

A stylized graphic of a road with a dashed yellow center line and solid blue outer lines, curving upwards and to the right against a green background.

WASHINGTON STATE ROAD USAGE CHARGE

*Forward Drive Project Update
August 16, 2022*

Travis Dunn
CDM Smith

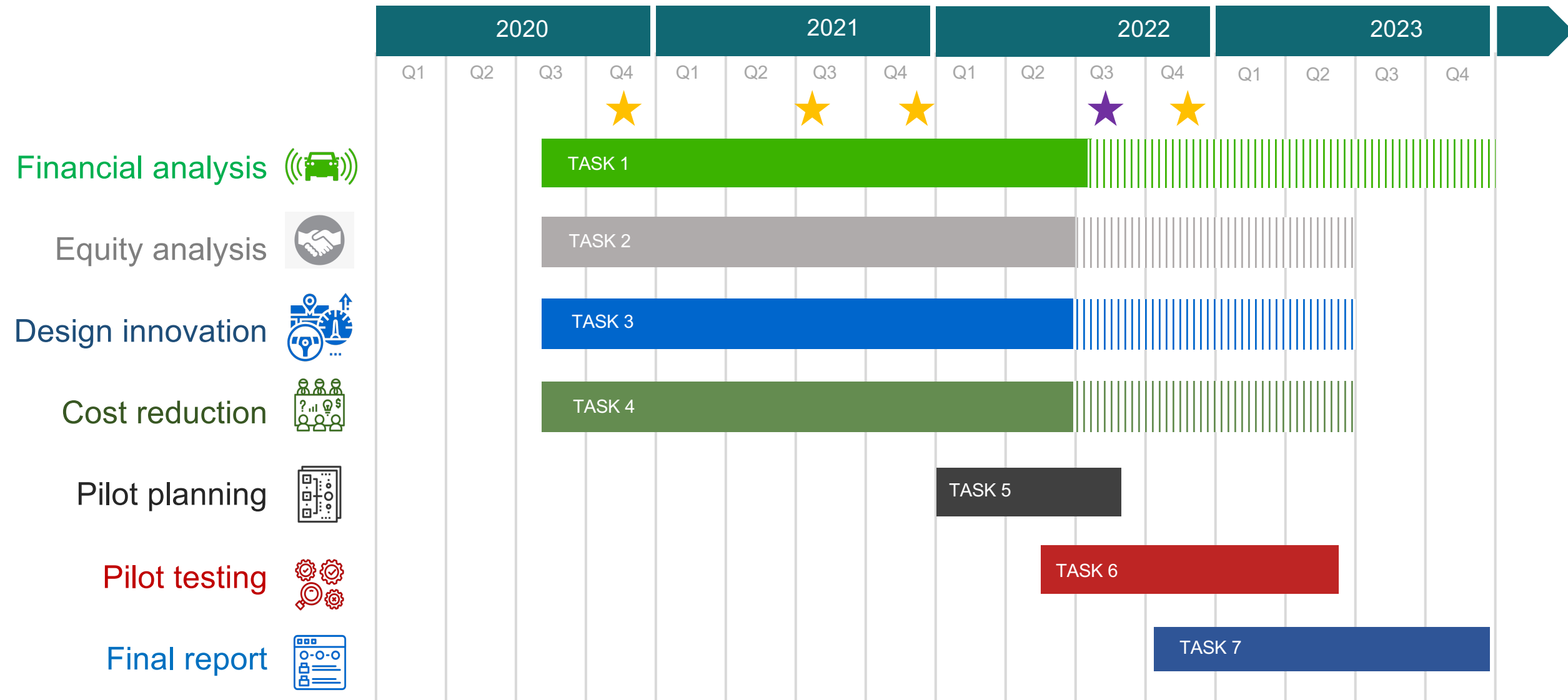


Washington State
Transportation Commission

Forward Drive Project Update

1. Project status
2. Equity research
3. Financial analysis findings
4. Pilot testing

Forward Drive Project Status



Equity Research



Equity Research and Outreach

June 2022

 BERK

 Yates
Consulting
Group

 CDM
Smith

Financial Analysis Findings

 WA RUC

 **WA RUC**

Road Usage Charge Financial Model

July 2022

 **WA RUC**

Model User Interface

- Easily access and configure selections for scenarios and policy choices
- Scenarios:
 - Choose pre-defined scenarios with a single click
 - Easily customize any combination of scenario factors
- Policy choices:
 - RUC per-mile rate
 - RUC transition approach including vehicle types and timelines

Washington State Transportation Commission, WARUC

Welcome to WARUC Scenario Analysis Program
(Please select parameter values and click Apply Selections. Alternatively, click any Named Scenario)

VMT Growth: Low

Fuel Type & Electrification: Reference Case

Commute Shifts: 25% Increase

Pandemic Scenario: Return to Normal

E-Commerce Impact: 10%

RUC Transition Approach: MPG and/or Year

Gas Tax Scenario: No Change

RUC Rate (\$/mile): 0.024

Average Commute Length: 10

(Urban and Rural) 10

Scrapage: WA Low

Transition Phase: Phase 1

Miles Per Gallon Transition: 25

Transition Year: 2020

Apply Above Selections

Named Scenarios:

Neutral Cruise Control Over Drive

Shared Drive Low Gear

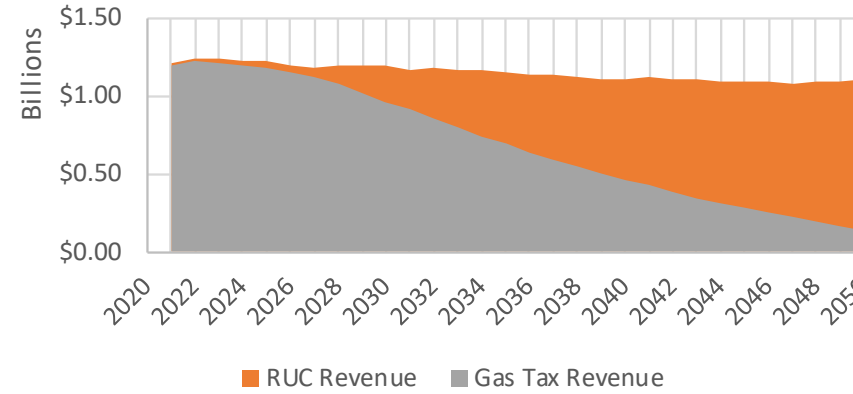
Revenue and Cost Summary : Neutral

Input Assumptions:

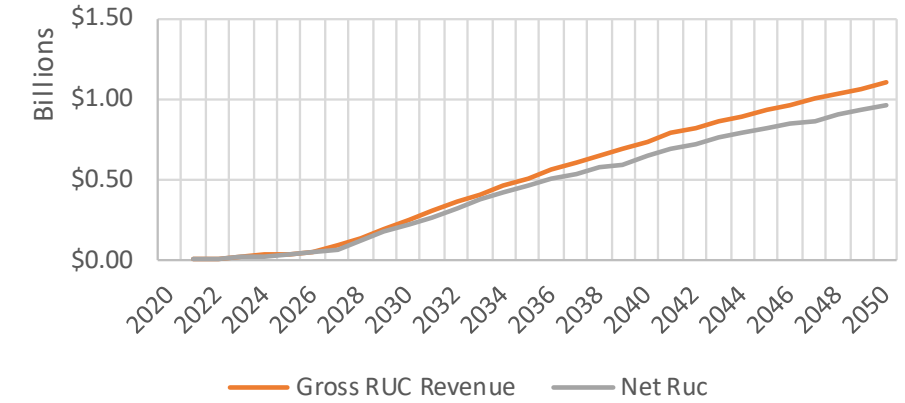
VMT Growth: Low
 Electrification: 2030 No ICE
 RUC Rate (\$/mile): 0.024
 RUC Transition: MPG and/or Year
 RUC Phase-In:

Year	MPG Threshold
2027	35
2032	30
2040	25
2050	20

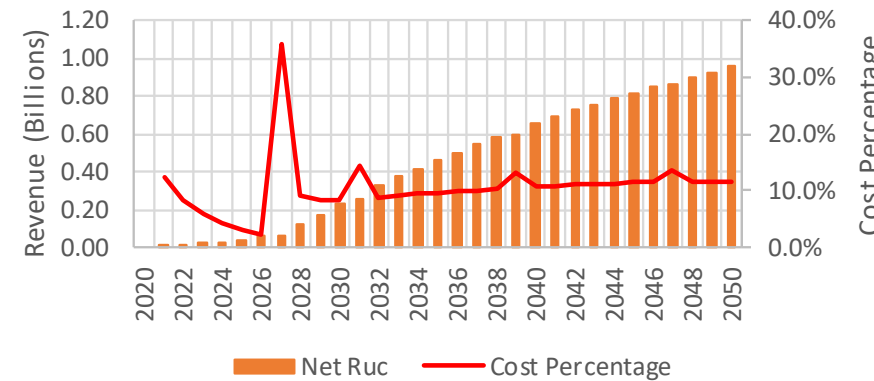
NET REVENUE FROM RUC & GAS TAX



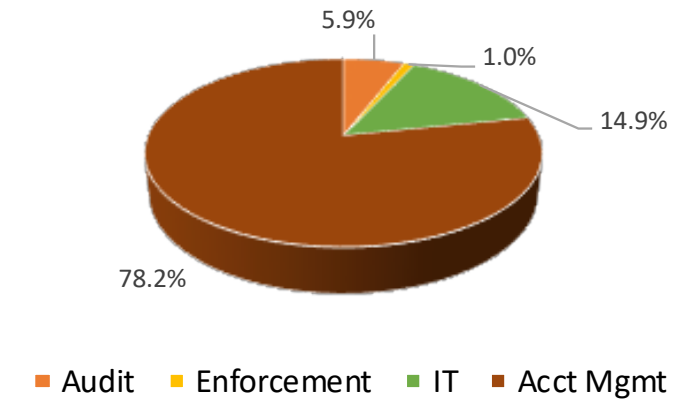
GROSS AND NET RUC REVENUE



COST AS PERCENT OF REVENUE



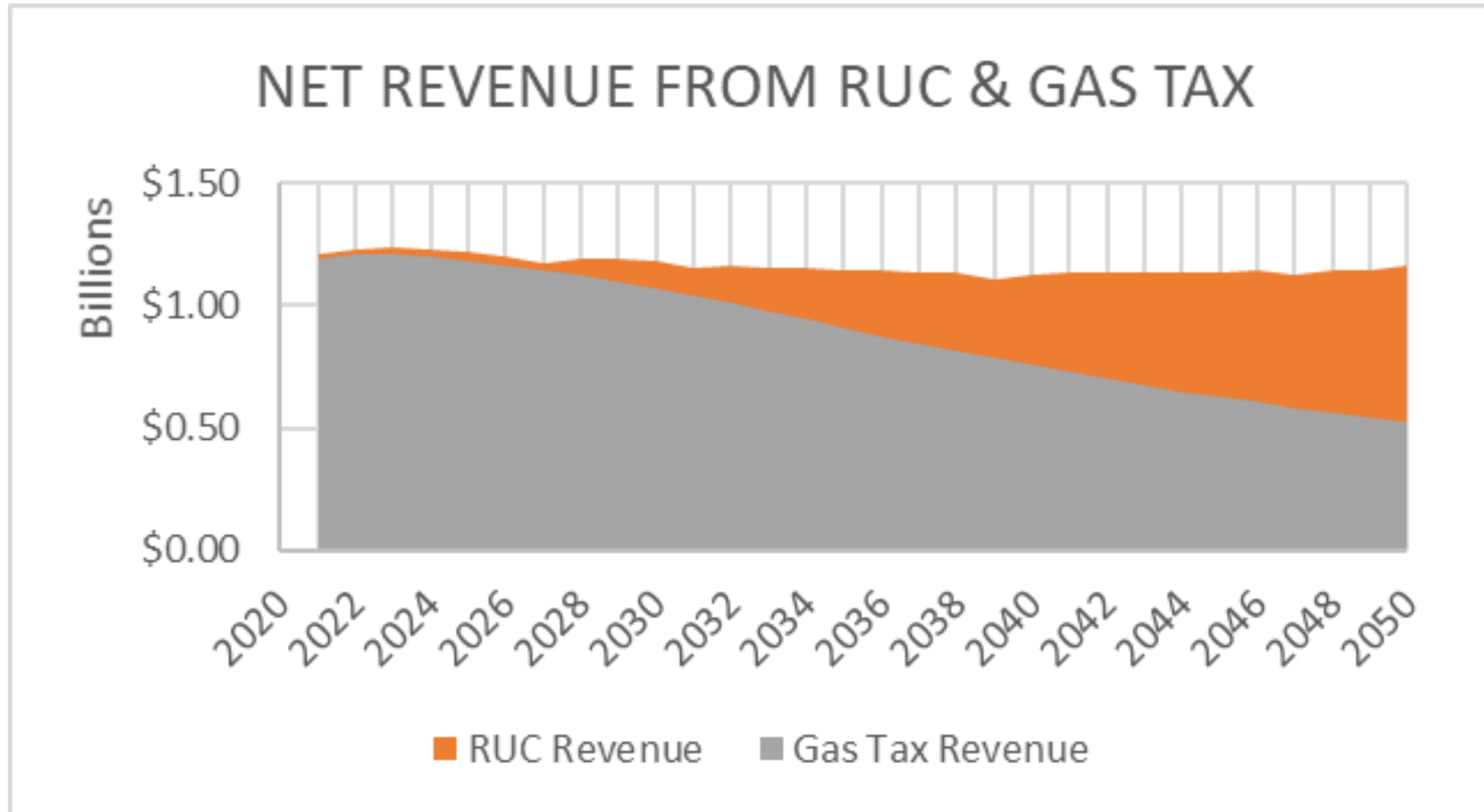
COST BREAKDOWN



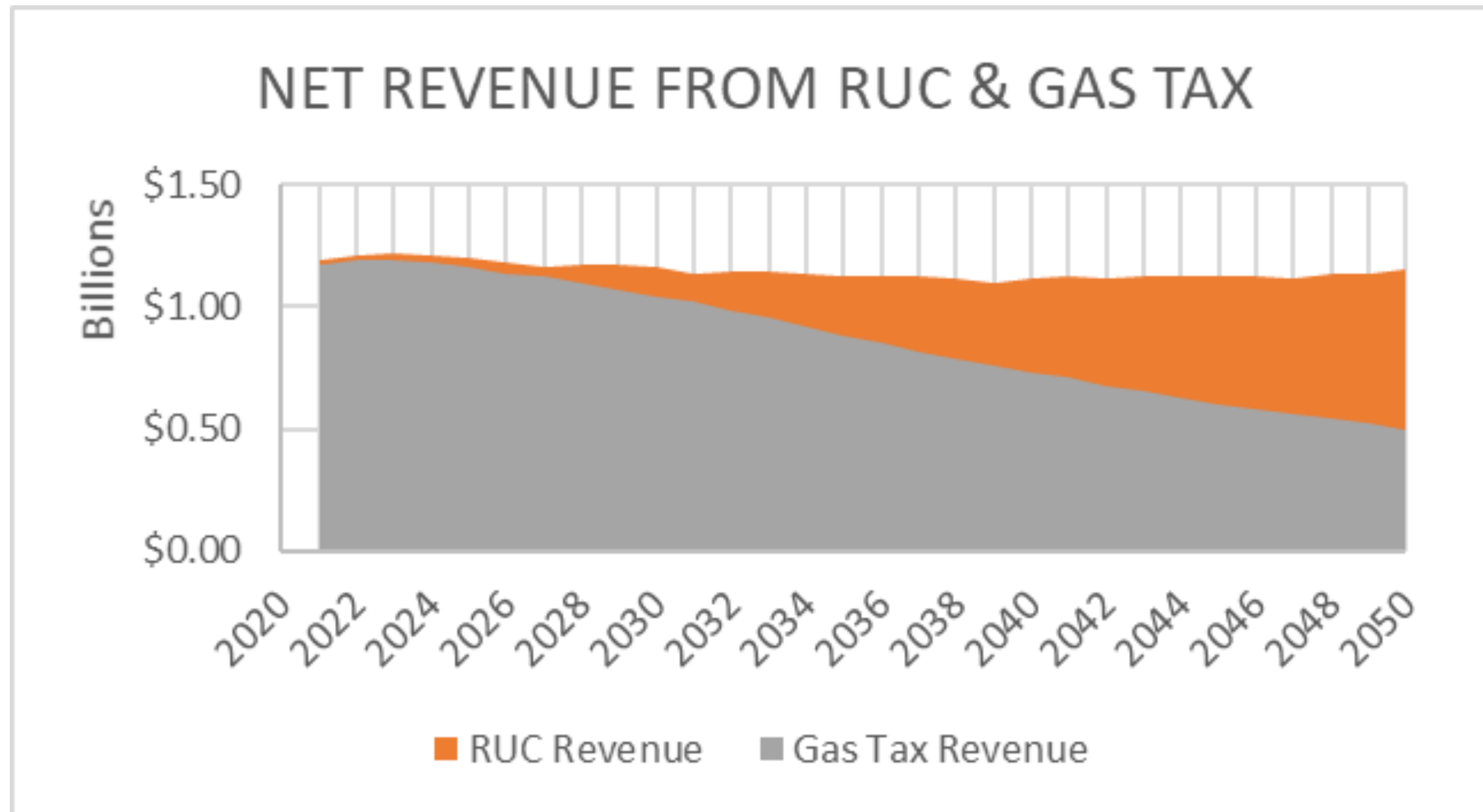
Revenue Summary by Key Years (millions)

Revenue Type	2030	2040	2050
Fuel Tax	\$ 965	\$ 459	\$ 138
Net RUC	\$ 227	\$ 652	\$ 960
Cost	\$ 23	\$ 86	\$ 141
Net Total	\$ 1,192	\$ 1,111	\$ 1,098

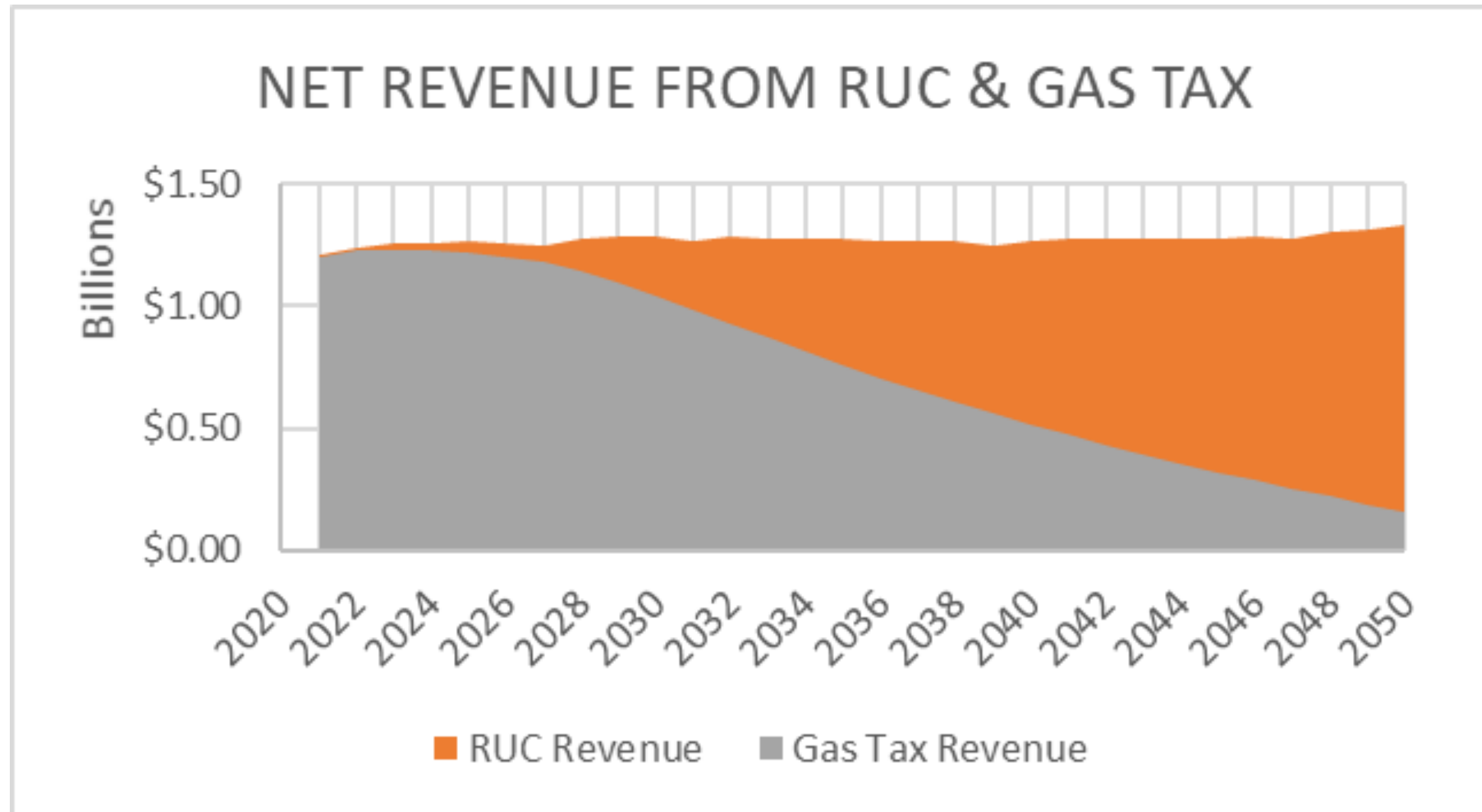
Neutral



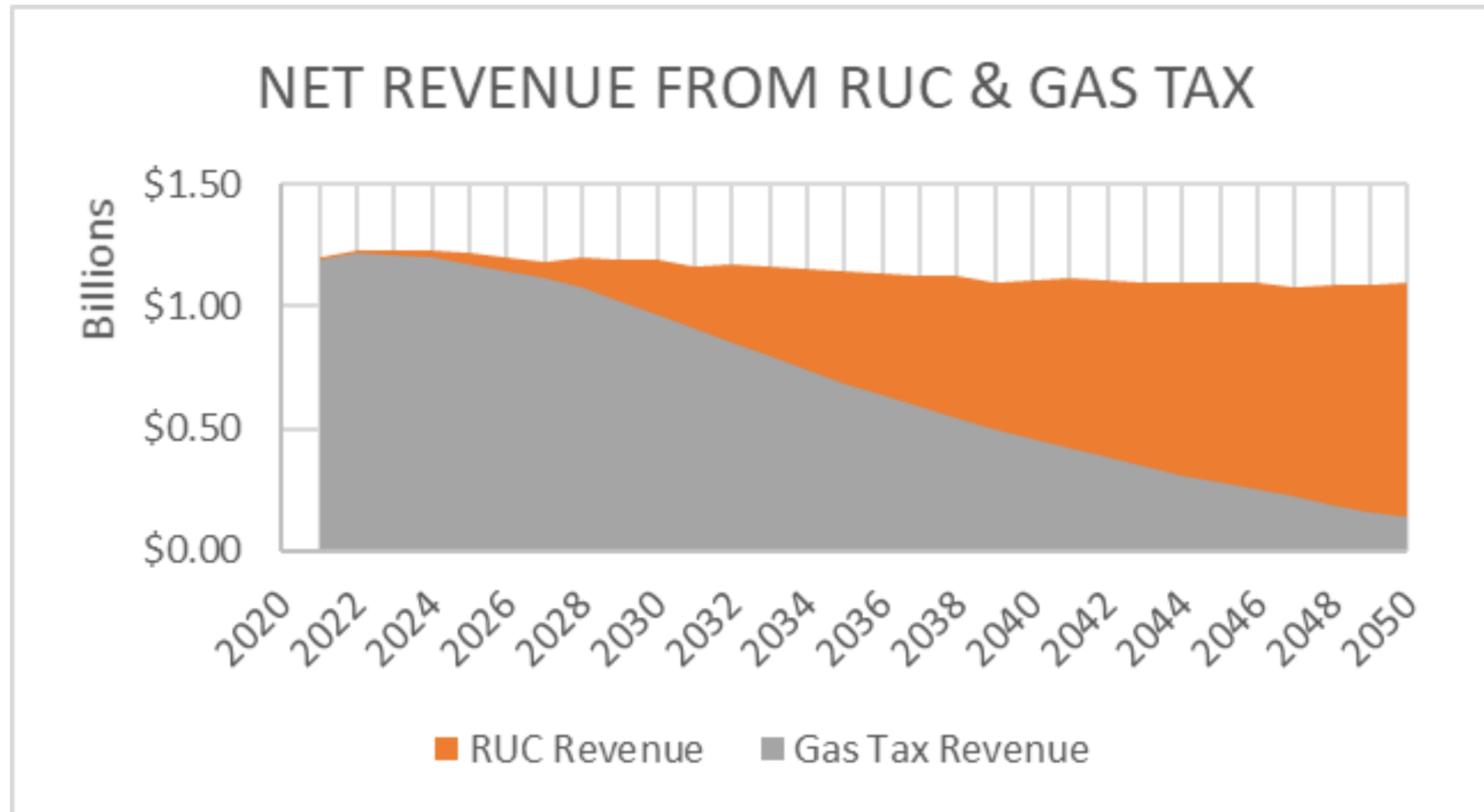
Cruise Control



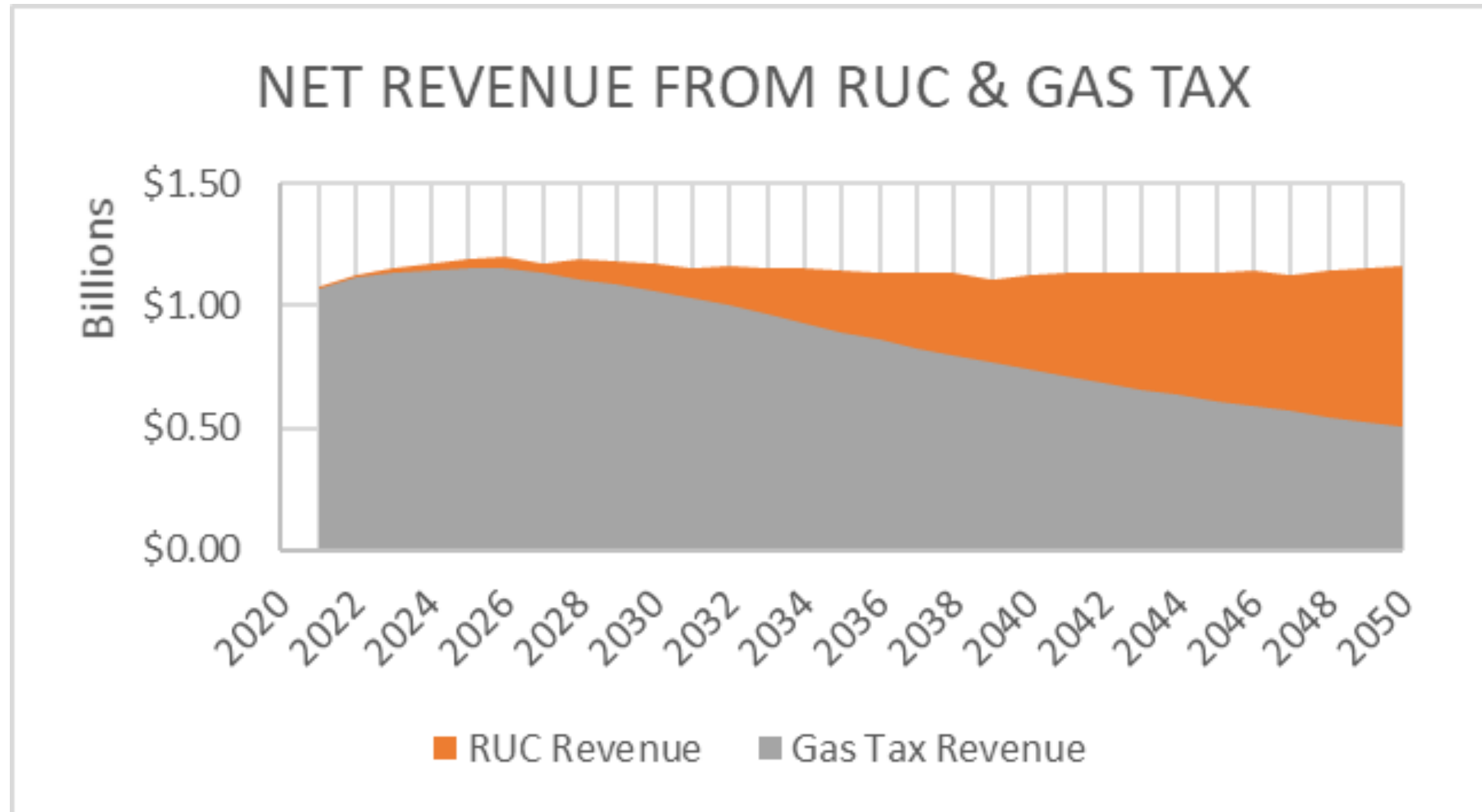
Overdrive



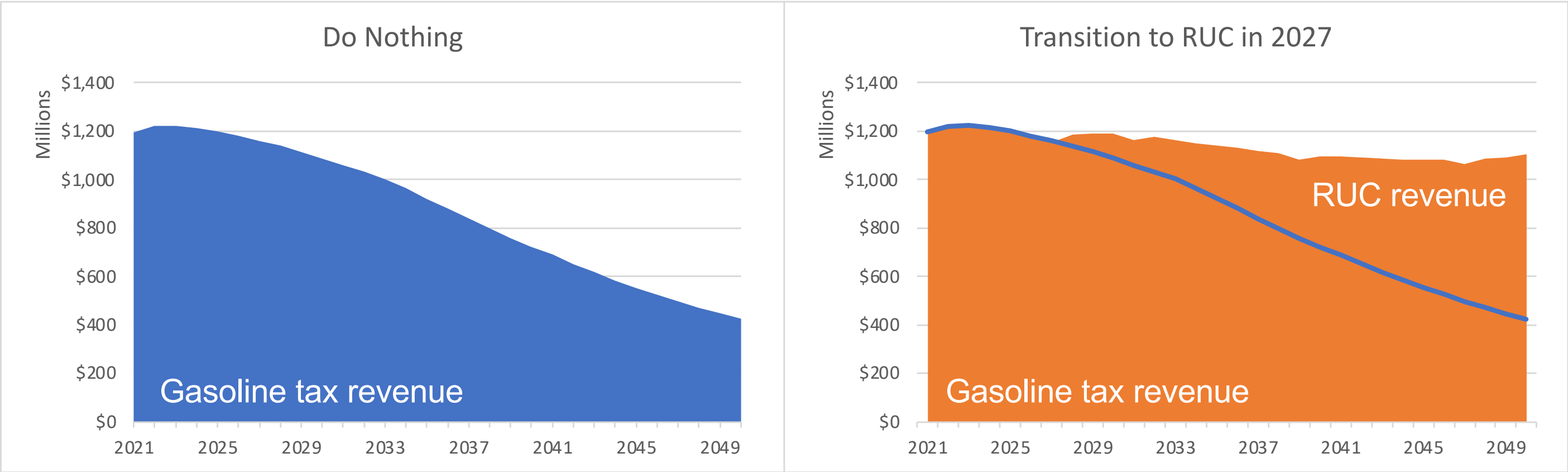
Neutral + 2030 Ban on Gasoline Vehicle Sales



Low Gear



Transition *New Vehicles* Starting 2027



User Experience Research: Two Phases

- 1) User research
- 2) Pilot testing

User Experience Research: Two Phases

- 1) User research: concept development and refinement
- 2) Pilot testing: prototype deployment and evaluation

Objectives of research



User Experience

Understand and improve the user experience



Cost Reduction

Identify and demonstrate viable approaches to reducing cost of collection



Equity

Honor and incorporate equity through policy and system design

Components of current phase of research

User experience research to inform RUC policy choices and system operations

Features:

- Self-reporting of odometer readings at registration renewal (“RUC Basic”)
- Alternative invoice designs
- Accommodations for low-income vehicle owners
- Mileage reporting choices
- *In-vehicle telematics as a mileage reporting choice*
- *Installment payment plans*
- *Out-of-state and off-road exemptions without GPS*

Field research to enhance RUC systems

Features:

- Unregistered vehicle research
- Vehicle transaction research
- Mock standards committee



WASHINGTON STATE ROAD USAGE CHARGE

RUC Simulation & Insights
August 16, 2022

Gabriel Post
Teague



Washington State
Transportation Commission



WA RUC Simulation & Insights

August 2022

**CDM
Smith**

TEAGUE

Objective

Gauge the public's comprehension, perceptions, and preferences for how a Washington Road Usage Charge (WA RUC) might impact their lives.

Based on these insights, develop design recommendations for WA RUC experiences, supported by evidence-based rationale.

Additional Context

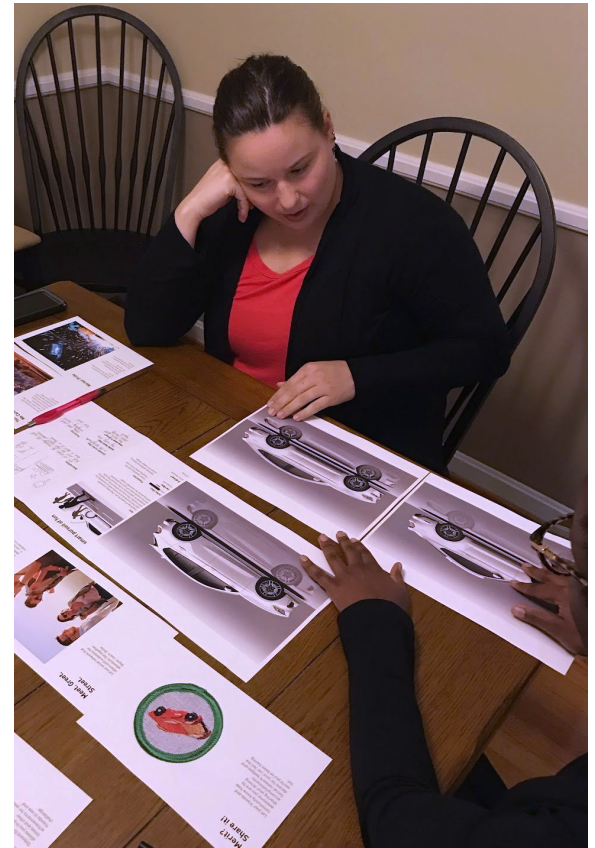
CDM Smith has been contracted by the WSTC to conduct research on transportation funding, primarily per-mile road usage charging (RUC), as directed by the WSTC for the Forward Drive Washington Road Usage Charge Demonstration Project. A key component of this research focuses on the pilot testing of RUC options, including design, test, and fielding of revenue collection concepts such as road usage charges with user groups specified by the Commission. Teague was engaged to support Task 6: RUC Prototype Demonstration and Sub-tests through the development of a user experience (UX) simulator.

What is design research?

Design research is a method in which designers observe, interview, and collaborate with individuals that will use the service or product being designed.

Why is it valuable?

It provides insight into the deeper “why” and rationale behind people’s perception, comprehension, preferences, behavior, usability, and desirability of a product or service.



A design research session in which a participant collaborates with a designer to piece together their ideal vehicle and service ecosystem.

Overview

CDM Smith and Teague designed and created a simulation of a WA RUC payment user experience and had 48 Washington vehicle owners “test” the simulation while being observed and interviewed. Data from these sessions was synthesized into this report.

Define

4 weeks

Gather input, create initial concepts, and align on a RUC UX simulation design.

Activities

- Tab renewal audit
- Reference experience audit
- Participant screener
- Initial design concepts

Design

5 weeks

Produce the RUC UX simulation and plan, recruit, and schedule research sessions.

Activities

- Simulation production
- Research planning
- Session protocol

Research

4 weeks

Gather research data from participants through moderated research sessions.

Activities

- Moderated sessions
- Initial data gathering

Synthesis

3 weeks

Collate and analyze research data to produce a report of insights and recommendations.

Activities

- Data organization, triage, & normalization
- Synthesis & documentation

Participants

We spoke with a total of 48 participants from four distinct cohorts. Each cohort was defined by a set of qualifications to ensure a diverse participation of Washingtonians.

Low-Income

12 participants

A mix of vehicle owners with an annual income below \$60,000.

Electric & Hybrid

8 participants

A mix of hybrid and electric vehicle owners.

Border-Crossing

12 participants

A mix of vehicle owners who regularly drive across national or state borders, or drive on private roads.

Average / Typical

18 participants

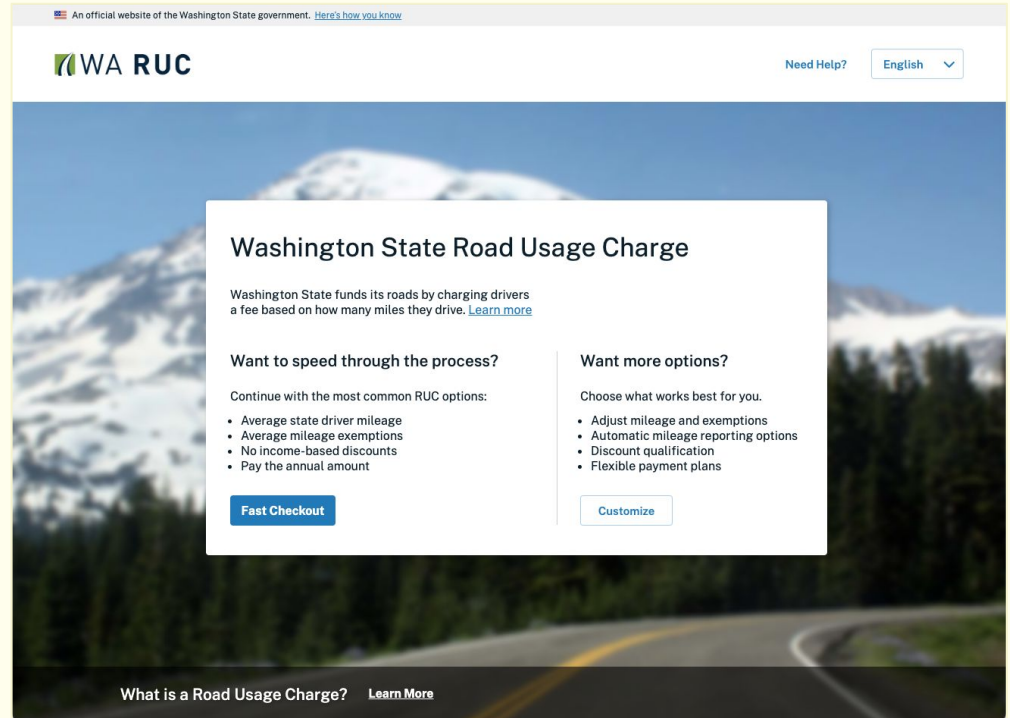
A mix of common types of vehicle owners.

Approach

During our interviews, participants engaged with a web-based simulation which took them through a semi-integrated first and second year tab renewal and RUC reporting and payment scenario.

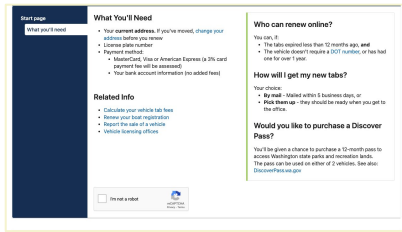
Participants were asked to speak aloud their thoughts and feelings during each step of the simulation and were asked key questions in order to meet the objectives of the research.

This research and RUC reporting and payment experience is intentionally designed to provoke thoughts, opinions, and insights so we may improve and refine the approach for deployment with a larger volume of unmoderated participants.



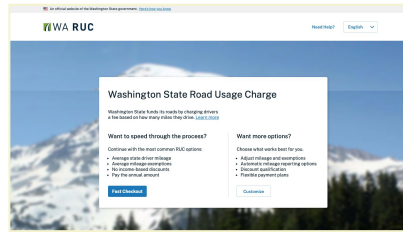
Simulation Overview

Step 01 Tab Renewal (Begin)



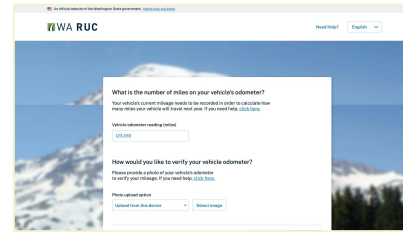
The first steps of tab renewal up until tab vendor selection.

Step 02 WA RUC Intro



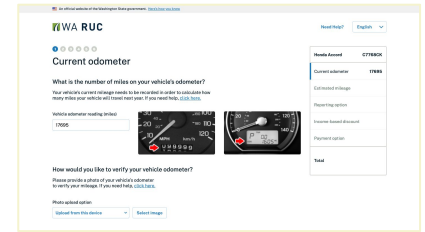
A transition from tab renewal to WA RUC payment.

Step 03 RUC Plan Selection



A choice between a fast preset plan or a custom plan.

Step 04 Mileage Reporting



Input of initial mileage and photo evidence.

Key Questions

- How do people feel about the transition from tab renewal to RUC payment?
- How do people feel about the RUC program?
- How do people feel about an option of preset selections or flat fee versus a customizable process?
- How do people feel about mileage reporting and verification?

Simulation Overview

Step 05 (Year 2) Exemption Reporting

Report exemptions

How many miles did your vehicle drive out-of-state last year?

Estimated mileage: 436

Total: \$270.29

Input of claimed exempt mileage and photo evidence.

Key Questions

- How do people feel about claiming and verifying mileage exemptions?

Step 06 Mileage Estimates

Mileage estimate

How many miles might your vehicle be driven next year?

Estimated mileage: 1765

Total: \$240.00

Selection or input of estimated mileage and exemptions for next year.

Step 07 Reporting Options

Mileage Reporting Options

How would you like to report your mileage and exemptions?

Basic

Advanced

Total: \$240.00

Selection of reporting method between self and automated reporting (telematics, device, phone) options.

Step 08 Income-based Discounts

Income-based discount

Have you qualified for any income-based state assistance services?

State assistance service: None

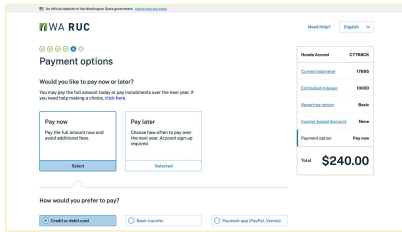
Total: \$240.00

Selection and verification of participation in state services to apply for a discount.

- How do people feel about how discounts should work?
- Who do people think should qualify for income-based discounts?

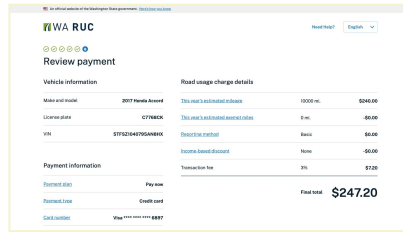
Simulation Overview

Step 09 Payment Options



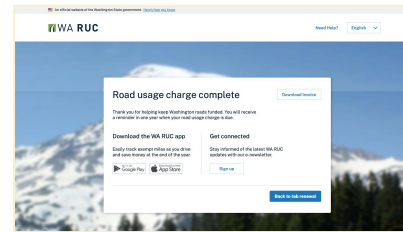
Selection of a payment plan, payment method, and billing info.

Step 10 Review



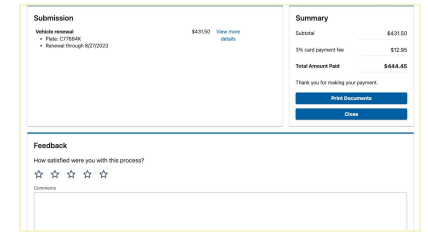
Finalization of all selections, inputs, and costs for the total RUC plan.

Step 11 Confirmation



Confirmation of RUC payment and completion. Access to downloadable invoice.

Step 12 Tab Renewal (Finish)



The final steps of tab renewal starting at donations through to confirmation.

Key Questions

- How would people prefer to pay a RUC and how often?
- What information are people interested in throughout their RUC experience?
- How do people feel about the year-over-year experience?
- Why would people want an invoice and what information are people interested in seeing on that invoice?
- How do people feel about the tab renewal and RUC integration?

Synthesis

After completing the interviews, the team began synthesis; a collaborative process of analysis and sense-making, leading to a coherent summary of data gathered during research.

Observation

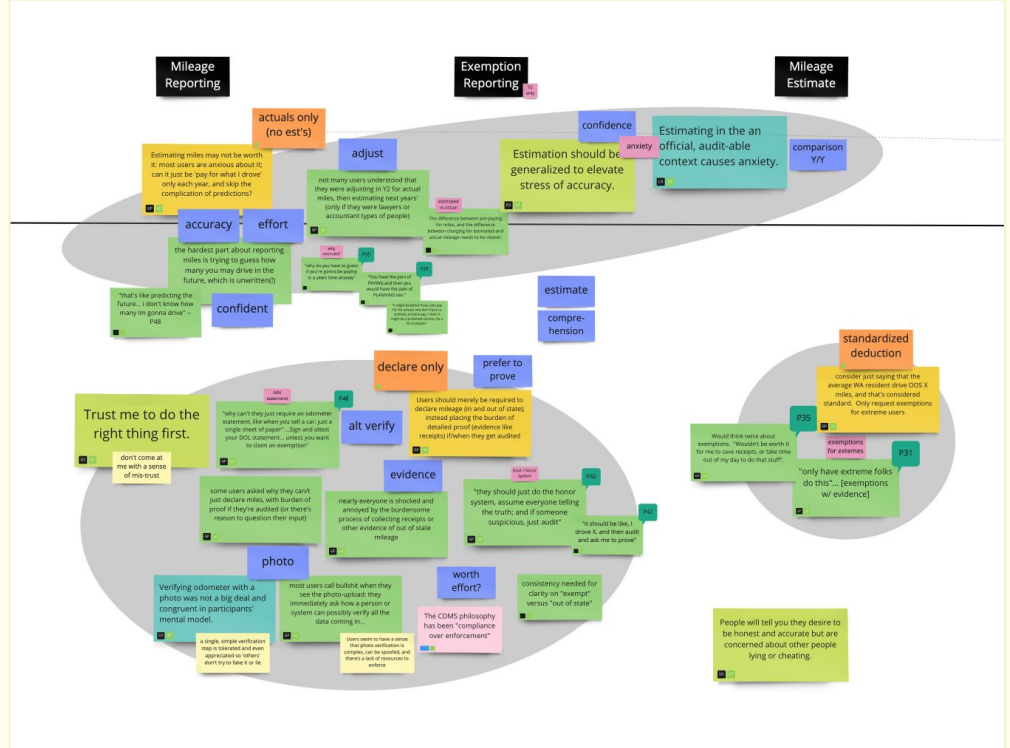
For each session, notes were taken documenting what we saw and heard from each participant. Over the course of our 48 sessions, we recorded more than 70 hours of interviews and wrote 2,434 observations.

Organization

We “tagged” observations with metadata to identify patterns that help us understand themes between participants, and hone in on certain aspects of the simulation.

Interpretation

With initial groupings in place, we began to see relationships emerge, connecting our observations across participants to tell a complete story.



Screenshot of our virtual whiteboard with a clustering of themes, observations, and notes.

Participant Archetypes

While speaking with participants, patterns began to emerge across the 4 cohorts which represented a worldview beyond driving behavior or income.

In the beginning...

Disinterested / unconcerned

Interested / concerned

People here just wanted to fast track through and/or setup to do so in the future.

People here wanted to learn more, and have all the information available.

Speed Racers

Make it fast.

Want to do what's required and move on as fast as possible.

“This is not an enjoyable task I want to spend a lot of time on. I would go through this quickly.”

– Naomi E.

Set-it-and-forget-its

Make it easy.

Want to set up automated means to remove effort to their benefit.

“Honestly, these all just sound like more work. I want the options which are more automatic.”

– Nathan N.

Penny Pinchers

Make it cost less.

Aren't always on a budget but are looking for opportunities to save.

“I want to take my time to read so I don't miss something and waste my money.”

– Daouda K.

Knowledge Seekers

Make it make sense.

Are interested in understanding how it works, both out of curiosity and to make informed decisions.

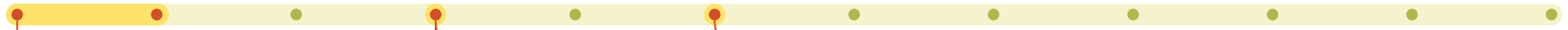
“I get excited when I get to learn something new and I didn't know about any of this.”

– Scott C.

In the end...

With time and comprehension people began to care less, shifting their disposition.

Key Insights



WA RUC Introduction

DOL integration was intuitive.

People will have more trust and confidence in a DOL-integrated tab renewal and RUC payment.

“I would want [RUC and tab renewal] to be a single service. It makes sense and I’m not sure why they’re not here.”

– Shannon J.

Reporting

Basic reporting as a default was fine.

People found self reporting to be sufficient and didn’t really mind the effort of odometer verification.

“That’s pretty slick—to be able to quickly scan the QR code and then send the photo from your phone.”

– George L.

Reporting

Perception of compliance harmed confidence.

People were quick to think evidence photos could be easily spoofed, giving them a feeling of doubt in the program.

“This whole thing is ripe for being manipulated.”

– Lawrence J.

Estimations

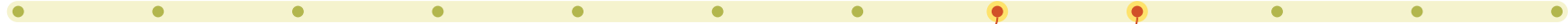
Prepay and estimation is not intuitive.

People do not expect to have to prepay for estimated mileage, finding it confusing, unnecessary, and upsetting.

“I’d much rather just pay for what I use. [Estimating] just just feels super convoluted and more work for everyone.”

– Naomi E.

Key Insights



Discounts

Discounts have a halo effect.

People expect and appreciate discounts for those in need, regardless of their own qualifications.

“Ahh nice, this is good, I worry about how it impacts people who can’t afford [things like this].”

– Darin K.

Payment Options

Pay Now was preferred (to a point).

People prefer to pay in full when they can, and would like to choose to pay in installments when necessary.

“I like to pay now so I don’t have to worry about it later.”

– Christine L.

General

Everyone was able to get through it.

Regardless of their sentiment, everyone was able to complete the simulation without failure.

“I would describe this site as much better than most government websites.”

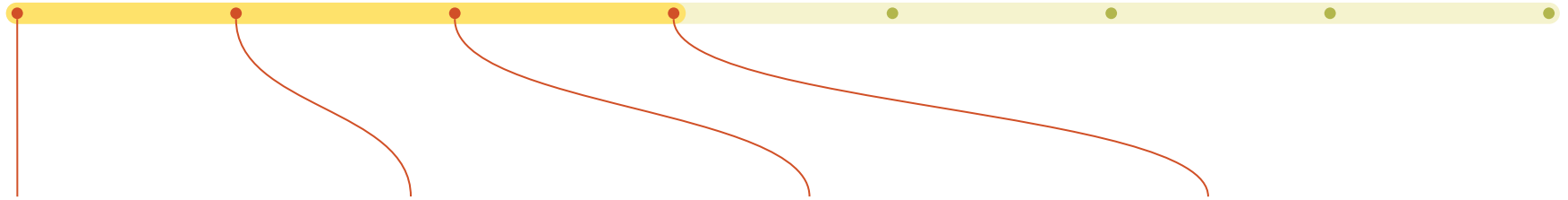
– Ethan N.

Experience Blueprint.



Pilot User Experience

This diagram represents the key steps and changes Teague suggests for the upcoming pilot.



RUC Introduction

Introductory content with a focus on instruction and education.

- Remove the Fast Checkout option.
- Add what you'll need to complete the process.
- FAQ as a separate "learn more" link may not be necessary.
- Remove "Washington themed" imagery.
- Do not use acronyms (e.g., WA RUC).

Mileage Reporting

Input of initial mileage and photo evidence.

- Display warnings of high mileage or significant changes in driving behavior.
- Move odometer reference images to the "learn more" content state.
- Use terms consistently, for example Exemptions not "out-of-state-miles".
- Display photo upload options side-by-side.
- Content and features which encourage compliance.

Mileage Estimation

Selection or input of estimated mileage and exemptions for next year.

- Provide quick reference for typical mileage examples/archetypes.
- Ranges for mileage (5-7 options).
- Provide manual entry for high mileage.
- Consider notifications when estimations seem overly high or low.

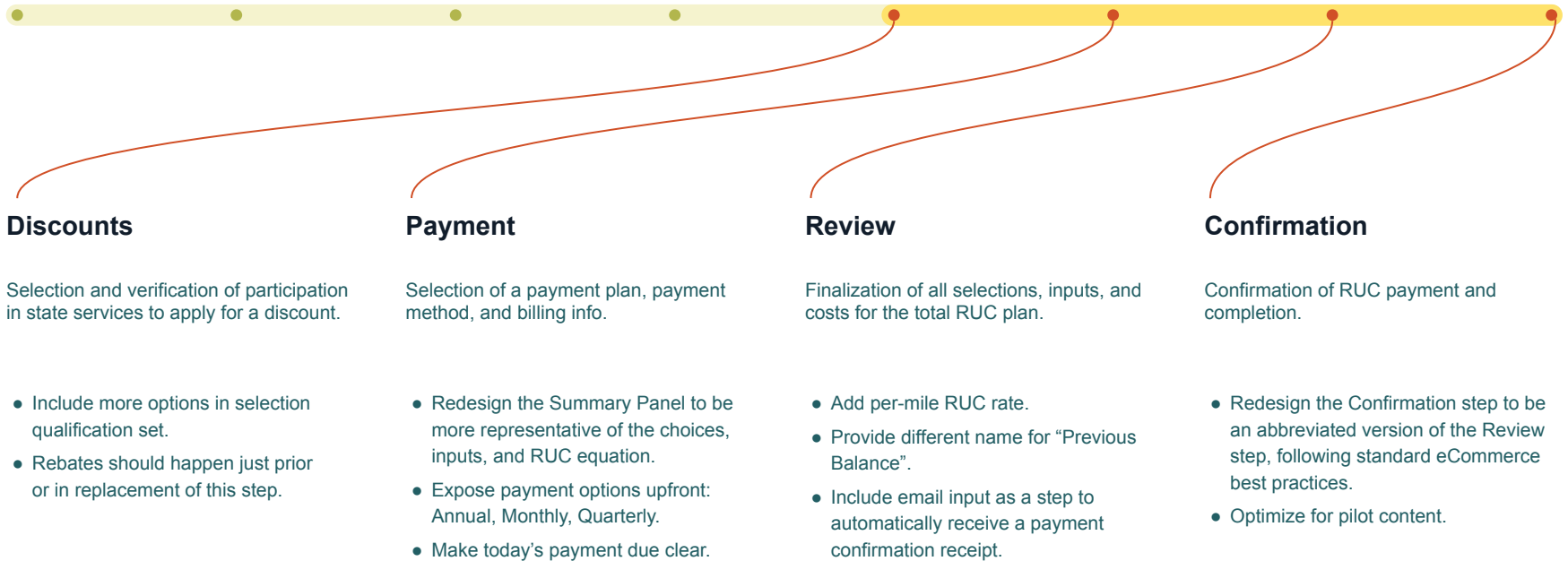
Reporting Options

Selection of reporting method between self and automated reporting options.

- Expose all options upfront (but no more than 4, preferably 3).
- Default remains "Basic".
- Don't add charges or fees for choosing Advanced Reporting options.
- Clearly communicate the service, cost, and benefits in a comparison view.

Pilot User Experience

This diagram represents the key steps and changes Teague suggests for the upcoming pilot.



**CDM
Smith**



TEAGUE

A stylized graphic of a road with a dashed yellow center line and solid blue outer lines, curving upwards and to the right against a green background.

WASHINGTON STATE ROAD USAGE CHARGE

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August 16, 2022*

Ging Ging Fernandez
& Steven Marfitano
CDM Smith



Washington State
Transportation Commission

Update Items

1. Schedule
2. RUC Basic design and participant experience
3. Recruitment
4. Follow-on experience research
5. Field research
6. Next steps

Schedule

User experience schedule



RUC Basic Design and Participant Experience

1. Objectives
2. Progress and next steps

Objectives of research



User Experience

Understand and improve the user experience



Cost Reduction

Identify and demonstrate viable approaches to reducing cost of collection



Equity

Honor and incorporate equity through policy and system design

Design

User Experience Design

- 1 Tab Renewal (Begin)
- 2 WA RUC Intro
- 3 RUC Plan Selection
- 4 Mileage Reporting
- 5 Exemption Reporting
- 6 Mileage Estimates
- 7 Reporting Options
- 8 Income-based Discount
- 9 Payment Options/Plan
- 10 Review
- 11 Confirmation
- 12 Tab Renewal (Finish)



User Experience

Design
Updates

RUC Basic Design

- 2 WA RUC Intro
- 4 Mileage Reporting
- 5* Exemption Reporting (Manual Mileage Exemptions)
- 7* Reporting Options (Telematics)
- 8 Income-based Discount
- 9* Payment Options/Plan (Installment Payment Plans)
- 10 Review
- 11 Confirmation



Cost Reduction

RUC Basic



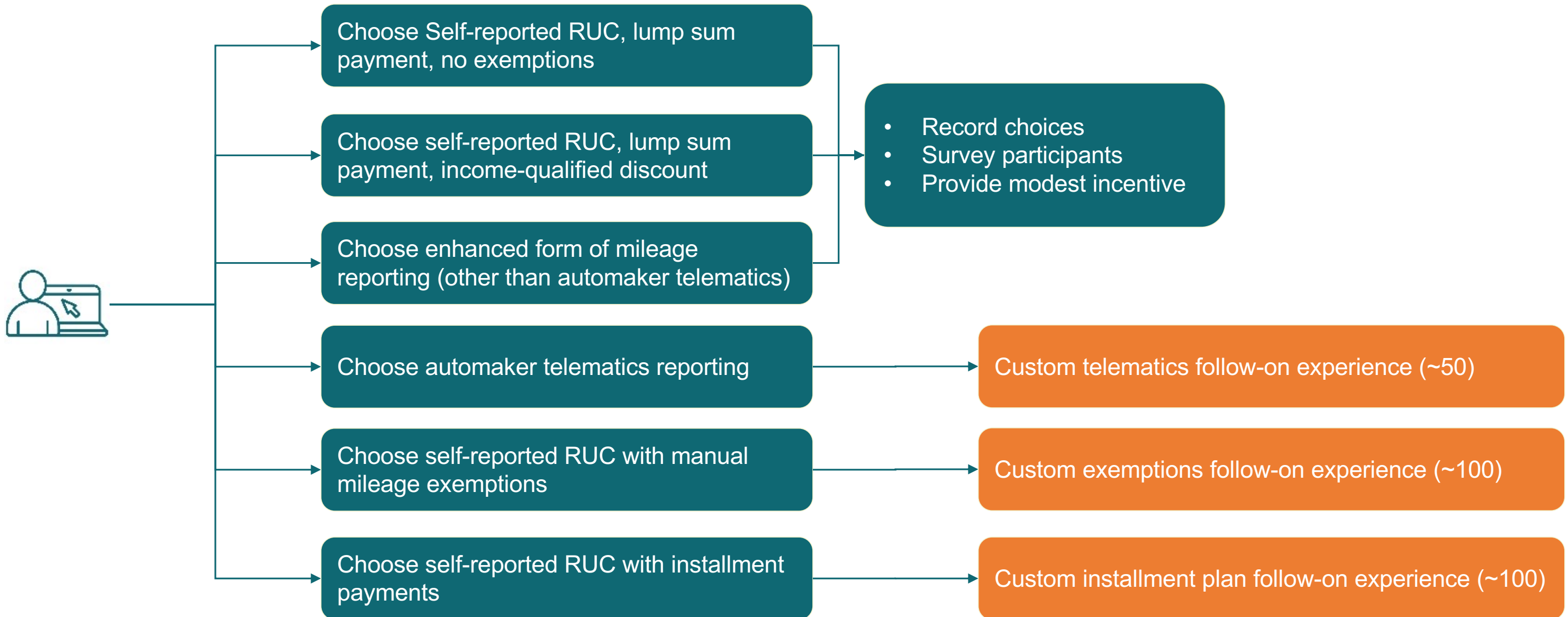
Objectives

- Validate design from user experience research by building a prototype
- Gauge user comprehension, perceptions, and preferences
- Measure scalability, cost, and performance of prototype features

Features

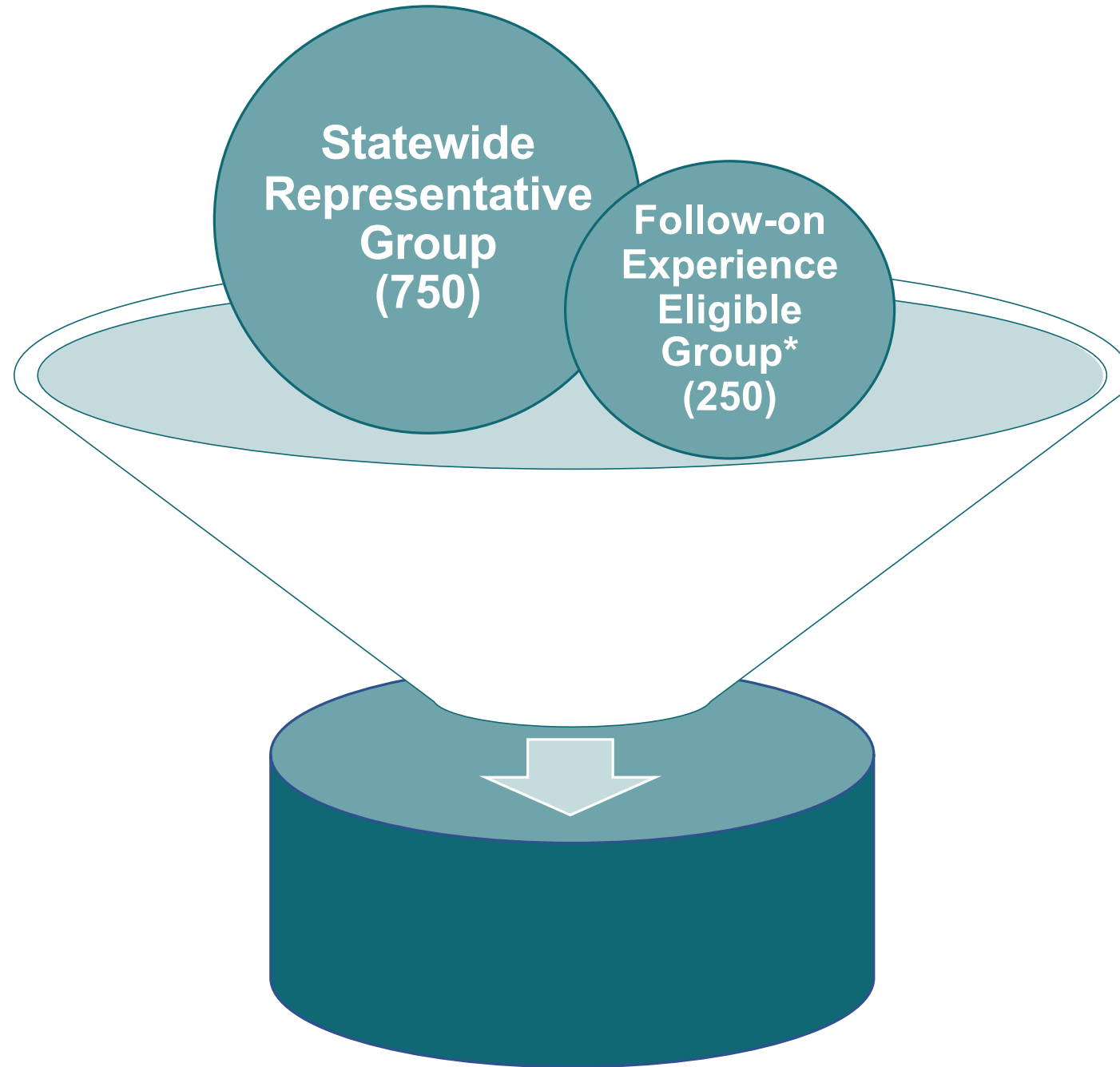
- Up to 1,000 participants
- Unmoderated “sessions” where participants interact with a RUC enrollment, reporting, and payment site
- Opportunity to experience “RUC simple” while making a range of choices reflecting interaction preferences
- Opportunity for follow-on experiences

Participant Experience



Recruitment

Recruitment Approach



*Follow-on Experience Participation

- **Installment payments** (up to 100)
- **Telematics** (up to 50)
- **Manual mileage exemptions** (up to 100)

Recruitment Approach

Statewide Representative Group

- Seeking 750 participants in a coordinated sample that reflects the full statewide population
- Focus areas for creating a statewide sample
 - Geography (urban, rural)
 - Location (East, West, etc.)
 - Race and ethnicity
 - Age
 - Gender
 - Marital status
 - Income



Recruitment Approach

Follow-on Experience Eligible Group

An operating principle of the pilot is to let participants **self-select rather than to recommend or require certain choices**. It is possible that few drivers will self-select into the follow-on experiences at the desired rates because they may simply not be interested.

That is a research finding in itself! Time will tell.

Installment Payments



- Low-income vehicle owners
- Diverse vehicle types and uses
- Urban, suburban, and rural



User Experience



Equity

Telematics



- Electric vehicle owners
- New vehicle owners



User Experience



Cost Reduction

Manual Mileage Exemptions



- Residents of border regions
- Frequent out-of-state travelers



User Experience



Cost Reduction



Equity

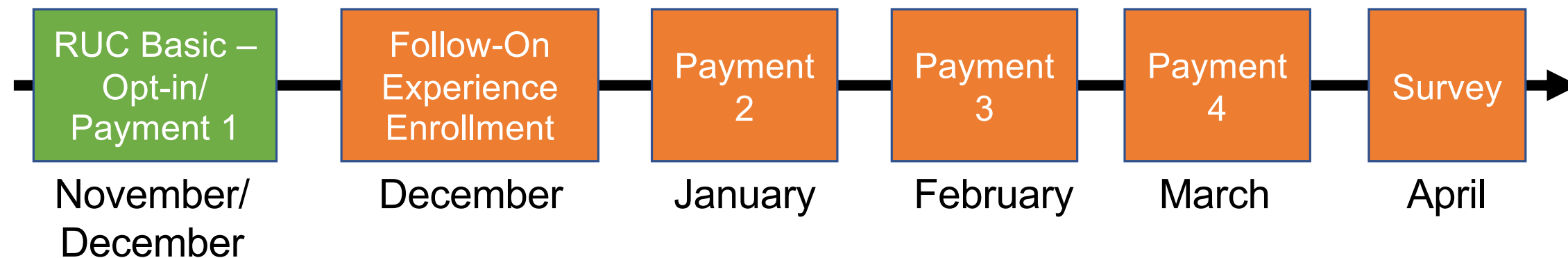
Follow-on Experiences

1. Installment Payment Plans
2. Telematics
3. Manual Mileage Exemptions

Installment Payments Follow-on Experience



What participants will experience



- The first installment is simulated (no money is transacted)
- Upon enrollment in this follow-on experience, participants will receive a cash card loaded with their next installment amount
- After making a payment, participants' cards will be reloaded with the next installment amount
- Card will not be reloaded if participant fails to make a payment

Installment Payments Follow-on Experience



What we will assess

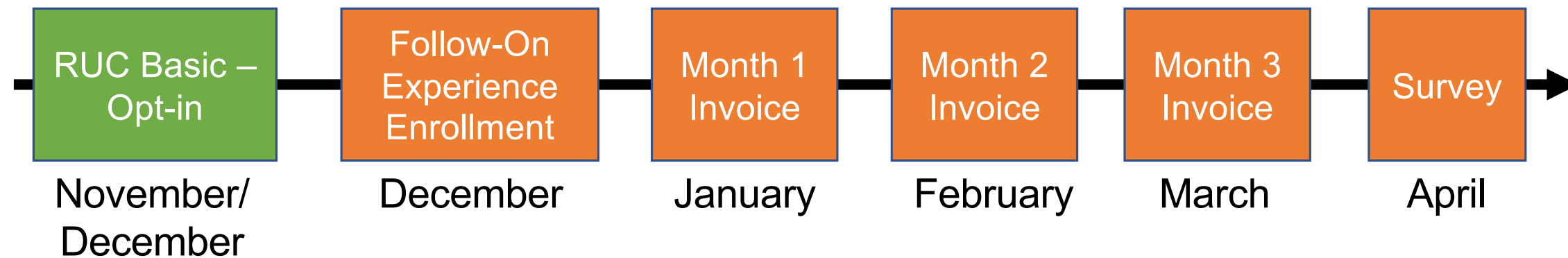
- Level of interest among participants – especially among low-income households
- Compliance
- Effectiveness of reminders
- Complexity
- Cost of administration



Telematics Follow-on Experience



What participants will experience



- Participants will provide vehicle information during recruitment and be notified of eligibility during RUC Basic – ***enrollment in telematics is optional!***
- Participants who choose to enroll in telematics will sign a data access agreement with the project vendor, allowing access to data needed to calculate RUC directly from their vehicle
- No money will change hands during the follow-on experience
- Participants will receive mock invoices showing charges for miles driven each month
- The project vendor will provide miles driven by jurisdiction to allow for automatic exemption of miles driven out-of-state

Telematics Follow-on Experience



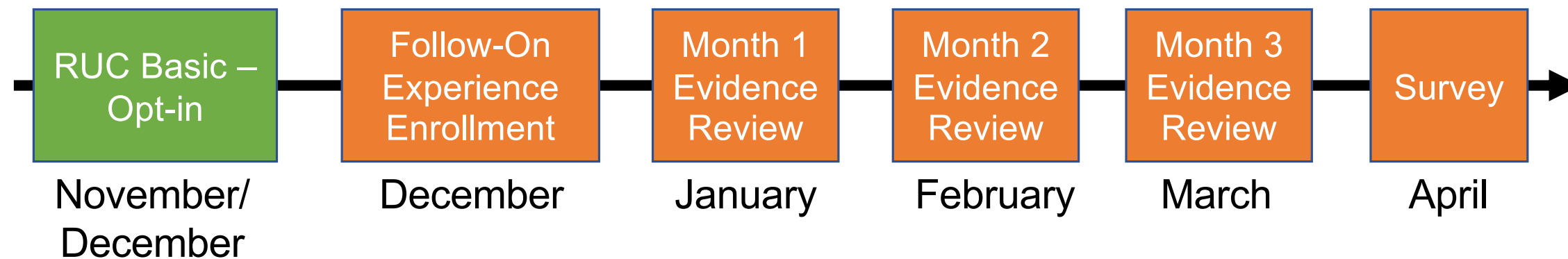
What we will assess

- User experience including feedback on process, ease of use, convenience, and understanding
- Cost to administer
- Scalability
- Accessibility/availability
- Pathways, configurations, and costs for telematics as a reporting option in the long term

Manual Mileage Exemptions Follow-on Experience



What participants will experience



- During enrollment, participants will receive instruction about how to provide documentation to substantiate exemption claims
- Feedback will be provided on documentation as the program is refined
- Interviews with participants will allow unique opportunities for feedback

Manual Mileage Exemptions Follow-on Experience



What we will assess

- Level of interest among participants
- User experience including feedback on process, ease of use, convenience, and understanding
- Reliability and validity of process including:
 - Participant evidence
 - Verification procedures
- Cost and effort to administer
- Scalability

Field Research

- 1) Low-income discounts
- 2) Vehicle registration research findings
- 3) Vehicle transactions research
- 4) Mock standards committee

Low-income discounts



Goal: Understand the **interest** in and utility of discounts and the **costs** of offering them

Research:

- Offer users a choice to auto-enroll in a discount based on enrollment in other state assistance programs based on income qualification
- Apply a 20% discount on RUC
- Observe behavior with respect to discounts

What we will assess

- How many participants indicate eligibility for a discount
- **How useful or meaningful participants who elect the discount find it**
- **How useful or meaningful participants who do not elect the discount find it**
- Opinions on whether and how much a discount should be offered
- Cost of verifying eligibility

Unregistered vehicle research



Goal: Quantify the **extent and duration** of lapses in vehicle registration

Research:

- Review prior DOL research and analysis of registration renewals
- Conduct research on trends, findings, and compliance improvement efforts from other states
- Design generic approach for conducting field research on registration compliance

What we will assess

- Accuracy and ability to protect privacy for various approaches for measuring registration compliance rates in the field
- Registration renewal compliance rates (short-term vs. long-term) based on available data
- Effectiveness of compliance improvement techniques

Note: no field research will be conducted in Washington

Vehicle transactions research



Goal: Uncover characteristics of **vehicle-related transactions** such as triggers, the processes associated with the transaction, transaction time, and user attitudes

Research:

- **Participants journal transactions** for a four-month period
- Reminders sent every two weeks
- Review and analyze data collected

What we will assess

- Frequency and location of existing vehicle-related transactions
- Suitability of existing touchpoints for RUC-related transactions such as mileage reporting and payments
 - User experience
 - Cost
 - Scalability

Mock standards committee



Goal: Establish a mock committee of **peer states** and **private sector partners** to identify specific elements of RUC **standardization** with highest potential to **reduce costs** and enhance user experience

Research:

- Standards committee models appropriate for collection of taxes/fees (e.g. IRP, IFTA)
- Design objectives, roles, procedures, and candidate topics for committee
- **Invite and convene committee**
- Record notes, decisions, participant feedback, and lessons learned

What we will assess

- Areas of RUC that would benefit from inter-jurisdictional standardization
- Areas where standardization could reduce RUC cost of collection
- Areas of standardization that would benefit from state leadership
- Recommendations/lessons learned from mock standards committee

Next Steering Committee Meeting

In person!

Thursday, November 17, 2022

9 am – 3 pm

SeaTac Airport

THANK YOU

Consultant support provided by:

**CDM
Smith**

BERK

ei enviroissues

Yates
Consulting
Group

WA RUC