Zoom Interface and Controls

Update your Zoom name if needed

Remain on mute when not speaking

Raise your hand to speak
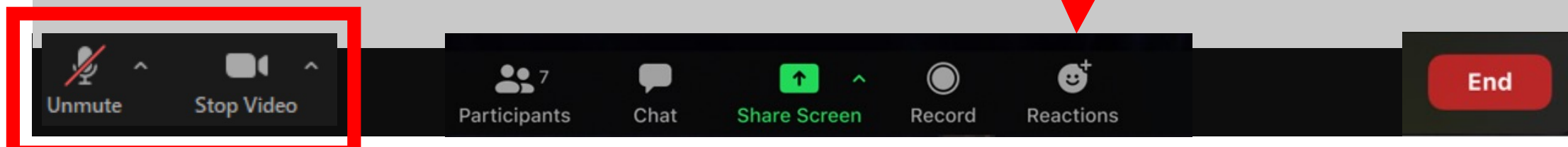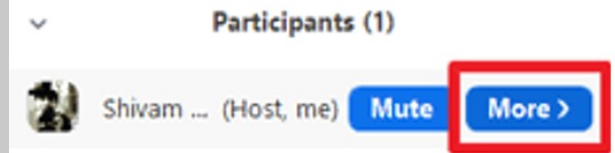
Technical difficulties?
Call or text Ara Swanson
206-409-7210

WA **RUC**

2

Agenda

1) Welcome & introductions

2) National RUC update

3) Research update
   - RUC financial analysis
   - Equity analysis and outreach
   - Cost reduction

–Lunch break–

   - RUC innovation

4) 2022 Demonstration plans

5) Open Steering Committee discussion

6) Next steps

WA **RUC**

Welcome and Introductions

Roy Jennings
Commissioner, WSTC, and RUC Steering Committee Chair
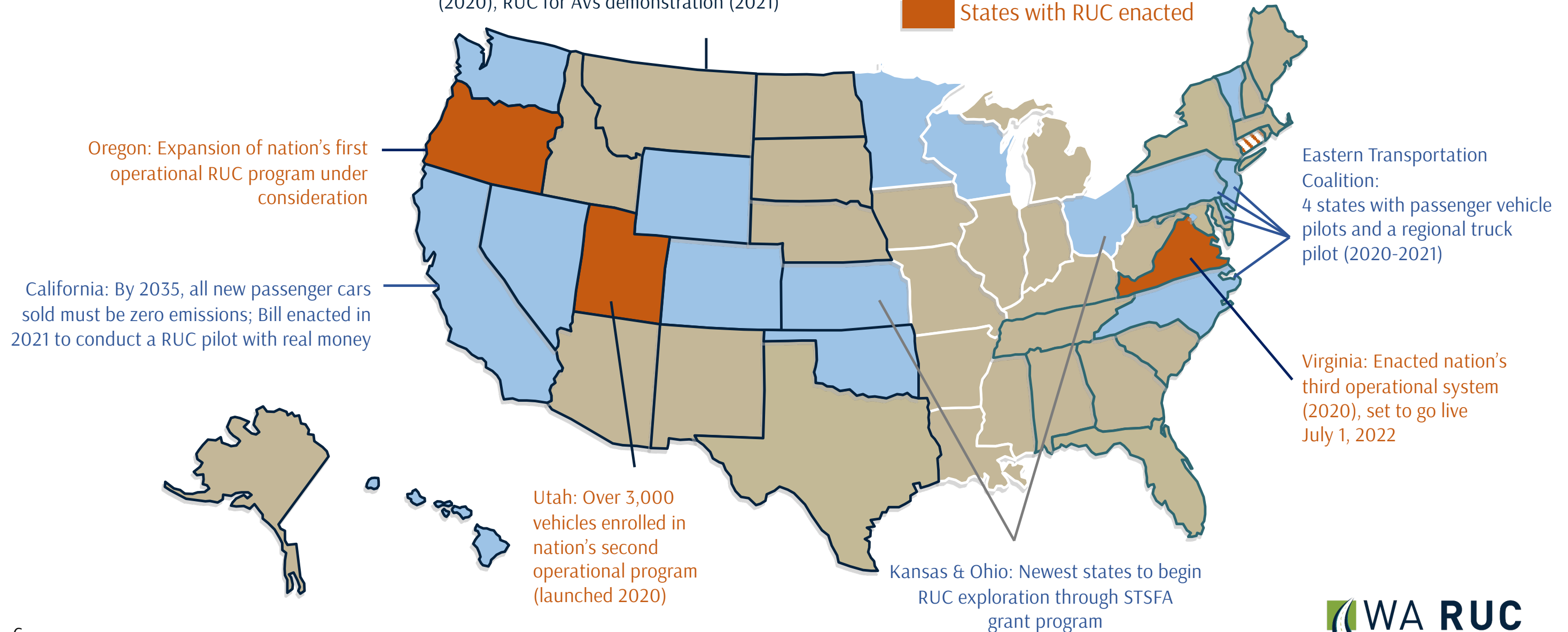
WA RUC

National RUC Update

Travis Dunn
Project Manager, CDM Smith

WA RUC

State-Level RUC Activities

RUC West: interoperability demonstration (2020), RUC for AVs demonstration (2021)

■ States conducting independent research and pilots
■ States with RUC enacted

Oregon: Expansion of nation's first operational RUC program under consideration

California: By 2035, all new passenger cars sold must be zero emissions; Bill enacted in 2021 to conduct a RUC pilot with real money

Eastern Transportation Coalition:
4 states with passenger vehicle pilots and a regional truck pilot (2020-2021)

Virginia: Enacted nation's third operational system (2020), set to go live July 1, 2022

Utah: Over 3,000 vehicles enrolled in nation's second operational program (launched 2020)

Kansas & Ohio: Newest states to begin RUC exploration through STSFA grant program

WA RUC

Bipartisan Infrastructure Law: RUC Provisions

Continues support for state RUC programs through grant funding

- Provides $75 million over 5 years
- Increases federal share of costs to 70-80%
- Allows that funding can support operational program implementations
- Expands eligibility to states, groups of states, local governments, and MPOs
- Requires recommendations to inform national RUC alternatives

Creates a national Advisory Board and directs USDOT to conduct a national pilot

- Empowers panel of national experts to oversee pilot design and national outreach effort
- Requires recruitment of volunteers from 50 states, DC, and Puerto Rico
- Collects real money from volunteers, with rates set by vehicle type by Treasury Dept
- Directs Treasury & Transportation Secretaries to collaborate in fielding pilot

WA **RUC**

Forward Drive Project Update

WA **RUC**

RUC Financial Analysis

Zubair Ghafoor
CDM Smith

WA **RUC**

Overall Project Status

- ✓ Data collection and analysis
- ✓ Financial model development
- ✓ Scenario development
- ✓ Scenario analysis
- ✓ Revenue projections
- ✓ Analytical tool development

WA **RUC**

Analytical Approach

- Develop updated financial model
- Identify factors potentially affecting travel
- Develop an integrated framework to incorporate the factors
- Analyze illustrative scenarios
- Perform scenario planning using the framework

WA **RUC**

Financial Model

WA RUC

Primary Data Types and Sources

- Vehicle Miles Traveled (VMT):
  - Washington State Office of Financial Management (OFM)
  - FHWA, Highway Performance Monitoring System (HPMS)
  - US Energy Information Administration (EIA)

- Commute Patterns and Work From Home:
  - Integrated Public Use Microdata Series (US IPUMS)
  - US Census Bureau, National Household Travel Survey (NHTS)

- Energy/Fuel Consumption and Electrification:
  - US Energy Information Administration (EIA)
  - Bloomberg New Energy Finance (BNEF)

- Vehicle Fleet and Fuel Efficiency:
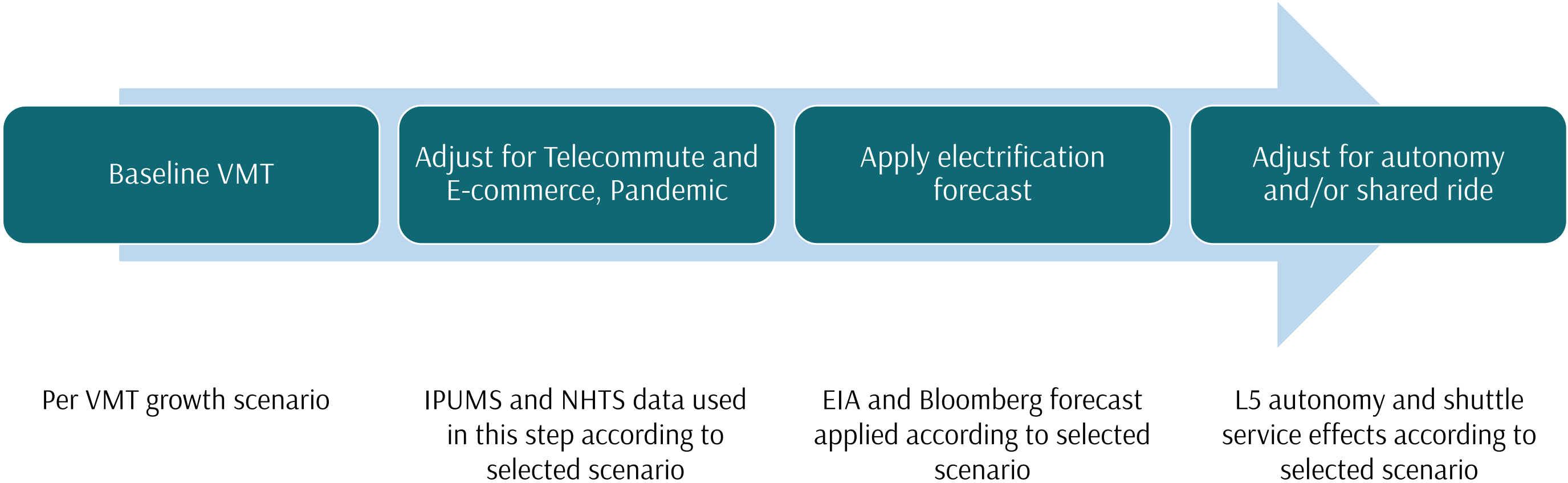 - Washington State Department of Licensing (DOL)

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Financial Model Capabilities

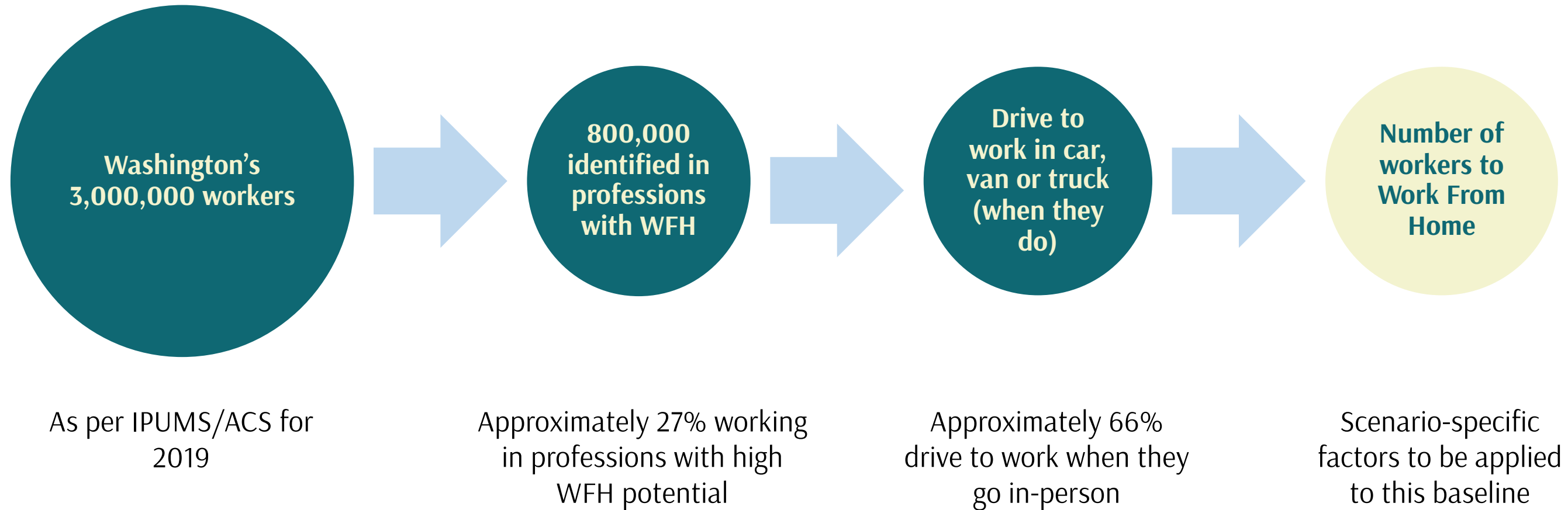**Consideration of the following factors:**

- Vehicle Miles Travelled (VMT)
- Electrification forecasts
- Potential shifts in commute patterns due to Covid-19
- A possibility of another pandemic
- Impact of E-Commerce
- Temporal and technology consideration of transition to RUC
- Impact of autonomy and/or shared mobility
- Urban and rural separation for revenue
- Vehicle fleet composition and fuel efficiency distribution
- Difference in urban and rural areas

All the above factors have been implemented in the financial model through a user-friendly interface

WA **RUC**

Adjustments to VMT

Baseline VMT	Adjust for Telecommute and E-commerce, Pandemic	Apply electrification forecast	Adjust for autonomy and/or shared ride
Per VMT growth scenario	IPUMS and NHTS data used in this step according to selected scenario	EIA and Bloomberg forecast applied according to selected scenario	L5 autonomy and shuttle service effects according to selected scenario

WA RUC

Identifying Workers/Occupations Expected to Continue Working from Home

Washington's 3,000,000 workers

→

800,000 identified in professions with WFH

→

Drive to work in car, van or truck (when they do)

→

Number of workers to Work From Home

As per IPUMS/ACS for 2019

Approximately 27% working in professions with high WFH potential

Approximately 66% drive to work when they go in-person

Scenario-specific factors to be applied to this baseline

WA RUC

Integrated Public Use Microdata Series (IPUMS)

EMPLOYMENT TYPES AND WORK FROM HOME (WFH) TRENDS IN URBAN/SUBURBAN AREAS

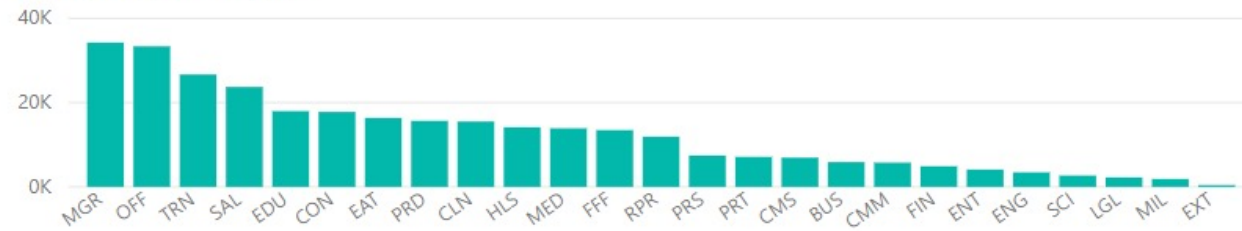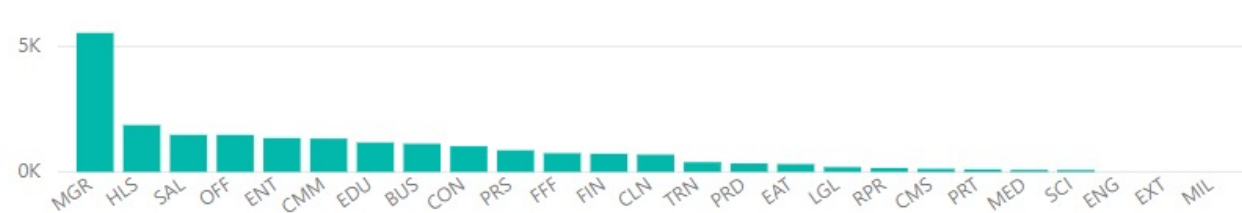| JOB CATEGORY	DESCRIPTION
ENG	Architecture and engineering occupations
MIL	Armed Forces
ENT	Arts, design, entertainment, sports, and media occupations
CLN	Building and grounds cleaning and maintenance occupations
BUS	Business and financial operations occupations
CMS	Community and social service occupation
CMM	Computer and mathematical science occupations
CON	Construction and extraction occupations
EDU	Education, training, and library occupations
FFF	Farming, fishing, and forestry occupations
EAT	Food preparation and serving related occupations
MED	Healthcare practitioner and technical occupations
HLS	Healthcare support occupations
RPR	Installation, maintenance, and repair occupations
LGL	Legal occupations
SCI	Life, physical, and social science occupations
MGR	Management occupations
OFF	Office and administrative support occupations
PRS	Personal care and service occupations
PRD	Production occupations
PRT	Protective service occupations
SAL	Sales and related occupations
TRN	Transportation and material moving occupations

WA RUC

Integrated Public Use Microdata Series (IPUMS)

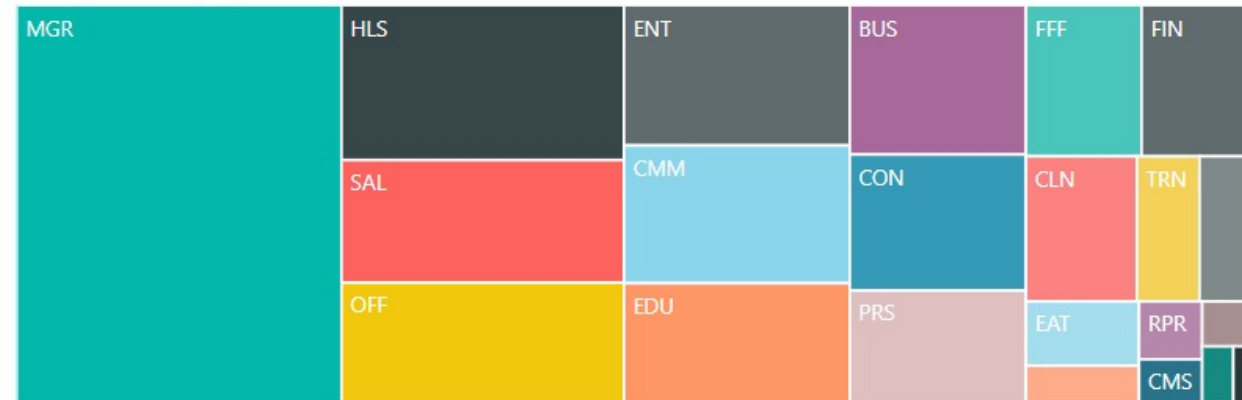
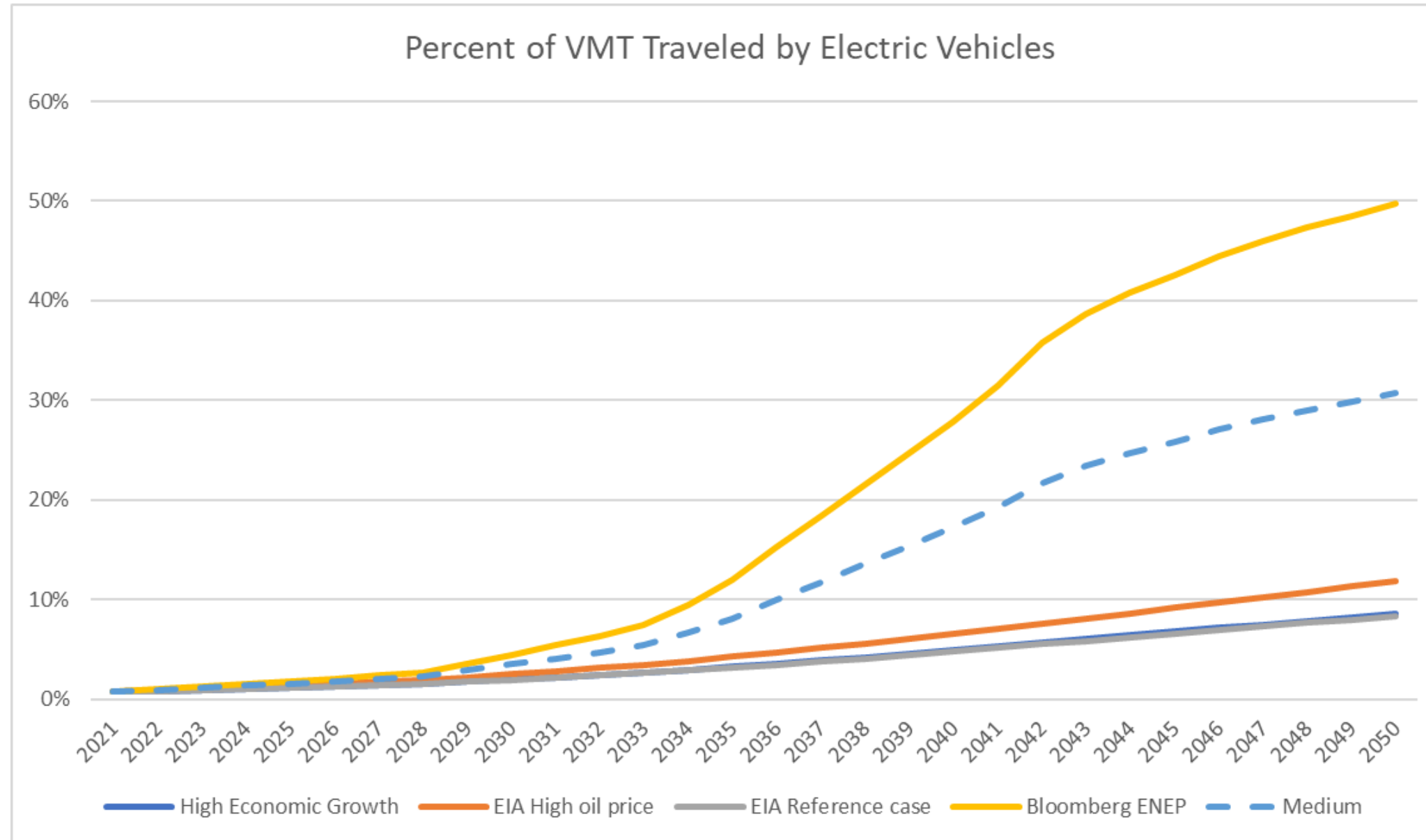EMPLOYMENT TYPES AND WORK FROM HOME (WFH) TRENDS IN RURAL AREAS

JOB CATEGORY	DESCRIPTION
ENG	Architecture and engineering occupations
MIL	Armed Forces
ENT	Arts, design, entertainment, sports, and media occupations
CLN	Building and grounds cleaning and maintenance occupations
BUS	Business and financial operations occupations
CMS	Community and social service occupation
CMM	Computer and mathematical science occupations
CON	Construction and extraction occupations
EDU	Education, training, and library occupations
FFF	Farming, fishing, and forestry occupations
EAT	Food preparation and serving related occupations
MED	Healthcare practitioner and technical occupations
HLS	Healthcare support occupations
RPR	Installation, maintenance, and repair occupations
LGL	Legal occupations
SCI	Life, physical, and social science occupations
MGR	Management occupations
OFF	Office and administrative support occupations
PRS	Personal care and service occupations
PRD	Production occupations
PRT	Protective service occupations
SAL	Sales and related occupations
TRN	Transportation and material moving occupations

Electrification Forecasts

Percent of VMT Traveled by Electric Vehicles

Legend: High Economic Growth, EIA High oil price, EIA Reference case, Bloomberg ENEP, Medium

Assumed Temporal Differences Between Urban and Rural Electrification and Autonomy

Urban L5 Autonomous Vehicles on Road 2035

Rural L5 Autonomous Vehicles on Road 2040

Urban Shared Mobility Shuttles on Road 2030

Rural Shared Mobility Shuttles on Road 2035

WA RUC

Vehicle Fleet Composition Using DOL Data

- Department of License (DOL) data containing Vehicles' ID Numbers (VIN) (6.7 million)

- VIN decoding performed on the dataset (6.1 million)

- Algorithm developed to estimate fuel efficiency using VIN

- Data used to develop fleet composition by model year and fuel efficiency (miles per gallon)

- Analysis output used to forecast fleet composition and fuel efficiency

WA RUC

Vehicle Fleet Composition Using DOL Data
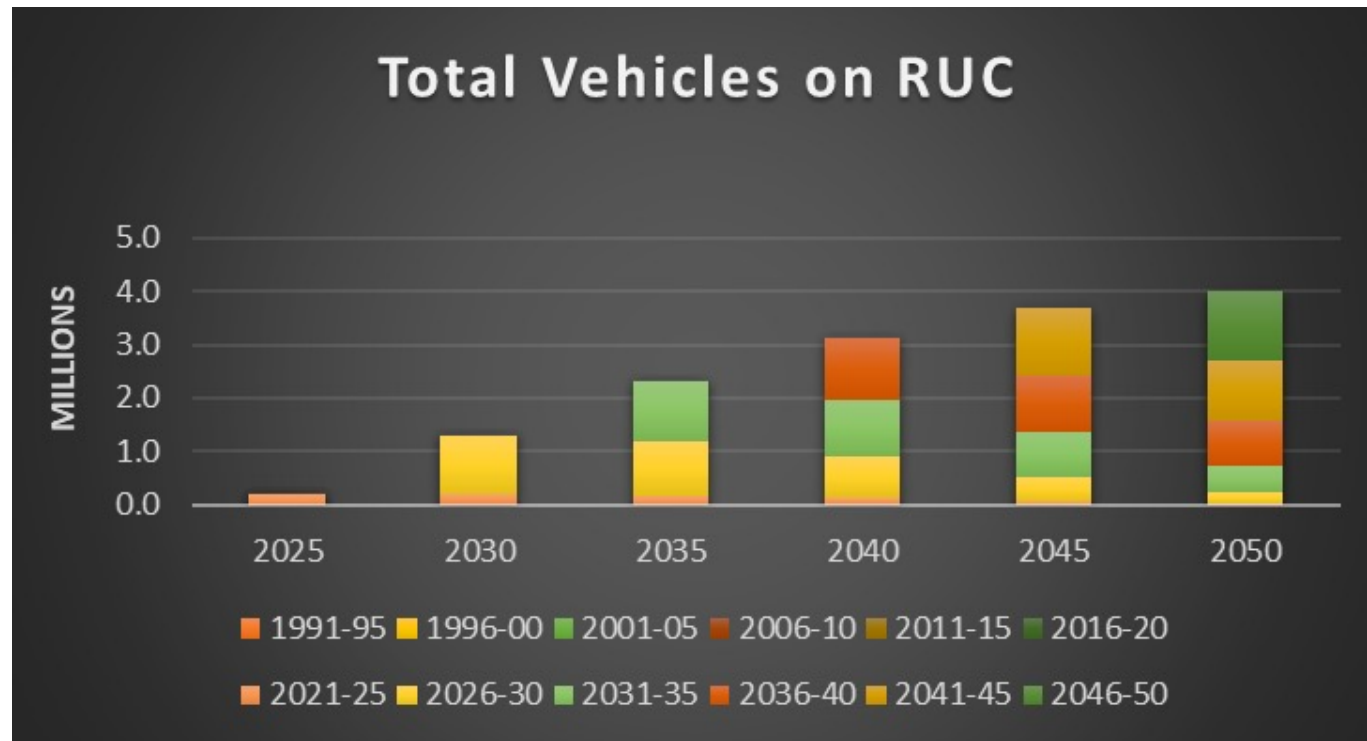
(Illustrative examples based on Over Drive scenario)

Scenario Development

WA RUC
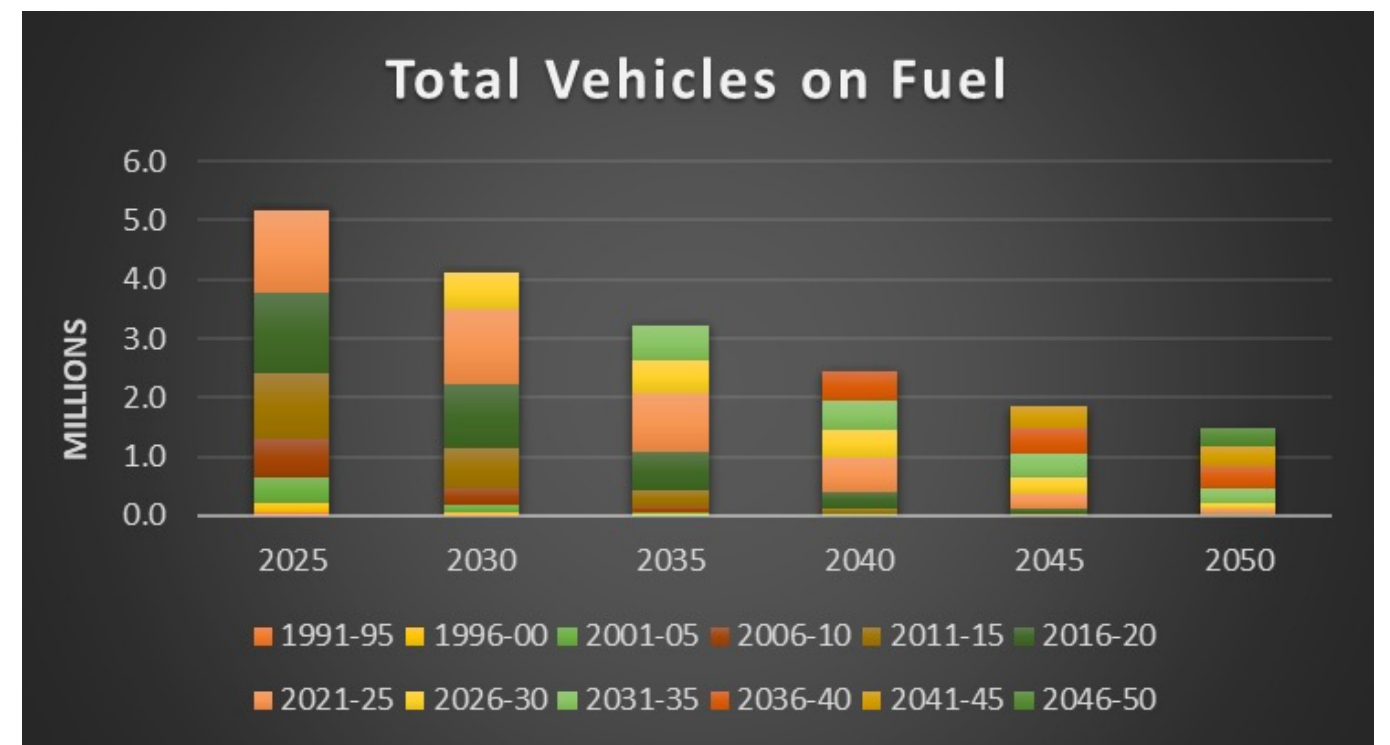
Scenario Development Rationale/Goals

- Scenarios should cover a broad spectrum of future conditions
- Scenario analysis process should be based on factors that seem to have a strong impact on vehicular travel
- Temporal variations to consider:
  - Telecommuting and E-Commerce/online shopping
  - Technological advancements in non-fossil fuel vehicles
  - Vehicle inventory and fuel efficiency
- Scenario analysis should capture urban/rural differences

WA **RUC**

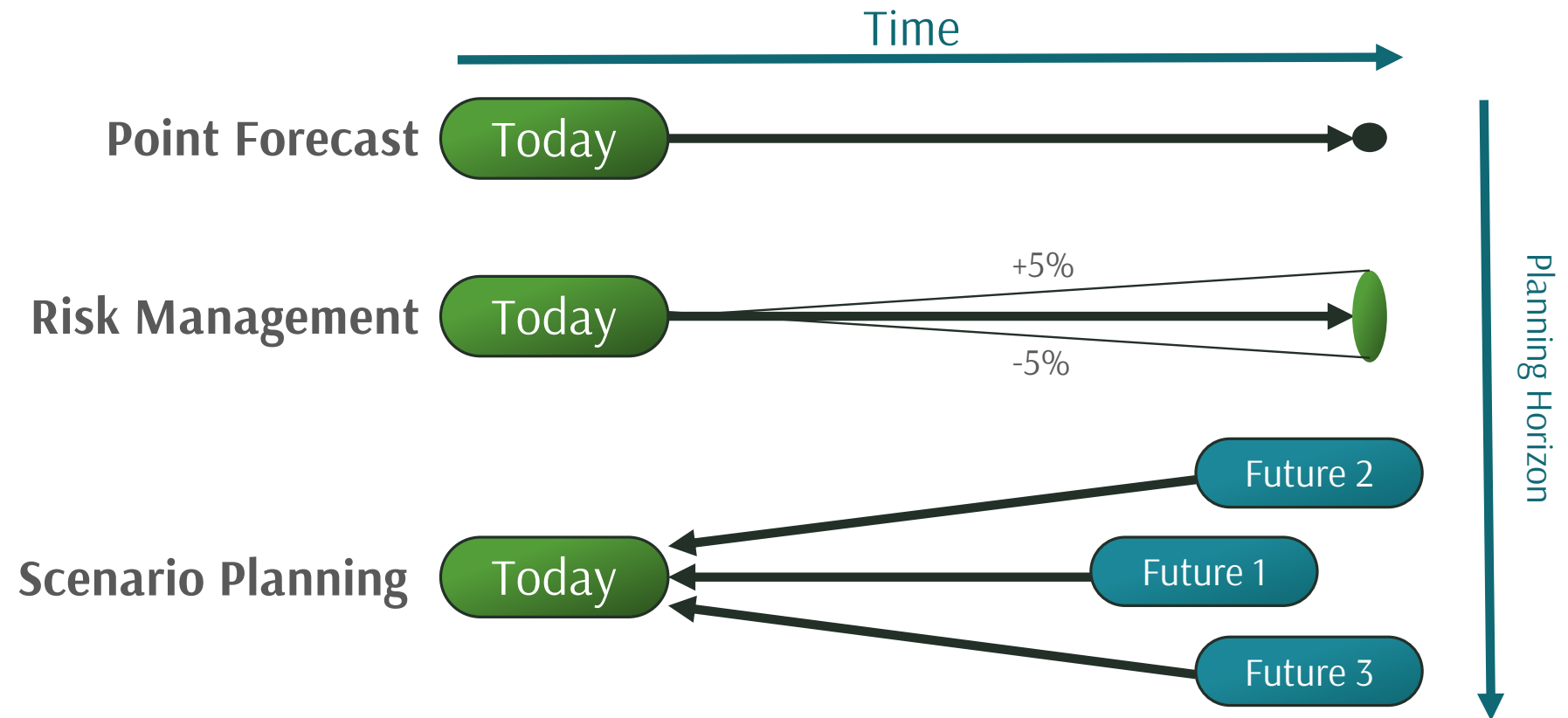# Scenario Planning Vs. Traditional Planning

Planning Techniques

> Traditional planning techniques generally focus on point forecasts

> Risk Analysis generally looks at ranges of results

> Scenario planning techniques shift from forecasting the future to preparing for potential depictions of future

Planning Methods

Time

Point Forecast — Today

Risk Management — Today — +5% / -5%

Scenario Planning — Today — Future 1, Future 2, Future 3

Planning Horizon

> Multiple scenarios are developed and used as depictions of future

WA RUC

Approach to Scenario Development

- Scenarios cannot be defined in "isolation" using just a single factor, e.g., "Low Economic Growth"

- Analyzing ALL possible combinations of the factors is not practical

- Define a "Baseline Scenario" using appropriate factors' ranges

- Identify 5 "plausible" combinations to develop a reasonable number of preliminary scenarios to analyze

- Select 3 scenarios to be analyzed in detail

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Factors Defining RUC Scenarios (expanded)

- Vehicle Miles Travelled (VMT)
- Electrification forecasts
- Potential shifts in commute patterns due to Covid-19
- A possibility of another pandemic
- Impact of E-Commerce
- Temporal and technology consideration of transition to RUC
- Impact of autonomy and/or shared mobility
- Urban and rural separation for revenue
- Vehicle fleet composition and fuel efficiency distribution
- Difference in commute length between urban and rural areas

WA **RUC**

Factors Defining RUC Scenarios

- VMT/Economic growth
- Covid/Pandemic outlook
- Telecommuting impacts
- E-Commerce impacts
- Technology adoption outlook (electrification)
- Autonomy and Shared Mobility impacts

WA **RUC**

Scenario Names and Descriptions

- **Neutral:** Represents a continuation of "past" growth and passive technology adoption

- **Cruise Control:** Represents a "moderate" increase of growth and slightly faster autonomous vehicles compared to Neutral

- **Overdrive:** Represents an "aggressive" economic growth and high electrification and technology adoption

- **Shared Drive:** Variant of Overdrive, with more adoption of shared mobility while still including aggressive growth

- **Low Gear**: Represents slow growth among electric vehicles, autonomous vehicles and shared mobility

WA **RUC**

Scenario Definition

Factors		Neutral	Cruise Control	Over Drive	Shared Drive	Low Gear
VMT Growth		Medium	Medium	High	High	Low
Pandemic Risk		Low	Low	Low	Low	Moderate
Telecommuting Increase		Medium	Moderate	High	Moderate	Low
E-Commerce		Medium	Moderate	Moderate	Moderate	Low
Electrification		Low	Moderate	High	High	High
Autonomy	Traditional Vehicles	Medium	Low	Low	Low	High
	Private L5 Vehicles	Low	Medium	High	Moderate	Low
	Shared Mobility	Low	Medium	Moderate	High	Low

Low	Medium	Moderate	High

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Scenario Analysis Results

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Model User Interface

RUC Revenue (Neutral)

RUC Revenue(Billions)
Urban and Rural

■ Urban RUC   ■ Rural RUC

WA RUC

RUC Revenue (Cruise Control)

RUC Revenue(Billions)
Urban and Rural
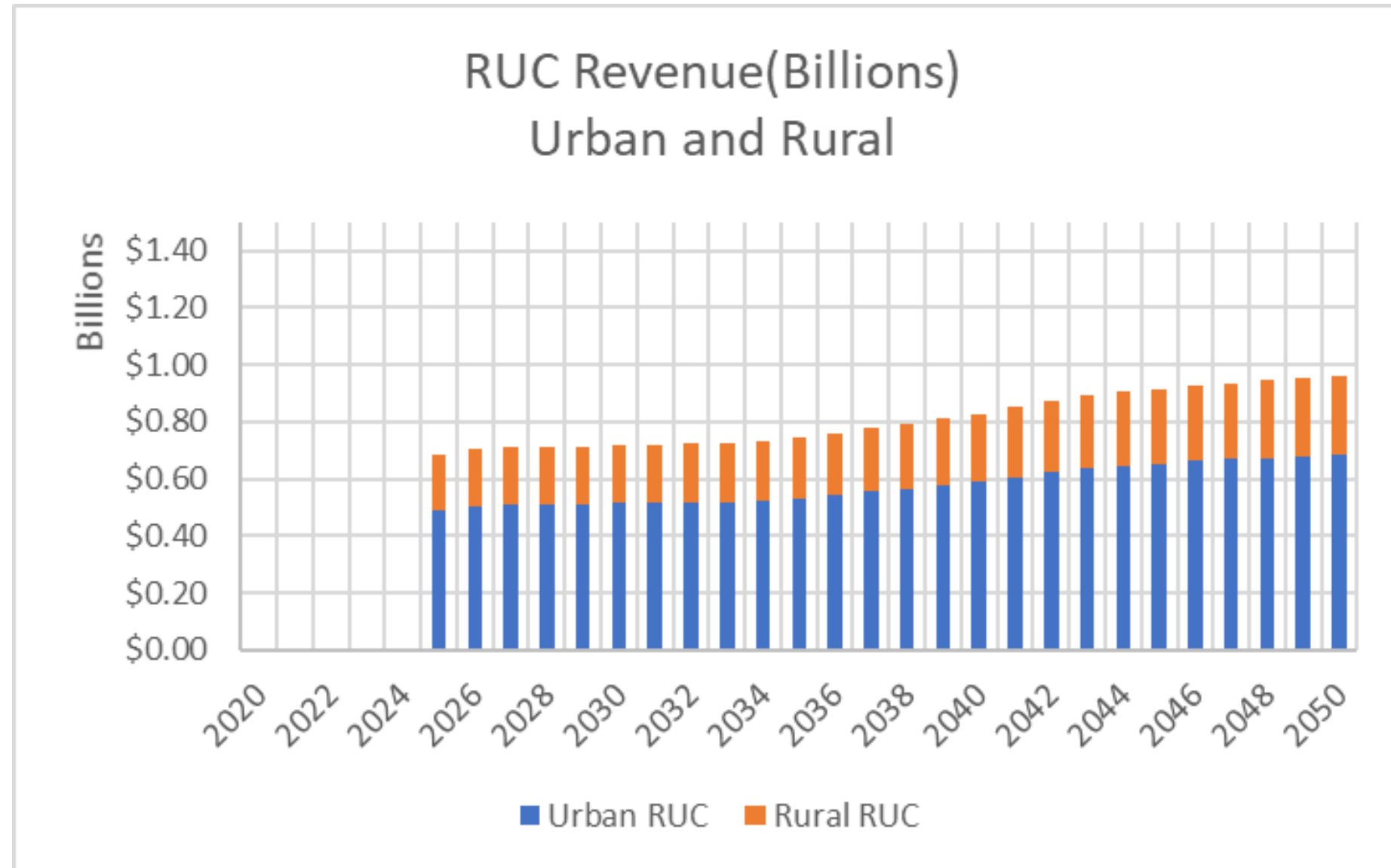
RUC Revenue (Over Drive)
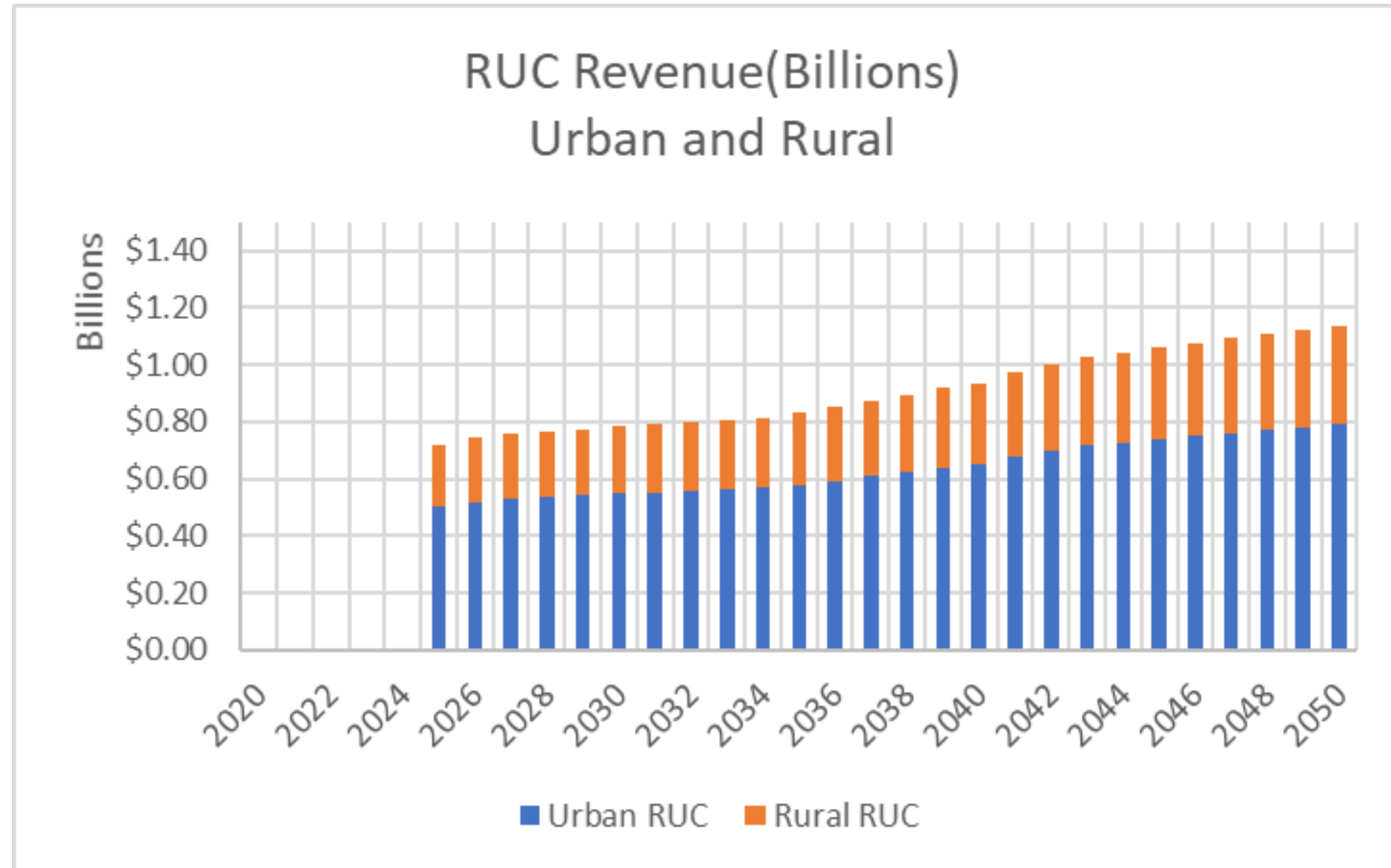
RUC Revenue (Shared Drive)

RUC Revenue (Low Gear)

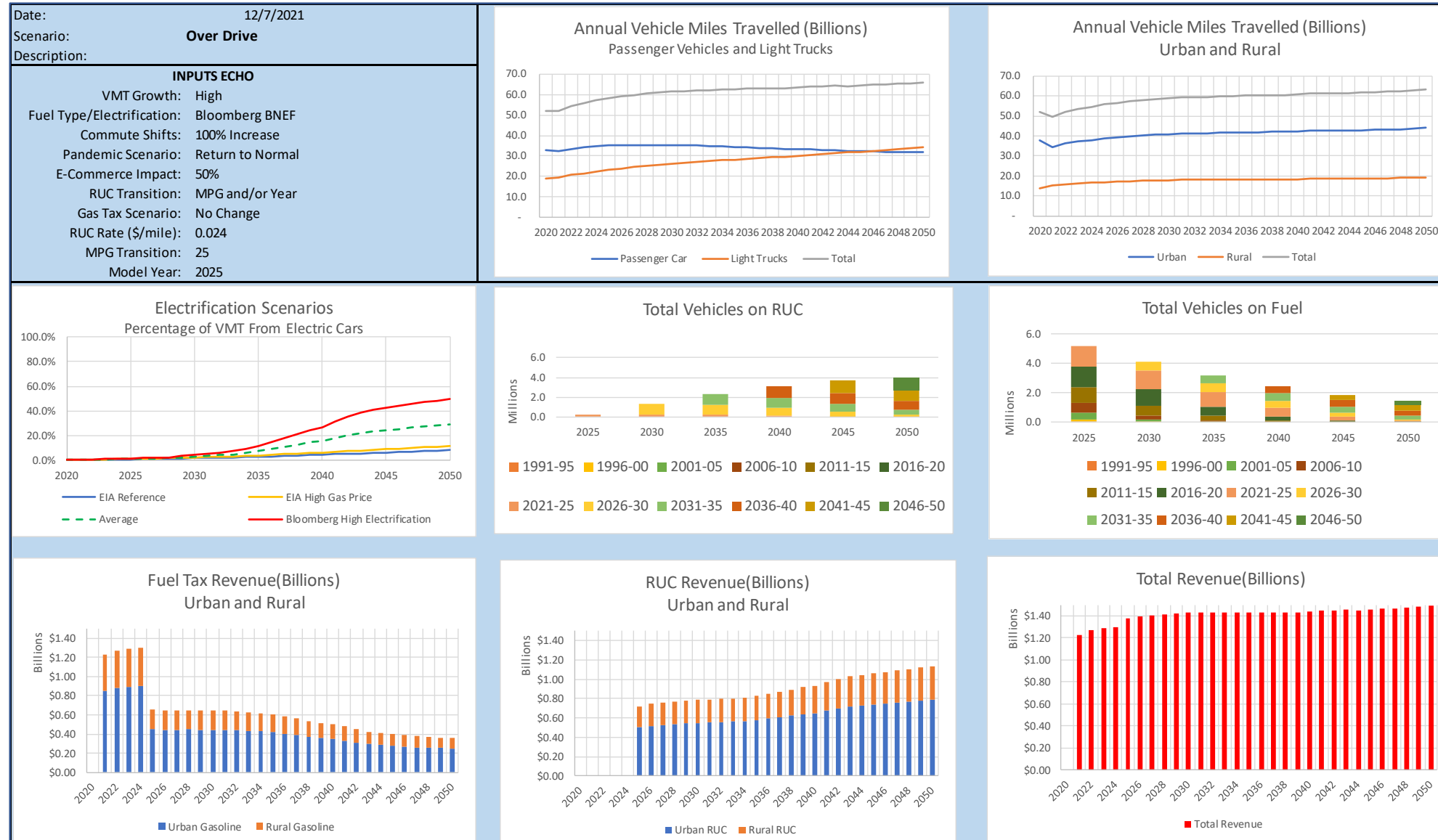
RUC Revenue(Billions)
Urban and Rural

Legend: Urban RUC, Rural RUC

WA RUC
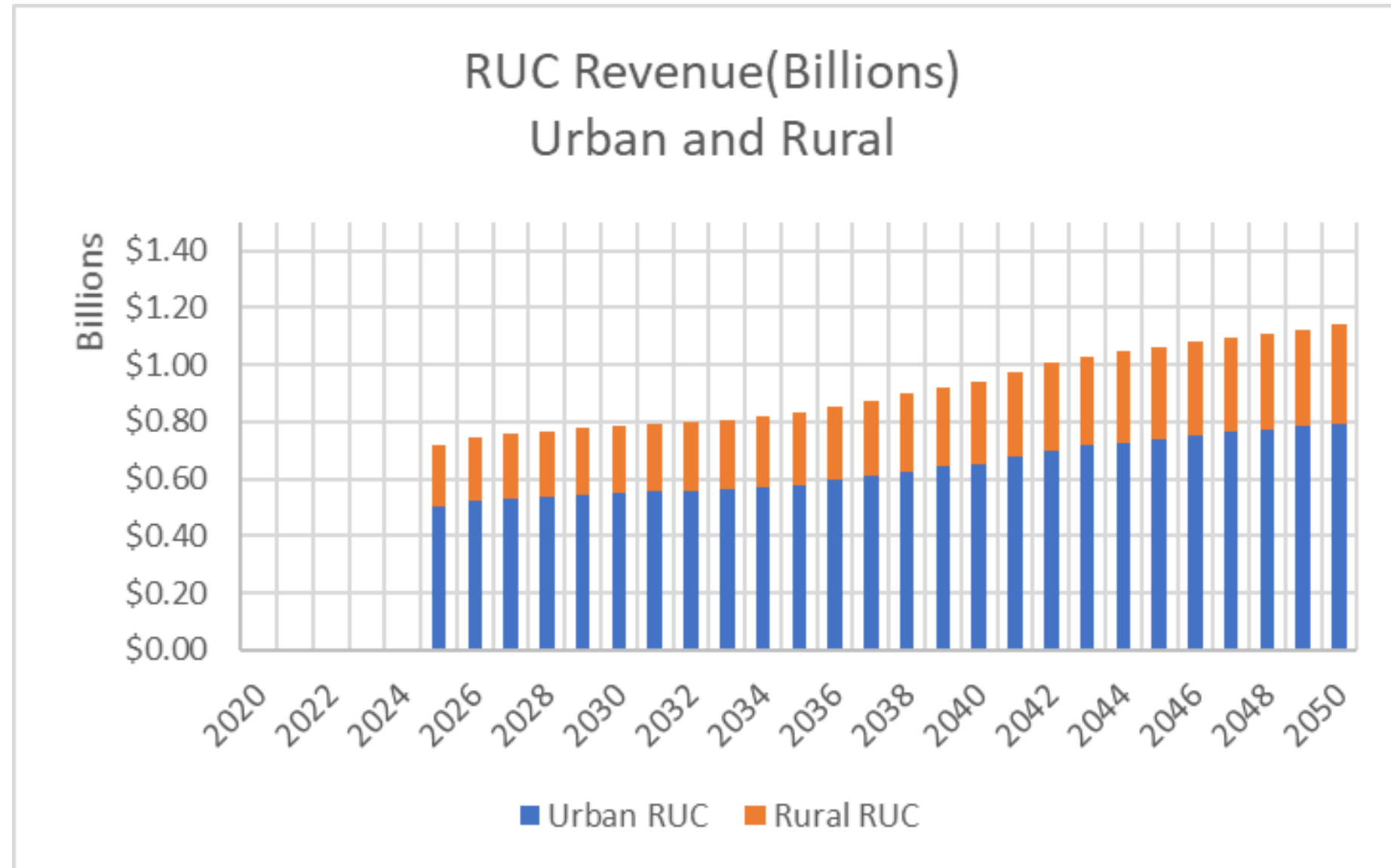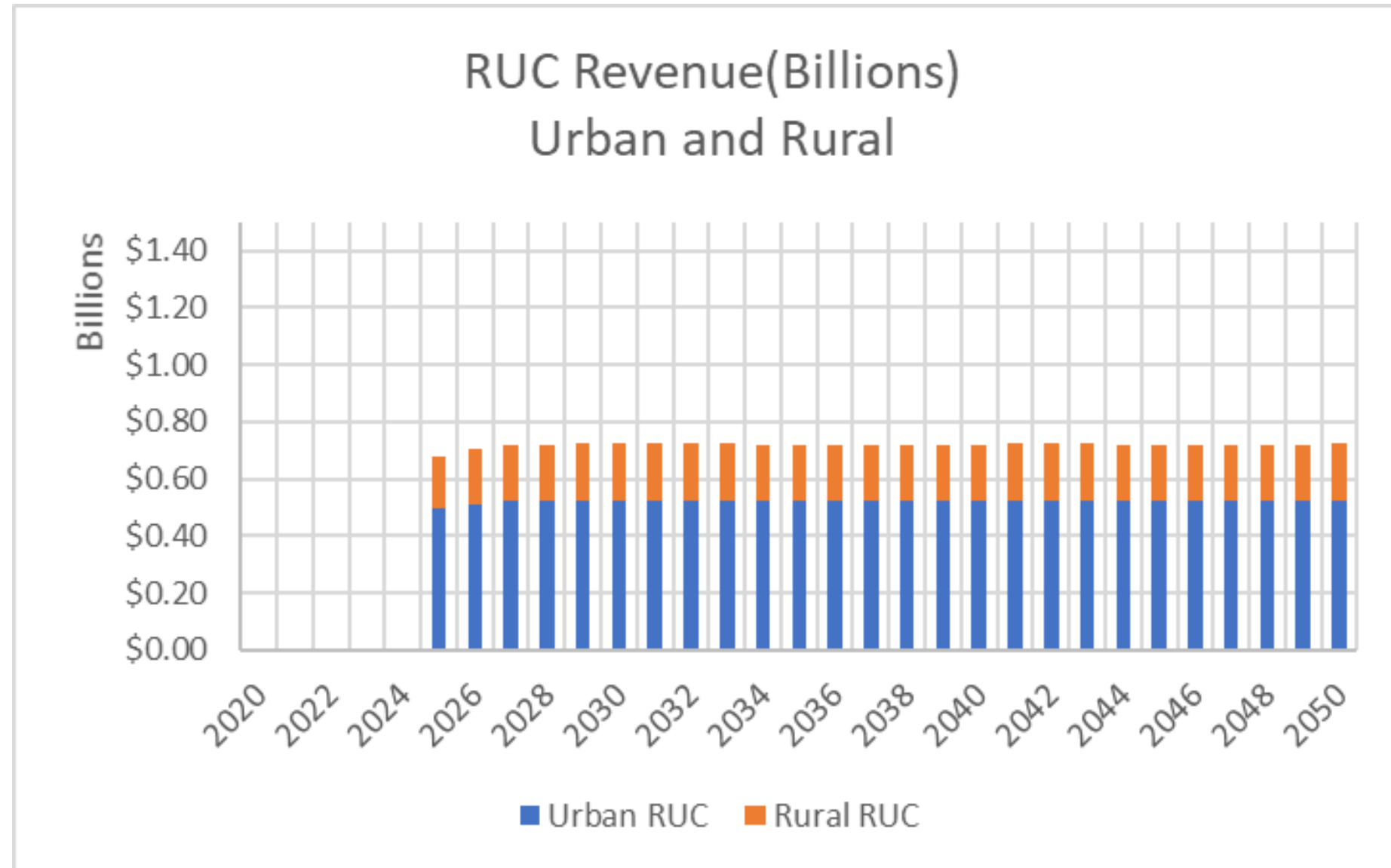
Sample Output From Dashboard

Sample Output From Dashboard

39
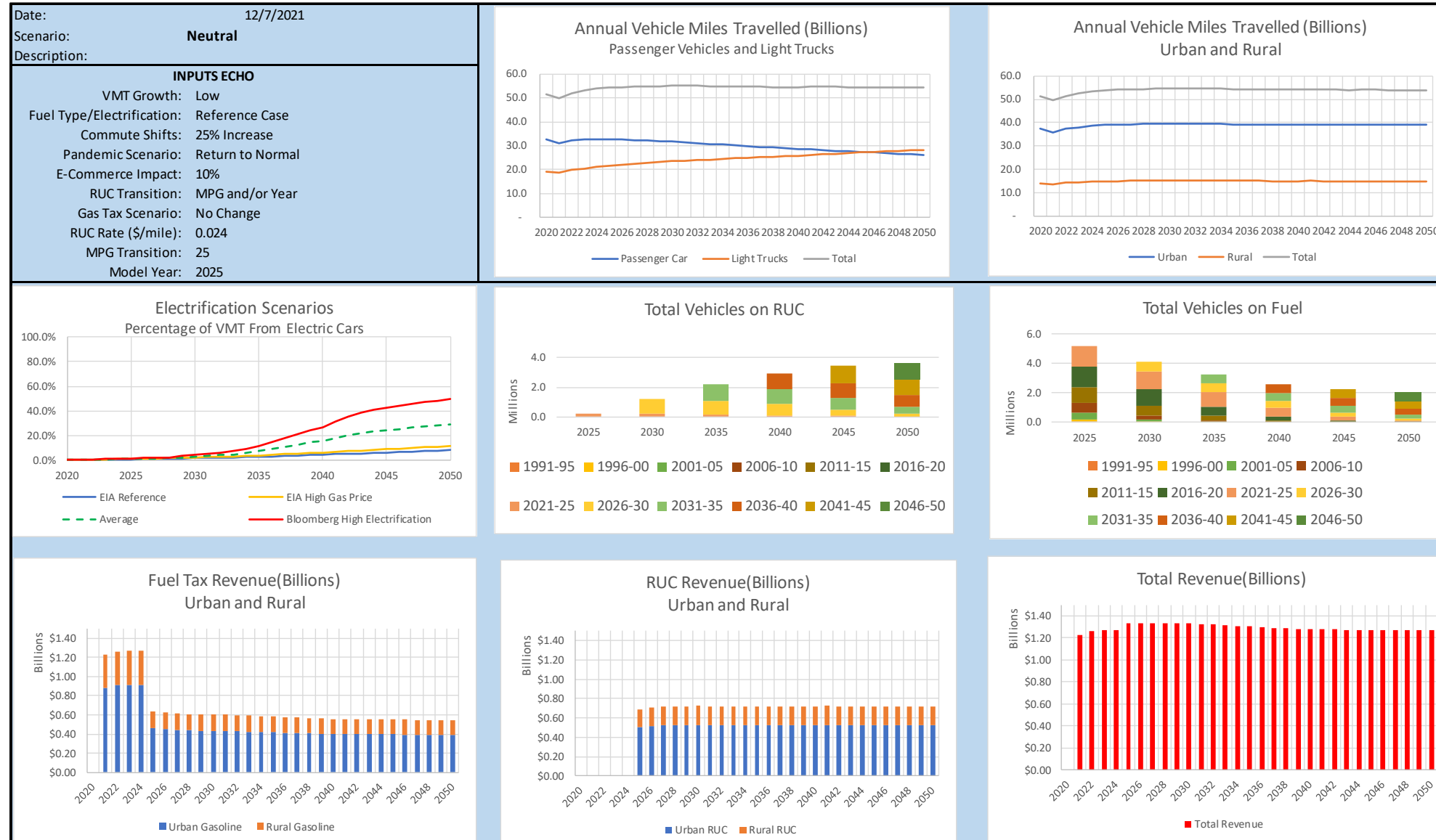
Next Steps

- Finalize the modeling tool

- Develop a final report and user guide for the model

- Transfer knowledge to WSTC staff

- Utilize the modeling tool to support Commission, Steering Committee, and legislative requests regarding future revenue scenarios

WA **RUC**

RUC Rate Setting Considerations

Travis Dunn
CDM Smith

WA RUC

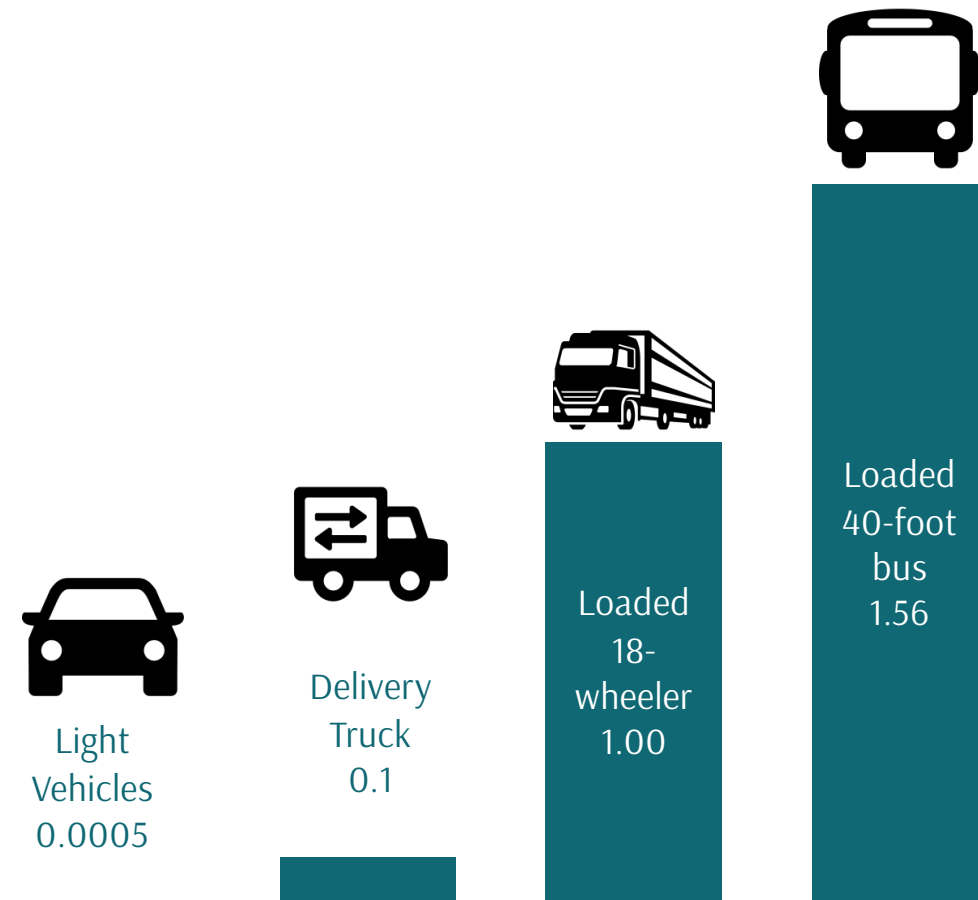# Rate Setting has Emerged as an Issue for Resolution

What is the basis of a per-mile RUC rate? Choices:

- Cost recovery
- Revenue target
- Revenue replacement

What potential rate factors are available? Proposals:

- Weight
- Energy efficiency
- Vehicle owner income

WA **RUC**

Weight-Based Rate Factors

Light Vehicles 0.0005

Delivery Truck 0.1

Loaded 18-wheeler 1.00

Loaded 40-foot bus 1.56

Equivalent axle-loadings used to calculate pavement impacts by various types of vehicles.

There is no engineering evidence to support weight-based rates for passenger cars and trucks under 10,000 pounds. These vehicles all have equivalent negligible impacts on pavements and bridge structures. This is because roads are designed to accommodate the heaviest of vehicles–trucks and buses–safely.

WA RUC

Energy Efficiency-Based Rate Factors

Using energy efficiency ratings as a basis for per-mile rate setting can undermine revenues unless the gas tax is raised significantly. Raising the gas tax puts more pressure on low-income households who drive older, less fuel-efficient vehicles

Vehicle	MPGe	Per-mile rate	RUC per 10k miles
Older model pickup	17	2.91	$291
Avg Washington car	20.5	2.41	$241
Hybrid	48	1.03	$103
New electric vehicle	129	0.38	$38

WA RUC

Equity Analysis & Outreach

Allegra Calder
BERK Consulting

Henry Yates
Yates Consulting

WA RUC

Equity Analysis

"Identify and measure potential disparate impacts of a road usage charge on designated populations, including communities of color, low-income households, vulnerable populations, and displaced communities."

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Financial Analysis

WA RUC

Overview

- Specific analysis within broader conversation about transportation equity.

- Key question:
  - **Would households in different income brackets pay more or less under a potential road usage charge, compared with the gas tax?**

WA **RUC**

Transportation Taxes are Small as a Proportion of Household Expenditures

Transportation as a percent of household expenditures, by income level
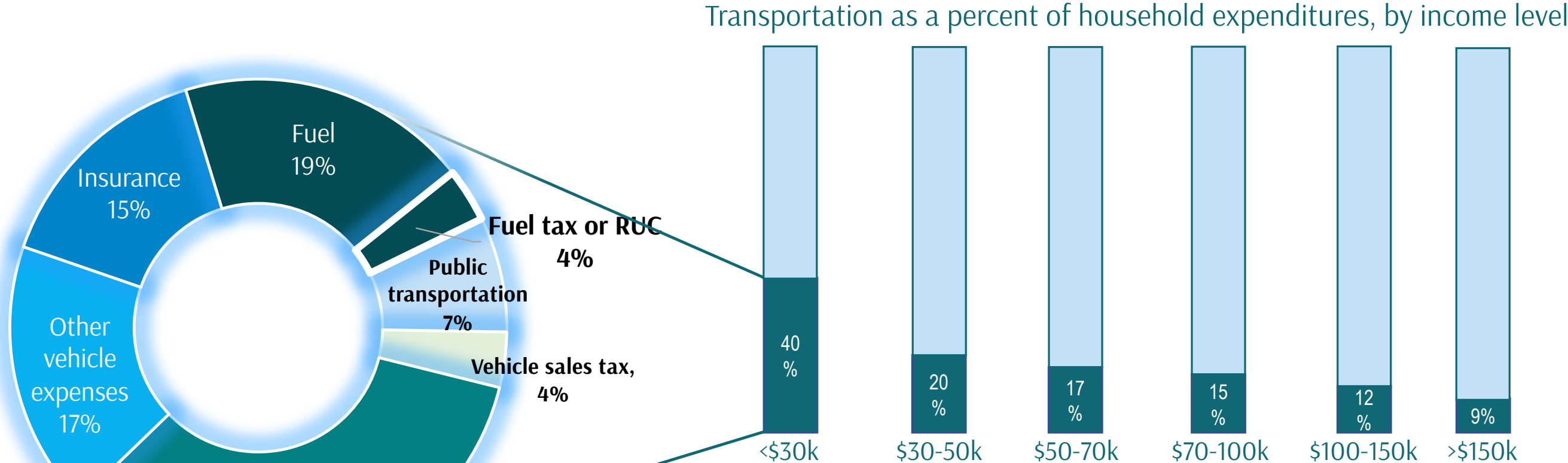
Today's fuel tax represents only 4% of low-income household transportation expenditures but will increase as fuel taxes increase.
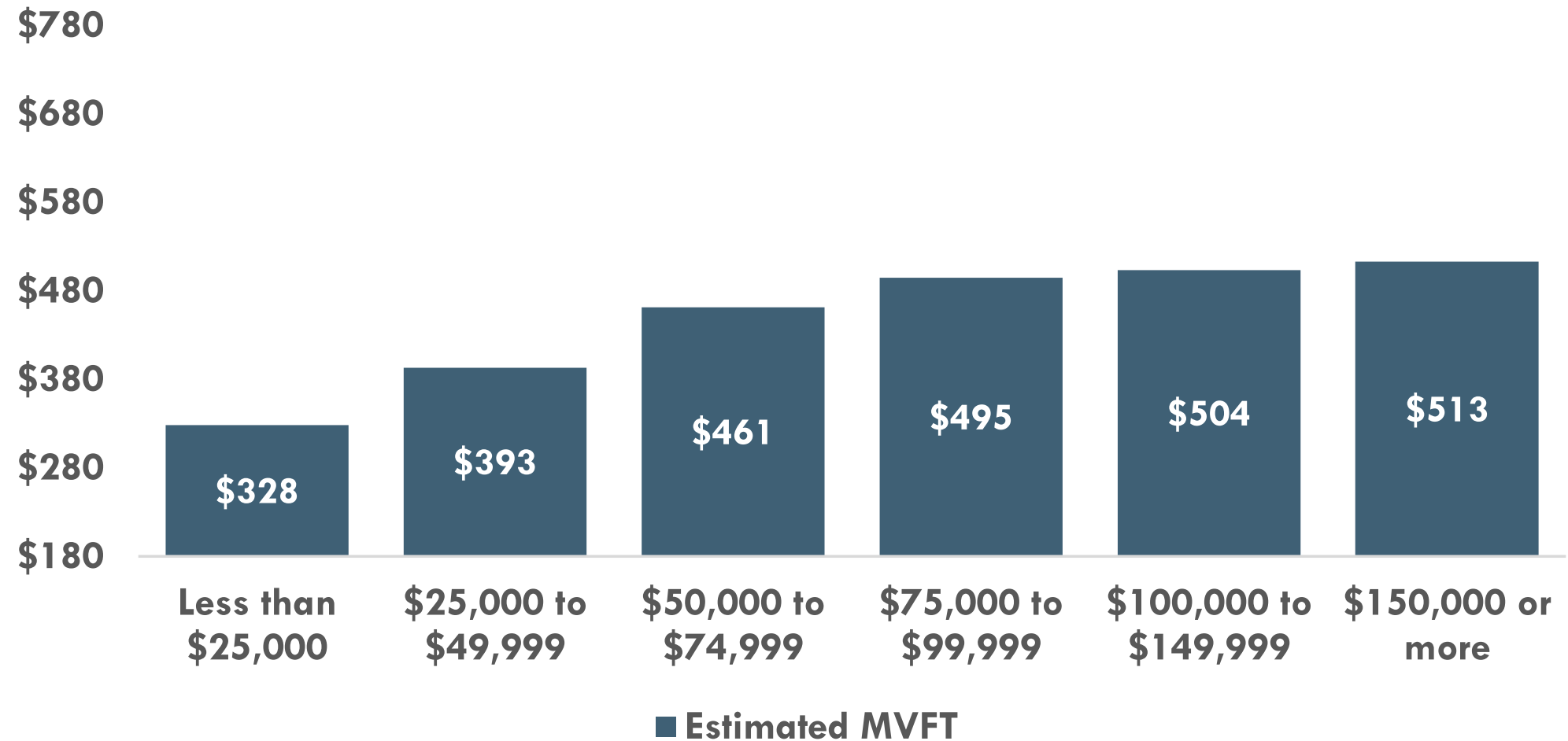
WA RUC

On Average, Lower Income Households Pay Higher Fuel Taxes Per Mile Driven

Census tract average household income	Census tract average MPG	Fuel Tax per 10,000 miles driven
Less than $50k	20.0	$247
$50-75k	20.1	$246
$75-100k	20.5	$241
$100-150k	21.4	$231
Over $150k	22.6	$219

WA RUC

On Average, Higher Income Households Pay More in Fuel Taxes Over the Course of a Year

This is because higher income households drive more miles, on average, over the course of a year.

Estimated average amount paid in state fuel tax per year

Income Range	Estimated MVFT
Less than $25,000	$328
$25,000 to $49,999	$393
$50,000 to $74,999	$461
$75,000 to $99,999	$495
$100,000 to $149,999	$504
$150,000 or more	$513

■ Estimated MVFT

WA RUC

Under RUC, All Households Would Pay the Same Per Mile Driven

Census tract average household income	Census tract average MPG	RUC per 10,000 miles driven (2.4¢/mile)
Less than $50k	20.0	$240
$50-75k	20.1	$240
$75-100k	20.5	$240
$100-150k	21.4	$240
Over $150k	22.6	$240

WA RUC

Under RUC, Higher Income Households Would Generally Pay More Over the Course of a Year

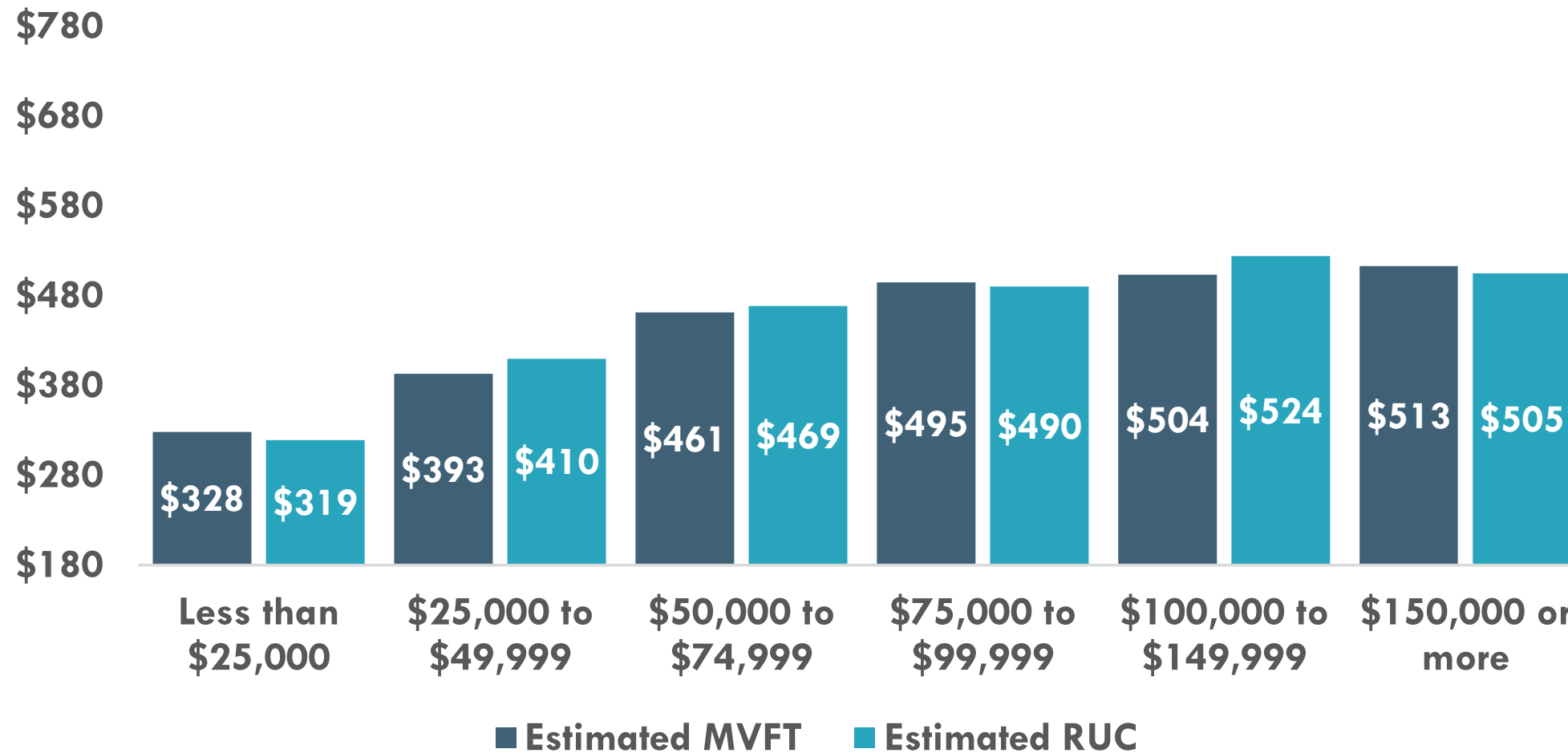**This is because higher income households drive more miles, on average, over the course of a year.**

Estimated average amount paid in RUC per year

Income Group	Estimated RUC
Less than $25,000	$319
$25,000 to $49,999	$410
$50,000 to $74,999	$469
$75,000 to $99,999	$490
$100,000 to $149,999	$524
$150,000 or more	$505

■ Estimated RUC

Note: The lower number of miles driven in the highest income group is likely due to the small number of households in this group in the WA State sample. In the national data, the highest income group drives the most miles, on average.

WA RUC

When Considered <u>Over the Course of a Year</u>, the Differences in Average Fuel Tax and Average RUC Paid are Small

Estimated average amount paid in fuel tax vs. RUC per year

	Less than $25,000	$25,000 to $49,999	$50,000 to $74,999	$75,000 to $99,999	$100,000 to $149,999	$150,000 or more
Estimated MVFT	$328	$393	$461	$495	$504	$513
Estimated RUC	$319	$410	$469	$490	$524	$505

■ Estimated MVFT   ■ Estimated RUC

WA RUC

Focus Groups

WA **RUC**

RUC Equity Analysis

Proviso: "Identify and measure potential disparate impacts of RUC to communities of color, low-income households, displaced communities and vulnerable populations through targeted outreach and engagement."

Methods: Series of focus groups, surveys, and one-on-one interviews using a pre-determined set of questions.
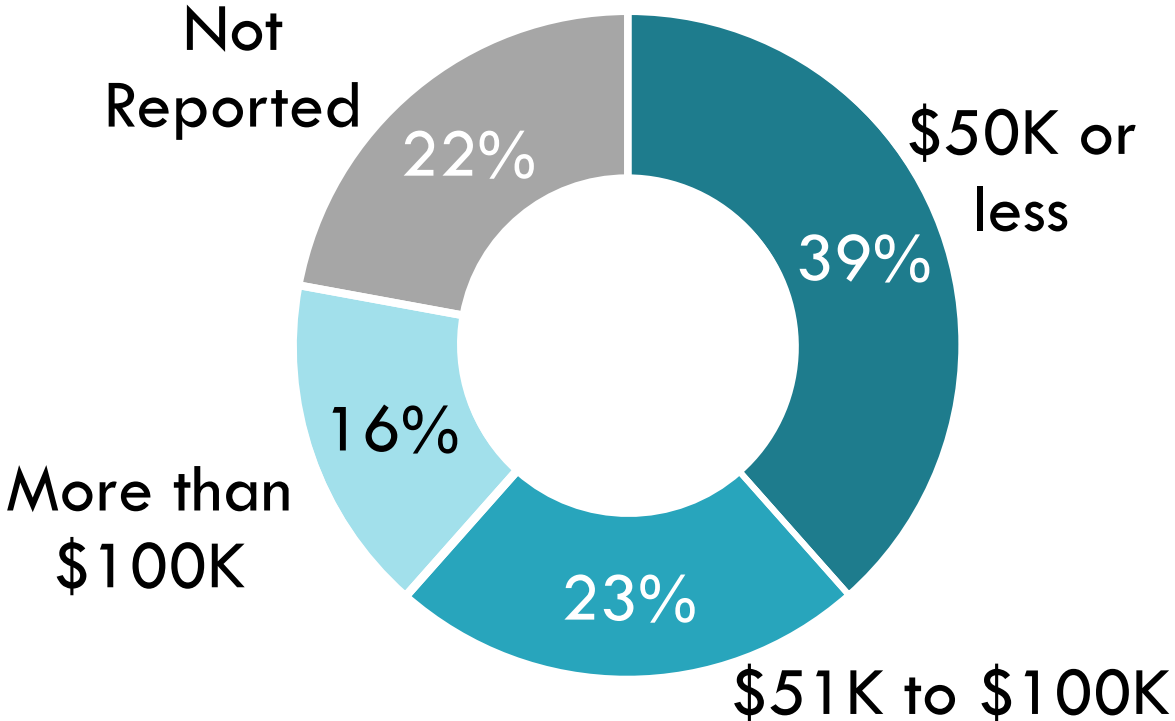
WA **RUC**

Focus Group Participants

Organization/Group	Number of Participants	% of Total Participants
Ahora Construction	5	5%
Arab Festival	4	4%
Bremerton NAACP	7	7%
Coalition of Immigrants Refugees & Communities of Color	4	4%
COVID-19 Community Response Fund Alliance	7	7%
Disability Rights Washington	9	9%
Filipino Chamber of Commerce of the Pacific Northwest	8	8%
India Association of Western Washington	8	8%
Kent/Renton African American Group	9	9%
Legacy of Equality Leadership & Organizing	7	7%
Neighborhood House	7	7%
Refugee Women's Alliance	10	10%
Yakima County Development Association	19	18%
Total	**104**	**100%**

Note: The charts on the following slides summarize information that was self-reported by focus group participants. The "Not Reported" category indicates participants that did not submit this information.

WA RUC

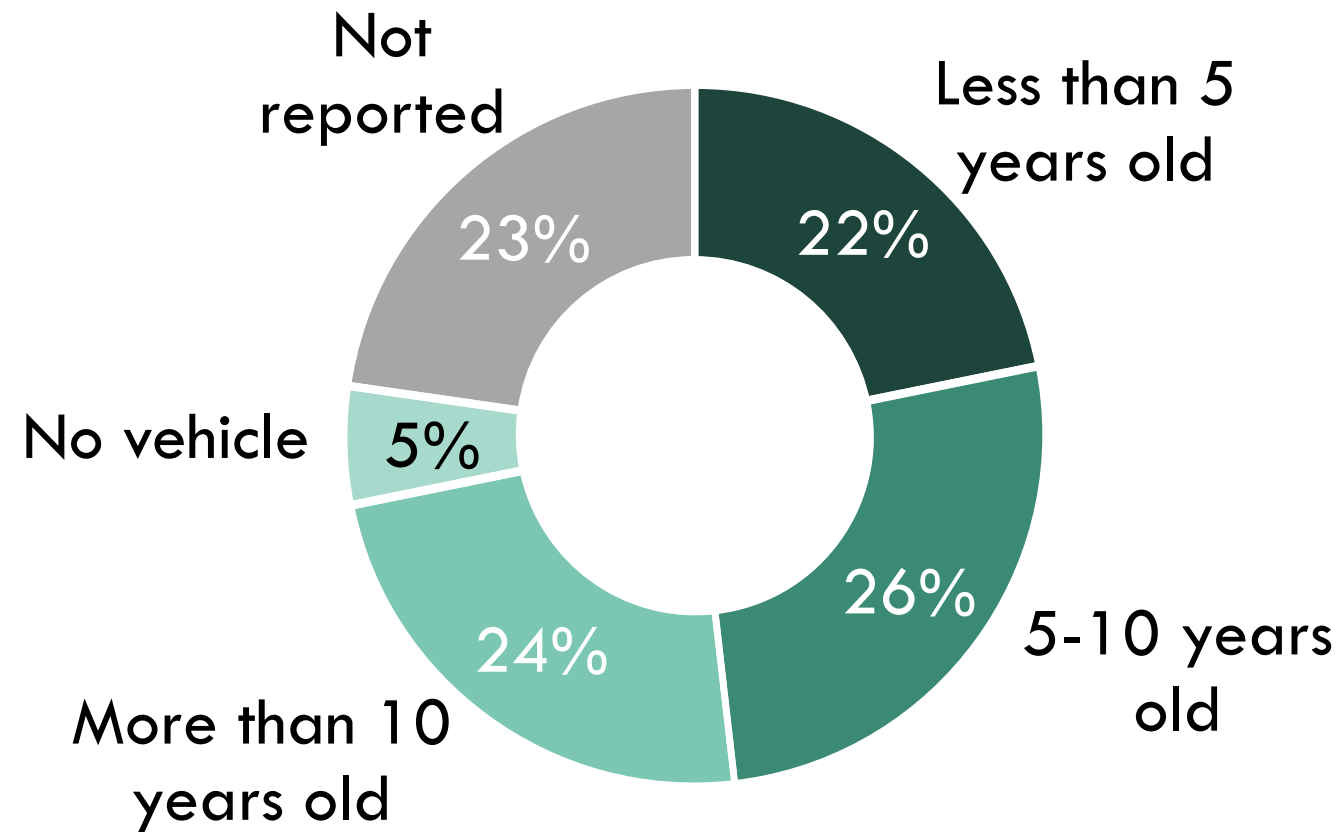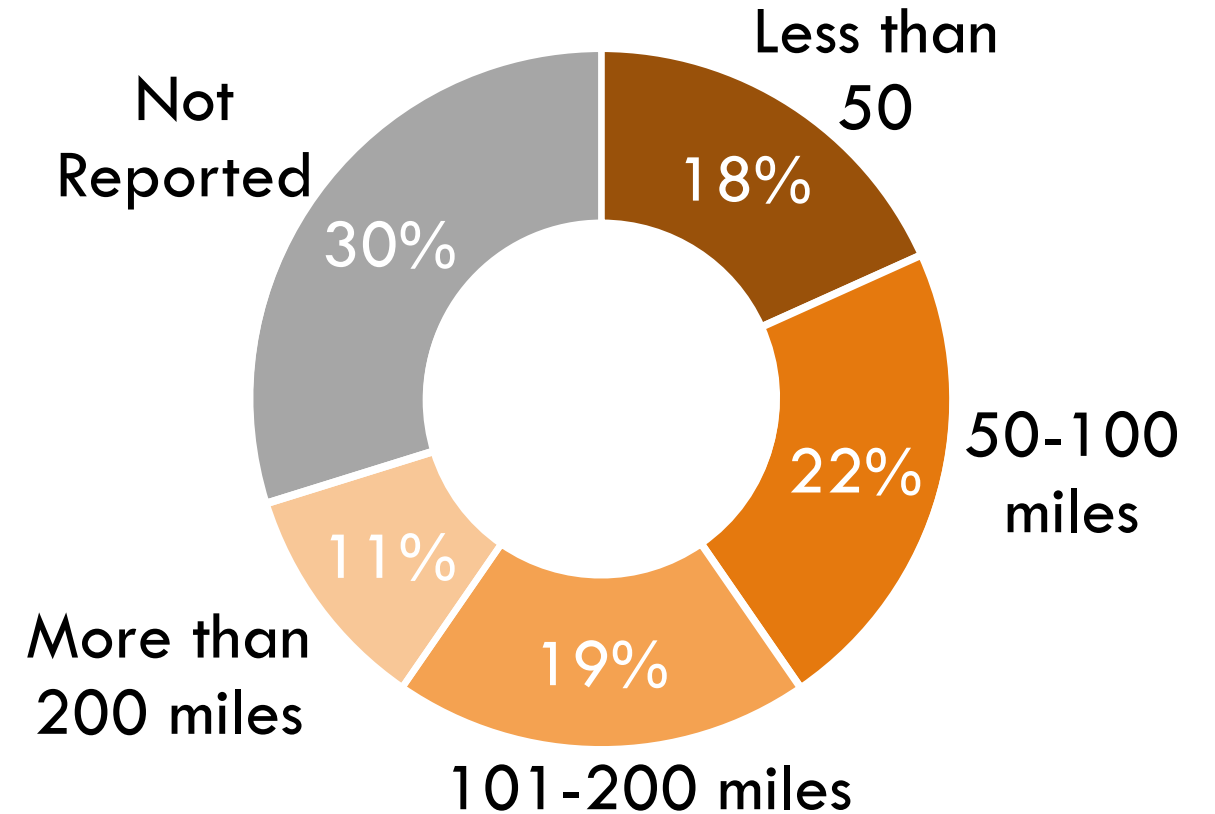# Focus Group Participants: Income and Household Size

Income

- $50K or less: 39%
- $51K to $100K: 23%
- More than $100K: 16%
- Not Reported: 22%

Household Size

- 1 member: 8%
- 2 members: 32%
- 3 members: 9%
- 4 members: 15%
- 5 or more members: 14%
- Not Reported: 22%

WA RUC
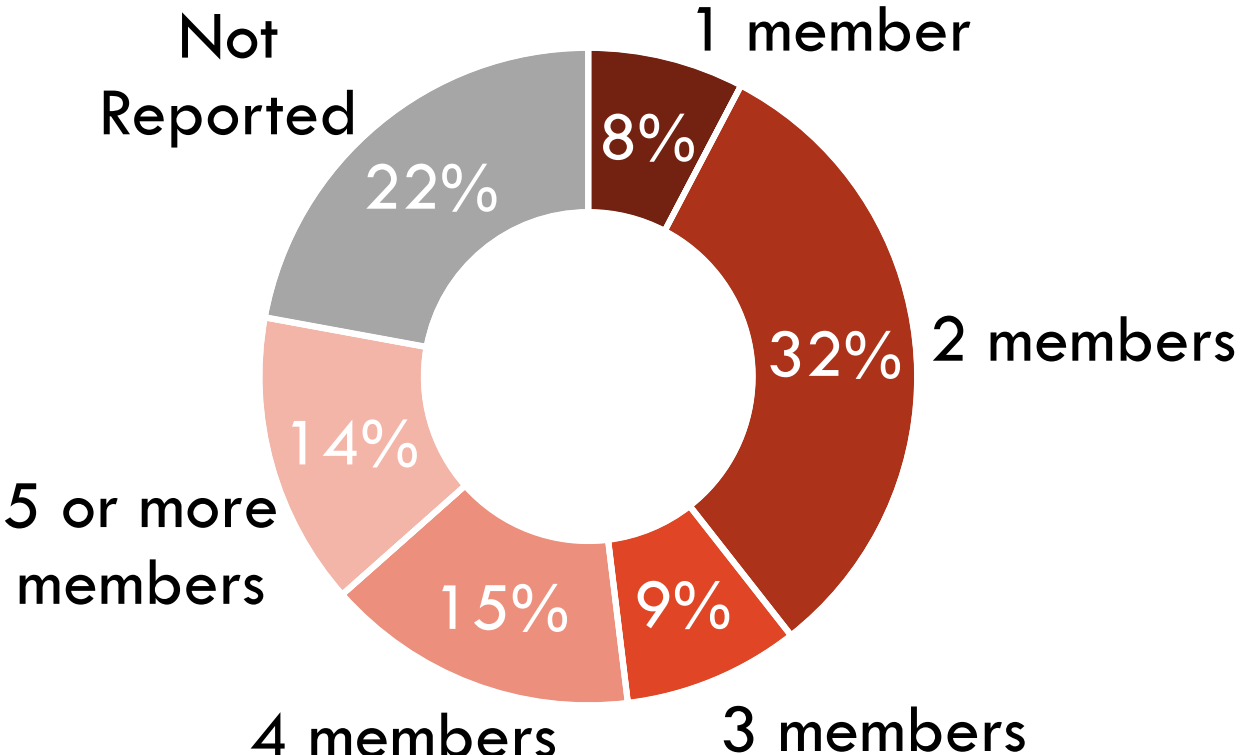
Focus Group Participants: Vehicle Age and Weekly Mileage

Vehicle Age

- Not reported — 23%
- Less than 5 years old — 22%
- 5-10 years old — 26%
- More than 10 years old — 24%
- No vehicle — 5%

Miles Driven per Week

- Not Reported — 30%
- Less than 50 — 18%
- 50-100 miles — 22%
- 101-200 miles — 19%
- More than 200 miles — 11%

WA RUC

How Familiar are you with How Roads are Paid for in the State?

- 38% were unfamiliar or did not respond (15%)
  - Many who were unfamiliar offered taxes as their guess
  - Federal and state government were also listed
- For those who were familiar, taxes, car tabs, and tolls were most often cited

WA RUC

How Much do you Pay Yearly in Gas Tax?

Estimate of Gas Tax Paid per Year

Less than $50 — 6%
$50-$250 — 10%
$251-$500 — 16%
$501-$1,000 — 12%
More than $1,000 — 16%
Don't know/Answer unclear — 27%
Not reported — 13%
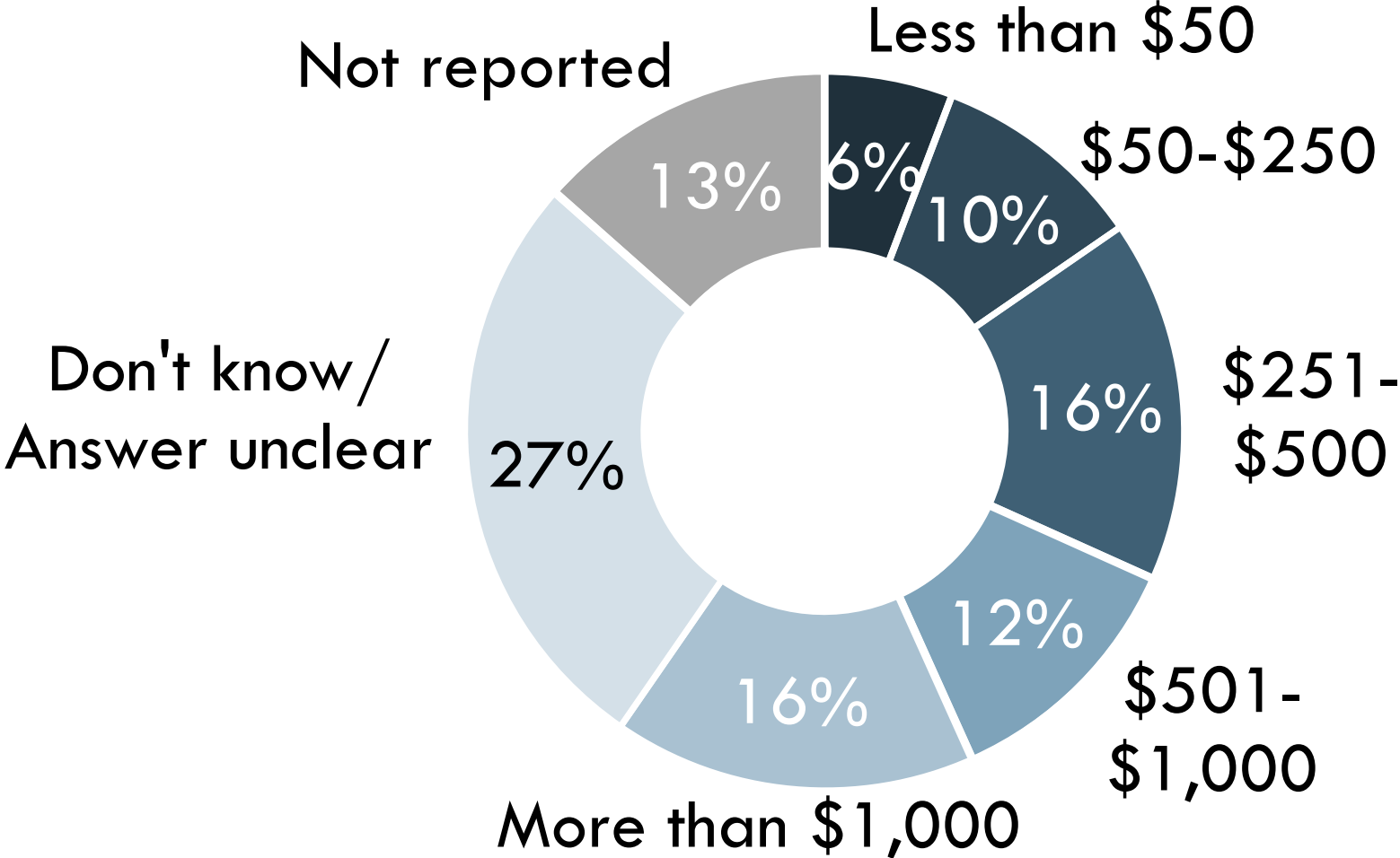
The answers shown here reflect respondents' estimates of how much they pay in gas tax over the course of the year. Some respondents answered in formats that could not be translated into a dollar amount per year (e.g., a percentage). These are included under the "Don't know/Answer unclear" category, which also includes respondents who said they didn't know how much they paid in gas tax.

WA RUC

Next Steps

- Interviews with community leaders
- Electronic survey to Groups for broader distribution
  - Questions would be same as those asked in Focus Groups
- Reach back out to participants about pilot participation

WA RUC

RUC Cost Reduction

Travis Dunn
CDM Smith

WA **RUC**

Cost of Collection Reduction Workshop Approach

Background research and initialization

- Cost analysis framework
- Challenge statements for each workshop
- Invite partner agencies

Workshops

1 → 2 → 3

- Orientation: background briefing, challenge statement, and operating rules
- 1 week of dedicated work
- Presentation of findings

Report out

- Public policy elements
- System design concepts
- Concepts and recommendations for pilot testing
- Concepts and recommendations for other states and federal government in pilot testing or implementations

Schedule of Topics

- Week of September 13: **Customer Service**

- Week of September 27: **Enforcement**

- Week of October 11: **Procurement & Certification**

WA **RUC**

Participation

Assumptions

Manual mileage reporting method based on self reporting offered by DOL

Automated mileage reporting options offered by or with support from private vendors

Responsibility for revenue collection, customer service, and vendor participation rests with DOL

WA RUC

Customer service challenge statement

Design a customer service center at low cost of operations.

WA RUC

Customer Journey

	Pre-service	During service				Post-service
		Customer journey				
	Public Education	Enrollment	Mileage Reporting	Invoice/Payment		Follow-up/survey
		In-person services	Call Center	Website	Mail	
				Frontstage activities		
		Mileage collection system	Data processing system	Account mgmt. system	Invoicing system	
				Backstage activities		

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WA RUC
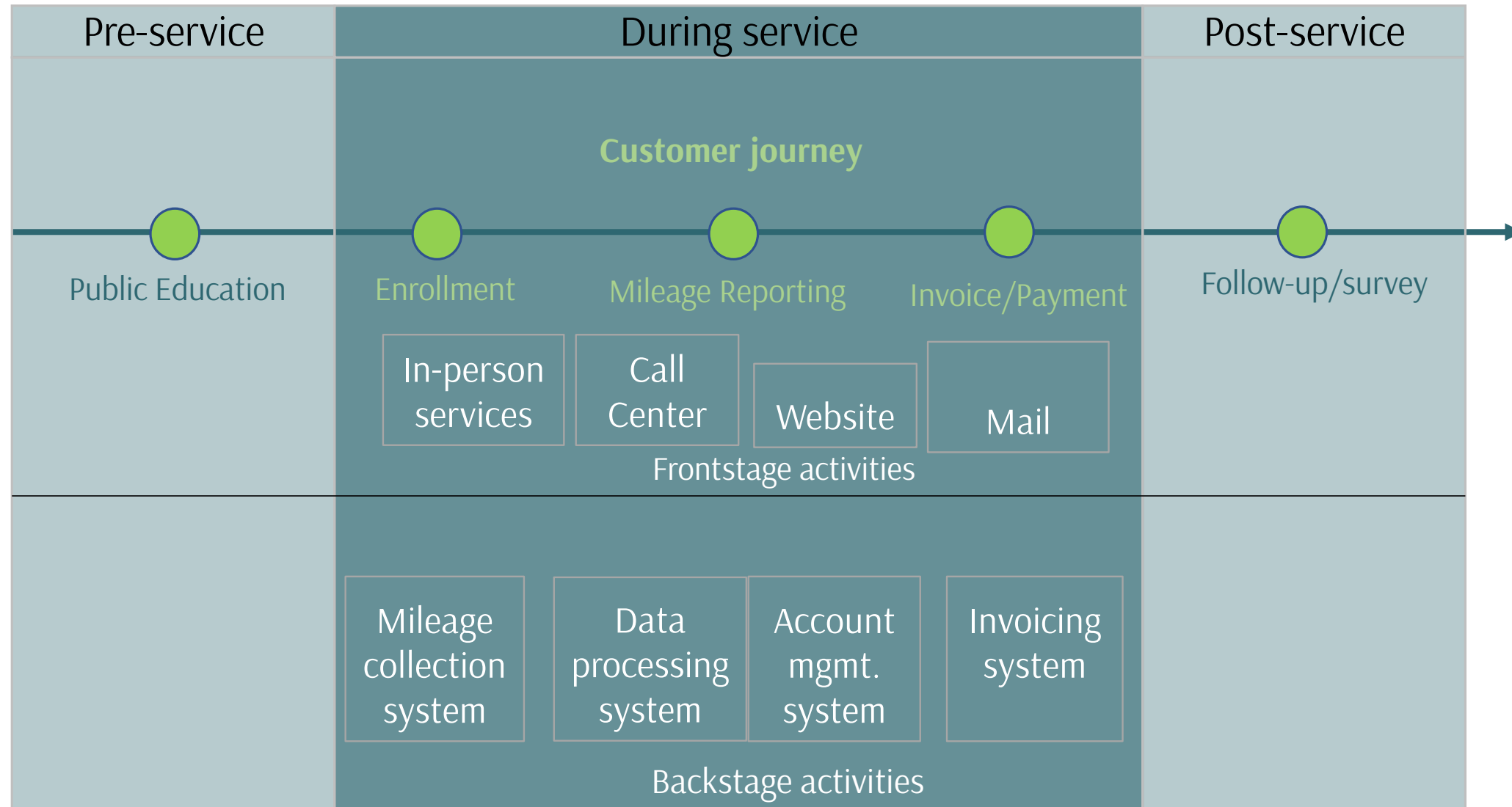
Balancing Key Customer Service Objectives

Customer satisfaction

- "Wow" the customer. This is not about compliance.

- Educate customers so they know what they need to do

- Keep it simple and easy for customers to complete tasks quickly

Operational efficiency

- Keep it simple and easy for the agency to administer

- Establish clear boundaries and ability to monitor via defined measures and metrics

WA **RUC**

Common Threads and a Gap

Common threads

- Get to know your customer and meet them where they are, sometimes literally

- Deploy targeted/customized support especially in early years of a new program

- Offer alternatives in all that we do–mileage reporting, payment methods, payment locations

- Customize how issues are addressed

Gap

- Managing customer changes

WA RUC

Procurement & certification challenge statement

Design a regional procurement and certification process for RUC vendors with a market contract accessible by multiple states through service level agreements.

WA RUC

Spectrum of Procurement Possibilities for RUC

Full government delivery: set-up, operations, maintenance of system and provision of mileage reporting, fee collection, customer support and account management

Government delivery with contracting to private partners for specific functions

Contracting to a single vendor to provide customer functions, with oversight by government **"competition for the market"**

Contracting to multiple qualified vendors to provide customer functions, with oversight by government **"competition *in* the market"**

Open market for qualified vendors to provide customer functions, with certification by government

WA **RUC**

Elements of a Market Contract for RUC Service Providers

Commonalities

- Data collection, account management, customer service
- Issues to manage: privacy protection, data security, performance requirements.

Key Differences

- Setup requirements, metrics, performance targets vary across mileage reporting methods
- Data requirements vary: may include fuel consumption, location data, and other data elements users can choose to share or which is collected depending on policy choices.

Commercial Terms

- States can share benchmarks for performance like reliability, accuracy, security, privacy, distribution, and customer service
- Compensation per vehicle or as a fraction of gross revenue collected
- Consider bonding

Contract Duration

- Can be fixed duration with renewals, or open-ended
- Termination – define exit clauses, contingency, covered costs

WA **RUC**

Framework for Multi-State Certification

Elements of RUC vendor systems most useful to certify:

- Mileage reporting technologies
- Account management systems
- Customer service systems

Identify existing standards to leverage

Standardize certification process including testing procedures and presentation of test results

WA **RUC**

Elements of a RUC System to Certify

Mileage reporting technologies

- Devices and software
- Messages (mileage or odometer messages) and acknowledgements
- Exception management
- End to end message processing

Account management systems

- Transaction processing (correct computation of transaction data)
- Invoice charges/ rounding
- Workflows (for usability aspects)
- Payment options

Customer service systems

- Customer request handling processes
- Reporting capabilities
- Training (content, quality and frequency)

WA RUC

External Standards to Leverage

PRIVACY PROTECTION (SOC2)

DATA SECURITY (ISO 27001)

PAYMENT PROCESSING (PCI)

BANKING STANDARDS

ACCOUNTING STANDARDS

PROOF OF FINANCIAL SUSTAINABILITY

INSURANCE

WA RUC

Enforcement Challenge Statement

Design a low-cost enforcement regime that captures a relatively high percentage of violation events.

WA **RUC**

Categorizing Non-Compliance

Voluntarily compliant

Short-term unintentionally non-compliant

Long-term unintentionally non-compliant

Long-term intentionally non-compliant (for "good" reason)

Long-term intentionally non-compliant (for no "good" reason)

Intentionally non-compliant (active evasion/cheating/fraud)

WA RUC

Strategies for Maximizing Voluntary Compliance

Design	Language	Coaxing
Design for compliance with simplicity, centralized information, ease of payment	Minimize unintentional non-compliance through clear, simple language and eye-catching reminders	Work constructively with the intentionally non-compliant via direct letters, kind language, avoiding punishment or shaming

WA RUC

Strategies for Maximizing Voluntary Compliance

Payment plans	Grace periods	Incentives
Possibly based on eligibility criteria and not necessarily advertised	Builds empathy with the unintentionally noncompliant	Without undermining revenue, reward good behavior

WA RUC

Next Steps

- Report-out in Q1 2022

  ◦ Public policy elements

  ◦ System design concepts

  ◦ Concepts and recommendations for pilot testing

  ◦ Concepts and recommendations for other states and federal government in pilot testing or implementations

- Pilot concepts to carry forward

WA RUC

RUC Innovation

Baxter Shandobil
CDM Smith

WA **RUC**

RUC Innovation Objectives

Incorporate new mileage reporting approaches into Washington's RUC research, such as in-vehicle telematics, improved smartphone apps, use of private businesses to provide odometer verification and mileage reporting services, and more.

New mileage reporting methods →

RUC Innovation

WA RUC

RUC Innovation Objectives

1. Improve the user experience

- More choices for mileage reporting and payment
- Better service design to address operational equity and promote compliance
- User-friendly privacy policies

2. Optimize RUC Service

- Build on existing state capabilities
- Leverage private sector services
- Define public/private sector roles

3. Open the market

- Identify new business models
- Define standards

WA RUC

RUC Enhancements Through Research, Industry Outreach, and Design

2020	Q4	2021	Q1	Q2	Q3	Q4

Research & Industry outreach
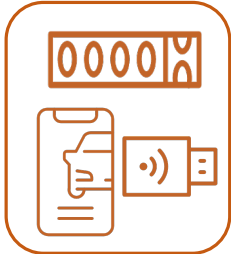
Design pilot tests

Build on past efforts

Industry outreach

Explore new opportunities

Build RUC scenarios, based on

- Equity guidelines (Task 2)
- Cost reduction guidelines (Task 4)
- Best practices for a positive customer experience

WA **RUC**

RUC Innovation Research Goals for Pilot Testing

RUC prototype "sub-tests" instead of a single pilot

Conduct tests of new mileage reporting methods, equity policies, RUC for new mobility, and low-cost approaches

Each subtest should be focused on a specific research objective

RUC Innovation Guiding Principles

User experience
- A RUC system should be simple, convenient, transparent to the user
- Compliance should not create an undue burden and should be encouraged by design

Cost-effectiveness
- Administration of a RUC system should be cost efficient
- Define common terminology to make it easier to compare costs of RUC systems

Equity through user choice
- Consumer choices should be considered to address typical "user situations"
- A RUC system provides relevant choices to drivers for not only how they report their miles but also how and when they pay and to which entity

Systems & operational Equity
- Offer simple, accessible and convenient options
- Create user-friendly privacy policies
- Design systems to make it easy to comply
- Assist users with decision making

WA RUC

Research Approach in Three Steps

1. Break down RUC into core function

- **Identify subject vehicle & owner/lessee**–connect with vehicle registry & set up account
- **Generate road usage data for subject vehicle over designated time**–report data
- **Access road usage data**–receive reporting of road usage data
- **Apply per-mile charging rates**–process data to determine amount of charges
- **Provide invoice to owner/lessee**–issue notice of the charge
- **Collect payment**–provide one or more ways to pay
- **Issue acknowledgement of payment**–create a receipt
- **Enforce payment**–apply mechanisms for ensuring everyone pays
- **Remit revenue to appropriate fund**–integrate revenue collection with financial systems

## 2. Identify new mileage reporting and payment choices

Feasibility / Services	No connectivity	3rd party connectivity	Native connectivity
Assisted (in-person assistance)			
Self-reporting (manual action required)			
Fully automated (no action required)			

3. Identify compatible business models

Already piloted

- Usage-Based Insurance Account Managers
- Tolling Account Managers
- Technology providers
- Fleet telematics service providers

Additional candidates

- Data aggregators
- Ride share providers
- Automakers
- Clearing-houses
- Business mileage logging apps
- Mobility-as-a-Service (MaaS) platform providers
- Auto dealers
- Vehicle history report providers
- Vehicle Licensing Offices
- Auto repair and service stations

WA RUC

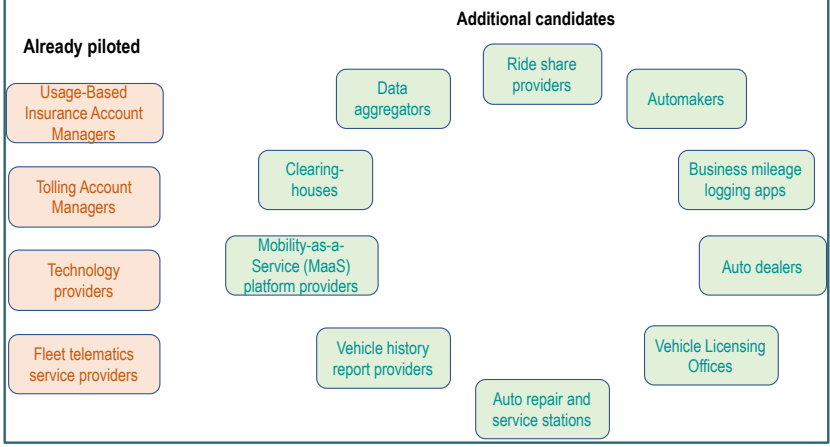# Key Research Outcomes: More Reporting Choices

1. Break down RUC into core function

- **Identify subject vehicle & owner/lessee**–connect with vehicle registry & set up account
- **Generate road usage data for subject vehicle over designated time**–report data
- **Access road usage data**–receive reporting of road usage data
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- Mobility-as-a-Service (MaaS) platform providers
- Auto dealers
- Vehicle history report providers
- Vehicle Licensing Offices
- Auto repair and service stations

Reporting choices supported by a range of business partners:
- MaaS technology platform providers
- Vehicle-registry system operators
- Data aggregators
- Retail partners
- Automakers

WA RUC

Key Research Outcomes: Service Improvement

1. Break down RUC into core function

- **Identify subject vehicle & owner/lessee**–connect with vehicle registry & set up account
- **Generate road usage data for subject vehicle over designated time**–report data
- **Access road usage data**–receive reporting of road usage data
- **Apply per-mile charging rates**–process data to determine amount of charges
- **Provide invoice to owner/lessee**–issue notice of the charge
- **Collect payment**–provide one or more ways to pay
- **Issue acknowledgement of payment**–create a receipt
- **Enforce payment**–apply mechanisms for ensuring everyone pays
- **Remit revenue to appropriate fund**–integrate revenue collection with financial systems

2. Identify new mileage reporting and payment choices

Feasibility ＼ Services	No connectivity	3rd party connectivity	Native connectivity
Assisted (in-person assistance)			
Self-reporting (manual action required)			
Fully automated (no action required)			

3. Identify compatible business models

Already piloted
- Usage-Based Insurance Account Managers
- Tolling Account Managers
- Technology providers
- Fleet telematics service providers

Additional candidates
- Data aggregators
- Ride share providers
- Automakers
- Clearing-houses
- Business mileage logging apps
- Mobility-as-a-Service (MaaS) platform providers
- Auto dealers
- Vehicle history report providers
- Vehicle Licensing Offices
- Auto repair and service stations

RUC service improvement opportunities

RUC Service Entry Point

WA RUC

RUC Service Approach to Design "Sub-Tests"

Design RUC service that:
- Is easy and cost-efficient to administer
- Supports a positive user experience with relevant choices
- Addresses systems and operational equity
- Promotes compliance

Key steps:
- Consider the full RUC process and range of user perspectives
- Identify pain points for administrators and end users
- Design potential solutions
- Test the solutions (pilot "sub-tests")

RUC Service Entry Point

Educate Inform — Enrollment — Select mileage reporting method — Report — Receive invoice — Pay

WA RUC
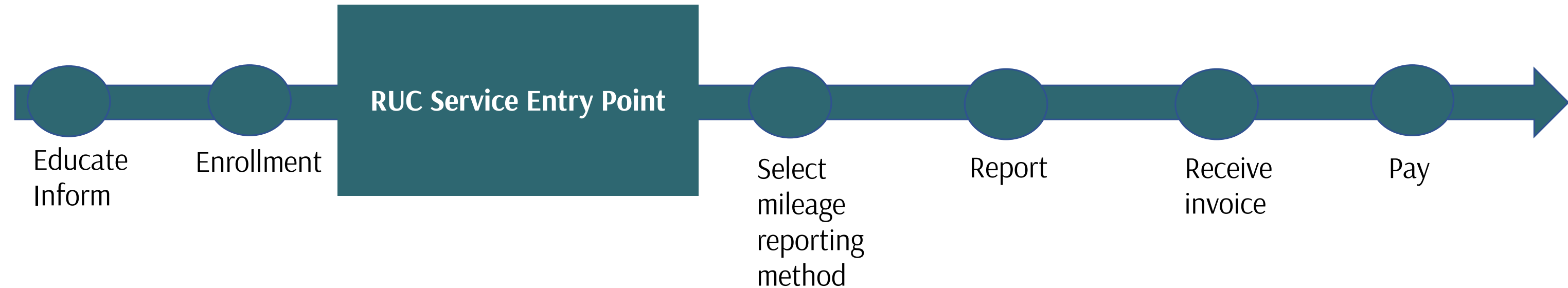
RUC Concept: Self-Reporting Mileage and Payment at Tab Renewal

RUC service improvement based on the simplest, most cost-effective RUC service possible:

- Leverages existing vehicle tab renewal process
- Offers self-reporting of odometer mileage
- Requires annual payment
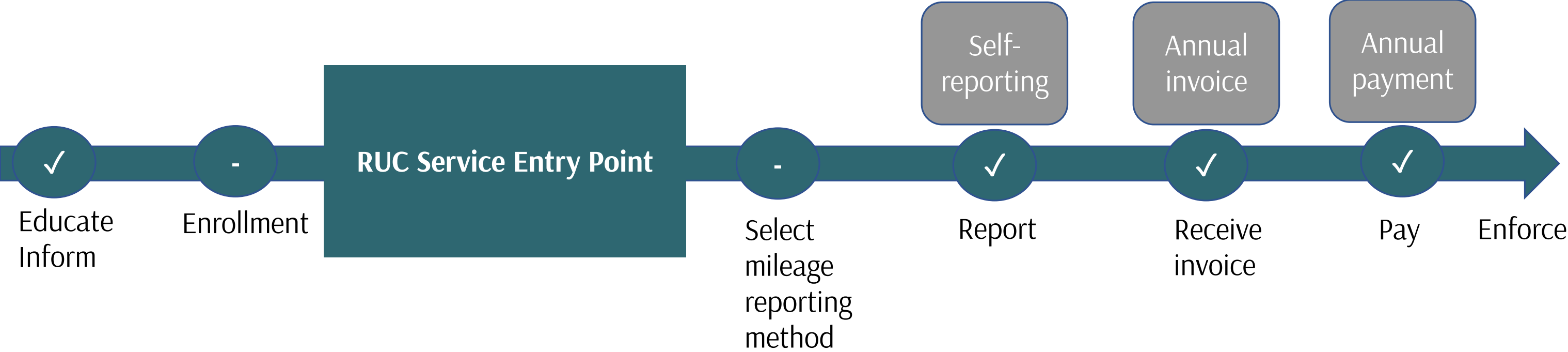
RUC Concept: Offering Additional Reporting and Payment Options

RUC service improvement based on more choice to report mileage and pay.

| | | No tech
Low tech
High tech | Choice in reporting frequency and timing | Choice in payment frequency | Choice in payment means |

RUC Service Entry Point

✓ Educate Inform — ✓ Enrollment — ✓ Select mileage reporting method — ✓ Report — ✓ Receive invoice — ✓ Pay — Enforce

WA RUC
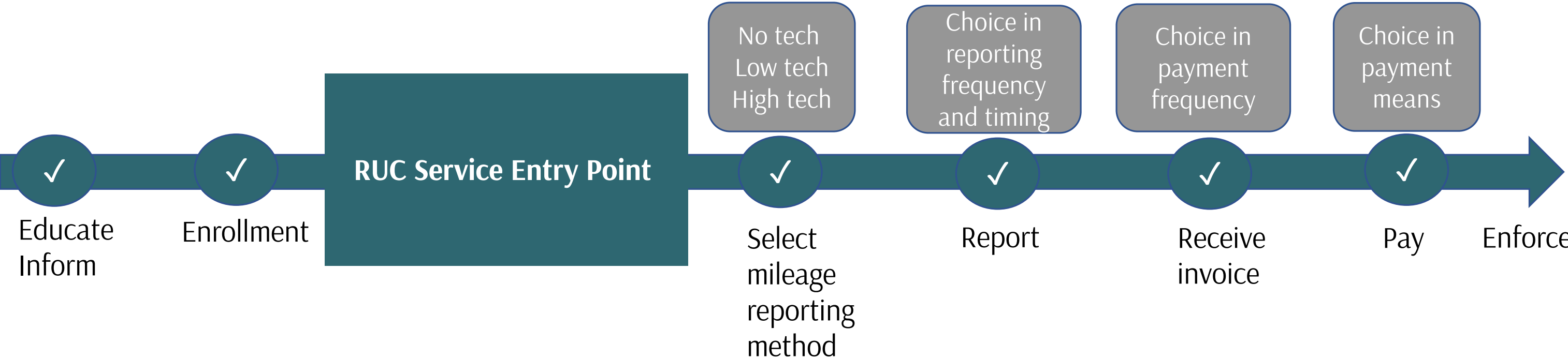
RUC Concept: Offering Choices for Payment Frequency

RUC service improvement that specifically addresses the "payment pain point"
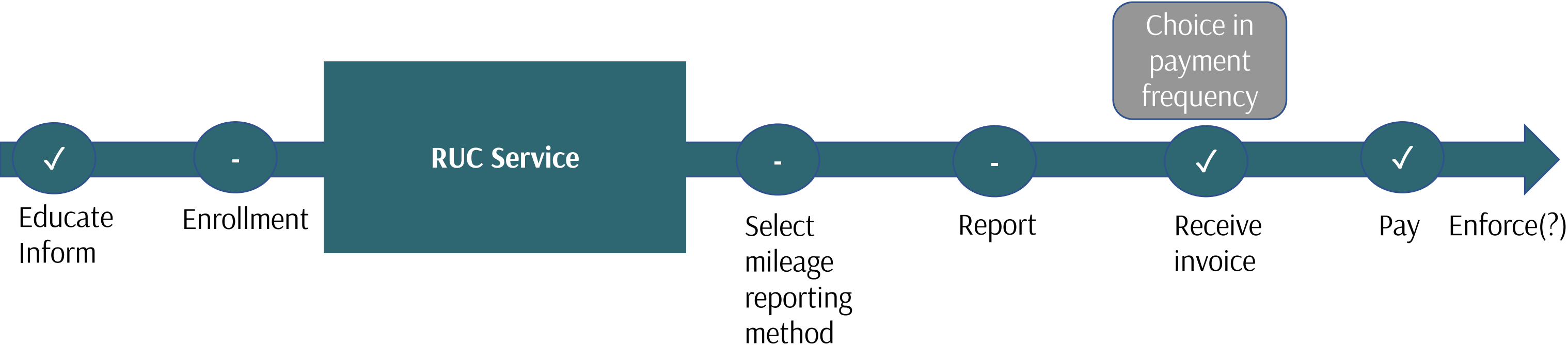
RUC Concept: Native Automaker Telematics for Mileage Reporting

RUC service improvement based on mileage collection through native automaker telematics.

Report through telematics services

RUC Service Entry Point

Educate Inform

Enrollment

Select mileage reporting method

Report

Receive invoice

Pay

Enforce

WA RUC
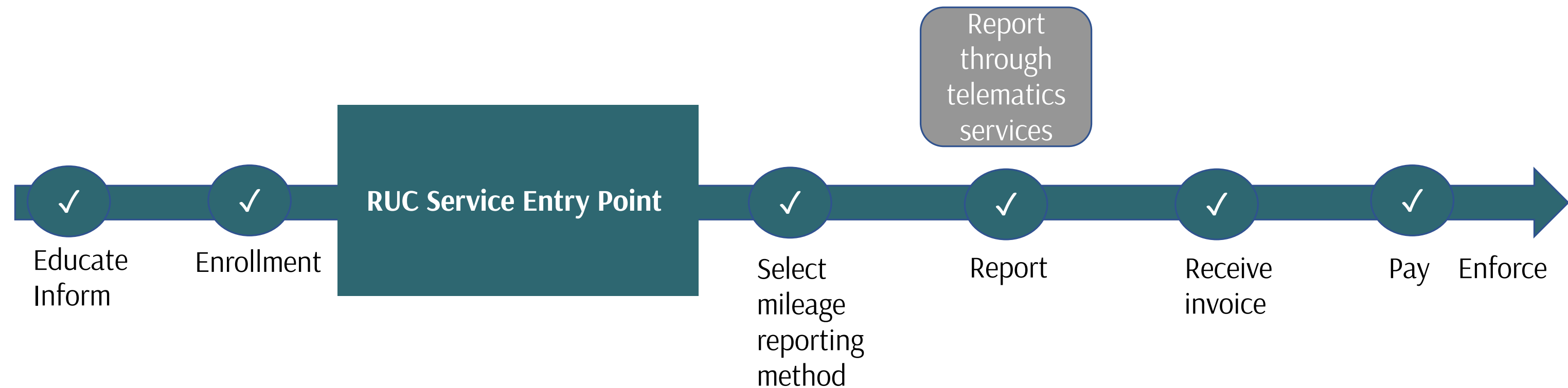
Other RUC Service Concepts

RUC service improvement focused on various aspects of the RUC process and objectives (equity, cost reduction, user experience)
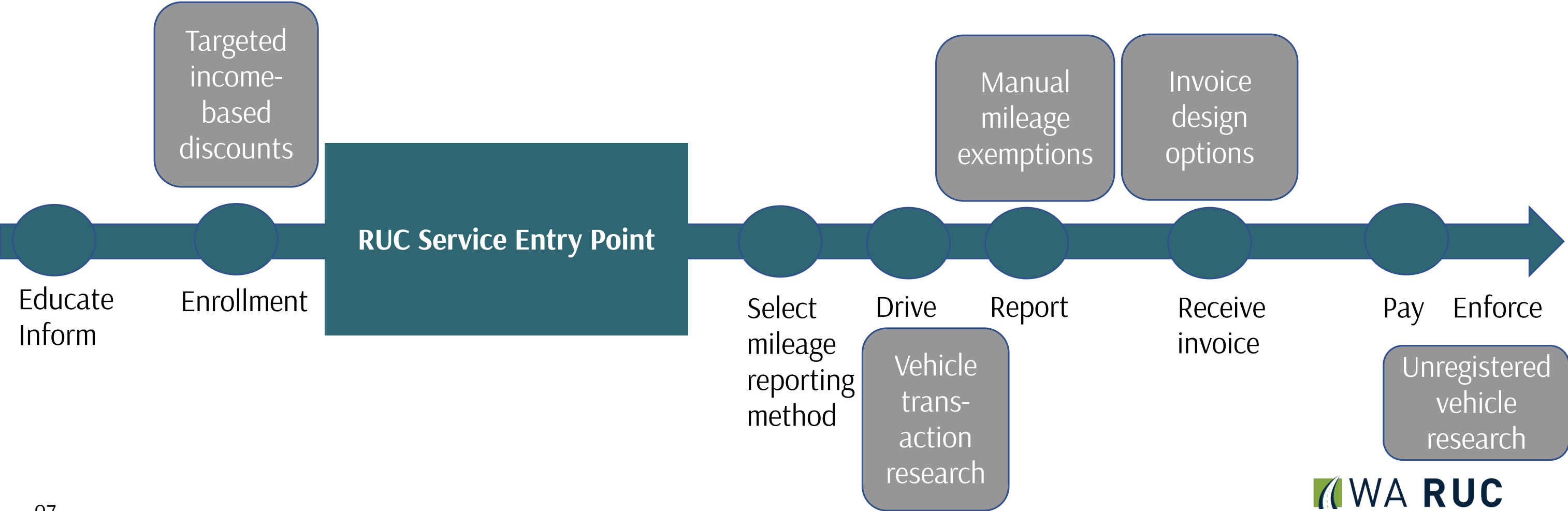
2022 RUC Demonstration Plans

Ging Ging Fernandez
CDM Smith

WA RUC

Concepts for 2022 Mini-Pilot Tests

#	Concept	Type	Equity	Cost-effectiveness	User experience
1.	Self-reporting, tab renewal-based RUC	Prototype testing		X	X
2.	Flexible payment plans	Pilot	X		X
3.	Enhanced RUC options	Pilot			X
4.	Native automaker telematics-based RUC	Pilot		X	X
5.	Manual mileage exemptions	Prototype testing			X
6.	Targeted income-based discounts	Prototype testing	X		X
7.	Alternative invoice designs	Prototype testing		X	X
8.	Unregistered vehicle research	Field research/pilot		X	X
9.	Vehicle transactions research	Field research		X	X
10.	Mock standards committee	Simulation		X	X

WA RUC

Concepts for 2022 Mini-Pilot Tests

7. Alternative invoice designs

8. Unregistered vehicle research

2. Flexible payment plans

3. Enhanced RUC options

4. Telematics-based RUC

9. Vehicle transactions research

10. Mock standardization committee

5. Manual mileage exemptions

1. Self-reporting, tab renewal-based RUC

6. Targeted income-based discounts

WA RUC

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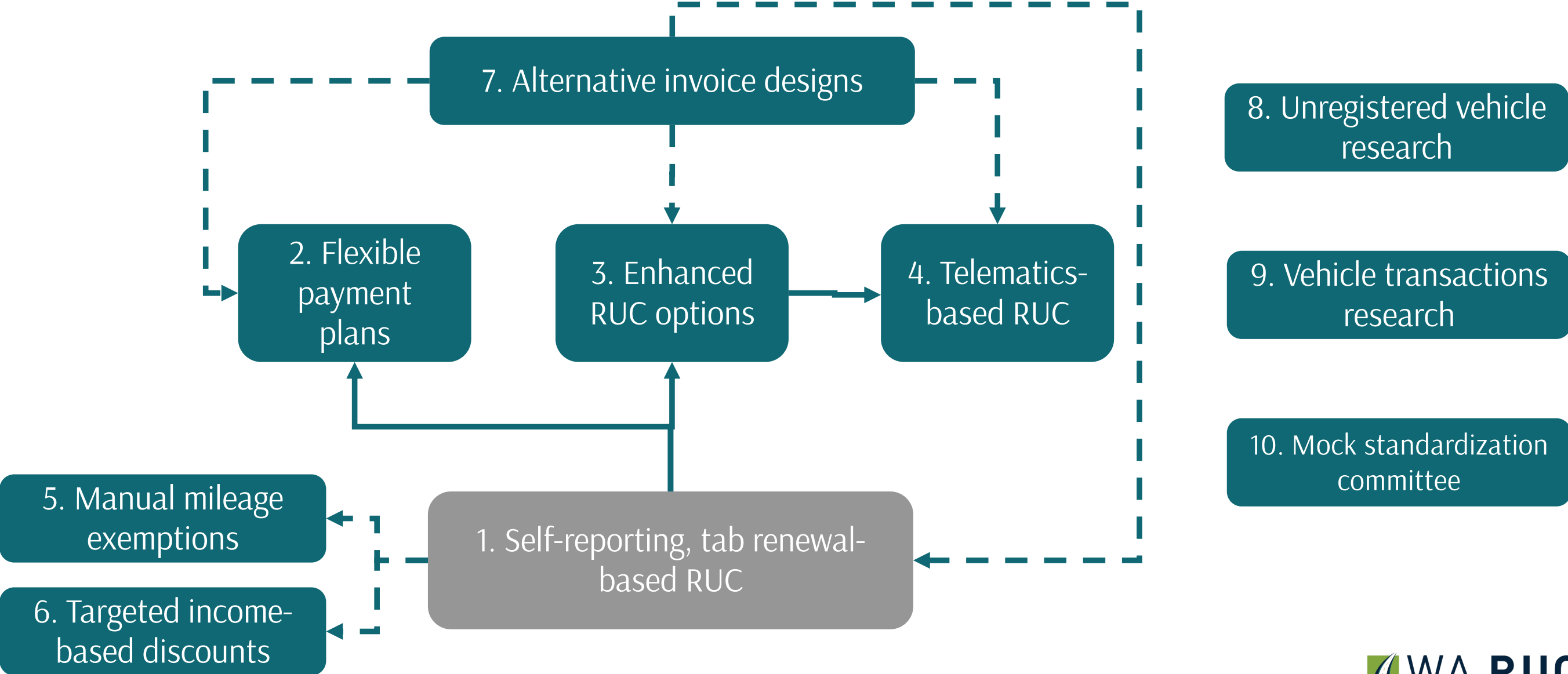
1. Self-Reporting, Tab Renewal-Based RUC

Goal: Design and simulate a self-reporting, vehicle registration-based RUC process

Objectives:
- Cover standard RUC functions (report, invoice, pay)
- Simulate existing vehicle-registry interfaces
- Minimize cost of setting up and administering RUC
- Provide positive user experience

Assumptions:
- Transaction time is the largest cost driver
- Well designed self-service channels can reduce costs while providing a positive user experience

Metrics
- Cost-effectiveness: estimated cost per RUC transaction
- User experience: end-user satisfaction score, customer service agent satisfaction score
- Equity (ease of compliance): compliance rate

WASHINGTON STATE DEPARTMENT OF LICENSING

SKIP THE TRIP
YOU MAY BE ABLE TO RENEW ONLINE
dol.wa.gov

KINSEY, CHLOE E

SEATTLE WA

10724

It's time to renew your vehicle tabs for license plate number:

Follow these easy steps:

Review fees and any donations
Please see details on the other side of this notice.

Consider donating
- **State parks** – A $5 donation to keep state parks open is included in the total fees and donations. If you prefer not to support state parks, subtract $5 on the payment coupon.
- **Organ/Tissue donation awareness** – To contribute $1 or more to support organ, eye, and tissue awareness, add the amount of your contribution on the payment coupon.

Choose how you would like to renew
- **Online** at www.dol.wa.gov. You can pay with:
  - MasterCard, Visa, American Express (credit or debit card) – 3% card payment fee added.
  - Checking account information – no added fee.
- **By mail** to the address listed below with your payment.
- **Renew in person** at a vehicle licensing office.

Details: Title and Licensing questions? Call 360-902-3770
$ 30.00	License fee funds road construction and maintenance projects
$ 25.00	Vehicle weight fee funds highway improvements, transit, and other transportation needs
$ 4.50	Filing fee funds go to the county in which the fee is paid
$ 8.00	Service fee retained by subagent, or funds ferry replacement if renewed at County Auditor/DOL
$ 0.50	The DOL service fee supports the computer system and reimbursement of county licensing activities
$ 0.25	License service fee supports the computer system used to provide licensing services
$ 20.00	Transportation Benefit District - Seattle
$ 106.00	Regional Transit Authority tax: www.soundtransit.org/rtatax
$ 194.25	**Subtotal**
$ 5.00	Optional state parks donation
$ 199.25	**Total**

Messages

Mandatory insurance. You must carry a valid insurance ID card when operating most motor vehicles, including motorcycles, registered in Washington State. You must show your insurance ID card to law enforcement upon request.

If you're thinking about buying a new car, be sure it is California emission compliant! Washington law requires vehicles model year 2009 and newer to be California emission compliant to be registered in this state. For more information visit www.dol.wa.gov/vehicleregistration/cleancar.html

State Parks donation: A $5 State Parks donation with your license renewal helps keep our parks open. Thank you! To offer more support, please mail a check to Washington State Parks Headquarters, 1111 Israel Road S.W., Olympia, WA 98504-2650.

Discover Pass supports state-managed recreation lands: A $30 annual Discover Pass, which may be used on either of two vehicles, gives you access to millions of acres of state recreation lands, including parks, trails, wildlife areas and water-access sites. You should receive your pass in the mail from a State Parks vendor within 10 business days. To check on the delivery status of your Discover Pass, please visit www.MyDiscoverPass.com or call 1-844-271-7041. Learn more about the Discover Pass at www.DiscoverPass.wa.gov.

Regional Transit Authority. Voters in the Regional Transit Authority area have approved a total of one and one-tenth (1.1%) percent of the vehicle's depreciated value to be collected for Sound Transit to invest in projects and expand mass transportation options for commuters in the region over the next several years. For more information please visit www.soundtransit.org.

Mandatory motorcycle insurance: As of July 28, 2019, liability insurance is required for motorcycles.

If renewing by mail, detach the payment coupon below and return it with your check or money order payable to "Department of Licensing."

WA RUC

1. Self-Reporting, Tab Renewal-Based RUC

How ? (Methodology)	• Discovery phase
	  • Confirm DOL processes and operating constraints
	• Design and prototyping phase
	  • Design a RUC reporting and payment process flow that leverages existing processes and systems
	  • Build prototypes of RUC process elements: mailers, invoices, mock websites, and in-person service
	• Prototype testing phase
	  • DOL management, subagents, and end-users experience
	  • Evaluate the prototypes through observation and surveys

Who? How many ?	DOL management 5-10 DOL subagents 50-100 Washington drivers statewide
How long?	Discovery: 2-3 months Design & prototyping: 1-2 months Testing prototype: 1-2 months

WA RUC

2. Flexible Payment Plans

Goal: Explore various approaches to periodic payment of RUC

Objectives:
- Provide flexibility for those drivers who most need it
- Funnel majority of drivers to cost-effective payment mechanisms

Key Assumptions:
- If RUC were paid annually, some drivers would use a payment plan to ease the added financial impact
- Payment plans incur additional administrative costs

Metrics
- Do drivers that need a flexible payment plan find and use it?
- Do they see value in it?
- How many people would use a payment plan?
- What is the compliance rate?
- What are the added costs of administration?

Pilot exploration: Is there a sweet spot?

Lump-sum payment

Wallet based payments administered by private partners

Flexible payment plans including financial management tips

Flexible payment plans with low interest rates

Flexible payments by 3rd parties

Lower revenue risk

WA RUC

2. Flexible Payment Plans

How? (Methodology)	- Design phase - Create a range of payment plan models - Build a payment portal on top of the prototype from mini-pilot #1 - Recruitment phase - Recruit Washington drivers of various income levels, with a focus on low-income volunteers. - Collect vehicle information (year, make, model, estimated annual mileage). - Pilot phase - Provide volunteers reloadable gift cards preloaded with a fraction of the amount needed to pay - Volunteers experience self-reporting RUC prototype and payment portal with flexible payment options and payment methods - Reload gift card periodically during ensuing months - Evaluate behavior and experiences through surveys - Provide a reward for those who complete all payments
Who? How many?	100-200 Washington drivers - At least 50% qualified as low-income per state definitions
How long?	- Design & recruitment: 2 months - Pilot phase: 6 months

WA RUC

3. Enhanced RUC Options

Goal: Design enhanced vehicle registry-based RUC process flow that offers more choices for mileage reporting and payment

Objectives:
- Provide a complete suite of mileage reporting options as an alternative to self reporting
  - Determine percentage of users that opt for enhanced service
  - Understand factors that drive consumers to choose more advanced reporting options

Key assumptions
- Some registered owners would benefit from enhanced options
- 3rd party entities are better equipped to support automated mileage reporting methods

Metrics
- Cost-effectiveness: cost per transaction for different options supported
- User experience: end-user satisfaction score for each enhanced option supported compared to basic option
- Equity (ease of compliance): compliance rate per option offered
- Choice/relevance: percentage of end users opting for enhanced options

WA RUC

3. Enhanced RUC Options

How ? (Methodology)	• Design & development phase 　• Design enhanced service catalogue: mileage reporting methods and payment options 　• Develop prototype of enhanced registration portal and process flows • Pilot phase 　• Volunteers experience the RUC process flows and make choices about mileage reporting 　• Observe choices and survey volunteers about their experience
Who? How many ?	200 drivers from across Washington
How long?	Design and development: 3 months Pilot: 1-2 months

WA RUC

4. Native Automaker Telematics-Based RUC

Goal: Demonstrate mileage reporting using in-vehicle native automaker telematics

Objectives:
- Provide a seamless customer experience
- Reduce touchpoints for customers
- Reduce cost of collection

Key assumptions
- Automaker odometer data must be accessed through third parties

Metrics
- Number of participants who choose telematics
- Amount of time participants devote to telematics-based RUC compliance
- Cost per transaction

WA **RUC**

4. Native Automaker Telematics-Based RUC

How ? (Methodology)	• Design & development phase
	    • Design data integration and process flows from automaker through aggregator to account manager
	    • Integrate telematics data from one or more automakers
	    • Test performance of system to design requirements
	• Pilot phase
	    • Volunteers from pilot #3 who choose telematics experience reporting mileage via telematics and receive mock invoices
	    • Survey volunteers about their experience

Who? How many ?	Volunteers from pilot #3 who opt for telematics (<200)
How long?	Design and development: 3 months Pilot: 3 months

WA RUC

5. Manual Mileage Exemptions

Goal: Design and test a manual approach to providing deductions for out-of-state travel by WA residents

Objectives:
- Design a process that does not require automated mileage reporting
- Ensure that the process is fair and easy to understand for the user
- Ensure that the process is relatively easy/inexpensive to implement and audit by the operator

Assumptions:
- Self-reporting rather than automated GPS-based reporting
- WA drivers would have the option of claiming either:
  - no out-of-state miles
  - a standard deduction for out-of-state driving, without any proof required
  - a higher deduction with evidence required

Metrics:
- Technical feasibility
- User experience
- Cost effectiveness

WA RUC

5. Manual Mileage Exemptions

How ? (Methodology)	• Discovery phase
	  • Investigate standard deduction options, including possibilities for varying by location or other factor
	  • Evaluate alternatives for accepting evidence (technology-based vs. manual trip reports vs. incidental evidence like gas receipts)
	  • Market sizing to determine benefit-cost on individual level and likely number of customers who would utilize such a feature.
	• Design phase
	  • Design a prototype out-of-state travel deduction process that builds on pilot #1
	• Prototype testing phase
	  • End-users experience evaluate the deduction process based on their own travel; Interviews
	  • Evaluate operator's costs

Who? How many ?	100 drivers near state borders with OR and ID
How long?	Discovery: 2 months Design: 2-3 months Prototype testing phase: 6 months

WA RUC

6. Targeted Income-Based Discount

Goal: Demonstrate how a targeted RUC per-mile rate discount could function in Washington.

Objectives:
- Create a low-cost, user-friendly experience for customers to simulate the steps in receiving a discount.
- Assess the "benefit-cost" of a discount at the individual level and for the state

Key assumptions
- DSHS data can reliably identify low-income individuals
- DOL data may not be compatible with DSHS data, but a prototype can still be tested to identify pathways to improvement.

Metrics
- Customer satisfaction, including relative value to customer of discount received
- Cost per transaction

WA **RUC**

6. Targeted Income-Based Discount

How ? (Methodology)	• Design phase
	    • Through collaboration with DSHS and DOL, design an approach for applying the verified income from DSHS registers to DOL vehicle records.
	    • Based on that, design a prototype for testing purposes
	• Prototype testing phase
	    • Building on pilot #1, present customers with a discount, including any additional steps required to verify/validate
	    • Evaluate performance through customer observation and surveys
	    • Assess cost of administering discounts in this manner on a per transaction basis

Who? How many ?	100 drivers who qualify as low-income per state definitions
How long?	Design: 1-2 months Development: 2-3 months Pilot: 2-3 months

WA RUC

7. Alternative Invoice Designs

Goal: Create a range of invoice designs for different circumstances to understand content and style preferences among drivers

Objectives:
- Enhance understanding of RUC through invoice design
- Achieve clarity and simplicity for end users
- Encourage voluntary compliance

Key assumptions
- Invoices can take many forms depending on whether a program is pre-pay or post-pay, and where and how mileage reporting and payments occurs

Metrics
- Level of understanding of invoice contents
- Level of agreement with invoice contents
- Willingness to comply
- Cost of complying

WA **RUC**

7. Alternative Invoice Designs

How ?
(Methodology)
	• Design phase
	  • Develop a range of designs for customer-facing RUC materials including reminders, statements, and invoices
	• Prototype testing phase
	  • Building on pilot #1, present customers with the materials at the appropriate points in the transaction process
	  • Evaluate performance through customer observation and surveys
	  • Make continuous adjustments and improvements in 2-3 cycles

Who? How many ?	100 drivers statewide
How long?	Design: 2 months Prototype testing: 2-3 months

WA RUC

8. Unregistered Vehicle Research

Goal: Assess duration and cause of vehicle registration lapses.

Objectives:
- Quantify extent and duration of lapses in vehicle registration
- Understand factors driving vehicle registration lapses to improve user experiences and issues
- Ultimately, increase compliance rates, reduce costs, and increase net revenue

Key assumptions
- Most unregistered vehicles eventually renew
- Most vehicle owners want to be compliant

WA **RUC**

8. Unregistered Vehicle Research

How? (Methodology)	• Research design phase:
	  • Determine data collection plan and methods
	  • Design analytical approach
	• Deployment phase
	  • Field vehicle data collection
	  • Compare data collected with registration status at point of collection, +2 days, +1 week, + 1 month, and +3 months
	• Evaluation phase
	  • Evaluate data for unregistered vehicle trends such as geography, vehicle age, fees
	  • Survey Washington drivers about registration status and reasons for lapses

Who?	Vehicles from all areas of the state, including urban, rural, Eastern, Central, Western, and border areas
How long?	Design: 3 months Deployment: 6 months Evaluation: 3 months

WA **RUC**

9. Vehicle Transactions Research

Goal: Document the full range of mileage reporting and payment transaction opportunities

Objectives:
- Design RUC mileage reporting and payment transaction opportunities that tie to pre-existing transactions.
- Compare the user experience and administrative costs across each opportunity.

Key assumptions
- Vehicle registration-based system is well positioned to collect RUC with registration renewal
- RUC can be paid via existing registration renewal channels

Metrics

User Experience: What typical activities of vehicle owners (i.e. registration renewal, maintenance, refueling/recharging) is convenient?

Cost-effectiveness: What is the most cost-effective way of colleting RUC payments that doesn't place undue burden on the end user?

Equity: Is the most cost-effective RUC fee collection method equitable?

WA RUC

9. Vehicle Transactions Research

How? (Methodology)	• Design & Recruitment Phase
	    • Recruit vehicle owners from various demographics to keep a log of all vehicle-related transactions (e.g. mechanic visits, dealership visits, auto parts store, registration renewal) to determine opportunities for collecting mileage data and payment collection.
	    • Design and develop a survey tool to document the participant journey
	• Field research phase
	    • Each transaction point has a survey tied to it that asks about the type of transaction, any reporting that occurred (e.g. odometer, fuel consumption), the decision making that led up to the transaction, type of payment made (if any), the quality of the transaction (smooth, frustrating, etc.), and suggested areas for improvement
	    • Interview representatives from the most promising (in terms of cost-reduction, user experience, and equity) vehicle transaction locations about the feasibility of collecting RUC data or payment, including opportunities and challenges

Who?	100-200 Washington drivers
How Long?	6 – 9 months

WA **RUC**

10. Mock Standards Committee

Goal: Begin discussions around and test the process for development, ratification and testing of nationally applicable standards for RUC systems, applications, and services.

Objectives:
- **Minimize cost of interoperability** between systems approved in one jurisdiction to measure and report trip data for travel in other jurisdictions, and to collect revenue for RUC systems in each other's jurisdictions.
- **Create opportunities for vendor economies of scale** in the supply of systems, applications and services for RUC, by enabling standardization of data requirements and interfaces
- **Keep the door open for new market entry** in the supply of systems, applications and services for RUC, to lower costs to states and end users
- **Encourage innovation** in the supply of systems, applications and services for RUC
- **Ease procurement** for jurisdictions seeking road usage charging systems, applications and services.

Key assumptions
- There is sufficient exploration of RUC to begin standardization of commonalities
- RUC standards are best developed with government and industry participation
- RUC standards should take into account known technologies, but not be dependent on them

Metrics
- Ability to reach consensus on objectives and a scope of standards
- Perceived usefulness of the exchanges and way forward
- Diversity and utility of perspectives around the table to make decisions

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10. Mock Standards Committee

How ?
(Methodology)
	• Discovery phase
	    • Initiate discussions with peer states on membership structure
	• Setup phase
	    • Establish committee structure, operating rules/guidelines, and logistics
	• Simulation phase: conduct a series of three-day sessions to:
	    • Confirm objectives and structure of committee
	    • Begin development of a *reference architecture* based on a generalization of RUC solutions
	    • Begin developing common terminology, concepts, building blocks
	    • Develop interoperability data exchange needs

Who? How many ?	States, federal representative, and RUC vendors
How long?	Discovery phase: 3-4 months Setup phase: 1-2 months Pilot phase: 6+ months

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Steering Committee Discussion

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Next Steps

Ging Ging Fernandez
CDM Smith

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Upcoming Research Activities

2022 Q1: Task reports on research activities

- Financial model and analysis

- Equity outreach

- RUC innovation

- Cost of collection workshop series

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Upcoming Pilot-Related Activities

Project Activities

Q1-Q2 2022

Pilot planning
- Final designs
- Evaluation planning
- System development and testing
- Participant recruitment

Summer 2022

Staggered launch of mini-pilots

Q3-Q4 2022

Operation of mini-pilots
Ongoing evaluation of mini-pilots

Steering Committee Activities

April-May: Spotlight sessions
- The mini-pilot user experience
- Evaluation plan
- Recruitment and participation

July: Meeting to review launch of mini-pilots
Member enrollment/participation

December: Meeting to report on pilot progress

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THANK YOU

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