Phase 2 System Design Document (SDD)

Heart of Iowa Regional Transit Agency ITS4US Deployment Project

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Final Report — May 3, 2024

FHWA-JPO-23-101

ITS4US

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U.S. Department of Transportation

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16. Abstract

Heart of Iowa Regional Transit Agency (HIRTA) is one of four awardees for Phase 2 of the ITS4US program for its proposed concept ***"Health Connector: Bridging the Gap Between Healthcare and Transportation"*** (Health Connector) by the United States Department of Transportation (USDOT). Per the goals of the program, Health Connector project is focused on improving transportation access to healthcare for all groups in Dallas County, Iowa. This document serves as the System Design Document (SDD) for HIRTA. The SDD describes the overall system for Health Connector's mobility on demand solution, followed by a detailed description of each of the system application components. The SDD also identifies any software and hardware that related to the system and subsystem components, as well as the functionalities of each of these components. The SDD provides traceability of requirements tied to each component from user needs through design for Phase 2 of the project. The SDD is supported by the companion HIRTA ITS4US Deployment Project Interface Control Document (ICD) which provides a detailed description of the internal and external interfaces for the HIRTA ITS4US Deployment Project and the data, information and messages that are transcribed across those interfaces.

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1 Introduction

This System Design Document (SDD) is organized into the following sections:

1. **Introduction** – Provides information about the purpose of this document and relevant project background.

2. **System Description** – Provides information about the entire project and identifies the complete list of subsystems and components described in this document.

3. **Subsystems and Components** – Discusses the subsystems previously identified in the Phase 2 System Architecture Document (SAD) in more detail and outlines specific components of each with detailed functions and screenshots where possible [1].

4. **Requirements Traceability Matrix** – Summarizes the requirements as identified in the SyRS that map to each system design component and subcomponent [2]. Note data and interface requirements are referenced in the ICD [7].

Format and content of this document incorporate recommendations outlined in IEEE Standard 1016-2009 (IEEE Recommended Practice for Software Design Descriptions) [3].

1.1 Intended Audience

The intended audience for this document is the HIRTA project team, the United States Department of Transportation (USDOT), vendor teams, and project stakeholders. This audience also includes future deployers and developers who might learn or build upon the development work described in this document for future deployments of a similar nature.

1.2 Project Background

HIRTA provides over 300,000 customer rides and operates 95,000 hours (2019 estimates; pre-pandemic) along with 1.3 million miles of service within the seven-county region encircling the Des Moines urban area. HIRTA provides demand response services to customers for all trips booked from 24 hours to up to 14 days in advance. If capacity is available, HIRTA also provides trips to meet same day requests. HIRTA also acts as a service provider for the State of Iowa Medicaid broker, Access2Care.

HIRTA was awarded a Phase 2 agreement of the ITS4US Program for its proposed concept *"Health Connector: Bridging the Gap Between Healthcare and Transportation"* (Health Connector) by the United States Department of Transportation (USDOT).

Health Connector is an innovative solution that will address various bottlenecks associated with transportation access to healthcare for HIRTA communities. Some of these challenges are key reasons behind missed appointments or the unacceptable level of preventive or as-needed

healthcare in the HIRTA service area. For this deployment, the HIRTA team plans to implement a scalable and replicable solution that enables access to non-emergency medical transportation for all travelers by resolving transportation 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 through separate smart device (e.g., smartphone) applications or an equally effective alternate method. Further, this solution will include information and wayfinding services to guide them at every step of their trip.

This deployment will provide enhanced transportation access to healthcare options for all travelers in Dallas County with a specific focus on underserved communities, rural travelers, older adults, and veterans. In addition to addressing mobility needs, the proposed deployment will recognize the net impact that access to health services has on patient healthcare outcomes as well as both the financial and health outcomes from the perspective of the healthcare community/Dallas County Health Department (DCHD).

HIRTA was awarded a Phase 2 agreement of the Complete Trip - ITS4US contract for its proposed concept *"Health Connector: Bridging the Gap Between Healthcare and Transportation"* (Health Connector) by the United States Department of Transportation (USDOT) to showcase innovative business partnerships, technologies, and practices that promote independent mobility for travelers regardless of location, income, or disability.

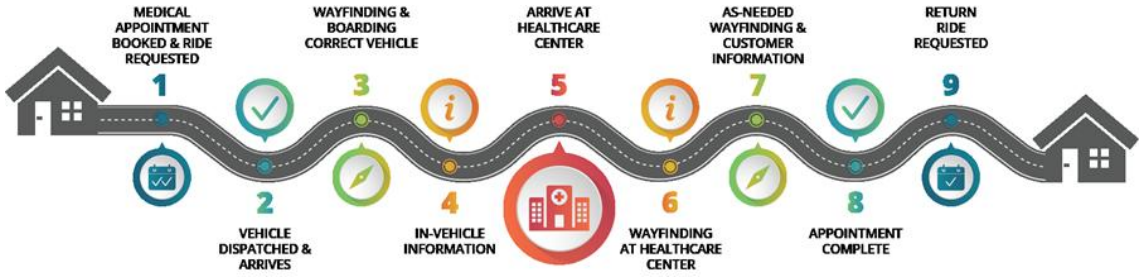

Figure 1. Overview of Health Connector (Source: HIRTA team)

For more information about the key capabilities of the proposed Health Connector technology, refer to the Phase 2 concept of operations (ConOps) and Phase 2 System Requirements Specifications (SyRS) documents [4] [5].

There are five main goals for the Health Connector Concept, which include:

- Improved health outcomes through increased access to medical transportation for Dallas County residents
- Self-reliance and spontaneity for all, including underserved groups
- Efficient transportation management capabilities for medical transportation services
- Financial sustainability of medical transportation programs
- Safe medical transportation services

For more information regarding these goals and more detailed objectives and performance measures, please refer to the Phase 2 Performance Measurement and Evaluation Support Plan (PMESP) [6]. Throughout, 'Traveler' refers to those individuals who will use Health Connector services to access healthcare appointments.

1.3 Purpose of the Plan

This document describes the detailed system design for the Heart of Iowa Regional Transit Agency (HIRTA) “Health Connector: Bridging the Gap Between Healthcare and Transportation” (Health Connector) solution for the United States Department of Transportation’s (USDOT) ITS4US program. This report describes the overall system, followed by a detailed description of each of the system application components. The system described here was designed to meet user needs and functions described in the HIRTA ITS4US Deployment Project Phase 2 Concept of Operations (ConOps) and the requirements enumerated in the HIRTA ITS4US Deployment Project System Requirements (SyRS) [4] [5]. The design is built upon the architecture described in HIRTA ITS4US Deployment Project System Architecture Document (SAD) [1]. This System Design Document (SDD) provides traceability of requirements from user needs through design for Phase 2 of the project.

The SDD is supported by the companion HIRTA ITS4US Deployment Project Interface Control Document (ICD) which provides a detailed description of the internal and external interfaces for the HIRTA ITS4US Deployment Project and the data, information, and messages that are communicated across those interfaces [7]. For each interface, the ICD describes associated hardware/software, message structure, requirements traceability and communication protocols.

This document is used to guide system testing and deployment in future stages of Phase 2 and Phase 3.

2 System Description

2.1 Physical System Overview

Figure 2 represents the block diagram of the systems and interfaces in the HIRTA Health Connector system. This view illustrates the result of design decisions made by the HIRTA team for implementing the Health Connector systems and its subsystems. Furthermore, these figures present the physical architecture that is used by the project team to establish plans for system integration and testing, as well as to track and report readiness for deployment. The next subsections describe each entity in the figure and the logical connections between them.

- **Traveler-end Subsystem**: includes the tools and technologies (phone/interactive voice response (IVR), mobile/smart devices, web-based tools) to be used by Travelers seeking transportation services for their healthcare appointments as part of their pre-trip, during trip, on arrival, and return trip activities. This includes both a mobility-on-demand (MOD) application for planning, booking, and payment, as well as a wayfinding application for more detailed guidance within care facilities.

  This application, provided by Via, the selected MOD vendor for Health Connector, also provides real-time status of trips on demand and through push notification services and allows Travelers to discover options and plans trips. Mobile/smart devices will be used as part of the Traveler-end subsystem but are not a part of this procurement.

- **HIRTA Transportation Management Subsystem (TMS):** A TMS refers to any systems related to the operational backend functions involved in service delivery. HIRTA's TMS includes the Mobility-on-Demand TMS in addition to other functions that support Health Connector from outside if the MOD platform such as the call center software. The MOD Platform TMS will also host two interfaces (middleware products) being developed by the HIRTA team and made freely and publicly available on GitHub under a permissive license to support interfacing with State of Iowa Medicaid transportation broker(s) and the EHR system.

    - **MOD Platform TMS (also referred to as "VOC"):** Provided by Via and includes the technologies used to assist customer care and operations staff with Traveler registration, eligibility management, reservations, scheduling, dispatching, billing, and administration activities.

- **Vehicle 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 pickup), on-board information and fare payments. On all HIRTA-owned vehicles, drivers will use tablets running the driver app. On other vehicles, drivers may use the driver app on their tablet or their phone.

- **Wayfinding Subsystem:** refers to the technologies and infrastructure to be used for providing outdoor wayfinding, indoor positioning, orientation, and navigation on request to travelers. It may also assist with translation functionality. One or more commercially available wayfinding system providers may be used. One of those providers will be NaviLens. Others include SafeFleet (for infotainment devices) and RedyRef (for the wayfinding kiosk).

- **External Systems:** These systems, external to Health Connector, 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.

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

    - **Health Navigator- and Healthcare-end Subsystem**: refers to the limited access MOD platform that will be available to health navigators and healthcare customer care staff to request trips, modify trip requests, and check on trip status on behalf of Travelers. Additionally, health navigators and the health administrator at the Dallas County Health Department (DCHD) use a Microsoft Access-based information and referral (I&R) product to track the status of referral activities and for coordination with Dallas County residents' health navigation/social care services.

    - **EHR/Medical Record 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. Participating healthcare partners use different EHR services. The following bullet points outline participating healthcare partners and the EHR systems they currently employ. Health Connector will develop a new interface with at least one healthcare partner's EHR system.

        - Mercy One Hospital – Transitioning to Epic EHR, in the near future

        - Dallas County Hospital – Veradigm EHR until at least 2026, then transitioning to Epic EHR

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

    - **Supporting systems**: These are existing systems and are not part of Health Connector. However, the TMS will exchange data with these systems or HIRTA staff may interact with these systems for certain operational functions, as needed. Specifically, this refers to the phone system, payroll, driver or vehicle information management, vehicle maintenance management, customer service management, safety event reporting, and other systems and processes for data collection and reporting.

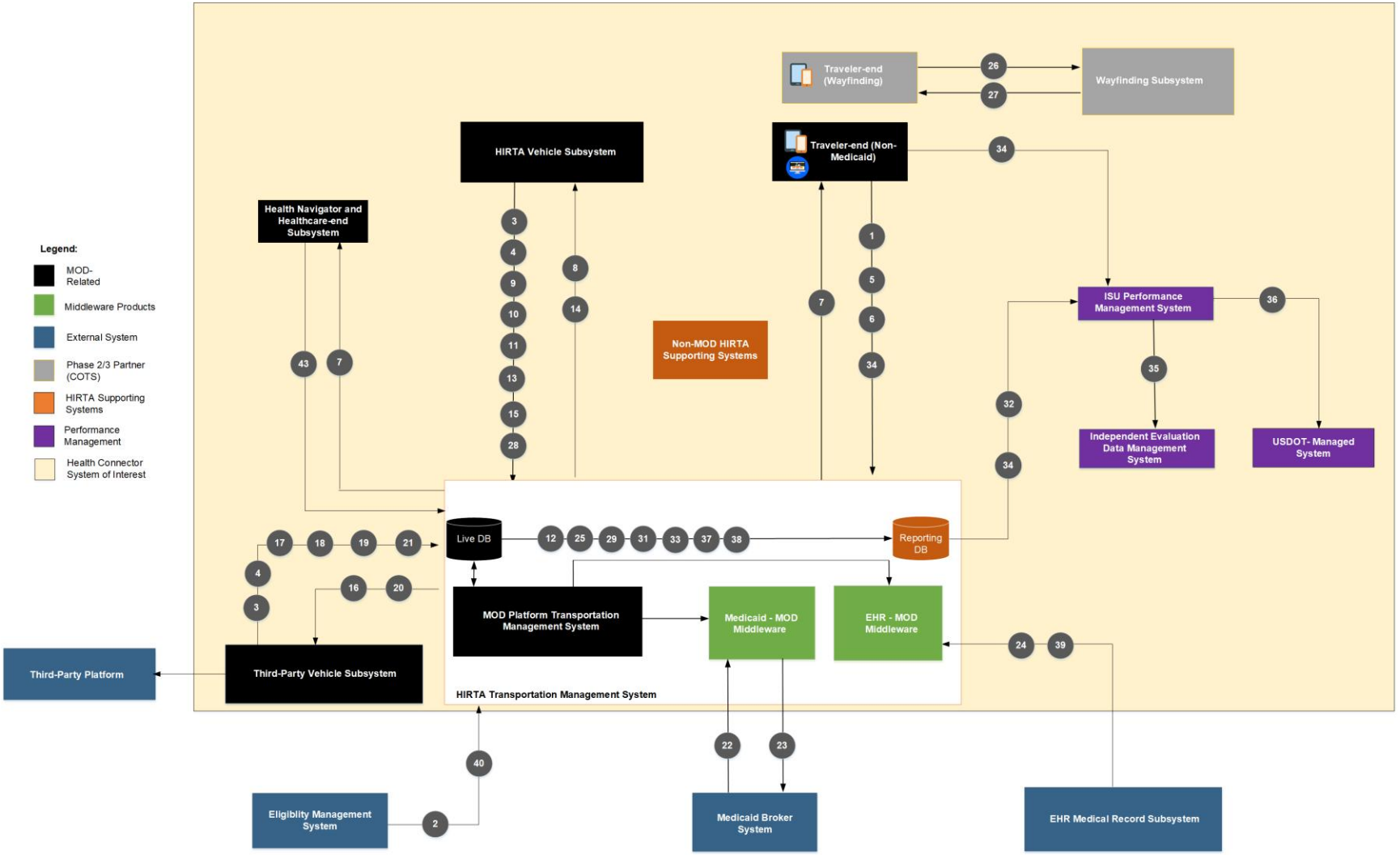

Figure 2. Health Connector System of Interest Diagram (Source: HIRTA team)

The system of interest diagram outlines the data that will pass between systems as part of Health Connector. Keeping the replicability of Health Connector in mind, these datasets and terms used are common in paratransit/demand response industry and are applicable to most commercially available platforms/solutions. The labels referencing data flow IDs in Figure 2 refer to IDs described in Table 1. Data Needs Summary (please see the Phase 2 DMP [8] for further reference).

Table 1. Data Needs Summary

ID	Data	High-level Description	System(s) of Interest Involved
1	Traveler profile	Traveler's personal details as provided as part of registration.	MOD Platform TMS
2	Traveler eligibility	Traveler's eligibility for a funding source or program; also verified with funding entities (e.g., Medicaid).	Eligibility management system/funding source
3	Fleet information	Details on HIRTA's vehicles; also, details on third-party vehicles.	MOD Platform TMS; third-party platform
4	Driver information	Details on HIRTA's drivers; also, details on third-party vehicles.	MOD Platform TMS; third-party platform
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.	MOD Platform TMS
6	Trip modification or cancellation	Traveler's request to cancel an existing scheduled trip. To modify an existing trip, Travelers will cancel existing reservations and submit new booking requests.	MOD Platform TMS
7	Trip status	Current information on upcoming trip.	MOD Platform TMS
8	Manifest	Time and location details on Travelers to be picked up and dropped off by a driver during a shift.	MOD Platform TMS
9	Vehicle location	Location and heading along with other details for a vehicle in service.	MOD Platform TMS

ID	Data	High-level Description	System(s) of Interest Involved
10	Trip performance	Trip-level log of actual time and location for trips on the manifest along with any no-shows and cancellation events.	MOD Platform TMS
11	Driver performance	Driver-level log of operational performance on log on, on-time performance, manifests completed.	MOD platform TMS
12	Travel time	Time needed to perform on-board component of a trip.	MOD Platform TMS
13	Driver messages	Messages sent by drivers to dispatchers.	MOD Platform TMS
14	Dispatcher messages	Messages sent by dispatchers to drivers.	MOD Platform TMS
15	Fare payment log	Log of amount paid for a trip and method of payment.	MOD Platform TMS
16	Request for third-party trips	Time and location details on Travelers to be picked up and dropped off by a third-party driver during a shift.	MOD Platform 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.	Third-party platform
18	Vehicle location (third party)	Location and heading for a vehicle in service along with other details for a third-party provider.	Third-party platform
19	Driver messages (third party)	Messages sent by drivers to HIRTA dispatchers.	MOD Platform TMS
20	Dispatcher messages (third party)	Messages sent by HIRTA dispatchers to drivers.	MOD Platform TMS
21	Fare payment log (third party)	Log of amount paid for a trip and method of payment.	Third-party platform

ID	Data	High-level Description	System(s) of Interest Involved
22	Medicaid trip requests	HIRTA-accepted request for Medicaid-funded trips through Medicaid broker platform.	Medicaid broker 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.	MOD Platform TMS
24	Medical appointment details	Consists of medical appointment date, time, and location (facility address and doctor's office) for a particular Traveler.	EHR
25	Aggregated summary	Aggregated data on driver, vehicle, and trip performance.	MOD Platform TMS
26	Traveler wayfinding request	Requests initiated by Travelers to the wayfinding system.	Wayfinding Subsystem
27	Traveler wayfinding guidance	Log of wayfinding information provided to Travelers.	Wayfinding Subsystem
28	Safety event	Log of incidents and accidents by vehicle/driver/trip.	MOD Platform TMS
29	Safety event report	Detailed reports by a safety event (incident, accident) with response.	MOD Platform TMS
31	System performance	Log of system performance, including any failures.	MOD Platform TMS; HIRTA supporting systems
32	Anonymized and/or aggregated data for performance evaluation	Anonymized/aggregated Traveler, trip, and operations data (as described in Table 3. Scope and Availability of Private Data in the Data Privacy Plan [4]) to support Health Connector performance evaluation.	MOD Platform TMS
33	Traveler complaints log	Log of Traveler complaints received and actions taken.	MOD Platform TMS

ID	Data	High-level Description	System(s) of Interest Involved
34	Traveler survey results	Customer data and survey conducted by ISU (including through the MOD platform) of human use participants and control group.	MOD Platform TMS; local data system at ISU
35	Processed data for controlled sharing	Controlled-access data available to researchers and the Independent Evaluation team.	Local data system at ISU
36	Data for public access	Aggregated trip summary at Census tract and/or traffic analysis zone (TAZ) level as defined in DMP (or another unit as refined in Phase 2) will be provided. Other data such as fleet, vehicle, and safety event (incident/accident) will also be provided.	Local data system at ISU
37	Cost and revenue data	Cost and revenue data by trip, including actual cost, fare paid, funding source share.	MOD Platform TMS
38	Wheelchair failure log	Summary of events referring to situations when wheelchair lift could not function at the time of pickup or drop-off.	HIRTA
39	Medical appointment status	Real-time status of progress on a medical appointment resulting in an impact on the pick-up time.	EHR
40	Discount coupon/credit	Discount coupons or credits applied by trip.	Eligibility management system/funding source
41	Call center log	HIRTA call center statistics available from phone systems or manual logs.	HIRTA supporting systems
43	Trip request (partners)	Trips requested by DCHD and healthcare providers using MOD platform. To be tracked separately to assess the benefit of such capability.	MOD Platform TMS

2.2 List of Subsystems and Components

This section provides a summary of the major subsystems, components, and subcomponents described in Section 3. Components identified are matched to their corresponding subsystem and major system in Table 2.

Table 2. List of Subsystems and Components

Subsystem	Component	Subcomponent	High Level Description
HIRTA TMS	Hardware Components	HIRTA Supporting Hardware	Includes HIRTA-owned, health navigator, and healthcare partner phones, tablets and computers.
HIRTA TMS	MOD Platform TMS	Scheduling	Allows for advanced and real-time scheduling, driver/vehicle assignment, batch optimization of trips booked in advance, and real-time optimization.
HIRTA TMS	MOD Platform TMS	Manifest Building/Runcutting	Allows for vehicle manifest creation and distribution.
HIRTA TMS	MOD Platform TMS	Dispatch	Allows for shift creation, modification and monitoring, ride assignment, ride status updates
HIRTA TMS	MOD Platform TMS	Cost Allocation and Billing	Allows for trip verification, billing and invoicing, reimbursement and accounting, and reporting.
HIRTA TMS	MOD Platform TMS	Performance Management and Reporting	Allows for reporting of defined performance KPIs, custom reporting through direct data access (DDA) and data sharing.
HIRTA TMS	MOD Platform TMS	Notifications	Allows HIRTA staff to receive audio notifications and push notifications to Travelers and drivers.

Subsystem	Component	Subcomponent	High Level Description
HIRTA TMS	MOD Platform TMS	Reservations and Customer Service	Allows for CSRs to perform traveler registration, customer profile creation, trip booking, and trip cancellation and to assist with broker or third-party contractor trips, self-service tools, and translation services on behalf of travelers. Also allows CSRs to contact Travelers and view Traveler trip history and relevant KPIs.
HIRTA TMS	MOD Platform TMS	Operations Management	Allows for driver manifest management, management of third-party provider and Access2Care trips, dynamic vehicle reassignment, real-time capacity management, and access to real-time trip details.
HIRTA TMS	MOD Platform TMS	Safety Event/Incident Management	Allows users to report and modify details on safety events, as well as assign risk levels to the events.
HIRTA TMS	Health Navigator & Healthcare-end Subsystem	N/A	Provides health navigators and healthcare partners a limited access version of the web-based MOD Platform TMS available to HIRTA operations staff. This subsystem allows health navigators and healthcare partners to perform trip planning, trip booking, trip cancellation, translation services, and appointment management on behalf of Travelers as well as to access real-time trip status and trip feedback.

Subsystem	Component	Subcomponent	High Level Description
External System	Health Navigator & Healthcare-end Subsystem	I&R	The product used by DCHD to track the status of referral activities and for coordination with Dallas County residents' health navigation/social care services.
HIRTA TMS	MOD-EHR Middleware	Electronic Health Record (EHR) Software	Provides platform for partner hospitals and clinics for booking and maintaining medical appointments.
HIRTA TMS	MOD-EHR Middleware	EHR API	Allows for data exchange between the MOD Platform TMS and EHR software, including confirmed medical appointment data, trip booking confirmation, medical appointment changes or cancellations, and trip status.
HIRTA TMS	MOD-EHR Middleware	EHR Read-Only Webpage	Allows HIRTA staff and healthcare partner staff to access real-time information through the MOD-EHR middleware.
HIRTA TMS	MOD-Medicaid Middleware	Brokerage	Provides the State of Iowa Medicaid broker, which uses Access2Care, the ability to perform Medicaid trip booking and management.
HIRTA TMS	MOD-Medicaid Middleware	Medicaid API	Allows for data exchange between the MOD Platform TMS and Medicaid broker, including service requests from the Medicaid broker and service confirmations, trip status, and trip performance data from the MOD Platform TMS.

Subsystem	Component	Subcomponent	High Level Description
HIRTA TMS	MOD-Medicaid Middleware	Medicaid Read-Only Webpage	Allows HIRTA staff and Access2Care staff to access real-time information on Medicaid-funded trips through the MOD-Medicaid middleware.
HIRTA TMS	Reporting Database	CyBox	Provides file sharing and file storage for performance-related datasets and reports.
Traveler-end Subsystem	Hardware Components	Personal Devices	Includes Travelers' personal web-enabled devices, such as smart phones and tablets to deploy the Traveler mobile application and Traveler web application.
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Registration	Allows Travelers to perform registration and preference management and to input funding eligibility and mobility aid/accessibility needs.
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Trip Planning	Allows travelers to select pick-up and drop-off locations, trip brokering, and multimodal trip planning.
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Travel Assistance	Provides Travelers with additional assistance in planning/booking trips through a HIRTA contact and FAQ page.

Subsystem	Component	Subcomponent	High Level Description
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Trip Booking	Allows travelers to submit on-demand, pre-scheduled, and recurring trip proposals and to access third-party services if no Health Connector rides are available. Also allows Travelers to perform trip cancellation, rebook for modifications, and to input mobility aid/accessibility services needed, requests for personal companions, and number of passengers.
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Translation Services	Allows Travelers with LEP needs to access translation services before, during, and after a trip.
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Payments	Allows Travelers to select from the following payment methods for Health Connector trips: electronic payments/credit cards, account debit, discount codes/coupons, cash or check, and debit account replenishment.
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Traveler Notifications	Allows Travelers the ability to subscribe to receive trip-related notifications and add up to 5 individual contacts to receive notifications on their trip status.

Subsystem	Component	Subcomponent	High Level Description
Traveler-end Subsystem	Health Connector Traveler Mobile Application	Trip Information	Allows Travelers to perform vehicle identity verification and Traveler identity verification, obtain real-time trip status information and orientation/information on healthcare services on arrival (TBD), and share ride status with an external contact while on board.
Traveler-end Subsystem	Health Connector Traveler Web Application	N/A	Provides the same functionalities and comprises the same components as the Traveler mobile application. Provides additional translation service abilities through Google Translate.
Traveler-end Subsystem	IVR	N/A	HIRTA's IVR system allows Travelers to obtain automated Traveler assistance and notifications by phone.
Vehicle Subsystem	Hardware Components	HIRTA Supporting Hardware	Includes on-board mobile tablets for deployment of driver application, driver terminal GPS receiver and magnetometer for vehicle tracking, and two-way radio for operations communication.
Vehicle Subsystem	Hardware Components	Third-party Driver Devices	Third-party vehicles operating Health Connector trips will use GPS-enabled smart devices, including phones and tablets, to deploy the driver application.

Subsystem	Component	Subcomponent	High Level Description
Vehicle Subsystem	Via Driver Application	Scheduling	Allows drivers to receive trip assignments, Traveler details, trip manifests and waiting locations, as well as contact Travelers and input breaks and break requests.
Vehicle Subsystem	Via Driver Application	Navigation	Allows drivers to receive turn-by-turn navigation, live support, Traveler information and translation services and track driver locations and manifest updates via cellular data coverage or cached data in the event of lost connectivity.
Vehicle Subsystem	Via Driver Application	Trip Performance	Allows drivers to input information on pick-up status, no-shows, drop-off status, payment status, and pre-trip and post-trip vehicle checks as well as to send non-medical emergency safety messages.
Wayfinding Subsystem	Hardware Component	Kiosks	Physical, static hardware systems through which Travelers are able to request and receive information regarding wayfinding (TBD).
Wayfinding Subsystem	Hardware Component	NaviLens Codes	Located throughout the healthcare facility to assist with Traveler navigation within the facility and to pick-up locations.
Wayfinding Subsystem	Hardware Component	Personal Devices	Includes web-enabled smart devices for scanning codes and deploying the wayfinding application.

Subsystem	Component	Subcomponent	High Level Description
Wayfinding Subsystem	Wayfinding Application	NaviLens/NaviLens GO App	Provides Travelers the ability to perform wayfinding within the healthcare facility, including buildings, offices, check-in desks, referred buildings/offices after discharge, and door entrances.
Wayfinding Subsystem	Wayfinding Kiosk CMS	N/A	Communicates with the wayfinding kiosks to provide information to Travelers and allows healthcare facilities and other relevant parties to update code content.
Wayfinding Subsystem	NaviLens and Cloud Platform	N/A	Cloud-based server that handles traveler wayfinding requests and traveler wayfinding guidance through the mobile wayfinding application.
Performance Management	ISU Performance Management System	Public Dashboard	Provides an interface for public-facing information regarding Health Connector performance.
External System	Eligibility Management System	N/A	Contains a database that regulates who is eligible for Health Connector rides and the use of discount coupons or credit.
External System	Eligibility Management System	Funding Entities	Organizations funding customer trips that will interface with the system for automated billing and payment processing.
External System	Third-Party Platform	N/A	Platform for managing vehicles and operations available for Health Connector service that are not operated by HIRTA (i.e. TNC platform).
External System	Medicaid Broker System	N/A	The State of Iowa Medicaid broker, which uses Access2Care for booking and managing Medicaid trips.

Subsystem	Component	Subcomponent	High Level Description
External System	EHR Medical Record System	N/A	Systems used by partner hospital and clinics for booking and maintaining medical appointments.

2.3 Health Connector External Interfaces

Table 3 lists a summary of the interfaces and corresponding data flows between major systems subcomponents and subcomponents identified in the Phase 2 ICD [7].

Table 3. Summary of Interfaces

Interface Number	Source Element	Destination Element	Data Needs
HC1	MOD Platform TMS	HIRTA Vehicle Subsystem	8, 14
HC1	HIRTA Vehicle Subsystem	MOD Platform TMS	3, 4, 9, 10, 11, 13, 15, 28
HC2	MOD Platform TMS	Traveler-end Subsystem	7
HC2	Traveler-end Subsystem	MOD Platform TMS	1, 5, 6, 34
HC3	MOD Platform TMS	Health Navigator & Healthcare-end Subsystem	7
HC3	Health Navigator & Healthcare-end Subsystem	MOD Platform TMS	5, 6, 43
HC4	Eligibility Management System	HIRTA TMS (Via Central Software)	2, 40
HC5	MOD Platform TMS	Third-Party Vehicle Subsystem	16, 20
HC5	Third-Party Vehicle Subsystem	MOD Platform TMS	3, 4, 17, 18, 19, 21
HC6	MOD Platform TMS	Medicaid – MOD Middleware	23A
HC6	Medicaid – MOD Middleware	MOD Platform TMS	22A
HC6	Medicaid – MOD Middleware	Medicaid Broker System	23
HC6	Medicaid Broker System	Medicaid – MOD Middleware	22
HC7	MOD Platform TMS	EHR – MOD Middleware	7A
HC7	EHR – MOD Middleware	MOD Platform TMS	24A, 39A, 42A
HC7	EHR – MOD Middleware	EHR Medical Record Subsystem	7
HC7	EHR Medical Record Subsystem	EHR – MOD Middleware	24, 39, 42
HC8	MOD Platform TMS	Reporting Database via Live Database	12, 25, 31, 33, 37
HC9	Non-MOD HIRTA Supporting Systems	Reporting Database	29, 31, 33, 37, 38, 41
HC10	Reporting Database	ISU Performance Management System	32, 34
HC11	ISU Performance Management System	Independent Evaluation Data Management System	35

Interface Number	Source Element	Destination Element	Data Needs
HC12	ISU Performance Management System	USDOT Managed System	36
HC13	Wayfinding Subsystem	Traveler-end (Wayfinding)	26
HC13	Traveler-end (Wayfinding)	Wayfinding Subsystem	27

3 Subsystems and Components

3.1 HIRTA Transportation Management System

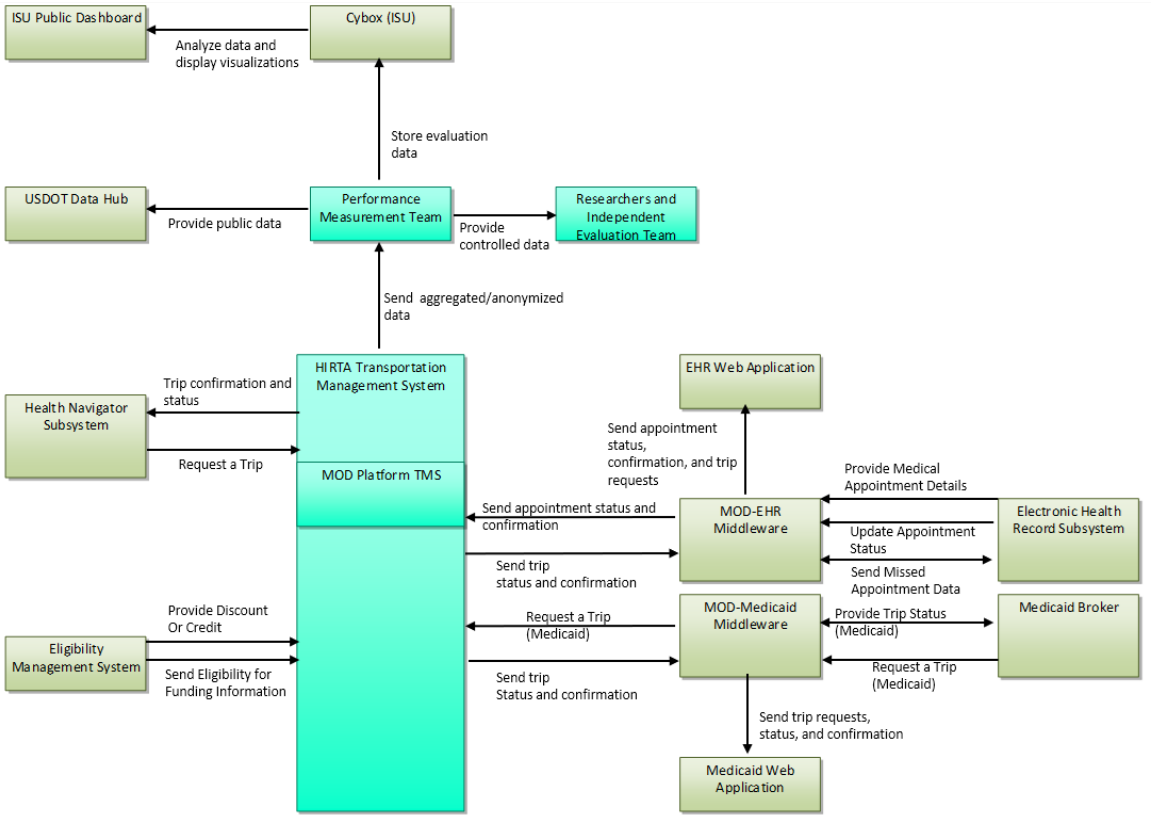

Figure 3. HIRTA Transportation Management Subsystem (Source: HIRTA team)

The HIRTA TMS includes the MOD Platform TMS, the Health Navigator & Healthcare-end Subsystem, and the MOD-EHR and MOD-Medicaid Middleware Subsystems. This subsystem diagram depicted in Figure 3 details the technologies used to assist customer care and operations staff with Traveler registration, eligibility management, reservations, scheduling, dispatching, billing, and administration activities. Further, this new software will support utilizing third-party service providers for added capacity when needed in real time. Finally, limited access to this software will be made available to health navigators and healthcare providers, so they are able to book trips directly without the involvement of HIRTA staff. Critical flows in this diagram include trip requests by health navigators or through the Medicaid broker, sharing of eligibility criteria, survey data interactions, and the sharing of medical appointment information that is critical to Health Connector. The MOD Platform TMS will be provided by Via and is otherwise known as the Via Central Software or VOC.

3.1.1 Hardware Design

The HIRTA TMS will be accessed and operated on HIRTA-owned devices, including:

- HIRTA phones
- HIRTA tablets
- HIRTA computers

HIRTA operations staff that are involved in dispatching will have access to two-way radios to allow voice communication with drivers.

The Health Navigator and Healthcare-end Subsystem, which acts as a component of the HIRTA TMS will be accessed and operated on the following devices:

- Healthcare partner tablets
- Healthcare partner computers

3.1.1.1 HIRTA Supporting Hardware

3.1.1.1.1 Function(s):

HIRTA supporting hardware will be utilized for the following functions:

1. *Inbound/Outbound Calls:* HIRTA uses a voice over internet protocol (VOIP) phone system to make and receive calls on landline phones as well as on desktops and personal devices. This allows HIRTA dispatchers and customer service staff to communicate with Travelers and book rides or field comments and questions.

2. *MOD Platform TMS Access:* The MOD Platform TMS is a web-based application that will be accessed and managed through web-accessible HIRTA-owned phones, tablets and computers.

3. *Health Navigator and Healthcare-end Subsystem Access*: The Health Navigator and Healthcare-end Subsystem web-based application is a limited access version of the MOD Platform TMS available to health navigators and healthcare partners.

3.1.1.1.2 Applicable Model(s):

The specific models of phones and computers used by HIRTA and health navigators and healthcare staff cannot be outlined in this document for cybersecurity reasons.

3.1.1.1.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-OPS-8.5

3.1.1.1.4 Interfaces*:*

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem

- HC2: MOD Platform TMS <-> Traveler-End Subsystem
- HC3: MOD Platform TMS <-> Health Navigator & Healthcare-End Subsystem
- HC4: MOD Platform TMS <-> Eligibility Management System
- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem
- HC6: MOD Platform TMS <-> Medicaid Broker System via Medicaid-MOD Middleware
- HC7: MOD Platform TMS <-> EHR Medical Record Subsystem via EHR-MOD Middleware
- HC8: MOD Platform TMS <-> Reporting Database via Live Database

3.1.2 Software Design

3.1.2.1 MOD Platform TMS

The HIRTA TMS is built upon the MOD Platform TMS, which is provided by Via and otherwise referred to as the Via Central Software or VOC. This software acts as the backend for the HIRTA TMS and provides an interface for HIRTA operations and customer service staff to manage Health Connector trips and aid Travelers in booking and managing rides. The software functionality, requirement traceability, and relevant interfaces to the MOD Platform TMS are detailed below.

The MOD Platform TMS software provides nine major subcomponents as described below. These include:

- Scheduling
- Manifest Building/Runcutting
- Dispatch
- Cost Allocation and Billing
- Operations and Performance Reporting
- Notifications
- Reservations and Customer Service
- Operations Management
- Safety Event/Incident Management

3.1.2.1.1 Scheduling

3.1.2.1.1.1 Function(s):

The Scheduling module of the MOD Platform TMS provides four primary functions, as listed below:

1. *Advance and Real-time Scheduling:* Provide the capability to schedule requested trips in advance or in real time. Schedulers will log into the platform using an authenticator code, which can be reset through User Management. For trips booked in advance, pick-up time will be confirmed in real time. The window for which a trip can be scheduled in advance, maximum length of trip, and other parameters will be configurable per Via's and HIRTA's requirements. Driver schedules can be uploaded to the system by HIRTA staff in bulk as CSV files and imported into a template provided by Via. The scheduling tool will also provide the ability for additional vehicle creation for schedule assignment within the platform. It will be possible to edit the scheduling during live shifts, for use cases such as flat tires or drivers calling out sick.

2. *Driver/Vehicle Assignment:* Provide the capability to assign requested trips to drivers/vehicles per labor/work rules as configured in the system. The backend algorithm considers relevant vehicle restrictions (e.g., wheelchair accessible vehicle, child seat, capacity or needed seats in the vehicle, space to stow mobility device).

3. *Batch Optimization for Trips Booked in Advance:* Provide the capability to optimize trips booked in advance of the day before a trip for appropriate utilization of driver/vehicle resources. Parameters to be used for such optimization (e.g., grouping, on-board travel time, dwell time, modification of travel time for street segments, maximum detour limitations) will be configurable per Via's and HIRTA's requirements. Schedulers will have the ability to protect a ride and/or schedule so it is not impacted by optimization.

4. *Real-time Optimization:* Provide the capability to optimize trips in real time to better utilize the driver/vehicle resources. The system will recommend vehicle assignments/reassignments based on the schedule.

3.1.2.1.1.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-OPS-1A.1
- RC-OPS-1B.1
- RC-OPS-1B.3
- RC-OPS-2.1
- RC-OPS-6A.6
- RC-SCH-1.1
- RC-SCH-1.2
- RC-SCH-1.3
- RC-SCH-2.1
- RC-SCH-2.1.1
- RC-SCH-2.1.2
- RC-SCH-2.1.3
- RC-SCH-2.1.4
- RC-SCH-2.1.5
- RC-SCH-2.1.6
- RC-SCH-3.1
- RC-SCH-3.2
- RC-SCH-4B.1
- RC-SCH-4B.2
- RC-SCH-5.1
- RC-SCH-5.2
- RC-SCH-5.3
- RC-SCH-6.1
- RC-SCH-6.2
- RC-SYS-7.1
- RC-HNV-1.1
- RC-HNV-1.1.1
- RC-HNV-1.1.2
- RC-HNV-1.2

- RC-HNV-1.3
- RC-HNV-3.1
- RC-HNV-3.2
- RC-HNV-3.3
- RC-HCR-1.1
- RC-HCR-1.3
- RC-HCR-1.4
- RC-HCR-1.5
- RC-HCR-1.6
- RC-HCR-2.1
- RC-HCR-2.2
- RC-HCR-3.1
- RC-HCR-5.1
- RC-HCR-5.2
- RC-HCR-7.1
- RC-HCR-7.2
- RC-HCR-1.6
- RC-CSR-5.1.2
- RC-CSR-5.1.3
- RC-CSR-6.1
- RC-CSR-6.2
- RC-CSR-6.3
- RC-CSR-7.1
- RC-CSR-7.2
- RC-CSR-7.3
- RC-CSR-7.4
- RC-CSR-8.1
- RC-CSR-12.1
- RC-CSR-12.2
- RC-CSR-16.2

3.1.2.1.1.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: HIRTA TMS <-> HIRTA Vehicle Subsystem
- HC5: HIRTA TMS <-> Third-Party Vehicle Subsystem

3.1.2.1.2 Manifest Building/Runcutting

3.1.2.1.2.1 Function(s):

The Manifest Building/Runcutting module of the MOD Platform TMS provides the following function, as listed below:

1. *Vehicle Manifest Creation and Distribution:* Once schedules are finalized, vehicle manifests are created and pushed to vehicles wirelessly through a cellular data connection. These manifests include information on customer ID, name, pick-up/drop-off

locations, time of pickup, any mobility aid (and/or driver assistance) needed and required fare payment.

3.1.2.1.2.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-OPS-6B.1
- RC-OPS-6B.2
- RC-OPS-6B.3
- RC-OPS-6B.4
- RC-OPS-6B.5
- RC-OPS-6B.6
- RC-SCH-4A.1
- RC-SCH-4A.2
- RC-SCH-4A.3
- RC-SCH-4A.4
- RC-SCH-4B.1
- RC-OPS-6B.7

3.1.2.1.2.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem
- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem

3.1.2.1.3 Dispatch

3.1.2.1.3.1 Function(s):

The Dispatching module provides 6 primary functions, as listed below:

1. *Shift Creation:* Provide the capability for dispatchers and schedulers to create driver shifts, vehicle assignments, and schedule driver breaks. The system will allow Health Connector shifts to be comingled with other service shifts as configured by HIRTA.

2. *Shift Modification:* Provide the capability for dispatchers and schedulers to modify existing driver shifts, vehicle assignments, and scheduled driver breaks. The system will protect shifts that already have ride assignments from being deleted.

3. *Ride Assignment:* Provide the capability for dispatchers and schedulers to view ride details, assign rides, cancel rides, reassign rides, protect rides from optimization, update the communicated window on rides, assign all rides, and mark a shift as unavailable for new rides. Dispatchers have ride assignment options of varying strength from general assignment respecting all system rules to flexible assignment to manual assignment.

4. *Update Ride Status:* Provide the capability for dispatchers to update ride status including pick-up and drop-off time or no-show time with notes. Through the “Rider Account”, dispatchers have additional functionalities including editing ride time, plus ones, and

travel reason prior to the ride. Dispatchers are able to update ride status through the "Ride Plan" to:

a. "Complete"
b. "Boarded"
c. "Reassignment in Progress"
d. "No Show"
e. "Other"

5. *Shift Monitoring:* Provide the capability for dispatchers to monitor live vehicle locations, including all pickups and drop-offs planned and executed for the current shift, force log out drivers, and see general service performance trends for the day. This will be possible through a tab in the VOC, labeled as the "Hub."

6. *Driver/Rider Communication:* If enabled, dispatchers can text drivers and Travelers and receive texts. Dispatchers will be able to send pre-configured messages or personalized messages to drivers/Travelers. Dispatchers can also communicate with HIRTA drivers via on-board two-way radio.

3.1.2.1.3.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-OPS-1A.3
- RC-OPS-1A.4
- RC-OPS-1B.2
- RC-OPS-6A.1
- RC-OPS-6A.3
- RC-OPS-6A.4
- RC-OPS-6A.4.1
- RC-OPS-6A.5
- RC-OPS-6A.8
- RC-OPS-6A.9
- RC-OPS-6A.10
- RC-OPS-8.1
- RC-OPS-8.2
- RC-OPS-8.3
- RC-OPS-8.5
- RC-SYS-9.1
- RC-SYS-9.3
- RC-SYS-9.8

3.1.2.1.3.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem
- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem

3.1.2.1.4 Cost Allocation and Billing

3.1.2.1.4.1 Function(s):

The Cost Allocation and Billing module provides four primary functions, as described below:

1. *Trip Verification*: Provide the capability to verify trips, if necessary, prior to cost allocation and billing.

2. *Billing and Invoicing*: Provide the capability to perform cost allocation and billing and generate appropriate invoices accordingly. A list of available sponsors for each rider is defined at the rider account level and can be assigned and adjusted based on eligibility. For each sponsored trip taken by a rider, the sponsor assigned and billed for the ride will be visible.

3. *Reimbursement and Accounting*: As currently set up, provide the capability to account for any reimbursements received from funding entities electronically.

4. *Reporting*: At the end of the configured cadence, partners are able to generate an invoicing report through the VOC that details each trip that was fully- or partially funded through one of these billing codes, including trips with multiple funding sources. Partners can then use these reports to generate invoices as appropriate.

3.1.2.1.4.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-ADM-2.1
- RC-ADM-2.2
- RC-ADM-3.1
- RC-ADM-4.1
- RC-ADM-4.2
- RC-ADM-5.1
- RC-SYS-7.2
- RC-GPA-1.1
- RC-CSR-16.1

3.1.2.1.4.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC4: MOD Platform TMS <-> Eligibility Management System
- HC6: MOD Platform TMS <-> Medicaid Broker System via Medicaid-MOD Middleware
- HC7: MOD Platform TMS <-> EHR Medical Record Subsystem via EHR-MOD Middleware
- HC8: MOD Platform TMS <-> Reporting Database via Live Database

3.1.2.1.5 Performance Management and Reporting

3.1.2.1.5.1 Function(s):

The reporting suite has the ability to capture, store, and report all of HIRTA's required metrics, collect on-time performance data, and allow for breakdowns by vehicles and service zones. Via utilizes a Direct Data Access (DDA) solution to allow partners to query the data stored in MOD Platform database directly or connect the data to other business intelligence and reporting tools. Via also provides a tool that allows creation and saving of custom reports with designated access for certain users. The reporting suite is web-based and data can be downloaded in CSV, .xls or JPEG (not JSON) format for further analysis. HIRTA personnel will not need to perform any manual data input to capture reporting data. The reporting module provides two primary functions:

1. *Reporting*: Provide the capability to report per defined KPIs for measuring system performance and measuring the project (and service delivery) outcomes. The reporting suite is organized into three core interfaces:

    a. Service KPI reports – Allow partners to assess service patterns and track KPIs.

    b. Data generator – Consolidates all service data into filterable and exportable tables. Authorized administrators can review and download data into various formats and tables for granular review or analysis in third-party reporting tools. Distinction of "Booking Method" (i.e., web application, mobile application, agent, unknown) is available through the Data Generator under Ride Requests. Additional filters include by day, sponsor, ride type, among others.

    c. Regulatory reports – These reports are tailored to present precise service data in the exact form requested by city, state, and/or national regulatory agencies.

    Reports available through Via's Direct Data Access (DDA) solution:

    a. 3B Report
    b. A2C Report
    c. Asset Monthly Report
    d. Amerigroup/ITC Report
    e. DAR Report
    f. Funding Source Report
    g. Productivity Report
    h. DAR-Productivity Report
    i. New Riders Report

    Additional reports will be made available through the VOC.

2. *Data Sharing:* Provide the capability to share data per data sharing agreements in the Phase 2 DMP [8].

3.1.2.1.5.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-ADM-6.1
- RC-ADM-7.1
- RC-GPA-1.2
- RC-GPA-1.3
- EC-CPS-1.1
- RC-SYS-1.1
- RC-SYS-1.2
- RC-SYS-1.2.1
- RC-SYS-1.2.2
- RC-SYS-1.2.3
- RC-SYS-1.2.4
- RC-SYS-1.2.5
- RC-SYS-1.3
- RC-SYS-1.3.1
- RC-SYS-1.3.2
- RC-SYS-1.3.3
- RC-SYS-1.3.4
- RC-SYS-3.1
- RC-SYS-3.2
- RC-SYS-3.2.1
- RC-SYS-3.2.2
- RC-SYS-3.2.3
- RC-SYS-3.3
- RC-SYS-10.1
- RC-SYS-10.2
- RC-SYS-10.3
- RC-SYS-10.8
- RC-SYS-12.1
- RC-HAD-1.1
- RC-HAD-1.2.1
- RC-HAD-1.2.2
- RC-HAD-1.2.3
- RC-HAD-1.2.4

3.1.2.1.5.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC8: HIRTA TMS <-> Reporting Database via Live Database

3.1.2.1.6 Notifications

3.1.2.1.6.1 Function(s):

The Notification module provides the following functions, as described below:

1. *Receive Notifications*: Provide the capability for HIRTA staff to receive audio notifications through the MOD Platform TMS.

2. *Push Notifications*: Provide the capability for HIRTA staff to push notifications to Travelers and drivers.

3.1.2.1.6.2 Requirement Traceability:

- RC-OPS-10.2.2
- RC-OPS-6A.7

3.1.2.1.6.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.1.2.1.7 Reservations and Customer Service

3.1.2.1.7.1 Function(s):

This module is intended for Travelers who need assistance or cannot use the Traveler application and need to contact a dispatcher or customer service representative (CSR) to book their rides. The Reservations and Customer Service module provides nine primary functions:

1. *Traveler Registration:* For Travelers not registered with HIRTA, provide the capability for a CSR to perform the registration on behalf of the customer.

2. *Customer Profile:* Add pertinent details in the Traveler profile as provided, including Traveler name, mobility aids/accessibility requirements, and funding eligibility and expiration details.

3. *Trip Booking:* Provide the capability to aid Travelers requesting a recurring or ad-hoc trip in advance (24 hours or earlier, per current policy) or same-day for their medical appointment needs. CSRs will have the capability to view medical appointment time and determine pick-up and/or drop-off times as well as manually override trip booking restrictions caused by the expiration of a funding source eligibility by manually updating the expiration date. Provides CSRs the ability to override any restrictions presented by the system, so trips are not denied.

4. *Trip Modification/Cancellation:* Provide the capability to cancel transportation services on a Traveler's behalf, as requested and allowed per policy. To modify a scheduled trip, the existing trip will be canceled and rebooked.

5. *Assistance with Broker or Third-Party Contractor Trips:* Provide the capability to assist Travelers with trips that were booked by Access2Care (Medicaid Broker) and are being delivered by HIRTA or trips that were booked by HIRTA but are being provided by a third-party service provider (e.g., Uber TNC). Allows the ability to contact third-party service providers; if the third party is using the Via driver app, the dispatcher will be able to see location and ETA in the VOC and may not need to contact the third party.

6. *Assist Travelers Needing Assistance with Self-Service Tools:* Provide the capability to assist Travelers that need assistance with web or mobile-based tools available to them but are having difficulty for any reason (e.g., internet connectivity, technical difficulty with user interface).

7. *Contact Travelers:* Provide tools to connect with Travelers according to their preference to assist with any aspect of their trips. Provide information to Travelers about the status of their trips, including current location of vehicle, ETA, assigned vehicle, assigned driver, and whether mobility needs are met by the assigned vehicle.

8. *Translation Service:* Provide tools to request translation service when needed to assist Travelers. View preferred language and other necessary accommodations needed to address Traveler communication preferences. Language displayed will automatically default to user device setting for English, Spanish, and Mandarin. If a user's device is set outside of these languages, English will be used as the default presentation setting. The VOC cannot translate messages directly into other languages. For passenger surveys, translations into languages other than English will be provided in CSV format, as there is no automatic translation within Leanplum/SurveyMonkey. The survey language will then default to the user's device setting if translated text is available.

9. *Trip History:* If configured as such, CSRs will have the capability to view Traveler trip history and any relevant KPIs (e.g., number of no-shows, number of cancellations, number of completed trips against what is allowed quota under a funding source). They will also have the ability to view a Traveler's no-shows and cancellations and to filter cancelled trips by cancellation time. Based on this information, CSRs can restrict bookings according to no-show policies set by HIRTA or a funding source. CSRs will have the ability to filter list of trips by a funding source and by transportation provider.

3.1.2.1.7.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-OPS-12.1
- RC-CSR-1.1
- RC-CSR-2.1
- RC-CSR-3.1
- RC-CSR-4.1
- RC-CSR-4.2
- RC-CSR-4.3
- RC-CSR-5.1
- RC-CSR-5.1.1
- RC-CSR-5.1.4
- RC-CSR-5.1.5
- RC-CSR-9.1
- RC-CSR-9.2
- RC-CSR-9.3
- RC-CSR-11.1
- RC-CSR-11.2
- RC-CSR-13.1

- RC-CSR-14.1
- RC-CSR-14.2
- RC-CSR-14.3
- RC-CSR-14.4
- RC-CSR-14.5
- RC-CSR-14A.1
- RC-CSR-14A.2
- RC-CSR-14A.3
- RC-CSR-14A.4
- RC-CSR-14A.5
- RC-CSR-15.2
- RC-CSR-16.3
- RC-CSR-17.1
- RC-CSR-17.2
- RC-CSR-17.3
- RC-SYS-2.1
- RC-SYS-2.1.1
- RC-SYS-2.1.2
- RC-SYS-2.1.3
- RC-SYS-10.5
- RC-HNV-2.1
- RC-HNV-2.2
- RC-HNV-4.1
- RC-HNV-5.1
- RC-HNV-5.2
- RC-HNV-6.1
- RC-HNV-6.2
- RC-HNV-6.3
- RC-HCR-4.1

3.1.2.1.7.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem
- HC3: MOD Platform TMS <-> Health Navigator & Healthcare-End Subsystem

3.1.2.1.8 Operations Management

3.1.2.1.8.1 Function(s):

The Operations Management module provides six primary functions, as described below:

1. *Driver Manifest Management*: Provide the capability to manage electronic manifests to be performed by HIRTA drivers in real time.

2. *Managing Third-Party Provider Trips:* Manifests performed by third-party providers will be managed in separate systems owned by those providers, but the status of those will be

accessible to HIRTA operations staff. Trips that are served by third parties using the Via driver application (Vehicle Subsystem) are treated the same as trips served by HIRTA. Vehicle information and driver information are managed under the MOD Platform TMS or Via Central Software (VOC). Trip details will include the license plate number of the assigned vehicle.

3. *Managing Access2Care Trips:* Trip requests from Access2Care (Medicaid) customers will be managed in that system but monitored by HIRTA operations staff.

4. *Dynamic Vehicle Reassignment:* Provide the capability to reassign trips to another vehicle in the event of an incident/accident if needed.

5. *Real-time Capacity Management:* Provide real-time information on current system capacity across all HIRTA vehicles and third-party providers to accommodate real-time requests or better utilization of resources.

6. *Real-time Trip Details:* Provide real-time status on trips with appropriate level of details. ETA status can be split into the following codes: ahead, on time, behind, very behind. The scheduler will have the ability to manually update the trip status in the event a driver is unable.

3.1.2.1.8.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-ADM-1.1
- RC-ADM-1.2
- RC-SYS-3.4
- RC-SYS-4.1
- RC-SYS-4.2
- RC-SYS-4.3
- RC-SYS-5.1
- RC-SYS-6.1
- RC-SYS-6.2
- RC-SYS-6.3
- RC-SYS-6.4
- RC-SYS-6.5
- RC-SYS-7.3
- RC-SYS-8.1
- RC-SYS-9.2
- RC-SYS-9.3
- RC-SYS-9.4
- RC-SYS-9.5
- RC-SYS-9.6
- RC-SYS-9.7
- RC-SYS-10.5.1
- RC-SYS-10.5.2
- RC-SYS-10.5.3
- RC-SYS-10.5.4

- RC-SYS-10.5.5
- RC-SYS-10.5.6
- RC-SYS-10.5.7
- RC-SYS-10.5.8
- RC-SYS-10.5.9
- RC-SYS-10.5.10
- RC-SYS-13.1
- RC-SYS-13.2
- RC-SYS-13.3
- RC-SYS-13.4
- RC-SYS-13.5
- RC-SYS-13.6
- RC-SYS-13.7
- RC-SYS-13.8
- RC-SYS-13.9
- RC-OPS-1A.2
- RC-OPS-1A.3
- RC-OPS-1A.5
- RC-OPS-1B.7
- RC-OPS-2.2
- RC-OPS-3.1
- RC-OPS-3.1.1
- RC-OPS-3.1.2
- RC-OPS-3.1.3
- RC-OPS-3.1.4
- RC-OPS-3.1.5
- RC-OPS-3.1.6
- RC-OPS-3.2
- RC-OPS-3.2.1
- RC-OPS-3.2.2
- RC-OPS-3.2.3
- RC-OPS-3.2.4
- RC-OPS-3.2.5
- RC-OPS-4.1
- RC-OPS-4.2
- RC-OPS-5.1
- RC-OPS-5.2
- RC-OPS-5.3
- RC-OPS-6B.1
- RC-OPS-6B.7
- RC-OPS-11.2
- RV-DRV-4.10.1
- RC-HCR-6.1
- RC-HCR-6.2
- RC-HCR-8.1
- RC-HCR-8.2
- RC-HCR-8.3

- RC-HCR-8.4
- RC-HCR-8.5
- RC-HCR-8.6
- RC-HCR-9.1
- RC-HCR-9.1.1
- RC-HCR-9.1.2
- RC-HCR-9.1.3
- RC-HCR-9.1.4
- RC-HCR-9.2
- RC-HCR-9.3
- RC-HCR-9.4
- RC-HCR-9.5
- RC-HCR-9.6

3.1.2.1.8.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem
- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem
- HC6: MOD Platform TMS <-> Medicaid Broker System via Medicaid-MOD Middleware

3.1.2.1.9 Safety Event Management

3.1.2.1.9.1 Function(s):

1. *Safety Event Reporting:* Per HIRTA's PTASP and Phase 1 SMP, a safety event is defined as an accident, incident, or occurrence [9] [10]. The safety event management feature allows users to report and modify any safety events, including the following information: date of event, event time, event type, related driver, vehicle, related routes, status (open -> in progress -> escalated -> resolved), severity (low/medium/high), event details (free text), and event documentation (file upload). If any hazards are identified – that is, any real or potential condition that may cause injury, illness, or death – these can also be reported through the event reporting module and assigned a risk level using the event details box as needed.

3.1.2.1.9.2 Requirement Traceability:

- RC-SYS-5.2

3.1.2.1.9.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem
- HC2: MOD Platform TMS <-> Traveler-End Subsystem
- HC3: MOD Platform TMS <-> Health Navigator & Healthcare-End Subsystem
- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem

3.1.2.2 Health Navigator & Healthcare-end Subsystem

The Health Navigator & Healthcare-end Subsystem's primary component is a limited access version of the MOD Platform TMS made available to health navigators and healthcare staff. Health navigators and healthcare staff will be provided limited access to the MOD Platform TMS VOC interface to book and manage trips on behalf of Travelers with the same functionalities available to HIRTA CSRs, however, will not have access to scheduling, manifest creation, or operations management specific modules. Access to the Health Navigator & Healthcare-end Subsystem VOC can be granted to staff by generation of a unique login for each staff member with access permissions set as such. This version of the VOC will be accessed through any web-accessible device, such as smartphones or computers. Health navigators and healthcare staff will have access to the EHR-MOD Middleware webpage to allow viewing of transportation and healthcare related information concurrently. Outside of the MOD Platform TMS, I&R functionality is also a tool used by Health Navigators.

3.1.2.2.1 Function(s):

The Health Navigator & Healthcare-end Subsystem provide health navigators and healthcare staff (HCRs) the following functionalities:

1. *Trip Planning & Booking:* Health navigators and HCRs will have the ability to log into the limited access MOD TMS Platform to search for, book, and manage trips for their customers. This includes the selection of timing, pick-up and drop-off destinations, and mobility preferences as well as the scheduling of multi-legged trips and recurring trips.

2. *Translation Services:* Health navigators and HCRs will have access to translation services when working with persons with LEP. They will also be able to identify preferred languages for Travelers when using Health Connector.

3. *Appointment Management:* Health navigators and HCRs will be able to view upcoming medical appointments for their customers, as well as the wait time between drop-off and the start of an appointment and length of an appointment.

4. *Trip Cancellation/Modification:* Health navigators and HCRs will have the ability to cancel existing trips before or during an appointment and rebook if modifications are needed.

5. *Real-time Trip Status:* Health navigators and HCRs will have access to the real-time status of a Traveler's trip, including any delays in pickup or drop-off. They will receive notifications upon pickup, drop-off, trip completion, and any delays.

6. *Trip Feedback:* If configured to allow access to all Health Connector incident reporting, Health navigators and HCRs will have the ability to receive and view feedback from customers once a trip is complete.

7. *Performance Sharing:* If configured to allow access to all Health Connector reporting, performance data from the Health Navigator and Healthcare-end Subsystem will be made available to Health Navigators, HCRs and DCHD.

8. *Independent Information & Referral (I&R) Product*: I&R refers to the information & referral (I&R) product used by Dallas County Health Department (DCHD) to track the status of referral activities and for coordination with Dallas County residents' health

navigation/social care services. This mainly relates to the Health Navigator and Healthcare-end Subsystem, in which health navigators or healthcare workers may refer patients to Health Connector to aid with their healthcare related transportation needs. While Health Connector does not interface with I&R systems directly, health-end users will have access to both systems and may refer to each when booking.

3.1.2.2.2 Requirement Traceability:

- RC-HNV-1.1
- RC-HNV-1.1.1
- RC-HNV-1.1.2
- RC-HNV-1.2
- RC-HNV-1.3
- RC-HNV-2.1
- RC-HNV-2.2
- RC-HNV-3.1
- RC-HNV-3.2
- RC-HNV-3.3
- RC-HNV-4.1
- RC-HNV-5.1
- RC-HNV-5.2
- RC-HNV-6.1
- RC-HNV-6.2
- RC-HNV-6.3
- RC-HAD-1.1
- RC-HAD-1.2.1
- RC-HAD-1.2.2
- RC-HAD-1.2.3
- RC-HAD-1.2.4
- RC-HCR-1.1
- RC-HCR-1.3
- RC-HCR-1.4
- RC-HCR-1.5
- RC-HCR-1.6
- RC-HCR-2.1
- RC-HCR-2.2
- RC-HCR-3.1
- RC-HCR-4.1
- RC-HCR-5.1
- RC-HCR-5.2
- RC-HCR-6.1
- RC-HCR-6.2
- RC-HCR-7.1
- RC-HCR-7.2
- RC-HCR-8.1
- RC-HCR-8.2
- RC-HCR-8.3
- RC-HCR-8.4

- RC-HCR-8.5
- RC-HCR-8.6
- RC-HCR-9.1
- RC-HCR-9.1.1
- RC-HCR-9.1.2
- RC-HCR-9.1.3
- RC-HCR-9.1.4
- RC-HCR-9.2
- RC-HCR-9.3
- RC-HCR-9.4
- RC-HCR-9.5
- RC-HCR-9.6
- RC-CSR-15.1
- RC-RFR-1.1
- RC-RFR-1.2
- RC-RFR-2.1
- RC-RFR-3.2

3.1.2.2.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC3: MOD Platform TMS <-> Health Navigator & Healthcare-End Subsystem

3.1.3 Middleware Design

The MOD Platform TMS interfaces directly with two middleware products to allow data exchange between the EHR Medical Record System and the Medicaid Broker System, as shown in Figure 4. The specifications and functionality for the MOD-EHR Middleware and MOD-Medicaid Middleware systems are described at a high level below. Additional functionality and specifications for each middleware product are described in the Middleware Design Document [12].

3.1.3.1 MOD-EHR Middleware

The MOD-EHR Middleware is an open-source middleware product that allows data exchanged from the MOD Platform TMS and the EHR Software system into a centralized location. The middleware will use the bi-directional APIs provided by Via as part of the MOD Platform TMS and the EHR software provider, such as Epic or AllScripts/Veradigm, to implement the data flows described below. A translation engine will be used at both API end points to translate data available from the APIs to a standardized data schema to enable the data exchange by the middleware application. A conceptual overview of the MOD-EHR Middleware application is shown in Figure 4 below.

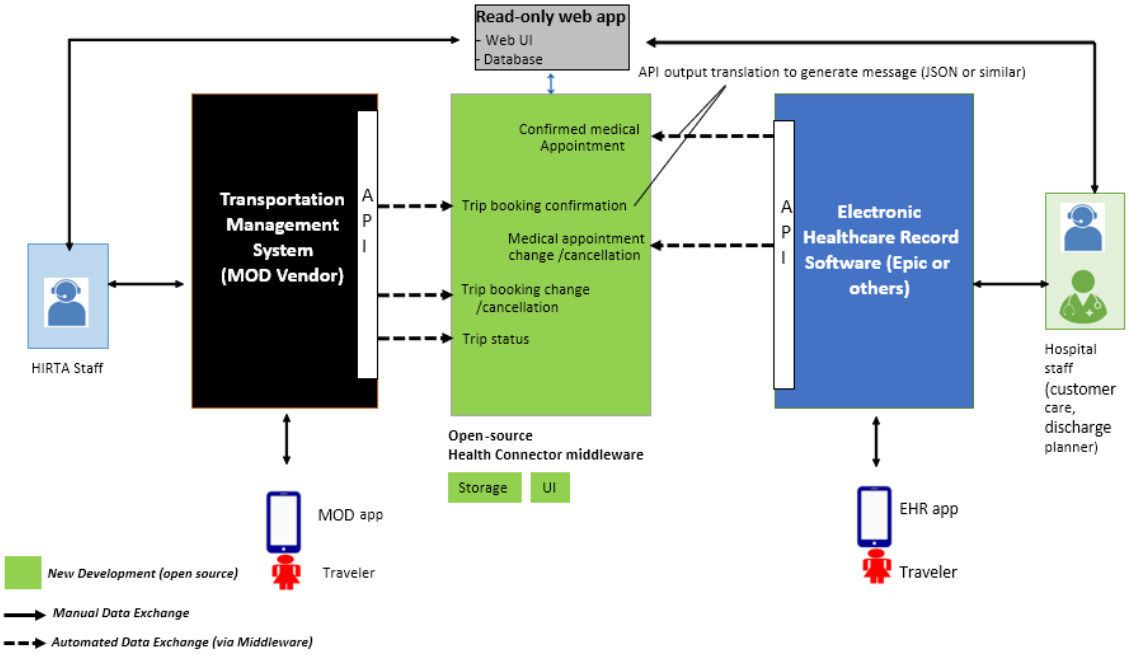

Figure 4. MOD-EHR Middleware Interface (Source: HIRTA team)

3.1.3.2 MOD-Medicaid Middleware

The MOD-Medicaid Middleware is an open-source middleware product that allows data exchange between the MOD Platform TMS and the State of Iowa Medicaid broker system. The Medicaid broker system uses Access2Care, which provides Non-Emergency Medical Transportation (NEMT) services to Medicaid and Medicare members, allowing Medicaid-funded trips through Health Connector for eligible Travelers. The middleware will use the bi-directional APIs provided by Via in the MOD Platform TMS and the Medicaid broker through Access2Care, to implement the data flows described below. A translation engine will be used at both API end points to translate data available from APIs to a standardized data schema to enable the data exchange by the middleware application. A conceptual overview of the MOD-Medicaid Middleware application is shown in Figure 5 below.

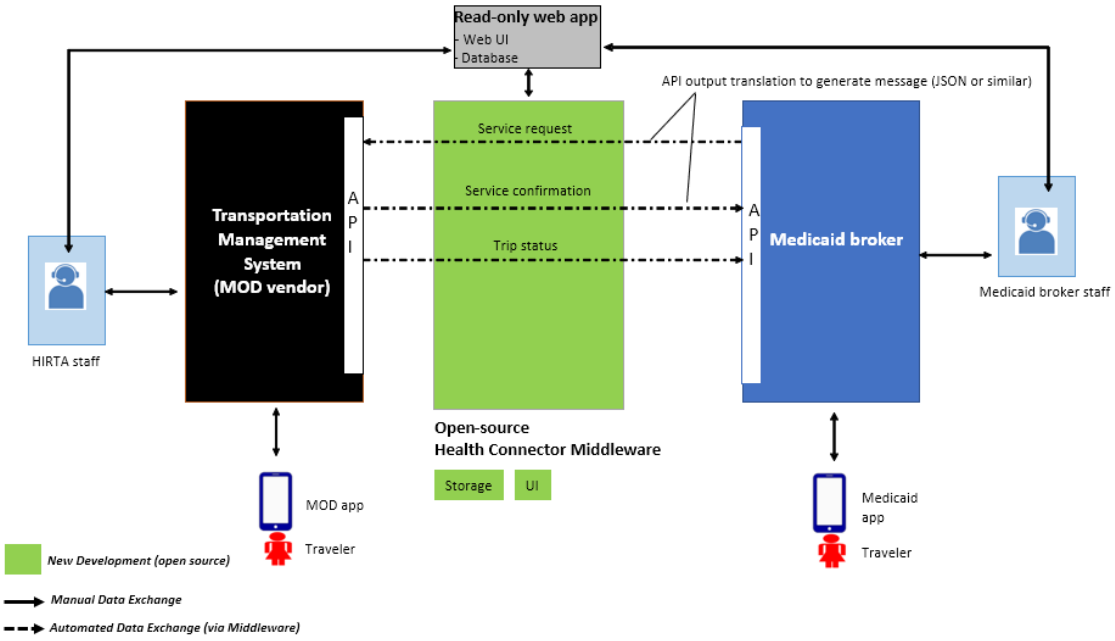

Figure 5. MOD-Medicaid Broker Interface Middleware (Source: HIRTA team)

3.2 Traveler-end Subsystem

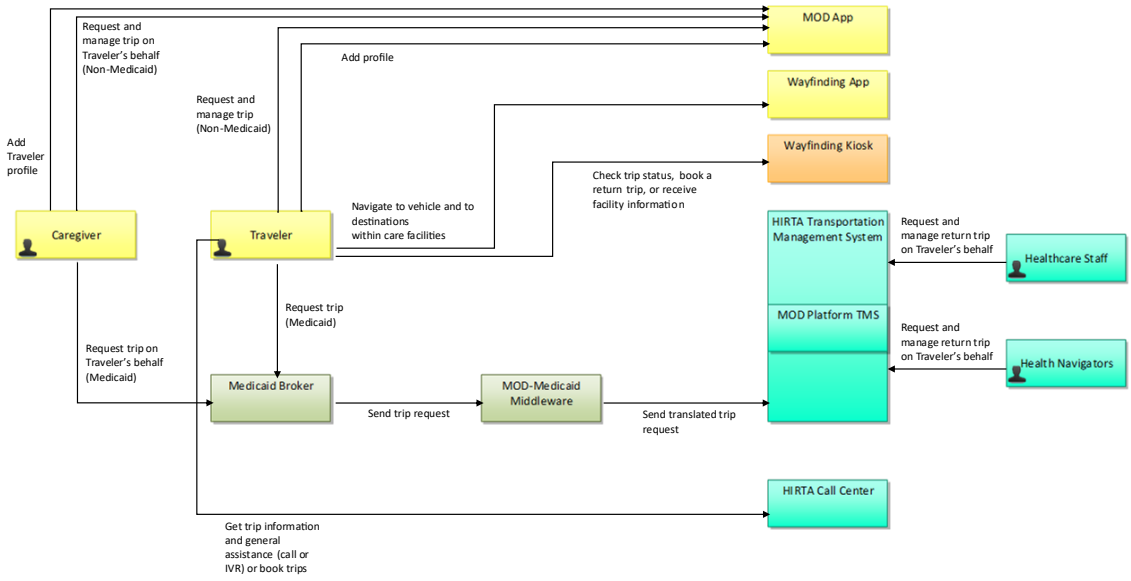

Figure 6. Traveler-end Subsystem (Source: HIRTA team)

The Traveler-end Subsystem diagram shown in Figure 6 includes the tools and technologies (phone/interactive voice, mobile/smart devices, web-based tools) to be used by Travelers or patients seeking transportation services for their medical appointments as part of their pre-trip,

during trip, on arrival, and return trip activities. The Traveler-end Subsystem comprises the mobile-based Traveler application and web application, which provide identical features and functionality. Critical flows in this diagram show how travelers can book rides, either through a Medicaid broker, or separately through the Traveler application. They are also able to utilize the HIRTA call center for booking or other assistance. The Traveler mobile and web applications can be used by caregivers on behalf of a traveler using the traveler's registration information or personal device.

3.2.1 Hardware Design

The Traveler-end Subsystem is an application that can be downloaded to a Traveler's personal web-enabled smart devices or is accessible by web through a browser. Please see specific hardware specifications below.

3.2.1.1 Personal Devices

3.2.1.1.1 Applicable models:

The Traveler-end Subsystem Traveler Application can be downloaded for free to any commercially available, GPS-enabled iOS or Android mobile device, including tablets and smartphones that meet the following minimum requirements:

1. *Android*
    a. RAM: 4 GB+
    b. OS version: Android 5.0+
    c. Year of device release: 2019+
    d. Screen size: 5.8# +
    e. Play Services Available
2. *iOS*
    a. OS version: iOS 13+
    b. Device model: iPhone 6 and later

The Android Traveler Application fully conforms to WCAG 2.1AA standards. The iOS Traveler Application conforms to WCAG 2.1AA standards except for a few criteria.

The Traveler Web Application can be run on any standard browser through a personal computer/laptop.

Personal devices can also be utilized to interact with IVR systems used to support Traveler's using Health Connector.

3.2.1.1.2 Function(s):

Using personal hardware devices, Travelers will be able to perform the following functions as they relate to Health Connector:

1. *Mobile/Web-App Deployment*: Travelers will use personal devices, including smart-phones and tablets to deploy the Traveler application and can also use computers to utilize the web-based application. Travelers without smart devices can book rides by contacting HIRTA CSRs by phone. Third parties booking trips on behalf of Travelers can

also use their own personal devices to download the Traveler Application and book rides on behalf of Travelers using the Traveler's login credentials or can book directly using the Traveler's personal device.

2. *Display and Accessibility Preferences:* Travelers will be able to configure their mobile and web settings to accommodate display preferences, such as text-size, brightness, contrast and audio-based assistance. These preferences will automatically apply to the display settings of the Traveler application. The application will also automatically respond to changes in data use settings set on a mobile device.

3.2.1.1.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-1.2
- RM-TRV-1.2.1
- RM-TRV-1.2.2
- RM-TRV-1.2.2.2
- RM-TRV-1.2.2.3
- RM-TRV-1.2.3
- RM-TRV-1.2.4
- RM-TRV-1.2.4.2
- RM-TRV-1.2.4.3
- RM-TRV-6.1
- RM-TRV-6.1.1
- RM-TRV-6.1.2

3.2.1.1.4 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2 Software Design

3.2.2.1 Health Connector Traveler Mobile Application

The Health Connector Traveler Mobile Application provides travelers with 6 major functionalities as described below. These include:

- Registration
- Trip planning
- Trip booking
- Translation services
- Payments
- Traveler Notifications

3.2.2.1.1 General

3.2.2.1.1.1 Function:

The ‘General’ subcomponent of the Health Connector Traveler Mobile Application refer to broad criteria related to accessibility and usability of the app as part of the Health Connector journey. These are not components of the app that serve a ‘function’ but rather general use cases and services the app should provide. These include:

1. *Accessibility for underserved populations:* Ensure that all six underserved groups identified by the HIRTA team are able to use the app.

2. *Accessibility for those with disabilities:* Ensure that people with disabilities, such as visual impairment, are able to use the app.

3. *Accessibility via web application:* Ensure that all features available on the mobile app are also available on a web app.

3.2.2.1.1.2 Requirement Traceability

The following requirements are applicable to this component and met by this design:

- RM-TRV-1.2
- RM-TRV-1.2.2
- RM-TRV-1.2.2.3
- RM-TRV-6.1
- RM-TRV-6.1.2

3.2.2.1.1.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.2 Registration

3.2.2.1.2.1 Function:

The registration tool provides the following key functionalities:

1. *Registration and Preference Management*: Provide the ability to register to receive HIRTA services if not an existing customer and allow Travelers to enter their booking preferences (e.g., mobility aid, personal companion need, notification preferences, favorite pick-up location and others). An example user interface (UI) for Traveler registration is shown in Figure 7.

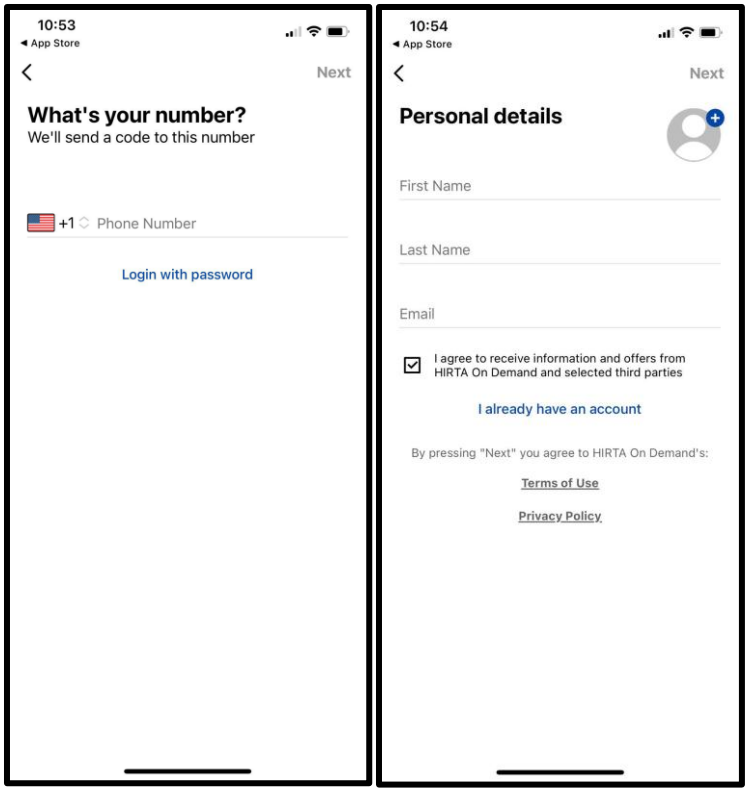

Figure 7. Traveler registration page (Source: Via)

2. *Funding Eligibility Information:* Allow Travelers to enter and update the status of their funding and eligibility information.

3. *Mobility Aid/Accessibility Services:* Upon registration, Travelers may request accessible service if needed. Travelers can indicate the need for a wheelchair accessible vehicle (WAV) in the application. More granular information, such as type of wheelchair, accompaniment by a service animal or personal care attendant (PCA), or other medical devices can be included via a call with a dispatcher. Travelers who have self-identified as requiring mobility assistance or as a paratransit service user will automatically be provided with curb-to-curb or door-to-door service. An example UI for mobility aid/accessibility services selection is shown in Figure 8.

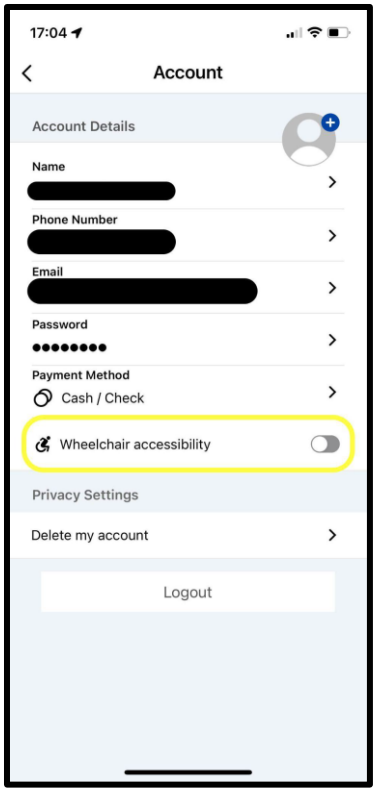

Figure 8. Accessibility preference selection (Source: Via)

3.2.2.1.2.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-2.1
- RM-TRV-2.2
- RM-TRV-2.2.1
- RM-TRV-2.2.2
- RM-TRV-2.2.3
- RM-TRV-2.4
- RM-TRV-15.2

3.2.2.1.2.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.3 Trip Planning

3.2.2.1.3.1 Function:

The application provides the following functionalities surrounding trip planning:

1. *Pick-Up and Drop-Off Selection:* Once registered, Travelers will see a map with the geofenced zone(s) in which service is offered and will be invited to set a pick-up location. If the pin is moved outside an eligible service zone for on-demand pickup, the map will be grayed out. Zones for drop-off will automatically update to display eligible destination areas. Pick-up/drop-off locations can be entered in the following ways:

    a. Travelers can type actual address into map search bar at the top of the screen and select from the search results.

    b. Travelers can scroll across the map, zoom in on a particular location, and drop a pin. If pin-drop location is not a viable address for pickup, HIRTA will have the ability to contact the Traveler and update the trip location (i.e., cancel and rebuild the trip in the updated/accurate location).

    c. Travelers can choose from a dynamically updated “Recents” list containing recently-used locations and saved, customizable “Favorites” that appear below the search bar.

    d. Travelers can tap on a Point of Interest (POI) on the map, such as a transit hub, hospital, grocery store, library, or other location, or bring up a list of POIs to select from.

    e. To add specific details, such as door number or landmark, to a pick-up location, Travelers can add a note in the ride notes describing in more detail where they would like to be picked up. This information will be available to drivers.

    Example UI pages for the functions described above are shown in Figure 9. The sub-images of Figure 9 include:

    a) [Top Left] Destination search map interface with geo-fences, serviceable zones outlined in blue.

    b) [Top Center] Destination search bar interface with selectable favorited locations.

    c) [Top Right] Destination selection map interface within geo-fenced serviceable zone.

    d) [Bottom Left] Destination selection map interface outside of geo-fenced serviceable zone, with warning that destination is outside of service zone.

    e) [Bottom Center] Pickup location selection map interface.

    f) [Bottom Right] Drop-off location selection map interface.

Figure 9. Pick-up and drop-off destination selection within geo-fenced zones (Source: Via)

2. *Trip Brokering*: See TMS (Via Central Software)

3. *Multimodal Trip Planning*: Displays real-time schedule information about other transit modes though integration with public GTFS feeds. Travelers are able to view live bus locations and schedules and book trips to connect to existing fixed-route services. This functionality is available through Via but will not be deployed for Health Connector.

3.2.2.1.3.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-1.1
- RM-TRV-1.1.1
- RM-TRV-1.1.2
- RM-TRV-1.1.3
- RM-TRV-1.1.4
- RM-TRV-1.1.5
- RM-TRV-1.3
- RM-TRV-4.1
- RM-TRV-5.1
- RM-TRV-11.1
- RM-TRV-11.1.1
- RM-TRV-11.1.2

3.2.2.1.3.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.4 Travel Assistance

3.2.2.1.4.1 Function(s):

The travel assistance subcomponent provides Travelers tools to get additional assistance in planning and booking rides. The Traveler application will display links to contact information to connect with a health navigator at the Dallas County Health Department, frequently asked questions (FAQs), and first-time use guides for navigating the Traveler application. If trip options presented to a Traveler do not meet their mobility needs, they will be able to contact HIRTA staff. An example UI for travel assistance requests is shown in Figure 10.

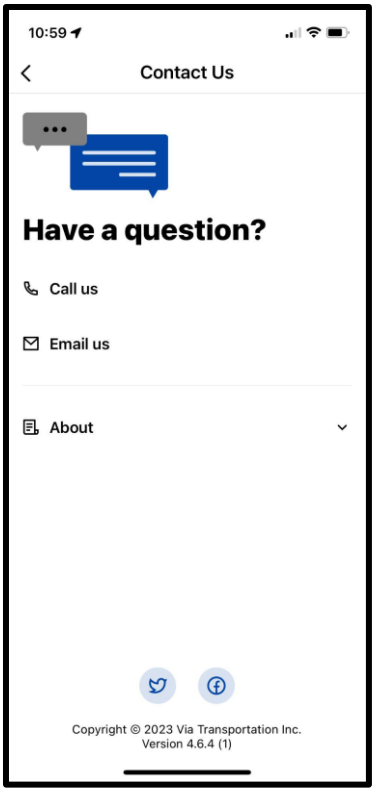

Figure 10. Health navigator contact information (Source: Via)

3.2.2.1.4.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-6.2
- RM-TRV-9.1
- RM-TRV-9.2

3.2.2.1.4.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.5 Trip Booking

3.2.2.1.5.1 Function(s):

The Trip Booking subcomponent provides the following functions, as described below:

1. *On-Demand Trip Proposal*: Travelers can submit an on-demand trip request, for trips up to a configurable duration. Via's algorithm matches the requested ride with available seats across the fleet, assigning the Traveler to a vehicle for a convenient personal trip

that optimizes efficiency across the service. Travelers may receive multiple trip proposals, each containing the following information:

a. *Vehicle's estimated time of arrival (ETA) at the pickup location*
b. *Pick-up and drop-off addresses*
c. *Trip fare (if applicable)*
d. *Estimated drop-off time*

The Traveler can then select their preferred trip alternative by tapping the "Book This Ride" button to confirm the ride. If desired, private rides can be enabled, allowing Travelers to have a vehicle to themselves. However, the Traveler does not have the option to book all legs of the trip with the same vehicle. This is applicable for both original and return trips. For multi-legged trips, each leg will be booked as a separate trip. An example UI for trip booking is shown in Figure 11.

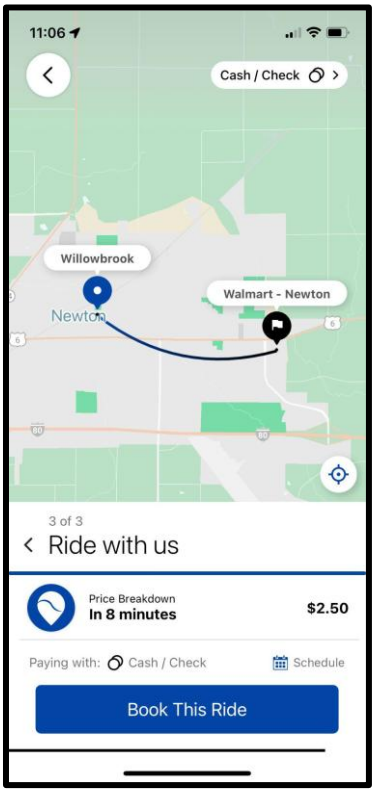

Figure 11. "Book this ride" with fare proposal (Source: Via)

2. *Pre-scheduled Trip Proposal*: Travelers can input their requested trip date, and whether they would like to be picked up or dropped off by their requested time for up to 14 days in advance. Trip duration limits can be configured within the system. Upon inputting preferences, the Traveler receives a trip proposal and can tap the "Book This Ride" button to confirm. Rides are always shared if aggregation is possible. An example UI for a pre-scheduled trip proposal is shown in Figure 12.

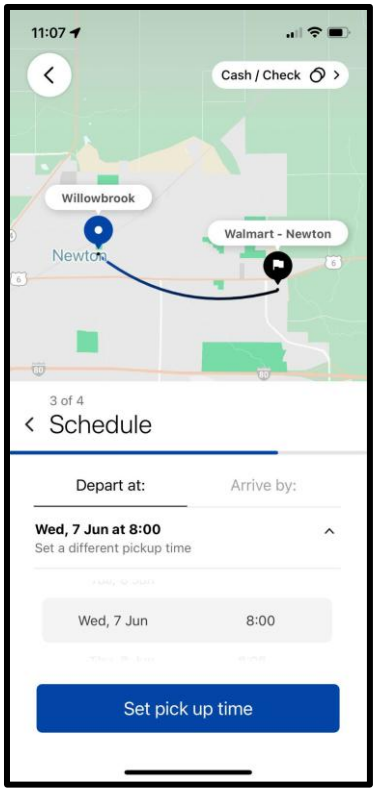

Figure 12. Pre-scheduled trip booking sequence (Source: Via)

3. *Recurring Trips*: Travelers can utilize the “Recurring ride” toggle to book a recurring trip (for example, every weekday, every Tuesday and Thursday, etc.). Upon inputting preferences, the Traveler receives a trip proposal and can tap the “book ride” button to confirm.

4. *Third-party References*: If a Traveler has requested a ride and no rides are available, Travelers can be directed to another transportation option and/or to contact HIRTA customer service via a notification.

5. *Trip Modification/Cancellation*: Travelers will be able to cancel a scheduled trip up to 20 minutes in advance of the scheduled pickup and rebook if modifications are needed.

6. *Multi-legged Trip Booking:* To book multi-legged trips, Travelers will book each leg as a separate trip.

7. *Mobility Aid/Accessibility Services:* Travelers can update their mobility aid/accessibility services at their account level during the trip booking sequence on a ride-by-ride basis. Mobility aid preferences do not need to match preferences used for previous rides.

8. *Personal Companions and Group Size Requests*: At the time of booking, Travelers may select the number of people traveling in their party up to a maximum number which is determined based on fleet capacity and HIRTA preferences. In the event a Traveler arrives with additional passengers not accounted for in the original reservation, the driver can contact a dispatcher who will confirm the change does not affect the on-board or

pending customers and will then update the reservations accordingly. If all seats in the vehicle are booked, the dispatcher can assist the party in booking a new ride. Travelers can account for different rider types in their group, ensuring the appropriate concessionary fare is applied or that caregivers ride for free and the correct level of service is provided. Personal companions are allowed regardless of the Traveler's ability to pay or their funding source. The algorithm will assign all riders in the group to the same vehicle and the Traveler app will confirm seats at the time of booking. Travelers can book seats for additional family members using the same process and can indicate if car seats are necessary. An example UI for adding extra passengers to a trip is shown in Figure 13.

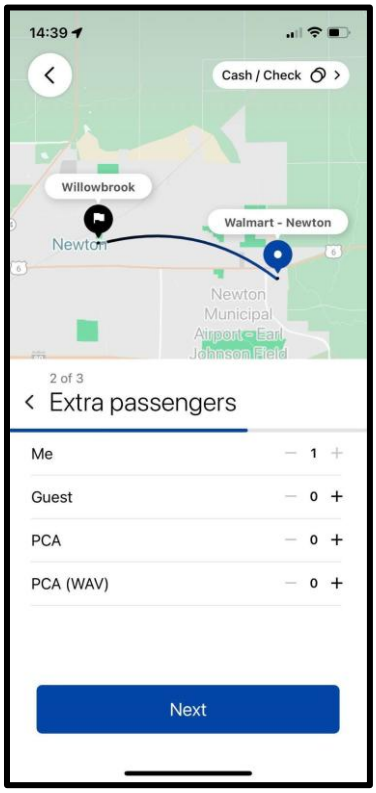

Figure 13. Personal companions and group size adjustment (Source: Via)

3.2.2.1.5.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-1.4
- RM-TRV-1.4.1
- RM-TRV-1.4.2
- RM-TRV-1.4.4
- RM-TRV-1.4.5
- RM-TRV-1.4.7
- RM-TRV-2.3
- RM-TRV-8.1
- RM-TRV-8.2

- RM-TRV-8.3
- RM-TRV-10.1
- RM-TRV-10.2TO AID
- RM-TRV-11.1.3
- RM-TRV-11.1.4
- RM-TRV-11.1.5
- RM-TRV-11.1.6
- RM-TRV-11.1.7
- RM-TRV-12.1
- RM-TRV-12.2
- RM-TRV-13.1
- RM-TRV-14.1
- RM-TRV-14.2
- RM-TRV-14.4
- RM-TRV-15.1
- RM-TRV-15.3
- RM-TRV-16.1
- RM-TRV-16.2
- RM-TRV-22.2.3
- RM-TRV-23.1
- RM-TRV-23.2
- RM-TRV-24.1
- RM-TRV-25.1
- RM-TRV-25.2
- RM-TRV-27.2

3.2.2.1.5.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.6 Translation Services

3.2.2.1.6.1 Function(s):

The translation services tool will provide access to translation services for before/during/after trip when needed by Travelers with Limited English proficiency (LEP) needs. Translation services will provide both audio and visual assistance. The Traveler and web applications will automatically default to the Traveler's hardware device settings if set in English, Spanish, or Mandarin. If a device is not set to one of these three languages, the application will default to English.

3.2.2.1.6.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-7.1
- RM-TRV-7.2

- RM-TRV-7.3

3.2.2.1.6.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.7 Payments

3.2.2.1.7.1 Function(s):

The payment methods described below will be applicable to rides provided by both HIRTA and third-party drivers. Volunteer provided rides will be on a donation basis and thus no fare will be required. The application provides the following payment capabilities (an example UI is shown in Figure 14):

1. *Electronic Payments/Credit Cards*: Provide the ability for Travelers to be able to pay for their trips electronically using the mode of payment available in their accounts.

    a. Travelers will input credit card payment information using a smartphone camera, by entering it manually in the Traveler app, or by calling dedicated customer support representatives. Travelers are able to save multiple credit/debit cards saved in their account at a time, and whichever card is set as their default will be charged at the completion of a ride. If a Traveler does not have the Traveler app, they can provide HIRTA their credit card information over the phone. HIRTA will have the ability to conference in the payment line, which will prompt the Traveler to type in the credit card details in their phone. This information will be saved to the Traveler's account.

    b. Travelers will be able to add electronic vouchers to their payment method.

    c. The system will automatically charge the appropriate fare for future trips.

    d. If a Traveler has no money left on their debit or credit card upon charge at the completion of a ride, it will be marked as a failed payment and their account will be deactivated. At such time, the HIRTA team will receive a notification and will work with the Traveler to reconcile the balance.

2. *Cash, Check or Electronic Voucher*: Traveler will be able to pay drivers of HIRTA vehicles on-board using cash or check. This payment method will be marked by the driver when the Traveler is dropped off.

3. *Account Debit*: Travelers will be allowed to pay for their trip by debiting their HIRTA account (e.g., "HIRTA Bucks" as seen in Figure 14). They will have the capability to replenish the account if the balance goes below a certain limit or on demand. Examples of account debits may include:

    a. *Traveler could purchase a Weekly Health Connector Pass for flat fee, allowing them to ride up to 4 times a day at no additional cost*.

b. *Travelers can purchase "packages" of ride credit for discounted rates*.

Travelers can check their prepaid account balance at any time and set it to auto-load using a preferred payment method based on a predefined trigger set by the Traveler (e.g., balance below $10).

4. *Discount Codes/Coupons*: Travelers will also be able to apply any discount code or other digital cash available to them for the medical transportation needs.

5. *Unbanked/Underbanked*: Travelers will be able to replenish their HIRTA debit accounts by using cash or a check to purchase cash cards and electronic vouchers, which can be purchased at convenient locations. This is intended for passengers without bank accounts.

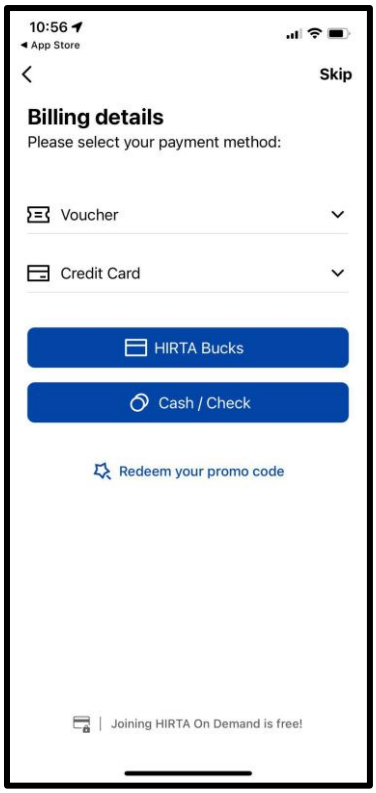

Figure 14. Fare payment registration method (Source: Via)

3.2.2.1.7.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-1.4.3
- RM-TRV-1.5
- RM-TRV-30.2
- RM-TRV-30.3
- RM-TRV-30.4

- RM-TRV-30.5
- RM-TRV-31.1
- RM-TRV-31.2
- RM-TRV-32.1
- RM-TRV-32.2
- RM-TRV-33.1
- RM-TRV-34.1
- RM.TRV-34.2
- RM-TRV-34.3
- RM-TRV-34.4

3.2.2.1.7.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.8 Traveler Notifications

3.2.2.1.8.1 Function(s):

The Traveler notification subcomponent provides the following functions, as described below:

1. *Traveler Notifications:* The Traveler will have the ability to subscribe to receive notifications on the status of their upcoming trips, including the type of vehicle, license plate and driver first name. In-app settings will allow Travelers to configure their preferences regarding frequency and type of notifications (email, text, IVR). Example notifications include:
    a. *Booking Confirmation:* The Traveler will receive a booking confirmation notification once a trip is successfully booked.
    b. *Trip Reminders*: Travelers will be reminded at least one day prior to a trip.
    c. *Vehicle Status Updates*: Travelers will receive notifications day-of before a vehicle is dispatched and status updates once the vehicle is dispatched.

2. *Contact Information*: Travelers have the ability to select up to five individual contacts (health provider, health navigator, caregiver) to also receive notifications for their scheduled trips. This information must be entered in the Traveler's profile at the time of booking.

3.2.2.1.8.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-17.1
- RM-TRV-17.2
- RM-TRV-17.3
- RM-TRV-17.4
- RM-TRV-17.5
- RM-TRV-17.6
- RM-TRV-17.7

- RM-TRV-17.8
- RM-TRV-17.9
- RM-TRV-17A.1
- RM-TRV-17A.2
- RM-TRV-17A.3
- RM-TRV-17A.4
- RM-TRV-17A.5
- RM-TRV-17A.6
- RM-TRV-22.2.1
- RM-TRV-22.2.2
- RM-TRV-26.1
- RM-TRV-30.1

3.2.2.1.8.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.1.9 Trip Information

3.2.2.1.9.1 Function(s):

The 'trip information' tab in the VOC provides the following key functions (an example UI is shown in Figure 15):

1. *Vehicle Identity Verification:* Provide the capability for Travelers to identify the correct vehicle for boarding, using vehicle information provided through the Traveler App. The following driver and vehicle details can be shown to the Traveler when waiting for a ride:

    a. License plate number
    b. Vehicle visual ID (number printed on the vehicle)
    c. Vehicle make and model
    d. Vehicle photo
    e. Driver's name (first name and last initial)
    f. Driver's photo

2. *Traveler Identify Verification:* Provide the capability to show electronic Traveler profile to the driver if requested for verification.

3. *Real-time Information:* Provide the ability for Travelers to be able to obtain real-time information related to their trip status (e.g., traffic delay, delayed arrival).

    a. *Pick-up Location*: Provide the capability to describe exact pick-up location for medical appointment and return trips that Travelers can use for wayfinding and boarding the vehicle.

    b. *Arrival Notification*: Provide the capability to notify about arriving vehicle at a pre-determined interval.

c. *Real-time Vehicle Location:* Provide the capability to view vehicle location in real time on a map-based interface.

d. *Vehicle Image:* Provide the capability to view the vehicle image and vehicle number.

e. *Real-time Trip Progress*: Provide the capability to view current trip progress and estimated time of arrival at the destination.

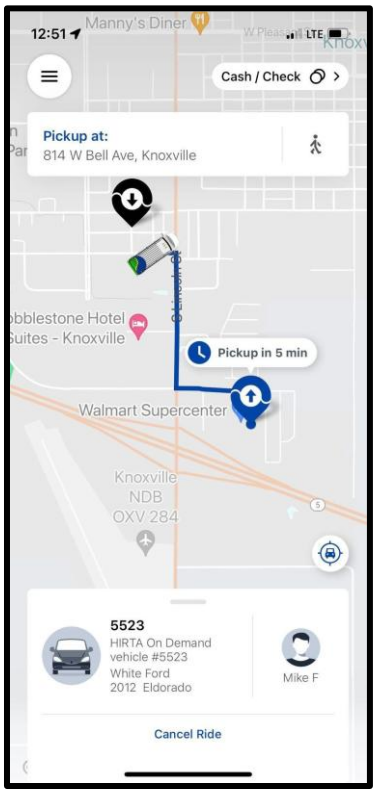

Figure 15. "Walk to pickup" with Driver/Vehicle information (Source: Via)

4. *Orientation/Information on Healthcare Services on Arrival (TBD)*: If requested by Travelers, provide information on wayfinding capability on arrival. Such capability will be provided via Traveler devices or infotainment screens installed within vehicles.

5. *Shared Ride Status*: Provide the capability for Travelers to share their ride details through an SMS or phone call with a contact they choose while riding. A text message would be sent to the chosen contact with the following information: Traveler name, drop-off location, service name, drop-off ETA timestamp, van model, license plate, and driver's first name.

3.2.2.1.9.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-1.2.2.1

- RM-TRV-18.1
- RM-TRV-18.2
- RM-TRV-19.4.1
- RM-TRV-19.4.2
- RM-TRV-20.1
- RM-TRV-20.4
- RM-TRV-22.1
- RM-TRV-22.2
- RM-TRV-26.2

3.2.2.1.9.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.2.2.2 Health Connector Traveler Web Application

3.2.2.2.1 Function(s):

The Traveler web application provides the same functionalities and comprises the same components as the Traveler mobile application. An example UI for the Traveler web application is shown in Figure 16. The web application provides additional functionality with regards to translation, as described below:

1. *Translation Services*: In addition to the translation service functionality described through the Traveler mobile application, the Traveler web application provides the ability to integrate with Google Translate for additional language offerings.

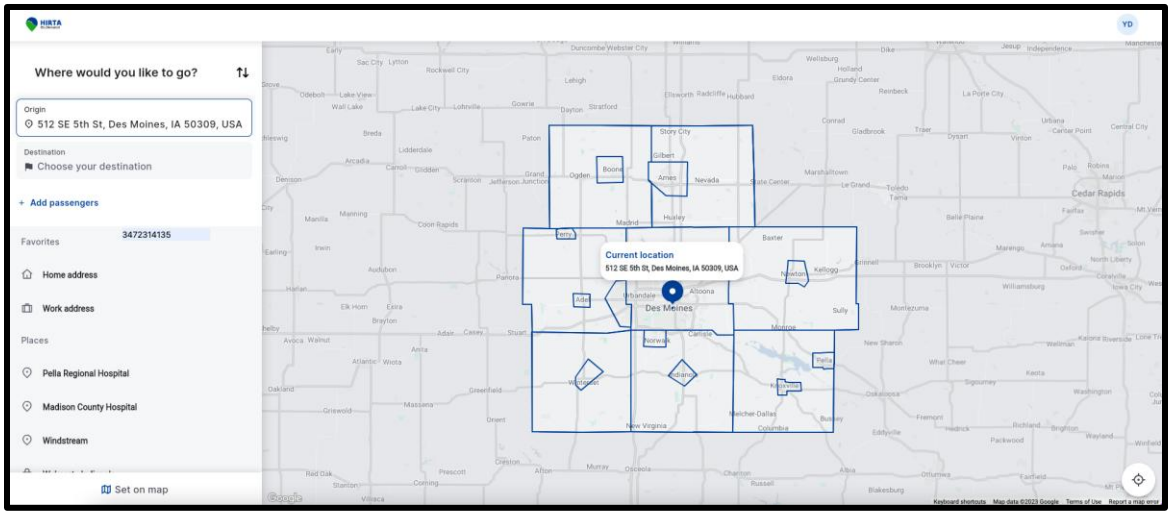

Figure 16. Web application booking screen (Source: Via)

3.2.2.2.2 Requirement Traceability:

The Traveler web application meets the same requirements as the Traveler mobile application described above. Requirements specific to the web application are listed below:

- RM-TRV-6.1
- RM-TRV-6.1.2

3.2.2.2.3 Interfaces:

The Traveler web application related to the same interfaces as the Traveler mobile application described above.

3.2.2.3 IVR

3.2.2.3.1 Function(s):

HIRTA's IVR system provides the following functionalities to the Traveler when using Health Connector:

1. *Traveler Assistance:* When Travelers contact HIRTA CSRs by phone, HIRTA's IVR system will provide a variety of automated responses to aid Traveler questions or forward a Traveler to a CSR.

2. *Notifications:* Travelers who elect to receive primary or secondary contact notifications by phone will receive automated alerts on the status of their ride.

3.2.2.3.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-17.4

3.2.2.3.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC2: MOD Platform TMS <-> Traveler-End Subsystem

3.3 Vehicle Subsystem

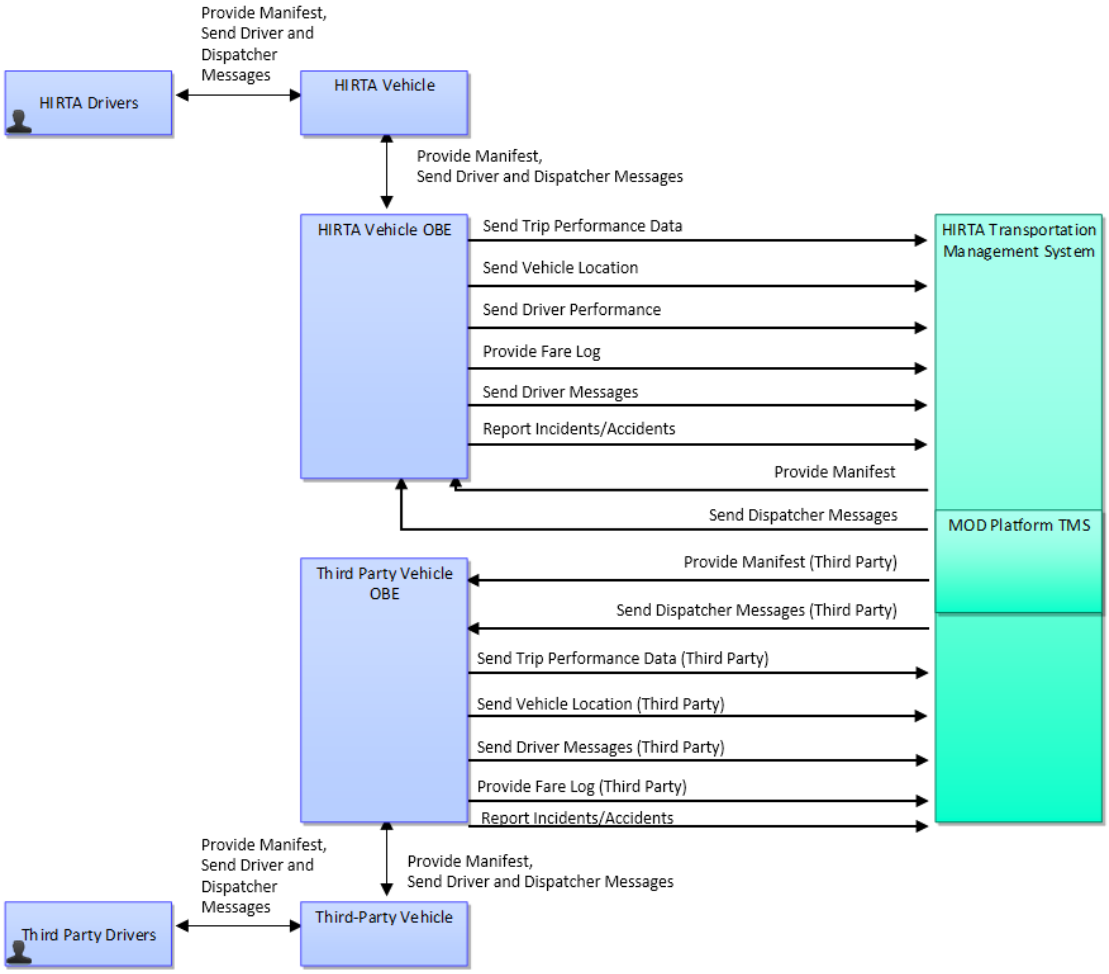

Figure 17. Vehicle Subsystem (Source: HIRTA team)

The Vehicle Subsystem shown in Figure 17 refers to the technologies, or on-board equipment (OBE) deployed on vehicles to support driver-end functions for driver-dispatch communications, manifest management, just-in-time dispatching, turn-by-turn navigation, on-board customer information, and fare payments. On all HIRTA-owned vehicles, drivers will use tablets running the driver app. For trips that are performed by third-party vehicles, drivers may use the driver application on their tablet or their phone. The Vehicle Subsystem will be provided by Via.

3.3.1 Hardware Design

3.3.1.1 HIRTA Supporting Hardware

3.3.1.1.1 Function(s):

All HIRTA vehicles will be equipped with the following hardware devices:

1. *On-board mobile tablets:* Drivers of HIRTA vehicles will utilize touch-screen, on-board tablets to deploy the Vehicle Subsystem's driver application. Drivers will also be able to contact dispatchers and Travelers via phone calls and text message using cellular devices.

    a. *Driver Terminal GPS Receiver & Magnetometer (and/or gyroscope and accelerometer):* Allows vehicle tracking and reporting at a predefined interval on vehicle latitude, longitude, and heading.

2. *Two-way Radio:* All HIRTA vehicles will be equipped with a two-way radio that operates independent of the driver terminal.

The hardware devices will remain connected to the MOD TMS system using cellular data.

3.3.1.1.2 Model Numbers:

The Vehicle Subsystem driver application can be downloaded for free to any commercially-available, GPS-enabled iOS or Android mobile device, including tablets and smartphones that meet the following minimum requirements:

3. *Android*
    a. RAM: 4 GB+
    b. OS version: Android 5+
    c. Year of device release: 2019+
    d. Screen size: 5.8# +
    e. Play Services Available
4. *iOS*
    a. OS version: iOS 13+
    b. Device model: iPhone 6 and later

3.3.1.1.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RV-DRV-0.1
- RV-DRV-0.1.1
- RV-DRV-0.2
- RV-DRV-0.2.1
- RV-DRV-0.3
- RV-DRV-0.7
- RV-DRV-4.4
- RV-DRV-4.4.1

3.3.1.1.4 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem

3.3.1.2 Third-Party Driver Devices

3.3.1.2.1 Function(s):

All Third-Party vehicles will be equipped with the following hardware:

1. *Mobile GPS Enabled Smart-Device:* Drivers of third-party vehicles will use phones, tablets, and other smart-devices to deploy the driver application. This will allow third-party drivers to receive trip manifests and directions, Traveler information, and communicate with HIRTA dispatchers, customer service staff, and Travelers. Third-party vehicle drivers will have access to the same functionality as HIRTA drivers.

The hardware devices will remain connected to the MOD Platform TMS using cellular data networks.

3.3.1.2.2 Eligible Models:

The Vehicle Subsystem driver application can be downloaded for free to any commercially available, GPS-enabled iOS or Android mobile device, including tablets and smartphones that meet the following minimum requirements:

5. *Android*
    a. RAM: 4 GB+
    b. OS version: Android 5+
    c. Year of device release: 2019+
    d. Screen size: 5.8# +
    e. Play Services Available
6. *iOS*
    a. OS version: iOS 13+
    b. Device model: iPhone 6 and later

3.3.1.2.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RV-DRV-0.1
- RV-DRV-0.1.1
- RV-DRV-0.2
- RV-DRV-0.2.1
- RV-DRV-0.3
- RV-DRV-0.7
- RV-DRV-4.4
- RV-DRV-4.4.1

3.3.1.2.4 Interfaces*:*

The following interfaces are related to this subcomponent:

- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem

3.3.2 Software Design

3.3.2.1 Via Driver Application

The Via driver application is the software application through which drivers are able to utilize the Vehicle Subsystem. This application provides the following functions:

- Scheduling
- Navigation
- Trip Performance

3.3.2.1.1 Scheduling

3.3.2.1.1.1 Function(s):

The scheduling subcomponent provides the following functions, as described below:

1. *Trip Assignment:* After logging into the driver application with a secure username and password, drivers will begin receiving trip assignments and directions to pickups and drop-offs.

2. *Traveler Details:* The Driver can see information about the Traveler, such as their first and last name, concessions (Traveler type), payment method, mobility aids, notes, travel reason, and whether they are traveling with additional riders. Travelers can add specific pickup instructions (e.g., door number) to the ride notes.

3. *Traveler Communication:* Drivers may call the Traveler directly by tapping the telephone button on the driver application. In instances where a pickup location needs to be changed (e.g., closed entrance), the Traveler will add the information to the rider notes or contact a dispatcher who will communicate this information to the driver.

4. *Trip Manifest:* Drivers may view their entire upcoming manifest in list form. If there are no upcoming trips booked, vehicles will be routed to areas of expected demand. Trips cancelled by Travelers disappear immediately from drivers' manifests.

5. *Waiting Locations:* Drivers will see directions to "Terminals" – safe, strategically-positioned waiting areas—to ensure they are best positioned to meet future demand.

6. *Driver Breaks:* Drivers can take pre-scheduled breaks or input new break requests directly in the driver app. Drivers will receive no new tasks while on break.

3.3.2.1.1.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RV-DRV-0.5
- RV-DRV-0.6
- RV-DRV-2.1
- RV-DRV-4.9.1
- RV-DRV-4.9.1.1
- RV-DRV-4.9.1.2
- RV-DRV-4.9.1.3
- RV-DRV-4.9.1.4
- RV-DRV-4.9.1.5
- RV-DRV-4.9.1.6
- RV-DRV-4.9.1.7
- RV-DRV-4.9.3
- RV-DRV-4.9.4
- RV-DRV-4.9.5

3.3.2.1.1.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: HIRTA TMS <-> HIRTA Vehicle Subsystem
- HC5: HIRTA TMS <-> Third-Party Vehicle Subsystem

3.3.2.1.2 Navigation

3.3.2.1.2.1 Function(s):

The navigation subcomponent provides the following functions, as described below:

1. *Turn-by-turn Navigation:* Provide turn-by-turn directions for the pick-up or drop-off locations as requested by the driver. Should a driver miss a turn, the system will automatically recalculate the most efficient route to pickup while, at the same time, considering the driver's other pickups and drop-offs. Navigation includes spoken directions and other audible cues.

2. *Driver Location:* Location and manifest updates in the driver application are available every two seconds to account for turn-by-turn directions and Traveler updates. For dispatchers, the "Ride Plan" is updated every 10 seconds, the "Hub" every 20 seconds, and the notifications panel every 10 seconds.

3. *Live Support:* At any time during the trip, a driver can request live support through the application. Drivers can easily communicate with dispatchers through the driver application. Messages can be labeled as varying priorities to indicate importance, such as for medical emergencies.

4. *Traveler Information:* Upon pickup, the driver can view any Traveler- or pickup-specific notes, such as the Traveler needs assistance boarding or will be waiting at a particular entrance. This includes the Traveler's location for pickup and during a trip.

5. *Limited/Lost Cellular Coverage:* In the event of lost connectivity, the driver application will continue to operate using cached data. Drivers will no longer receive new bookings but

will continue to be presented with turn-by-turn navigation and directions to their current pick-up and drop-off tasks. When connectivity is regained, the driver app will immediately sync up with the system and be updated with any relevant ride or route changes. Drivers are notified when connectivity is lost. Two-way radios will be available for drivers to contact dispatchers and two internet providers are used for redundancy in the case of lost connectivity.

6. *Translation Services:* When requested, a driver will be provided with translation services.

3.3.2.1.2.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RV-DRV-0.3
- RV-DRV-0.8
- RV-DRV-3.1
- RV-DRV-4.1
- RV-DRV-4.2
- RV-DRV-4.6.1
- RV-DRV-4.6.2
- RV-DRV-4.6.3
- RV-DRV-4.6.4
- RV-DRV-4.6.5
- RV-DRV-4.6A.1
- RV-DRV-4.9.2
- RV-DRV-4.11.1
- RV-DRV-4.11.2

3.3.2.1.2.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem
- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem

3.3.2.1.3 Trip Performance

3.3.2.1.3.1 Function(s):

The trip performance subcomponent provides the following functions, as described below:

1. *Pick-up status:* When the Traveler boards, the driver confirms the Traveler's first name and taps the blue button in the lower-right corner to confirm the pick-up.

2. *No-show:* Drivers may mark a no-show by tapping the red no-show button. No-shows can easily be undone if the Traveler arrives. The waiting time before a driver marks the passenger as a no-show can be set to HIRTA's specifications.

3. *Drop-off status:* When the driver reaches a Traveler's drop-off location, the driver will tap the drop-off button next to the Traveler's name.

4. *Payment Status:* Upon drop-off, the driver will be able to update the amount paid by the Traveler, apply discounts or coupons, or contact HIRTA operations staff in the event a Traveler is unable to pay the fare amount.

5. *Safety Alerts:* Drivers can send non-medical emergency messages via the silent alarm feature. The MOD Platform TMS (VOC) displays this alarm as an alert to dispatchers.

3.3.2.1.3.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RV-DRV-1.1
- RV-DRV-1.3
- RV-DRV-2.2
- RV-DRV-2.3
- RV-DRV-2.4
- RV-DRV-3.2
- RV-DRV-3.3
- RV-DRV-4.5.1
- RV-DRV-4.5.2
- RV-DRV-4.7.1
- RV-DRV-4.8.1
- RV-DRV-4.8.2
- RV-DRV-4.8.3
- RV-DRV-4.10.2
- RV-DRV-4.10.3
- RV-DRV-4.10.4
- RV-DRV-4.10.5
- RC-OPS-10.1

3.3.2.1.3.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC1: MOD Platform TMS <-> HIRTA Vehicle Subsystem
- HC5: MOD Platform TMS <-> Third-Party Vehicle Subsystem

3.4 Wayfinding Subsystem

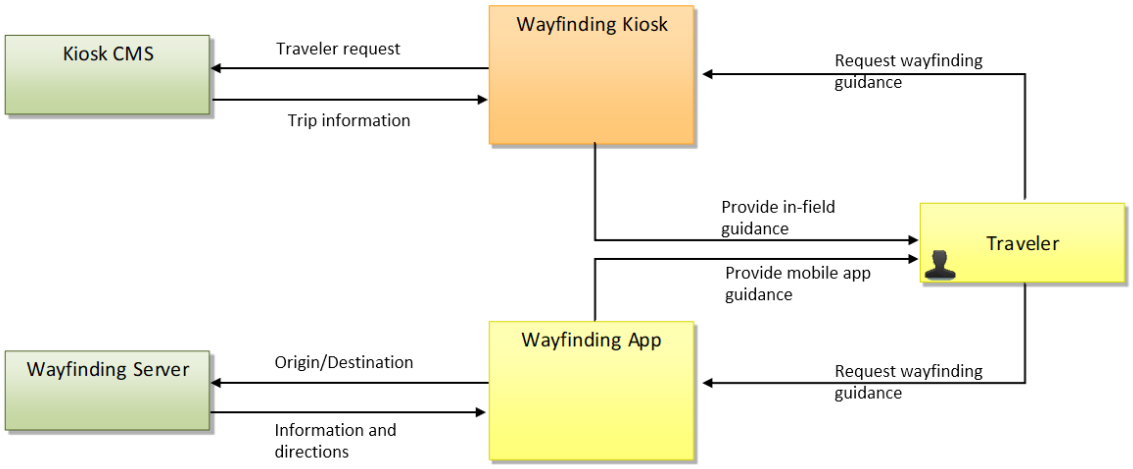

Figure 18. Wayfinding Subsystem (Source: HIRTA team)

The Wayfinding Subsystem shown in Figure 18 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. HIRTA Health Connector partner, NaviLens, will provide the Wayfinding Subsystem. Core components of the Wayfinding Subsystem include NaviLens codes placed around the healthcare facilities and the central software that provides information to that equipment. The addition of wayfinding kiosks in the care facilities are being evaluated at this phase in design. Interaction with the Traveler-end wayfinding app is also critical.

3.4.1 Hardware Design

3.4.1.1 Kiosks

3.4.1.1.1 Function(s):

The Wayfinding Kiosk is the physical, static hardware system through which travelers are able to request and receive information regarding wayfinding, including information related to the healthcare facility and transportation options. The wayfinding kiosk was evaluated for the following potential use cases:

Use Case #1: Kiosk serves as the general information board for patients letting them get familiar with the healthcare facility (inside and outside) using accessible but static content.

Use Case #1-A: Kiosk serves as a virtual assistant to serve as alternative to NaviLens wayfinding to those who may not have a smartphone or are less comfortable with the smaller device size.

Use Case #2: Kiosk serves as a virtual assistant to assist with transportation options for those who may not have a smartphone.

Ultimately, Use Case #2 was chosen as the focus for the kiosk. The following functions will be provided by the kiosk to support the use cases described above:

1. *Check Trip Status:* A Traveler will be able to check on the status of an existing trip booking via the Kiosk.

2. *Book a Trip:* A Traveler will be able to book a Health Connector ride from the healthcare facility to a destination of their choosing within the service area. Potential limitations to this functionality include identifying a secure way for Traveler's to access their HIRTA accounts, or the ability for Traveler's to book rides without an account if the aforementioned functionality is not feasible.

3. *Access NaviLens Wayfinding Information:* The Kiosk will have a NaviLens code mounted on it to provide Travelers with information about the purpose of the kiosk.

3.4.1.1.2 Model(s)

The model of the wayfinding kiosk will be the RedyRef T-Flex.

3.4.1.1.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-21C.3
- RM-TRV-21C.4
- RM-TRV-21C.5
- RM-TRV-21C.6
- RM-TRV-21C.7
- RM-TRV-21C.8

3.4.1.1.4 Interfaces:

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.4.1.2 NaviLens Codes

3.4.1.2.1 Function(s):

NaviLens Codes will be strategically located throughout the healthcare facility to assist with Traveler navigation within the facility, as well as to vehicle pick-up locations. Travelers will scan the codes using a camera-enabled web-accessible device and be presented with such information. These codes will also be placed on HIRTA vehicles to allow identification of the correct vehicle for travelers using the Wayfinding Application. These codes are scannable at long distances and wide angles that allow ease of scanning by pointing a camera in their direction. The content displayed on each code will be programmable through the backend of the wayfinding application.

3.4.1.2.2 Models(s):

297 mm printed codes on sign material will be hung at care facilities. Adhesive codes will be printed for vehicles.

3.4.1.2.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-SYS-12.1
- RC-SYS-12.2
- RC-SYS-12.3
- RC-SYS-12.4
- RC-SYS-12.5
- RC-SYS-12.6
- RC-SYS-12.7
- RC-SYS-12.8
- RC-SYS-12.9

3.4.1.2.4 Interfaces:

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.4.1.3 Personal Devices

3.4.1.3.1 Function:

Travelers will be able to use any camera-enabled smart device to scan the codes and deploy the NaviLens GO wayfinding application. Travelers will open the camera application and scan a code, which will then automatically load wayfinding guidance.

3.4.1.3.2 Models:

Personal smart phones can be used by Travelers to scan codes and receive wayfinding information.

3.4.1.3.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-21.3.5

3.4.1.3.4 Interfaces*:*

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.4.1.4 Infotainment Devices

3.4.1.4.1 Function:

Infotainment devices will be screens on HIRTA vehicles used to display relevant information about Health Connector and information about the trip or destination. Content will be managed by HIRTA.

3.4.1.4.2 Models:

Infotainment devices from Safe Fleet will include the following components and models:

- LCD Monitor Kit: MVQ-DS215-KIT-3Y
- HDMI Cable: HDMI-AM-AM-15-CP-G
- Media Player for Infotainment: MP-1144-EXW-3Y
- HDMI Video Distribution Unit (Splitter): VDU-HDMI-1-4-1
- 64GB SD Card: SDCARD64
- Cradlepoint/ Router: SRC-ROUTER-2
- Ethernet Cable: MSS-4030-03-01-ETH

3.4.1.4.3 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-21.3.5
- RM-TRV-20.2

3.4.1.4.4 Interfaces*:*

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.4.2 Software Design

3.4.2.1 Wayfinding Application

The Wayfinding Application comprises two subcomponent applications, including:

1. NaviLens
2. NaviLens GO app
    a. Version: NVGO 1.3.30

Both applications can be used by Travelers to scan NaviLens codes and obtain wayfinding information.

3.4.2.1.1 Function(s):

The application provides Travelers with the following functions related to wayfinding:

1. *Locate Correct Building after Dropoff*: Provide the capability to locate the correct building and by way of scanning a NaviLens code.

2. *Locate Correct Vehicle for Pickup*: Provide the capability to locate the correct vehicle for pick-up by way of scanning a vehicle NaviLens code.

3. *Locate Correct Office after Entering the Building*: Provide the capability to locate the correct office by way of scanning a NaviLens code. Distinguish between ambulatory and non-ambulatory Travelers for guidance (e.g., use of escalator/stairs versus elevator).

4. *Locate the Check-in Desk*: Provide the capability to locate check-in desk upon arrival at the healthcare provider's office.

5. *Locate Other Referred Buildings/Offices on Discharge*: Provide the capability to locate other buildings/facilities and offices on the campus based on referral by the provider upon discharge.

6. *Locate the Door Entrance (if needed):* Provide the capability to be able to locate the door entrance for boarding.

7. *Addressing the Needs of Underserved Groups:* Provide the capability such that the needs of various underserved groups are addressed as follows:

    a. Persons who are blind have audio guidance available.

    b. Persons who are deaf are able to visually see the instructions.

    c. Persons who are not ambulatory are able to select suitable direction (e.g., no use of escalator or staircases).

    d. Persons with cognitive disability are able to easily interpret the information by seeing visual markers and simple instructions (e.g., turn arrows).

    e. Persons who are not able to afford large data plans are still able to use the features.

    f. Older adults are able to see and comprehend instructions through use of large fonts, color contrast, and other necessary features.

    g. Persons with LEP are able to see instructions in the language of their choice.

3.4.2.1.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-SYS-12A.3
- RM-TRV-19.1
- RM-TRV-19.2
- RM-TRV-19.3
- RM-TRV-19.4
- RM-TRV-20.2
- RM-TRV-20.3
- RM-TRV-21.1
- RM-TRV-21.2
- RM-TRV-21.2.1
- RM-TRV-21.2.2
- RM-TRV-21.3
- RM-TRV-21.3.1
- RM-TRV-21.3.2
- RM-TRV-21.3.3
- RM-TRV-21.3.4
- RM-TRV-21.3.5
- RM-TRV-21.3.6
- RM-TRV-21.3.7
- RM-TRV-21A.1
- RM-TRV-21A.2
- RM-TRV-21A.3
- RM-TRV-21A.4
- RM-TRV-21B.1
- RM-TRV-21B.2
- RM-TRV-21B.3
- RM-TRV-21C.1
- RM-TRV-21C.2
- RM-TRV-21C.3
- RM-TRV-29.2

3.4.2.1.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.4.2.2 Wayfinding Kiosk Content Management Software

3.4.2.2.1 Function(s):

Content management for the kiosk software will be done through the Engage IoT software platform, which will allow for configuration and monitoring of the kiosk and configuration of kiosk-compliant webpages. A webpage will be developed on that server which connects to the MOD Platform API and allows Travelers to retrieve trip status information and make new bookings, provided they comply with security requirements of the system and meet the needs required to book on the MOD Platform TMS.

3.4.2.2.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-SYS-10.6
- RC-SYS-10.7

3.4.2.2.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.4.2.3 NaviLens and Cloud Platform

3.4.2.3.1 Function(s):

The Wayfinding Server is a cloud-based server that handles traveler wayfinding requests and traveler wayfinding guidance via the mobile app. The server will store wayfinding information related to the installed NaviLens codes. The server will receive requests when NaviLens codes are scanned by a Traveler and respond with the applicable wayfinding information related to that NaviLens code.

3.4.2.3.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-SYS-12A.3

3.4.2.3.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.4.2.4 Infotainment Devices Content Management Software

3.4.2.4.1 Function(s):

The Infotainment Device CMS communicates with infotainment device media player on vehicles to deliver content to travelers on the screens onboard. The CMS will include a backend portal for HIRTA to update content.

3.4.2.4.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RM-TRV-21.3.5
- RM-TRV-20.2

3.4.2.4.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC13: Wayfinding Subsystem <-> Traveler-End (Wayfinding)

3.5 Performance Management

In this context, performance monitoring refers to data being collected and analyzed to evaluate project performance against stated project goals. The performance measurement team, ISU, plays a central role in this system, and HIRTA TMS acts as a central provider of data for both ISU and USDOT archive data repositories.

3.5.1 Software Design

3.5.1.1 ISU CyBox

3.5.1.1.1 Function:

The ISU CyBox provides file sharing and file storage for collaborative documents, small files, or archives of large files. For the purpose of this project, this component will be used for maintaining performance management data and reports. CyBox is managed by ISU, however, other users such as HIRTA, may enter input data into this system. It is therefore shared between the Performance Management Subsystem and HIRTA TMS. The following features are included with this component:

- No quote, 15GB limit per file
- HIPAA certified
- Integrates with office programs
- Limits on specific file types
- Easily accessible from over the world

This system will be the primary storage location for information including KPI reports, call log information, and trip complaints, among others.

3.5.1.1.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-SYS-3.5
- RC-SYS-11.1

3.5.1.1.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC10: Reporting Database <-> ISU Performance Management System
- HC12: ISU Performance Management System <-> USDOT Managed System

3.5.1.2 Public Dashboard

3.5.1.2.1 Function(s):

A public dashboard will be available to display public-facing information regarding Health Connector performance. The details of this subcomponent will be updated as design is finalized.

3.5.1.2.2 Requirement Traceability:

The following requirements are applicable to this component and met by this design:

- RC-GPA-1.1

3.5.1.2.3 Interfaces:

The following interfaces are related to this subcomponent:

- HC12: ISU Performance Management System <-> USDOT Managed System

3.6 External Systems

3.6.1 Eligibility Management System

The Eligibility Management System refers to all external systems that contain information about what funding riders may or may not be eligible for on Health Connector trips. This information is used confirm the eligibility of Travelers requesting rides and the use of discount coupons or credit.

Funding Entities refer to the organizations funding customer trips (e.g., Medicaid) that will interface with the system for automated billing and payment processing. This includes Access2Care.

Requirement Traceability:

The following requirements are applicable to this system and met by this design:

- RC-FND-1.1
- RC-FND-1.2
- RC-FND-1.3
- RC-FND-1.4
- RC-FND-1.5
- RC-FND-1.6
- RC-FND-1.7

3.6.2 Third-Party Platform

Third-party platforms refer to vehicles available for Health Connector service that are not operated by HIRTA. This could include services, such as volunteer driver networks or taxis, which utilize their own operational platforms but will have drivers deploy the MOD Platform TMS for Health Connector trips. Third-party service providers will have access to the driver application but will not have access to Health Connector-generated performance data.

3.6.3 Medicaid Broker System

The Medicaid Broker system refers to the State of Iowa Medicaid broker. Currently, Access2Care's system is used for booking and managing Medicaid trips. HIRTA is one of the providers used by Access2Care. Medicaid trips will continue to be booked by Access2Care when requested by Travelers. Medicaid trips will be ingested in the HIRTA system when assigned to HIRTA. At that point, a Traveler using Medicaid benefits will be able to use Health Connector Traveler tools.

3.6.4 EHR Medical Record System

The EHR Medical Record System 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. The healthcare partners will use different EHR services and provide APIs for data access. Health Connector will develop a new interface with at least one healthcare partner's EHR system.

Requirement Traceability:

The following requirements are applicable to this system and met by this design:

- RM-TRV-12.3

4 Requirements Traceability Matrix

The following table provides traceability between the system requirements and design. This table covers all requirements that appear in the SyRS, with the exception of data and interface requirements which are all covered in the ICD.

Table 4. Requirements Traceability Matrix

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Planning	RM-TRV-1.1	The system shall include a Traveler Application to provide trip planning capabilities.
Traveler	Traveler Application	Trip Planning	RM-TRV-1.1.1	The Traveler application can be configured to provide up to 2 transportation options that meet Traveler's search criteria within 10 minutes of requested pick-up time 95% of the time if there is sufficient available vehicle supply. If no options are found, the application shall direct Travelers to contact HIRTA customer service.
Traveler	Traveler Application	Trip Planning	RM-TRV-1.1.2	The trip planning request shall require at least the following input: pick-up location/origin, drop-off location/destination, pick-up or drop-off time, mobility need.
Traveler	Traveler Application	Trip Planning	RM-TRV-1.1.3	The Traveler Application shall allow Travelers or any authorized individuals by Travelers to search for transportation options for given origin and destination locations.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Planning	RM-TRV-1.1.4	The Traveler Application shall allow Travelers or any authorized individuals by Travelers to search for transportation options for selected pick-up and drop-off times.
Traveler	Traveler Application	Trip Planning	RM-TRV-1.1.5	The Traveler Application shall allow Travelers or any authorized individuals by Travelers to search for transportation options for identified mobility needs.
Traveler	Traveler Application	General	RM-TRV-1.2	The Traveler Application shall be designed to be accessible to all underserved populations.
Traveler	Traveler Application	Trip Planning	RM-TRV-1.2.1	The Traveler Application shall allow searching for transportation options based on their mobility needs (e.g., wheelchair, service animal).
Traveler	Traveler Application	General	RM-TRV-1.2.2	The Traveler Application shall be accessible to all persons with disabilities.
Traveler	Traveler Application	General	RM-TRV-1.2.2.1	The Traveler Application shall provide audio guidance when needed by Travelers (e.g., persons who are blind).
Traveler	Traveler Application	General	RM-TRV-1.2.2.2	The Traveler Application shall allow Travelers to configure to use visual cues instead of audio-based notifications.
Traveler	Traveler Application	General	RM-TRV-1.2.2.3	The Traveler Application shall provide an intuitive user interface that could be used by persons with cognitive disabilities.
Traveler	Traveler Application	General	RM-TRV-1.2.3	The Traveler Application shall allow users to change the font size and contrast.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Personal Devices		RM-TRV-1.2.4	The Traveler Application shall provide the capability to meet the needs of Travelers who may be on limited capability phones (e.g., government-provided phones through Medicaid program) and have limited data plans (e.g., 2GB per month).
Traveler	Personal Devices		RM-TRV-1.2.4.2	The Traveler Application shall have the ability to turn off features that may require constant synchronization with cloud-based servers (e.g., to store search logs).
Traveler	Traveler Application	General	RM-TRV-1.2.4.3	The Traveler Application shall allow users to enter and exit low data mode using application settings.
Traveler	Traveler Application	Trip Planning	RM-TRV-1.3	The system shall allow logging of search queries for administrative analysis from Travelers as part of the trip planning function provided the Traveler requests trip proposals.
Traveler	Traveler Application	Trip Booking	RM-TRV-1.4	The Traveler Application shall allow the Travelers to book a trip for their preferred trip alternative.
Traveler	Traveler Application	Trip Booking	RM-TRV-1.4.1	The Traveler Application shall allow booking of transportation up to 30 days in advance.
Traveler	Traveler Application	Trip Booking	RM-TRV-1.4.2	The Traveler Application shall allow booking of a single ride or allow pooling of trips with other Travelers.
Traveler	Traveler Application	Payments	RM-TRV-1.4.3	The Traveler Application shall allow booking of a trip to an alternate destination other than home even if that may not be covered by the funding source. The Traveler shall pay out of pocket in such situations.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Booking	RM-TRV-1.4.4	The Traveler application shall allow booking of a single-leg round-trip as part of the same transaction. Additional legs will need to be booked in single transactions.
Traveler	Traveler Application	Trip Booking	RM-TRV-1.4.5	Entire process of planning and booking shall not take more than 2 minutes for registered Travelers.
Traveler	Traveler Application	Trip Booking	RM-TRV-1.4.7	The Traveler app shall allow cancellation of a trip up to 20 minutes in advance.
Traveler	Traveler Application	Payments	RM-TRV-1.5	If applicable, The Traveler Application shall allow the Travelers to pay for a trip using a preferred method of payment after the booking for the selected alternative is complete.
Traveler	Traveler Application	Registration	RM-TRV-2.1	Health Connector shall allow new Travelers to register and create their profile.
Traveler	Traveler Application	Registration	RM-TRV-2.2	The customer profile shall include at least the following information: first and last name, address, contact information (e.g., home and mobile phone number, email address), eligible funding sources, travel preferences (e.g., mobility aid, notification preferences) and favorite locations.
Traveler	Traveler Application	Registration	RM-TRV-2.2.1	The customer profile data shall not be stored locally on devices unless such consent is received from the Traveler.
Traveler	Traveler Application	Registration	RM-TRV-2.2.2	The Traveler registration process shall be scoped and configured to meet the current policies as set by HIRTA and its funding source providers.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Registration	RM-TRV-2.2.3	Traveler data collected on servers as part of the registration process shall be stored in the Health Connector system as approved by Travelers and as governed by the privacy policy of HIRTA.
Traveler	Traveler Application	Trip Booking	RM-TRV-2.3	The Traveler application shall allow booking of a trip even if the funding status of Travelers may not be current or known pending any limiting logic HIRTA may have in place (i.e., if certain areas are only eligible for certain funding sources).
Traveler	Traveler Application	Registration	RM-TRV-2.4	The Traveler application shall not validate information provided in registration, and as such Travelers are able to proceed with a booking as long as they enter a name, phone number, and email address to create a profile.
Traveler	Traveler Application	Registration	RM-TRV-2.4.1	Guest mode shall require contact information such as first name, last name, email address and mobile phone number.
Traveler	Traveler Application	Trip Booking	RM-TRV-2.4.2	“Guest” mode shall only require a customer pick-up address, and drop-off address and accessibility need for requested trip.
Traveler	Traveler Application	Trip Planning	RM-TRV-4.1	Health Connector shall provide contact information or a webpage URL for accessing Information and Referral (I&R) services.
Traveler	Traveler Application	Trip Planning	RM-TRV-5.1	Health Connector shall provide contact information or the webpage URL for connecting with a Health Navigator at the Dallas County Health Department (DCHD).

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	General	RM-TRV-6.1	The Traveler Application shall be available via a platform-independent web browser and shall provide all capabilities available through a Traveler Application on a mobile device.
Traveler	Traveler Application	General	RM-TRV-6.1.1	Traveler Application available on web-enabled mobile devices shall use accessibility options as available through iOS and Android operating systems for native applications on those devices.
Traveler	Traveler Application	General	RM-TRV-6.1.2	The system shall comply with Section 508 of the Rehabilitation Act §1194.22.
Traveler	Traveler Application	Travel Assistance	RM-TRV-6.2	Travelers shall be able to contact HIRTA, Healthcare Provider or a Health Navigator for booking of their trips when web-enabled or smart devices are not available.
Traveler	Traveler Application	Translation Services	RM-TRV-7.1	The Traveler application shall allow searching for transportation options using an interface in the requested language of the user, provided the app is available in the requested language. The app is available in Spanish, English, and Mandarin.
Traveler	Traveler Application	Translation Services	RM-TRV-7.2	The Traveler application shall allow booking for transportation options using an interface in the requested language of the user, provided the app is available in the requested language.
Traveler	Traveler Application	Translation Services	RM-TRV-7.3	The Traveler application shall allow Travelers to identify notification preferences in the language of their choice in the Traveler application, provided the app is available in the requested language.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Booking	RM-TRV-8.1	The Traveler Application shall provide at least 2 transportation options within 10 minutes of requested pick-up time when searched by Travelers that live in rural areas or areas with limited HIRTA services.
Traveler	Traveler Application	Trip Booking	RM-TRV-8.2	The Traveler application shall allow Travelers to successfully book trips using third-party services when HIRTA services are not running provided the third-party services have available supply in the Via system and are utilizing the Via driver app.
Traveler	Traveler Application	Trip Booking	RM-TRV-8.3	When no transportation options are available, the Traveler Application shall direct Travelers to contact the HIRTA customer service.
Traveler	Traveler Application	Travel Assistance	RM-TRV-9.1	The Traveler Application shall provide tools (e.g., links to frequently asked questions, in-app help functions) that do not require relying on help from third parties.
Traveler	Traveler Application	Travel Assistance	RM-TRV-9.2	The Traveler Application shall provide tools (e.g., first-time use guide to each button's function, travel training videos) to familiarize with application functions.
Traveler	Traveler Application	Trip Booking	RM-TRV-10.1	Traveler Application shall provide real-time availability of transportation options to allow same-day booking of a new return trip from the healthcare facility to home destination.
Traveler	Traveler Application	Trip Booking	RM-TRV-10.2	Traveler application shall allow cancellation of a previously booked appointment and booking for another transportation available the same day.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Planning	RM-TRV-11.1	Traveler Application shall allow searching for transportation offered for HIRTA for a trip to another medical facility when a follow-up medical appointment (e.g., X-ray, blood work) is booked after the treatment.
Traveler	Traveler Application	Trip Planning	RM-TRV-11.1.1	The Traveler Application shall offer at least 2 options within 20 minutes of requested pick-up time using HIRTA's own vehicles or through third-party providers.
Traveler	Traveler Application	Trip Planning	RM-TRV-11.1.2	If suggestion transportation option does not meet Traveler needs (e.g., mobility preferences, longer than acceptable on-board time), they shall be able to contact HIRTA customer service or healthcare staff for booking other transportation.
Traveler	Traveler Application	Trip Booking	RM-TRV-11.1.3	The Traveler Application shall provide allow Travelers to select any mobility needs for requested transportation. Mobility needs may be different than the previously requested trip.
Traveler	Traveler Application	Trip Booking	RM-TRV-11.1.4	The Traveler Application shall successfully book trips based on transportation option selected by the Traveler and provide booking confirmation.
Traveler	Traveler Application	Trip Booking	RM-TRV-11.1.5	Once the trip is booked, the Traveler Application shall keep Traveler informed on the status of trip per requirements as described for requirement RM-TRV-17.
Traveler	Traveler Application	Trip Booking	RM-TRV-11.1.6	The Traveler Application shall alert the Traveler if a return trip was already booked and prompt them to modify the return trip.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Booking	RM-TRV-11.1.7	If no return trip was previously booked, The Traveler Application shall allow Travelers to book return trip to home or primary medical facility, as needed, if return time is known.
Traveler	Traveler Application	Trip Booking	RM-TRV-12.1	The Traveler application shall provide the ability to modify a medical appointment by linking to the application available from the healthcare provider if applicable.
Traveler	Traveler Application	Trip Booking	RM-TRV-12.2	The Traveler application shall provide the ability to modify or rebook a transportation appointment linked to a medical appointment.
External Systems	EHR		RM-TRV-12.3	If medical appointment is modified based on the trip status, the Traveler shall be notified by the healthcare staff.
Traveler	Traveler Application	Trip Booking	RM-TRV-13.1	For follow-up care, Health Connector shall provide the ability to book a telehealth appointment by linking to the application provided by the healthcare provider.
Traveler	Traveler Application	Trip Booking	RM-TRV-14.1	The Traveler application shall allow Travelers to identify that they are travelling with a personal companion at the time of booking a trip.
Traveler	Traveler Application	Trip Booking	RM-TRV-14.2	A personal companion shall be allowed regardless the ability to pay by the Traveler or their funding source.
Traveler	Traveler Application	Trip Booking	RM-TRV-14.4	The Traveler Application shall confirm the booking of a personal companion on the same vehicle as the Traveler.
Traveler	Traveler Application	Trip Booking	RM-TRV-15.1	The Traveler Application shall allow Travelers to identify number of people in their group at the time of booking.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Registration	RM-TRV-15.2	The Traveler Application shall allow identification of any accommodation needed for the persons in their group (e.g., child seat).
Traveler	Traveler Application	Trip Booking	RM-TRV-15.3	The Traveler Application shall confirm the booking of all family members on the same vehicle.
Traveler	Traveler Application	Trip Booking	RM-TRV-16.1	The Traveler Application shall identify the physical location for boarding as part of the trip confirmation.
Traveler	Traveler Application	Trip Booking	RM-TRV-16.2	31. Physical locations with a Virtual Bus Stop (VBS) are identifiable geo-locations on a map. HIRTA administrators can add unlimited VBS to the mapping interface.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.1	The Traveler shall be able to subscribe to receive notifications on the status of their upcoming trips per their preferences or update notifications configurations using in-app settings.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.2	The System shall provide at least 1) day before reminders; 2) provide any updates on the day of trip before a vehicle is dispatched; and 3) provide any updates once a vehicle is dispatched.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.3	The Traveler shall be able to the types of alerts of they wish to receive.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.4	The Traveler shall be able to identify primary and secondary contact information to receive alerts by email, text messages or IVR.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.5	The Traveler shall be able to select their contact information or another contact of their choice (e.g., healthcare provider, Health Navigator, caregiver). The Traveler shall be able to identify up to unique 5 individuals for receiving alerts.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.6	The Traveler Application shall provide advance notification to riders on pick-up time and pick-up location about an upcoming trip day before the trip.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.7	The Traveler Application shall provide updates in pick up time and location on the day of travel, if any changes, before a vehicle is dispatched.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.8	Once a vehicle is dispatched, the Traveler application shall provide real-time notification on the trip status (e.g., assigned driver, assigned vehicle, ETA) per a configurable threshold by HIRTA (e.g., number of minutes prior to arrival).
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17.9	The Traveler Application shall provide any updates (e.g., delayed pick-up time, alternate vehicle/driver assignment), if necessary, for the pick-up location, along with pick-up time alert.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17A.1	The Traveler shall be provided an option to confirm or cancel their trip through the application when they receive notification on an upcoming pick-up per HIRTA policy (e.g., cancellation up to x minutes before pick-up time). Traveler action will be required only on those notifications that impact the trip delivery.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17A.2	The Traveler shall be able to receive a notification which includes the pick-up time. If not acceptable, the Traveler shall be able to be allowed to cancel their initial ride and request an alternate trip that meets their preferences.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17A.3	The Traveler shall be able to receive a notification which includes the pick-up location. The Traveler shall be able to contact customer service to update notes associated with a specific pick-up. Additionally, if permitted by HIRTA, the Traveler shall be able to call the driver when they approach to relay pick-up spot preference.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17A.4	The Traveler shall be able to communicate via call or text messages with HIRTA customer service or Driver to find out about additional details in the event of delays.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17A.5	The Traveler shall be able to communicate via call or text messages with Health Navigators or caregivers to notify them on delays or other updates with transportation.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-17A.6	The Traveler shall be able to communicate via call or text messages with healthcare providers to notify them on delays or other updates with transportation that may impact the medical appointment.
Traveler	Traveler Application	Trip Information	RM-TRV-18.1	Travelers shall be able to view the current location of their vehicle in real-time.
Traveler	Traveler Application	Trip Information	RM-TRV-18.2	The location of the vehicle shall refresh at a configurable time interval by HIRTA. The system shall allow location refresh at least every 30 seconds, if needed.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Wayfinding	Wayfinding Application		RM-TRV-19.1	The Traveler shall be able to use the Wayfinding Application to identify a fixed pick-up spot if such infrastructure is available (e.g., a fixed bus stop at a healthcare facility).
Wayfinding	Wayfinding Application		RM-TRV-19.2	The Traveler shall be able to use the Wayfinding Application to identify the vehicle upon its arrival for pick-up.
Wayfinding	Wayfinding Application		RM-TRV-19.3	Blind Travelers shall be able to use the Wayfinding Application to identify the entrance door as needed.
Traveler	Wayfinding Application		RM-TRV-19.4	The Wayfinding Application shall be able to identify the correct vehicle 95% of the time.
Traveler	Traveler Application	Trip Information	RM-TRV-19.4.1	The Traveler Application shall provide additional features to identify correct vehicle/Traveler combination before a trip can proceed to ensure Traveler safety.
Traveler	Traveler Application	Trip Information	RM-TRV-19.4.2	The Traveler Application shall provide the details (e.g., driver photo, vehicle image, vehicle license plate, van number) on the vehicle approaching to pick-up the Traveler.
Traveler	Traveler Application	Trip Information	RM-TRV-20.1	Travelers shall be able to use the Traveler Application to stay informed about any delays and estimated time of arrival (ETA).
Wayfinding	Wayfinding Application		RM-TRV-20.2	Infotainment Devices shall provide tools so any personalized real-time updates relevant to a trip (e.g., expected inclement weather later in the day affecting trip performance, expected long wait at the facility, expected detour due to a water main break, modified entry and check-in procedures due to a repair work scheduled for that day) can be communicated using on-board information infrastructure

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Wayfinding	Wayfinding Application		RM-TRV-20.3	The Wayfinding Application shall translate the information in the language of choice as requested by a Traveler. Per HIRTA's LEP Plan, preferred top languages are: Spanish, French, German, Russian, Korean, Chinese, Vietnamese, Tagalog, and Arabic.
Wayfinding	Infotainment Devices		RM-TRV-20.4	HIRTA vehicles shall be equipped with infotainment screens to provide information relevant to a trip in progress as well as general overview of the destination facility.
Wayfinding	Wayfinding Application		RM-TRV-21.1	Upon getting dropped off at the healthcare facility, the Traveler shall be able to use the Wayfinding Application to navigate to the door entrance, as needed (e.g., persons who are blind).
Wayfinding	Wayfinding Application		RM-TRV-21.2	The Wayfinding Application shall be able to detect the visual marker or sensor within 1 second of being in the range.
Wayfinding	Wayfinding Application		RM-TRV-21.2.1	For visual markers, the Wayfinding Application shall be able detect within a wide reading angle of 160 degrees in all lighting conditions.
Traveler	Wayfinding Application		RM-TRV-21.2.2	The Wayfinding Application shall be able to recognize the visual marker or sensor 95% of the time.
Wayfinding	Wayfinding Application		RM-TRV-21.3	The Wayfinding Application shall provide indoor and outdoor information and directions in accessible format.
Wayfinding	Wayfinding Application		RM-TRV-21.3.1	Travelers shall have audio guidance available for visual wayfinding instructions.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Wayfinding Application		RM-TRV-21.3.2	Travelers shall be able to visually see the instructions.
Wayfinding	Wayfinding Application		RM-TRV-21.3.3	Travelers shall be able to select suitable direction per their mobility preferences (e.g., no use of escalator or staircases).
Traveler	Wayfinding Application		RM-TRV-21.3.4	Travelers shall be able to easily interpret the information by seeing visual markers and simple instructions (e.g., turn arrows).
Traveler	Wayfinding Application		RM-TRV-21.3.5	The wayfinding feature shall not use more than 1 MB of data per minute.
Traveler	Wayfinding Application		RM-TRV-21.3.6	Travelers shall be able to see and comprehend instructions through use of large font and color contrast.
Wayfinding	Wayfinding Application		RM-TRV-21.3.7	Travelers shall be able to see or hear instructions in the language of their choice.
Wayfinding	Wayfinding Application		RM-TRV-21A.1	The Wayfinding Application shall use the indoor navigation infrastructure to navigate to the check-in desk after entering the facility.
Wayfinding	Wayfinding Application		RM-TRV-21A.2	The Wayfinding Application shall provide step-by-step directions per traveler preferences to locate other offices inside the building.
Wayfinding	Wayfinding Application		RM-TRV-21A.3	The Wayfinding Application shall provide updated step-by-step guidance as soon as it detects that the Traveler has reoriented.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Wayfinding	Wayfinding Application		RM-TRV-21A.4	The Wayfinding Application shall let the Traveler confirm the need for updated directions before overriding the previously suggested step-by-step guidance.
Wayfinding	Wayfinding Application		RM-TRV-21B.1	The Wayfinding Application shall be able to identify the correct office desired by the Traveler when at the correct floor.
Wayfinding	Wayfinding Application		RM-TRV-21B.2	The Wayfinding Application shall use the indoor navigation infrastructure to provide the turn-by-turn navigation in accessible format to reach the correct office location when at the correct floor.
Wayfinding	Wayfinding Application		RM-TRV-21B.3	The Wayfinding Application shall use the indoor navigation infrastructure to provide the turn-by-turn navigation in accessible format to reach an office located inside another building on the same medical campus.
Wayfinding	Wayfinding Application		RM-TRV-21C.1	The Wayfinding Application shall be able to provide the capability to obtain relevant information in accessible format inside healthcare facilities.
Wayfinding	Wayfinding Application		RM-TRV-21C.2	The Wayfinding Application shall help locate customer service desk for patient services as made available by the healthcare facilities.
Wayfinding	Wayfinding Application		RM-TRV-21C.3	If Wayfinding Kiosks are installed by healthcare facilities for patient services, the Wayfinding Application shall be able to locate that kiosk.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Wayfinding Kiosk		RM-TRV-21C.4	The Wayfinding Kiosk shall be a commercial off-the-shelf large touch-screen device capable of running Android, iOS-based app or a browser-based application.
Traveler	Wayfinding Kiosk		RM-TRV-21C.5	The Wayfinding Kiosk shall be able to connect to cellular data network using a secure connection. The network connections shall be designed to ensure secure and encrypted data exchange with cloud-based servers using standards such as Secure Sockets Layer (SSL) or Transport Layer Security (TLS) and shall avoid any exposure to PII for Travelers. Alternatively, the Kiosk shall connect to a secure network connection made available by the healthcare provider.
Traveler	Wayfinding Kiosk		RM-TRV-21C.8	The Wayfinding Kiosk hardware shall have a mean time between failure (MTBF) rate of 60,000 hours.
Traveler	Wayfinding Kiosk		RM-TRV-21C.7	The Wayfinding Kiosk hardware shall be designed to withstand the indoor environment within a typical hospital or medical facility. At the least, the hardware shall be designed to withstand exposure to disinfectant or chemicals used in a typical healthcare facility.
Traveler	Wayfinding Kiosk		RM-TRV-21C.6	The Wayfinding Kiosk shall be installed as a standalone structure according to the current requirements as defined in the ADA Accessibility Guidelines (ADAAG).
Traveler	Traveler Application	Trip Information	RM-TRV-22.1	The Traveler Application shall provide the ability for Travelers to notify healthcare staff on the status of their trips to the medical facility. The notification shall be automated. However, Travelers shall have the capability to notify directly using text messaging or voice call capability available within the Traveler Application.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Information	RM-TRV-22.2	Participating healthcare providers shall be able to see any necessary accommodation in the ride notes (e.g., to be escorted by a healthcare facility staff).
Traveler	Traveler Application	Traveler Notifications	RM-TRV-22.2.1	The Traveler Application shall require that contact information be entered at the time of booking to send notifications automatically.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-22.2.2	The Traveler Application shall provide confirmation of accommodation requested by Travelers and any additional instructions as necessary.
Traveler	Traveler Application	Trip Booking	RM-TRV-22.2.3	In the event Traveler requests an attendant, the Traveler Application shall provide the name of the person assigned to meet the Traveler at the drop-off location.
Traveler	Traveler Application	Trip Booking	RM-TRV-23.1	The Traveler Application shall allow booking of a new return trip for the same day when requested by Travelers.
Traveler	Traveler Application	Trip Booking	RM-TRV-23.2	The Traveler Application shall allow Travelers to choose the transportation option of their choice if more than one (1) options are presented.
Traveler	Traveler Application	Trip Booking	RM-TRV-24.1	The Traveler application shall allow modification of an already booked return trip to choose a different destination if permitted by HIRTA.
Traveler	Traveler Application	Trip Booking	RM-TRV-25.1	The Traveler Application shall allow Travelers to insert at least one new destination if required.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Trip Booking	RM-TRV-25.2	The Traveler Application shall allow Travelers to choose pick-up/drop-off times and vehicles separately for each leg of the trip, if needed.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-26.1	The Traveler Application shall provide real-time notification on the trip status per a configurable threshold for the return trip (e.g., number of minutes prior to arrival).
Traveler	Traveler Application	Trip Information	RM-TRV-26.2	The Traveler Application shall provide real-time status updates, as described in requirement RM-TRV-17 for inbound trips, regardless the service provider.
Traveler	Traveler Application	Trip Booking	RM-TRV-27.2	The Traveler Application shall identify a fixed stop for Traveler pickup if such infrastructure is available at the healthcare facility.
Traveler	Wayfinding Application		RM-TRV-28.1	The Traveler shall be able to use the Wayfinding Application to identify a fixed pick-up spot if such infrastructure is available (e.g., a fixed bus stop at a healthcare facility).
Traveler	Wayfinding Application		RM-TRV-28.2	When using turn-by-turn navigation, the Traveler shall have the ability to review pathways direction prior to proceeding.
Traveler	Wayfinding Application		RM-TRV-28.3	Traveler shall be able to turn on or off the step-by-step direction at any point during the walk. When restarted at a point on the pathway, the system shall immediately calculate turn-by-turn direction from that point.
Wayfinding	Wayfinding Application		RM-TRV-29.1	The Traveler shall be able to use the Wayfinding Application to identify the vehicle upon its arrival for pick-up.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Wayfinding	Wayfinding Application		RM-TRV-29.2	Blind Travelers shall be able to use the Wayfinding Application to identify the entrance door as needed.
Traveler	Traveler Application	Traveler Notifications	RM-TRV-30.1	The Traveler Application shall notify the Traveler of the due amount at the start of the trip.
Traveler	Traveler Application	Payments	RM-TRV-30.2	The Traveler Application shall allow payment for their trip once the trip is complete.
Traveler	Traveler Application	Payments	RM-TRV-30.3	The Traveler Application shall allow selecting the method of payment.
Traveler	Traveler Application	Payments	RM-TRV-30.4	On HIRTA vehicles, the Traveler shall be able to pay using the following methods: 1) cash; 2) check; 3) tickets; 4) prepaid account debit; 5) discount coupon applied to prepaid account to cover the due amount.
Traveler	Traveler Application	Payments	RM-TRV-30.5	On non-HIRTA vehicles, Traveler will pay using prepaid account debit.
Traveler	Traveler Application	Payments	RM-TRV-31.1	The Traveler application shall allow identification of funding source at the time of booking should HIRTA wish to reveal this field to Travelers. The exact flow for riders would be scoped with HIRTA throughout the launch process as currently either all or no funding sources can be revealed.
Traveler	Traveler Application	Payments	RM-TRV-31.2	The Traveler application shall verify if the Traveler is eligible for the requested funding source provided the source is a rider account level logic. Specific logic to be scoped with HIRTA during the launch process.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Traveler	Traveler Application	Payments	RM-TRV-32.1	The Traveler Application shall allow applying a discount coupon to the Traveler account which they may have obtained from healthcare provider, HIRTA or another participating entity approved by HIRTA.
Traveler	Traveler Application	Payments	RM-TRV-32.2	The Traveler Application shall verify the validity of the discount code.
Traveler	Traveler Application	Payments	RM-TRV-33.1	The Traveler Application shall provide access to a prepaid/cash account.
Traveler	Traveler Application	Payments	RM-TRV-34.1	The Traveler Application shall be able to replenish the prepaid account by cash, bank card and a discount coupon.
Traveler	Traveler Application	Payments	RM-TRV-34.2	The Traveler Application shall allow checking balance of the prepaid account at any time.
Traveler	Traveler Application	Payments	RM-TRV-34.3	The prepaid account shall be configurable to auto-load using a preferred payment method from a Traveler based on a predefined trigger set by the Traveler (e.g., balance below $10).
Traveler	Traveler Application	Payments	RM-TRV-34.4	The prepaid account shall support pass product where a Traveler shall not be charged after a certain number of trips amounting to a certain amount within a defined timeframe (e.g., month) have been completed. This shall be configurable based on policy defined by HIRTA.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-1.1	The CSR shall have access to Transportation Management System (TMS) to register new customers.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-2.1	The TMS shall allow CSR to create a customer profile as part of the registration process and store that data in the TMS database. The following information shall be needed for registration: first name, last name, and contact information (email address, phone number). Additional details that can be included are: home address, favorite POI locations, mobility needs, and eligibility for a funding source.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-3.1	The TMS shall allow CSR to identify funding source eligibility in the customer profile.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-4.1	The TMS shall allow CSR to record the type of eligibility in the TMS. Eligibility types shall include the following categories: 1) temporary; 2) conditional; 3) unconditional.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-4.2	For temporary eligibility, the CSR shall be able to identify the reason in the eligibility notes and expiry date.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-4.3	For conditional eligibility, the CSR shall be able to identify any applicable conditions (e.g., severe winter weather), however conditions (for example, weather) cannot be enforced by the system and must be enforced operationally.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-5.1	The TMS shall allow CSR TMS to assist Travelers at every stage of their Complete Trip.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-5.1.1	The TMS shall allow CSR to help riders with registration and creation of customer profile.
TMS	MOD Platform TMS	Scheduling	RC-CSR-5.1.2	The TMS shall allow CSR to help riders with trip planning.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Scheduling	RC-CSR-5.1.3	The TMS shall allow CSR to help riders with trip booking and modification of an already booked trip as described in RM-CSR-6.X and RM-CSR-7.X.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-5.1.4	The TMS shall allow CSR to provide information to Travelers on the status of their trips. The CSR shall be able to inform on current location of vehicle, ETA, assigned vehicle, assigned driver, and whether or not mobility need is met by the assigned vehicle.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-5.1.5	The TMS shall allow CSR to assist Travelers that require assistance when they are on-board or after they are dropped off (e.g., recording safety event, providing contact for healthcare staff to assist with directions to the doctor's office).
TMS	MOD Platform TMS	Scheduling	RC-CSR-6.1	The TMS shall allow CSR to assist with trips to be scheduled in advance according to HIRTA policies.
TMS	MOD Platform TMS	Scheduling	RC-CSR-6.2	The TMS shall allow CSR to assist with trips to be scheduled the same day of the trip according to HIRTA policies.
TMS	MOD Platform TMS	Scheduling	RC-CSR-6.3	The TMS shall allow CSR to assist with a single leg or two-legged trip. For two-legged trips, the CSR shall be able to choose pick-up/drop-off times and vehicles separately for each leg of the trip.
TMS	MOD Platform TMS	Scheduling	RC-CSR-7.1	The TMS shall allow CSR to notify Travelers on current location and ETA for an upcoming third-party vehicle.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Scheduling	RC-CSR-7.2	The TMS shall allow CSR to view any changes in third-party provided vehicle or driver assigned to a trip and communicate that to the Traveler.
TMS	MOD Platform TMS	Scheduling	RC-CSR-7.3	If TMS does not have accurate information available, the CSR shall be able to use TMS to contact the third-party service provider on an updated status of driver and vehicle information, current location of vehicle and ETA for an upcoming trip.
TMS	MOD Platform TMS	Scheduling	RC-CSR-7.4	The TMS shall allow CSR to notify Travelers on delayed status when ETA is not available. If Traveler intends to reschedule or cancel trip in the case of a severe delay, the TMS shall allow CSR to make trip modification based on Traveler's approval.
TMS	MOD Platform TMS	Scheduling	RC-CSR-8.1	The CSR shall be able to determine status of all trips being completed by HIRTA or its partner vehicles, even if trips are booked by non-HIRTA systems such as Access2Care before getting assigned to HIRTA provided these trips are currently in the Via system.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-9.1	The CSR shall have access to contact information for Travelers or their caregivers.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-9.2	The CSR shall be aware of any necessary accommodation needed to address Traveler communication preferences (e.g., language, persons with disabilities).
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-9.3	The CSR shall be able to contact Travelers as needed to provide them relevant status information about their trip.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-11.1	The CSR shall have access to a language translation assistance service to assist a Traveler who is looking for a translation service when on a phone.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-11.2	The CSR shall be able to send messages to the Traveler directly from the Rider Profile in the VOC. Although the Via TMS cannot translate messages into other languages, the dispatcher can easily use a web-based translation service such as Google Translate and copy and paste the result into the TMS chat function.
TMS	MOD Platform TMS	Scheduling	RC-CSR-12.1	The CSR shall have the ability to manually override a restriction on booking of a trip caused by the expiration of eligibility for an applicable funding source by manually updating the expiration date.
TMS	MOD Platform TMS	Scheduling	RC-CSR-12.2	The system shall note the manual override action and shall make this event available in the Activity Monitor for HIRTA.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-13.1	The CSR shall have the ability to review the recent history of trips taken by a Traveler.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-13.2	The CSR shall be able to filter the list of trips by a funding source.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14.1	The CSR shall have the ability to view the number of no-shows for recently booked trips by a Traveler.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14.2	The CSR shall be able to filter the list of trips by a funding source.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14.3	The CSR shall be able to review the reason for no-show for a past trip.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14.4	If HIRTA policy allows restricting booking of trips by number of no-show events, the system shall assist CSR to comply with the no-show policy.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14.5	If there is a restriction policy by a funding source based on the number of no-show events, the system shall assist CSR to comply with the no-show policy by making no-shows by rider prominent on the rider's profile as well as available in the data generator.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14A.1	The CSR shall have the ability to review the number of cancellations for recently booked trips by a Traveler.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14A.2	The CSR shall be able to filter the list of trips by a funding source.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14A.3	The CSR shall be able to filter the list of trips by the cancellation time in relation to the trip time to determine which cancellations were in advance or same day.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14A.4	The CSR shall be able to review the cancellation reason for a past trip.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-14A.5	The number of cancellations caused due to software system reliability resulting in a missed trip shall be less than 5% for all trips requested within a month by a Traveler.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
External Systems	I&R		RC-CSR-15.1	The CSR shall have access to an information and referral (I&R) database of transportation providers that can service the entire HIRTA service area. The I&R database shall provide at least the following information on a provider: 1) services provided; 2) jurisdictional restrictions; 3) service type restrictions; 4) service hours; 5) availability of accessible vehicles; 6) contact information.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-15.2	The CSR shall be able to filter the rideplan by transportation provider.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-CSR-16.1	The CSR shall have the ability to verify funding eligibility in real-time by accessing the eligibility database as approved by the funding source.
TMS	MOD Platform TMS	Scheduling	RC-CSR-16.2	If real-time eligibility verification is not available, the CSR shall have the ability to override any restrictions presented by the system, so trips are not denied. Manual assignments and eligibility updates are logged in the Activity Monitor in the Via Operations Center.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-16.3	The CSR shall have access to reason behind ineligibility so they can advise Travelers for a corrective action by contacting directly with the funding provider.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-17.1	The system shall have the ability to record any complaints received from Travelers related to any aspect of a trip.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-17.2	The CSR staff shall be able to review complaints by a predefined list of categories, as configured by HIRTA.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Reservations and Customer Service	RC-CSR-17.3	The CSR staff shall be able to track the status of received complaints while those are being resolved.
TMS	MOD Platform TMS	Scheduling	RC-OPS-1A.1	The system shall automatically assign trips to drivers and vehicles pool based on preconfigured business rules (e.g., type of trip, service zones).
TMS	MOD Platform TMS	Operations Management	RC-OPS-1A.2	Trips for Access2Care shall not be assigned on non-HIRTA vehicles without getting approved by Access2Care.
TMS	MOD Platform TMS	Dispatch	RC-OPS-1A.3	The OPS staff shall have the ability to assign a trip to a HIRTA vehicle and driver pool.
TMS	MOD Platform TMS	Dispatch	RC-OPS-1A.4	The OPS staff shall be able to verify the availability of a vehicle for a service prior to assigning a trip.
TMS	MOD Platform TMS	Dispatch	RC-OPS-1A.5	The OPS staff shall be able to import any trips by the Access2Care system for trips funded by Medicaid.
TMS	MOD Platform TMS	Scheduling	RC-OPS-1B.1	The system shall track the location and available capacity along with any constraints (e.g., wheelchair space) on HIRTA contractor vehicles in real-time.
TMS	MOD Platform TMS	Dispatch	RC-OPS-1B.2	Third party contractor vehicle pool shall include: a) taxis; b) volunteer vehicles; c) transportation network companies (TNCs).
TMS	MOD Platform TMS	Scheduling	RC-OPS-1B.3	The system shall be able to automatically assign trips to contractor vehicles provided these vehicles use the Via Driver app. Trips shall be assigned according to the following factors:

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-1B.4	Trips shall be assigned according to pre-configured business rules (e.g., type of trips, service zones).
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-1B.5	Trips shall be assigned according to Traveler's mobility needs (e.g., wheelchair, personal companion).
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-1B.6	Trips shall be assigned according to travel constraints (e.g., maximum on-board time, required boarding time).
TMS	MOD Platform TMS	Operations Management	RC-OPS-1B.7	Given adequate supply, the system shall be able to successfully assign trips to the third-party contractor vehicles 95% of the time.
TMS	MOD Platform TMS	Scheduling	RC-OPS-2.1	The system shall track availability of wheelchair accessible vehicles for HIRTA and non-HIRTA vehicles.
TMS	MOD Platform TMS	Operations Management	RC-OPS-2.2	The operations staff shall always have access to the real-time status of functional status of wheelchair/lift accessible vehicles.
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.1	The OPS staff shall be able to view in real-time the performance status of all trips being performed by a HIRTA vehicle.
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.1.1	The trip performance information shall include current status of all trips on the driver manifest.
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.1.2	The trip performance information shall provide details of each trip on the manifest (e.g., trip ID, customer name, pick-up and drop-off locations, pick-up and drop-off times).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.1.3	The trip performance information shall provide include details on the vehicle delivering the trip (e.g., vehicle ID).

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.1.4	The trip performance information shall include details on the driver delivering the trip (e.g., driver ID).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.1.5	The trip performance information shall include current vehicle location (e.g., map position, speed, and heading) which can be viewed on the Via Operations Center Hub.
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.1.6	The trip performance information shall provide current trip status (e.g., scheduled/not picked-up, in-progress, on-time, delayed, cancelled, no-show).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.2	The OPS staff shall be able to view in real-time the status of all trips being performed by a non-HIRTA vehicle (e.g., contractor vehicle, taxi or TNC).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.2.1	The status information shall provide trip details (e.g., trip ID, customer name, pick-up and drop-off locations, pick-up and drop-off times).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.2.2	The status information shall provide vehicle delivering the trip (e.g., vehicle ID).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.2.3	The status information shall provide driver delivering the trip (e.g., driver ID).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.2.4	The status information shall include the current location of the vehicle (e.g., location on map, heading, and speed).
TMS	MOD Platform TMS	Operations Management	RC-OPS-3.2.5	The status information shall provide current trip status (e.g., scheduled/not picked-up, in-progress, on-time, delayed, cancelled, no-show).

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Operations Management	RC-OPS-4.1	The operations staff shall be able to compare current vehicle location with the scheduled Traveler location to verify the validity of a reported no-show event.
TMS	MOD Platform TMS	Operations Management	RC-OPS-4.2	If Traveler location is not known, the OPS staff shall be able to contact Traveler to verify the validity of a reported no-show event.
TMS	MOD Platform TMS	Operations Management	RC-OPS-5.1	The OPS staff shall have the ability to contact a healthcare customer care representative to determine the status of a medical appointment and its impact on booked transportation.
TMS	MOD Platform TMS	Operations Management	RC-OPS-5.2	The TMS shall provide the OPS staff with the ability to see if a trip was dropped off late in the rideplan and to move scheduled return transportation to a later time as needed.
TMS	MOD Platform TMS	Operations Management	RC-OPS-5.3	The OPS staff shall be able to adjust a scheduled return transportation by manually assigning the trip to a later time and updating the communicated pickup window, by editing the trip if available, or by cancelling and rebooking the trip for a later time.
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.1	The OPS staff shall be able to reassign a trip to a new vehicle in the event of a vehicle breakdown or another issue that requires a vehicle swap.
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.3	The system shall recommend vehicles for reassignment per Traveler profile and trip preferences. In the event there is more than one Traveler on the manifest, the operations staff will have discretion to take into account the Travelers' preferences.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.4	The system shall consider all applicable vehicle/driver pools for reassignments.
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.4.1	When a Medicaid-funded trip is reassigned to a new vehicle, the system shall notify Access2care and get approval about this change prior to proceeding with the reassignment.
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.5	The OPS staff shall be able to override the system recommendation.
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.6	The reassigned vehicle shall pick up the Traveler within 10 minutes if there is adequate supply.
TMS	MOD Platform TMS	Notifications	RC-OPS-6A.7	Although ETAs are impacted by factors outside of the control of the TMS, such as vehicle supply, Travelers shall be notified of any change in ETA, and automatic reassignments will not be made that do not improve lateness unless there is an operational factor (i.e., a vehicle has broken down and the nearest available vehicle is far away).
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.8	If a Traveler is being accompanied by a personal caregiver/companion, both of them shall be accommodated in the same vehicle in the event of a reassignment.
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.9	If a Traveler is being accompanied by one or more family members as a part of the same booking, all members shall be accommodated in the same vehicle in the event of a reassignment. Appropriate accommodation, as needed, (e.g., child seat) shall be considered.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Dispatch	RC-OPS-6A.10	In the event of reassignment, any stakeholder with access to the operations center or who receives ride notifications for the particular ride would have access to the details of the new vehicle and driver.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-6B.1	The daily manifest shall indicate the projected arrival time of the vehicle at each pick-up and drop-off location, listing the trip events in chronological order. The pull-out time in the system is the start of the shift.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-6B.2	The system shall be able to generate and display all manifests for a given day. The system shall provide tools to allow manual adjustments to the run manifests, including manually moving trips between manifests.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-6B.3	The system shall send manifest trip pick-up and drop-off data to the vehicle assigned to that manifest.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-6B.4	The OPS staff shall be able to configure which portions of the upcoming manifest entries shall be sent to the vehicle (e.g., the next X trips, all trips in the next Y minutes).
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-6B.5	Additional portions of the manifest shall be automatically sent to the vehicle on an ongoing basis as trip events are completed, in accordance with the HIRTA-configured manifest transmission parameters.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-6B.6	The system shall automatically display any same day manifest changes, such as trip additions, no shows or cancellations, to the dispatcher and transmit these manifest changes to the vehicle assigned to that manifest.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-OPS-6B.7	The system shall provide tools to allow manual adjustments to the run manifests, including manually moving trips between manifests.
TMS	MOD Platform TMS	Dispatch	RC-OPS-8.1	The system shall allow the OPS staff to view received text messages in a tabular display that also indicates the vehicle ID and the time of the message.
TMS	MOD Platform TMS	Dispatch	RC-OPS-8.2	The system shall allow the operations staff to send a text message to a single vehicle or schedule an in-app message for all vehicles.
TMS	MOD Platform TMS	Dispatch	RC-OPS-8.3	The system shall allow OPS staff to enter a free text message.
TMS	MOD Platform TMS	Dispatch	RC-OPS-8.5	The OPS staff shall be able to use two-way radio when a voice communication is required between the OPS staff and the Driver.
TMS	MOD Platform TMS	Notifications	RC-OPS-10.1	A non-medical emergency message may be sent from the driver via the silent alarm feature. The alarm is seen as an alert in the Via Operations Center.
TMS	MOD Platform TMS	Notifications	RC-OPS-10.2.2	HIRTA shall be able to configure the audio notification method as on or off.
TMS	MOD Platform TMS	Operations Management	RC-OPS-11.2	OPS staff can view Traveler pick-up and drop-off locations and assist drivers via voice calls.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-OPS-12.1	The OPS staff shall have access to language translation service to assist Drivers with translation needs.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Vehicle	HIRTA Supporting Hardware		RV-DRV-0.1	The Driver shall have access to a touch-screen mobile data terminal for completing operations-related functions on-board.
Vehicle	HIRTA Supporting Hardware		RV-DRV-0.1.1	The terminal shall run an in-vehicle application preferably on Android or iOS platforms.
Vehicle	HIRTA Supporting Hardware		RV-DRV-0.2	The Driver terminal shall have built-in GPS receiver and magnetometer (and/or gyroscope and accelerometer).
Vehicle	HIRTA Supporting Hardware		RV-DRV-0.2.1	The built-in GPS receiver and magnetometer (and/or gyroscope and accelerometer) shall allow vehicle tracking and report at a predefined interval on vehicle latitude, longitude, and heading.
Vehicle	Driver Application	Navigation	RV-DRV-0.3	The location report shall be provided at least every 30 seconds or as configured by HIRTA.
Vehicle	Driver Application	Scheduling	RV-DRV-0.5	The Driver shall have access to data on the terminal only after a secure log on is complete.
Vehicle	Driver Application	Scheduling	RV-DRV-0.6	The Driver shall have access to its manifest with all trip details upon a successful log on, as authorized by the OPS staff.
Vehicle	HIRTA Supporting Hardware		RV-DRV-0.7	The Driver terminal shall stay connected to the TMS in real-time using a cellular data connection method.
Vehicle	Driver Application	Navigation	RV-DRV-0.8	The Driver terminal shall have the ability to function in offline mode. The terminal shall synchronize information with the TMS once the connection is restored.
Vehicle	Driver Application	Trip Performance	RV-DRV-1.1	The Driver shall be able to verify the identity of the Traveler boarding the vehicle.
Vehicle	Driver Application	Trip Performance	RV-DRV-1.3	The Driver terminal shall indicate whether or not the Traveler boarding the vehicle is assigned to the vehicle.
Vehicle	Driver Application	Scheduling	RV-DRV-2.1	The Driver terminal shall indicate the amount due from the Traveler in the manifest details.
Vehicle	Driver Application	Trip Performance	RV-DRV-2.2	The driver terminal shall allow the driver to update the amount paid by the Traveler based on the actual amount paid.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Vehicle	Driver Application	Trip Performance	RV-DRV-2.3	The driver terminal shall allow the driver to update the rider's payment method should the rider wish to use a prepaid cash balance to pay for the trip. Discount codes must be applied in the rider app or administrative portal.
Vehicle	Driver Application	Trip Performance	RV-DRV-2.4	In the event, the Traveler does not have money to pay, the Driver shall be able to notify as such to the OPS staff.
Vehicle	Driver Application	Navigation	RV-DRV-3.1	The driver shall be able to view the scheduled pickup location for the Traveler on their terminal when they leave for a pick-up and any point during the trip.
Vehicle	Driver Application	Trip Performance	RV-DRV-3.2	The Driver shall be able to notify the OPS staff about a no-show if the Driver cannot locate a Traveler.
Vehicle	Driver Application	Trip Performance	RV-DRV-3.3	The Driver shall wait for 5 minutes prior to notifying the OPS staff about a no-show. This threshold shall be configurable by HIRTA.
Vehicle	Driver Application	Navigation	RV-DRV-4.1	The Driver shall be able to send a data message to the OPS staff when needed. The message shall be sent using stored messages.
Vehicle	Driver Application	Navigation	RV-DRV-4.2	The Driver shall be able to receive a message from the OPS staff on their terminal.
Vehicle	HIRTA Supporting Hardware		RV-DRV-4.4	The Driver shall have access to two-way radio to communicate with the OPS staff using voice communication.
Vehicle	HIRTA Supporting Hardware		RV-DRV-4.4.1	The two-way radio shall operate independent of the Driver terminal.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.5.1	The Driver shall be able to notify the OPS staff about a medical emergency as a highest priority message.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.5.2	The Driver shall be able to notify the OPS staff about non-medical emergency as a high priority message.
Vehicle	Driver Application	Navigation	RV-DRV-4.6.1	The vehicle system shall automatically provide turn-by-turn navigation if needed by a Driver.
Vehicle	Driver Application	Navigation	RV-DRV-4.6.2	The driver shall have the ability to drive based on their local knowledge, and the navigation will re-route as the driver continues to drive.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Vehicle	Driver Application	Navigation	RV-DRV-4.6.3	The Driver shall have the ability to turn the audio guidance on or off.
Vehicle	Driver Application	Navigation	RV-DRV-4.6.4	The turn-by-turn navigation function shall recalculate the navigation if needed.
Vehicle	Driver Application	Navigation	RV-DRV-4.6.5	The turn-by-turn navigation function shall adjust the guidance based on real-time traffic conditions.
Vehicle	Driver Application	Navigation	RV-DRV-4.6A.1	The Driver shall be able to use wayfinding capability when turn-by-turn navigation capability is not available to the pick-up or drop-off spot due to lack of GPS.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.7.1	The Driver shall have access to translation service when serving persons with LEP.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.8.1	The system shall track the status of the wheelchair/lift functional status.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.8.2	The system shall detect failure in wheelchair/lift functional status and notify such failure to the Driver and the OPS staff.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.8.3	The Driver shall be able to receive the modified manifest to arrange for a vehicle swap if a pick-up is impacted due to wheelchair/lift failure.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1	The Driver manifest shall provide detailed information for each trip, as needed, for delivering a Traveler trip.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1.1	Each trip on the Driver manifest shall include traveler first name and last name.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1.2	Each trip on the Driver manifest shall include pick-up and drop-off locations.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1.3	Each trip on the Driver manifest shall include mobility aid needed.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1.4	Each trip on the Driver manifest shall include pick-up and drop-off times.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1.5	Each trip on the Driver manifest shall include fare due for a trip.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1.6	Each trip on the Driver manifest shall include relevant notes for the driver.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.1.7	Each trip on the Driver manifest shall include ETA for pick-up or drop-off locations.
Vehicle	Driver Application	Navigation	RV-DRV-4.9.2	The ETA shall be updated at least every 30 seconds or immediately when a major delay is detected and an impact to the ETA is determined.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.3	The driver shall be able to view the status of a trip on their manifest at any point when the trip is in progress provided the trip has not been cancelled.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.4	The driver manifest shall update no later than 10 seconds after a change is made by the OPS staff or the TMS to a trip provided the driver has cell service in their area.
Vehicle	Driver Application	Scheduling	RV-DRV-4.9.5	The Driver manifest shall immediately delete a trip if a trip is cancelled by a Traveler.
TMS	MOD Platform TMS	Operations Management	RV-DRV-4.10.1	The OPS staff shall be able to update pertinent details after a trip is complete, if needed.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.10.2	The system shall automatically collect at least the following information: revenue mileage, fare paid.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.10.3	The system shall allow updates to only limited data by the Driver as configured by HIRTA to prevent data manipulation or loss.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.10.4	The Driver shall be able to notify the OPS staff in the event of a safety event using the Driver terminal.
Vehicle	Driver Application	Trip Performance	RV-DRV-4.10.5	The dispatcher shall have access to tools to complete any relevant safety reporting process per PMESP.
Vehicle	Driver Application	Navigation	RV-DRV-4.11.1	The Driver shall have access to tools to notify the OPS staff about a delay.
Vehicle	Driver Application	Navigation	RV-DRV-4.11.2	The Driver shall have access to tools to contact healthcare staff directly in the event of a severe delay that may impact the medical appointment.
TMS	MOD Platform TMS	Scheduling	RC-SCH-1.1	The system shall be able to perform batch scheduling for trips that are booked in advance.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Scheduling	RC-SCH-1.2	The system shall be able to optimize trips booked in advance the day before those are assigned to vehicle using parameters listed under requirement RC-SCH-2.1.
TMS	MOD Platform TMS	Scheduling	RC-SCH-1.3	The system shall have the capability to book trips in real-time and assign to vehicles in real-time.
TMS	MOD Platform TMS	Scheduling	RC-SCH-2.1	The system shall be capable of scheduling, in batch mode, all bookings for the next travel day, provided there is sufficient vehicle supply to schedule without breaking any of HIRTA's programmed scheduling rules. At least the following parameters shall be included:
TMS	MOD Platform TMS	Scheduling	RC-SCH-2.1.1	Scheduling optimization parameters shall include dwell time at a pick-up or drop-off location as one of the variables.
TMS	MOD Platform TMS	Scheduling	RC-SCH-2.1.2	Scheduling optimization parameters shall include available on-board capacity as one of the variables.
TMS	MOD Platform TMS	Scheduling	RC-SCH-2.1.3	Scheduling parameters shall include average vehicle speed profile for street segments as one of the variables to calculate realistic travel times.
TMS	MOD Platform TMS	Scheduling	RC-SCH-2.1.4	Scheduling parameters shall include grouping of trips on manifest based on geographic location of origin and destination of trips.
TMS	MOD Platform TMS	Scheduling	RC-SCH-2.1.5	Scheduling optimization parameters shall include avoidance of street segments with known detours/road closures at the time of schedule creation.
TMS	MOD Platform TMS	Scheduling	RC-SCH-2.1.6	Scheduling optimization parameters shall include accessibility needs/mobility aids as applicable to trips.
TMS	MOD Platform TMS	Scheduling	RC-SCH-3.1	The system shall provide continuous optimization function to optimize the schedule in real-time for appropriate utilization of resources.
TMS	MOD Platform TMS	Scheduling	RC-SCH-3.2	The optimization algorithm shall not move the time for trips that must be anchored (e.g., critical care appointments booked in advance).

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-SCH-4A.1	The daily manifest shall indicate the projected arrival time of a vehicle at each pick-up and drop-off location and shall list the trip events in chronological order. Pull-in and pull-out times are defined as the start and end of a shift in the Via system.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-SCH-4A.2	When creating a daily manifest, the system must take into account any vehicle assignment restrictions (e.g., wheelchair accessible vehicle, child seat, capacity or needed seats in the vehicle, space to stow mobility device).
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-SCH-4A.3	Once generated, the system shall be able to display all manifests with all driver instructions for a given day.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-SCH-4A.4	The system shall provide tools to allow manual adjustments to the run manifests, including manually adding notes and moving trips between manifests.
TMS	MOD Platform TMS	Manifest Building / Runcutting	RC-SCH-4B.1	The system shall have internal validation checks to ensure that manifests do not violate work and labor rules (e.g., driver work hours and breaks).
TMS	MOD Platform TMS	Scheduling	RC-SCH-4B.2	The system shall not allow auto scheduling of trips where travel times for individual passengers exceed the maximum time onboard allowed.
TMS	MOD Platform TMS	Scheduling	RC-SCH-5.1	The system shall accommodate personal caregiver on the same vehicle as Traveler when scheduling a trip.
TMS	MOD Platform TMS	Scheduling	RC-SCH-5.2	The system shall accommodate family member(s) that are required to accompany a Traveler, provided family member(s) are part of one booking.
TMS	MOD Platform TMS	Scheduling	RC-SCH-5.3	The system shall accommodate any mobility aid needed for accompanying Traveler family member (e.g., child seat for accompanying children)
TMS	MOD Platform TMS	Scheduling	RC-SCH-6.1	For co-located addresses when multiple Travelers are sharing a vehicle, the system shall perform appropriate grouping to maximize optimum utilization of resources.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Scheduling	RC-SCH-6.2	The system shall allow manual adjustments of grouping.
TMS	MOD Platform TMS	Operations Management	RC-ADM-1.1	HIRTA shall be able review trip performance data in real-time.
TMS	MOD Platform TMS	Operations Management	RC-ADM-1.2	The trip performance data shall be refreshed based on a configurable threshold or when there is a change in a trip status.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-ADM-2.1	The system shall track Travelers trips funded by separate sources in a shared scenario.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-ADM-2.2	The system shall allow HIRTA to access data to manage cost allocation per HIRTA policies.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-ADM-3.1	The system shall allow HIRTA to pull data necessary to generate invoices per business rules as configured by HIRTA.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-ADM-4.1	The system shall allow billing a funding source electronically.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-ADM-4.2	The system shall receive an acknowledge from a funding source if an invoice was successfully submitted.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-ADM-5.1	The system shall allow collection of payment using electronic methods.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-ADM-6.1	The system shall provide tools to report on system operational performance, as defined in the PMESP.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Performance Management and Reporting	RC-ADM-7.1	The system shall provide tools to report on system operational performance, as defined in the PMESP.
External Systems	I&R		RC-RFR-1.1	I&R entities shall have access to tools that provide real-time access to transportation alternatives.
External Systems	I&R		RC-RFR-1.2	I&R entities shall have access to tools that provide real-time access to information on availability of medical appointments.
External Systems	I&R		RC-RFR-2.1	I&R entities shall have access to tools and information that shall allow them to connect with DCHD, Travelers, HIRTA and healthcare provider
External Systems	I&R		RC-RFR-3.2	I&R entities shall be able to document results of referral activity when successful connections are accomplished.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HNV-1.1	Health Navigators shall have access to MOD platform within HIRTA TMS to assist their customers with transportation needs.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HNV-1.1.1	The System shall allow Health Navigators to search for transportation options for pick-up/drop-off times and pick-up/drop-off locations.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HNV-1.1.2	The System shall allow Health Navigators to book trips using preferred transportation option and booking preferences of Travelers.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HNV-1.2	Health Navigators shall be able to book single or multi-legged trips.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HNV-1.3	When booking multi-legged trips, Health Navigators shall be able to choose pick-up/drop-off times and vehicles separately for each leg of the trip, if needed.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-2.1	Health Navigator shall have access to language translation service when working with persons with LEP.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-2.2	The Health Navigator shall be able to identify preferred language for Travelers when assisting them with transportation services so Driver and Traveler communication is possible without assistance from a Health Navigator.
External Systems	EHR		RC-HNV-3.1	The Health Navigator shall have access to tools to view upcoming medical appointments for their customers.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HNV-3.2	The Health Navigators shall be able to book recurring transportation appointments for recurring medical trips.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HNV-3.3	The Health Navigator shall be able to modify or cancel appointments as needed on behalf of their customers.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-4.1	The Health Navigators shall have access to tools to determine the amount of wait time for their customers upon their arrival for an appointment.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-5.1	The Health Navigators shall have access to tools to determine the amount of time needed for completion of a medical appointment to make any adjustments to the return appointment.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-5.2	The Health Navigators shall be able to make adjustment to a return appointment in the event that appointment is expected to last longer than an allowed threshold (e.g., more than 30 minutes of delay).
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-6.1	The Health Navigators shall have access to tools to follow-up with their customers after a trip is complete.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-6.2	The Health Navigators shall have access to the outcome of the follow-up with their customers.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HNV-6.3	The Health Navigators shall be able to extract the feedback data for further analysis in the DCHD I&R system.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Performance Management and Reporting	RC-HAD-1.1	DCHD shall be able to use the system for assessing the success of Health Navigator in meeting the needs of the Dallas County residents. Assessment will be stored in the DCHD system.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Performance Management and Reporting	RC-HAD-1.2.1	The system shall provide data for assessing DCHD's ability to meet the needs of equipped client placed on waitlist for two months or longer for a medical appointment but do not require any follow-up from Health Navigators
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Performance Management and Reporting	RC-HAD-1.2.2	The system shall provide data for assessing DCHD's ability to meet the needs of equipped clients who feel equipped to proceed without further follow up from Health Navigators.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Performance Management and Reporting	RC-HAD-1.2.3	The system shall provide data for assessing DCHD's ability to meet the needs of clients who no longer want to work on their needs because their needs were met elsewhere or not a priority for them.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Performance Management and Reporting	RC-HAD-1.2.4	The system shall provide data for assessing DCHD's inability to meet the needs of clients due to lack of resources.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-1.1	Health Connector shall provide an HCR Application (access to MOD platform within HIRTA TMS) for HCR staff to manage Transportation for their customers.
TMS	MOD-EHR Middleware		RC-HCR-1.2	For TMS and EHR interface, the systems shall have access to data related to the Traveler (Patient) which shall at least include first name, last name and internal id.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-1.3	The HCR staff shall be able to use HCR Application to request trips for customers looking for transportation at the time of booking of their medical appointments.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-1.4	The HCR staff shall be able to use HCR Application to request trips for customers looking for return trips to home after the appointment.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-1.5	HCR staff shall be able to use HCR Application to view conflict with any trips for the customer has already booked in the system.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-1.6	HCR staff shall be able use HCR Application to modify an existing trip to change times, locations or mobility aids.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-2.1	The HCR staff shall be able to use the HCR Application to book a single ride per customer request.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-2.2	The HCR staff shall be able to use the HCR Application to book subscription/recurring trips per customer request.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-3.1	The HCR staff shall be able to use the HCR Application to identify any customer mobility needs at the time of booking. Mobility needs supported in the application will be same as what is supported in HIRTA TMS- MOD platform.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Reservations and Customer Service	RC-HCR-4.1	The HCR staff shall have access to translation tools to assist with the booking.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-5.1	The HCR staff shall be able to use the HCR Application to book same day trips on behalf of customers.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-5.2	The HCR staff shall be able to book trips to destinations other than home at the same time when booking a medical appointment for a referral facility.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-6.1	The HCR staff shall be able to use the HCR applications to connect with HIRTA staff using a voice call or text message.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-6.2	The HCR staff shall be able to use HCR application to monitor the status of an upcoming or in-progress trip.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-7.1	The HCR staff shall be able to book multi-legged trips.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Scheduling	RC-HCR-7.2	The HCR staff shall be able to choose pick-up/drop-off times and vehicles separately for each leg of the trip, if needed.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-8.1	The HCR shall be notified when a Traveler is a no-show for a scheduled trip for a medical appointment.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-8.2	The HCR staff shall be able to view the reason for a no-show.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-8.3	The HCR staff shall be able to note the no-show and no-show reason for transportation as the reason for no-show for the medical appointment.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-8.4	The HCR shall be notified when a Traveler cancels a scheduled trip for a medical appointment.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-8.5	The HCR staff shall be able to view the reason for a cancellation.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-8.6	The HCR staff shall be able to note the cancellation and cancellation reason for transportation as the reason for no-show for the medical appointment.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.1	The HCR staff shall be notified when there are delays encountered with the transportation for a medical appointment as follows:
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.1.1	The system shall notify HCR staff on late pick-up events.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.1.2	The system shall notify HCR staff on late arrival events at the healthcare facility.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.1.3	The system shall notify HCR staff on delays while en-route resulting in modified ETA.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.1.4	The system shall notify HCR staff on delays in approaching the office after the drop-off at the facility.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.2	The HCR staff shall have access to real-time information on the progress of a trip booked by the HCR staff as return trip.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.3	The HCR staff shall be notified when there is a delay for pick-up at the facility for return trip to due to late arrival of a vehicle.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.4	The HCR staff shall be notified when there is a delay for pick-up due to patient's late arrival at the pick-up spot.
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.5	The HCR staff shall be notified when a leg of a trip is successfully completed.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	Health Navigator & Healthcare-end Subsystem (Limited View MOD Platform TMS)	Operations Management	RC-HCR-9.6	The HCR staff shall be notified when there are delays to any leg of the return trip.
External Systems	Funding Entity		RC-FND-1.1	The funding entity shall be able to receive invoices electronically.
External Systems	Funding Entity		RC-FND-1.2	The funding entity shall notify HIRTA when an invoice is successfully received.
External Systems	Funding Entity		RC-FND-1.3	The funding entity shall be able to reimburse for submitted invoices electronically.
External Systems	Funding Entity		RC-FND-1.4	The funding entity shall be notified when a payment is successfully completed for an invoice.
External Systems	Funding Entity		RC-FND-1.5	The funding entity shall be notified about the transportation successfully provided under that funding source for a medical appointment.
External Systems	Funding Entity		RC-FND-1.6	The funding entity shall be notified about the number of no-shows for a scheduled transportation under that funding source for a medical appointment.
External Systems	Funding Entity		RC-FND-1.7	The funding entity shall be notified about the number of cancellations for a scheduled transportation under that funding source for a medical appointment.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-GPA-1.1	Iowa Department of Transportation, Iowa Department of Public Health, Dallas County Health Department, Dallas County and the City partners shall be able to track the cost and revenue associated with the Health Connector program.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Performance Management and Reporting	RC-GPA-1.2	The System shall provide reports required for the National Transit Database.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-GPA-1.3	The Government partners shall be able to measure the impact of reduction in the number of no-shows for medical appointments.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-CPS-1.1	The Government partners shall be able to measure the impact of reduced no-shows on overall well-being of the community per KPIs defined in the PMESP.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.1	The system shall collect data and report on data specific to a demographic profile without exposing Traveler's personal information.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.2	The system shall use personal data in connection with the following circumstances based on data sharing practices as identified in the DMP.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.2.1	The system shall use personal data as needed for the safety and security of users and services.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.2.2	The system shall use personal data as needed for customer support.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.2.3	The system shall use personal data as needed for research and development provided the terms and conditions HIRTA defines in the rider app state this use as acceptable for users opting into this service.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.2.4	The system shall use personal data as needed for enabling communication between users.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.2.5	The system shall use personal data as needed for connections with legal proceedings.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.3	The system shall collect cookies for improved user experience.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.3.1	The cookies shall be collected for user authentication.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.3.2	The cookies shall be collected for remembering user preferences and settings.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.3.3	The cookies shall be collected for determining popularity of content.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-1.3.4	The cookies shall be collected for analyzing site traffic & trends and generally understanding online behaviors and interest of users.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-SYS-2.1	The system shall allow users to communicate with each other electronically using the platform.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Reservations and Customer Service	RC-SYS-2.1.1	The communication methods shall include voice calls.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-SYS-2.1.2	The communication methods shall include text messages.
TMS	MOD Platform TMS	Reservations and Customer Service	RC-SYS-2.1.3	The communication methods may include sending files electronically.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-3.1	Health Connector shall emphasize on privacy at all times and shall be compliant with HIPAA and HIRTA's privacy policy.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-3.2	The system shall track, manage and report on user information without exposing actual user information to external systems through use of encrypted identifier, known as Universal Unique Identifier (UUID).
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-3.2.1	The system shall have a UUID for each Traveler in the system.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-3.2.2	The system shall have a UUID for each driver in the system
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-3.2.3	The system shall have a UUID for each trip in the system

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-3.3	The system shall use only UUID for sharing data externally, instead of actual Driver, Traveler or Trip identifier.
TMS	MOD Platform TMS	Operations Management	RC-SYS-3.4	The system shall have permission levels for access to the system based on the user roles. Roles will be defined in Phase 2 design.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-3.5	Data accessed from the system by external entities shall be over secure file transfer protocols (SFTP).
TMS	MOD Platform TMS	Operations Management	RC-SYS-4.1	The system shall require unique usernames and passwords to access the system.
TMS	MOD Platform TMS	Operations Management	RC-SYS-4.2	The system shall require a minimum of 2 factor authentication to access the system.
TMS	MOD Platform TMS	Operations Management	RC-SYS-4.3	Access to system shall be made available to external users using secure and encrypted data exchange with cloud-based servers using standards such as Secure Sockets Layer (SSL) or Transport Layer Security (TLS) and shall avoid any exposure to PII for Travelers.
TMS	MOD Platform TMS	Operations Management	RC-SYS-5.1	Health connector shall provide ability to track safety events to ensure safe transportation at all times for medical appointment needs. The safety events will be categorized as 1) catastrophic; 2) critical; 3) marginal; 4) negligible, as defined in the Safety Management Plan (SMP).
TMS	MOD Platform TMS	Safety Event Management	RC-SYS-5.2	The HIRTA safety management system (SMS) shall prove detailed assessments on reported safety events.
TMS	MOD Platform TMS	Operations Management	RC-SYS-6.1	Health Connector system shall be highly reliable with no more than 1 hour of downtime per week (99.5% availability).

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Operations Management	RC-SYS-6.2	Health Connector shall have the ability to operate even when a subsystem or component is temporarily not functional.
TMS	MOD Platform TMS	Operations Management	RC-SYS-6.3	Health Connector shall be able to function even when vehicle and central systems temporarily lose data connectivity.
TMS	MOD Platform TMS	Operations Management	RC-SYS-6.4	Even when external entities (e.g., DCHD or healthcare provider) temporarily lose access to the system, HIRTA shall be able to provide services to its Travelers.
TMS	MOD Platform TMS	Operations Management	RC-SYS-6.5	In the event of total failure, HIRTA shall still be able to use two-way radio and offline mode of the TMS application to perform its daily business functions.
TMS	MOD Platform TMS	Scheduling	RC-SYS-7.1	Health Connector scheduling parameters shall be configured to enhance system productivity and shall allow maintaining delivering at least 3 rides per hour.
TMS	MOD Platform TMS	Cost Allocation and Billing	RC-SYS-7.2	The system optimization algorithm shall be such that the cost per trip shall not exceed $20 per trip after subsidy is applied.
TMS	MOD Platform TMS	Operations Management	RC-SYS-7.3	The Health Connector solution shall help reduction in coordination for a trip to 2 minutes or less.
TMS	MOD Platform TMS	Operations Management	RC-SYS-8.1	The system shall help HIRTA achieve at least 95% on-time performance target.
TMS	MOD Platform TMS	Operations Management	RC-SYS-9.1	The system shall provide capability to manage vehicle resources for HIRTA and third-party service providers.
TMS	MOD Platform TMS	Operations Management	RC-SYS-9.2	The system shall be able to obtain vehicle data from a master source at HIRTA.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Operations Management	RC-SYS-9.3	The system shall maintain at least the following information on vehicles: vehicle ID, owner, pool type, license plate, number of seats, availability of wheelchair/lift, number of wheelchair seats.
TMS	MOD Platform TMS	Operations Management	RC-SYS-9.4	The system shall have the ability to activate or deactivate drivers and vehicles so only credentialed drivers and valid vehicles are assigned for Health Connector trips.
TMS	MOD Platform TMS	Operations Management	RC-SYS-9.5	The system shall provide tools to manage driver resources with ability to add drivers and attach drivers to vendors.
TMS	MOD Platform TMS	Operations Management	RC-SYS-9.6	The system shall be able to obtain driver data from a master source at HIRTA, if available.
TMS	MOD Platform TMS	Operations Management	RC-SYS-9.7	The system shall maintain at least the following information on drivers: driver ID, first name, last name, phone number.
TMS	MOD Platform TMS	Dispatch	RC-SYS-9.8	The system shall track validity of license and insurance for drivers.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-10.1	The system shall maintain a log of trip planning results.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-10.2	The system shall maintain a log of vehicle locations sent by the vehicle.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-10.3	The system shall maintain a log of data messages exchanged between dispatchers and drivers.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5	The system shall maintain a log of trip history by a Traveler.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.1	The trip history shall maintain a log of scheduled pick-up and drop-off locations.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.2	The trip history shall include actual pick-up and drop off locations.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.3	The trip history shall include scheduled pick-up and drop-off times.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.4	The trip history shall include actual pick-up and drop-off times.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.5	The trip history shall include no-show status.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.6	The trip history shall include cancellation status.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.7	The trip history shall include fare quoted.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.8	The trip history shall include fare paid.
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.9	The trip history shall include revenue mileage.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Operations Management	RC-SYS-10.5.10	The system shall allow calculation of deadhead mileage.
Wayfinding	Wayfinding Application		RC-SYS-10.6	The system shall include a log of wayfinding request received from Travelers
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-10.7	The system shall provide a data access portal for all authorized HIRTA partners to access the reporting section of the Via Operations Center.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-10.8	The system shall use trip history dataset to review and investigate any issues with performance of a trip.
TMS	MOD Platform TMS	Performance Management and Reporting	RC-SYS-11.1	The system shall provide a data access portal for all authorized HIRTA partners to access the reporting section of the Via Operations Center.
Wayfinding	Wayfinding Codes		RC-SYS-12.1	The wayfinding system shall consist of sensors/ visual markers installed at strategic locations outdoors and indoors to guide a Traveler during their Complete Trip steps.
Wayfinding	Wayfinding Codes		RC-SYS-12.2	The sensor or visual marker shall be designed to withstand temperatures in the range of -40 degrees F to 130 degrees F.
Wayfinding	Wayfinding Codes		RC-SYS-12.3	The sensor or visual marker shall be designed to withstand humidly levels in the range of 5% to 95% non-condensing.
Wayfinding	Wayfinding Codes		RC-SYS-12.4	The sensor or visual marker shall be designed to withstand dust and water intrusion as well as snow and freezing temperatures, certified in compliance with or exceeding the NEMA4 or IP65 standard.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
Wayfinding	Wayfinding Codes		RC-SYS-12.5	The sensor or visual marker shall be designed to withstand the harsh environment posed by the disinfectant or other chemical exposure as normal in a typical hospital environment.
Wayfinding	Wayfinding Codes		RC-SYS-12.6	The sensor or visual marker shall be installed inside and outside a healthcare facility according to approved installation design from an authorized healthcare facility coordinator.
Wayfinding	Wayfinding Codes		RC-SYS-12.8	The sensor or visual marker shall be designed to withstand mean time between failure (MTBF) rate of 60,000 hours.
Wayfinding	Wayfinding Codes		RC-SYS-12.9	The sensor/visual marker shall indicate: 1) encoded node on a pathways network; 2) encoded information to guide Traveler.
Wayfinding	Wayfinding Application		RC-SYS-12A.1	The Wayfinding Central Application shall create and maintain a pathways network that shall consist of nodes and pathways linking the nodes.
Wayfinding	Wayfinding Application		RC-SYS-12A.2	The Wayfinding Central Application shall generate step-by-step guidance using the pathways direction and provide to the Traveler Wayfinding Application upon request.
Wayfinding	Wayfinding Application		RC-SYS-12A.3	The Wayfinding Central Application shall provide tools to encode the sensor/visual marker installed in the field.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.1	Technical support shall be available 24 hours a day, 365 days a year.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.2	Technical support shall respond to a request per the service level agreement as agreed with HIRTA. At a minimum, the support staff shall respond to a request within one hour of notification of the problem.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.3	HIRTA staff be able to track the status of reported issue at any time using a web-based tool.

Subsystem	Component	Subcomponent	Requirement ID	Requirement
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.4	The system shall monitor all networked subsystems and components for normal operations 24 hours a day, 365 days a year.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.5	The data centers to be used for hosting shall have existing scheduled routine maintenance and emergency situation management plans.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.6	HIRTA shall be notified in advance of any planned data maintenance.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.7	HIRTA shall be notified of any ad-hoc data maintenance activity to resolve an issue with the system as soon as it is discovered.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.8	HIRTA shall be notified in advance of availability of enhancements, releases, and newer versions of the software (including third party software), including all bug fixes, patches, and modifications, or any modifications to the system components.
TMS	MOD Platform TMS	Operations Management	RC-SYS-13.9	System upgrades or updates shall be implemented only upon HIRTA approval.

5 References

[1] System Architecture Document (SAD): Heart of Iowa Regional Transit Agency ITS4US Deployment Project (FHWA-JPO-22-983) https://rosap.ntl.bts.gov/view/dot/68863

[2] Phase 2 System Requirements Matrix, to be published

[3] IEEE Standard 1016-2009 (IEEE Recommended Practice for Software Design Descriptions) https://standards.ieee.org/ieee/1016/4502/

[4] Concept of Operations (ConOps): Heart of Iowa Regional Transit Agency ITS4US Deployment Project (FHWA-JPO-21-859) https://rosap.ntl.bts.gov/view/dot/57469 (to be updated)

[5] Systems Requirements Specification (SyRS) – Heart of Iowa Regional Trasnit Agency ITS4US Deployment Project (FHWA-JPO-21-882) https://rosap.ntl.bts.gov/view/dot/61724 (to be updated)

[6] Phase 1 Performance Measurement and Evaluation Support Plan (PMESP) (FHWA-JPO-21-877) https://rosap.ntl.bts.gov/view/dot/60580 (to be updated)

[7] Phase 2 Interface Control Document (ICD), to be published

[8] Phase 1 Data Management Plan (FHWA-JPO-22-975) https://rosap.ntl.bts.gov/view/dot/61727 (to be updated)

[9] HIRTA Public Transit Agency Safety Plan (PTASP), https://irp.cdn-website.com/bdcffb01/files/uploaded/Safety%20Plan%20-%20HIRTA%20Approved%202020.pdf

[10] Phase 1 Safety Management Plan (SMP) (FHWA-JPO-21-872), https://rosap.ntl.bts.gov/view/dot/58323

[11] Phase 2 Data Privacy Plan (DPP), to be published

[12] Middleware System Design Document, to be published

Appendix A. Definitions, Acronyms, and Abbreviations

Table 5. Definitions, Acronyms, and Abbreviations

Term	Name	Description
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.
API	Application Programming Interface	Software interface that allows two devices or applications to exchange data with each other
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.
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 are covered by separate funding sources and share a vehicle for a trip.
COTS	Commercial Off-The-Shelf	A software/hardware that is commercially ready, made and available for sale, lease, or license to the general public
CSR	Customer Service Representative	Refers to the person who will act as a liaison between HIRTA and Traveler. The CSR will answer questions, and resolve emerging problems that Travelers may face
DCHD	Dallas County Health Department	One of the project Partners who will lead integration with health care services.
Dispatching		Refers to an operations management function which involves assigning vehicle, tracking fleet location, managing schedule adherence, managing trip manifests and other operational functions.

Term	Name	Description
DMP	Data Management Plan	The Data Management Plan describes the approach for data collection, processing, storage and utilization.
EHR	Electronic Healthcare Record	Refers to the healthcare information management system used by hospitals for patients' healthcare-related appointments, transactions, and records management
GTFS	General Transit Feed Specification	Common format for public transportation schedules and associated geographic information
HIPAA	Health Information Portability and Accountability Act	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.
ICD	Interface Control Document	The Interface Control Document describes the data flows and sub flows between systems in detail
IVR	Interactive Voice Response	Technology that allows telephone users to interact with a computer-operated telephone system through the use of voice and inputs using a keypad
KPI	Key Performance Indicators	Represents primary metrics used to assess the success of a project or operations
LEP	Limited English Proficiency	Refers to individuals who have a limited ability to read, speak, write, or understand English.
MOD	Mobility-On-Demand	Refers to the ability of individuals to utilize varying transportation modes to make their journeys more efficient or complete
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.

Term	Name	Description
PCA	Personal Care Attendant	Refers to the person who assists the elderly or persons with disabilities with daily living activities in the persons home or in a care facility
PII	Personally Identifiable Information	Refers to any data that can distinguish an individual, either alone or when linked with other available data.
PMESP	Performance Measurement and Evaluation Support Plan	Documents the KPIs, targets, goals, and objectives that will be evaluated as the project launches
POI	Point of Interest	A specific point or location that someone may find useful or interesting
SyRS	System Requirements Specifications	Refers to the requirements developed to guide implementation of the system
TMS	Transportation Management System	Refers to the technologies used to assist customer care and operations staff with Traveler registration, eligibility management, reservations, scheduling, dispatching, billing, and administration activities.
Vehicle 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 pickup), on-board information and fare payments.
VOC	Via Central Software	Central operations software used by HIRTA operations for scheduling, dispatching, ride monitoring and reporting
VOIP	Voice Over Internet Protocol	Technology that allows you to make voice calls using a broadband internet connection instead of a regular phone line
WAV	Wheelchair Accessible Vehicle	Vehicles that are manufactured to offer ease of access for wheelchair and scooter users
Wayfinding 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.

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