

Surface Transportation System Funding Alternatives (STSFA) Program

2021 Biennial Report

April 2023



U.S. Department
of Transportation

**Federal Highway
Administration**

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TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. FHWA-HOP-22-090	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Surface Transportation System Funding Alternatives (STSFA) Program 2021 Biennial Report		5. Report Date April 2023	
		6. Performing Organization Code	
7. Author(s) Joshua Hassol, Dawn LaFrance-Linden		8. Performing Organization Report No.	
9. Performing Organization Name and Address Volpe National Transportation Systems Center 55 Broadway Cambridge, MA 02142		10. 10. Work Unit No. (TRAIS)	
		11. Contract or Grant No.	
12. Sponsoring Agency Name and Address United States Department of Transportation Federal Highway Administration 1200 New Jersey Avenue, SE Washington, DC 20590		13. Type of Report and Period Covered Evaluation Report 2020–2021	
		14. Sponsoring Agency Code	
15. Supplementary Notes The Government's Task Manager for this effort was Angela Fogle.			
16. Abstract This Biennial Report provides an update on the status of the Surface Transportation System Funding Alternatives (STSFA) demonstration programs, and describes key lessons learned from the demonstrations for which formal evaluations have been conducted. This report is a high-level summary and synthesis. Detailed descriptions of individual STSFA demonstration programs and evaluation findings are available in the individual annual reports submitted by the grantees and in the evaluation reports. The evaluations identified several important factors for implementation of road-user charge programs: data security, interoperability among multiple States, program administrative costs, and public acceptance.			
17. Key Words road usage charge, mileage based user fee, vehicle miles fee, Surface Transportation System Funding Alternatives, STSFA		18. Distribution Statement No restrictions.	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 47	22. Price n/a

SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in ²	square inches	645.2	square millimeters	mm ²
ft ²	square feet	0.093	square meters	m ²
yd ²	square yard	0.836	square meters	m ²
ac	acres	0.405	hectares	ha
mi ²	square miles	2.59	square kilometers	km ²
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft ³	cubic feet	0.028	cubic meters	m ³
yd ³	cubic yards	0.765	cubic meters	m ³
NOTE: volumes greater than 1,000 L shall be shown in m³				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2,000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
TEMPERATURE (exact degrees)				
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
ILLUMINATION				
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²
FORCE and PRESSURE or STRESS				
lbf	poundforce	4.45	newtons	N
lbf/in ²	poundforce per square inch	6.89	kilopascals	kPa
APPROXIMATE CONVERSIONS FROM SI UNITS				
Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH				
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
AREA				
mm ²	square millimeters	0.0016	square inches	in ²
m ²	square meters	10.764	square feet	ft ²
m ²	square meters	1.195	square yards	yd ²
ha	hectares	2.47	acres	ac
km ²	square kilometers	0.386	square miles	mi ²
VOLUME				
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m ³	cubic meters	35.314	cubic feet	ft ³
m ³	cubic meters	1.307	cubic yards	yd ³
MASS				
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2,000 lb)	T
TEMPERATURE (exact degrees)				
°C	Celsius	1.8C+32	Fahrenheit	°F
ILLUMINATION				
lx	lux	0.0929	foot-candles	fc
cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS				
N	newtons	2.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

*SI is the symbol for International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)

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LIST OF ACRONYMS

Acronym	Definition
AV	Automated vehicles/autonomous vehicles
Caltrans	California Department of Transportation
CDOT	Colorado Department of Transportation
ConOps	Concept of operations
DBF	Distance-based fee
DBUF	Distance-based user fee
DelDOT	Delaware Department of Transportation
DMV	Department of Motor Vehicles
DOR	Department of Revenue
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FY	Fiscal year
HDOT	Hawaii Department of Transportation
GPS	Global Positioning System
HOTM	FHWA Office of Transportation Management
JTC	Joint Transportation Commission
IFTA	International Fuel Tax Agreement
KDOT	Kansas Department of Transportation
MaaS	Mobility as a service
MBUF	Mileage-based user fee
MnDOT	Minnesota Department of Transportation
MoDOT	Missouri Department of Transportation
MPG	Miles per gallon
NHDOT	New Hampshire Department of Transportation
OBD	On-board diagnostics
ODOT	Ohio Department of Transportation/Oregon Department of Transportation
PATP/CP	Pay-at-the-pump/charge point
PMVI	Periodic motor vehicle inspection

RFP	Requests for proposal
RUC	Road usage charge
RUC West	Western Road Usage Charge Consortium
RUF	Road user fee
SB	State Bill
STSFA	Surface Transportation System Funding Alternatives
TETC	The Eastern Transportation Coalition
TNC	Transportation network company
TxDOT	Texas Department of Transportation
UBI	Usage-based insurance or user-based insurance
UDOT	Utah Department of Transportation
VMT	Vehicle miles traveled
WG	Working group
WSDOT	Washington State Department of Transportation
WSTC	Washington State Transportation Commission
WYDOT	Wyoming Department of Transportation

INTRODUCTION

DOCUMENT PURPOSE

This 2021 Biennial Report provides an update on the status of the Surface Transportation System Funding Alternatives (STSFA) demonstration programs and describes key lessons learned from the demonstrations for which formal evaluations have been conducted. This report is a high-level summary and synthesis. Detailed descriptions of individual STSFA demonstration programs and evaluation findings are available in the annual reports submitted by the grantees and in the evaluation reports.

The STSFA web page provides detailed information about the program: <https://ops.fhwa.dot.gov/stsfa/index.htm>.

BACKGROUND OF SURFACE TRANSPORTATION SYSTEM FUNDING ALTERNATIVES (STSFA) GRANT PROGRAM

The Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94), Section 6020, directed the U.S. Department of Transportation (DOT) to establish the Surface Transportation System Funding Alternatives Program, with funding levels of \$15 million in fiscal year (FY) 2016 and \$20 million in each of FYs 2017–2020. The funds are derived from a set-aside from the Highway Research and Development Program under section 503(b) of Title 23, United States Code.

The purpose of the program is to provide grants to States to demonstrate user-based alternative revenue mechanisms that employ a user fee structure to maintain the long-term solvency of the Highway Trust Fund. These grants must make up no more than 50 percent of total proposed project costs, with the remainder coming from non-Federal sources. If by August 1 of each fiscal year, the Secretary determines that there are not enough grant applications that meet the requirements of the program for a fiscal year, Secretary shall transfer any of the funds reserved for the fiscal year for the program that the Secretary has not yet awarded back to the Highway Research and Development Program under section 503(b) of title 23 U.S. Code.¹ Section 6020 also lays out program objectives that each demonstration project funded under the statute should consider include: testing, design, implementation, and acceptance of functional future user-based alternative revenue mechanisms that minimize administrative costs; increasing public awareness of the need for, and possible approaches to, alternative funding sources for surface transportation programs; and providing recommendations on various approaches.

The grants require a State DOT to administer the funds. Projects awarded funds under this program explored a variety of strategies designed to address implementation, interoperability, public acceptance, and potential hurdles to adoption of the demonstrated user-based alternative revenue mechanism; privacy protection; use of independent and private third-party vendors; congestion mitigation impacts; equity concerns; ease of user compliance; and the reliability and security of technology used. Geographic diversity is a statutory requirement.

The program is administered through the Federal Highway Administration (FHWA) Office of Transportation Management (HOTM). Each recipient of a grant under the STSFA Program is required to submit an annual report to DOT that describes (1) how the demonstration activities carried out with grant funds meet the objectives of the program, and (2) lessons learned for future deployment of alternative revenue mechanisms that employ a user fee structure. The first of these reports was due one year after the first grant was awarded to a project under the program. Section 6020 also requires that DOT produce this biennial report on the demonstration activities carried out under the STSFA Program and make it publicly available on the Internet. The annual reports submitted by States participating in the program provide the primary inputs for the biennial reports.

¹Section 503(b) of Title 23 U.S.C. is a reference to the Highway Research and Development Program.

APPLICATION AND AWARD STATISTICS FY 2016–2020

SUMMARY STATISTICS FY 2016–2020

There were 12 applications in 2020. In each of the previous years, there were 7–8 applications.

Rows bold indicate coalitions of States

**Table 1. STSFA awards by State FY 2016–2020.
(see maps on the following pages).**

State (# Awards)	2016	2017	2018	2019	2020	Total
CA (4)	\$750,000	\$1,750,000	\$2,030,000		\$2,150,000	\$6,680,000
CO (1)		\$500,000				\$500,000
DE (5)	\$1,490,000	\$975,000	\$3,028,000	\$3,350,000	\$4,670,000	\$13,513,000
HI (2)	\$3,998,000				\$250,000	\$4,248,000
KS (1)					\$3,250,000	\$3,250,000
MN (2)	\$300,000		\$999,600			\$1,299,600
MO (3)	\$250,000	\$2,772,500	\$1,782,500			\$4,805,000
NH (1)			\$250,000			\$250,000
OH (1)					\$2,000,000	\$2,000,000
OR (3)	\$2,100,000	\$2,315,000		\$5,000,000		\$9,415,000
OR (5)	\$1,500,000	\$2,590,000	\$950,000	\$250,000	\$134,875	\$5,424,875
TX (1)					\$5,000,000	\$5,000,000
UT (4)*			\$1,250,000	\$395,000	\$1,250,000	\$2,895,000
UT (4)*			\$1,250,000	\$350,000	\$1,250,000	\$350,000
WA**	\$3,847,000	\$4,600,000		\$5,525,000		\$13,972,000
WY				\$250,000		\$250,000
TOTAL AWARDS	8	7	7	7	8	37
TOTAL APPLICATIONS	8	7	7	8	12	42
TOTAL AWARDED	\$14,235,000	\$15,502,500	\$10,290,100	\$15,120,000	\$18,704,875	\$73,852,475
TOTAL AVAILABLE***	\$14,235,000	\$18,560,000	\$18,340,000	\$18,020,000	\$21,020,000****	\$90,175,000

* Utah had two awards in 2019.

** The Washington State Transportation Commission manages the program.

*** The annual authorization was \$20 million in fiscal years 2017–2020, but each year the amount made available for the award was less due to fiscal year limitations on obligations.

**** Includes funds returned from closed prior-year projects.

STATE DOTs WITH STSFA AWARDS: FY 2016–2020

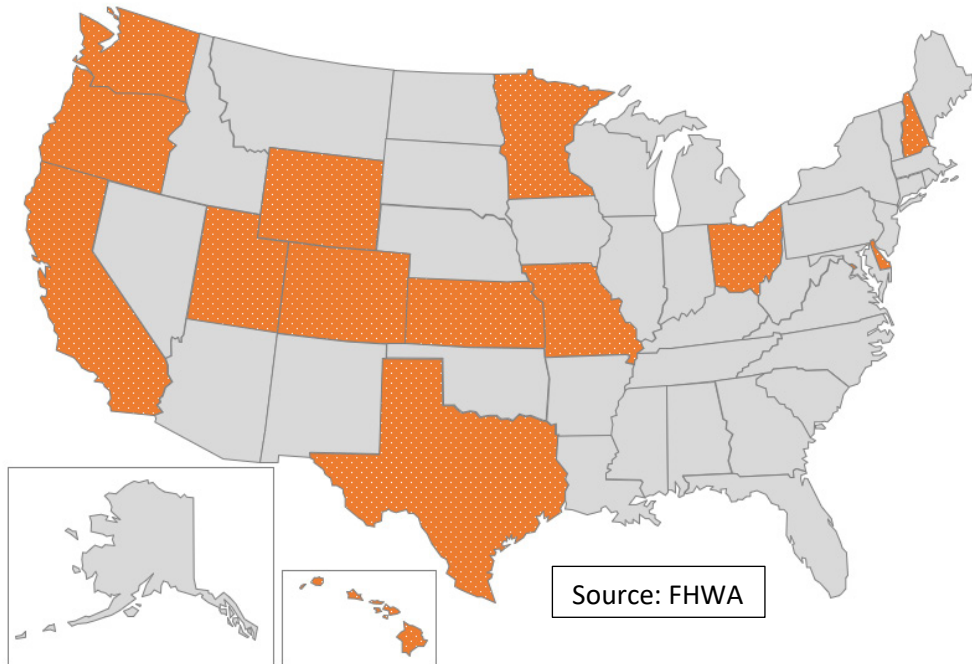


Figure 1. Map. State DOTs with STSFA awards FY 2016–2020.

MULTI-STATE GROUPS: FY 2016–2020

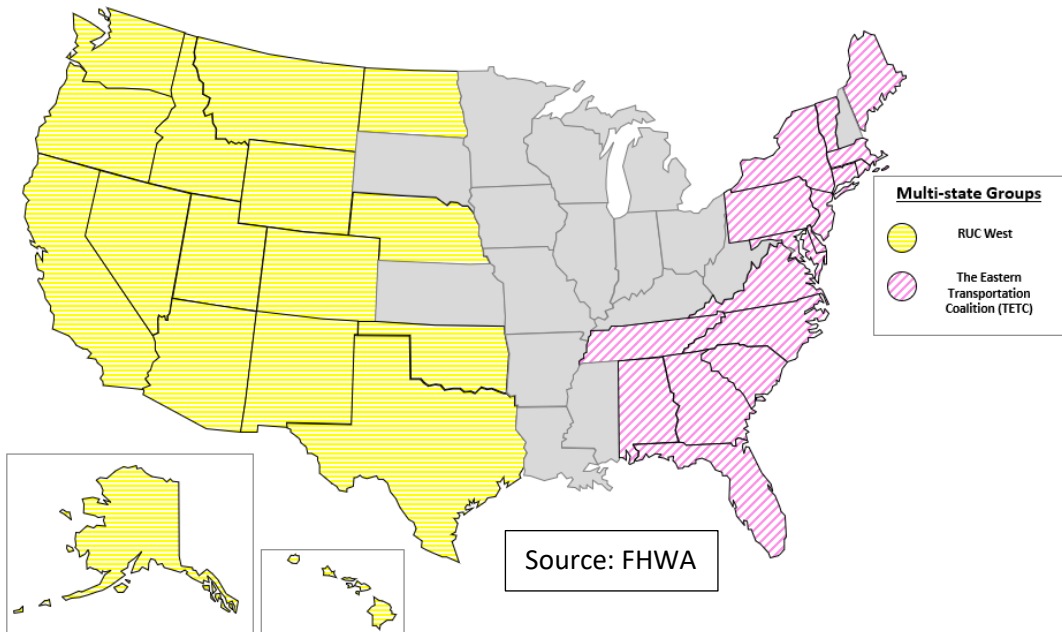


Figure 2. Map. Multi-State groups: FY 2016–2020.

Summary of FY 2016 STSFA Awards

Eight projects were awarded under the 2016 STSFA Program. They are summarized in the map and table below.

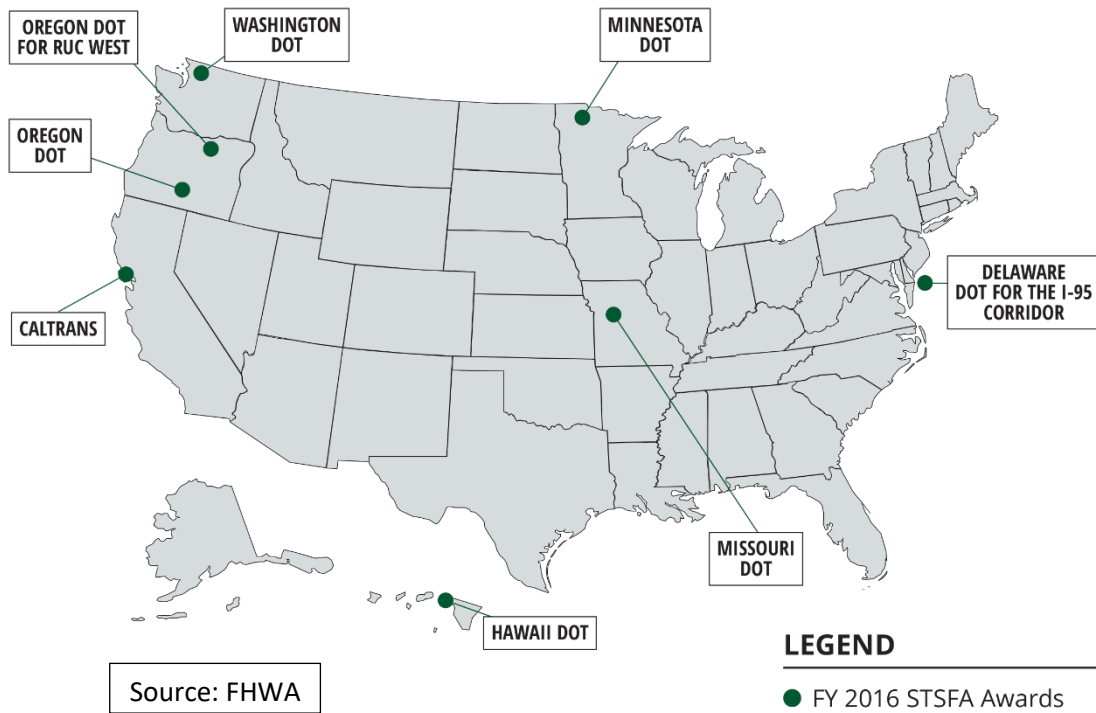


Figure 3. Map. Projects awarded under the 2016 STSFA Program.

Table 2. Projects awarded under the 2016 STSFA Program.

State	State DOT and Partners	Description	Award
CA	California Department of Transportation (Caltrans)	Road usage charge (RUC) using pay-at-the-pump (PATP)/charging station approach	\$750,000
DE	Delaware DOT (DeIDOT), in partnership with The Eastern Transportation Coalition (TETC)	Collecting user fees based with on-board mileage counters in collaboration with members of TETC	\$1,490,000
HI	Hawaii DOT (HDOT)	Collecting of user fee based on manual and automated odometer readings at inspection stations	\$3,998,000
MN	Minnesota DOT (MnDOT)	Using mobility-as-a-service (MaaS) providers as a revenue collection mechanism	\$300,000
MO	Missouri DOT (MoDOT)	Implementing a new registration fee schedule based on estimated miles per gallon	\$250,000
OR	Oregon DOT (ODOT)	Making improvements to Oregon's existing RUC program	\$2,100,000

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Table 2. Projects awarded under the 2016 STSFA Program. (continuation)

State	State DOT and Partners	Description	Award
OR	ODOT, in partnership with Western Road Usage Charge Consortium (RUC West)	Establishing the consistency, compatibility, and interoperability in road usage charging for a regional system in collaboration with RUC West	\$1,500,000
WA	Washington State DOT (WSDOT), in partnership with Washington State Transportation Commission (WSTC)	Testing critical elements of interoperable, multi-jurisdictional alternative user-based revenue collection systems and piloting methods of road usage reporting with the WSTC	\$3,847,000

SUMMARY OF FY 2017 STSFA AWARDS

Seven projects were awarded under the FY 2017 STSFA Program. They are summarized in the map and table below.

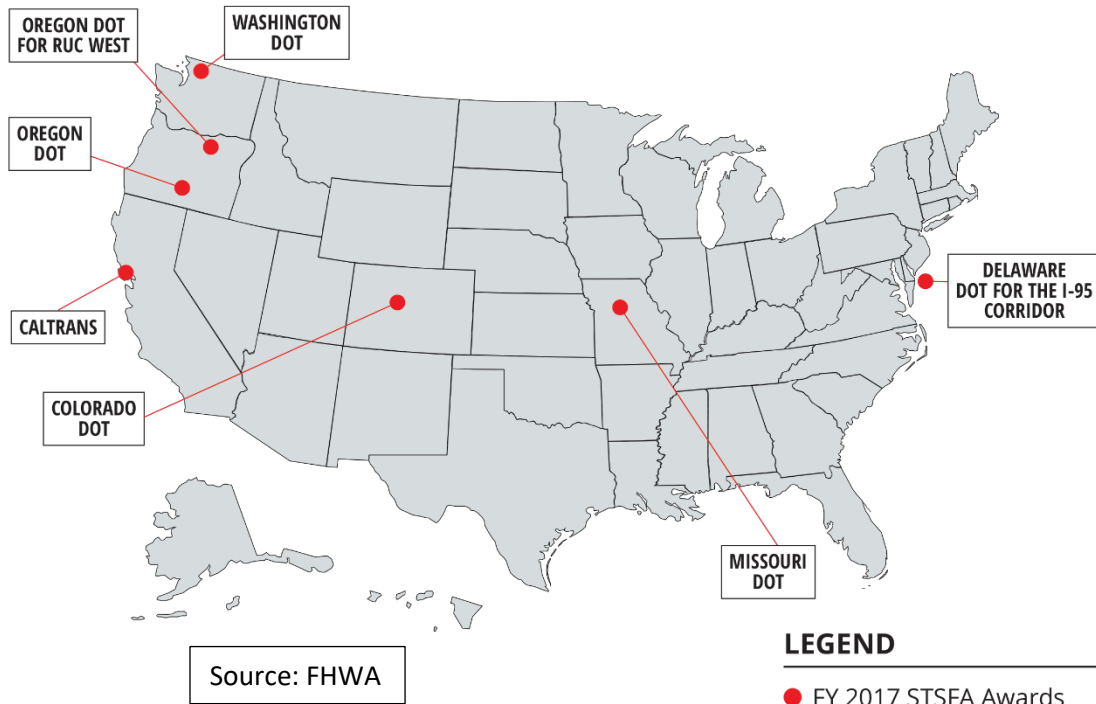


Figure 4. Map. Projects awarded under the FY 2017 STSFA Program.

Table 3. Projects awarded under the FY 2017 STSFA Program.

State	State DOT and Partners	Description	Award
CA	Caltrans	Exploring mechanisms to collect revenue at PATP charging stations	\$1,750,000
CO	Colorado (CDOT)	Investigating data collection mechanisms	\$500,000
DE	DelDOT, in partnership with TETC	Studying equitability and privacy issues in a multi-State region	\$975,000
MO	MoDOT	Conducting public outreach on concerns related to equity and data security issues	\$2,772,500
OR	ODOT	Initiating improvements to Oregon's existing RUC program	\$2,315,000
OR	ODOT, in partnership with RUC West	Launching a pilot between California and Oregon to connect the two States' per-mile road usage charging systems, to ultimately expand the concept regionally	\$2,590,000
WA	WSDOT in partnership with WSTC	Conducting public outreach with users regarding methods for assessing and collecting fees	\$4,600,000

SUMMARY OF FY 2018 STSFA AWARDS

Seven projects were awarded under the FY 2018 STSFA Program. They are summarized in the map and table below.

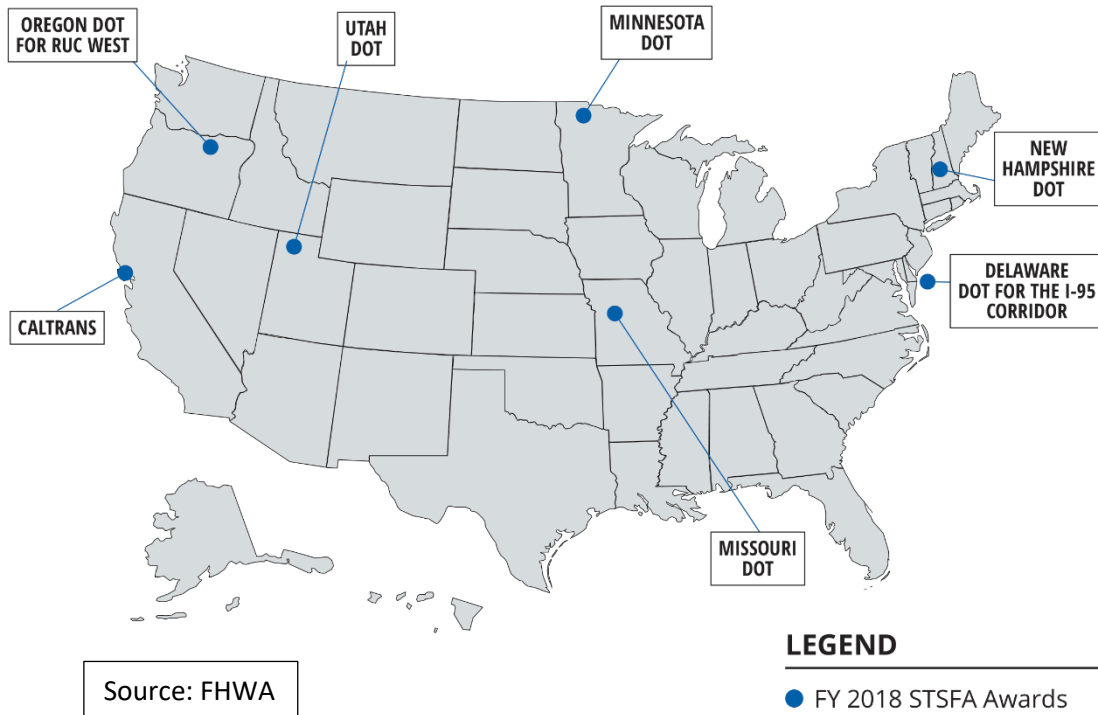


Figure 5. Map. Projects awarded under the FY 2018 STSFA Program.

Table 4. Projects awarded under the FY 2018 STSFA Program.

State	State DOT and Partners	Description	Award
CA	Caltrans	Exploring California’s RUC program with emerging technologies and services, such as user-based insurance (UBI), transportation network companies (TNCs), and automated vehicles (AVs)	\$2,030,000
DE	DelDOT, in partnership with TETC	Using mileage-based user fees (MBUFs) in a multi-State region addressing requirements for implementation, interoperability, public acceptance, and other potential hurdles over State lines	\$3,028,000
MN	MnDOT	Demonstrating feasibility of distance-based user fees through the shared mobility model, such as MaaS providers	\$999,600
MO	MoDOT	Deploying innovative strategies, such as vehicle registration fees, along with other use-based charges	\$1,782,500

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Table 4. Projects awarded under the FY 2018 STSFA Program. (continuation)

State	State DOT and Partners	Description	Award
NH	New Hampshire DOT (NHDOT)	Exploring RUCs levied in conjunction with vehicle registration fees	\$250,000
OR	ODOT, in partnership with RUC West	Exploring RUCs and AVs at both at the State level and in a regional interoperable system	\$950,000
UT	Utah DOT (UDOT)	Piloting an RUC program for alternative fuel vehicles, including hybrid and electric vehicles	\$1,250,000

SUMMARY OF FY 2019 STSFA AWARDS

Seven projects were awarded under the 2019 STSFA Program. They are summarized in the map and table below.

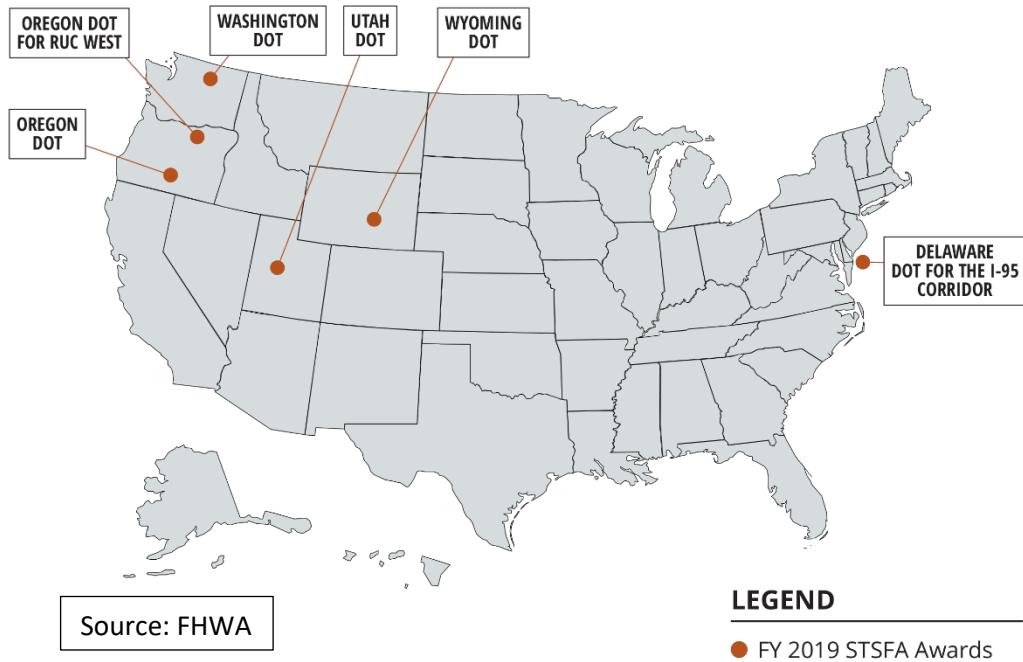


Figure 6. Map. Projects awarded under the FY 2019 STSFA Program.

Table 5. Projects awarded under the FY 2019 STSFA Program.

State	State DOT and Partners	Description	Award
DE	DelDOT, in partnership TETC	Addressing MBUF barriers through expanded and enhanced pilot deployments within TETC States	\$3,350,000
OR	ODOT	Road usage charging in a connected vehicle ecosystem	\$5,000,000
OR	ODOT, in partnership with RUC West	Road usage charging and use of blockchain	\$250,000
UT	UDOT	Integrating RUCs and express lane tolling	\$395,000
UT	UDOT	Road usage charging local overlay	\$350,000
WA	WSDOT in partnership with WSTC	Forward Drive Washington road usage charging demonstration project	\$5,525,000
WY	Wyoming DOT (WYDOT)	Wyoming truck mileage user fee pilot	\$250,000

SUMMARY OF FY 2020 STSFA AWARDS

Eight projects were awarded under the 2020 STSFA Program. They are summarized in the map and table below.

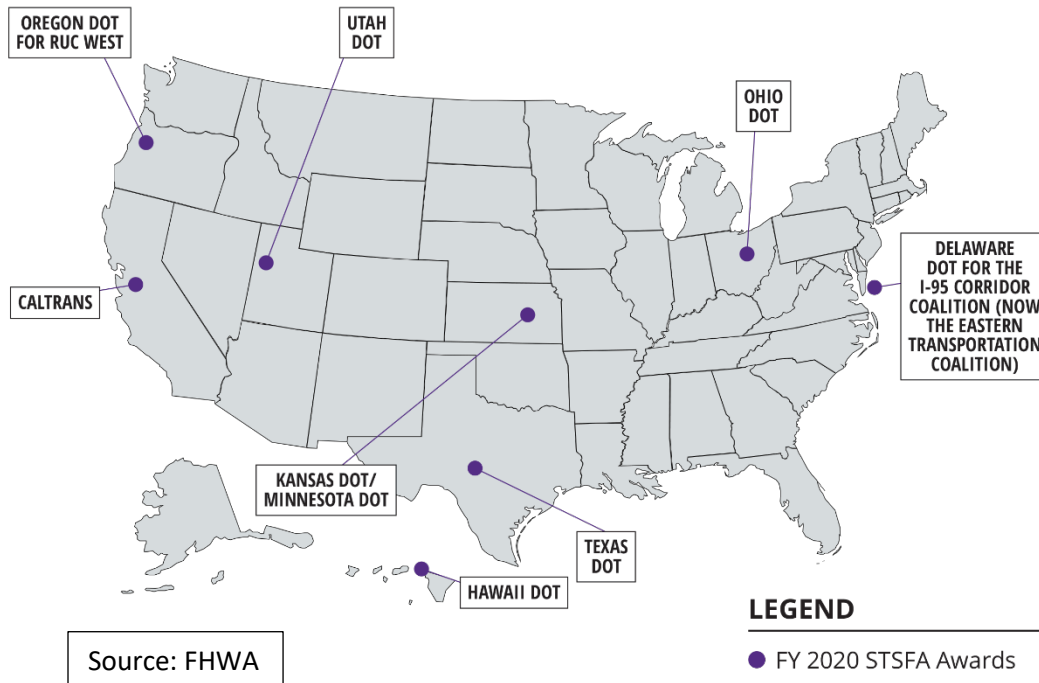


Figure 7. Map. Projects awarded under the FY 2020 STSFA Program.

Table 6. Projects awarded under the FY 2020 STSFA Program.

State	State DOT and Partners	Description	Award
CA	California Department of Transportation (Caltrans)	Testing viability of current GPS technology to determine which roads are part of a public network and may be subject to a fee	\$2,150,000
DE	DelDOT, in partnership with TETC	Demonstrating test paths for MBUF in the DC metro area and 7 States—DE, MD, ME, NC, NJ, PA, and VA	\$4,670,000
HI	HDOT	Investigating current state and completeness of digital mapping data to determine roads that are part of a public network and may be subject to a fee	\$250,000
KS	Kansas DOT (KDOT), in partnership with Minnesota DOT	Exploring impacts of RUC implementation in the Midwest, focusing on rural and agricultural populations and intrastate and interstate commercial freight and supply chain operators	\$3,250,000
OH	Ohio DOT (ODOT)	Obtaining data for a large-scale outreach program geared toward educating the public about RUC	\$2,000,000

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Table 6. Projects awarded under the FY 2020 STSFA Program. (continuation)

State	State DOT and Partners	Description	Award
OR	ODOT, in partnership with RUC West	Hosting conference (Road Usage Charge Summit) to explore opportunities and barriers to interoperability, expand knowledge about RUC, and foster new partnerships	\$134,875
TX	Texas DOT (TxDOT)	Assessing feasibility and technological capability of utilizing smartphone technology to understand travel patterns and development of an accounting framework	\$5,000,000
UT	Utah DOT	Developing and validating RUC-specific customer service improvements designed to enhance public acceptability and attract more voluntary participants	\$1,250,000

STATUS OF STSFA GRANT PROJECTS BY STATE DOT

This section summarizes the funding history and status of the STSFA demonstration projects.

California

Table 7. Projects awarded under the STSFA program in California

Fiscal Year	Amount Granted	Objective(s)
2016	\$750,000	Testing RUC pilot using PATP/charging stations.
2017	\$1,750,000	Exploring mechanisms to collect revenue at PATP/charging stations.
2018	\$2,030,000	Exploring using other emerging technologies in California's RUC Program, such as UBI, TNCs, and AVs.
2020	\$2,150,000	With the Road Charge Pilots Program, testing viability of current global positioning system technology to determine which roads are part of a public network and may be subject to a fee.

Program Approach and Design

Caltrans was awarded Federal grant funding in 2016 (Round 1) and 2017 (Round 2). Round 1 has since been completed. In 2018, Caltrans applied for Round 3 of the STSFA grant and was awarded funding in early 2019. Round 2 and Round 3 have been combined into California's Four Phased Demonstration project, which launched in 2021. This phased demonstration will include testing of a road charge with the following concepts: PATP, UBI, TNCs, and AVs.

California completed a State-funded mileage-based revenue collection pilot in March 2017 known as the Road Charge Pilot Program, which included more than 5,000 participants and tested the functionality, complexity, and feasibility of a mileage-based system as a potential new revenue collection method for transportation funding. More information is available at: <https://www.californiaroadchargepilot.com/>.

Status

During 2020, funds from the 2017 and 2018 STSFA grant awards were used to design a comprehensive road charge demonstration that features emerging technologies in transportation. Caltrans launched the California Road Charge Demonstration, show how road charge can be assessed on PATP/electric charge point, UBI, TNCs, and AVs in early 2021. The six-month demonstration explored accurate, secure, and comprehensive data collection, assessment, and reporting of a road charge on these technology platforms.

The project team compiled self-declarations from pilot participants on demonstration incentive eligibility and completion of closeout activities and held a workshop to discuss next steps and final refinements to the revenue model and the business case. The team prepared the following final draft reports: Business Evaluation and Business Case Report; the Revenue Forecast Model, Data Security Audit Report; and final PATP/CP and UBI Independent Evaluation reports. This work represented the final TNC and AV Independent Evaluation reports.

The four-phased demonstration closed on June 30, 2021. In early July 2021, the project team began demonstration closeout activities. A demonstration debrief workshop was held on August 12, 2021, to discuss demonstration

activities by phase, lessons learned, and opportunities for improvement and reuse of concepts, systems, and processes. The project team delivered presentations to the California Department of Motor Vehicles (DMV) and Caltrans’ finance office on PRIME’s capabilities.

Colorado

Table 8. Projects awarded under the STSFA program in Colorado

Fiscal Year	Amount Granted	Objective(s)
2017	\$500,000	Investigating data collection mechanisms, addressing concerns from the agricultural and rural community identified in the Colorado RUC Pilot Program.

Program Approach and Design

In 2018, CDOT was awarded FY 2017 STSFA funds to explore what it learned from the 2016 State-supported RUC pilot. The intent was to focus on opportunities to address perceived agricultural and rural community concerns about RUC. However, post award, the State was directed by its Administration to consider alternate transportation funding options. In 2019, CDOT returned STSFA funds.

Status

In June of 2019, Colorado announced that it would pursue other strategies for funding transportation investments in the State and returned its STSFA funds.

Delaware

Table 9. Projects awarded under the STSFA program in Delaware DOT (on behalf of TETC, formerly I-95 Corridor Coalition)

Fiscal Year	Amount Granted	Objective(s)
2016	\$1,490,000	Conducting planning activities and initial deployment of a MBUF pilot within participating I-95 Corridor Coalition States (CT, DE, NH, PA, and VT).
2017	\$975,000	Studying equitability and privacy issues in a multi-state region (DE, NC, PA, and VA).
2018	\$3,028,000	Addressing requirements for implementation, interoperability, public acceptance, and other potential hurdles of implementing mileage-based fees in a multi-state region (CA and OR).
2019	\$3,350,000	Addressing MBUF barriers through expanded and enhanced pilot deployments within the I-95 Corridor Coalition States.
2020	\$4,670,000	Testing Implementation Paths for MBUF: demonstrating and testing paths for MBUF in the DC metro area and 7 States—DE, MD, ME, NC, NJ, PA, and VA.

Program Approach and Design

The STSFA program has awarded TETC \$13,513,000 over the five years of the program. The Coalition participated in the program to account for the unique characteristics of the Eastern Seaboard, such as frequent cross-state travel, numerous toll facilities, and multiple major truck corridors. While neutral about whether MBUF presents the ultimate solution for transportation funding, the Coalition is dedicated to ensuring that the voices of Eastern Seaboard residents as well as the trucking industry are part of the national discussion on MBUF. Prior-year activities (Phase 1) are described in the 2019 STSFA Biennial Report.

Status

Phase 2 activities included two components. During Phase 2, the Coalition launched the Nation’s first multi-state truck road-user charge pilot. The pilot comprised 55 trucks in 27 States and lasted 6 months. Trucks in the pilot drove a total of 1.4 million miles. Several motor carriers directly participated in the multi-state pilot, which examined the International Fuel Tax Agreement (IFTA) and International Registration Plan as potential templates for multi-State truck MBUFs.

Through the multi-State truck pilot, the Coalition is exploring how the MBUF concept could be applied to heavy trucks and the feasibility of using existing regulations, administrative processes, and technology as a potential MBUF foundation. The Coalition also conducted a series of stakeholder interviews and formed a Motor Carrier Working Group (WG) to gain a better understanding of motor carrier needs and viewpoints.

The Motor Carrier WG included key stakeholders—trucking companies, truck manufacturers, trucking associations, and regulators. The WG helped understand the diversity of truck ages, types/weights, and fuel efficiencies when setting road-user charge rates. In addition, the WG explored issues of enforcement and compliance, so that all participants in a mileage-based road-user program pay their fair share.

Phase 2 also included the expansion of passenger vehicles in the pilot, to include the public. In total, 889 participants across 42 States and Canada drove 3.1 million miles during Phase 2. Approximately 13 percent of those miles were driven outside of the participants’ home States. Phase 2 also involved public outreach and education, including development of an online calculator, and simulated monthly billing statements to help educate people about what they would pay under an MBUF program versus what they currently pay in fuel taxes. Overall, 83 percent of participants felt that an MBUF program was as fair or fairer than a fuel-tax based program.

Phase 3 passenger car pilots are underway in North Carolina, New Jersey, Delaware, Pennsylvania, and Northern Virginia. As of November 2020, 362 participants had driven a total of 301,208 miles across 21 States (12 percent of miles were out of State). Phase 3 also includes a national truck pilot, launched in 2020. This pilot comprises 200 trucks in 48 States. As of October 2020, participants had driven 1.7 million miles. The national truck pilot explored several issues: fair and transparent rate setting, synergies with existing regulatory processes and procedures, and system compliance needs and monitoring.

Hawaii

Table 10. Projects awarded under the STSFA program in Hawaii

Fiscal Year	Amount Granted	Objective(s)
2016	\$3,998,000	Exploring user fee collection based on manual and automated odometer readings at inspection stations

Fiscal Year	Amount Granted	Objective(s)
2020	\$250,000	Investigating the current state and completeness of digital mapping data to support classifying public and private road networks.

Program Approach and Design

The Hawaii RUC (HiRUC) pilot seeks to understand how mileage-based fees would affect the purchase and use of high-mileage-per-gallon or alternative fuel vehicles. The pilot will build on existing State infrastructure that collects odometer readings annually as the basis for testing the RUC system. The project involves implementation of an accounting system to provide prototypical invoices (or “billings”) for mileage driven and other direct communications about revenue alternatives to over 1 million motorists. Billings will feature personalized information about motorists’ road use and corresponding RUCs, gas taxes paid, and other fees. More information is available at <https://hiruc.org>.

Status

In Phase 1, the project engaged recruited volunteers and the public using an extensive public outreach campaign that started in early 2019 and is ongoing. In addition, HiRUC formed a multi-stakeholder project Advisory Group that provides more input for consideration by the project and serves as another means for communication to and from stakeholder constituencies.

In Phase 3,² HiRUC used existing production data already in the DMV and the Periodic Motor Vehicle Inspection (PMVI) systems (collected with the State required annual “Safety Check” in Hawaii). Information from these two datasets was merged to produce Driving Reports that showed personalized and customized information to a vehicle owner. The Driving Report shows the owner’s name and address, opens with information about the project, and lists the vehicle’s year, make, and model; license plate number; how many miles that vehicle traveled between the last two Safety Checks; how much combined State and county gas tax the vehicle owner may have paid using the manufacturer’s EPA miles per gallon (MPG) estimate for the actual vehicle; and how much RUC would be charged for the same distance traveled.

The use of production data in existing DMV and PMVI systems to generate a mock invoice, and at the scale performed by HiRUC, had never been done before. This project also demonstrated that using existing DMV and Safety Check data is a viable RUC option in Hawaii, does not require more work by the vehicle owner, and administratively would be cheaper than other RUC pilot systems already demonstrated by other States. For Phase 3, scale-wise, the HiRUC project is one of the closest approximations to an actual live RUC system compared to other past pilots ranging from 150 to 5,000 vehicles. By mailing this Driving Report unsolicited to hundreds of thousands of vehicle owners across the State, this direct outreach far exceeds other communication attempts by other pilot projects to date. Paired with the Driving Report was a HiRUC project survey offered both electronically and on paper that resulted in over 34,000 responses by August 2021.

Phase 5 offered recruited volunteers the choice of three automated mileage collection options: OdoFoto (image uploads), On-Board Diagnostic II (OBD-II) non-Global Positioning System (GPS) plug in device, and an OBD-II GPS enabled plug-in option. This project phase is similar to the scale (2,000 recruited volunteers) and scope of

²Phases 2 and 4 involve design, testing, and set-ups for the Manual Reporting and Automated Reporting RUC pilot systems.

other RUC projects conducted by other States. This allowed HDOT to observe the mileage reporting choices made by Hawaii participants, offer opportunities for participants to have firsthand experience, observe local patterns and preferences, and for those participants to provide their input based on their experiences. Phase 5 participants were spread across the various islands representing a broad range of demographics that included individual vehicle owners, public employees, and some governmental fleet vehicles.

The last phase (Phase 6) will develop white papers and other reports from the extensive technical and public opinion and response data collected. The project end product will be a final report summarizing findings, possible policy and implementation approaches and options, reorganizational approaches, administrative cost estimates, ease of compliance for users, evasion and enforcement considerations, instructive products for informational sharing across jurisdictions, and actionable items for policymakers.

Fiscal Year 2020 Award

As part of the ongoing demonstration, the HiRUC revealed gaps in the current available digital mapping data in Hawaii. The Hawaii DOT will collaborate with the University of Hawaii at Manoa investigating the current state and completeness of digital mapping data to support classifying public and private road networks. Within the context of RUC in Hawaii, this project will further support RUC by enabling policy choices between public and private roadways and related mechanisms. Accurate digital maps and their elements contained within databases are needed to support this functionality for RUC and taxation purposes.

Kansas

Table 11. Projects awarded under the STSFA program in Kansas

Fiscal Year	Amount Granted	Objective(s)
2020 (KS)	\$3,250,000	RUC Demonstration Project: KDOT will be working with MnDOT in exploring the impacts of RUC implementation in the Midwest, focused on rural and agricultural populations and intrastate and interstate commercial freight and supply chain operators.

Program Approach and Design

In FY 20, FHWA awarded KDOT \$3,250,000 to conduct an RUC Demonstration Project. KDOT will lead a joint effort working with MnDOT to explore the impacts of RUC implementation in the Midwest, with a focus on rural and agricultural populations, intrastate and interstate commercial freight, and supply chain operators.

Status

KDOT launched a statewide transportation survey to gauge the public’s understanding of how transportation is funded in October 2021.

Minnesota

Table 12. Projects awarded under the STSFA program in Minnesota

Fiscal Year	Amount Granted	Objective(s)
2016	\$300,000	Use of mobility-as-a-service providers (MaaS) as the revenue collection mechanism by charging distance-based user fees (DBUFs); Phase 1 goals include designing an affordable DBUF program premised on shared mobility, creating MaaS partnerships that can leverage existing onboard technologies that could be used to collect DBUFs, and conducting a limited proof-of-concept demonstration of data transfer between shared mobility providers and MnDOT.
2017	N/A	N/A
2018	\$999,600	Demonstrating the feasibility of DBUFs through the MaaS shared-mobility model.
2019	N/A	N/A

Program Approach and Design

Minnesota did not focus on replacing the gas tax. Instead, the State explored options to supplement dwindling gas tax revenues. Minnesota proposed a distance-based RUC concept that involves collaborating with a MaaS provider, HourCar. This system works alongside the motor fuel tax, rather than replacing it. Minnesota would collect mileage fees from these commercial mobility providers in exchange for fuel tax rebates and other financial incentives. The MnDOT expects that this MaaS model will afford better data security and system reliability due to its use of a private third-party data repository and an already-implemented mileage-tracking technology.

More information is available at <http://www.dot.state.mn.us/mileagebaseduserfee/>.

Status

At the completion of its Phase 1 activities, Minnesota produced a concept of operations (ConOps), carried out and summarized the results of stakeholder outreach, and executed a 2-week proof-of-concept with 56 vehicles and 23,000 miles. The proof-of-concept validated the ability of MnDOT to download and put mileage data in a secure depository. Building upon the demonstration implementation planning portion of Phase 1, MnDOT submitted a grant project application under Section 6020 of the FAST Act in July 2018 for a DBUF demonstration (Phase 2). The proposal, which was awarded funding in February 2019, identified a series of comprehensive tasks and schedules needed to plan, design, deploy, administer, communicate, and evaluate the 12-month demonstration. The MnDOT partnered with shared mobility providers to test the feasibility of assessing a DBUF on shared mobility vehicle fleets. Data was collected per vehicle to calculate and assess DBUFs (equating to 2.7 cents per mile). The Minnesota Department of Revenue (DOR) received electronic financial reports and invoices detailing the net DBUFs and assessed charges and reconciled accounts as necessary. The DOR also evaluated potential revenue impacts. All DBUF charges reported during the demonstration were simulated, and no real monies were collected.

The year-long distance-based fee (DBF) demonstration ended on March 31, 2021. Sixty-four vehicles from two shared mobility partners and the AV research partner participated in the demonstration. The demonstration resulted in the successful capture of 565,839 miles; 18,068.83 gallons of fuel purchased; \$15,358.67 in simulated gross DBF revenues; and \$6,884.47 in simulated net DBF revenues. MnDOT developed a final report.

Missouri

Table 13. Projects awarded under the STSFA program in Missouri

Fiscal Year	Amount Granted	Objective(s)
2016	\$250,000	Implementing a new registration fee schedule based on estimated miles per gallon.
2017	\$2,772,000	Conducting public outreach on concerns related to equity and data security issues.
2018	\$1,782,000	Using innovative strategies such as vehicle registration fees along with other user-based charges.

Program Approach and Design

Missouri proposed a user-based alternative revenue mechanism that does not anticipate replacing its current gas tax; rather, it proposes to supplement the diminishing Highway Trust Fund revenue by changing registration fees. The existing motor fuel tax system includes a registration fee system based on taxable horsepower. By charging vehicle licensing fees, Missouri will be able to maintain the Highway Trust Fund revenue stream while simultaneously addressing the existing payment inequity between high- and low-efficiency vehicles. Specifically, low-efficiency vehicles will be charged a smaller registration fee than high-efficiency vehicles, as lower-efficiency vehicles carry a larger motor fuel tax burden. Missouri's STSFA Phase 1 activities developed a new sliding scale fee schedule for vehicles averaging greater than 20 MPG and provided education and outreach to the Missouri General Assembly with regards to alternate funding and new technology for transportation infrastructure.

Status

As a result of its STSFA Phase 1 activities, Missouri built a dynamic financial modeling tool to show how its proposed vehicle registration fee schedule could be used to replace the existing vehicle registration fee schedule. In addition, Missouri developed a ConOps that describes its proposed MPG-based fee schedule. Finally, Missouri produced a technical memorandum on vehicle identification number decoding and analysis, which outlines how to identify each passenger vehicle with the appropriate U.S. Environmental Protection Agency (EPA)-estimated fuel economy, fuel type, and other vehicle descriptors needed for the proposed schedule. These data are used in Missouri's STSFA financial model to analyze the potential impacts of transitioning away from the existing schedule to the proposed new one.

At the beginning of 2020, State Bill (SB) 906 was proposed in support of changing the Missouri vehicle registration fee to an MPG-based fee. SB 906 was filed and assigned to committee and received a public hearing on March 12, 2020. At that time, the nationwide threat of the COVID-19 pandemic was becoming more of a concern. As a result, legislative leaders suspended all but a few fiscal bills for the 2020 session. The SB 906 sponsoring MPG-based registration fee did not go any further despite having more support than in any other year.

In the fall of 2020, MoDOT set sights on preparing for the next legislative session. Working with a consultant, MoDOT developed other strategies and educational material for the 2021 session. A customized calculator tool was developed so users could see exactly how the revised fee would impact them. Material was not distributed to the public before gaining legislative support to avoid the appearance of lobbying. MoDOT participated with the DOR in peer State interviews to learn how other States financed their system modernization. The MO STSFA program is currently on hold.

New Hampshire

Table 14. Projects awarded under the STSFA program in New Hampshire

Fiscal Year	Amount Granted	Objective(s)
2018	\$250,000	Investigating the feasibility and impact of using a road user fee (RUF) levied in conjunction with vehicle registration.

Program Approach and Design

The New Hampshire DOT studied a road usage fee based on the EPA fuel economy rating of the vehicle that would charge vehicles with higher mileage per gallon a larger fee. Phase 1 estimated the revenue potential of the new RUF compared to the existing motor fuel tax revenue, exploring any uncertainties associated with key factors influencing revenue projections, evaluating the equity implications of the proposed new fee, researching public opinion on the proposed RUF, considering policy design options, and developing a work and evaluation plan for Phase 2.

Status

New Hampshire's STSFA demonstration program was awarded FY18 funds in March 2019. The consultant team began work in August 2019 with the initial task of matching NH vehicle registration data to EPA MPG data. The team was able to match a significant majority of the light-duty fleet to valid EPA MPG data. Prior to this project, such matching was considered one of the technical hurdles of instituting the RUF that had not yet been overcome. Work was also undertaken to model the vehicle fleet in NH over time as well as to forecast revenues. The interim results of those efforts were shared with the NH Legislature during deliberations of the 2019 RUF bill.

Through September to November 2019, the consult team focused on public outreach and equity analysis. The University of New Hampshire Survey Center conducted four focus group sessions, each in a different area of the State. They also completed a telephone survey of residents. The consultant team used location-based information from cell phone data along with census information to help with the equity research. The interim results from those efforts were shared with the NH Legislature during deliberations of the 2019 RUF bill.

From December 2019 to February 2020, the consultant team developed the Phase 1 report and coordinated with NHDOT. The Department worked with the lead sponsor of the RUF legislation to review the report and to make revisions. The final Phase 1 report was provided in February of 2020. This report represented the majority of the STSFA project by scope and budget (87 percent). The next steps for the project were to develop deployment and evaluation plans. Through February and March 2020, the proposed legislation (2019 HB478) did not advance through the NH House. Also, in March 2020, the COVID-19 pandemic caused dramatic shifts for all key parties to the NH Road Usage Fee: Phase 1 effort and the project was placed on hold for two months. During that time, a state of emergency was declared in NH and significant impacts persisted for the DMV and city/town clerks. Both groups, who normally have close interaction with the public, needed to shift business models in response to the COVID-19 pandemic and Centers for Disease Control and Prevention guidelines. Personnel within both groups focused on meeting the most urgent and basic needs of residents. At the same time, the COVID-19 pandemic caused significant unemployment in the State of New Hampshire along with other lost revenues. The project remained on hold for another month.

Following a review of the project status in August 2020, NHDOT concluded that the project should be closed.

Ohio

Table 15. Projects awarded under the STSFA program in Ohio

Fiscal Year	Amount Granted	Objective(s)
2020	\$2,000,000	Obtaining data for a large-scale outreach program geared toward educating the public about RUC.

Program Approach and Design

ODOT will work to engage the public to provide information about the current funding structure and conduct educational outreach to show why the existing funding mechanism is no longer sustainable over the long term. In addition, public feedback will be obtained regarding the multiple user fee options that exist and material will be presented to explain how a potential alternative user-based revenue method would vary from the current funding mechanism. ODOT will function as the lead agency and partner with Ohio Department of Taxation, Ohio Department of Public Safety, Ohio universities, and private third parties to collaborate on a large-scale outreach and research project. ODOT will be one of the first Midwestern States to obtain data and insight into a large-scale alternative user-based revenue mechanism. ODOT will complete a research study about the feasibility of an alternative user-based revenue program in Ohio and receive recommendations on next steps.

Status

The Ohio project is still in the early stages.

Oregon

Table 16. Projects awarded under the STSFA program in Oregon

Fiscal Year	Amount Granted	Objective(s)
2016	\$2,100,000	Improving Oregon’s existing RUC Program.
2017	\$2,315,000	Improving scalability of Oregon’s RUC Program (OReGO) and demonstrating its utility as a funding source for local jurisdictions; as such, the OReGO system needs to prove that it is flexible enough to accommodate varying tax rates and jurisdictional types.
2019	\$5,000,000	Road usage charging in a connected vehicle ecosystem.

Program Approach and Design

Oregon’s RUC Program, OReGO, has been operating since July 2015. It is Oregon Department of Transportation’s (ODOT’s) opinion that their program demonstrates that it is possible to charge drivers more equitably through miles driven, as opposed to fuel purchased. By leveraging private sector account managers, the program is able to provide reliable, effective customer service and consumer choice. ODOT believes it demonstrates that a fuel tax and RUC can coexist without double taxation, streamlining the driver/taxpayer experience.

The State is using STSFA funds to enhance the current system Oregon already has in place. Oregon will carry out 3 simultaneous, 6-month pilots with up to 100 passenger vehicles each. The first simulation will focus on area pricing in which an area is geographically bounded, and a local RUC rate will be added to the broader statewide RUC rate during specific times. The second simulation will overlap two geo-fenced areas and test different RUC rates during certain times of the day. The third simulation will look at corridor pricing, where drivers are charged different RUC rates for shorter trips on freeway corridors during certain times of the day to preserve capacity for through trips.

Status

As of the first quarter of 2019, Oregon had defined a ConOps and its high-level program architecture, drafted requests for proposals (RFPs) and statements of work, updated its RFP for posting, and provided continued progress updates to the program’s technical WG.

The current program uses technology installed in vehicles to capture taxable miles and fuel consumption. However, not all vehicles can accommodate the current mileage reporting technologies, so the program needs a way to manually report taxable miles and fuel consumption when participating in the RUC program. Also, the only current method to manage RUC accounts is through an online portal and, for many reasons, Oregonians may not have access to a computer or mobile device and cannot manage an online account. Developing a process for all Oregonians to report taxable miles manually will be crucial if the RUC program becomes mandatory. The object of the study was to identify requirements for a manual reporting option.

One of the outcomes of the manual reporting project is the certification and adoption of new third-party vendors to help manual reporting option participants with mileage verification, enrollment, and other areas of the new reporting option.

As of January 2021, the project has secured a business partner to manage the pilot participant accounts. The account manager’s system is in the final stages of testing and certification. A business partner was contracted to recruit participants and conduct research. Recruitment efforts were planned and are ready to execute. The RUC administrative system has been built and tested. Planned next steps include participant onboarding, and initiation of research activities, including a targeted questionnaire to garner participant feedback. Following completion of the pilot, ODOT will produce a report that provides a quantitative and qualitative analysis of what was done, challenges to overcome, potential to deploy on a broader scale, and recommendations.

Oregon

Table 17. Projects awarded under the STSFA program in Oregon DOT (on behalf of RUC West)

Fiscal Year	Amount Granted	Objective(s)
2016	\$1,500,000	Define and outline a multi-State pilot focused on consistency, interoperability, and compatibility.
2017	\$2,590,000	Launch a pilot between California and Oregon which connects the two States’ per-mile road usage charging system, with the goal of expanding the concept regionally.
2018	\$950,000	Continue exploring RUC systems and automated vehicles at both the State and regional levels.
2019	\$250,000	Design and test blockchain technology to share transactional information between jurisdictions. Blockchain represents a digital database containing information (such as records of

Fiscal Year	Amount Granted	Objective(s)
		financial transactions) that can be simultaneously used and shared within a large decentralized, publicly accessible network.
2020	\$134,875	RUC West to host an RUC Summit exploring opportunities and barriers to interoperability, expanding knowledge about RUC, and fostering new partnerships.

Program Approach and Design

ODOT is the lead agency for RUC West’s application. RUC West is a voluntary coalition of 17 State DOTs (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming) looking to tackle the policy, organizational, technological, and operational challenges associated with RUC. Since 2013, RUC West has attempted to resolve many of the technological and operational challenges involved in improving the future of transportation infrastructure funding. Through five years of research and pilot programs, the consortium has developed the groundwork for per-mile RUC while addressing issues such as interoperability, privacy, public education, and rural/urban equity.

The purpose of RUC West’s Phase 1 pre-deployment activities was to define and plan a consistent, interoperable, and compatible multi-state RUC. Phase 1 was divided into two parts. Phase 1A included efforts by all participating States to create system definition of a multi-State pilot. Phase 1B, which included only California, Colorado, Oregon, and Washington, focused on the development of the regional pilot project plans to be carried out in STSFA Phase 2. The RUC West’s Phase 1 activities included the following: researching and drafting pilot plans; pulling together technical design documents; creating a communications plan along with information folios and media kits; gauging private sector vendor interest; and compiling a list of future considerations for RUC development.

Status

The two main accomplishments of RUC West’s Phase 1 were the creation of a high-level ConOps outlining the basic principles of a regional RUC system as they apply to future pilots, and the creation of a document detailing future multi-State pilot system and business requirements based on the results of the California and Oregon pilots. The implication of these findings show that States can coordinate the technical and logistical challenges of launching a multi-state RUC Program. Overall, Phase 1 activities affirm the feasibility of RUC interoperability, find some RUC compatibility with low-technology (though GPS-based technology is the most conducive for compliance), present several strategies for minimizing system administrative costs, and identify a need to further examine user privacy, equity, ease of use, and public acceptance issues.

The Oregon legislature passed House Bill (HB) 2881 in the 2019 legislative session. This legislation requires updates to the OReGO RUC Program. As a result, all OReGO program and project resources were redirected to plan, develop, implement, and test the required updates to meet the HB 2881 requirements. In 2019, the project revised the project scope to accommodate Oregon RUC legislation. The Regional RUC project vetted a change proposal with the Regional RUC project stakeholders. Upon review, RUC West agreed with the proposal to reduce the project scope. In April of 2020, FHWA approved a change request submitted by ODOT on behalf of RUC West to re-scope the project and budget.

Under the revised project plan, the project will build and demonstrate the clearinghouse function. Tax data and payment for both California and Oregon were simulated. The clearinghouse demonstrated how a driver will be charged the Oregon RUC rate and credited Oregon State fuels tax for miles driven in Oregon; but once the vehicle

crosses the border, the driver is charged the California RUC rate and credited California State fuels tax for miles driven in California. The project illustrates how a coordinated RUC system can accommodate different States’ requirements, processes, systems, rates, and laws. With this flexibility, RUC can expand to include more States and eventually serve the whole Nation. The pilot demonstrates how two funding mechanisms, RUC and fuels tax, can operate together in multiple jurisdictions in a seamless way that does not double-tax the driver.

Lessons Learned

For the administering States, the clearinghouse reporting solves today’s State-centric reporting gaps. The project meets a key pilot objective: data collected can be verified it is going to the correct corresponding state. The project found that it is possible to collect RUC data across all jurisdictions. The existence of the clearinghouse allows for visibility into this comprehensive travel data that was not possible before; this includes aggregating travel from all vehicle identification numbers across each State’s program. This level of detail will also be useful when planning and informing decisions regarding the implementation for the national RUC pilot. It is also possible to report local layered RUC data. It will allow entities to view travel and RUC data by State, as well as by county, city, or district.

Texas

Table 18. Projects awarded under the STSFA program in Texas

Fiscal Year	Amount Granted	Objectives
2020	\$5,000,000	Demonstration of Smartphone-Based Alternative to Current Gas Tax Structure: Dallas-Fort Worth to assess the feasibility and technological capability of utilizing smartphone technology to understand travel patterns and the development of an accounting framework.

Program Approach and Design

The TxDOT project will assess the feasibility and technological capability of utilizing smartphone technology for the purposes of understanding travel patterns on roadway facilities and other areas, and to allow for the development of an accounting framework as an alternative to the current gas tax structure. By testing the design, implementation, and acceptance of this alternative user-based accounting tool, this project seeks to identify evidence-based recommendations regarding adoption and implementation for the State of Texas and the long-term operation, funding, and maintenance of roads. This framework can be applied to toll roads, as well as gas tax-supported roads, and offer the ability to incentivize behavior through a credit system applied to users or vehicles. The project will be implemented with a set of volunteers. No credits will be issued except to those who volunteer to participate in the program.

This project will demonstrate the significant cost reductions and easing of administrative burdens associated with a smartphone-based approach and that pricing/crediting can be dynamically configured for any target location throughout the Dallas-Fort Worth region. This enables more equitable and targeted road pricing and incentive credits that allow for sensitivity to variables such as location, time-of-day, and vehicle occupancy.

The project will also assess the behavioral and traffic-mitigating impacts afforded by the provision of user-based incentives. Dynamic pricing will be designed, implemented, and tested with participation by thousands of road users recruited from existing user communities, for projects administered by the North Central Texas Council of Governments. Policy recommendations will be founded on both quantitative impact analysis and qualitative

feedback to best derive insights on potential adoption. The project will be assessed independently by the Texas A&M Transportation Institute to measure the performance (accuracy, reliability, impact); acceptability (to both authorities and road users); and social equity (being fair) of the proposed system.

Status

The TxDOT project has not officially started.

Utah

Table 19. Projects awarded under the STSFA program in Utah

Fiscal Year	Amount Granted	Objective(s)
2018	\$1,250,000	Piloting an RUC program for alternative fuel vehicles, including hybrid and electric vehicles.
2019	\$395,000	Testing interagency coordination and system interoperability between State and local entities by allowing local jurisdictions the ability to piggyback on existing MBUFs, including Utah's system.
2019	\$350,000	Examining the ability to integrate several aspects of the UDOT’s newly implemented RUC program for alternative vehicles with its existing express lanes tolling systems.
2020	\$1,250,000	STFSFA Project extension developing and validating RUC-specific customer service improvements designed to enhance public acceptability. The effort will explore new ways to use RUC programs to reduce administrative costs and attract more voluntary participants.

Program Approach and Design

Utah’s RUC system is a voluntary program that alternative fuel vehicle owners may opt into at the time of their annual registration renewal, instead of paying a flat fee. UDOT was awarded FY 2018 STSFA funds in March 2019 to support the startup of its program. Utah joined Oregon in January 2020 as the only other State operating an ongoing system collecting real tax payments through an RUC Program. Approximately 44,000 electric and hybrid vehicles in Utah are eligible for participation in the RUC Program.

Participants sign up with a third-party account manager who collects and reports miles driven, using in-vehicle technology that UDOT provides. UDOT requires participants to place a credit card on file and set up a prepaid wallet from which mileage fees are periodically deducted. Payment of the per-mile fee stops once the accumulated total for the year is equal to the annual flat fee. The account manager provides several options for mileage data reporting, including smartphone apps, in-vehicle telematics, Bluetooth OBD devices (using vehicles’ OBD-II ports), and odometer capture technology. Anyone with privacy concerns may opt for limited data retention or pay the flat fee.

More information is available at: <https://roadusagecharge.utah.gov/>.

Status

An advisory committee was created to advise the development of Utah's RUC system. This committee represents State entities such as UDOT, the DMV, and the Legislature—as well as rural, environmental, privacy, taxpayer, business, and trucking interests. The full committee met three times to review proposed system elements and offer input. Committee subgroups met numerous times to explore specific topics, including privacy and security, data collection, compliance and enforcement, communications, and policy.

Utah passed Senate Bill 72, which allows the State to implement an RUC Program. This bill provided added guidance for setup and administration of the RUC Program. It directed UDOT to create administrative rules related to various elements of the program.

In 2020, Utah was awarded two FY 2019 grants: \$395,000 to test interagency coordination and system interoperability between State and local entities by allowing local jurisdictions the ability to piggyback on existing MBUFs, and \$350,000 to examine the ability to integrate several aspects of UDOT's newly implemented RUC program for alternative vehicles with its existing Express Lanes tolling systems.

UDOT coordinates with the DMV and Department of Technology Services to verify RUC enrollment status when individuals call the customer support line to inquire about their status. The agency also finalized a blueprint document, *The Future of RUC in Utah*, which discusses the legislature's goal of expanding RUC to the entire vehicle fleet by the end of 2031.

Washington

Table 20. Projects awarded under the STSFA program in Washington State (on behalf of the Washington State Transportation Commission)

Fiscal Year	Amount Granted	Objective(s)
2016	\$3,847,000	Testing and evaluating an RUC system as an alternative to special license surcharges on plug-in electric vehicles; conducting the first test on the international interoperability of an RUC system between the United States and Canada; exploring opportunities to leverage the capabilities of third-party enterprises to reduce mileage reporting costs; co-developing an RUC pilot in parallel with the deployment of the Washington Department of Licensing's new vehicle licensing information technology system; and carrying out a "codefest" to develop an owner-controlled smartphone app to accurately report out-of-state mileage.
2017	\$4,600,000	Carrying out and evaluating a 12-month pilot that tests 5 concepts of mileage reporting to collect feedback from users regarding methods for assessing user fees and collaborating with other States to test and develop organizational and operational capabilities for implementing an RUC Program.

Fiscal Year	Amount Granted	Objective(s)
2019	\$5,525,000	Forward Drive Washington RUC demonstration project.

Program Approach and Design

Washington’s RUC Program predates the STSFA Phase 1 Project. In the spring of 2014, the Washington Legislature created a steering committee comprised of business, government, nonprofit, and academic stakeholders to begin investigating an RUC that could replace the existing fuel tax. Later, in July 2016, the Washington State Transportation Commission set up a pilot project to test an RUC pilot program. The State applied for and obtained an STSFA Phase 1 grant to help supplement the cost of the pilot. Washington’s RUC Program pilot proposed to test a flat mileage fee assessed from data collected through different methods. Specifically, the pilot offered five mileage tracking options: a mileage permit charge, self-reporting vehicle odometer readings, or an automated distance charge (calculated using either a plug-in telematics device with or without GPS or a smartphone app). The STSFA Phase 1 grant funded the final design necessary to deploy a 12-month pilot, a public attitude assessment, evaluation planning and activities, recruitment of volunteers for the test pilot, and execution of a smartphone innovation challenge. More information is available at <https://waroadusagecharge.org/>.

Status

Research completed in 2021 includes the following:

To anticipate accelerating declines in revenue, the Commission built a revenue modeling tool capable of estimating the long-term revenue impacts of vehicle fleet changes, including accelerated electrification as well as changes in driving due to emerging trends of teleworking, automation, and ridesharing.

To assess equity impacts of RUC, the Commission conducted community engagement focused on historically underserved communities and a quantitative analysis of the impacts of RUC relative to the gas tax by income level. Analysis revealed that low-income drivers currently pay more per mile driven in gas taxes than higher-income households. Low-income households would, on average, save under an RUC.

To expand the range of choices and possibilities for operating an RUC system, the Commission explored emerging technology and business applications with a focus on improving equity, ease of use, compliance, and cost-efficiency in RUC. This research led to the discovery and development of new methods of an RUC to test in mini-pilots in 2022, ranging from self-reporting miles driven to allowing customers the choice to report miles directly from their vehicle’s telematics platforms.

To reduce the cost of collection, the Commission hosted a series of workshops with the Department of Licensing and staff from the Oregon and Utah RUC programs that explored and devised more cost effective approaches for collecting RUC. Based on these research activities, 10 mini-pilot concepts have been identified for small-scale testing in 2022.

Wyoming

Table 21. Projects awarded under the STSFA program in Wyoming

Fiscal Year	Amount Granted	Objective(s)
2019	\$250,000	Assess the feasibility of using IFTA data and processes to create a truck MBUF for Wyoming. Develop MBUF functionality and revenue potential by creating a truck-based user fee that uses existing data and processes.

Program Approach and Design

WYDOT originally proposed a project to study an RUC for IFTA trucks that would focus on major interstate traffic within the State. The project proposed to use mileage data already reported by these motor carriers to assess an RUC. WYDOT staff determined the truck-only approach was problematic because of stakeholder perception and legal concerns that the strategy would not comply with the concept of fairness in which all users would be charged an equitable amount. WYDOT expanded the scope of the pilot to include an RUC program that would include all types of vehicles. The proposed project explored rates, possible methods to collect intrastate truck data and other details to be included in a final action plan in consultation with trucking companies, the energy industry, the public, and other stakeholders.

Status

As of July 2021, the Wyoming RUC project had accomplished the following:

WYDOT established a working group in December of 2019 to review funding options and provide recommendations back to the Joint Transportation Commission (JTC). Between December 2019 and April 2020, the WG considered 54 options and determined that only 9 were feasible. In March 2020, WYDOT hired a consultant team to provide consulting services, technical expertise, and developmental studies to aid in organizing an alternate revenue funding program. The team began to educate members of the WG about how an RUC works at scheduled meetings. The JTC directed the department to pursue RUC program recommendations.

In November 2020, the WG provided JTC recommendations for changes to the RUC legislative bill, through House Bill 0037, which was provided to the State House of Representatives in early 2021.

On March 8, 2021, House Bill 0037 was not considered for introduction and no further action will be taken on the bill this session. The project is currently on hold while policymakers consider their options. WYDOT will continue to monitor the situation, adapt as directed, and keep the FHWA informed.

CONCLUSIONS: KEY LESSONS LEARNED

- Challenges remain in identifying potential transition paths from the current fuel tax-based system of revenue collection to a mileage-based user fee system and whether such transitions will involve replacing gas taxes entirely or supplementing them. A question remains about what impact the transition to mileage-based systems could have in States that have issued bonds against expected future gas tax receipts.
- Questions remain about setting per-mile road-user-charge rates to accomplish established policy goals, and what Federal agencies might be involved in estimating those rates.
- Equity issues may need to be examined and analyzed to provide clarity on actual, potential, and perceived equity issues. While national studies would be instructive, they may not be persuasive for stakeholders at the local level.
- There is more work to be done to account accurately for interstate travel in areas where routes frequently cross multiple jurisdictional boundaries (e.g., the Interstate 95 corridor along the east coast).
- It may be useful to design a national repository to house lessons learned and other knowledge gained from the independent RUC pilots and to make such knowledge easily accessible.
- States conducting pilots have identified the need to communicate progress in RUC explorations to elected officials.
- Hosting national level RUC forums would be beneficial to increase awareness about what is happening with the State pilots.
- There is not agreement yet on whether standardized terminology across the country is desirable, but the conversation is raised often. Terms varied across the multiple demonstration sites and included the use of “mileage-based user fees (MBOFs),” “distance-based user fees (DBUFs),” “road-user charges (RUC),” and “vehicle miles traveled (VMT) tax,” among others. Using differing terminology can impact the public perception and acceptance of the programs and may not be ideal for interoperability between jurisdictions, particularly across State boundaries. Furthermore, in the Oregon program, the term “interoperability” is used to refer to both managing of operations across jurisdictional/State boundaries as well as the convergence of MBOF and other transportation pricing such as parking and transit.

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April 2023
FHWA-HOP-22-90