MINNESOTA DEPARTMENT OF TRANSPORTATION

MINNESOTA DISTANCE BASED USER FEE DEMONSTRATION PLAN

Business and System Requirements

VERSION 1.2

MARCH 2020

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DEPARTMENT OF TRANSPORTATION

REVISIONS

VERSION	DATE	CHANGES
1.0	01/31/2020	Initial Draft
1.1	02/19/2020	Revisions based on project team feedback
1.2	03/02/2020	Revisions to project goals language

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TERMS & ACRONYMS

AES	Advanced Encryption Standard
C/AV	Connected/Automated Vehicle
CFR	Code of Federal Regulations
ConOps	Concept of Operations
DBUF	Distance-Based User Fee
FCC	Federal Communications Commission
GAAP	Generally Accepted Accounting Principles
Humphrey School	University of Minnesota Humphrey School of Public Affairs
ICD	Interface Control Document
MnDOT	Minnesota Department of Transportation
NIST	National Institute of Technology and Standards
PCI-DSS	Payment Card Industry Data Security Standard
PII	Personally Identifiable Information
Research Partners	WSP USA and the University of Minnesota Humphrey School of Public Affairs
Revenue	Minnesota Department of Revenue
Revenue Report	A monthly report sent to Revenue showing simulated DBUFs for SM and C/AV Providers
SM	Shared Mobility
SP	Special Publication
SSL	Secure Socket Layer
State	Minnesota Department of Revenue and the Minnesota Department of Transportation
TLS	Transport Layer Security
Trip	Operational travel of a vehicle from one geographical location to another
Waypoint	A point on a vehicle's travel route, represented in longitudinal and latitudinal coordinates

1 DEMONSTRATION OVERVIEW

The Minnesota Department of Transportation (MnDOT), in partnership with the Minnesota Department of Revenue (Revenue) and its Research Partners, the University of Minnesota, Humphrey School of Public Affairs (the Humphrey School) and WSP USA, will conduct a 12-month Distance-Based User Fee (DBUF) demonstration to confirm the ability to accurately and securely collect travel data from Shared Mobility (SM) providers' vehicle fleets and Connected and Automated Vehicles (C/AV) to assess a DBUF for use of the roads.

During the demonstration, SM Providers will collect mileage, location, and fuel consumption (if applicable) information from participating vehicles. The SM Providers will sanitize and aggregate the data for each vehicle, calculate the assessed DBUF, subtract the state and federal motor fuel tax based on the number of gallons of fuel consumed, and then present a simulated financial report to the state that shows the net DBUF charges due. The report will be sent electronically in a predefined format via a predefined transmission method to Revenue, who will review for accuracy, assess the charges, and conduct a mock audit(s) as necessary to validate the information provided by the SM Provider. All DBUFs assessed will be simulated over the course of the demonstration. SM Providers will continue to collect monies from their customers as part of their normal business operations.

The demonstration will also evaluate the feasibility of collecting DBUF-related data from a Connected/Automated Vehicle (C/AV). MnDOT and its partners will collaborate with a C/AV Researcher to conduct phased data collection for evaluation of various DBUF pricing scenarios such as time-of-day pricing and location-based pricing. The C/AV also provides a robust dataset that could be used to explore other potential uses of collected data such as supporting transportation planning and modeling and overall performance monitoring and management of Minnesota's transportation network.

An evaluation will be conducted on the 12-month demonstration to assess how well the demonstration met objectives, challenges that had to be overcome, the potential to deploy this model on a broader scale, and policy recommendations for Minnesota State Legislature to consider.

1.1 GOALS

The DBUF demonstration is intended to confirm that DBUFs can be efficiently and effectively collected using vehicle technology embedded in SM fleet vehicles and C/AVs. Successful completion of the demonstration will validate or invalidate the ability of DBUF to meet the following goals:

- **Fairness**: Ensures all road users subject to a DBUF pay a fair share for use of the roads;
- **Public acceptance**: If DBUFs are viewed as a solution, more travelers will support it;

- **Privacy protection**: Stringent security protocols must protect personal information;
- **Ease of payment and collections**: A system with low administration costs that uses existing technologies;
- **Transparency**: Use and fee data are readily accessible as needed;
- **Low evasion rates**: Vehicle-embedded technology and encrypted transmission ensures low avoidance; and
- **Scalability**: DBUFs should be incrementally implemented.

1.2 OBJECTIVES

Specific objectives to meet the goals of the demonstration are:

- Develop a scalable, secure and transferable approach to user-based fees that can be adopted widely and cost-effectively;
- Leverage partnerships with SM Providers to demonstrate simulated DBUF collections with existing onboard technologies that minimize collection and enforcement costs, as well as enhance user privacy and equity;
- Demonstrate how DBUF accounts from SM Providers could be seamlessly integrated into existing Minnesota financial reporting, auditing, and enforcement systems;
- Confirm reliability and security of SM Providers data and financial systems, and potential for integration with state fee collection systems;
- Explore ways the nexus between connected and automated vehicles (C/AV), vehicle electrification, and SM ownership models can be used to promote a more sustainable transportation funding mechanism;
- Through targeted messaging and outreach, educate Minnesota's public and policymakers as to the decline in transportation funding, shared mobility's contribution to the problem, and how SM providers can be incorporated within a collaborative DBUF solution;
- Establish appropriate pricing structure for various parameters, such as vehicle classes, times of day, and other variables; and
- Develop a blueprint that charts a path forward to validate the feasibility of distance-based user fees.

1.3 FUNCTIONAL ARCHITECTURE

During the demonstration, the SM Providers will collect and transmit data to their respective proprietary data repositories, process and aggregate the data, and transmit simulated Revenue Reports to the State. The SM Providers will also send lower-level aggregate data to a secure data repository for research partner analysis. Additionally, the C/AV Researcher will conduct focused tests, collect and process travel data from the C/AV, and transmit the data to the demonstration's third-party data repository for analysis.

During the demonstration, the MnDOT and its partners will work closely with the SM Providers to progressively move towards this final end state demonstration functional architecture, with three stages of demonstration operations and communications channels for phased development of interfaces, Revenue Report design, and validation checkpoints.

- ***Stage 1 – No Formal Reporting*** (~4 months): SM providers will sanitize and aggregate collected travel data on a monthly basis and transmit the datasets to the third-party data repository. Simulated financial reporting to the State, using the information provided by the SM providers, will be conducted by MnDOT's research partners, the Humphrey School and WSP USA. During this stage, the research partners will work with the State and SM providers to develop the Revenue Report template to be used in subsequent stages. The State may conduct initial mock audit inquiries with SM Providers, based on aggregated data transmitted. The Research Partners will conduct analyses on transmitted data. See Figure 1, Minnesota DBUF Phased Demonstration Architecture – Stage 1 No Formal Report, below for a process diagram.

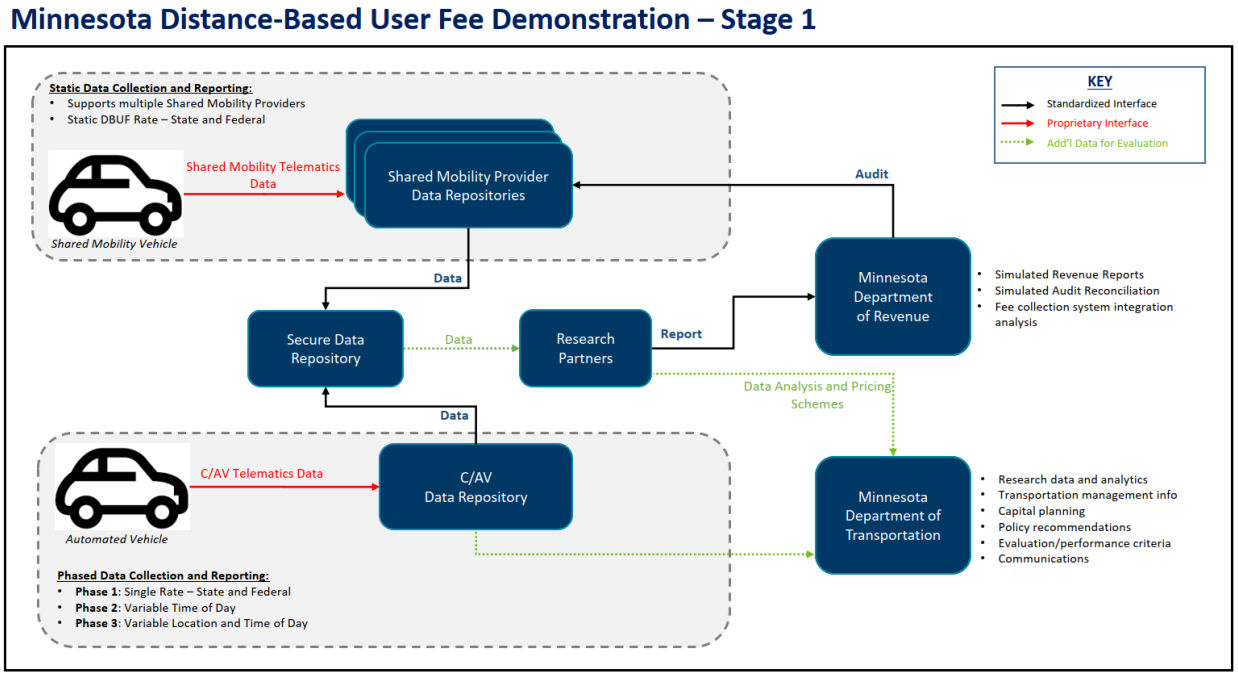

Figure 1: Minnesota DBUF Phased Demonstration Architecture – Stage 1 No Formal Reporting

- ***Stage 2 – Initial Revenue Reporting*** (4 months): SM providers will sanitize and aggregate collected travel data on a monthly basis and transmit the datasets to the third-party data repository. SM providers will also assess DBUF and fuels tax rates to the collected travel data, generate a Revenue Report (using the template designed in Stage 1) and transmit the report to the third-party data repository for validation by the research partners. The C/AV Researcher may generate datasets for use in simulated Revenue Reporting. The State may conduct initial mock audit inquiries with SM Providers, based on aggregated data transmitted. The Research Partners will conduct analyses on transmitted data. See Figure 2, Minnesota DBUF Phased Demonstration Architecture – Stage 2 Initial Revenue Reporting, below for a process diagram.

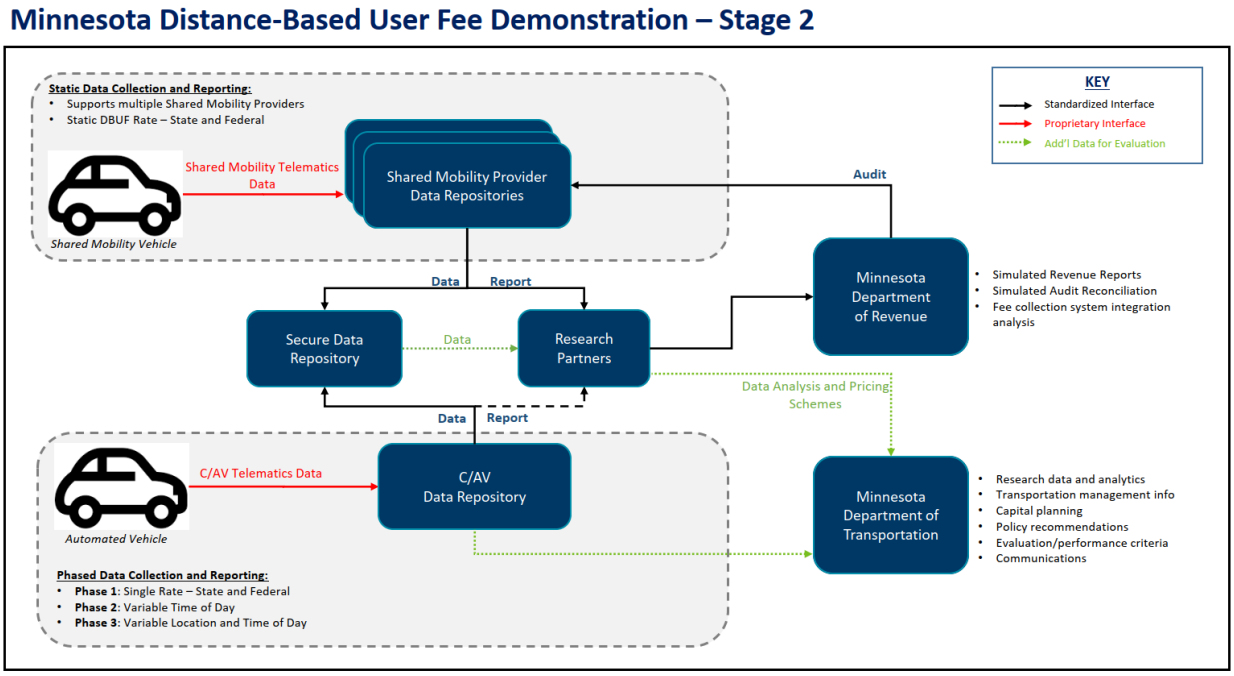

Figure 2: Minnesota DBUF Phased Demonstration Architecture – Stage 2 Initial Revenue Reporting

- ***Stage 3 – Final Revenue Reporting*** (4 months): Each month, SM and C/AV Providers will sanitize and aggregate collected travel data and transmit the datasets to the third-party data repository. SM and C/AV Providers will also assess DBUF and fuels tax rates to the collected travel data, generate a Revenue Report and transmit the report to Revenue directly for simulated tax reporting, mock auditing, and demonstration evaluation purposes. The C/AV Researcher may generate datasets for use in simulated Revenue Reporting. The Research Partners will conduct analyses on transmitted data. See Figure 3, Minnesota DBUF Phased Demonstration Architecture – Stage 1 Formal Revenue Reporting, below for a process diagram.

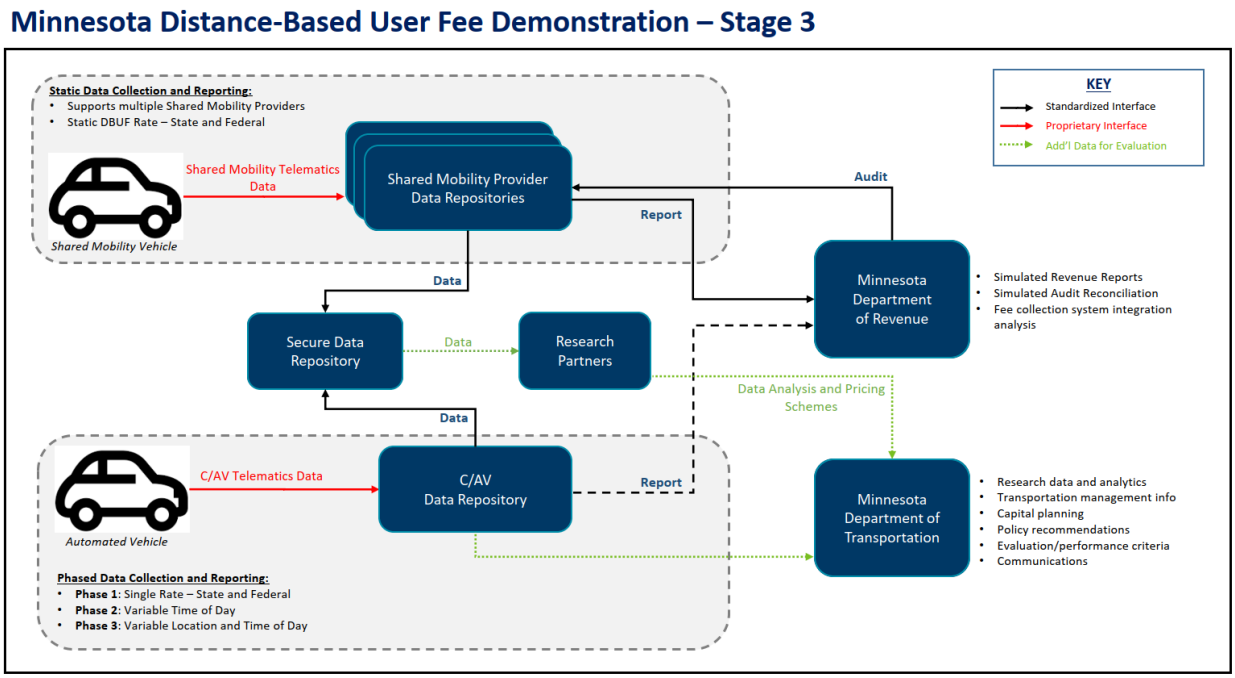

Figure 3: Minnesota DBUF Phased Demonstration Architecture – Stage 3 Formal Revenue Reporting

1.4 PROJECT DOCUMENT REFERENCES

Additional documents should be referred to for overall demonstration details:

- A Concept of Operations (ConOps) that provides demonstration needs and objectives, stakeholders, roles & responsibilities, and the operational and administrative scenarios for the demonstration.
- An Interface Control Document (ICD) which defines how demonstration systems communicate with one another, including communications protocols, data fields, format, and frequency.

2 REQUIREMENTS

Requirements detail ***what*** the system must do, and ***how*** the system is expected to perform those functions. The requirements for this project are broken down to disaggregate the system into its individual components, to support verification of how each component functions on its own as well as how it interacts with other components. Requirements will be broken down, as follows, to allow for validation at varying levels of the system:

- Operational Process
    - Activity
        - Requirement

The demonstration is divided into three main operational processes:

- **Data Collection:** The collection of mileage, fuel and related travel data from participating vehicles. SM Providers will collect and report data no less than monthly during the demonstration. C/AV data will include additional, more detailed travel and location data for data analyses.
- **Data Processing:** The processing of collected mileage, fuel and related travel data into logical transactions. SM Providers will sanitize and aggregate collected data prior to transmitting the data to the State (or its representatives).
- **Data Reporting:** Calculation of DBUF and applicable fuels tax credits, net DBUF owed, and formal (simulated) reporting to Revenue. A mock audit will be conducted on SM Provider reports by the State (or its representatives) to investigate feasibility and applicability to current or future tax system integration.

Each Operational Process will then contain its own set of activities and requirements. Overarching system specifications are also defined in this section that apply to all systems, subsystems, components and processes to be used to operate the demonstration.

Whether the requirement applies to SM Providers, the C/AV Researcher, or both is identified for each requirement.

2.1 REQUIREMENT NAMING CONVENTIONS

Each requirement is coded according the abbreviation of the defined operational process and activity, and numerical requirement index number, using the following format:

<operational abbreviation>.<activity abbreviation>.<requirement index>

Example: *Data Collection* > *Trip Data* > *Requirement # 1* = **DC.TD.1**

2.2 OVERARCHING SYSTEM SPECIFICATIONS

The system, as defined for the purposes of this demonstration, includes all subsystems, operational processes, activities, components and functions of SM and C/AV Providers, Research Partners and the State needed to successfully operate the demonstration. The overarching need for the State is a reliable DBUF system that accurately collects, assesses, and transfers DBUF from participating vehicles to the State, accurately and cost effectively. To meet this need, the demonstration system shall:

- Be secure
- Protect data privacy
- Be reliable and available
- Be auditable
- Promote safe and reliable operations

System specifications apply to all aspects of the demonstration system, and meet or exceed industry standards and applicable federal and state laws.

System Need: Security

REQ #	DESCRIPTION	SM	C/AV
SN.SEC.1	An Information Systems Management Plan shall be maintained that includes policies, processes and procedures for managing security, privacy, confidentiality, availability and processing integrity of systems and data to be used for or impact the demonstration.	X	X
SN.SEC.2	Physical security measures shall be in place to protect against unauthorized entry and/or access to demonstration data.	X	X
SN.SEC.3	Restricted level (or higher) demonstration data shall be encrypted at rest with AES 256-bit encryption or stronger.	X	X
SN.SEC.4	Demonstration data shall be encrypted in-transit with AES 256-bit encryption or stronger.	X	X
SN.SEC.5	Demonstration data stored on or made available to access using web-based methods shall secure the data using current TLS/SSL protocols (currently TLS 1.3 and SSL 3.0). This includes data upload and download; account creation, login, and maintenance; and data access using the web-based method.	X	X
SN.SEC.6	User accounts established to access demonstration data shall use, at a minimum, NIST guideline SP 800-63B (Dec 2017) for electronic authentication requirements.	X	X

REQ #	DESCRIPTION	SM	C/AV
SN.SEC.7	Systems used to collect, store, and/or transmit demonstration data shall have network security systems and processes operating and enforced. Network security systems and processes include, but may not be limited to: • Intrusion Detection Systems • Intrusion Prevention Systems • Network Firewalls • Firewall and Packet Monitoring • Anti-Virus Software • Anti-Malware Software	X	X

System Need: Data Privacy and Protection

REQ #	DESCRIPTION	SM	C/AV
SN.DPP.1	Access to demonstration data and systems storing demonstration data shall be restricted using role-based access controls, using the principle of least privilege.	X	X
SN.DPP.2	Personally Identifiable Information (PII) shall be defined in accordance with the U.S. General Services Administration Privacy Program Privacy Act. https://www.gsa.gov/reference/gsa-privacy-program/rules-and-policies-protecting-pii-privacy-act	X	
SN.DPP.3	Information Asset Classification levels shall be defined for all demonstration data, with PII classified at no less than a "restricted" level. A "restricted" level shall be defined, at a minimum, as highly sensitive or valuable information, considered proprietary and/or personal. Restricted data shall be disclosed only to authorized personnel and entities, and shall be protected using, at minimum, authentication guidelines as defined in NIST guideline SP 800-63B (Dec 2017).	X	X
SN.DPP.4	PII shall be sanitized from demonstration datasets prior to transmission to the State, including the secure, third-party data repository hosted by the State or its Research Partners.	X	X
SN.DPP.5	The system shall provide a means to detect and report unauthorized access and/or changes.	X	X
SN.DPP.6	The system shall comply with Minnesota Statute 325E.61, data warehouses; notice required for certain disclosures, subdivision 1 disclosure of personal information and notification of data breach. https://www.revisor.mn.gov/statutes/cite/325E.61	X	X

System Need: Reliability and Availability

REQ #	DESCRIPTION	SM	C/AV
SN.RAV.1	The system shall have high availability, with no less than 99.9% uptime in a given month during the demonstration. System uptime calculations do not include scheduled maintenance or situations outside the system's (or administering entity) control.	X	X
SN.RAV.2	Maintenance outages or other scheduled downtime of demonstration systems shall be scheduled when the downtime or outage is least likely to impact demonstration data collection, processing and retention.	X	X
SN.RAV.3	The system shall maintain regular backup and recovery processes to prevent demonstration data loss.	X	X
SN.RAV.4	The system shall contain redundancy where practical to prevent demonstration data loss.	X	X

System Need: Auditability

REQ #	DESCRIPTION	SM	C/AV
SN.AUD.1	Demonstration-specific data shall be retained for the duration of the demonstration for auditing purposes. *Note: Upon identification of conflict between compliance with this requirement, and compliance with data purge requirements for PII-related data and applicable laws, SM Providers shall coordinate with project team to assess to determine best course of action.*	X	X
SN.AUD.2	Demonstration-specific data shall be purged from SM Provider systems not later than one calendar month following completion of the final month of the demonstration operations period.	X	X
SN.AUD.3	Demonstration-specific data stored in the secure, third-party data repository shall be purged from the repository not later than 90 calendar days following completion of the demonstration operations period.	X	X
The following financial transaction requirements are to validate SM Provider live operations' compliance with applicable financial standards, confirming scalability for a future DBUF program handling real monies.			
SN.AUD.4	The SM Provider shall provide proof of compliance with industry security standards required for the payment options provided. *Example: Compliance with Payment Card Industry Data Security Standards (PCI-DSS) is required for credit and debit card transactions.*	X	
SN.AUD.5	The SM Provider shall prove compliance with Generally Accepted Accounting Principles (GAAP) for aspects of the demonstration system that handle financial transactions and accounting.	X	

System Need: Safe and Reliable Operations

REQ #	DESCRIPTION	SM	C/AV
SN.SRO.1	Systems and technologies used to collect demonstration data from participating vehicles shall not compromise the safe operation of the vehicle.	X	X
SN.SRO.2	Systems and technologies used to collect demonstration data from participating vehicles shall not compromise the safety of vehicle operators or passengers.	X	X
SN.SRO.3	Systems and technologies used to operate the demonstration shall not compromise SM Provider's normal business operations.	X	X
SN.SRO.4	Communications protocols used to collect and transmit demonstration data shall be compliant with Title 47 of the Code of Federal Regulations (CFR) and other applicable Federal Communications Commission (FCC) regulations.	X	X

2.3 DATA COLLECTION

The Data Collection operational process leverages the SM Provider's and C/AV Researcher's existing systems and technologies to collect relevant travel data from participating vehicles and transmit the data to the SM Provider's and C/AV Researcher's internal data repository for further processing. The Data Collection operational process includes several key activities:

- Prepare Vehicle
- Collect Trip Data
- Collect Location Data (*where applicable)*
- Collect Fuel Purchase Data (*where applicable*)
- Transmit Collected Data for Processing
- Report Errors and Events

The frequency of these activities is dependent on the SM Provider's and C/AV Researcher's individual implementation, but must occur at least monthly during the demonstration.

Activity: Prepare Vehicle

REQ #	DESCRIPTION	SM	C/AV
DC.PV.1	Each participating vehicle shall have a mechanism to collect trip data.	X	X
DC.PV.2	The vehicle, or a mechanism used to collect trip data from the vehicle, shall have storage and communications capabilities to prevent loss of trip data collected, even after periods of disrupted communications.	X	X
DC.PV.3	A unique vehicle identifier shall be assigned to each participating vehicle.	X	X

Activity: Collect Trip Data

REQ #	DESCRIPTION	SM	C/AV
DC.TD.1	Trip data shall be delineated by vehicle.	X	X
DC.TD.2	A unique trip identifier shall be assigned to the data collected on each discrete trip.	X	X
DC.TD.3	Trip data collected shall include, at minimum, the associated vehicle, the mileage travelled, and the associated trip start and end date and time.	X	X
DC.TD.4	Mileage collected for a participating vehicle shall be calculated within -/+5% of the actual miles traveled of the participating vehicle.	X	X
DC.TD.5	The amount of miles traveled shall be recorded to a precision of 1 decimal place (i.e. 4.1 miles).	X	X
DC.TD.6	The time at which the mileage measurement is captured (at the start of the trip, end of trip, or at any point during the trip) shall be captured at a minimum to the precision of minutes, with an accuracy of -/+30 seconds.	X	X

REQ #	DESCRIPTION	SM	C/AV
DC.TD.7	Trip data shall be collected for each discrete trip taken by a participating vehicle.	X	X
DC.TD.8	Trip data shall be collected at the same frequency at which location (waypoints) data is collected.		X

Activity: Collect Location Data

REQ #	DESCRIPTION	SM	C/AV
DC.LD.1	Detailed location data shall be collected to provide the specific geographic coordinates of waypoints on each trip in latitudinal and longitudinal decimal degrees to a precision of five (5) decimal places (i.e. 0.00001).		X
DC.LD.2	Waypoints shall be collected at a frequency of one point per second.		X
DC.LD.3	If location data is collected independently from the trip data, the data must be assigned appropriate identifiers to enable linkages back to the corresponding vehicle and trip identifiers.		X
DC.LD.4	Vehicle origin and destination location shall be collected for each vehicle, to include street address, city, state and postal code.	X	

Activity: Collect Fuel Purchase Data

REQ #	DESCRIPTION	SM	C/AV
DC.FPD.1	Fuel purchase data will be collected for each participating vehicle.	X	X
DC.FPD.2	Fuel purchase data must be associated with a specific vehicle participating in the demonstration, referenced through the unique vehicle identifier.	X	X
DC.FPD.3	Fuel purchase data shall include, at a minimum, the amount of fuel purchased, the type of fuel purchased, the price per gallon at the time the fuel was purchased, the total purchase price of the fuel, and the date and time at which the fuel purchase is made.	X	X
DC.FPD.4	The amount of fuel purchased shall be recorded in gallons, to a precision of 3 decimal places (i.e. 13.649 gallons).	X	X
DC.FPD.5	The price per gallon for the fuel purchased shall be recorded in dollars ($) per gallon, to a precision of at least 2 decimal places, and up to 3 decimal places where possible.	X	X
DC.FPD.6	The total purchase price for the fuel purchased shall be recorded in dollars ($), to a precision of 2 decimal places.	X	X
DC.FPD.7	The time at which the fuel purchase is made shall be recorded to a precision of minutes.	X	X

Activity: Transmit Collected Data

REQ #	DESCRIPTION	SM	C/AV
DC.TCD.1	Trip data collected from participating vehicles will be transmitted to the respective SM Provider's / C/AV Researcher's data repository.	X	X
DC.TCD.2	Fuel purchase data collected for participating vehicles shall be transmitted to the respective SM Provider's / C/AV Researcher's data repository.	X	X
DC.TCD.3	Trip and fuel purchase data collected for participating SM vehicles shall be transmitted to the SM Provider's data repository at least monthly for each participating vehicle.	X	
DC.TCD.4	Trip data shall be transmitted to the C/AV Researcher's data repository at the completion of each trip for each participating vehicle.		X
DC.TCD.5	Fuel purchase data collected for participating C/AVs shall be transmitted to the C/AV Researcher's data repository at least monthly for each participating vehicle.		X
DC.TCD.6	The transmitted trip and fuel purchase data shall be formulated/processed into logical sets of records (e.g. by vehicle, by trip).	X	X
DC.TCD.7	Transmitted data shall be delineated by vehicle.	X	X

Activity: Report Errors and Events

REQ #	DESCRIPTION	SM	C/AV
DC.EE.1	Errors or events that occur during data collection and transmission that may affect or compromise the accuracy and completeness of the data shall be documented. This may include, among others: - Data collection device malfunctioning, being disconnected, or turned off - Software updates - Anomalies in vehicle function	X	X
DC.EE.2	Errors and events reported shall include the date and time at which the incident occurred to enable validation of data records.	X	X
DC.EE.3	Errors and events reported shall indicate the specific nature of the error or event, as well as the cause of the error or event where possible.	X	X
DC.EE.4	Errors and events reported shall be associated to the appropriate vehicle and trip record according to the unique vehicle identifier and unique trip identifier.	X	X

2.4 DATA PROCESSING

The Data Processing operational process leverages SM Provider's and C/AV Researcher's existing processes to receive data from vehicles, validate and process the data into transactions, and use the transactions to sanitize and aggregate the data for transmission to the DBUF demonstration third-party repository for simulated revenue reporting and analyses. The Data Processing operational process includes the following key activities:

- Receive transmitted data
- Assign data to vehicle
- Process into transactions
- Validate data (logic checks)
- Sanitize data of PII
- Transmit detailed data to repository

The frequency of these activities is dependent on the SM Provider's and C/AV Researcher's individual implementation, but must occur at least monthly during the demonstration.

Activity: Receive Transmitted Data

REQ #	DESCRIPTION	SM	C/AV
DP.RTD.1	Collected data transmitted from the SM vehicle data collection systems will be received and stored in the respective SM Provider's / C/AV Researcher's data repository.	X	X
DP.RTD.2	The SM Provider data repository and C/AV data repository shall be configured in a manner to effectively receive the transmitted data in the appropriate formats, and with sufficient capacity to hold all data collected and processed during the demonstration.	X	X

Activity: Assign Data to Vehicle

REQ #	DESCRIPTION	SM	C/AV
DP.ADV.1	Data collected—including all trip data, location data, and fuel purchase data—must be assigned accordingly to the specific participating vehicle with which it is associated.	X	X
DP.ADV.2	A record of the unique vehicle identifiers assigned to each participating SM vehicle shall be maintained in the respective data repository.	X	X

Activity: Process into Transactions

REQ #	DESCRIPTION	SM	C/AV
DP.PIT.1	Transmitted data shall be processed into transactions that allow the SM Provider and C/AV to delineate all trips, fuel purchases and errors/events associated with a unique vehicle in a given month.	X	X
DP.PIT.2	Transmitted data shall be processed into transactions that align with discrete vehicle trips.	X	X
DP.PIT.3	SM Providers and C/AV shall maintain a record of unique transaction identifiers.	X	X
DP.PIT.4	The total number of unique transactions must align with the total number of unique trips recorded.	X	X

Activity: Validate Data

REQ #	DESCRIPTION	SM	C/AV
DP.VD.1	Reasonableness/sanity validation checks shall be performed on transactions to confirm the validity and accuracy of the data, including but not limited to:	X	X
DP.VD.1.1	Unreadable data;	X	X
DP.VD.1.2	Date/time not increasing from last trip dataset;	X	X
DP.VD.1.3	Accumulated mileage not increasing from last trip dataset;	X	X
DP.VD.1.4	Unique trip identifiers not correctly incrementing;	X	X
DP.VD.1.5	Unique transaction identifiers not correctly incrementing;	X	X
DP.VD.1.6	Duplicate trip dataset;	X	X
DP.VD.1.7	Trip data reported for vehicle not assigned to SM Provider or C/AV;	X	X
DP.VD.1.8	Fuel purchase data reported for vehicle not assigned to SM Provider or C/AV;	X	X
DP.VD.1.9	Error/event data reported for vehicle not assigned to SM Provider or C/AV;	X	X
DP.VD.1.10	Anomalies between miles traveled and fuel consumed;	X	X
DP.VD.1.11	Data reported for invalid trip type (e.g. Canceled);	X	X
DP.VD.1.12	Vehicle associated with more than one trip within the same reported time frame.	X	X
DP.VD.2	Validation checks identified shall be documented and associated with the appropriate vehicle and transaction record.	X	X

Activity: Sanitize Data of PII

REQ #	DESCRIPTION	SM	C/AV
DP.SOP.1	Processed and validated transactions shall be sanitized of any PII.	X	
DP.SOP.1.1	SM Providers shall ensure that any information related to the customer identity is removed from processed and validated transactions.	X	
DP.SOP.1.2	SM Providers shall ensure that any information related to customer billing and payment is removed from processed and validated transactions.	X	

Activity: Transmit Data to Repository

REQ #	DESCRIPTION	SM	C/AV
DP.TDR.1	Sanitized data shall be transmitted from the respective SM Provider or C/AV data repository to the shared demonstration data repository (hosted by the Research Partners) for each of the twelve months of the demonstration.	X	X
DP.TDR.2	Processed and sanitized transactions shall be transmitted to the shared demonstration data repository monthly, no later than the 10th of the month following the month of data collection.	X	X
DP.TDR.3	Processed and sanitized data transmitted to the shared demonstration data repository shall comply with data transmission protocols, data fields and formats as defined in the Interface Control Document.	X	X

2.5 REPORTING

The Reporting operational process includes applying DBUF and fuels tax rates to applicable mileage and fuel data to calculate the net DBUF owed for each participating vehicle, and for each SM Provider's entire fleet for a given reporting period. Calculated data will be processed into reports, including at a minimum, a Revenue Report for simulated tax reporting. It is also anticipated that the State (or its representatives) will conduct mock audits based on submitted simulated tax reports to investigate the feasibility of a DBUF as a revenue-generating mechanism, and the potential for integration with current or future State tax systems.

Key activities for demonstration reporting include:

- Apply DBUF rate
- Apply fuels tax credit rate
- Calculate net DBUF balance owed
- Process into monthly report
- Transmit report to Revenue
- Mock audit

REQUIREMENTS IN THIS SECTION WILL BE DEFINED DURING STAGE 1 OF THE DEMONSTRATION.