**: Direct-Current (DC) 480 volt to 900 volt for fast charging and supercharging (Tesla).

Commercial EV public charging stations apply Level 2 and Level 3 charging.

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Pricing mechanisms for collecting per-kWh fee?

Two existing options – kWh and Time of Use

Public charging	AC Level 2	DC Fast Charging (Level 3)
Blink	kWh	Time of Use
Tesla	kWh	Time of Use
Charge Point	Time of Use	kWh
EVGo	Time of Use	Time of Use
Electrify America	Time of Use	kWh
Beneficial Charging	Free or at cost	Free or at cost

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Where to collect payment?

Four options based on electricity distribution stream

DISTRIBUTION	WHO PAYS	DESCRIPTION
DOWNSTREAM	EV OWNER PAYS AT RETAIL	Station owner collects fee from EV owner based on kWh transferred.
MIDSTREAM	CHARGING STATION OWNER PAYS (GAS TAX MODEL)	Station owner pays fee to state and builds cost into retail price.
UPSTREAM	ELECTRIC UTILITY PAYS	Utility pays fee to state and builds cost into wholesale price.
MIDSTREAM	BENEFICIAL (FREE & AT-COST) CHARGING STATION OWNER PAYS	Beneficial station pays fee and collects reimbursement, donation or nothing from EV owners.

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How to ensure accuracy of kWh measurement? Availability of revenue-grade metering for per-kWh fee

	(1) EV OWNER PAYS AT RETAIL	(2) CHARGING STATION OWNER PAYS (GAS TAX MODEL)	(3) ELECTRIC UTILITY PAYS	(4) BENEFICIAL CHARGING STATION OWNER PAYS
Dedicated utility meter	No	No	Yes	No
Submetering	Maybe	Maybe	n/a	No
EV charging equipment	Yes	Yes	n/a	Yes

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Options to protect Vermonters from paying per-kWh fee

	(1) EV OWNER PAYS AT RETAIL	(2) CHARGING STATION OWNER PAYS	(3) ELECTRIC UTILITY PAYS	(4) BENEFICIAL CHARGING STATION OWNER PAYS
Present receipts of fee to get credit	X			
Present Vermont identification to get discount	X	X		X
Input discount code to get discount	X	X		X
Use receipts of electricity purchase to calculate credit		X		X

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Comparisons to other states that enacted per-kWh fees/taxes

	IOWA	OKLAHOMA
Who pays tax	Licensed electric fuel dealers	EV drivers
Where tax collected	Point-of-sale	Point-of-sale
Equipment required	In manner prescribed by Department of Revenue	Requires accurate metering system but exempts legacy systems
Resident exemption	No	No
Tax rate	$0.026 per-kWh	$0.03 per-kWh
Effective date	July 1, 2024	January 1, 2023

Per kWh fee recommendations for Vermont

Vermont Road Usage Charging Advisory Committee September 29, 2021

Per-kWh fee recommended findings

Recommended findings:

- Imposition of per-kWh fee concept on nonresident EV drivers at public charging stations is not imminently doable.

- The gas tax model (Charging Station Owner Pays) shows most promise for application of a per-kWh fee on all transfers of electricity to non-resident EVs at public charging stations but would require accurate revenue-grade metering equipment.

- Imposing a requirement for accurate metering equipment at public charging stations without a method for cost recovery would disrupt the current business operations of many existing public charging stations, especially benevolent stations, and therefore impede opening new EV public charging stations.

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Per-kWh fee recommended actions

Recommendations:

- Vermont should undertake a pilot program to test the gas tax model approach to collection of the per-kWh fee. The pilot should include at least the following elements:
  - Research and analyze the cost and impact of requiring all public charging stations in Vermont to have the metering capability necessary to collection the fee.
  - Examine the possibilities for cost recovery of software and hardware upgrades at public charging stations.
  - Determine the impact of imposing the fee on beneficial public charging stations.
  - Evaluate the various possibilities for ensuring resident EV owners are not burdened by per-kWh fee.

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Road Usage Charge Rate Setting

Vermont Road Usage Charging Advisory Committee September 29, 2021

Best practice rate setting in other jurisdictions

Three have established revenue collecting light-duty vehicle MBUF systems

Jurisdictions	Basis for rate	Applicable vehicles	AEV rate (Flat fee/MBUF)	PHEV rate (Flat fee/MBUF)
Oregon	Average gas tax paid per mile by vehicles not paying RUC	Light-duty vehicles of 40 MPG or greater	$158 **or** $0.018 per mile	$76 **or** $0.018 per mile
Utah	Average gas tax paid per mile by vehicles not paying RUC	AEVs and PHEVs only	$120 **or** $0.015 per mile	$52 **or** $0.015 per mile
New Zealand	Cost allocation model calculates rates to raise revenue for projected spending based on allocating costs by vehicle type and impact on spending	All light-duty vehicles not powered by gasoline or natural gas and all heavy-duty vehicles	$0.076 per mile (AEVs exempt until March 31 2024) (No flat fee except registration)	Pays gas tax only at standard rate ($1.86 gallon) (No flat fee except registration)

Guiding criteria for rate setting

- **Revenue generating potential**
  - *Net revenue able to be generated*

- **Do No Harm**
  - Avoid negative impacts on AEV/PHEV uptake

- **Equitable & Fair**
  - Equity and revenue neutrality
  - Economic efficiency

- **Feasible & Efficient**
  - Operational feasibility

- **Adaptive for the future**
  - Financial sustainability
  - Flexibility

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Updated fee estimates *methodology*

- 2013 estimates reviewed with updated data and assumptions

- Average fuel economy for *new* or *all* light-duty vehicles in Vermont?

- Average vehicle miles traveled for light-duty vehicles in Vermont

- Estimated average fuel consumption of PHEVs (to estimate gap in gas tax paid per mile compared to gasoline powered light-duty vehicles).

- Varying assumptions

- Unlike flat fee and MBUF, per kWh fee is not seeking to recover equivalent to gas tax paid

Additional data needed to refine estimates for per kWh fee and PHEV fees, such as proportions of energy charged at public charging stations, relative use of electricity vs. gasoline for PHEVs and recovery of costs of per kWh Vermont vehicle exemptions

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Updated fee estimates - *results*

Type of fee/vehicle type	AEVs	PHEVs
Original flat fee estimates	$120 (2013 prices)	$71
Revised flat fee estimate	$139	$44
MBUF estimate	$0.013 per mile	$0.013 per mile (with gas tax credit) $0.005 per mile (without gas tax credit)
Per kWh estimate	$0.04 per kWh	$0.04 per kWh

Flat fee estimate assumes MPG for all light-duty vehicles in Vermont and VMT for all light-duty vehicles is applicable, assumes PHEVs pay 68% of gas tax of average light-duty vehicle per mile

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Equity and revenue neutrality

High level issues

- Owners of AEVs and PHEVs pay significantly less to use the roads than other light-duty vehicle owners

- Average light-duty vehicle age in Vermont is 9.9 years, but AEV age US-wide averages at 3.9 years, indicating owners of AEVs tend to buy new vehicles

- The amount of gas tax paid for a vehicle's road use is not capped

- A flat fee is effectively a cap on how much fee is levied to drive

- MBUF and a per kWh fee could be capped or not

- Revenue neutrality seeks to ensure two different light-duty vehicles are levied on average the same for similar road use patterns

- *Net* revenue neutrality should be considered (revenue after costs of collection for a mature system)

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Equity and revenue neutrality

Rural vs. urban owners

- 55% of AEVs (53% of PHEVs) are owned in the three counties with the highest population density (where 44% of the population live)
- Research across nine states indicates <u>rural drivers do *not* drive on average significantly greater miles than urban drivers</u> (urban drivers drive more frequent shorter trips)
- Further data needed to establish Vermont profile of AEV/PHEV rural vs. urban users

Income and AEV/PHEV ownership

US wide data indicates

- 79% of AEV (80% of PHEV) purchases are from households earning >$50k per annum (57% over $100k per annum in income
- 78% of owners of AEVs and PHEVs are in households with two or more vehicles
- Profile of AEV/PHEV owners has not changed in eleven years

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Future proofing revenues

Three best practice techniques have been applied elsewhere to ensure revenues are not eroded over time

- INFLATION ADJUSTMENT BASED ON INFRASTRUCTURE COSTS: Automatic adjustment of rates based on inflation *of types of expenditure that the fee is used to fund*
- MODEL REVENUE TO REFLECT CHANGES IN DRIVER BEHAVIOR: Regular revenue modeling of projected revenue based on actual observed fleet changes, VMT and energy consumption compared to forecasts
- UNDERTAKE A COST RESPONSIBILITY STUDY AND REGULARLY UPDATE IT: This should inform a revenue model, by forecasting future spending and use well established economic principles to allocate types of spending to different types of vehicles and fees, so fees reflect what money is being spent on whom.

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Agenda topics for 3rd Road Usage Charge Advisory Committee Meeting in November 2021

Agenda topics

- Reports on additional stakeholder input

- Carryover topics from September 29th meeting

- Presentation: Financial analysis of Vermont Road Usage Charge Concept

- Presentation: RUC management and operational structure

- Presentation: RUC concept implementation v. pilot test

- Decisions:
  - Management and operational structure
  - Feasibility or pilot program for RUC Concept
  - Recommendation on implementation or pilot test