Phase 1 Data Management Plan

Heart of Iowa Regional Transit Agency ITS4US Deployment Project

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Final Report — December 15, 2021
FHWA-JPO-21-867

COMPLETE TRIP
ITS4US

U.S. Department of Transportation

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Notice

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16. Abstract
The Heart of Iowa Regional Transit Agency (HIRTA) is one of the 5 awardees for Phase 1 of the Complete Trip – ITS4US contract for its proposed concept *"Health Connector for the Most Vulnerable: An Inclusive Mobility Experience from Beginning to End"* (Health Connector) by the United States Department of Transportation (USDOT). Per the goals of the program, the Health Connector project is focused on improving transportation access to healthcare for underserved groups in Dallas County, IA. The Data Management Plan (DMP) identifies the data to be collected, how the data will further the goals of the USDOT and the Complete Trip-ITS4US program, how the data will be managed, how the data will be made accessible, how the data will be stored, and what data standard(s) will be used. Researchers, including, HIRTA partner Iowa State University (ISU), Independent Evaluators and the USDOT will be provided access to data as described in this document when it starts to become available in Phase 2 during initial system deployment and testing.

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Santosh Mishra, IBI Group	22 Oct 2021	3.0	Updated to address USDOT comments	Brooke Ramsey
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1 Introduction

The Heart of Iowa Regional Transit Agency (HIRTA) is one of the 5 awardees for Phase 1 of the Complete Trip – ITS4US contract for its proposed concept *"Health Connector for the Most Vulnerable: An Inclusive Mobility Experience from Beginning to End"* (Health Connector) by the United States Department of Transportation (USDOT).

The Health Connector solution intends to demonstrate an innovative concept that will address various bottlenecks associated with healthcare access for HIRTA communities. Some of these challenges are the key reason behind missed appointments or unacceptable level of preventive or as-needed healthcare in HIRTA service area. For this deployment, the HIRTA team plan to implement a scalable and replicable solution that enables inclusive access to non-emergency medical transportation for all underserved populations and their caregivers by resolving access barriers with the use of advanced technologies. This solution will allow Dallas County residents without access to transportation who may be seeking a medical appointment to explore their transportation alternatives and book both medical and transportation appointments at the same time. Further, this solution will include information and wayfinding services to guide them at every step of their trip.

The referenced underserved populations' mobility needs vary based on the individual. This deployment will provide enhanced access to healthcare options for "all travelers" in Dallas County with a specific focus on underserved communities, including persons with disabilities, low income, rural, older adults, veterans, and persons with limited English proficiency.

In addition to addressing mobility needs, the proposed deployment will recognize the net impact that access to health services have on patient health care outcomes as well as both the financial and health outcomes from the perspective of the health care community/Dallas County Health Department (DCHD).

Figure 1 provides an overview of the Health Connector concept.

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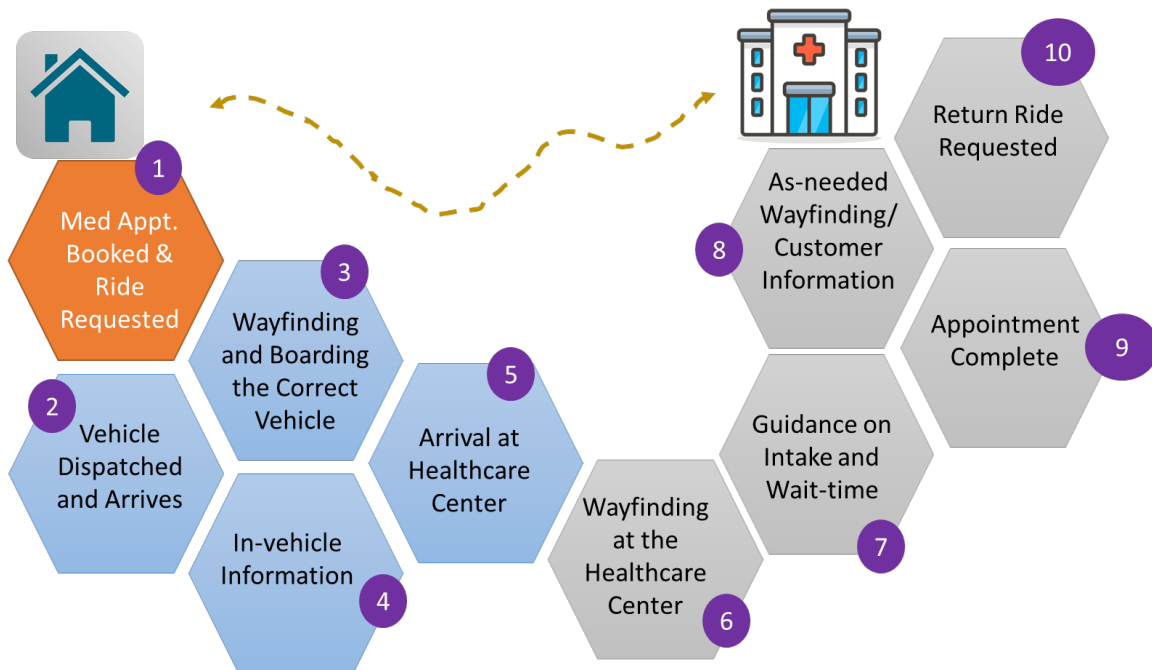
Figure 1. Overview of Health Connector System Concept (Source: HIRTA team)

Every step of the trip shown in Figure 1, utilizes tools that require good quality data to function as follows:

- At pre-trip, the trip planning function will require access to appointment details to find out applicable transportation alternatives. Booking function will require access to customer profile with details on customer mobility needs and eligibility for a funding source; vehicle and driver availability, estimated arrival time, travel time and others. Traveler may also coordinate with Health Navigators or caregivers who will have access to the data to provide help related to medical appointment or required transportation.

- During trip, Traveler will need to be notified at every step of their trip on estimated pick-up time and estimated travel time. This information will be provided using data generated by the system in real-time on trip performance (e.g., actual time of arrival or trip status). Travelers will also be able to use the outdoor wayfinding function which will provide information related to localization and orientation (e.g., locating vehicle at the pickup spot).

- On arrival, at the healthcare center, systems will use the data available to guide the Traveler to locate the correct door and entrance and provide step-by-step guidance indoors if necessary, using the mapping and pathways data available from wayfinding system. Traveler will also initiate a return trip based on current availability of driver and vehicle information.

Detailed data needs for the system providing Health Connector functions are summarized in Table 3 and Table 4 of the DMP. The DMP further describes how the data will further the goals of the USDOT, how the data will be managed, how the data will be made accessible, how the data will be stored, and what data standard(s) will be used.

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Final updates for the Phase 1 to the DMP will be made by December 2021 but will it be a living document and may be updated based on testing results in Phase 2 and operation and performance management in Phase 3. A change control process for the DMP is described in Section 2.1 along with the triggers for the DMP update. Within Phase 1, the document will be further updated based on the findings from Institutional Review Board (IRB) approval process and through the preparation of Human Use Summary document (HUA), and as part of the development of the Performance Management and Evaluation Support Plan (PMESP), Systems Requirements Development (SysRS), and Integrated Completed Trip Deployment Plan (ICTDP).

Researchers, including, HIRTA partner Iowa State University (ISU), Independent Evaluators and USDOT will be provided access to the data as described in this document as it starts to become available in Phase 2 during initial system deployment and testing.

1.1 Project Background

The Health Connector solution intends to demonstrate an innovative concept that will address various bottlenecks associated with healthcare access for HIRTA communities. Some of these challenges are the key reason behind missed appointments or unacceptable level of preventive or as-needed healthcare in HIRTA service area. For this deployment, the HIRTA team plans to implement a scalable and replicable solution that enables inclusive access to non-emergency medical transportation (NEMT) for all underserved populations and their caregivers by resolving access barriers with the use of advanced technologies. This solution will allow Dallas County residents without access to transportation who may be seeking a medical appointment to explore their transportation alternatives and book both medical and transportation appointments at the same time. Further, this solution will include information and wayfinding services to guide them at every step of their trip.

Key capabilities of the proposed technology solution are as follows:

- Enable the customer to use a smart device (e.g., smartphone, smartwatch) application or equally effective alternate methods to schedule and manage medical appointments and transportation services all in one location (Health Connector App). Provide customers options to choose from available providers. Provide same day response if needed by customers.
- Send customers alerts before arrival and again when the vehicle is approaching.
- Keep customers informed on trip progress at all stages of the complete trip: pre-trip (e.g., planning, booking) or trip/en-route (e.g., waiting, boarding, on-board environment, drop off) and return trip booking.
- Provide directions (audible and visual) on where to meet the vehicle/driver. On arrival, drivers should have the ability to automatically confirm customer identity and assist with boarding as needed.
- Provide drivers the capability to request turn-by-turn navigation to a desired destination.
- The Health Connector App will enable the customer to utilize advanced wayfinding solutions with the help of indoor and outdoor navigation technologies to provide personal concierge-style travel from origin to destination. This will include:
  o Locating the vehicle outside origin and destination locations

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- o Locating healthcare facility when dropped off by vehicles
  - o Locating desired floor/room when inside the healthcare facility
- Customers will be able to use the Health Connector solution for any contactless payment needs at any point for transportation-related payments.
- Customers can initiate return trip when the appointment is complete and follow the similar process as the inbound trip to medical facility to locate and board the vehicle for the return trip.

If customers or their caregivers desire to book and pay for another local trip as an additional leg along with the medical trip, they will be able to do that using Health Connector solution.

Figure 2 provides a generic system context diagram with high-level flows. A more granular system diagram with detailed data flows is provided in Figure **5**.
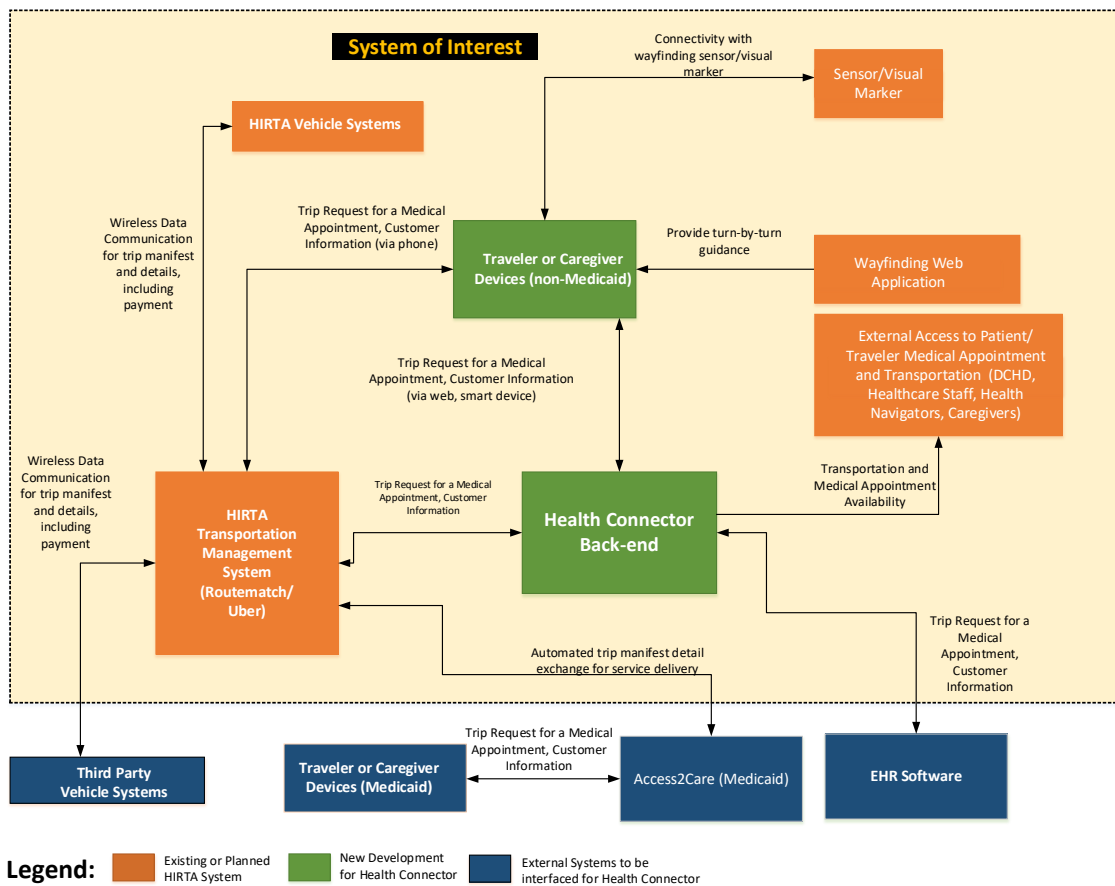
Figure 2. Health Connector Overview (Source: HIRTA team)

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1.2 Document Overview

The DMP provides relevant information, as described earlier, for the data stakeholders that include the following:

- The USDOT.

- Government and funding agencies as defined in the ConOps.

- Non-government stakeholders, as described in the ConOps.

- Independent Evaluators.

- Researchers.

- Third party developers.

- Future implementers of the system.

The DMP is organized as follows:

- Section 2 provides an overview of the HIRTA ITS4US Complete Trip project.

- Section 3 describes data to be collected as part of the project.

- Section 4 identifies data ownership and describes the process for required data to be collected, stored and shared as part of the project.

- Section 5 provides information on standards and metadata for the data involved.

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2 Project Overview

The information about the HIRTA Complete Trip-ITS4US deployment project and its goals, as well as how the project's data helps achieve USDOT's research goals is summarized below.

- **Project Title:** Health Connector for the Most Vulnerable: An Inclusive Mobility Experience from Beginning to End.

- **Project Goals and Objectives:** The goals and objectives of this project, developed as part of the PMESP (USDOT publication number: FHWA-JPO-21-877), are listed in Table 1. The PMESP is currently in the process of being finalized so this section will be updated to reflect the changes in the final PMESP as completed by mid-November 2021.

Table 1. Health Connector System Goals and Objectives

Goals/Outcomes	Description	Objectives
G1. Improved health outcomes for Dallas County residents	Reduction in the number of no-shows for medical appointments due to increased access to transportation will help Dallas County residents, particularly underserved populations, make their appointments in a timely manner. This increased access to medical services will result in measurable positive health outcomes.	G1O1. Reduced number of no-shows for medical appointments with availability of increased access to transportation options in Dallas County.
		G1O2. Increased access to follow-up care options through availability of transportation services and telehealth (where available such as Veterans Affairs and through healthcare providers).
		G1O3. Tracking of measurable positive impacts of transportation access on healthcare outcomes for Dallas County residents.
G2. Self-reliance and spontaneity for underserved groups	Health Connector will provide tools to access safe, affordable and reliable transportation services, and relevant information/wayfinding as and when needed by underserved groups.	G2O1. Availability of reliable tools and services for underserved groups for planning, booking, payment and customer information for accessing safe transportation services with minimal number of required steps.

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Goals/Outcomes	Description	Objectives
		G2O2. Availability of reliable indoor and outdoor wayfinding tools to assist underserved travelers locate vehicles and/or facilities at destinations in a safe manner.
		G2O3. Delivery of safe and reliable transportation services at all times when needed by underserved groups for their medical appointments, return trip and follow-up care.
G3. Efficient transportation management capabilities for medical transportation services	HIRTA and its contractors, Access2Care, DCHD, healthcare providers and funding agencies will have access to tools and services for coordinating booking, management, completion, billing, and payments for medical transportation in Dallas County requested by underserved Travelers.	G3O1. Availability of tools for managing transportation services from multiple service providers from a centralized Health Connector system along with enabling as-needed transportation capacity at all times.
		G3O2. Availability of tools and procedures as necessary to provide reliable transportation for requested trips.
		G3O3. Provision of affordable transportation through coordination with funding entities for subsidizing transportation for the underserved.
		G3O4. Implementation of automation for required coordination to reduce the amount of time needed by involved staff at HIRTA and its partners.
G4. Financial sustainability of medical transportation programs	Availability of tools to efficiently coordinate booking and manage delivery of transportation services through optimal use of resources will help in cost-reduction of medical transportation and will help with maintaining long term sustainability of funding programs.	G4O1. Availability of tools to track cost and revenue measures along with any applicable subsidies to analyze the total cost to HIRTA and partners for delivering medical transportation services.

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Goals/Outcomes	Description	Objectives
		G4O2. Implementation of processes to reduce the resources spent in delivering and administering the trips funded by various programs.
G5. Safe medical transportation services	Availability of advanced tools to provide trip information and wayfinding services customized per the needs underserved groups will help provide safe transportation options to travelers who may lack those.	G5O1. Timely and reliable delivery of required information on vehicle and trip status to enhance perceived safety with the system.
		G5O2. Implementation of required safety measures to mitigate the risks of any accidents, incidents and related injuries and severe consequences associated with trips to medical facilities, outdoor/indoor wayfinding and return trips.

- **Project Description:** The Health Connector solution intends to demonstrate an innovative concept that will address various bottlenecks associated with healthcare access for HIRTA communities, with a particular focus on underserved groups. Some of these challenges are the key reason behind missed appointments or unacceptable level of preventive or as-needed healthcare in HIRTA service area. For this deployment, the HIRTA team plans to implement a scalable and replicable solution that enables inclusive access to non-emergency medical transportation for all underserved populations and their caregivers by resolving access barriers with the use of advanced technologies. This solution will allow Dallas County residents, without access to transportation, who may be seeking a medical appointment to explore their transportation alternatives and book both medical and transportation appointments at the same time. This will also provide the capability for transportation, healthcare, and information and referral professionals to coordinate on a trip. Further, this solution will include information and wayfinding services to guide Travelers at every step of their trip.

- **Project Performance Measurements:** Performance measures are based on the goals and objectives identified according to the needs identified in the ConOps and also builds upon the preliminary measures that were identified in the ConOps.

  The performance measures are also mapped to the Mobility Performance Metrics (MPM), as described in the FTA Report No. 0152 on Mobility Performance Metrics (MPM) for Integrated Mobility and Beyond, published 2020. The focus of these measures will be on measuring the outcome of the project on the 6 target underserved groups identified for the project that include, persons with disabilities, older adults, veterans, persons with language barriers, rural populations, and persons with low income. The MPM measures are identified under the following high-level categories, also illustrated in Figure 3.

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- **Core Measures**: This category includes Traveler-centric measures and related to the following key aspects associated with a trip: availability of services; reliability of available services; budget needed/affordability; travel time; and safety.

- **Tier 1 Measures**: This category indicates system's ability to deliver on the required goals and objectives and refers to system capacity; system efficiency, effectiveness, and cost; utilization; safety; and reliability.

- **Tier 2 Measures**: This category refers to system's availability to deliver on the broader goals of the local community. The measures are related to overall mobility and safety/health of the members of the community; and financial performance of the systems and organizations involved.

- **Tier 3 Measures**: This category refers to system's ability to contribute to trends nationally and identifies measures related to financial performance of organizations delivering services; and safety/health of communities.
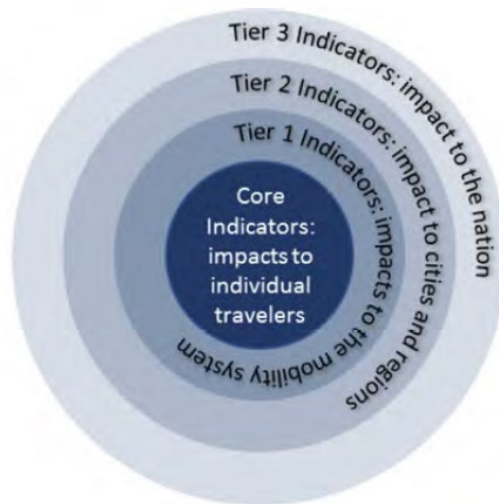
Figure 3. Tiered Framework for Metrics in MPM Report (Source: FTA)

For each of these categories, the HIRTA team has defined measures for the 3 stages of a Complete Trip that include pre-trip, trip/en-route, and post-trip. Initially, the HIRTA project team identified 57 measures in total and prioritized those as follows:

- **High**: These measures are highly critical to monitor to evaluate the success of the program.

- **Medium**: These measures are significant but a regular monitoring is not required.

- **Low**: These measures are not necessary for evaluating the success of the program.

A detailed list of measures is available in the Performance Measurement and Evaluation Support Plan (PMESP).

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2.1 Change Control

HIRTA, as the system owner, will be in charge of all data generated by the system. In this role, HIRTA will also keep track of any changes to the system that may impact: 1) data collected; 2) data quality and integrity; 3) data structure and metadata; 4) access control and other relevant changes to ensure data stakeholders have complete understanding of the data.

HIRTA has set up a change control board (CCB) for the project as identified for the User Needs Identification and Requirements Planning (UNIRP). This CCB consists of the lead project staff that include Project Management Lead (PML), System Development Lead (SDL), Concept Development Lead (CDL), Healthcare Lead (HL), Technology Lead (TL) and Stakeholder Engagement Lead (SEL) and Research and Evaluation Lead (REL). This CCB will be engaged in the management of the DMP as well.

As stated earlier, the DMP is a living document and any updates approved by the CCB will be made when there are any changes to the data management process. Triggers for changes to the DMP will be based on the identification of gaps in the DMP in advance of or during the following activities:

- Testing of system components and features.

- Addition, modification, or deletion of a new feature in one or more system components.

- Replacement of a system component, either due to replacement of a system provider or due to availability of new/upgraded component from a provider.

- Modification in the server infrastructure used for the storage and providing data access.

- Modification in the schema or structure for data tied to system components, data format for the data made available and metadata.

- Modifications in policies, system components and tools related to data storage, management, access and sharing.

HIRTA will follow the following process for the change control of the DMP:

1. **Change Identification**: HIRTA PML will keep track of any changes to the system that may impact any aspects of the data management per the triggers identified above.

2. **Change Evaluation**: In the event of a change identified, the HIRTA PML will consult with the CCB regarding any need to make changes to the existing DMP.

3. **Change Approval:** In the event a change is necessary, anticipating any impact on the way data is accessed and used by external third parties, the CCB will identify the scope of the changes needed and collectively approve those changes.

4. **Document Update:** The HIRTA SDL will update the document for approved changes on behalf of the HIRTA team.

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5. **Notification to DMP Stakeholders:** Once the changes are made, the HIRTA PML will notify the stakeholders about changes in the DMP and share the updated DMP. If there are any concerns, the HIRTA PML will consult those with the CCB, take appropriate actions and follow up with stakeholders. Once the stakeholder concerns are addressed, changes to the DMP will be fully authorized and current version will be shared with the USDOT.

2.2 Relevant Sources

The following documents were referenced when preparing this DMP:

1. USDOT, "Complete Trip- ITS4US Deployment Broad Agency Announcement (693JJ3-20-BAA-0004),"

2. HIRTA, "HIRTA - USDOT Complete Trip - final Proposal - v1.0 2020-07-31 (Volume 1)," July 2020.

3. Data dictionary for the Routematch software.

4. Data dictionary for Uber Transit.

5. Transit Center, "Mobility Performance Metrics (MPM)," February 2020, Federal Transit Administration, FTA Report No. 0152

6. Santosh Mishra et al., "Phase 1 Concept of Operations (ConOps), Heart of Iowa Regional Transit Agency ITS4US Deployment Project," August 2021, US department of Transportation, Publication Number: FHWA-JPO-21-859.

7. Santosh Mishra et al., "Phase 1 Performance Management and Evaluation Support Plan (PMESP)," Heart of Iowa Regional Transit Agency ITS4US Deployment Project, August 2021, US department of Transportation. Publication Number: FHWA-JPO-21-877.

8. Santosh Mishra et al., "Phase 1 Systems Requirements (SysRS) Document," Heart of Iowa Regional Transit Agency ITS4US Deployment Project," October 2021 (expected), US department of Transportation. Publication Number: FHWA-JPO-21-882.

9. Santosh Mishra et al., "Phase 1 Integrated Complete Trip Deployment Plan (ICTDP)," Heart of Iowa Regional Transit Agency ITS4US Deployment Project, January 2022 (expected), US department of Transportation.

10. Santosh Mishra et al., "Phase 1 Human Use Approval (HUA) Summary (HUA), Heart of Iowa Regional Transit Agency ITS4US Deployment Project, December 2021 (expected), US department of Transportation.

2.3 Data Schedule

The information included in this DMP is preliminary and current as of October 2021. Final updates for the Phase 1 to the DMP will be made prior to the conclusion of Phase 1, in December 2021. It is expected that within Phase 1, this version of the document will be further updated based on the

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findings from the Institutional Review Board (IRB) approval process and through the preparation of the following documents: Human Use Approval Summary (HUA), Performance Management and Evaluation Support Plan (PMESP), Systems Requirements Development (SysRS), and Integrated Completed Trip Deployment Plan (ICTDP).

Additional changes may be made in Phase 2 and 3 as details of the system and its components are further developed as part of the system design, deployment and testing. Figure 4 provides a tentative schedule for all 3 phases of the Health Connector that are used as a reference for developing a schedule for the maintenance of the DMP.
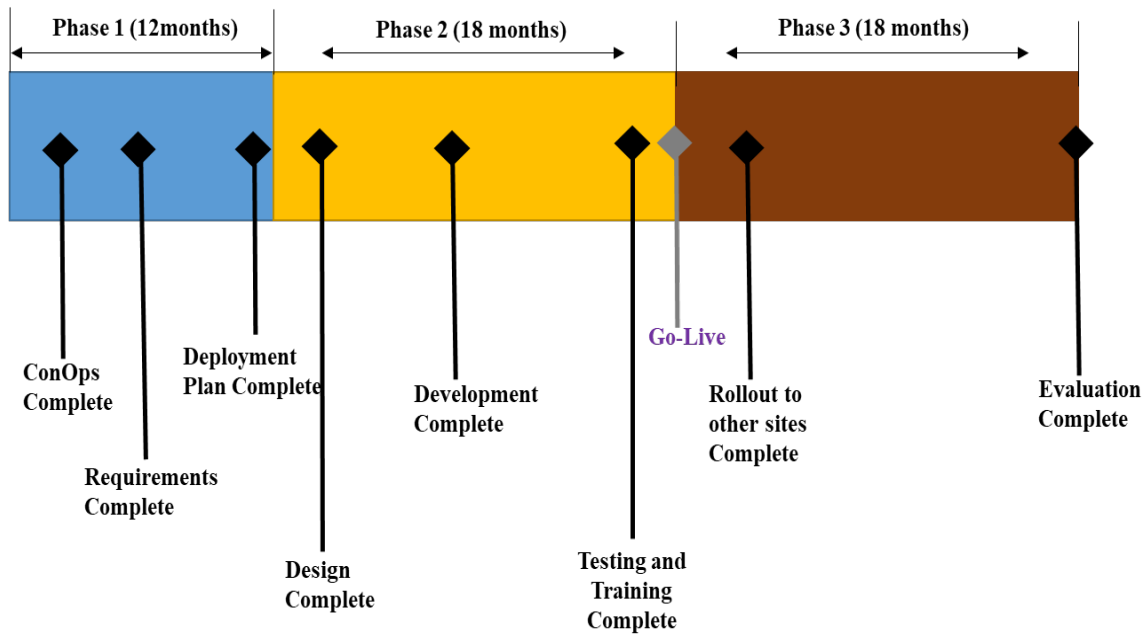
Figure 4. Health Connector Deployment Schedule (Source: HIRTA team)

Table 2 provides a preliminary schedule for maintaining the DMP. The dates for Phase 2 and 3 are currently unclear so only preliminary estimates of timing are provided.

Table 2. HIRTA DMP Schedule

ID	Event Title	Description	Phase	Date
1	Draft DMP Is delivered to USDOT	Initial Draft DMP with basic information known at the time of writing	Phase 1	Aug 2021
2	Final DMP	DMP is updated with USDOT comments addressed. Any outstanding details are included except those that require the completion of deliverables for future tasks	Phase 1	Aug 2021

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ID	Event Title	Description	Phase	Date
3	IRB application submitted	Data and performance management approach along with details regarding engaging human subjects in the study submitted to IRB for approval; May take up to 6 weeks per ISU process	Phase 1	Oct 2021
4	System requirements finalized	Requirements on performance and data developed; walkthrough conducted and requirements finalized.	Phase 1	Oct 2021
5	PMESP Finalized	Performance measures, required data and details regarding supporting independent evaluation are finalized	Phase 1	Nov 2021
6	IRB approval and Draft Human Use AfSLApproval (HUA) summary complete	IRB approval is received and HUA summary is developed for USDOT review.	Phase 1	Nov 2021
7	DMP Updated based on PMESP, SysRS, IRB input, HUA Summary	As details regarding the scope of public and private data is approved by the IRB and as it has become evident through completion of other documents, DMP will be updated reflect the current understanding of data management.	Phase 1	Nov 2021
8	Final Human Use Approval (HUA) summary complete	HUA summary document finalized per USDOT comments.	Phase 1	Dec 2021
9	Final updates to DMP for Phase 1	Any necessary updates are made to the DMP based on outcomes of Tasks 4-14.	Phase 1	Dec 2021
10	ICTDP Finalized	Data and performance management approaches are finalized per finalized Phase 1 DMP.	Phase 1	Jan 2022
11	Initial data samples provided to USDOT	Initial Data samples are created validated and submitted to USDOT for review.	Phase 2	Sep 2022
12	Initial meeting with USDOT data team to review data	Meeting to review data with USDOT and walkthrough the data schema and DMP	Phase 2	Oct 2022
13	Baseline data collection starts	Initial collection of data on current conditions starts	Phase 2	Nov 2022
14	DMP updated	DMP updated with any changes from testing and sample data schema.	Phase 2	Jan 2023
15	Baseline data provided to USDOT	Complete Baseline data sets are uploaded to USDOT and the IE	Phase 2	Jan 2023
16	Month of testing of applications begins	Initial upload after datasets are collected through testing	Phase 2	Feb 2023
17	Data transferred to USDOT	Daily updates of after case data are provided to USDOT and IE	Phase 2/3	Feb2023-Aug 2024
18	Go-live	Go-live	Phase 3	Aug 2023
19	Data Review	Data Review conducted with USDOT and IE to ensure datasets are complete	Phase 3	Sep 2024

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ID	Event Title	Description	Phase	Date
20	Draft Final Analysis Report submitted	Draft Final Analysis Report submitted to USDOT	Phase 3	Jan 2025
21	Final Analysis Report submitted	Draft Final Analysis Report submitted to USDOT	Phase 3	Feb 2025

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3 Data Overview

3.1 Data Needs Summary

The systems involved in the context of Health Connector, as shown in Figure **5**, can be defined as follows:

- **Traveler-end Subsystem**: this subsystem includes the tools and technologies (phone/interactive voice response (IVR), mobile/smart devices, web-based tools) to be used by travelers or patients seeking transportation services for their medical appointments as part of pre-trip, en-route trip, on arrival and return trip activities.

  Currently, HIRTA customers have access to the following Traveler applications from Routematch by Uber:

  - Amble App: used for requesting trip and finding out status of trips. No capabilities for planning are there in the Amble App.

  - RMPay: used for maintaining prepaid balance to pay for completed trips.

  - IVR: used to send night-before reminders to Travelers per their subscription preferences for upcoming trips. Real-time/same-day reminders are not available.

  Health Connector plans to implement capabilities to provide a new off-the-shelf unified application for planning, booking and payment. Also, this new application will provide real-time status on trips on-demand and through push notification services.

- **Transportation Management Subsystem (TMS):** this subsystem includes the technologies used to assist customer care and operations staff with Traveler registration, eligibility management, reservations, scheduling, dispatching, billing and administration activities. These products are commercially available from various providers of paratransit/demand response vendors. Currently, HIRTA utilizes capabilities in the Routematch Demand application from Routematch by Uber for completing transportation management functions. While limited capabilities exist to address same day requests (e.g., return trips), primarily Routematch Demand application is used to schedule trips at least a day in advance.

  Given Health Connector is focused on addressing same day and real-time requests, commonly referred to as mobility on-demand (MOD), HIRTA will procure such capabilities through an off-the-shelf MOD platform to augment existing TMS capabilities. The new MOD platform will also be fully integrated with the new Traveler and Driver applications. Further, this new platform will support utilizing third-party service providers for adding capacity when needed in real-time. Finally, limited access to this platform will be made

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available to Health Navigators and healthcare providers so they are able to book trips directly without involvement of HIRTA staff.

At this time, HIRTA anticipates both Routematch Demand and the new MOD platform to co-exist to meet Health Connector functions. This is required given advanced capabilities within Routematch Demand application for managing the travel needs of underserved populations (e.g., older adults and persons with disabilities) which are either not available in off-the-shelf MOD platforms or are very limited. Therefore, for Health Connector, Routematch Demand platform will be used for functions such as managing eligibility (e.g., advanced capabilities for eligibility/funding tracking and managing the mobility needs of underserved) or prescheduled trips (e.g., 24-hour advance booking or subscription-based) and the MOD platform will be used for providing same day booking, and for enabling coordination with healthcare providers and health navigators. At least a daily data exchange will be enabled between the MOD platform and Routematch Demand to make all trips available in the MOD platform for dispatching on the day of the trip. Further details of this data exchange and desired frequency are still being discussed and will be finalized at the time of Phase 2 design.

While there are various commercially available MOD platforms that can provide the new capabilities needed for Health Connector, HIRTA team is planning to deploy Uber Transit platform given the integration needs with existing Routematch Demand application and lack of proven data standards/standard interfaces to integrate with other commercially available/off-the-shelf MOD platforms. However, requirements in this document are vendor-agnostic and are defined such that any commercially available platform can meet those**.**

This document refers to MOD platform as Uber Transit and system provider as Uber Technologies where specific references are needed for a discussion (e.g., licensing, privacy policy, data stewardship). Uber Technologies is the provider of both Routematch Demand and Uber Transit products.

- **Vehicle Subsystem**: this subsystem refers to the technologies deployed on vehicles to support Driver-end functions for driver-dispatch communications, manifest management, support just-in-time dispatching, turn-by-turn navigation and outdoor wayfinding (e.g., to locate Travelers at the time of pick up), on-board customer information and fare payments. All HIRTA-owned vehicles, Drivers will use tablets running Driver app. On other vehicles, Drivers may use Driver app on their tablet or their phone.

- **Wayfinding Subsystem:** this subsystem refers to the technologies and infrastructure to be used for providing, outdoor wayfinding, indoor positioning, orientation, and step-by-step guidance on request to travelers**.** One or more commercially available wayfinding system providers may be used but the current plan is to utilize at least the system provided by HIRTA team partner, Navi Lens.

- **Supporting systems:** These refer to the phone system and existing functions provided within Routematch software that are not part of Health Connector project. However, the TMS will exchange data with these systems, as needed, or HIRTA staff may interact with those for the following functions:

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- **External Systems:** These systems are external to Health Connector that have been identified for close coordination among HIRTA and partners for providing efficient transportation services for medical trips or for collecting data for performance measurement needs.

  - **Access2Care**: this subsystem refers to State of Iowa Medicaid Brooker's system used for booking and managing Medicaid trips. HIRTA is one of the providers used by Access2Care. Medicaid trips will be booked by Access2Care when requested by Travelers and will be ingested in the HIRTA system when assigned to HIRTA. At that point, Traveler using Medicaid benefits will be able to use Traveler tools provided by Health Connector.

    HIRTA is planning to build a new interface with Access2Care to automate the data exchange and improve coordination for Medicaid-funded trips. Details of this interface are still under discussion and will be finalized by Phase 2 design.

  - **Health Navigator-end Subsystem**: This subsystem includes the following components:

    - An Information and referral (I&R) product that is used by Health Navigators and the Health Administrator at the Dallas County Health Department (DCHD) to track the status of referral activities and for coordination with Dallas County residents health navigation/social care services. Currently, DCHD uses Microsoft Access-based program that recently replaced the previously used product from Healthleads. No integration is planned with this product for Health Connector. However, access to data may be needed for measuring Health Connector performance.

    - Limited access to TMS components will be provided to Health Navigators to arrange transportation services for the patients /Travelers they may be working with and coordinate with HIRTA or healthcare staff on the status of trip. This will also allow Health Navigators to access customer feedback and trip performance data on transportation services provided by Health Connector.

  - **EHR/Medical Record Subsystem**: this subsystem refers to the systems used by partner hospitals and clinics for booking medical appointments and maintaining their appointments, including discharge and any subsequent referral activities.

    Health Connector will develop a new interface with at least one of the healthcare partner EHR.

Health Connector Back-end in Figure 4 and Figure 5 refers to new development as identified above.

- **Other**: Additional relevant details for the system to de deployed are as follows

  - **Supporting systems**: These are existing systems and are not part of Health Connector project. However, the TMS will exchange data with these systems or

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HIRTA staff may interact with these systems for certain operational functions, as needed. Specifically, this refers to driver or vehicle information management, vehicle maintenance management, customer service management, safety event reporting. HIRTA currently uses capabilities within Routematch Demand application for completing such functions but other off-the-shelf products are also commercially available. List of these functions that will get utilized include:

- Managing driver information.

- Managing vehicle inventory.

- Tracking vehicle maintenance and availability status.

- Managing customer service complaints.

- Managing safety events (e.g., incidents, accidents or others).

- o **Data Storage**: Traveler applications will store data locally as allowed by their devices and as authorized by Travelers. Vehicle and TMS subsystems will communicate over cellular data communication for operational data exchange. All data is exchanged in real-time (at a configurable frequency). Data is temporarily stored on the vehicle to support offline operations in the event of communication failures. On the central side, TMS data will be stored in a relational database in the AWS cloud storage. Data is stored in a live database to support real-time operations and then processed and archived for reporting in a historical database

Figure **5** provides a system context diagram for HIRTA Health Connector along with data flows: Data flows are labeled according to the data ID used in Table 3 and Table 4 and later in the document to provide the context for data exchange between systems and for data-related discussions.

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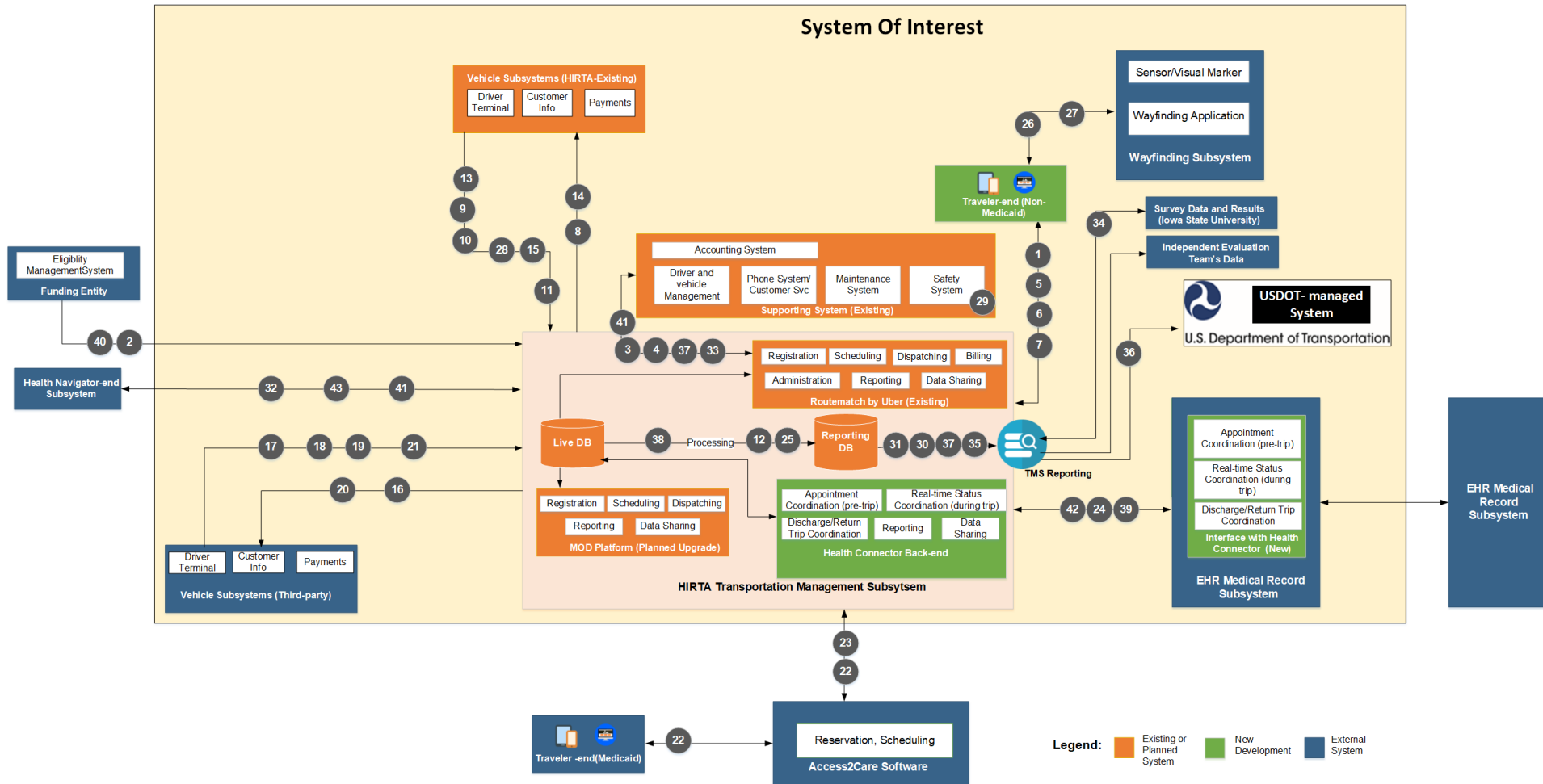
Figure 5**. High-level System Context Diagram for Health Connector (Source: HIRTA team)**

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Table 3 provides an overview of data flow between system components identified earlier. HIRTA will be the owner of all data generated by the system (exceptions listed in Section 4) and majority of the data generated by the Health Connector system will be collected, stored, processed, analyzed and archived within HIRTA TMS which will be maintained by Uber Technologies. Data collected and generated by the wayfinding system will be stored within that system and will be made available on-demand per HIRTA-defined terms and conditions.

For external systems from Access2Care and third-party service providers, data exchange will be based on open APIs and relevant data will be stored within HIRTA TMS per approved terms and conditions between HIRTA and external parties, as discussed in Section 4. Details of the API will be included in the SyRS document (Task 6 deliverable).

While Table 3 identifies datasets in the context of existing and future systems at HIRTA, the datasets are identified keeping the replicability of Health Connector system in mind. These datasets and terms used are common in paratransit/demand response industry and are applicable to most commercially available platforms/solutions. Most of the trip-related datasets are available in current Routematch Demand product, as indicated in Table 1.

Table 3. Data Needs Summary

ID	Data	High-level Description	Systems Involved
1	Traveler profile	Traveler's personal details as provided as part of registration.	Traveler-end system, HIRTA TMS
2	Traveler eligibility	Traveler's eligibility for a funding source or program; also verified with funding entities (e.g., Medicaid).	HIRTA TMS, Eligibility Management System/Funding Source
3	Fleet information	Details on HIRTA's vehicles; also, details on third-party vehicles.	Supporting System (Driver and vehicle management), HIRTA TMS
4	Driver information	Details on HIRTA's drivers; also, details on third-party vehicles.	Supporting System (Driver and vehicle management), HIRTA TMS
5	Trip request	Traveler request for a trip from a web or mobile device; some Travelers may request over phone and use concierge/customer care service.	Traveler-end system, HIRTA TMS
6	Trip modification or cancellation	Traveler's request for modification to an existing trip, including cancellation.	Traveler-end system, HIRTA TMS
7	Trip status	Current information on upcoming trip.	Traveler-end system, HIRTA TMS
8	Manifest	Time and location details on Travelers to be picked up and dropped off by a Driver during a shift.	Vehicle-end system, HIRTA TMS
9	Vehicle location	Location and heading along with other details for a vehicle in service.	Vehicle-end system, HIRTA TMS
10	Trip performance	Trip-level log of actual time and location for trips on the manifest along with any no-shows and cancellation events.	Vehicle-end system, HIRTA TMS
11	Driver performance	Driver-level log of operational performance on log on, on-time performance, manifests completed.	Vehicle-end system, HIRTA TMS

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ID	Data	High-level Description	Systems Involved
12	Travel time	Time needed to perform on-board component of a trip.	Processed using Trip Performance Data
13	Driver Messages	Log of messages sent by Drivers to Dispatchers.	Vehicle-end system, HIRTA TMS
14	Dispatcher Messages	Log of messages sent by Dispatchers to Drivers.	Vehicle-end system, HIRTA TMS
15	Fare Payment Log	Log of amount paid for a trip and method of payment.	Vehicle-end system, HIRTA TMS
16	Manifest (third party)	Time and location details on Travelers to be picked up and dropped off by a third-party Driver during a shift.	Vehicle-end system, HIRTA TMS
17	Trip performance (third party)	Trip-level log of actual time and location for trips on the manifest along with any no-shows and cancellation events for trips delivered by a third-party provider.	Vehicle-end system, HIRTA TMS
18	Vehicle location (third party)	Location and heading for a vehicle in service along with other details for a third-party provider.	Vehicle-end system, HIRTA TMS
19	Driver Messages (third party)	Log of messages sent by Drivers to Dispatchers.	Vehicle-end system, HIRTA TMS
20	Dispatcher Messages (third party)	Log of messages sent by Dispatchers to Drivers.	Vehicle-end system, HIRTA TMS
21	Fare Payment Log (third party)	Log of amount paid for a trip and method of payment.	Vehicle-end system, HIRTA TMS
22	Medicaid trip requests	Traveler request for Medicaid-funded trips from a web or mobile device through Access2Care; some Travelers may request over phone and use concierge service.	Traveler-end system (Medicaid), Access2Care system
23	Medicaid trip performance	Trip-level log of actual time and location for trips on the manifest along with any no-shows and cancellation events for trips delivered for Medicaid-funded trips.	Access2Care system, HIRTA TMS
24	Medical appointment details	Consists of medical appointment date, time and location (facility address and doctor's office) for a particular Traveler	HIRTA TMS, EHR system
25	Aggregated Summary	Aggregated data on driver, vehicle and trip performance.	TMS Reporting
26	Traveler wayfinding request	Requests initiated by Travelers to the wayfinding system.	Traveler-end system, Wayfinding system
27	Traveler wayfinding guidance	Log of wayfinding information provided to Travelers.	Traveler-end system, Wayfinding system
28	Safety event	Log of incident and accidents by vehicle/driver/trip.	Vehicle-end system, HIRTA TMS, Supporting System (Safety Management)
29	Safety event report	Detailed reports by a safety event (incident, accident) with response.	Supporting System (Safety Management)
30	Trip history playback	Replay of trip events performed along with location trail during a shift by a driver.	HIRTA TMS

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ID	Data	High-level Description	Systems Involved
31	System performance	Log of system performance, including any failures.	HIRTA TMS
32	Information/referral (I&R) request	Information and referral request.	DCHD I&R
33	Customer complaints log	Log of customer complaints received and actions taken.	Phone System, Customer Service System
34	Customer survey data and results	Customer data and survey conducted by ISU of human use participants and control group	Local database at ISU
35	Processed data for controlled sharing	Data accessible to researchers, Independent evaluation team and USDOT	TMS Reporting
36	Public data for USDOT-managed System	Data to be made available to the general public after further processing and anonymization	USDOT-managed System
37	Cost and revenue data	Cost and revenue data by trip, including actual cost, fare paid, funding source share	HIRTA TMS and Supporting System (Accounting)
38	Wheelchair failure log	Summary of events referring to situations when wheelchair lift could not function at the time of pick-up or drop-off.	HIRTA TMS/ Reporting
39	Medical appointment status	Real-time status of progress on a medical appointment resulting in an impact on the pick-up time.	HIRTA TMS, EHR system
40	Discount coupon/credit	Discount coupons or credits applied by trip	HIRTA TMS, Funding Entity
41	Call center log	Call center statistics available from HIRTA, DCHD and healthcare providers, as available from phone systems or manual logs.	Phone systems at HIRTA, DCHD and healthcare providers
42	Missed medical appointments linked to lack of transportation access	Anonymized missed appointments linked to transportation access	EHR or other systems internal to healthcare providers
43	Trip request (partners)	Trips manually requested by DCHD and healthcare providers using HIRTA TMS. To be tracked separately to assess the benefit of such capability.	HIRTA TMS

3.2 Data Overview

Table 4 provides an overview of the data to be collected in the Health Connector system. It references the data needs identified in Table 3 and provides additional information on the data to be collected, type and scale of data involved and data collection methods.

Table 4 provides the following information for each dataset:

- **Data**: Refers to distinct category of data exchanged between two systems. Distinction is provided by type of appointment (e.g., medical appointment or trip request), provider (e.g., in-house or contracted), type of trip (e.g., Medicaid and non-Medicaid) since the level of aggregation or anonymization needed will be different.

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- **Dataset**: Refers to the dataset that acts as the container for the data identified as follows:

  - **Admin:** includes data that is required for administrative needs prior to a trip can be provided (e.g., customer registration, eligibility management, fleet management/ maintenance). It also refers to any data that is part of routine process (e.g., safety management, complaints).

  - **Driver:** includes driver-level details on name, vehicle used, and their service performance (revenue miles, revenue hour, on-time performance).

  - **Trip:** includes trip-level data for Travelers and Drivers on location, time, fare payment. Traveler, Driver and Trip identifiers are anonymized.

  - **Aggregated:** refers to aggregated summary for a chosen time interval. Summary available at Traveler, Driver /Vehicle, Provider and Trip level.

  - **Survey:** refers to survey data and results. Details regarding this will be provided after the IRB process is complete.

  - **Health**: refers to medical appointment related data and any data collected by DCHD for Health Navigation purposes.

  - **System Log:** refers to data logged in the system to assess system performance and reliability. Also, may include supportive information (e.g., communication log indicating traffic delay)**.**

  - **Wayfinding**: refers to log of requests and pathways directions provided at device level**.**

- **Description**: Provides preliminary details on the fields available in a dataset. Further discussion on this is available in Table 6 and Table 7 in the context of access control.

- **Type and Scale**: Provides the type of data included in the dataset. Also, provides a high-level information on scale of data.

- **Collection method**: Provides information on how data is collected by the system.

- **Format:** Data that will be shared with the researchers and the USDOT will be in comma separated value (CSV) format for non-spatial data and JavaScript Object Notation (JSON) for spatial data. References to JSON is provided, as applicable in the table. Shape File (SHP) may be used for spatial analysis and sharing of results from survey data. Please note that this format does not indicate how systems components exchange data with each other.

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Table 4. Data Overview

ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
1	Customer profile	Admin	Consists of personal details (e.g., name, addresses, contact information, eligibility) and travel preferences (e.g., mobility aid, notification) for customers stored in Traveler profile.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 3000 or less customers	Traveler input; HIRTA or partner staff input as concierge service (HIRTA Customer care, healthcare customer care, Health Navigator)	CSV
2	Customer eligibility for a funding source	Admin	Status of eligibility for each customer for a funding source, as stored in Traveler profile.	**Type:** Text data, Numerical data. **Scale:** 3000 or less customers	Traveler input, Provided by funding entity	CSV
3	Fleet information	Admin	Consists of information on fleet (e.g., age, number of seats, accessibility).	**Type:** Text data, numerical data. **Scale:** 50 vehicles.	As maintained by HIRTA in driver and vehicle management (supporting) system	CSV
4	Driver information	Driver	Consists of information on driver identifier and their status (e.g., experience, part time, full time, contract, shift).	**Type:** Text data, numerical data. **Scale:** 50 drivers	As maintained by HIRTA in driver and vehicle management (supporting) system.	CSV
5	Trip request	Trip	Consists of customer identifier, trip identifier, date, time, and locations of pick-ups and drop-offs.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 400 trips per day.	Traveler input; HIRTA or partner staff input as concierge service.	CSV

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
6	Trip modification	Trip	Consists of customer identifier, trip identifier, date, time, and locations of pick-up and drop-off.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 400 trips per day	Traveler input; HIRTA staff input as concierge service.	CSV
7	Trip status	Trip	Consists of estimated time of arrival and/or delay status, as applicable along with pick-up location.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 400 trips per day	System-generated using vehicle location and driver/vehicle performance data received in real-time.	CSV
8	Manifest	Admin	Consists of all trips to be performed by a driver on a particular shift. Trip details provide necessary information needed for a driver to perform a trip (e.g., trip identifier, customer info, pick-up and drop-off locations and times, fare to be paid, mobility-aid needed). This dataset is listed for reference purpose only and is meant for internal operations management. This will not be made accessible to external entities. Trip request, Trip status and Trip performance datasets provide necessary information for external parties. For on-demand services, manifest may not be needed as vehicles are dispatched in real-time.	**Type:** Type: Text data, numerical data, temporal data, positional data. **Scale:** Up 20 trips a day per driver manifest.	System-generated using confirmed trips after runcutting and driver assignment process is complete. Real-time updates are made to the trips and driver/vehicle manifests if there are any changes through automated data transmission by HIRTA TMS communicating to the vehicle-end system using cellular communications. Changes to manifest are not stored.	CSV (unformatted) / PDF (formatted)

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
9	Vehicle location	Trip	Consists of vehicle location and heading along with time, speed, and vehicle or driver identifier. Current plan is for providing only historical record since use case for real-time data is unclear.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** Up to 20,000 records per day at 30 second refresh rate.	Automated data transmission at a configurable interval over cellular communications.	CSV, JSON
10	Trip performance	Trip	Consists of actual times and locations for pick-up and drop-off. Also, includes information on no-shows and cancellations, as applicable. Reasons for no-shows and cancellation will be included if available.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 400 trips per day	Automated data transmission over cellular communications; driver input on on-board terminals.	CSV
11	Driver performance	Driver	Consists of driver performance at trip or aggregated level (e.g., miles driven as revenue or deadhead, on-time performance).	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** For up to 50 drivers	System-generated based on trip performance data.	CSV
12	Travel time	Aggregated	Consists of time taken by driver/vehicle for a particular trip leg, available by origin and destination.	**Type:** Numerical data, positional data **Scale:** 400 trips a day	System-calculated using trip performance data.	CSV, JSON

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
13	Driver Messages	System Log	Consists of data messages sent by Drivers. Includes vehicle, driver identifier. This data is included to support analysis as in some cases results may not be conclusive due to confounding factors but relevant messages explaining a situation may be available (e.g., construction detour, traffic delay, slippery conditions, unexpected dwell time due to wheelchair cycle issue).	**Type:** Text data, positional data, temporal data. **Scale:** 5-10 messages per day per driver	Driver input on on-board terminals.	CSV
14	Dispatcher Messages	System Log	Consists of data messages sent by Dispatchers. Includes vehicle and driver identifier. This data is included to support analysis as in some cases results may not be conclusive due to confounding factors but relevant messages explaining a situation may be available (e.g., driver asked to swap vehicle mid-shift by dispatcher, no-show not approved, Traveler waiting at another pickup spot).	**Type:** Text data, positional data, temporal data. **Scale**: 100 messages per day	Dispatcher input in HIRTA TMS.	CSV
15	Fare Payment Log	Trip	Consists of log of fare paid by Traveler and method of payment. Includes trip identifier and customer identifier.	**Type**: Text data, numerical data **Scale**: 400 trips per day	Automated data transmission over cellular communications; driver input on on-board terminals for actual amount paid (some customers may overpay and balance is applied to their account which can be used towards future trips).	CSV

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
16	Manifest (third party)	Admin	Consists of all trips to be performed by a driver on a particular shift. Trip details provide necessary information needed for driver to perform the trip (e.g., trip identifier, customer info, pick-up and drop-off locations and times, fare to be paid, mobility-aid needed). This dataset is listed for reference purpose only and is meant for internal operations management. This will not be made accessible to external entities. Trip request, Trip status and Trip performance datasets provide necessary information for external parties. For on-demand services, manifest may not be needed as vehicles are dispatched in real-time.	**Type:** Text data, numerical data, temporal data, positional data. **Scale**: 50-75 trips per day	Automated data transmission over cellular communications; driver input on on-board terminals.	CSV (unformatted)/PDF (formatted)
17	Trip performance (third party)	Trip	Consists of actual times and locations for pick-up and drop-off. Also, includes information on no-shows and cancellations as applicable. Reasons for no-shows and cancellation will be included, if available.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 50-75 trips per day	Automated data communication over cellular; driver input on on-board terminals	CSV
18	Vehicle location (third party)	Trip	Consists of vehicle location and heading along with time, speed and vehicle identifier. Driver identifier may not be available. Current plan is for providing only historical record since use case for real-time data is unclear.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** Up to 5,000 records per day at 30 second refresh rate.	Automated data communication over cellular	CSV, JSON

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
19	Driver Messages (third party)	System Log	Consists of data messages sent by Drivers. Includes vehicle, driver identifier. This data is included to support analysis as in some cases results may not be conclusive due to confounding factors but relevant messages explaining a situation may be available (e.g., construction detour, traffic delay, slippery conditions, unexpected dwell time due to wheelchair cycle issue).	**Type:** Text data, positional data, temporal data **Scale:** 5-10 messages per day per driver for a total of 20 drivers.	Driver input on on-board terminals	CSV
20	Dispatcher Messages (third party)	System Log	Consists of data messages sent by Dispatchers. Includes vehicle and driver identifier. This data is included to support analysis as in some cases results may not be conclusive due to confounding factors but relevant messages explaining a situation may be available (e.g., driver asked to swap vehicle mid-shift by dispatcher, no-show not approved, Traveler waiting at another pickup spot).	**Type:** Text data, positional data, temporal data **Scale**: 50 messages per day	Dispatcher input in HIRTA TMS	CSV
21	Fare Payment Log (third party)	Trip	Consists of log of fare paid by Traveler and method of payment. Includes trip identifier and customer identifier.	**Type**: Text data, numerical data **Scale**: 400 trips per day	Automated data transmission over cellular communications for actual amount paid.	CSV

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
22	Medicaid trips requests	Trip	Trips requested by Travelers for Medicaid. Consists of customer identifier, trip identifier, date, time, and locations of pick-ups and drop-offs.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 50-80 trips a day	Traveler/concierge input into Access2Care system. From Access2Care, trips assigned to HIRTA will be ingested in HIRTA TMS. Current process of ingestion is manual and it is currently done on a daily basis for the trips scheduled for the next day. For ad-hoc/same day trips, Access2Care calls HIRTA to confirm and trips are entered at that point. A more frequent ingestion will be needed for same-day requests (e.g., return trips), which are critical to Health Connector. Since ConOps discussions, the HIRTA team has determined that an automated ingestion will be a better approach which will automatically ingest the trip if a same day trip is booked by the Access2Care system.	CSV
23	Medicaid trip performance	Trip	Consists of actual times and locations for pick-up and drop-off. Also, includes information on no-shows and cancellations as applicable. Reasons for no-shows and cancellation will be included if available.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 50-80 trips a day	Automated data transmission over cellular communications; Driver input on on-board terminals	CSV

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
24	Medical appointment details	Health	Consists of medical appointment date, time and location (facility address and doctor's office) for a particular customer. Whether or not transportation was requested or a telehealth appointment was requested will be included. Linked to a customer identifier and trip identifier if a corresponding transportation is booked. Data to be shared will include anonymized data on any link between medical appointment and transportation provided for those appointments.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 100 trips a day	Data entry in EHR or medical appointment system	CSV
25	Trip Summary	Aggregated	Consists of aggregated data on trip performance by different providers (e.g., revenue miles, fares collected, on-time performance, travel time, no-shows, cancellations, missed trips).	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** Up to 400 trips a day	System-generated	CSV, JSON
26	Traveler wayfinding request	Wayfinding	Consists of origin and destination location requested for step-by-step guidance by Traveler outdoors or indoors. Time of request and device ID (anonymized) will also be included.	**Type:** Positional data, temporal data. **Scale:** Requests for up to 50 trips a day	Data entry by Travelers/ caregivers on devices.	CSV/ JSON
27	Traveler wayfinding guidance	Wayfinding	Consists of the actual pathways provided to the customer; Also includes data on whether or not a provided guidance was used by a customer once provided. Time of request and device ID (anonymized).	**Type:** Positional data, temporal data **Scale:** Requests for up to 50 trips a day	System-generated step-by-step pathways direction as provided by the wayfinding system; depends on availability of mapping data	CSV/ JSON

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
28	Incident/ accident	Admin	Consists of any incident or accident event reported by Driver; Trip, vehicle and driver identifier included for internal analysis but only aggregated data by safety event type per day will be available for external use.	**Type:** Text data, Numerical data, Positional data, temporal data **Scale:** 10 events per months	Driver input using on-board terminals for a particular safety event. Initial incident data per report entered into HIRTA TMS by Dispatcher. Final report after investigation filed in Safety management System by Safety Program Manager.	CSV
29	Incident report	Admin	Consists of details of report after investigation by the Safety Program Manager. Driver, Trip, vehicle and driver identifier included for internal analysis but only aggregated data by safety event type per day will be available for external use.	**Type:** Text data, Numerical data, Positional data, temporal data **Scale:** 10 events per month	Filed in the Safety Management System by Safety Program Manager	CSV
30	Trip History Playback	Trip	Consists of a replay of events performed by a Driver during their shift. Used for internal investigation of customer complains. Listed here for information purpose only. Not to be made available to the external entities.	**Type:** Video **Scale:** 400 trips a day	System-generated using trip performance data by HIRTA TMS	MPEG, CSV
31	System performance	System Log	Consists of data on system reliability. It will be generated on a daily basis and will be grouped by failure type and system component.	**Type:** Numerical. **Scale:** N/A	System-generated; Analysis	CSV

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
32	Information/ referral request	Health	Consists of information/referral requests received by DCHD from Dallas County residents and outcome of efforts made by Health Navigators. This data will help track if I&R effort resulted in booking of an appointment.	Text data, numerical data, temporal data, positional data. **Scale:** 500 new customers per year. 1500 active customers. Customers typically active for 6-8 weeks.	Data entry; customer Surveys in the I&R system. There is no plan to link I&R system with HIRTA TMS. Therefore, information will be stored in the I&R system only.	CSV
33	Customer complaints log	Admin	Consists of customer complaint received, complaint date, resolution, and resolution date. Will be aggregated by complaint type and provider type at daily level for tracking customer complaints received.	**Type:** Text, numerical, temporal. **Scale:** 10 complaints per month	Data entry in Customer Service system	CSV
34	Customer survey results	Survey	Consists of analysis of survey data designed to measure the project outcomes. It will be managed by ISU. Results will be shared after using appropriate anonymization and aggregation. Additional details will be added regarding survey data once the approach is finalized through the IRB process.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** List of human participants TBD	Survey methods and details are yet to be determined. Will be finalized before IRB application filing in November 2021.	CSV (non-spatial), SHP format (spatial), charts
35	Processed private data for controlled sharing	Aggregated	Refers to anonymize and aggregated reports at daily level that will be provided to researchers and independent evaluators.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 400 trips a day	System-generated by processing information stored in the reporting database	CSV, JSON

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
36	Public data for USDOT-managed System	Aggregated	Refers to anonymized aggregated reports at daily level that will be provided for USDOT-managed System.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** 400 trips a day	System-generated by processing information stored in the reporting database	CSV, JSON
37	Cost and revenue summary	Aggregated	Refers to the cost and revenue data, aggregated on a monthly basis.	**Type:** Text data, numerical data, financial data **Scale:** 400 trips a day	System-generated by processing information stored in the reporting database	CSV
38	Wheelchair failure log	Aggregated	Refers to wheelchair failure log aggregated on a daily basis by vehicle.	**Type:** Text data, numerical data, temporal data, positional data **Scale:** 400 trips a day	System-generated by processing information stored in the reporting database	CSV
39	Medical appointment status	Health	This is for internal use only and is needed to track any changes in medical appointments that also require changes in transportation appointments.	**Type:** Text data, numerical data, temporal data, positional data **Scale:** 100 trips a day	Data entry in EHR or medical appointment system	CSV
40	Discount coupon/credit	Trip	Consists of a log of discount code applied to trips and amount of credit. Available at trip level and will be linked to Fare Payment Log.	**Type:** Text data, numerical data, temporal data, positional data **Scale:** 100 trips a day	Entered by Traveler or concierge/ customer service staff	CSV

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ID	Data	Dataset	Description	Type/Scale	Collected Method	Format
41	Call center log	Admin	Call center statistics available from HIRTA, DCHD and healthcare providers, as available from phone systems or manual logs	**Type:** Text, numeric, temporal **Scale**: 500 calls per day	Generated from phone system	CSV
42	Missed medical appointments linked to lack of transportation access	Trip	Anonymized missed appointments linked to transportation access	**Type:** Text data, numerical data, temporal data, positional data	Manual record	CSV
43	Trip request (partners)	Trip	Trips manually requested by DCHD and healthcare providers using HIRTA TMS. To be tracked separately to assess the benefit of such capability.	**Type:** Text data, numerical data, temporal data, positional data. **Scale:** TBD	Manual entry	CSV

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4 Data Stewardship

This section provides details concerning data stewardship. Data stewardship involves proper data management throughout the data lifecycle, including, but not limited to, maintaining data quality and safeguarding data.

4.1 Data Owner and Stewardship

Table 5 provides information on data title, data owner, data steward and federal sponsor as follows:

- **Data Title**: Provides the title of the data and/or datasets that are assigned to the designated data owner and/or data steward. Data and/or datasets with different data owners and/or data stewards are listed separately. Datasets that have the same information for Owner, Steward and Sponsor are all listed in the same row of the table for clarity.

- **Data Owner**: The data owner is the person or organization with the authority, ability, and responsibility to access, create, modify, store, use, share, and protect the data. Data owners have the right to delegate these privileges and responsibilities to other parties. For Phase 1, Data Owner is identified as the team/team member creating the dataset.

- **Data Steward**: The data steward, at the direction of the data owner, is the person or organization that is delegated the privileges and responsibilities to manage, control, and maintain the quality of a data asset throughout the data lifecycle. The data steward may also apply appropriate protections, restrictions, and other safeguards depending on the nature of the data, subject to the direction of the data owner.

- **Federal Sponsor**: Refers to the federal entity that is the sponsor for this deployment. The federal sponsor will assume the role of Data Owner once the dataset(s) are provided to them per BAA and notice of funding opportunity (NOFO) requirements later in the project.

  Data Title correspond to datasets listed in Table 3 and Table 4. Currently, HIRTA is listed as the owner of all data, except in the cases where data is generated in external systems. ITS JPO is the federal sponsor for all data sets created under the project. In future updates during Phases 2 and 3, as data is provided to the USDOT and made publicly available, USDOT may become the owner of the dataset.

  Where Federal Sponsor is not applicable (e.g., dataset is generated in systems outside the scope of this project) it is marked N/A.

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Table 5. Data Owner and Steward Information

Group ID	Data Title	Data Owner	Data Steward	Federal Sponsor
A	1) Customer profile, 2) Customer eligibility for a funding source, 3) Fleet information, 4) Driver information 28) Incident/ accident 29) Incident report, 33) Customer complaints log, 37) Cost and revenue summary	HIRTA	HIRTA	N/A
B	5) Trip request, 6) Trip modification, 7) Trip status, 8) Manifest, 9) Vehicle location, 10) Trip performance, 11) Driver performance, 12) Travel time, 13) Driver Messages, 14) Dispatcher Messages, 15) Fare Payment Log, 30) Trip History Playback, 31) System performance, 35) Processed private data for controlled sharing, 40) Discount coupon/credit, 38) Wheelchair failure log, 35) Trip Summary	HIRTA	Uber Technologies	ITS JPO
C	16) Manifest (third party), 17) Trip performance (third party), 18) Vehicle location (third party), 19) Driver Messages (third party), 21) Dispatcher Messages (third party), 22) Fare Payment Log (third party)	HIRTA	Provider TBD	ITS JPO
D	22) Medicaid trips requests, 23) Medicaid trip performance	Access2Care	HIRTA	N/A
E	24) Medical appointment details, 39) Medical appointment status	Healthcare Partner	Healthcare Partner	N/A
F	26) Traveler wayfinding request, 27) Traveler wayfinding guidance	HIRTA	Navi Lens and other wayfinding system provider (TBD)	ITS JPO
G	32) Information/ referral request	DCHD	DCHD	N/A
H	34) Customer survey results	HIRTA	ISU	ITS JPO
I	36) Public data for USDOT-managed System	USDOT	HIRTA	ITS JPO

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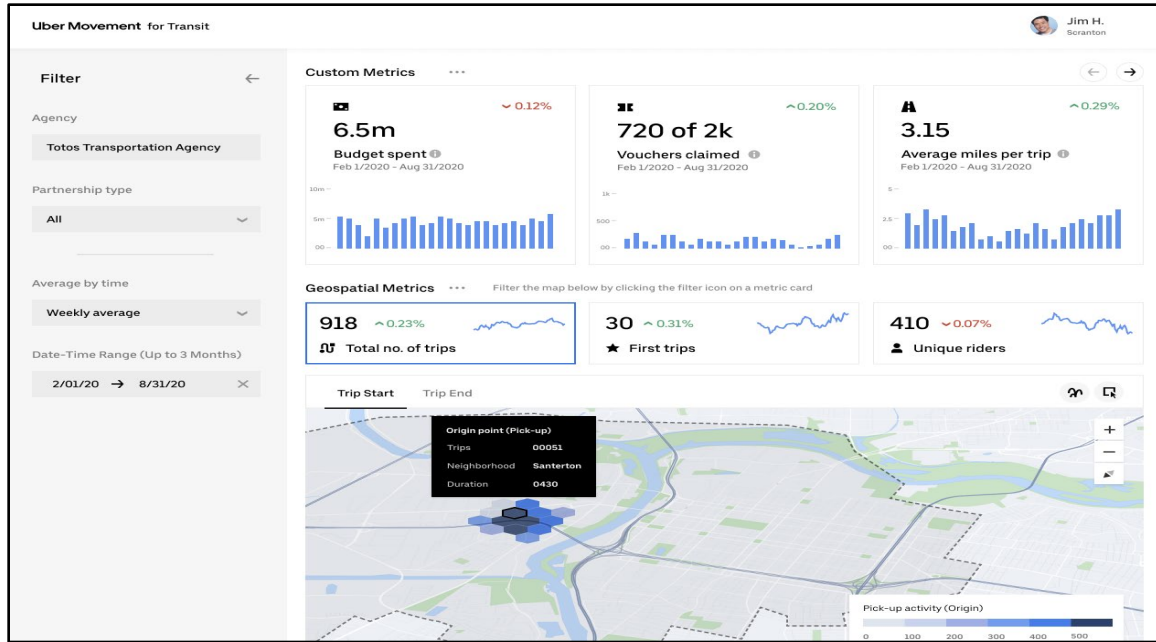
4.2 Access Level

Access level is defined for accessing data as follows:

- **Open** - Data that can be used by the public with no or limited licensing restrictions. This data is available to the public without needing to request permissions and will be provided to the USDOT-managed Public System. These datasets will be provided after anonymizing and aggregating raw private datasets to protect PII.

- **Private**- Data that cannot be shared with external users. Access to this data is limited and only granted with IRB and Project Team approvals. Private data will be available under the following subcategories of access levels:

  o **Personal Identifiable Information (PII)**- Data that has PII included in the data set. The access to this data will be restrictive to protect the PII based on IRB-approved processes. Data in this category will have an operational purpose that justifies its storage. For Health Connector, it will include Traveler details (name, ID, location), Driver details (name, ID, vehicle details), Trip details (Trip ID that can be linked to any personal identity), medical appointment details in the raw dataset and any other dataset marked as PII as part of the IRB process.

  o **Proprietary**– Licensed data from third parties or data that can reveal details on proprietary methods and applications protected as part of intellectual property. This data will be used for operational purposes. Any access to the data is determined by usage agreements between the parties. Examples include pathways structure for wayfinding, access to raw real-time data on service management from Uber Technologies.

  o **Research**- Data that is available for research, but users of the data must meet IRB requirements before gaining access to the data. These datasets may have PII. Examples of this data include survey data, trip-level data, driver-level data, Traveler-level data.

4.2.1 Public/Open Datasets

TMS reporting platform as shown in Figure 6 will be used for making access to open data available at aggregated level as part of data sharing requirement for USDOT-managed System. A publicly available open data portal already provides travel time and speed data by TAZ and CT for various US cities. A customized version for Health Connector will make additional data available as identified in Table 6.

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Figure 6. TMS reporting for Data Access (Source: Uber Technologies)

Table 6 provides a list of data that can be safely made available per the current understanding of HIRTA team as of October 2021. As the team continues to work through the finalization of PMESP, SyRS and HUA summary document along with the IRB process, further updates may become available and will be incorporated. HIRTA team plans to provide another version of updated DMP in November 2021 when PMESP, SysRS and Draft HUA summary document are complete. This is included in the DMP schedule in Table 2.

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Table 6. Health Connector Open Data Scope

ID	Data	Dataset	Access Portal	Safeguarding Methods and Processes
3	Fleet information	Admin	USDOT-managed System	Active HIRTA fleet data will be made publicly available "as is" given it does not contain any PII or sensitive information. Active fleet data for contractors or TNCs will be made available excluding any PII (e.g., license plate). Key purpose of making this dataset available will be to analyze capacity, reliability and availability by vehicle.
9	Vehicle location	Trip	USDOT-managed System	Historical log of raw vehicle location, time, heading and speed will be made available along with anonymized vehicle or driver ID (not both) for HIRTA vehicles.
18	Vehicle location (third party)	Trip	USDOT-managed System	Historical log of raw vehicle location, time, heading and speed will be made available along with anonymized vehicle ID for third-party vehicles.
25	Trip Summary	Aggregated	USDOT-managed System	Aggregated trip summary data at TAZ and CT level. At the least, aggregated operational summary (trips completed, vehicles in use, average travel time, average revenue miles, average deadhead miles, fare collected) by hour, funding program, provider and underserved group will be provided. Scope and level of aggregation for this data is still being finalized and will not be available until IRB process is complete.
28	Incident/accident	Admin	Secure FTP	Details involving HIRTA assets will be made available to report on safety events on a monthly basis. No PII will be included.
29	Incident report	Admin	Secure FTP	Details involving HIRTA assets will be made available to report on safety events along with any safety response taken on a monthly basis. No PII will be included.
36	Public data for USDOT-managed System	Aggregated	USDOT-managed System	Data described in this table will primarily be available. However, this list will be updated as the HIRTA team determines additional data that can be made publicly available through appropriate anonymization and aggregation exercise.
38	Wheelchair failure log	Aggregated	USDOT-managed System	Daily report on data aggregated at vehicle level will be available on wheelchair failure logs indicating number of failure events by vehicle.

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ID	Data	Dataset	Access Portal	Safeguarding Methods and Processes
12	Travel time	Aggregated	USDOT-managed System	Access to real-time data cannot be provided as continuous stream of real-time data can be used to reverse engineer proprietary algorithms. Travel time data by analyzing anonymized historical trip data will be available at CT and TAZ level. Travel time in the context of the project refers to only vehicle component of the Complete Trip. The wayfinding leg of the trip that involves walking or use of mobility aid is going to be calculated separately. Wayfinding data doesn't have PII since that is stored by device ID and nodes used in the pathway and pathway steps. However, this is listed currently as private dataset and will be made publicly available based on IRB approval.

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4.2.2 Private Datasets

Controlled access to private data will be made available in CSV and JSON format (as shown in Table 4) to researchers and USDOT Independent Evaluators through a web-based data access portal, TMS Reporting. A snapshot of TMS Reporting is provided in Figure 7.

Figure 7. Snapshot of TMS reporting used to Access Driver, Trip Level and Program Level Data (Source: Uber Technologies)

Table 7 provides a list of private data that can be securely made available per the current understanding of HIRTA team as of October 2021. As the team continues to work through the finalization of PMESP, SyRS and HUA summary document along with the IRB process, further updates may become available and will be incorporated. HIRTA team plans to provide another version of updated DMP in November 2021 when PMESP, SysRS and Draft HUA summary document are complete. In particular, feasibility of providing identified dataset will be assessed during SysRS development process. This is included in the DMP schedule in Table 2.

This section will be updated again in December 2021 after the IRB process is complete.

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Table 7. Scope and Availably of Private Datasets

ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
1	Customer profile	Admin	TMS reporting	• Research: This data consists of PII information on Travelers/customers and cannot be made available without anonymization and controlled access.	Uber dataset anonymizes personal information (name, address) and assigns a universally unique identifier (UUID), Traveler UUID, to the dataset. The UUID is mapped internally to Traveler's Uber ID and is inaccessible to unauthorized users. This approach will be used to make controlled access to Traveler profile available at CT or TAZ level. Primary purpose will be to provide data for researching transportation needs of underserved population. Planned data to be included: Traveler UUID, undeserved population category, mobility need, eligibility for funding sources (multiple sources may be applicable), recurring or ad-hoc trip customer,
2	Customer eligibility for a funding source	Admin	TMS reporting	• PII: Identified as a critical information and will not be made available.	Approach taken for Data ID #1 provides the eligibility information.
4	Driver information	Driver	TMS reporting	• Research: some PII data may be included so available only for research.	Uber dataset currently includes Driver PII (ID and name) when making information available through TMS Reporting. This will be explored further with IRB before deciding if information on Drivers can be made available as is.

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
5	Trip request	Trip	TMS reporting	• Research: Trip-level details include location and time information which can be an issue if somehow Rider identity is determined (e.g., looking up address in public records). Trip-level data will be made available only for research with an agreement that Traveler identity will be fully protected.	Uber dataset anonymizes Trip information (trip id, name, address) and assigns a unique identifier (Trip ID) to the dataset. The public Trip ID is mapped internally to Uber's internal Trip ID in the system and is inaccessible to unauthorized users. This approach will be used to make controlled access to trip data available. Planned data to be included: Trip ID (anonymized), requesting device id (anonymized), device type, pick-up location, drop-off location, pick-up time, drop-off time, mobility aid requested, funding source requested, whether or not request completed, gap in requested time and scheduled time
6	Trip modification	Trip	TMS reporting	• Research: Trip-level details include location and time information which can be an issue if somehow Rider identity is determined (e.g., looking up address in public records). Trip-level data will be made available only for research with an agreement that Traveler identity will be fully protected.	Same approach as Data ID #5 will be used. Planned data to be included: Trip ID (anonymized), device id (anonymized), device type, original/modified pick-up location, original/modified drop-off location, original/modified pick-up time, original/modified drop-off time, whether or not request completed, gap in requested time and scheduled time

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
7	Trip status	Trip	TMS reporting	• Research: Trip-level details include location and time information which can be an issue if somehow Rider identity is determined (e.g., looking up address in public records). Trip-level data will be made available only for research with an agreement that Traveler identity will be fully protected. • Proprietary: access to real-time data cannot be provided as continuous stream of real-time data can be used to reverse engineer proprietary algorithms.	Same approach as Data ID #5 will be used. Planned data to be included: To check the reliability of ETA, a log of Trip ID, ETA and actual time of arrival will be made available for a requested time period. Any log of delay communicated to Traveler, if available, will be provided as supporting dataset
8	Manifest	Admin	TMS reporting	Private dataset used for only internal operational purposes. Contains PII data.	Not made available externally since other data is sufficient.

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
10	Trip performance	Trip	TMS reporting	• Research: Trip-level details include location and time information which can be an issue if somehow Rider identity is determined (e.g., looking up address in public records). Trip-level data will be made available only for research with an agreement that Traveler identity will be fully protected • Proprietary: access to real-time data cannot be provided as continuous stream of real-time data can be used to reverse engineer proprietary algorithms.	Same approach as Data ID #5 will be used. Planned data to be included: Trip ID (anonymized), driver ID, vehicle ID, scheduled/actual pick-up location, scheduled/actual drop-off location, scheduled/actual pick-up time, scheduled/actual drop-off time, whether or not a no-show, no-show reason, whether or not cancelled, cancellation reason.
11	Driver performance	Driver	TMS reporting	• Research: raw driver-level data includes PII (name). Aggregated driver performance can be provided	Approach identified as part of Data ID #4 will be used for aggregation. Planned data to be included: Driver ID, revenue miles, revenue hours, trips completed, revenue collected, rating
13	Driver Messages	System Log	TMS reporting	• Research: sensitive operational information may be available that should not be made public. However, can be made available for researchers to investigate and resolve any confounding factors.	Log of messages will be provided as is. Planned data to be included: Driver ID, Vehicle ID, time, location, message text

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
14	Dispatcher Messages	System Log	TMS reporting	• Research: sensitive operational information may be available that should not be made public. However, can be made available for researchers to investigate and resolve any confounding factors.	Log of messages will be provided as is. Planned data to be included: Driver ID, Vehicle ID, Dispatcher ID, time, location, message text
15	Fare Payment Log	Trip	TMS reporting	• Research: while actual payment data is not there, fare payment data is connected with trip performance data and contains PII.	Trip anonymization approach as discussed for Data ID #5 will be used to provide log of fare payment. Planned data to be included: Trip ID, actual cost, fare required, fare paid, discount coupon/code, payment method.
16	Manifest (third party)	Admin	TMS reporting	Private dataset used for only internal operational purposes. Contains PII data.	Not made available externally since other data is sufficient.

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
17	Trip performance (third party)	Trip	TMS reporting	• Research: Trip-level details include location and time information which can be an issue if somehow Rider identity is determined (e.g., looking up address in public records). Trip-level data will be made available only for research with an agreement that Traveler identity will be fully protected • Proprietary: access to real-time data cannot be provided as continuous stream of real-time data can be used to reverse engineer proprietary algorithms.	Same approach as Data ID #5 will be used. Planned data to be included: Trip ID (anonymized), vehicle ID, driver ID, scheduled/actual pick-up location, scheduled/actual drop-off location, scheduled/actual pick-up time, scheduled/actual drop-off time, whether or not a no-show, no-show reason, whether or not cancelled, cancellation reason.
19	Driver Messages (third party)	System Log	TMS reporting	Research: sensitive operational information may be available that should not be made public. However, can be made available for researchers to investigate and resolve any confounding factors.	Log of messages will be provided as is. Planned data to be included: Driver ID, Vehicle ID, time, location, message text

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
20	Dispatcher Messages (third party)	System Log	TMS reporting	Research: sensitive operational information may be available that should not be made public. However, can be made available for researchers to investigate and resolve any confounding factors.	Log of messages will be provided as is. Planned data to be included: Driver ID, Vehicle ID, Dispatcher ID, time, location, message text
21	Fare Payment Log (third party)	Trip	TMS reporting	Research: while actual payment data is not there, fare payment data is connected with trip performance data and contains PII.	Trip anonymization approach as discussed for Data ID #5 will be used to provide log of fare payment. Planned data to be included: Trip ID, actual cost, fare required, fare paid, fare promotion, payment method.
22	Medicaid trips requests	Trip	TMS reporting	• Research: Trip-level details include location and time information which can be an issue if somehow Rider identity is determined (e.g., looking up address in public records). Medicaid trips may have other HIPAA-protected details as well. Trip-level data will be made available only for research with an agreement that Traveler identity will be fully protected	Uber dataset anonymizes Trip information (trip id, name, address) and assigns a unique identifier (Trip ID) to the dataset. The public Trip ID is mapped internally to Uber's internal Trip ID in the system and is inaccessible to unauthorized users. This approach will be used to make controlled access to trip data available. Planned data to be included: Trip ID (anonymized), pick-up location, drop-off location, pick-up time, drop-off time, whether or not request completed, gap in requested time and scheduled time

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
23	Medicaid trip performance	Trip	TMS reporting	• Research: Trip-level details include location and time information which can be an issue if somehow Rider identity is determined (e.g., looking up address in public records). Trip-level data will be made available only for research with an agreement that Traveler identity will be fully protected • Proprietary: access to real-time data cannot be provided as continuous stream of real-time data can be used to reverse engineer proprietary algorithms.	Same approach as Data ID #5 will be used. Planned data to be included: Trip ID (anonymized), scheduled/actual pick-up location, scheduled/actual drop-off location, scheduled/actual pick-up time, scheduled/actual drop-off time, whether or not a no-show, no-show reason, whether or not cancelled, cancellation reason.
24	Medical appointment details	Health	TMS reporting	• PII: HIPAA-protected details	Whether or not a transportation access was provided for a medical appointment is the only data made available; also identified if the medical appointment was a no-show. Planned data to be included: Trip ID (anonymized), No-show status, No-show reason.
26	Traveler wayfinding request	Wayfinding	Navi Lens	• Proprietary: the format in which request is received is proprietary given there is no standard available. • Research: Controlled access to researchers will be made available.	Information will be made available only by anonymized device ID. Planned data to be included: Device ID, wayfinding origin, wayfinding destination

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
27	Traveler wayfinding guidance	Wayfinding	Navi Lens	• Proprietary: the format in which direction is provided is proprietary given there is no standard available. • Research: Controlled access to researchers will be made available.	Information will be made available only by anonymized device ID. Planned data to be included: Device ID, wayfinding origin, wayfinding destination, whether or not direction provided, reason for not providing, pathways details for direction provided, customer feedback (if available)
30	Trip History Playback	Trip	TMS reporting	Private dataset used for only internal operational purposes. Contains PII data.	Not made available externally since other data is sufficient.
31	System performance	System Log	TMS reporting	• Proprietary: details may include server logs that may reveal unintended information	Only aggregated information of failure logs by component on a daily basis, will be available. Planned data to be included: failure type, occurrences, severity, resolution time, repeat problem
32	Information/referral request	Health	DCHD System	PII: HIPAA-protected details	Standard report on referral success will be made available by anonymized Traveler ID (as determined per approach for Data ID # 1)
33	Customer complaints log	Admin	SFTP	• PII: may include some PII information so wide release will be denied. • Research: will be made accessible for research, particularly to supplement findings from other analyses.	Will be aggregated by complaint type and provider type at daily level for tracking customer complaints received. Planned data to be included: customer complaint received, provider, date received, complaint date, resolution, and resolution date.

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
34	Customer survey results	Survey	SFTP	• PII: some PII information may be present • Research: will be made accessible for research, particularly to supplement findings from other analyses. Survey results will be critical for several performance measures	A detailed approach for survey data to be collected, terms and conditions for human subject participation, survey design, analysis plan still needs to be determined and will be finalized as part of IRB/HUA process and PMESP finalization.
35	Processed private data for controlled sharing	Aggregated	TMS reporting	Private dataset as discussed earlier in this table:	A controlled access to data, discussed earlier in this Table will be made available using appropriate level of anonymization, protection and aggregation
37	Cost and revenue summary	Aggregated	TMS reporting	• Research: cost and revenue data are sensitive until finalized	Data will be made available for research only. There are several factors involved in managing cost and revenue data and sometimes it is not done until a reporting period is complete. So, data based on formal request will be provided after proper validation. Planned data to be included: Reporting period (monthly, quarterly, annual), number of trips completed, total revenue miles, total revenue hours, total cost, total revenue, total fare paid, trips completed, number of Travelers served
39	Medical appointment status	Health	TBD	PII: HIPAA-protected details	Only limited information available indicating whether or not transportation access was provided for a medical appointment and if the medical appointment was a no-show. Planned data to be included: Trip ID (anonymized), No-show status, No-show reason.
40	Discount coupon/credit	Trip	TMS reporting	Same as Data ID #15 and #21	Same as Data ID #15 and #21
41	Call center log	Admin	SFTP	Same as Data ID #33	Same as Data ID #33

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ID	Data	Dataset	Access Portal	Reason(s) the Data is Private	Safeguarding Methods and Processes
42	Missed medical appointments linked to lack of transportation access	Trip	SFTP	Same as Data ID #39	Same as Data ID #39
43	Trip request (partners)	Trip	TMS reporting	Same as Data ID #5	Same as Data ID #5

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4.2.3 Access Request

Access to the Health Connector system and data is governed by user type, and access licenses and agreements, except for open data as defined Section 4.2.1 . The system, in general, is not publicly accessible. Access is based on the functional roles and responsibilities of each user requiring access to the system. Access to the system is permitted to the level of need for each user to perform his or her role. For example, this would include customer service representatives booking trips on behalf of riders and facilities, discharge planners management outflow of patients from area health care facilities, supervisors and managers tasked with oversight of the program and independent third-party evaluators requiring access to data for performance and program level reporting.

HIRTA can make data available to researchers based on terms and conditions yet to be determined. This section will be completed after IRB process is complete and human use approval (HUA) summary is available.

4.2.4 Related Tools, Software and/or Code

Health Connector includes several commercially available subsystems, as explained in Section 3.1.

Controlled access to private data will be made available in CSV (non-spatial) and JSON (spatial) format to researchers and USDOT Independent Evaluators through a web-based data access portal for download, TMS Reporting as identified in Table 4 and **Table 5**. Addition data with analytics capability will also be accessible to researchers through secure login to TMS Reporting platform providing the user to review and report on the system through the use of visual dashboards and graphs.

Public data for the USDOT-managed System will be made available after anonymization and aggregation, also in CSV and JSON formats.

4.2.5 Relevant Privacy and/or Security Agreements

The proposed project will make available the aggregate data and metadata for research purposes. Any PII, Confidential business information (CBI) and electronic personal health information (ePHI) as defined under the HIPAA will be collected, maintained and protected in secure data management system in accordance with all applicable state and federal laws. Written agreements entered into between HIRTA and Uber Technologies; the mobile application's terms of use entered into by the customer; and Uber Technologies privacy policy shall govern the collection and use of the data generated through use of the Software. Per these agreements, HIRTA and Uber Technologies will each protect all data access to ensure maximum security.

This section will be updated further once the IRB process is complete in December 2021. Also, additional agreements needed between HIRTA and Access2Care for Medicaid data; and HIRTA, EHR software and healthcare care provider for medical appointment data are expected be completed before the ICTDP is complete. While Uber Technologies will deploy the interfaces, HIRTA will be the lead for Phase 2/3 and will be entering in agreements needed with third parties on behalf of the HIRTA team. However, it is likely that details may not be finalized within Phase 1

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completion timeframe. The HIRTA team is tracking interfaces as risk items in the Risk Register. Once developed, the HIRTA team will submit agreements for approvals from the IRB.

4.3 Re-Use, Redistribution, and Derivative Products Polices

HIRTA maintains ownership of the electronic data of their customers, and its users, that is submitted by or imported by HIRTA into the Software in connection with HIRTA use of the Software.

The system will be licensed to HIRTA. HIRTA will comply with all licensing regulations set forth in the agreement. This project incorporates several off the shelf licensing components as well as planned custom configurations and potentially new feature builds as an outcome of the project pilot. The licenses will include licensing agreements from Uber Technologies, as well as other third-party vendors such as Navi Lens.

Open data through USDOT-managed system will be made available under Creative Commons, Attribution Non-Commercial License. Please note that the complete details of license are currently not available. This section will be updated once the details are available.

Table 8 provides further details.

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Table 8. Licensing for Private Data

Dataset Title	License Used	Reason(s) for Non-Open License
Trip Level Data	Uber Technologies Licensing Agreement	Contractual between HIRTA & Uber Technologies. Access can be provided through license agreement with HIRTA. Access will be granted based on defined roles and program responsibilities.
Driver Level Data	Uber Technologies Licensing Agreement	Contractual between HIRTA & Uber Technologies. Access can be provided through license agreement with HIRTA. Access will be granted based on defined roles and program responsibilities.

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Dataset Title	License Used	Reason(s) for Non-Open License
Aggregate Program Data	Uber Technologies Licensing Agreement	Contractual between HIRTA & Uber Technologies. Access can be provided through license agreement with HIRTA. Access will be granted based on defined roles and program responsibilities.
HIRTA Admin Data	Uber Technologies Licensing Agreement	Contractual between HIRTA & Uber Technologies. Access can be provided through license agreement with HIRTA. Access will be granted based on defined roles and program responsibilities. .
System Log	Uber Technologies Licensing Agreement	Contractual between HIRTA & Uber Technologies. Access can be provided through license agreement with HIRTA. Access will be granted based on defined roles and program responsibilities. .
Health Data	Uber Technologies Licensing Agreement	Includes sensitive data with PII Contractual between HIRTA & Uber Technologies. Access can be provided through license agreement with HIRTA. Access will be granted based on defined roles and program responsibilities
Wayfinding Data	Navi Lens Licensing Agreement	Pathways information is proprietary given there is currently no standard in use outside GTFS-pathways as available for the fixed route transit service.

4.4 Data Storage and Retention

Storing and retaining the data is a key part of the data steward's responsibilities to manage, control, and maintain the quality of a data asset throughout the data lifecycle. All data generated by Health Connector will be stored in the Amazon Web Service (AWS) cloud storage. The data will be made available for 7 years.

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HIRTA in collaboration with project stakeholders will determine the data storage and retention policies. These policies will include but not limited to the following:

- **User Data Retention and Deletion Policy** - defines how long user data should be retained before it is deleted or anonymized and how long user data may be accessible by team members.

- **Exceptions to User Data Retention and Deletions Policy**: May include specific circumstances such as maintaining data for security, safety, fraud and abuse. Other considerations would include legal proceedings or insurance claims.

- **Privacy Policies** - include how data/ information is collected, used, and shared; and choices and options regarding this data/ information.

- **Access Management Policy** - policy specifically managing access to Uber data and information sources

- **Change Management Policy** - Defining the change and release management requirements to be followed when implementing system changes to information and data resources.

- **Data Classification, Handling and Sharing Policy -** Defining classification and handling requirements for processing and storing data using system information resource and sharing data with external entities.

4.4.1 Storage Systems

While system will be hosted on AWS servers within the United States, actual storage details for the system are currently not known. Also, some of the details will not be made publicly available for security reasons. Detailed storage needs will be determined through the requirements development process in Phase 1 and the section will need to be revisited further in Phase 2 during System Design and testing as better details on storage needs, archival plan and other details become available (e.g., frequency and granularity of actual data needs after the review of initial dataset).

A summary of storage systems, per current understanding is provided in Table 9.

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Table 9. Summary of Storage Systems

Data Storage System Type	Dataset Title(s)	Initial Storage Date	Frequency of Update	Archiving and Preservation Period
Uber Technologies - AWS Hosted Storage Traveler trip requests may be logged locally. This is still being investigated and will be updated as details are available during system requirements.	Trip Level Data	Feb 2023	Daily	Through Feb 2025
Uber Technologies - AWS Hosted Storage. Some data may be temporarily stored on Driver tablets/phones to work in offline mode (e.g., due to data disconnection) before getting synchronized	Driver Level Data	Feb 2023	Daily	Through Feb 2025
Uber Technologies - AWS Hosted Storage	Aggregate Program Data	Feb 2023	Daily, Monthly, Annual	Through Feb 2025
Uber Technologies - AWS Hosted Storage	HIRTA Admin Data	Feb 2023	Daily	Through Feb 2025
Uber Technologies - AWS Hosted Storage	System Log	Feb 2023	Daily	Through Feb 2025
Uber Technologies - AWS Hosted Storage	Health Data	Feb 2023	Daily	Through Feb 2025
Navi Lens System	Wayfinding Data	Feb 2023	Daily	Through Feb 2025

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Data Storage System Type	Dataset Title(s)	Initial Storage Date	Frequency of Update	Archiving and Preservation Period
HIRTA Local Data Center	Open HIRTA Admin Data	Feb 2023	Daily	Through Feb 2025
ISU Local Data Center	Open-survey data and results	TBD	TBD	TBD
U.S. DOT-managed – Public System	USDOT-managed System	Aug 2023	Daily	Five years

4.4.2 Data Storage System Description

HIRTA will be transitioning from the current cloud-based hosting service to AWS-based hosting service within the United States. This section will be completed when the process is complete.

The system will use a relational database format in the collection, storage, and output of the data and metadata. The data collection, operational, and reporting processes are practical and within industry practices. The use of technology enables the protection of the data collection methodology and seeks to use standards where available.

4.4.3 Cybersecurity Policies

Core Security Engineering team at Uber Technologies will deliver secure system and services for the infrastructure and products. The team will manage all aspects of security architecture, engineering and operations focused operational risks driver product delivery in compliance with international standards and regulations. Further existing policies (not public), will govern cybersecurity incident management policy, defining the policies for managing cybersecurity incidents and threats that impact confidentiality, integrity or data availability.

Terms of use of NaviLens application will be as described in the conditions of use (https://www.navilens.com/terms). Also, privacy terms will be governed by Navi Lens privacy policy (https://www.navilens.com/privacy).

HIRTA does not have cyber security or privacy policies developed. Interfaces with Access2Care and EHR provider (Epic/Unity Point) are still under discussion so those cannot be included at this time. The document will be updated when these details are available. HIRTA team plans to finalize these details before Phase 2 design.

4.4.4 Data Security Policies and Procedures

Preliminary assessment related to data and system confidentiality, availability, integrity and authenticity are provided below:

- **Confidentiality:** HIRTA will be the owner of all datasets for the data collected within HIRTA TMS. Only authorized users, per their role, are provided access to specific modules of the system and the data generated by those systems, as identified in the system configurations. For Health Connector, data flow diagram by user group in ConOps will be used to identify access levels for system end users.

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When medical appointment data is made available by the healthcare provider, an information release form will have to be signed by the parties accessing such information. Consent form is approved by both healthcare provider and Patient/Traveler.

Data within Access2Care and Navi Lens systems will be made available to HIRTA per agreement signed by HIRTA with them but currently both of those organizations are marked as the owners of data generated in their systems. Further details on data ownership are clarified in **Table 5**.

- **Availability:** The system will have high-availability requirement and HIRTA's service level agreement (SLA) with Uber Technologies and Navi Lens will govern the availability of their products. The SLA language is still to be determined but will focus on the following key aspects of the system availability:

    o   Definition of types of expected issues and their severity.

    o   Identification of vendor response time and level of support to be provided depending on the severity of issue and the level of support needed, in the event an issue is reported.

    o   Identification of key performance indicators (KPIs) with respect to system performance.

    o   Guidance on planned system/data maintenance schedule.

    o   Vendor support cost as applicable by the severity of an issue.

    o   Clear description on what may constitute as a maintenance update, system upgrade or new enhancement, and what is covered per the vendor-agency contract.

    o   Identification of vendor credits as applicable in the event of a system outage /unavailability.

    o   Terms and conditions attached to the data breach or other security issues.

    o   Definition of roles and responsibilities (vendor, agency, third parties) with respect to system maintenance and incident response.

- **Integrity:** System functions will be made available to HIRTA staff and its partners according to their roles and responsibilities. Except for those privileges, no user is authorized to make any changes. Also, system audit trail shows if and what changes were made by a user.

- **Authenticity and non-repudiation:** Data sent and received between devices are logged with contextual information (e.g., vehicle to TMS messages have vehicle ID, location and time stamp attached). Also, when trip requests are sent by customers, those will include the customer information as only registered customers are allowed to book trips with HIRTA.

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4.4.5 Back-up and Recovery Policies and Procedures

Vendors will use a highly reliable system and data environments will be designed to protect any data loss due to routine and ad-hoc maintenance processes that may require data back-up and recovery.

For Uber Technologies, globally, policies are in place and systems are monitored in a real-time on a 24-hour basis with several undisclosed Network Operations Centers. The governing policy defines the standard for backup and recovery management of primary data generated by production systems and services. It outlines the requirements for taking backups, ensuring their security and integrity, monitoring and testing the backup and restoration process.

Back-up and recovery policies incorporate specific policies regarding eligibility for data stores, new datastores and existing datastores. Unless otherwise authorized backups include primary data, instances of all storage system and storing source of truth data. Incrementation and differential backups are also performed.

Access to backup data must be protected by access control list. Access must also be limited to the team responsible for production support of the storage system and data.

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5 Data Standards

5.1 Data Standards

A list of standards, as applicable to vehicle, central environment, and data access and sharing are discussed in the following subsections.

5.1.1 Vehicle Data Standards

Currently, only planned vehicle equipment is a tablet or a mobile device for Drivers that will exchange data over cellular data network.

HIRTA team also plans to explore the potential to provide advanced infotainment service on vehicles to provide information to travelers (e.g., orientation information upon arrival at the hospital). This was identified as low priority need at ConOps stage. However, it is included as an optional requirement based on subsequent stakeholder discussions and implementation approach (e.g., hardware and content management) will be revisited during design stage as part of Phase 2.

None of the planned features require a vehicle area network (VAN) except obtaining real-time status on wheelchair availability. Fault codes can be received over Society of Automobile Engineers (SAE) J1939 network if a wheelchair lift interlock module is available on a vehicle. Based on system requirements discussion, need for real-time monitoring of such failure is not considered essential.

5.1.2 Data Communication Standards

Vehicle to central communication will be accomplished using Internet Protocol (IP)-based transport protocols, Transmission Control protocol (TCP) or User datagram Protocol (UDP).

Data transport will occur over 4G or 5G network with a carrier-level encryption using a private Access Point Name (APN).

5.1.3 Data Access Protocols

At least the following protocols will be used:

- HTTPS: Hypertext Transfer Protocol Secure (HTTPS) will be used for accessing data over the web or mobile browsers. Secure Socket Layer (SSL)-based security as provided at OS-level will be used by mobile apps.

- SFTP: Secure file transfer protocol (SFTP) will be used to make access available to open data from HIRTA's local data center.

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5.1.4 Data Sharing Standards

Data will be shared using the following standard formats:

- CSV: non-spatial data will be shared using text-based files using CSV format. Files will include a header and data. Details on the header fields will be available in the metadata.

- JSON: TMS Reporting portal currently makes spatial data available over JSON and the same practice will be used for sharing spatial data.

- SHP: Shape file format may be used for sharing spatial analysis conducted using survey data.

5.1.5 Open Data Standards for Transactional Data

Open data, currently in practice in the transit industry, is applicable to fixed-route services only to openly share data related to Traveler information. For Health Connector, which will be a demand response service, only applicable standard is GTFS-flex. GTFS-flex, however, is limited to trip planning for demand response services and is mostly useful when multiple agencies are involved given the effort required in putting together the feed. Given the limited utility to the project, use of GTFS-flex is not planned.

Overall, open data-based exchange is not applicable to this project since there is currently no transactional data standard for functions such as booking, service management, payment in use for demand response services in the industry. Existing and planned open data standards for transactional information, General on-Demand Feed Specification (GOFS) or Transactional Data Standard (TDS), are still not ready for mainstream deployment based on our assessment. HIRTA team will continue to monitor that development for Phase 2 but currently taking the open API approach for interfacing with external systems (Access2Care, EHR system or third-party service providers).

Exchange with wayfinding system will be done using a standard format based on GTFS-pathways, which has been adopted for outdoor and indoor wayfinding by transit industry. However, officially there is no standard for indoor environment beyond transit industry.

5.1.6 Open API

Interfaces with Access2Care and Epic EHR are planned using Uber's open Representational State Transfer (REST) APIs. Detailed API document is available on Uber developer page (https://developer.uber.com/ , accessed Aug 2021).

Epic's open API will be needed to access medical appointment data. Details of the API are available at https://open.epic.com/ (accessed Aug 2021). Epic APIs are also compliant with Fast Health Interoperability Record (FHIR) and use eXtensible markup language (XML) or JSON for data exchange.

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5.2 Versioning

Datasets released at a particular interval (e.g., daily, monthly) will follow a naming convention (to be defined by Dec 2021) so it is easily identifiable by users. Also, datasets will be accompanied by metadata so users are able to determine information on what is included. If there are any changes in the data structure between versions, it will be identified in the metadata. Also, the DMP will be updated accordingly. Further details on metadata update process is described in Section 5.3.3.

Change and Release management policies govern the release of updated versions for the system.

5.3 Metadata

Routematch and other Uber products from Uber Technologies as discussed earlier will be part of the HIRTA TMS that will generate and maintain the datasets identified in this document. Data will also be generated in the third-party system (EHR, Access2Care) and will be accessed by HIRTA TMS through secure interfaces. Navi Lens system will contain its own data but will be shared by the Health Connector data access portal.

The following sections provide further details on the Metadata that will be included with the shared data.

5.3.1 Metadata Types

In the context of Health Connector project, metadata is defined as follows.

- **Business Metadata:** Data that is used to provide business value and context for the data. The following subcategories are used to define this metadata:

    o **Discovery:** Metadata that is used to allow other users to find and work with the data. This metadata includes information on why the data was collected, what type of data is it including, general description of the dataset types, location the data was collected, when it was collected, what techniques/technologies where used, and who created that data.

      DMP has identified data and datasets that will be generated, collected, stored and archived by the Health Connector system in Table 3 and Table 4. Owner and steward of the data and datasets are also identified in the DMP.

      Details of survey data are currently not available and will not complete until the PMESP is finalized and the IRB process is complete.

    o **Licensing:** Metadata that provides the licensing for the data and allows users to know the rights they have to use, any restrictions on copying, publishing, distributing, transmitting, citing or adapting the data.

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Section 4.2 defines the access levels for public and private data per HIRTA team's current understanding. This will be further reviewed as system requirements get finalized along with PMESP. Also, IRB will have to approve if the data can be provided as planned.

Terms and conditions of data use will be covered by the agreements between HIRTA and providers of systems as follows:

- Written agreements entered into between HIRTA and Uber Technologies; the mobile application's terms of use entered into by the customer; and Uber Technologies privacy policy shall govern the collection and use of the data generated through use of the Software.

- Access to wayfinding system data will be governed by licensing terms set by Navi Lens.

- Access to Medicaid data will be governed by terms of the agreement as entered into by HIRTA and Uber Technologies with Access2Care.

- Access to healthcare data will be covered by 1) consent release signed by healthcare provider, Traveler/patient, HIRTA and Uber Technologies; 2) terms and conditions as set by EHR provider (Epic) and Uber Technologies, and subsequently HIRTA and Uber Technologies. Note that the health data scope is limited to what is defined in this DMP.

Also, for access to data and use through TMS Reporting will be governed by Uber Technologies privacy policy (https://www.uber.com/legal/en/document/?country=united-states&lang=en&name=privacy-notice).

- **Technical Metadata:** Data that is used to provide technical details on the data, as defined under the following categories

  o **Data Schema:** Metadata that documents the exact fields in the data including, field name, description, data type, and notes. Currently, this information is available at dataset level for Uber Technologies, however, exact fields and other details are being determined during interface requirement development as part of systems requirements development process. A sample of Trip-level dataset (not finalized) as available through TMS Reporting is provided in Table 10. Please note that the schema may evolve through Phase 2 design and development, however, a finalized schema for datasets, including columns and descriptions will be included once the systems requirement document is complete by November 2021.

Table 10. Trip-Level Data Description

Data	Column Label
Trip	Status (e.g., completed, driver cancel)
	Trip ID
	Comments

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Data	Column Label
Rider & Driver Info	Rider ID (UUID) (for managed riders)
	Rider First Name (for managed riders)
	Rider Last Name (for managed riders)
	Rider Email (for managed riders)
	Seats Requested
	Driver Name
	Driver Last Lame
	Vehicle License
	Vehicle VIN
	Vehicle ID
	Vehicle Capacity
	Voucher name (if applicable)
Location	Route
	City
	Pickup Address
	Pickup Lat
	Pickup Long
	Dropoff Address
	Dropoff Latitude
	Dropoff Longitude
	Distance (miles)
Time	Pickup Date
	Pickup Time
	Drop Off Date
	Drop Off Time
	Request Timezone Offset from UTC
	Duration (minutes)
Transaction	Date
	Transaction Type (e.g., rider fare)
	Expense Code
	Expense Memo
	Payment Method
	Invoices
	Transaction Amount
Fare	Subtotal
	Taxes

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Data	Column Label
	Fees
	Tip
	Total fare
	Rider fare portion
	Organization fare portion
Type	Service (e.g., program name)
	Program
	Policy name (e.g., fare policy name)
	Rider Group Name (for managed riders)

- o **Data Processing:** Metadata that documents any data processing that was done to the data from the data inception (when the data was produced) to when it was delivered to the USDOT. This will be applicable to Aggregated dataset which will be anonymized and aggregated, available through TMS Reporting and USDOT-managed System. Also, metadata as it relates to the processing of survey data (data cleanup exercise, anonymization, aggregation) will be included.

- o **Data Impact Log**: Refers to metadata that provides information on any changes to data during the collection period. Any time the data changes in a unique way that is not expected in the experimental design either by internal or external forces it will be documented. An example of changes expected are listed below:

  - Testing of system components and features.

  - Addition, modification, or deletion of a new feature in one or more system components.

  - Replacement of a system component, either due to replacement of a system provider or due to availability of new/upgraded component from a provider.

  - Modification in server infrastructure used for storage and providing data access.

  - Modification in schema or structure for data tied to system components, data format for the data made available and metadata.

  - Modifications in policies, system components and tools related to data storage, management, access and sharing.

  Any changes required due to externalities will also be documented. Potential factors that may impact the data collection on the project include:

  - Extended impact of a severe weather event impacting data collection due to communication outage or other issues (e.g., flooding).

  - Regulatory changes, government policy changes or unanticipated data needs from funding entities that require additional /reduced data collection.

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▪ Major change in trip volume as service expands.

- **Static Metadata:** Metadata that is mostly static that describes key parts of the project. Data on fixed pick-up and drop-off locations (e.g., designated spot outside a hospital or a senior center to pick up Travelers) along with any relevant details (e.g., any signage or digital infrastructure at the stop) as those get defined will be included. Also, this category of metadata will include the application inventory (list of applications involved, version installed, vendor, SLAs, owner, next planned update/upgrade, last update/upgrade any other relevant information) and fleet inventory (ID, age, capacity, propulsion, digital infrastructure). Further, this category will include data on the sensor/visual marker installed outside and inside facilities to support outdoor and indoor wayfinding.

5.3.2 Metadata Structure

This section provides the structure used to communicate metadata information. Metadata will be provided in CSV format along with the datasets being provided.

Metadata will be stored with the data to allow the users of the data, including future deployers, researchers and the public all key information in a single location. Files will be provided in a way that maintain the structure of the data, so users of the data can easily determine what is project metadata and what is specific dataset metadata.

Each metadata package will include:

▪ Summary information for datasets included in the package along with any other reference information as needed (e.g., DMP, privacy policy, public information on additional details on data collection, as available).

▪ CSV file with static metadata.

▪ For each dataset, technical metadata in CSV format with schema, processing and license metadata.

5.3.3 Metadata Update Process

Metadata will be kept up to date so the current version is always shared with the data when there is a change. The following steps will be followed:

1. When it is learned that any of the changes in the dataset (e.g., examples listed in Section 5.3.1) trigger a change in metadata, CCB will meet to identify changes necessary in the metadata structure. In most cases, this meeting will occur months in advance of a change to the dataset.

2. If follow-up discussions and expert advice is needed, the CCB will meet with the subject matter expert from the dataset provider (e.g., Uber Technology, Navi Lens, ISU) to assess any impact on the metadata structure due to change in dataset (e.g., if column dropped or renamed in a new software release). The impact may be on business metadata, technical metadata or static metadata, or a combination of the 3 metadata types.

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3. If changes to the metadata is necessary, the vendor will be requested to provide a modified metadata file in a similar format as described in Section 5.3.1.

4. The CCB will assess any changes to the DMP as discussed in Section 2.1 and approve the updates to the DMP.

5. HIRTA PML will obtain the revised metadata file and include that within the appropriate folder structure for file sharing.

6. HIRTA team will verify once the new dataset based on revised metadata structure is generated (e.g., when changes are in technical and static metadata).

7. Metadata structure will be updated to reflect the changes and appropriate files will be updated.

8. Updated metadata structure along with the new dataset is uploaded to the USDOT-managed System. For researchers accessing data through Uber data portals, a link to download the revised metadata structure will be provided at the time of accessing the data request.

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Appendix A. Acronyms and Glossary

Access2Care

A transportation broker for State of Iowa Medicaid program that performs booking and scheduling and works with service providers such as HIRTA for successful delivery of Medicaid-eligible trips.

ADA – Americans with Disabilities Act

Refers to the civil rights legislation passed and signed into law in 1990 to prevent discrimination against people with disabilities.

API- Application Programming Interface

Software middleware that allows two devices or applications to exchange data with each other.

APN: Access Point Name

A communication gateway for enabling cellular data communications over a carrier network. Public or private APN configurations are used depending on data security needs.

AWS: Amazon Web Service

A commercial cloud-based hosting service provided by Amazon.

BAA- Broad Agency Announcement

A procurement instrument used by USDOT.

Billing

Refers to the process of invoicing third-party funding sources (e.g., Medicaid) after a successful delivery of a trip. Billing is typically done on a monthly basis.

CHNA - Community Health Needs Assessment

Refers to the Community Health Needs Assessment Report developed by Dallas County in 2019.

CCB- Change Control Board

A body of subject matter experts tasked to manage change control process for work products, schedule or other relevant matters related to a project or program.

CDL- Concept Development Lead

Key project team member tasked with leading Phase 1 concept development activities.

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CO: Contract Officer

The CO will serve as the USDOT point of contact for any concerns related to the contracts.

COR - Contract Office Representative

The Contract Office Representative will serve as the USDOT representative for this project and is responsible for coordination and review of the proposer's work.

Cost Allocation

Refers to the process of associating a funding source that should be billed for a trip in a shared ride scenario when riders covered by separate funding sources share the vehicle for their trips and trip purposes at the same time.

CSV- Comma Separated Value

A common text-based file format that is supported by many platforms and programs.

CT- Census Tract

A geographic region defined for the purpose of collecting census data.

CTAA – Community Transportation Association of America

One of the project Partners who will lead stakeholder engagement on this project.

DCHD – Dallas County Health Department

One of the project Partners who will lead integration with health care services.

DR-Demand Response

Refers to a service that is not run on a fixed route or a schedule (e.g., dial-a-ride, vanpool etc). This requires making trip booking by contacting the service provider (e.g., HIRTA). However, DR is different than an ADA Paratransit service which is provided as a complement to a fixed route and is governed by specific requirements provided in 49 CFR- Part F. HIRTA operates only DR Service in Dallas County and all discussion in this document is related to DR Service.

Dispatching

Refers to an operations management function which involves assigning vehicle, tracking fleet location, managing schedule adherence, managing trip manifests and other operational functions.

DMP – Data Management Plan

The Data Management Plan is Task 3 of Phase 1 and will describe the approach for data collection, processing, storage and utilization.

DOT – Department of Transportation

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The government department responsible for transportation. In this report, this generally refers to either the State of Iowa's DOT or the United States DOT referred to as Iowa DOT and USDOT, respectively.

EDI – Electronic Data Interchange

In this context, refers to the electronic data interchange (EDI) format messages developed by HIPAA following American National Standards Institute (ANSI) X12 standard for electronic data exchange and are used to communicate with third-party health care provider systems (e.g., Medicaid).

EHR – Electronic Healthcare Record

Refers to the healthcare information management system used by hospitals for patients' healthcare-related appointments, transactions, and records management.

FHIR- Fast Healthcare Interoperability Record

A standard developed to describe and exchange health records in electronic format.

FHWA- Federal Highway Administration

A USDOT agency in-charge of highway transportation.

FTA- Federal Transit Administration

A USDOT agency in-charge of public transportation.

GTFS – General Transit Feeds Specification

GTFS is a standard to provide static public transportation schedule information. The standard has been expanded to include real-time passenger information (GTFS-real-time), flexible services (GTFS-flex) and accessible routing within stations (GTFS-pathways).

HIPAA – Health Insurance Portability and Accountability Act of 1996

Provides guidelines for data protection of sensitive patient health information.

HIRTA - Heart of Iowa Regional Transit Agency

Rural, regional public transit agency in central Iowa. HIRTA will serve as Proposer/Applicant for the Complete Trip - ITS4US project.

HL7 – Health Level Seven International

A not-for-profit, standards developing organization focused on electronic health information.

HN-Health Navigator

Refers to services provided by Dallas County Health Department to Dallas County residents in identifying resources as necessary for improving social determinants of health.

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HUA- Human Use Approval Summary

A deliverable in Phase 1 for Task 8 that outlines the process to be used for human subject participation in the program for research and evaluation purposes.

HTTPS: Hyper Text Markup Language Secure

A protocol for accessing data/information over internet using Transport Layer Security (TLS)/ Secure Socket Layer (SSL).

ICTDP – Integrated Complete Trip Deployment Plan

The Integrated Complete Trip Deployment Plan is a deliverable of Task 13 under Phase 1.

I&R: Information and Referral

Refers to public and private entities that help their customers in identifying resources for health and human services and other needs.

IPFP - Institution, Partnership, and Financial Plan

The Institution, Partnership and Financial Plan is a deliverable of Task 10 under Phase 1.

IRB- Institutional Review Board

An institutional body that reviews and approves research methods to ensure ethical standards are followed, particularly when involving human subjects.

ISU– Iowa State University

Iowa State University is a public research university with multiple campuses in the State of Iowa and will be engaged as the research and evaluation partner in Phases 2 and 3.

IVR: Interactive Voice Response

A technology that allows humans relying on phone systems to interact with computer programs using natural voice or alphanumeric input using phone keys. This is an alternative used to provide services to populations that may not have access to web-based devices.

IP- Internet Protocol

A network layer protocol for enabling data exchange over Internet.

JSON: Java Script Object Notation

Open standard and human readable data format for storing and transmitting electronic data.

KPI – Key Performance Indicators

Represents primary metrics used to assess the success of a project or operations.

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LEP – Limited English Proficiency

Refers to individuals who have a limited ability to read, speak, write, or understand English.

LTE: Long Term Evaluation

A telecommunication standard for wireless communications using mobile devices, also referred as 4th generation wireless.

MOD: Mobility-on-demand

A USDOT program that intends to support the develop of an ecosystem that provides safe, reliable and sustainable solution for all. MOD includes both trips made by Travelers or Trip replacements (e.g., courier network services (CNS) such as food delivery).

MPM: Mobility Performance Metrics

MPM is a program being led by the FTA to develop performance measures that focus on new mobility modes (e.g., micromobility, TNC).

NDSP- Non-Dedicated Service Provider

NDSP refers to operators providing service under contract (e.g., taxis) to an agency (e.g., HIRTA).

NEMT – Non-emergency Medical Transportation

The provision of transportation to patients for medical appointments, lab visits, and other routine care. Generally, used in the context of Medicaid service only.

NOFO- Notice of Funding Opportunity

Formal announcement of availability of funding by US federal agencies for one of the financial assistance programs.

PII – Personally Identifiable Information

Refers to any data that can distinguish an individual, either alone or when linked with other available data.

PML-Program Management Lead

HIRTA project team member in-charge of managing all project and program management activities.

Provider

Provider in this context mainly refers to an entity performing service delivery for requested trips, sometimes also referred as service provider. the HIRTA team have also used healthcare partners as providers in some cases but referred as 'healthcare providers.'

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REL- Research and Evaluation Lead

HIRTA team member responsible for managing the research and evaluation as part of Phase 3 and guiding the concept development and deployment activities as part of Phase 1 and 2.

Reservation

Refers to the act of booking a trip based on a request from a customer. Reservation is available to only to registered customers.

REST- Representational State Transfer

A popular protocol to enable data exchange over the Internet using web APIs. HTTP/HTTPS is used for communication protocol and data in HTML, JSON, XML or other formats may be used for exchange.

SAE- Society of Automobile Engineers

Professional standards development organization, primarily focused on aerospace, automotive, and commercial vehicles (e.g., trucking).

Scheduling

Refers to the process of identifying driver and vehicle resources and their runs/shifts for a given workday. Scheduling is typically performed for all requests received until 24 hours in advance. Booking within 24-hour notice and on-demand is offered but not encouraged due to limited system capacity and resources.

SDL- Systems Development Lead

HIRTA team member responsible for all systems engineering aspects of the project.

SEL- Stakeholder Engagement Lead

HIRTA team member responsible for stakeholder engagement focused activities.

SFTP- Secure File Transfer Protocol

Protocol used to securely transfer file between networked devices.

SEMP – System Engineering Management Plan

A System Engineering Management Plan describes how systems engineering process of planning, design, and deployment is applied to a project.

SHP- Shape File Format

Common spatial data format developed and regulated by Esri.

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SMP – Safety Management Plan

A Safety Management Plan describes the steps to be taken to ensure the safety of the project stakeholders and beneficiaries.

Smart Device

Refers to smartphone, smartwatch and similar personal devices that may be internet enabled and are equipped with sensors.

TAG – Transportation Advisory Group

The TAG is a diverse group of community stakeholders and business representatives interested in the advancement and improvement of public transportation in the HIRTA service area.

TAZ- Traffic Analysis Zone

A geographical unit used to conduct traffic /transportation analysis, constructed using census block information.

TCP- Transmission Controls Protocol

A transport layer protocol that is focused on assured delivery of data packets over an IP network.

TDS: Transactional Data Standard

Open data standard for exchanging transactional data (booking, payment, service coordination) between different systems or system components. Available in TCRP Report 210 - Development of Transactional Data Specifications for Demand-Responsive Transportation (http://www.trb.org/Main/Blurbs/180593.aspx)

TMS- Transportation Management System

All systems and tools to be used by HIRTA for managing day-to-day delivery of transportation services. This will be provided by various products offered by Uber Technologies.

TNC – Transportation Network Company

Encompasses a group of companies that provide on-demand Ridehailing services.

UUID-Universal Unique Identifier

Encrypted label used for assigning a unique ID to a field in a computer system, network or program.

UDP- User Datagram Protocol

A transport layer protocol that uses connectionless datagrams for applications that need time-sensitive data transmission but do not require assured delivery

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Wayfinding

Refers to the tools and technologies that assist in orientation, locating objects, and step-by-step navigation to destinations in outdoor and indoor environments using visual markers, sensors or physical signage.

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