



Next Generation Funding for Minnesota's Roads and Bridges

# Distance-Based Fee Demonstration Project

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***Association of Minnesota Counties, 2020***

# DBF Project Overview

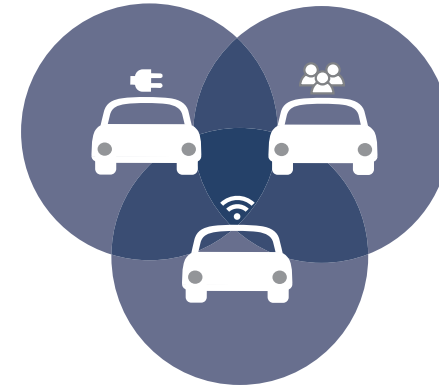
- Minnesota's experience with road user fees
- Project is focused on testing road user fees with Shared Mobility (Car-sharing) fleets and Automated Vehicles (AV)
- Developing a Rate Setting Framework
- Guided by DBF Technical Advisory Committee

# Many Names for the Same Thing

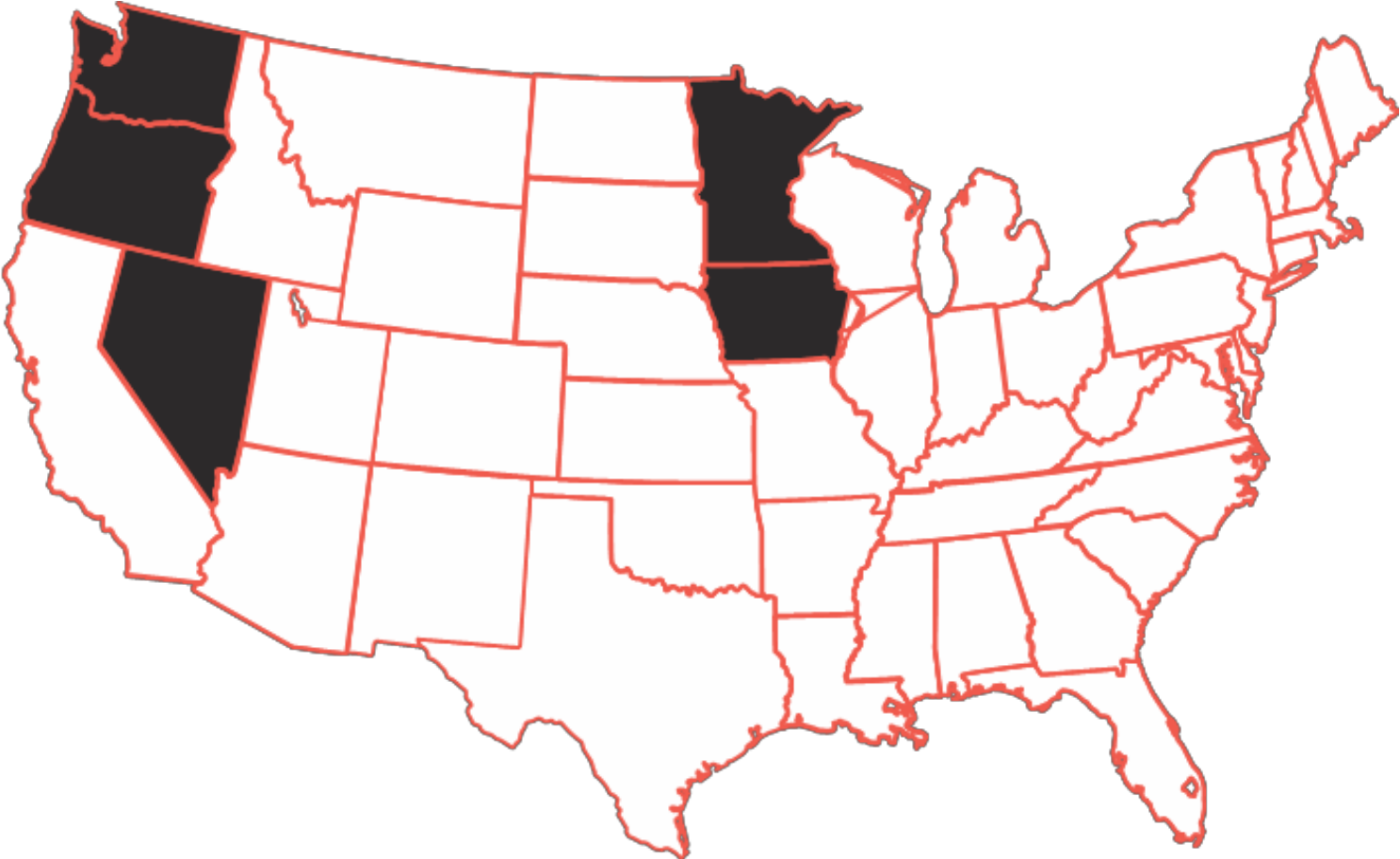
- Distance Based Fees (DBF)
- Mileage Based User Fees (MBUF)
- Road User Charges (RUC)
- Vehicle Miles of Travel (VMT) Fees
- *All are based on the principle that users should contribute a fair share for infrastructure costs on a per use basis*

# DBFs: What are the driving forces?

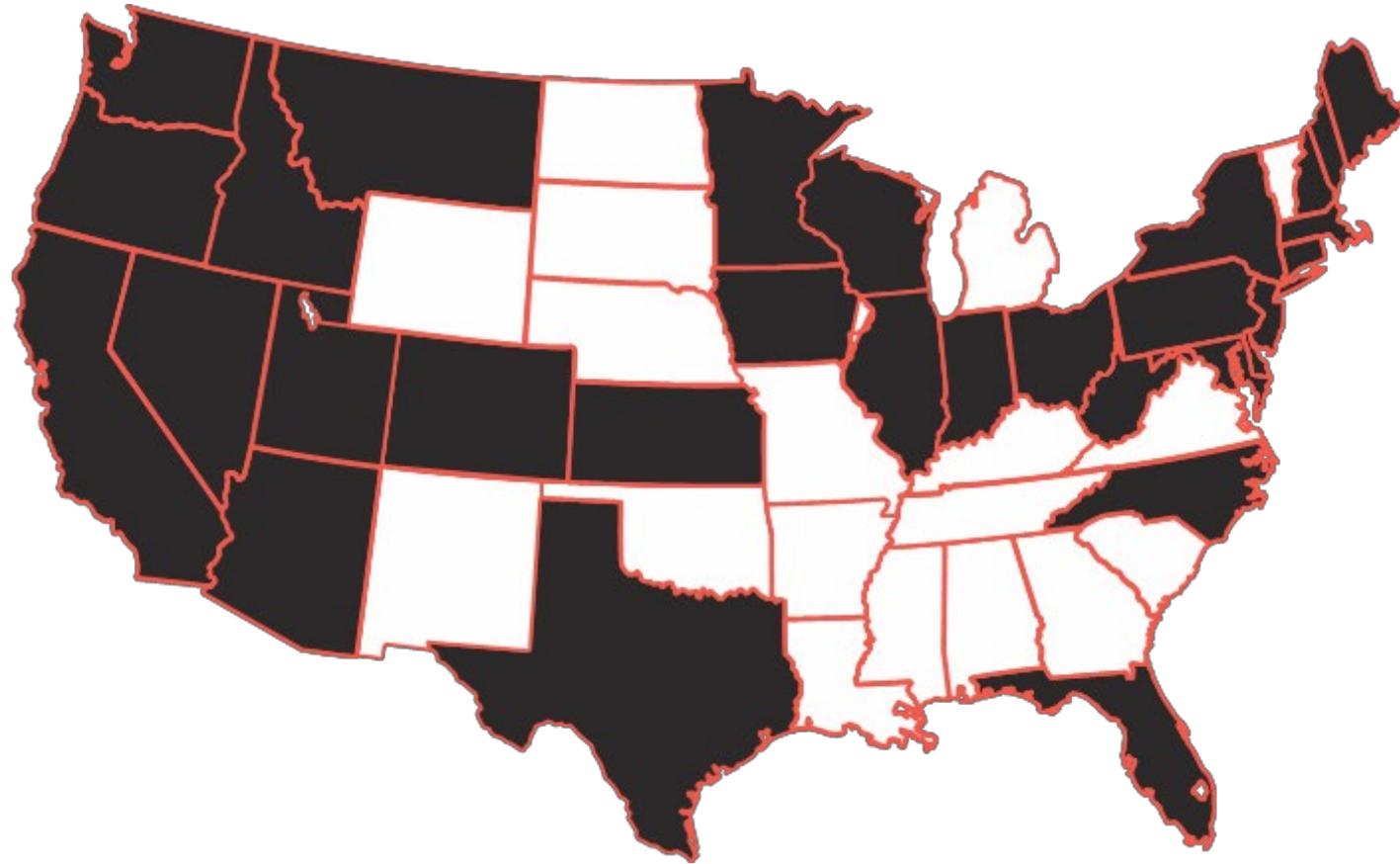
- Societal and Industry Trends
  - Increasingly efficient vehicles
  - Electric / Automated / Shared Mobility
- Congress has incentivized states to be the laboratories for DBF trials
  - Ensure long term sustainability of the Federal Highway Trust Fund
- Supported by MN State Legislature
- Trials and deployments in U.S.
- International, Europe and NZ



# States Exploring a Road Charge in 2010



# States Exploring a Road Charge in 2019



# Minnesota's Road User Fee Experience

- Pay-As-You Drive; Demonstration 2006
- Public Acceptance of Road User Charges; Customer Outreach 2010
- Minnesota Road Fee Test; Demonstration 2013
- Transportation Futures: 2016 Research, University of Minnesota
- <http://www.dot.state.mn.us/mileagebaseduserfee/pdf/EvaluationFinalReport.pdf>

# What have we learned from our research and deployments?

- Data privacy and security is paramount
- Collection costs
- Rate setting framework
- Scalability
- Complexity
- Evasion
- Equity
- Be nimble: Plan for an uncertain future



# Minnesota's DBF Demonstration Objectives

- Prove that on-board embedded technology in Shared Mobility (car-sharing) fleets and Automated vehicles can be used to efficiently and effectively collect distance based fees.
- Develop a DBF rate-setting frame work that conforms with accepted tax principles of
  - Equity
  - Efficiency
  - Adequacy
  - Feasibility

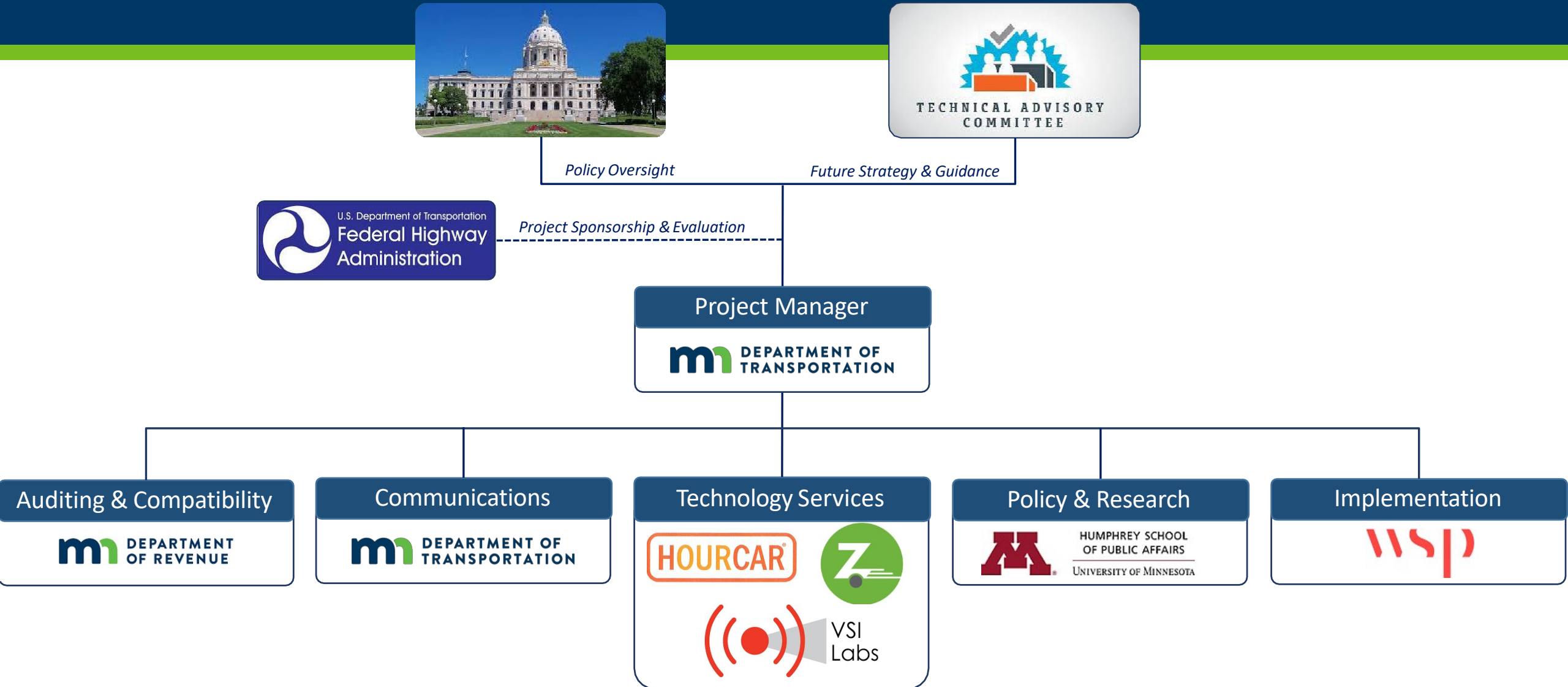
# Guiding Assumptions

- Automated vehicles, shared-mobility, electric vehicle are converging..., soon!
  - Vehicles are factory equipped with embedded telematics to enable fee collections
  - Tapping into that data is a hurdle
  - Blockchain and e-wallets
  - SM fleets are a testbed for future applications
  - Significantly reducing collection costs

# Guiding Assumptions

- Transportation authorities must prepare for a future with great uncertainty
  - There are many unknowns..., and unanticipated consequences
- Shared mobility (car-sharing) fleets are a transitional model for Road User Charges..., it is not the end game!
  - RUC collected at service provider level
  - Collections are at a central point
  - Data is aggregated to ensure privacy

# MN Distance Based Fee Demonstration Organization



# Charge to the DBF Technical Advisory Committee

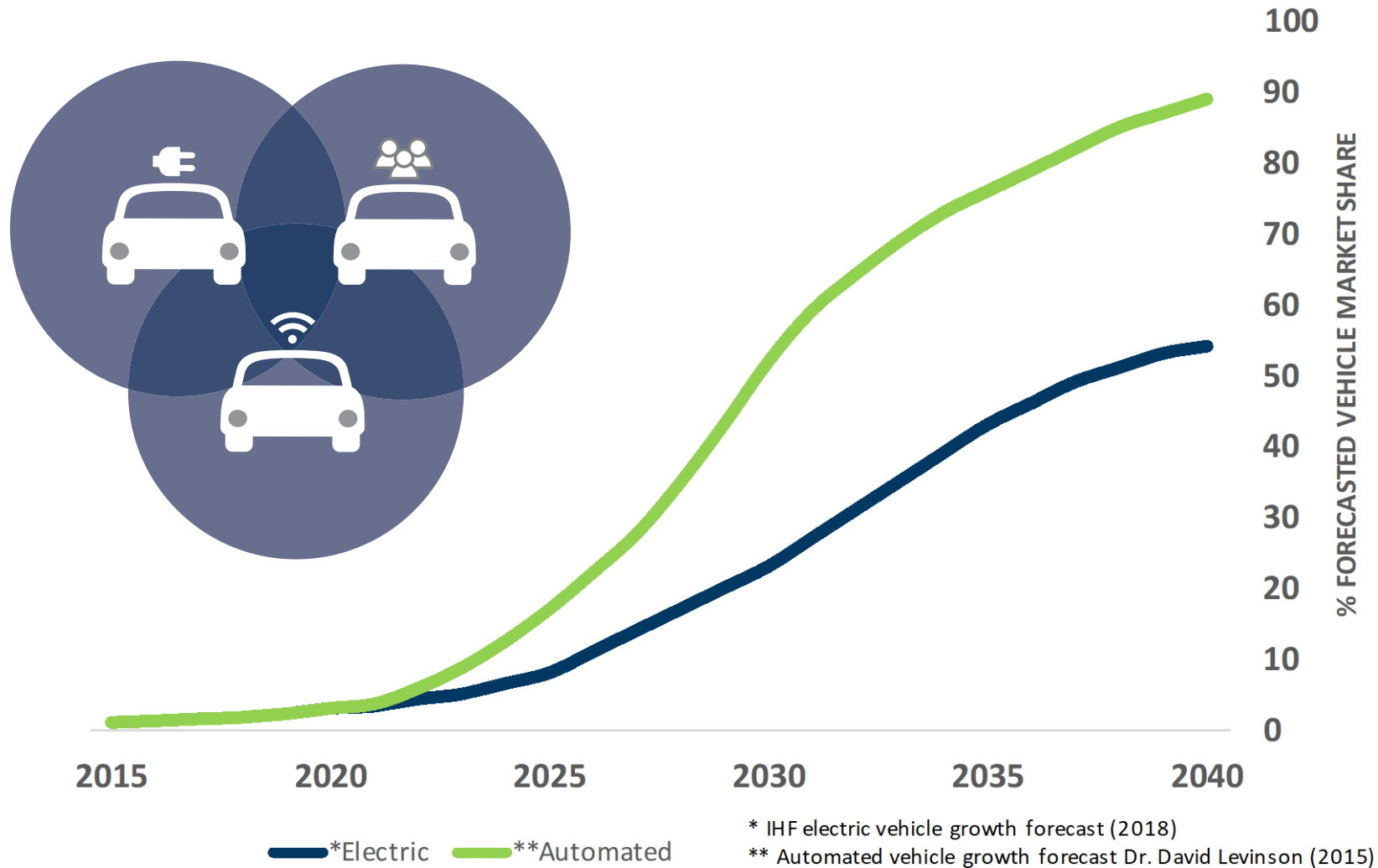
- Provide Advise and Guidance on Technical and Policy Issues to the Project Team and MnDOT
- Be an Informed Constituency in DBF Discussions with the Public and Policy Makers
- Help Ensure that the Project Contributes to the State and National Research Efforts

# Tax Evaluation Framework

Criterion	Sub-criterion	Current Fuel Tax System	Distance-Based Fee
Efficiency	Demand-side efficiency	Moderate	Strong
	Supply-side efficiency	Moderate	Strong
Equity	Benefit-received principle	Moderate	Strong
	Ability-to-pay principle	Moderate	Moderate
Adequacy	Revenue-raising capacity	Moderate	Moderate
	Revenue sustainability	Weak	Moderate
Feasibility	Political feasibility	Weak	?
	Administrative feasibility	Strong	?

Zhao et al. (2015). Revisiting the Fuel Tax-Based Transportation Funding System in the United States. *Public Works Management & Policy*. 20(2): 105-126.

# Convergence of Trends: Automation, Electrification & Sharing Growth

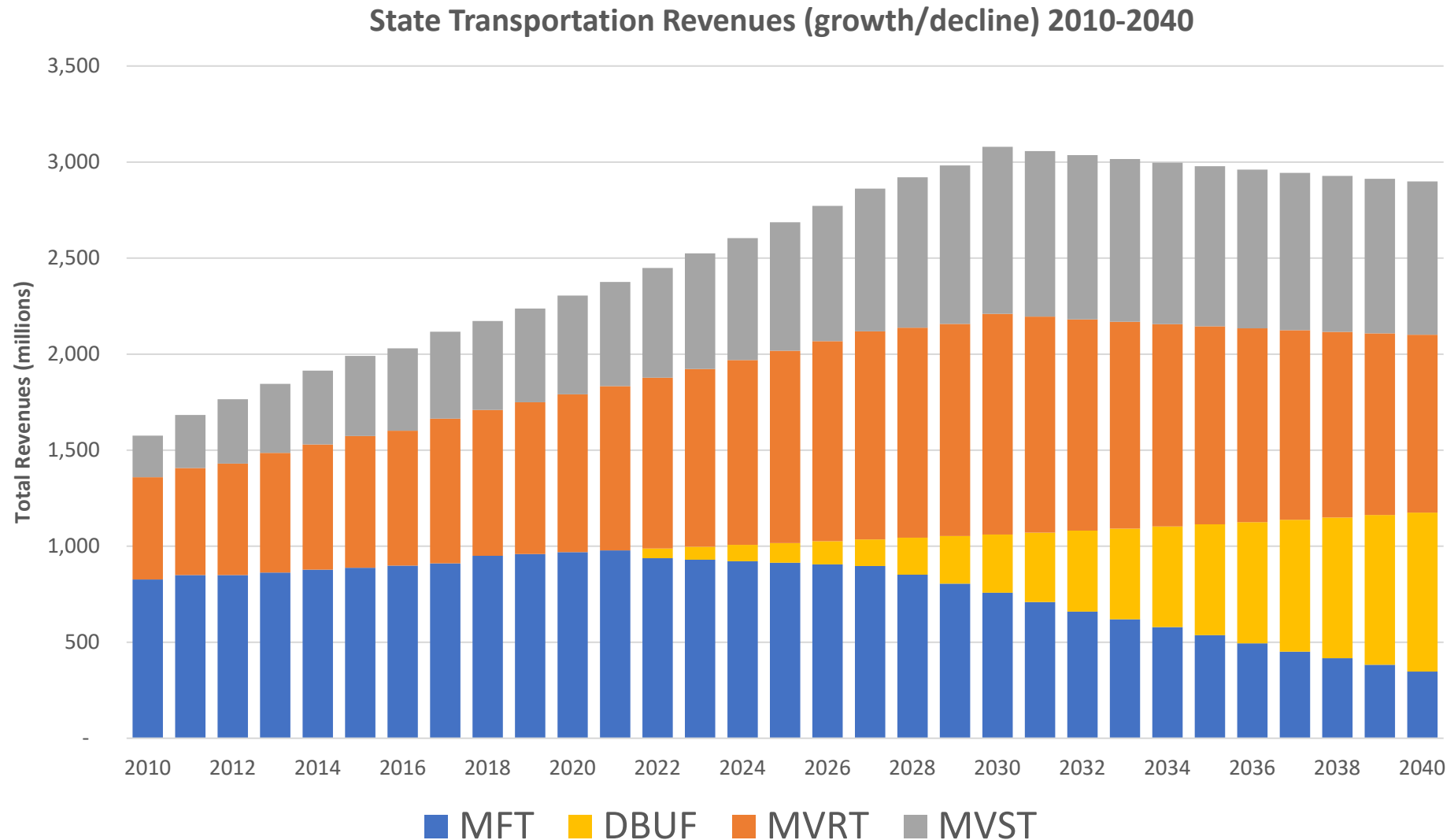


# Minnesota DBF Demonstration Principles

- The Motor Fuel Tax (still the primary source of highway revenue) remains in place
  - Establish clear goal
  - Operate two systems in parallel and with consideration for vehicle classification
  - Incremental and evolutionary path toward Road User Charges
- Minnesota's DBF demonstration is a loss aversion strategy
- The model represents a migration..., not a transformation



# DBF Begins to Backfills Lost MFT Revenue



# Why Demonstrate DBF with Car-Share Fleets and Automated Vehicles?

- Technology built in..., can't evade fees
- Car-Sharing platform is here today..., it systematically addresses a host of concerns
- Simple model that represents the future of new vehicles..., a testbed
- Willing partners, customer account managers
- **Efficiency in collection costs!!!**

# Demonstrating the Process

**Car-share vehicles on  
Minnesota Roads**

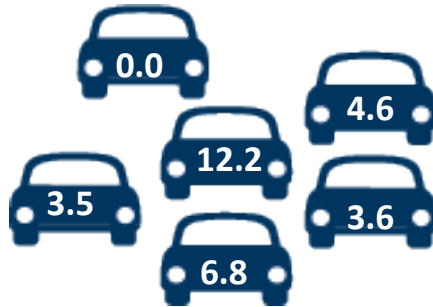


# Demonstrating the Process

Form car-share  
partnerships



Car-share company  
calculates distance  
traveled of all vehicles

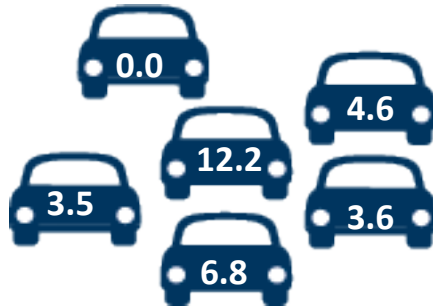


# Demonstrating the Process

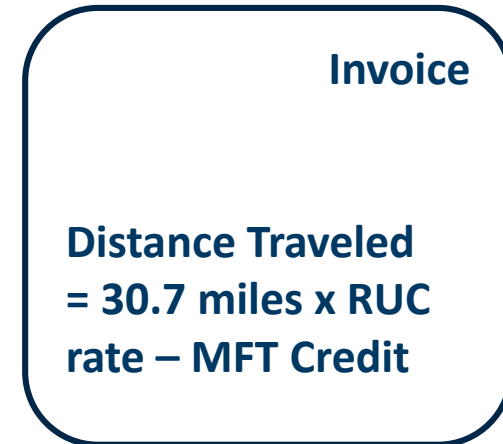
Calculate car-share vehicles on Minnesota Roads



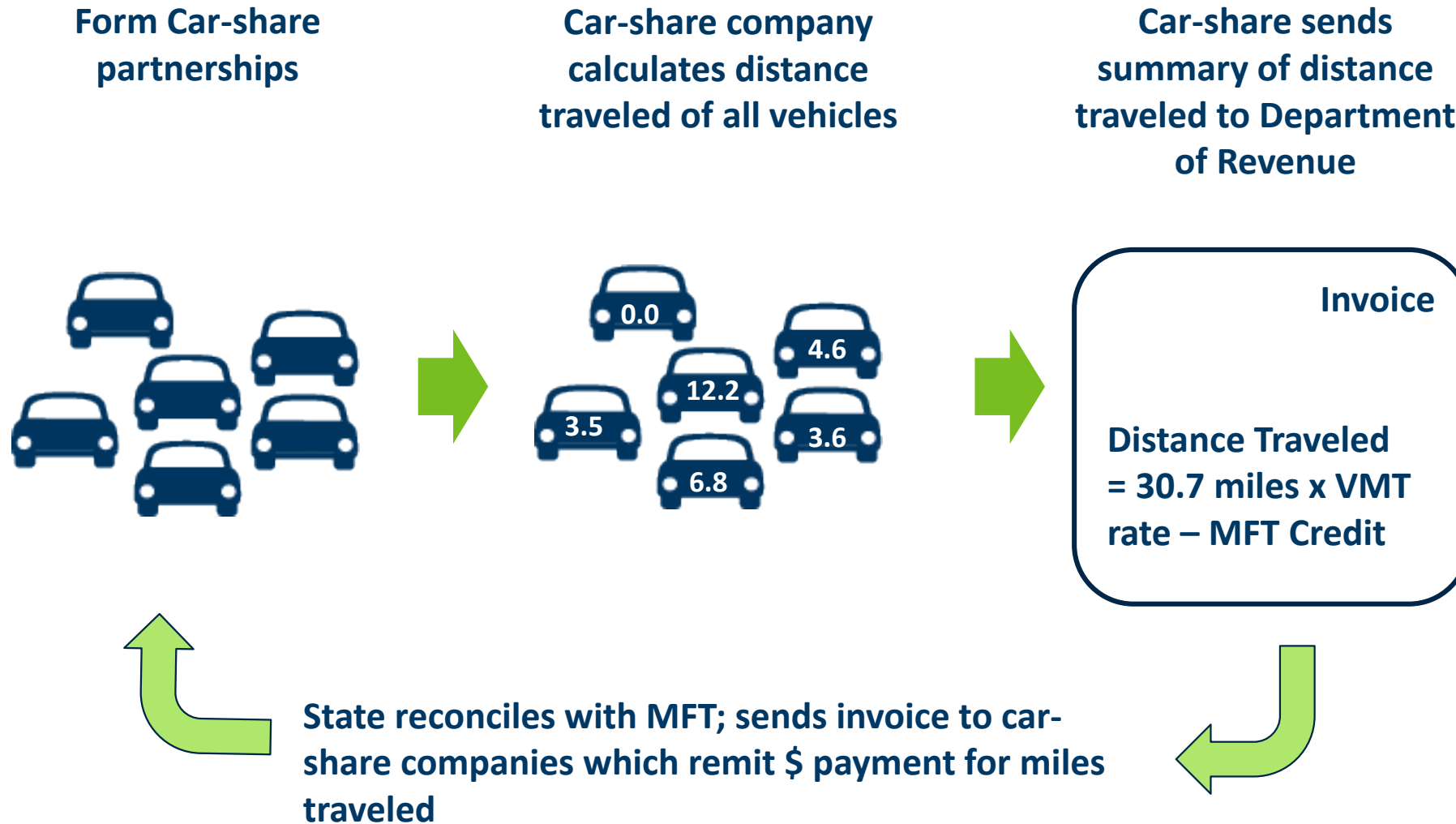
Car-share company calculates distance traveled of all vehicles



Car-share company aggregates data and sends summary of distance traveled to Department of Revenue



# Demonstrating the Process



# Advantages to this Approach

- Incremental adoption (migration not a transformation)
- Leverages an emerging and dynamic modal opportunity that may open doors to wider adoption, perhaps starting with other fleet applications
- Data already available on shared use vehicles
- Avoids many – but not all – privacy concerns related to individual vehicle ownership
- Allows the motor fuel tax to continue to perform where appropriate

# Challenges for Minnesota's DBF Demonstration

- This is not an immediate and universal path to implementation
- Revenue generation potential is unclear; will suffer same shortcoming as the motor fuel tax if implemented without indexing
- Requires added burden to shared mobility providers that must be accommodated in demo
- Requires added burden to administer at state and federal level
- Translate lessons: Maturity Model



# Next Steps Project Time Line

- Project Launch: April 2020
  - Phase I
  - Phase II
  - Phase III
- Data Collection Complete: March 2021
- Evaluation and Final Report: April-June 2021
- Nationally, we must have a Transition Plan







## THANK YOU

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