Phase 2 Concept of Operations (ConOps)

Heart of Iowa Regional Transit Agency ITS4US Deployment Project

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Phase 1 Final Report – August 4, 2021
Phase 2 Update — March 27, 2024
FHWA-JPO-21-859

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U.S. Department of Transportation

Produced by *Heart of Iowa Regional Transit Agency ITS4US Deployment Phase 2*
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16. Abstract

The Concept of Operations (ConOps) document serves as the guiding document for Health Connector Phase 2 design and testing activities, subsequent Phase 3 deployment, operations, and evaluation activities, and future operations and maintenance (O&M) activities. This document will be used to communicate overall quantitative and qualitative system characteristics to the end user, developer, agencies, organizations, and staff involved in the system.

This is a user-oriented document that defines applicable user groups and documents needs for those groups as collected and compiled through a stakeholder engagement process. The document also describes the current system and operating environment supporting users seeking transportation for their healthcare needs and identifies necessary improvements in the current environment to meet user needs. The document also describes the Health Connector concept and how it will help all populations in various applicable Complete Trip operational scenarios when they are seeking healthcare transportation services.

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Santosh Mishra, Flexlynqs; Josh Albertson, Arcadis; Brianna Jasset, Arcadis	27 March 2024	8.0	Updated to comply with 508 guidelines	Brooke Ramsey

Table of Contents

List of Tables

List of Figures

1 Scope

As shown in Figure 1, the Concept of Operation (ConOps) step serves as a critical milestone in the system planning and implementation process as it serves as the foundational document for subsequent activities that include system requirements, high-level and detailed design, development, integration, launch and operations.

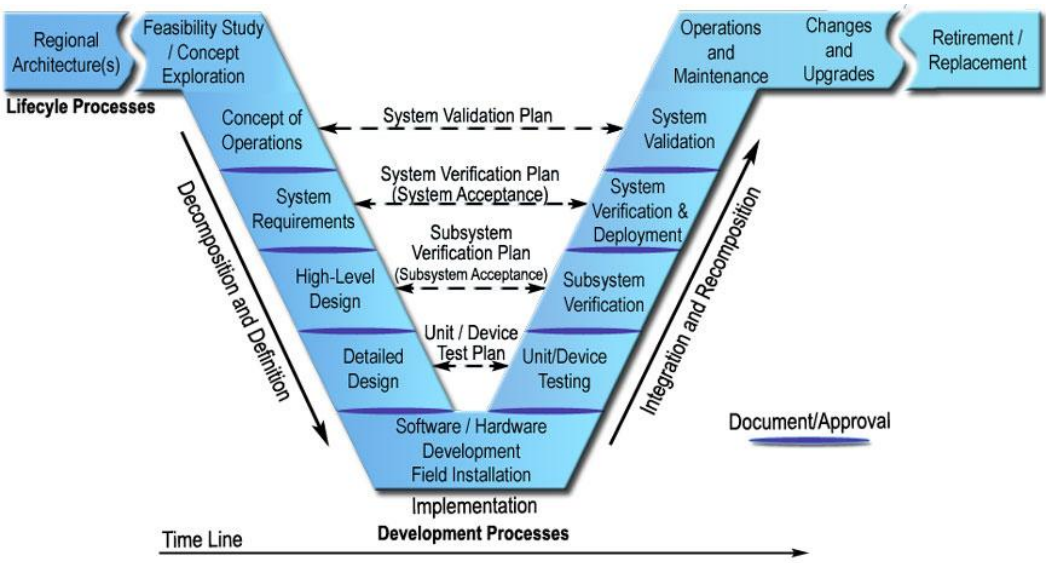

Figure 1. Systems Engineering "V " Diagram (Source: FHWA)

The ConOps document will serve as the guiding document for Health Connector Phase 2 design and testing activities, subsequent Phase 3 deployment, operations, and evaluation activities, and future operations and maintenance (O&M) activities. This document will be used to communicate overall quantitative and qualitative system characteristics to the end user, developer, agencies, organizations, and staff involved in the system.

This is a user-oriented document that defines applicable user groups and documents needs for those groups as collected and compiled through a stakeholder engagement process. The document also describes the current system and operating environment supporting users seeking transportation for their healthcare needs and identifies necessary improvements in the current environment to meet user needs. The document also describes the Health Connector concept and how it will help all populations including the underserved in various applicable Complete Trip operational scenarios when they are seeking healthcare transportation services.

1.1 Project Background

The Heart of Iowa Regional Transit Agency (HIRTA) provides 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 (DR) 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 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)

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 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 a smart device (e.g., smartphone) application or 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, and persons who need language translation. 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).

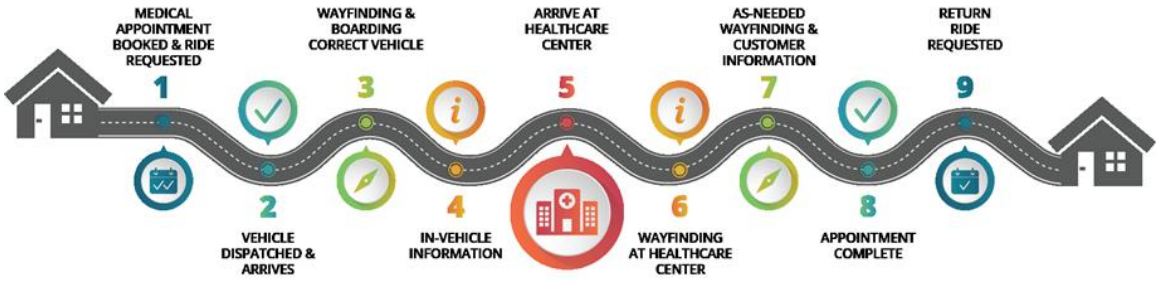

Figure 2. Overview of Health Connector System Concept (Source: HIRTA Team)

1.2 Summary of Changes Since Phase 1

The HIRTA team has updated this document to reflect the new expectations and most current understanding around design and testing activities, subsequent Phase 3 deployment, operations, and evaluation activities, and future operations and maintenance (O&M) activities.

Below you will find a summary of the key changes made to the document since Phase 1:

1. The technologies used to assist customer care and operations staff with Traveler registration, eligibility management, reservations, scheduling, dispatching, billing, and

administration activities will be referred to as the MOD Platform TMS in this document and future documents. As part of Phase 2, Via was selected as the MOD platform TMS provider for the Health Connector project. HIRTA currently uses Via's technology to support their existing on-demand service. The term "MOD Platform TMS" will continue to be used throughout the report (as opposed to referring to Via's system) when appropriate to serve as a vendor neutral resource for peer agencies considering the adoption of a similar system, but any references to a pending selection of an MOD vendor have been updated.

2. Since Phase 1, the Health Connector system has been modified in design and will no longer be provided as a unified application but rather a suite of services. This was due to limited willingness to full integrate applications from third-party providers.

3. While some user needs no longer carry requirements (as several have been updated or deleted since phase 1 based on contracting or other design changes), almost all user needs remain documented and referenced for consistency purposes. The only user need that has been deleted is TRV-1 which relates to the need for a single unified Health Connector app. It was determined this need was no longer valid since the system would meet the overall needs of users as a suite of tools. Additional user needs were developed as a result of creating the requirements matrix later in Phase 1. Table 3 identities all user needs except TRV-1.

4. For this proposed deployment, the HIRTA project team will first work with the following healthcare service providers to test MOD-EHR middleware products and for wayfinding and other demonstration testing:

    a. Dallas County Hospital

    b. Mercy One Care Facility Network

Other healthcare partners may still participate but will not be involved in testing and have not been engaged with the project, and therefore have been removed:

    c. Broadlawns Clinic

    d. Unity Point Health

5. Trip Status reporting capabilities for Access2Care software will still be available but may not happen in real-time. The HIRTA team will define a specific frequency at which to push status updates. These functions have been updated accordingly.

6. Clarification has been added as to how translation services will be provided to Travelers with limited English proficiency (LEP. Translation services will be accessible via:

    a. Wayfinding application

    b. MOD platform TMS

    c. Contacting customer care staff

7. During Phase 2, Data ID 32: ‘Anonymized and/or Aggregated data for Performance Evaluation’ was broken down and defined please see Table 5 for more information.

8. Operational scenarios have been updated to provide better flow charts and content has been modified to adjust for Phase 2 system design. One scenario was deleted, which was Scenario 1, an overarching demonstration. This was because it was determined that scenarios 2-14 illustrated the same user needs and had no unique steps to illustrate Health Connector functionality. Geographic bounds were updated to reflect trips could have an origin or destination within Dallas County, does not need to be entirely within the county.

1.3 Document Overview

The rest of this document is organized as follows:

- **Section 2 Current System and Situation**- provides a description of the current system environment as applicable to healthcare transportation services in Dallas County.
- **Section 3 Justification for and Nature of Changes** - documents current challenges and user needs as collected through the stakeholder engagement process.
- **Section 4 Concepts for the Proposed System**- describes the system components of the proposed system concept and relevant operational policies and constraints.
- **Section 5 Operational Scenarios-** lists applicable operational scenarios and provides pertinent details on how the system will be utilized for those use cases.
- **Section 6 Summary of Impacts-** provides a summary of impacts expected on HIRTA, DCHD and healthcare partner operations.
- **Section 7 Analysis of the Proposed Systems-** provides an analysis of the proposed system in terms of advantages, disadvantages and alternatives/tradeoffs considered.

1.4 System Overview

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 a smart device (e.g., smartphone) application or equally effective alternate method. Further, this solution will include information and wayfinding services to guide them at every step of their trip. Health Connector will leverage already existing demand response service management technologies at HIRTA and bring other

advancements. Any additional capacity needs will be fulfilled by seamless integration with Transportation Network Companies (TNCs), taxis, and other third-party service providers.

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).

Key capabilities of the proposed technology solution are as follows:

- Enable the Traveler to use a smart device (e.g., smartphone) application or equally effective alternate methods to schedule and manage transportation services to medical appointments through the Health Connector Traveler app.
- Provide Travelers options to choose from available providers. Provide same day response if needed by Travelers.
- Send Travelers an alert before arrival and again when the vehicle is approaching.
- Keep Travelers informed on trip progress.
- Provide directions (audible and visual) on where to meet the vehicle/driver. On arrival, drivers should have the ability to automatically confirm Traveler identity.
- Health Connector wayfinding app will provide the Traveler with wayfinding solutions through indoor and outdoor navigation technologies to provide personal concierge-style travel from origin to destination. This will include:
    - Locating the healthcare facility entrance when dropped off by vehicles
    - Locating the desired floor/room when inside the healthcare facility
- Travelers will be able to use Health Connector for any contactless payment needs at any point for transportation-related payments.
- If Travelers or their caregivers desire to book and pay for another local trip as an additional leg along with the medical trip, they will be able to do that using Health Connector.
- Healthcare staff will be able to book transportation for patients at the same time that medical appointments are made, by using the Health Connector online trip request portal.
- HIRTA staff will have access, through Health Connector middleware, to a webpage to track the status of linked transportation and healthcare appointments to ensure that any changes to medical appointments include an accompanying change to transportation services.

Figure 3 provides a context diagram for the proposed system concept. This diagram provides a high-level overview that is examined in more detail in Figure 2.

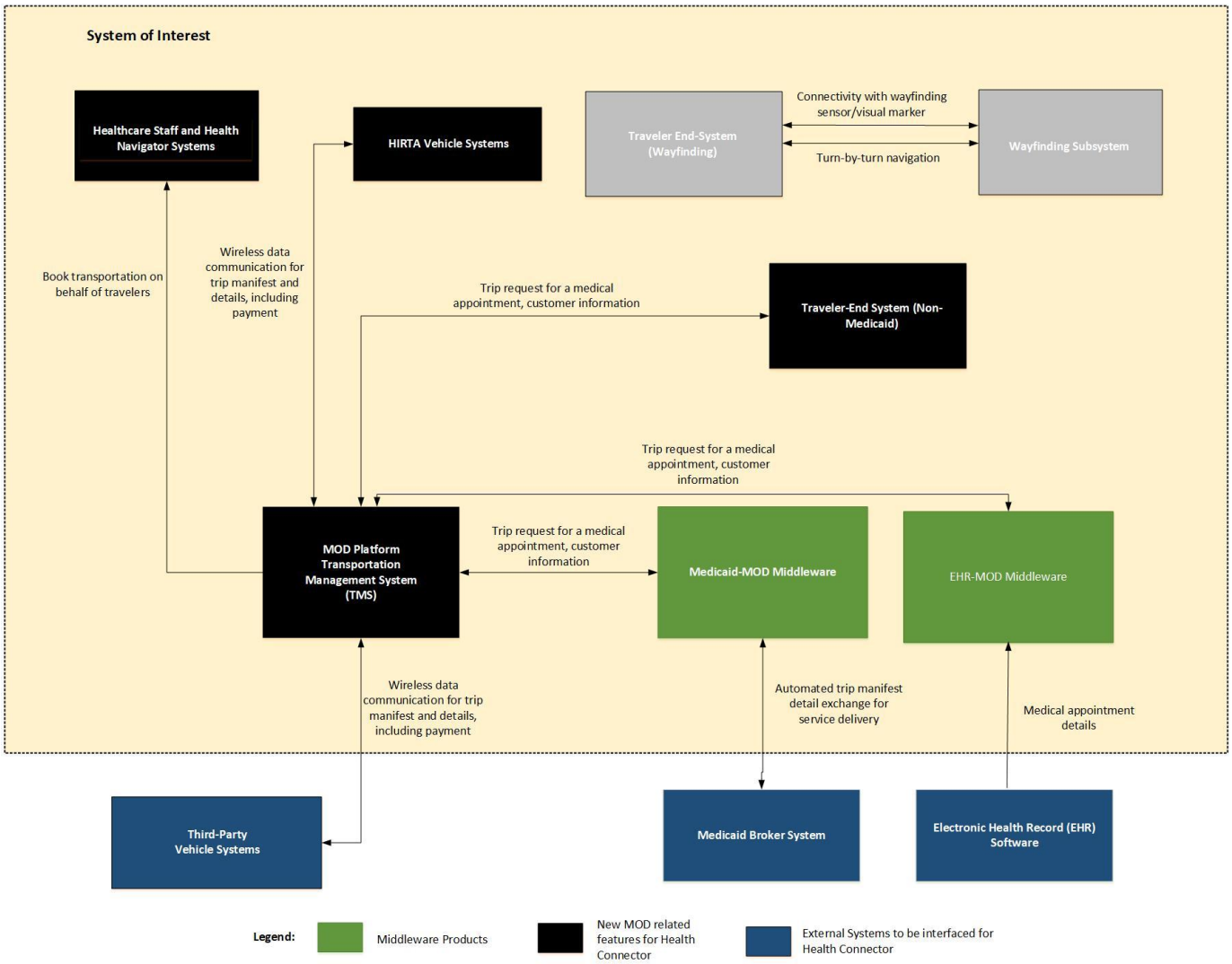

Figure 3. Generic System Concept Diagram (Source: HIRTA Team)

2 Current System and Situation

Underserved populations in Dallas County often experience challenges accessing medical care due to a lack of transportation, including information and services. In fact, according to a 2014 National Leadership Academy for the Public's Health (NLAPH) survey of Dallas County residents (see Figure 4), approximately 39% of respondents (out of a total of 144 Dallas County respondents) cited missing at least one healthcare appointment due to lack of available transportation options. Further, it is noteworthy that approximately 70% of total respondents relied on either HIRTA or family/friends for their transportation needs.

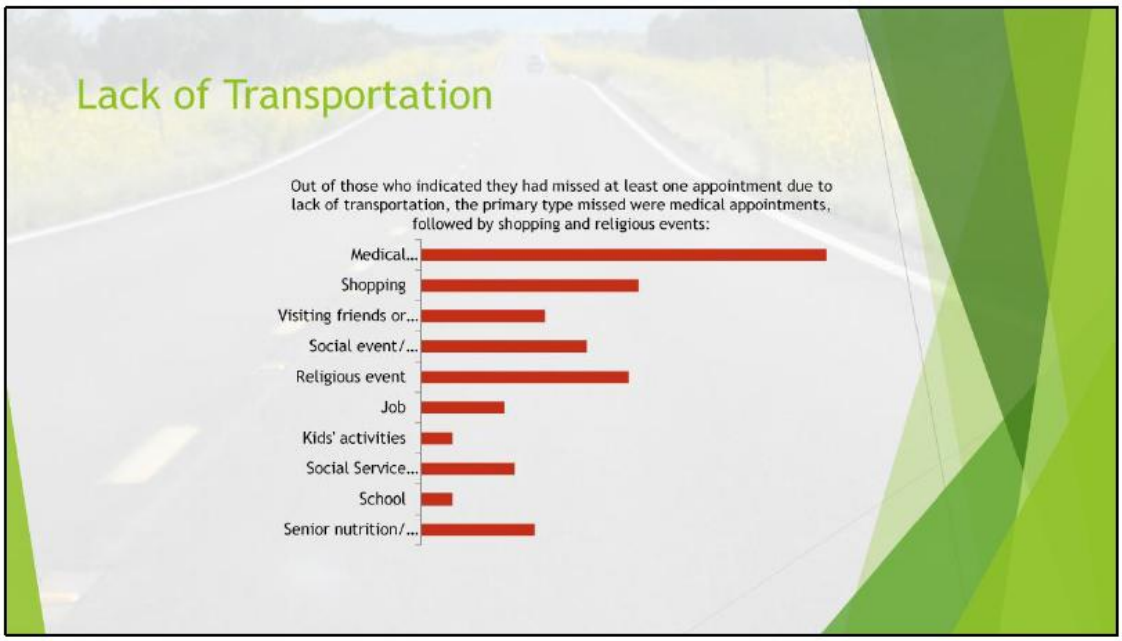

Figure 4. Excerpt of Survey Response from 2014 NLAPH Survey of Dallas County Residents (Source: DCHD)

Further challenges, as faced by the Dallas County residents, and identified during stakeholder discussions, are discussed in detail in document. Health Connector is intended to utilize advanced technologies for planning, booking, payment of transportation, as well as information and wayfinding services.

A primary objective of the ITS4US Deployment Program is to demonstrate, quantify, and evaluate the impact of advanced technologies, strategies, and applications toward addressing Travelers' challenges to planning and executing a complete trip. Accordingly, Health Connector is focused on evaluating the measurable impact of increased access to medical transportation on the health of Dallas County residents.

After the successful design, development, testing, and acceptance in Phase 2, Health Connector will be placed in full operation and maintenance in Phase 3. The system will be: 1) closely monitored for its performance; and 2) evaluated to measure the outcome of the project.

2.1 Background and Scope

2.1.1 Background

This Health Connector ITS4US Deployment project is being led by HIRTA, a state-designated regional rural public transportation provider, which operates across seven central Iowa counties, including Dallas County. Health Connector will focus on Dallas County, which has a total population of 93,453 and covers 588 square miles.

Commencing services in 1981, HIRTA is a quasi-state/local governmental agency under agreement through the State of Iowa's Chapter 28E. HIRTA provides coordinated door-to-door public transit and contracted human service transportation in Iowa Department of Transportation (IDOT) Region 11, comprising seven (7) central Iowa counties, including Boone, Dallas, Jasper, Madison, Marion, Story, and Warren. HIRTA's mission and vision statements are as follows:

> ***Mission Statement:*** *Provide customer-focused community transportation with a commitment to excellence in safety and service promoting independent lifestyles for central Iowa residents.*
>
> ***Vision Statement:*** *To become the transit provider of choice making a positive difference by enhancing community livability through safe, innovative, sustainable regional transportation options and promoting independent lifestyles for central Iowa residents.*

HIRTA provides public transportation to all travelers across the region with an emphasis on underserved communities, such as persons with disabilities, older adults, low-income residents, veterans, and persons with LEP. Providing services in an innovative way ensures public transportation continues to be an essential asset and keeps the community moving forward. HIRTA's funding varies from year to year, largely determined by outside factors. HIRTA partners with numerous stakeholder organizations in Dallas County to provide transportation services, as listed in Section 2.3. In addition, HIRTA partners with many local, state, and federal organizations in providing services in the county and region.

Different categories of underserved populations are covered by funding sources for which they are deemed eligible. Eligibility verification is part of the customer registration process as further explained in Section 2.2.1. However, customers apply to get approved by funding sources through a separate application process in which HIRTA is not directly involved. While Medicaid has several information resources available online, customers do need help with identifying other funding sources for transportation as they are often unaware due to lack of readily available resources. DCHD health navigators (HN) work directly with Dallas County residents in identifying such resources and coordinating with customers, HIRTA, and funding sources directly via phone calls and emails to help customers understand how transportation can be funded for a particular trip. We have also learned that healthcare facilities often have funds available that could contribute towards transportation for their customers. However, this information is not readily available to customers. This presents a significant need for a tool that can help consolidate such resources by linking with Information and Referral databases either available with DCHD or regional Information and Referral agencies.

HIRTA invoices funding sources directly, on a monthly basis, after the cost allocation and billing process is complete. While customers pay their share after each trip is complete, passenger fare revenue covers only limited operating expenses for HIRTA. HIRTA services are subsidized by operating assistance available from federal, state, and local authorities. Additional funding sources include contract revenues, passenger fare, donations, and others.

HIRTA completed its business plan, "2021 and Beyond," to create a vision for providing financially sustainable transportation while preserving and expanding service capacity in the entire seven county region. To effectively provide service to everyone, HIRTA is planning to act on actions identified in the business plan by focusing on financial sustainability, streamlining services, and making sure communities are not left behind. To accomplish this, HIRTA emphasizes the need to have a consistent funding model where local stakeholders have an established mechanism to determine the level of service received. HIRTA's goal is to operate services within the financial support received, allowing for some reserve funds to be established.

Health Connector is a direct outcome of actions identified in the HIRTA business plan. It will allow HIRTA to leverage existing and emerging technologies in serving the needs of all underserved groups. Financial sustainability will also be essential for operation and maintenance (O&M) of Health Connector. HIRTA has already identified state and local funds that will be used for the O&M, and the Phase 1 Institutional Partnership and Financial Plan [15] includes further details on state and local assistance and other funding sources through partners (e.g., healthcare providers), as applicable.

2.1.2 Summary of Key Elements of Scope

The following subsections summarize the scope by providing an overview of the key mobility challenges that were the motivation behind the conceptualization of Health Connector, identifying key components of Health Connector, and listing high-level desired outcomes.

2.1.2.1 Mobility Challenges

The proposed deployment will provide enhanced access to healthcare options for all travelers in Dallas County with a specific focus on underserved communities, including persons with disabilities, low income, rural, older adults, veterans, and persons with LEP. The referenced underserved populations' mobility challenges vary based on the individual, as identified through stakeholder meetings and shown in Table 1. Detailed needs that were identified by stakeholders, and which confirmed some of these challenges during focus group sessions and interviews, are listed in detail in Section 1.1.1.

Table 1. Challenges Faced by Underserved Population Group

Population Group	Topics
Persons with Disabilities (Mobility/Wheelchair User, Vision, Hearing, Cognitive/Developmental)	(1) Wayfinding services (provided in both audio and visual modes) to the transit vehicle, into the healthcare facility, and to their specific appointment location; (2) Smart device accommodations for blind and deaf/hard of hearing persons; (3) Smart device – user-based settings for ease of use and services preferences;
Older Adults	(1) Smart device - larger screen setting; (2) Smart Device – user-based settings for ease of use and services preferences; (3) Telephone number to call for services; (4) Maintains independence; (5) Solution/service ease of use
Low Income	(1) Contactless Payments: unbanked/underbanked customers; (2) Alternate modes needed due to limited number of personal vehicles per household.
Rural	(1) Limited access to healthcare appointments due to long distance travel; (2) Challenges in coordinating appointment times with availability of transportation; (3) Cost effective transportation solutions; (4) Maintaining independence; (5) Solution/service ease of use; (6) Long distance travel may present stamina challenges.
Veterans	(1) Access to veterans' hospitals and other veteran support services; (2) Same challenges as all above subgroups.
Persons with LEP	(1) Technology system and services enabling the use of Spanish and other languages; (2) Support to understand all services and technology system developed (e.g., HIRTA travel trainers, DCHD, etc.); (3) Generally rely on human assistance even if tools (e.g., translation service) available to help with the appointment

2.1.2.2 Technologies

Health Connector will comprise several different technologies, including new technologies for travelers, for HIRTA staff, and for healthcare staff and health navigators. Technologies will be a mix of commercial off-the-shelf and custom-developed technology. While 'customer' is commonly used by transit agencies and 'patient' or 'consumer' by healthcare facilities, for this project, 'Traveler' will be used to identify individuals who may benefit from Health Connector.

Travelers and their caregivers will be able to book, manage, and get real-time information about their trips to healthcare appointments through a mobile app or web portal. This will be available to all Health Connector Travelers. Healthcare and health navigator staff will also have access to a web portal to book trips for patients and to check on the status of trips. Once the transportation

appointment is booked, the system will provide one-stop tools for Travelers, their caregivers, health navigators, and healthcare providers to manage trips. This technology is part of a broader suite of tools that will help HIRTA schedule and dispatch trips and will support Health Connector reporting and analysis.

For Travelers accessing care at a participating healthcare facility, their Health Connector trip booking can be linked to their medical appointment time and location through middleware that will be developed as part of the project. When a change is made to the healthcare appointment, HIRTA staff will be notified of the need to change the corresponding transportation request, and this information will be available to healthcare staff and health navigators through a read-only web app as well.

Apart from appointment booking and management, the system will also provide origin-to-destination wayfinding solutions by using tools that provide indoor and outdoor navigation to assist with wayfinding needs such as navigating to pick-up spots, locating specific buildings, entrance doors, and offices inside the medical complex and others.

The system will help HIRTA more efficiently coordinate with Access2Care (Medicaid broker) for delivery of trips booked through their system by automating more of the process through a second custom-developed middleware application. Also, the system will allow HIRTA to use non-dedicated service providers (e.g., taxis, TNCs, volunteer drivers, other agency vehicles) to increase the capacity when demand cannot be met with HIRTA vehicles.

System technologies will also include technologies onboard vehicles to support driver-dispatch communications, manifest management, turn-by-turn navigation, on-board information, and fare payments. On all HIRTA-owned vehicles, drivers will use tablets running the driver app. On other non-dedicated service provider vehicles, drivers may access a driver app on their tablet or their phone to assist with these functions.

While the goal is to eventually have an integrated interface for all needs, we also recognize the complexity of interfaces between systems involved. Given this, our focus will be on addressing user needs by making tools available to customers, even if those tools are not fully integrated as part of the initial implementation.

Further details of the system are provided in Section 4.

2.1.2.3 Outcomes

As one of the key outcomes of the project, Health Connector will recognize the net impact that access to health services have on patient health care outcomes by potentially reducing no-shows caused by lack of transportation access. Health Connector will provide improved healthcare access and outcomes for Dallas County residents through enhanced interaction with and utilization of the county's transportation infrastructure by making NDSP vehicles available to supplement HIRTA’s capacity. Also, it will expand the extent to which health navigation services are provided to residents of Dallas County, both through an enhanced capacity for DCHD’s Health Navigators and through the on-line health navigation using Health Connector.

2.2 Description of the Current System and Situation

Dallas County is one of the fastest growing counties in terms of population in the United States with an increase of 36.4% since 2010 focused largely on the southeastern portion of the county in the western Des Moines suburbs. In 2019, out of a total population of 93,000, the county was home to approximately 3,700 persons with disabilities, 11,200 older adults, 4,000 low-income individuals, 4,000 veterans, and 10,500 people speaking language other than English. Dallas County's aging population grew 12% from 2000 to 2010 and is expected to double by 2030. The overall growth represents a shift from an agricultural to suburban commuter community. Such challenges require HIRTA to use the available driver and vehicle resources in the most efficient manner.

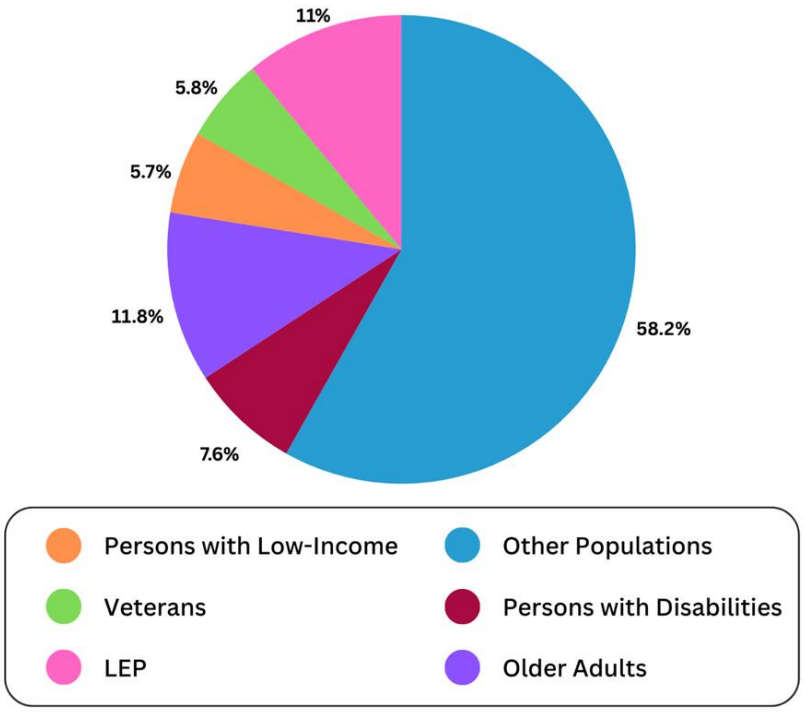

Figure 5. Population Breakdown in Dallas County (Source: HIRTA Team)

Dallas County comprises 18 municipalities with the largest being West Des Moines (population 66,641) and the smallest being Bouton (population 119). Portions of Dallas County are located in the Des Moines – West Des Moines Metropolitan Statistical Area and feature a mixture of suburban and rural densities.

The change in population brings opportunity and access to healthcare services for many residents, but also exacerbates differences between the affluent eastern side of the county and the rural and othercommunities to the north and west. Older adults make up a larger portion of rural populations (17%) than urban populations (13%) and rural residents with disabilities rely on public transit and take about 50% more public transit trips than those who do not have disabilities.

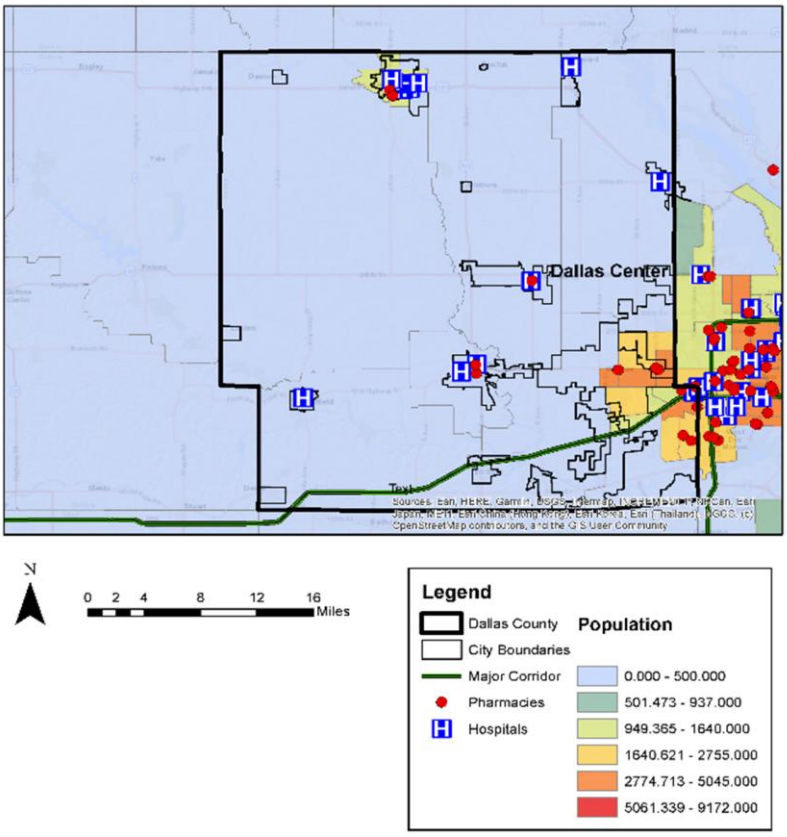

Figure 6. Health Connector Service Area (Source: HIRTA Team)

2.2.1 HIRTA

HIRTA provides demand response public and human service transportation using a total of eighty-seven (87) fully accessible vehicles with now 51 staff members (previously 90, prior to the COVID-19 pandemic) to meet regional service needs. HIRTA also provides customers with out-of-area medical services to the University of Iowa Medical Clinics in Iowa City, IA and to various locations within the Des Moines metro area. HIRTA's service area ranges from counties with 554 square miles to the largest covering 730 square miles and serving county populations from 16,013 to 97,502, who have experienced a range of change from a decline of 0.36% to an increase of 30.71%.

Services under discussion on this project are demand response only, not complementary ADA paratransit, as HIRTA does not operate ADA paratransit. This section presents an overview of current business processes for service registration, trip reservations, scheduling, dispatching, trip management, payments, cost allocation, and billing. HIRTA uses tools provided by Via for vehicle and central management/transportation management system functions. Figure 7 provides an overview of a typical process used in a trip life cycle. The same process is utilized for both healthcare and non-healthcare trips.

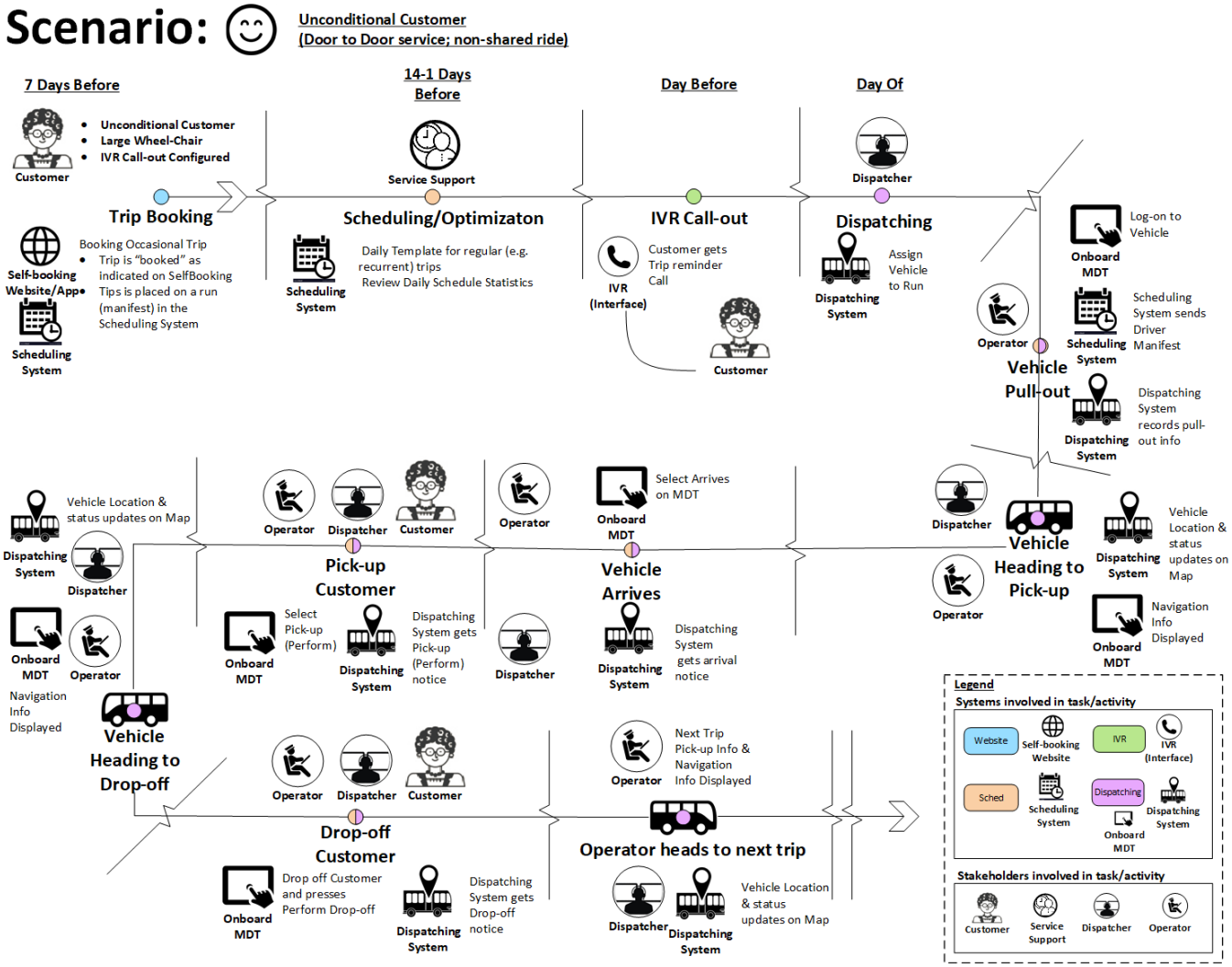

Figure 7. Typical Scheduling and Trip Delivery Flow (Arcadis IBI Group)

- **Customer Registration**: Prior to booking of trips, all customers are required to be registered within the Via system. This can be done by customers calling in to the call center or by using the Via app. Currently, the majority of the customers call in, as HIRTA is working towards the adoption of mobile app. As part of customer registration, a member of the HIRTA call center staff creates the customer profile and registers all their travel preferences (e.g., home address, contact information, mobility aid needs, point of interest locations, notification preferences). The customer profile also allows HIRTA to assign applicable funding sources (e.g., Medicaid) for a customer and to note expiry dates.

- **Reservation:** HIRTA mostly allows advance booking and customers can book trips up to 1-14 day in advance. Customer details from their profiles are automatically populated when booking trips. Pick-up/drop-off times are confirmed in real-time when trips are being confirmed. A 20-minute (+/-10) window is used for pick-up, and customers are required to be ready 10 minutes prior to the pick-up time. While not encouraged, HIRTA occasionally accommodates same day reservations.

- **Scheduling:** Schedules are finalized the day before. Via allows configuration of various parameters that are applied to optimize the schedule.

- **Manifest Building/Runcutting:** Once the schedules are finalized, vehicle manifests are created and pushed to vehicles wirelessly. These manifests include information on customer ID, name, pick-up /drop-off locations, time of pick up, any mobility aid (and/or driver assistance) needed and required fare payment.

- **Dispatching**: Drivers access electronic manifests using on-board tablets after vehicle pullout and logon. The size of the manifest visible to drivers is configurable. Drivers perform pick up and drop off of customers by using turn-by-turn navigation. Dispatchers have the capability to view real-time location of vehicles and can communicate with drivers in real time using voice (two-way radios) and data communications (canned messages). Dispatchers can also adjust manifests (add/modify/delete trips) as necessary. Dispatchers also manage the no-show process per HIRTA policy if a Traveler is not available for pick-up per time and location in the manifest.

- **Cost Allocation and Billing**: In a shared ride scenario, when multiple riders funded by separate funding sources may be riding the vehicle, HIRTA performs cost allocation so that funding sources are billed appropriately. Billing is conducted based on billing rules as configured in the system by funding source.

- **Customer Tools:** Customers have access to various self-service tools through the HIRTA on demand app provided by Via for booking trips, accessing details for upcoming trips, finding out real-time information on trips in progress. Via also provides payment management through Braintree, which allows HIRTA to maintain a cash account on behalf of customers within the Via system. It allows HIRTA to deduct appropriate fare amount once a trip is complete for a customer. Customers can pay cash or check to drivers on-board to replenish the account.

2.2.2 HIRTA Travelers

While HIRTA is fully ADA compliant and has adopted LEP and Title VI plans to meet the needs of underserved groups, challenges still exist, as discussed further in Section 2.1.2 and 3. There is also a need to reduce the administrative burden on health navigators and to facilitate increased efficiencies and enhanced access to health services. These are not to be construed as challenges with current HIRTA operations but as opportunities to enhance the experience for customers seeking transportation services for their medical appointments.

Dallas County was selected as a pilot area for this project, since population growth, proximity to the Des Moines metro, and unique public health program services available in Dallas County stood out as key determining factors. While the southeastern corner of Dallas County is part of the Des Moines metro (Waukee and West Des Moines) most of the county is rural, including Perry with a population of 7,599 people (2019 estimate). Rural areas have unique challenges; Dallas County hospital has reported instances of cancer patients walking through corn fields to get to treatment and women crossing the four-lane highway, with no controlled intersections, to get to prenatal care appointments.

Underserved groups served by HIRTA represent persons with different types of disabilities (e.g., physical and/or intellectual). For persons with low income, there are many challenges such as disparities among low-income rural residents versus low-income metro residents; fewer transportation providers in rural areas, contributing to longer trip length and higher costs; and limited access to internet services, among other others.

Persons with LEP have additional barriers in accessing transportation; HIRTA has an LEP plan and is actively working to enhance access to translation services for the community and to increase outreach efforts.

Section 2.2.1 provides an overview of how HIRTA manages its operations and the tools that are used. For medical transportation-related trips, the typical process from the Traveler perspective is as follows:

- **Booking:** The process for booking differs for Medicaid and non-Medicaid trips as follows:
    - Medicaid Trips: As further explained in Section 2.2.3, Medicaid trips are initiated within a system developed by Access2Care, the State of Iowa Medicaid broker. A Traveler/member reaches out to Access2Care via phone, through their website, or via membership app to request transportation after the medical appointment is confirmed. These trip requests are shared with HIRTA through an Access2Care web portal, where HIRTA can accept or turn down the trip requests.
    - Non-Medicaid Trips: Once the medical appointment is confirmed, customers call HIRTA to book their transportation appointment, following the process described in Section 2.2.1 for registration and reservation. Customers also have access to the app provided by Via, but utilization is currently low.
- **Trip Status Updates:** HIRTA Travelers are notified of upcoming trips the day before via IVR, email, or text messages, as subscribed. Currently, there are limited tools to provide trip status updates in real time in an automated way, but customer service

representatives can provide updates when they receive an inquiry. Also, Travelers can use the Via app to find out trip status information.

- **Payments:** Payments are made by Travelers on-board using cash, check, tickets, or mobile app. As part of Via's Braintree payment system, HIRTA also maintains a wallet for Travelers within the Via system attached to Traveler account. Those wallets can be replenished by providing cash or check to drivers or by visiting customer service center. Travelers, if they prefer, can also use credit/debit card to replenish their accounts.

Currently, there are no tools for wayfinding other than physical signage to guide Travelers indoors and outdoors in and around the medical facilities.

2.2.3 Access2Care

At the time that Health Connector's concept was developed, Access2Care was the only state-wide broker of non-emergency medical transportation (NEMT) funded by State of Iowa Medicaid. In late 2022, MTM was added as a second broker. The HIRTA team will include MTM in stakeholder conversations as relevant, but the main focus for Health Connector will continue to be on more efficient integration with Access2Care. Access2Care works under contract to Iowa Total Care, a managed care organization for the State of Iowa. The NEMT services are for members with full Medicaid benefits, who need travel reimbursement or a ride to get to their medical appointments. Access2Care works with various service providers in the HIRTA service area, including HIRTA.

Access2Care requires that all trips that are Medicaid-eligible are booked through their system. Once the trips are scheduled, Access2Care makes trips available to service providers such as HIRTA for service delivery 24 hours in advance. HIRTA dispatch staff check for those trips on a daily basis as part of their routine, as no automated alerts are received after trips are assigned. For late notice (same day or afternoon before), Access2Care calls HIRTA to confirm if HIRTA has the any availability to provide new trips.

Once the trips are assigned to HIRTA in the Access2Care system, at that point, HIRTA enters those trips into the Via system and manages those as any other type of trips. Once the trips are completed, HIRTA enters the details in the online portal provided by Access2Care. Medicaid trips make up about 20% of HIRTA's total trip volume.

For Medicaid participants, whether enrolled in traditional (fee-for-service) or managed care, transportation is centralized through Access2Care, but there are specific practices and procedures that need to be followed. There can be issues around the need to ensure that an eligible person is receiving allowable care or services from an approved provider, and challenges around what to do if proper procedures are not followed, even if the transportation would otherwise be eligible.

2.2.4 Dallas County Health Department/Health Navigators

Health navigators work with residents directly, helping identify resources to help meet resident health needs. Access to transportation for healthcare needs is one of the topics addressed by health navigators; they help residents connect with HIRTA or other providers in the area. In some cases, they help with booking and also follow up on appointments. Their association with residents seeking health navigation services is generally short and may last up to 8 weeks.

DCHD has built and maintain an Access database of residents seeking services. DCHD can track the needs and referral services provided to measure outcomes of services provided. Based on the most recent survey of Dallas County residents, DCHD has reported that transportation is 6th most common need experienced by their clients after food, health, housing, behavioral health, and utilities. Transportation is a barrier to access other needs beyond just healthcare, however, it is an indicator of challenges transportation presents to Travelers seeking healthcare. Based on stakeholder discussions, transportation is a barrier in most cases due to limited number of cars per household, limited affordability for transportation options such as taxi and TNC and limited services from HIRTA.

2.2.5 Healthcare Operations

Health Connector intends to integrate medical appointment and transportation booking experience. Customers currently have to separately contact HIRTA after medical appointment is booked with a healthcare provider. If they have to modify the medical appointment, it requires contacting HIRTA again for making adjustment in their transportation plans. Also, often times, return trips are not scheduled for healthcare trips due to uncertainty in the completion time for certain medical appointments (e.g., dialysis, prenatal care). This presents challenges for HIRTA since HIRTA has limited capability to accommodate same day reservations. Given this, Travelers have to rely on family or friends or make arrangements using unaffordable transportation means (e.g., taxis, TNCs). Some healthcare providers have mentioned that they have compassionate funds that can be used towards funding transportation for travelers in-need. However, currently, HIRTA does not have access to those funding sources.

The HIRTA project team has been exploring efficient methods to automatically and securely exchange medical appointment records for customers which will include date, time and location of appointment along with some type of personal identifier. Some healthcare providers store such information in the Electronic Health record (EHR) system for all patients while others use separate systems for in-patient and out-patient cares and out-patient appointment may not be in an EHR system.

Caregivers and social works/health navigators at DCHD or those affiliated with healthcare providers can also book appointments and/or find out the status of appointment on behalf of customers they are working with. This requires signing off an information release authorization given health/privacy related data is involved. DCHD and healthcare providers have their separate processes for establishing such agreements.

For this proposed deployment, the HIRTA project team is partnering, at varied levels of engagement, with the following healthcare service providers:

- **Dallas County Hospital**: Located in Perry, Iowa, Dallas County Hospital is a 25-bed private care facility and is associated with MercyOne, another hospital located in West Des Moines. Along with common care, Dallas County Hospital also provides specialized healthcare services such as radiology including mammography, chemotherapy, surgical, lab services and therapy services.

  Dallas County Hospital currently uses a spreadsheet for scheduling appointments and will be transitioning to Epic between 2025-2027.

- **MercyOne Hospital**: MercyOne is located in West Des Moines and is a full-service private hospital providing a range of care to the residents of Dallas and surrounding counties. MercyOne uses Epic EHR.

While physical signage is installed, based on the discussions thus far, none of the healthcare facilities provide a technology-based wayfinding solution to guide their customers when they are trying to locate offices within the same facility or within a nearby facility where customers may get referred to for a follow-up care.

2.3 Current System Stakeholders

Primary stakeholders in the context of this project refer to the following:

- Customers seeking HIRTA services for medical appointments.
- Call center and operations staff (e.g., customer care, drivers, dispatchers) at HIRTA responsible for using the system for reservations, scheduling, dispatching and administrative needs, including performance measurement.
- Community health partners, call center and reservations staff and other relevant staff at healthcare facilities using the system for coordinating medical and transportation appointments and performance measurement.
- Referral entities and health navigators, who connect customers with potential healthcare providers and transportation providers.

A full list of HIRTA/Dallas County stakeholders (also part of the proposed deployment) are shown in Figure 8.

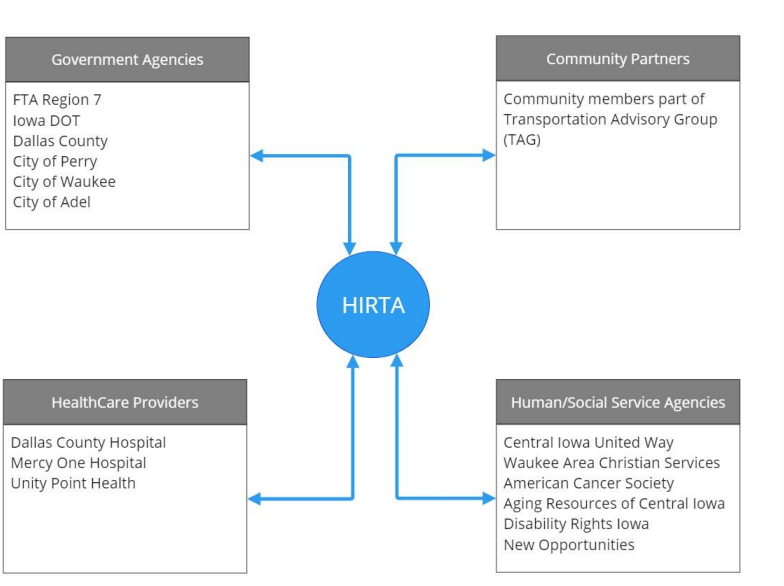

Figure 8. HIRTA Stakeholders (Source: HIRTA Team)

2.4 Support Environment

As stated earlier, HIRTA utilizes Via software for all transportation management needs. This system is hosted by Via. HIRTA has a maintenance contract with Via to support installed systems.

Day-to-day IT needs related to email servers, workstations, telephone systems, computer networking are provided by HIRTA's IT staff.

HIRTA vehicles are also equipped with two-way radios. These radios are used for communication between drivers and dispatchers when electronic communication may not be possible due to network or communication failure.

All facilities are leased or owned by another party. In some areas HIRTA has indoor bus parking, however in most communities' buses are stored outside and office space is limited or non-existent.

2.5 Modes of Operation for Current System

Different modes of HIRTA operations are reflected by current policies addressing trip delays or adverse weather conditions as reflected by the following processes/operating policies:

- **Normal**: In normal mode, the following capabilities exist:
    - HIRTA staff is able to use all functions within the Via software as installed.
    - Drivers can perform manifests and are able to communicate with the HIRTA operations staff.
    - Via system can provide customer-focused functions which include real-time information on trips and automated notifications on trip status and vehicle arrival status.
- **Degraded/Delayed Vehicles:** HIRTA vehicles experience the same traffic and weather conditions as the rest of the commuting public. Occasionally, their buses may be late for a pick-up. If the vehicle has not arrived by the end of the 20-minute (+/- 10 min) pick-up window, customers are advised to contact the office and they will be advised of the expected time of arrival.
- **Server or Communication Failure:** Occasionally servers that host Via applications may fail disrupting operations. Also, issues with carrier network may disrupt communication between central system and vehicles which will impact HIRTA's ability to automatically find out trip status. In this scenario HIRTA would rely strictly on paper manifests and two-way radios.
- **Emergency/Adverse Weather:** HIRTA will make every effort to provide service, however in the event extreme weather conditions exist and make travel unsafe, HIRTA reserves the right to discontinue services until conditions are more favorable. If service is temporarily discontinued, all rides, regardless of trip purpose, may be cancelled.

  HIRTA will place cancelation announcements on television stations KCCI and WHO, as well as on our website and social media outlets. HIRTA also notifies customers via channels of their preference of a service is cancelled using phone/IVR, email or text message.

  The following may occur when hazardous road conditions exist:

- Travel time may increase.
- Some trips may be cancelled, or service hours shortened.
- Bus service may be cancelled on non-plowed or un-sanded roads.
- Bus is not allowed to travel on alleyways.
- In case of severe weather, all customers may be taken home immediately.

2.6 Current Operational Policies and Constraints

2.6.1 HIRTA

Applicable operational policies and constraints for HIRTA are listed below:

- **Hours of operation:** Currently, HIRTA's services are available 7AM-5PM Monday through Friday.
- **After hours services:** Currently, there are no services to assist customers looking for services beyond regular hours.
- **Coordination with healthcare providers:** HIRTA coordinates with healthcare providers and health navigators when serving customers that have requested trips for medical appointments. All these coordination activities are conducted via phone or email.
- **IT-related policies:** Given the scale of operations, HIRTA's IT policies are basic in scope and are related to email and internet security. Current Via-provided systems are vendor-hosted and follow strict policies as outlined by the hosting data center and data security and privacy policies per HIPAA.
- **Staffing:** Current staffing includes administrator, business development manager, customer care staff, operations and safety staff, accounting staff, marketing/outreach staff, and maintenance staff.
- **Budget/financial constraints:** Like all transit systems, HIRTA funding does have limitations. On-going support fees collected from partners will be established during Phase 3.
- **Service level agreements (SLAs):** No relevant SLAs currently exist.

2.6.2 Healthcare Providers

Constraints and changes to operational policies as applicable to healthcare providers are listed below:

- **Hours of operation:** When there is a change in healthcare provider service hours for non-emergency visits, HIRTA is not currently notified directly.
- **Staffing and coordination:** HIRTA coordinates with dedicated social worker and health navigator staff at healthcare facilities. However, this process involves some manual coordination and communication can be cumbersome at times.
- **Tracking transportation access and missed appointments:** Currently, there is limited capability in linking missed appointments with transportation access and subsequent impact due to lost patient opportunities.

3 Justification for and Nature of Changes

This section provides a description of limitations in the current systems in use at HIRTA for transportation and wayfinding related stakeholder needs for their medical trips. Subsection 3.1 summarizes necessary changes in the way current tools function and fall short in meeting user needs. Subsection 3.2 lists the user groups and actors that will interact with the new system and 3.3 lists needs relevant to those users along with priorities. Subsection 3.4 summarizes alternatives considered but not included and subsection 3.5 lists relevant assumptions and applicable constraints.

3.1 Justification of Changes

Figure 9 provides an overview of current and planned traveler experience. In current environment, travelers connect with individual organizations separately through the customer engagement channels (e.g., phone, email, website, smartphone app) made available to them by those organizations. For example, separate phone calls or email communications are required to book medical and corresponding transportation appointments. There may also be a need to coordinate with the funding source to understand if the traveler's eligibility is valid for utilizing the funds for paying for transportation. Therefore, often times, a single medical appointment may require connecting with multiple entities. Also, in the event of an appointment modification, multiple follow-ups may be needed. Health Connector will help to streamline customer engagement channels associated with different parties and will help them communicate with customers through an integrated system. This diagram summarizes the needs and discussions we have had with stakeholders through a series of focus group meetings and one-on-one interviews.

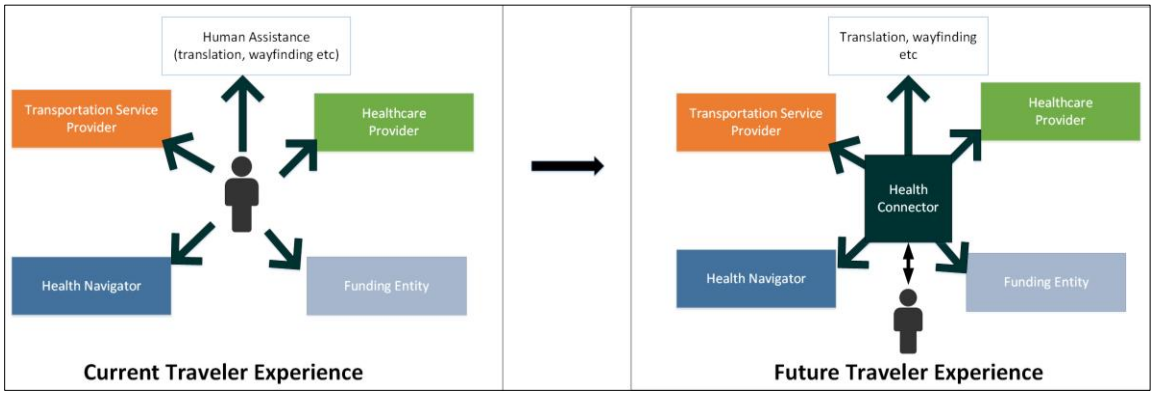

Figure 9. Comparison of Current Customer Experience and Future Experience (Source: HIRTA Team)

Overall, based on stakeholder discussions, the unmet needs can be summarized as follows:

- **Lack of awareness about available transportation options:** One of the major factors limiting access to transportation is Travelers having limited information about options beyond personal (or arranged via family/friends) transportation for medical trips. Health Connector will provide a platform that will allow customers to explore availability of HIRTA and its partner vehicles through a "trip planning/discovery" feature within Health Connector.
- **Lack of integrated booking and trip management experience**: The planned Health Connector deployment concept addresses a longstanding need to integrate transportation and healthcare scheduling, management, and day-of services monitoring functions for the ultimate "one stop" experience for all Travelers for their mobility needs, with a specific focus on underserved populations. This solution will help Dallas County residents who are not able to make their medical appointments due to lack of access to transportation; they will be able to explore their options and book and manage a ride at the schedule of their choice.
- **Challenges in meeting the needs of underserved groups:** The key challenges relevant to transportation access to healthcare services in the context of HIRTA services are as follows:
    - Return trip is a major issue for all groups, since the end time for appointments cannot be accurately determined ahead of time. HIRTA tries to accommodate customers' requests for same day service, particularly for return trips, but due to limited driver/vehicle and financial resources, it is not possible to address the needs of all customers. Sometimes customers do not want to be on the same vehicle with others, which creates additional burden on resources and capacity to provide single ride transportation.
    - DCHD health navigators spend a lot of time and resources, often arranging multi-party calls, given the lack of access to consolidated information (funding eligibility, transportation availability, healthcare service availability) from a single tool. While most underserved groups are affected due to this limitation, persons with LEP need the most assistance and are severally impacted.
    - HIRTA currently offers services in limited hours, which does not meet the needs of many Travelers who may be interested in using HIRTA vehicles but are unable to use HIRTA to make their appointments. HIRTA has plans for providing services through third-party service providers for Travelers' after-hours needs.
    - Some people are not aware of HIRTA, or they do not take it because of the fee (e.g., $5.00 one way).
    - Most of the customers that Iowa Health and Human Services (HHS) works with are on Medicaid or Medicare. Also, the elderly groups are on Supplementary Security Income (SSI) and getting Medicaid, which covers some part of the transportation. However, Medicaid has very strict requirements as to what qualifies, and if a trip does not qualify for coverage, that could be a barrier that prevents the customer from making the trip. When customers are not eligible for Medicaid, HIRTA coordinates with funding partners and health navigators to determine if other funding sources are available for healthcare trips.
    - Older adults have identified lack of comfort with the use of smart devices as a major issue and have expressed a preference for devices with larger font specifically designed for older adults (e.g., Grand Pad). However, those devices have limited

functions. Applications to be used by older adults must have the ability to adjust user experience by utilizing accessibility functions either available in the operating system or supplemented by built-in advanced capabilities within the application. Also, extensive training will be required so older adults are self-reliant in using the capabilities offered by Health Connector. To increase usability for populations that are not tech-savvy, it will be most helpful to make the system design as simple as possible and with larger fonts. In addition, the team will continue to take into account user feedback as the app is rolled out to ensure the design is user-friendly and addresses the needs of all users.

- Persons with disabilities have limited mobility options when booking transportation, due to lack of accessible vehicles or those that can accommodate mobility needs such as walkers, oxygen tank, service animals, and others. All HIRTA vehicles are accessible but commercial vehicles (e.g., taxis or TNCs) provide a limited fleet of accessible vehicles.
- Third-party drivers need to understand how to assist persons with disabilities should they need assistance when using Health Connector. HIRTA should work with third-party providers to ensure they receive proper training and understand the needs of these individuals.
- Even at smaller facilities, wayfinding is an issue. Customers may have their first appointment on one side of facility and a second on another side, but they may not remember to share this information when booking a trip. Drivers typically must coordinate with dispatchers to find the out exact pick-up location.
- Customer experience during initial trips is critical. If a customer has a long wait or services were not available when needed for an appointment, customers are likely to prefer other transportation options. Most trips are on time, but when there are delays, the experience may prevent customers from trying the service again.
- The customer's ability to pay for trips is a major barrier. While HIRTA services are offered at a fixed low fare for customers that are covered by external funding sources, many low-income customers may still not be eligible for those services, due to the income criteria established by those programs (e.g., Medicaid). Also, low-income populations may rely on cash if they do not use banking and financial institutions.
- Persons with LEP may prefer to have someone accompany them for medical appointments so they can be helped. They may not use the tools and services available (e.g., translation service) as may not feel comfortable.
- Helping customers get where they need to create an additional cost to hospitals at times. While hospitals may have affiliated social workers and health navigators who help customers find transportation services, the process of registering and booking trips creates an administrative burden, due to a largely manual process. Also, healthcare providers have only limited funds available to help customers who may not have funds to pay for services arranged. One healthcare provider mentioned that coordination for follow-up care, coordinating the time and availability for the patients and the provider, educating the patient on their options, and communicating with the provider ends up being a time-consuming process for healthcare professionals.

  - Healthcare customer coordinators currently rely on manual methods (e.g., phone calls, emails, in-person coordination, spreadsheets) to assist customers who may be looking for transportation services. They would prefer electronic capabilities as conceived within Health Connector, particularly real-time information on transportation services.
  - Many customers live in rural areas where broadband access is lacking, unreliable, or insufficient. Also, the expense of data plans may limit the ability of low-income populations to use applications that may require extensive data bandwidth (e.g., feature-rich map interface).

- **Limited capabilities with current transportation modes**: Apart from HIRTA vehicles, there are limited modes that can meet the needs of underserved groups related to visual, hearing and learning disabilities, language barriers, and other limitations. The proposed project deployment will be universally designed to meet the needs of all Dallas County's underserved population, including persons with disabilities, low income, rural, older adults, veterans, and persons with limited English proficiency. As needs vary by the individual, underserved citizens may qualify for one or more these subgroups (i.e., the person may be an older adult who lives in a rural area, is a veteran, or has physical limitations).
- **Limited wayfinding capabilities:** Another missing link in medical transportation has been wayfinding both for locating the vehicle on arrival or wayfinding/navigating to the correct destination inside a facility upon arrival. Health Connector will provide a seamless outdoor and indoor wayfinding experience from the same application.
- **Same day reservation and service capacity issues:** HIRTA typically does not provide same day reservations. Uncertainty with return trips may often generate a need for same day booking or modifications, creating capacity challenges in meeting customer demand. Health Connector will augment capacity through a seamless integration with taxi, TNC, and other non-dedicated service providers (NDSPs). Please note that these services are expensive and will have to be subsidized so the Traveler share is comparable to the use of other HIRTA services. HIRTA will be invoiced by NDSPs on a monthly basis for trips successfully performed.
- **Limited coordination among different organizations:** The proposed deployment seeks to further integrate the operations and services provided by HIRTA, DCHD, and the Dallas County healthcare community by providing them access to the transportation booking and real-time service information tools to maximize outcomes for the community and reduce the level of manual coordination by phone calls and emails. Access to these tools will also allow tracking of any missed medical appointments caused by lack of access to transportation.
- **Data sharing and reporting:** Currently, healthcare providers, DCHD, and HIRTA do not have any ability to share data or report on booking and delivery of medical trips. HIRTA has those trips captured within their transportation management system (TMS) provided by Via, but there is not enough data to analyze health outcomes of those trips. Health Connector will allow tracking of medical and transportation appointment related data (e.g., appointment date, time, and location by a customer identifier) by healthcare partners so DCHD, HIRTA, community partners, funding entities, and government partner agencies are able to monitor the impact of improved transportation access while protecting the privacy of individuals requesting trips. All data collection and sharing will be conducted per the approved process

from the Institutional Review Board (IRB) at the Iowa State University (ISU) as documented in the Phase 1 and Phase 2 Data Management Plan.

3.2 Description of Desired Changes

Health Connector was conceived to solve the most pressing issues that act as barriers to providing safe and efficient transportation to customers seeking healthcare services within Dallas County but do not have access to transportation. The design of Health Connector is driven by the user needs identified during Phase 1. These needs serve as the basis for the systems engineering process that includes concept of operations development, requirements definition, design, deployment, and testing. It is critical to identify all user and stakeholder needs for the overall success of the project.

'Users' in the context of this project refer to the following:

- Customers seeking HIRTA services for medical appointments due to lack of transportation access or their inability to drive themselves ('Travelers').
- Call center and operations staff at HIRTA responsible for using the system for reservations, scheduling, dispatching and administrative needs, including measuring of project outcomes.
- Community health partners, call center and reservations staff, and other relevant staff at healthcare facilities using the system for coordinating medical and transportation appointments and performance measurement.
- Referral entities and health navigators, who connect customers with potential healthcare providers and transportation providers.

3.2.1 User Groups and Actors

This section describes the different user groups or actors who will interact with the system. The user group represents responsible parties for performing an activity or supporting a business function related to the customer journey as part of their complete trip. This includes activities conducted pre-trip (e.g., referral, discovery, planning, booking), during the trip (e.g., boarding, payment, customer information), and after the trip (e.g., return trip booking, follow-up appointment booking, trips to pharmacies).

Table 2 provides a list of user groups used for the proposed deployment.

Table 2. HIRTA Health Connector User Groups

Organization	User Group	Abbreviation	Short Description
DCHD	Health navigators	HNV	Refers to the employees of the Dallas County Health Department (DCHD) who connect customers/patients with healthcare providers and HIRTA (or other transportation service providers) by providing information and referral services.

Organization	User Group	Abbreviation	Short Description
DCHD	Health administrator	HAD	Dallas County Health Commissioner (or individuals in similar role) responsible for wellbeing of the community. Users of the system for measuring performance and health outcomes.
HIRTA	Trip scheduler	SCH	HIRTA staff who processes customer requests and schedules rides.
HIRTA	Transportation operations staff	OPS	HIRTA staff who assigns trips to vehicles, monitors trips, coordinates with drivers in real time (e.g., their ability to perform additional trips, assisting to find origin or destination locations, help resolve no-show or cancellation) and makes reassignments if necessary. At times, this process may also be fully automated and performed by the dispatching algorithm (e.g., TNC that may be used as third-party provider for real-time trips include algorithm that does dynamic ride-matching with available driver pool without manual interaction).
HIRTA	Customer service staff	CSR	Refers to HIRTA customer service staff who responds to Travelers' requests for all aspects of their trip experience beyond trip booking/modifications.
HIRTA	Driver	DRV	Refers to HIRTA or contractor employees who pick up and drop off customers for their requested trips. There are no major changes expected for drivers as part of this implementation, but relevant needs are documented.
HIRTA	Administration	ADM	HIRTA staff responsible for administrative functions such as verification of trip data, cost allocation, third-party billing (e.g., to funding sources), accounting and reporting. Most of this process will not change but certain flows are planned to be automated (e.g., interface with Medicaid).
Contractor	Third-party service provider	CTR	Refers to contractors that may work with HIRTA in the future to provide services when HIRTA does not have the capacity through its own fleet.
Healthcare Partner	Healthcare customer care staff	HCR	Healthcare staff who take calls and intake customer request for medical appointments. Customer care staff may do other coordination related to medical appointments as well.

Organization	User Group	Abbreviation	Short Description
Healthcare Partner	Healthcare operations staff (e.g., customer care, nursing, community health partnership)	HOP	Staff that is responsible for interacting with customer on check-in and check-out. Also, includes staff that interacts with HIRTA, DCHD and other community partners on behalf of patients related to their appointments.
Healthcare Partner	Community health partner	CHP	Staff that interacts with HIRTA, DCHD, and other community partners for improving experience for patients vising healthcare facilities.
Other	Traveler	TRV	Individuals, who are HIRTA clients and are requesting transportation services for their medical appointments. These services may be performed using HIRTA-operated vehicles or through HIRTA contractors.
Other	Patients	PTN	Individuals who may not be HIRTA customers but are looking for transportation services for their medical appointments, referral appointments or follow-up appointments or other medical needs.
Other	Referral agents	RFR	Individuals employed by organizations that connect the public to the providers according to their service requests. In this context services may be related to healthcare or transportation.
Other	Funding entity	FND	Organizations funding customer trips (e.g., Medicaid) that will interface with the system for automated billing and payment processing. This includes Access2Care.
Other	Community partners	CPS	Stakeholders representing underserved groups and who will help identify needs for the groups they are representing. They will interface with the system for measuring performance of the system in meeting health outcomes within their communities
Other	Government partner agencies	GPA	Refers to local and state government entities that partner with HIRTA, will help identify broad community-based needs (e.g., social determinants of health), and will use the system to stay informed on project outcomes
Other	MOD system	MOD	Refers to the MOD platform and supporting vendor staff.

Organization	User Group	Abbreviation	Short Description
Other	Wayfinding system	WAY	Refers to the wayfinding system and supporting vendor staff.
Other	Iowa State University	ISU	Refers to Iowa State University's Institute for Transportation (InTrans) and supporting staff.
Other	United States Department of Transportation	USDOT	Refers to the USDOT-managed public data portal.

Most user groups for the current systems will also be the users Health Connector. Figure 10 provides a mapping of user groups listed in Table 2 in the current system context. Arrows are labeled to show the type of information exchanged between different user groups.

As Health Connector is put into place, several of these user touchpoints will change. For more information on how specific user touchpoints change under the new system, please see Section 6.1.1

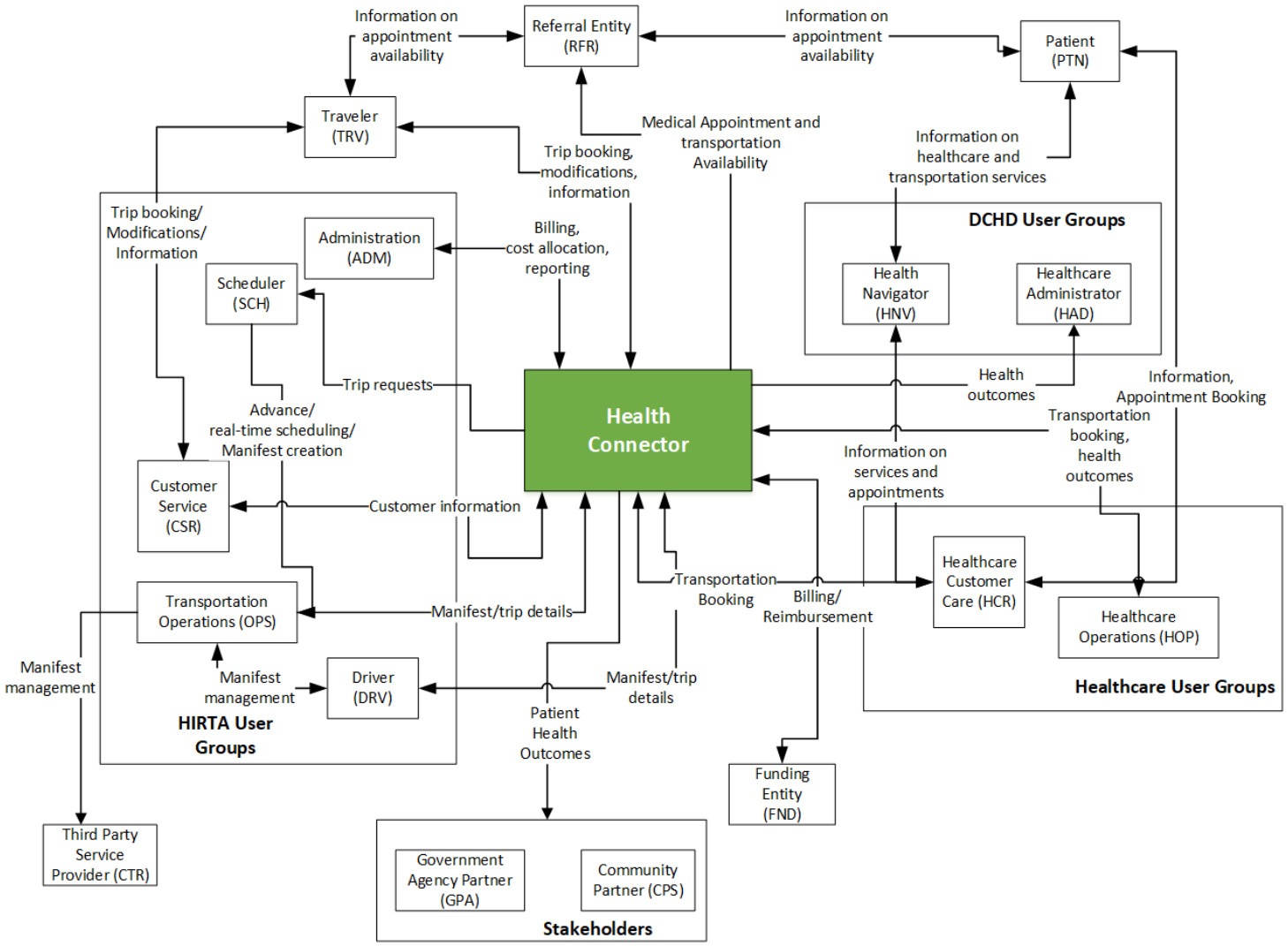

Figure 10. Health Connector User Group Touchpoints (Source: HIRTA Team)

3.2.2 User Needs Breakdown

The needs development process focused on the following:

- Needs are uniquely identifiable to ensure that they refer to a unique capability desired for the system.
- Needs must include a capability statement that call for a major feature that is desired in the new system.
- Needs should be technology- or solution-agnostic so subsequent steps of requirements definition and design are not tied to a specific solution.
- Needs statement must identify why a change is needed in the current capability of a system/solution.

A detailed process for defining user needs is provided in the Section 2 of User Needs Identification and Requirements Planning (UNIRP) document.

Table 3 provides a preliminary list of needs identified so far by User Groups. The table also identifies, based on stakeholder input, specific underserved groups that are related to a specific need. These groups include seniors (SNR), persons with disabilities (DIS), low income (INC), Limited English Proficiency (LEP), rural population (RLP) and veterans (VET).

Needs in the Table 3 are categorized as follows:

- **Essential needs.** Needs that must be provided by the new system.
- **Desirable needs.** Needs that should be provided by the new system.
- **Optional needs.** Needs that might be provided by the new system.

The initial prioritization was done by the project team based on the outcome of discussions at the focus group meetings and one-on-one stakeholder interviews. Further we validated these priorities with stakeholders during ConOps walkthrough and an online survey. HIRTA team recognizes that needs may vary by underserved group since a particular group may recognize a need as ‘essential’ while it may be ‘optional’ for others. To simplify the assessment, we have identified needs that are absolutely essential for a particular group and marked those as such in Table 3. Since the system will be designed for all population groups for “equally effective” experience, any desired feature relevant to a need and related to a specific underserved group will be addressed during requirements definition.

Further, the table identifies whether or not a particular need is met by the existing system in any capacity as follows:

- Fully Addressed (F): need is addressed in the current system but is identified here so the enhanced system still meets those needs.
- Partially Addressed (P): need is addressed in the current system in some capacity, but enhancements are needed.
- Not Addressed (N): need is not at all addressed in the current system.

Table 3. Health Connector User Needs

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-2	Registration for trip request	Travelers need to be able to register and request HIRTA for transportation services regardless of the approval status of their funding eligibility, so Travelers are not denied a trip.	P	Essential	X	X	X	X	X	X
TRV-3	Trip discovery	Even if Travelers are required to use another application for their medical trips (e.g., Access2Care for Medicaid), they need to be able to determine available transportation options for their medical appointment, so they are able to make appropriate arrangements per their preferences.	N	Desirable	X	X	X	X	X	X
TRV-4	Connect with referring entities (RFR)	Travelers need to be able to connect with referring entities (e.g., 211) if they are not aware of resources to contact for their healthcare and transportation services.	P	Desirable	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-5	Connect with health navigator	Travelers need to be able to connect with health navigators (HNV) if they are not aware of resources to contact for their healthcare and transportation services.	P	Desirable	X	X	X	X	X	X
TRV-6	Reduced reliance on smart devices	Travelers need to be able to arrange transportation for their medical appointments and obtain required information through smart device applications or equally effective alternate methods (e.g., call center, accessible smart device application) to address the needs of underserved groups that may not be comfortable with the use of smart devices.	N	Essential	X	X	X			
TRV-7	Addressing language barriers	Travelers with language barriers need to be able to arrange transportation for their medical appointments and obtain required information in a timely manner so they do not have to rely on human assistance for interpretation or translation services.	P	Essential			X			

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-8	Booking transportation for medical appointments at a facility of choice	Travelers need to be able to explore and book transportation for a medical appointment at a facility located outside their own community (but within the Dallas County) so they are able to be independent even if living in rural or remote locations.	P	Essential					X	
TRV-9	Reduce reliance on others for traveling to medical appointments	Travelers without access to personal transportation need to be able book transportation for their medical appointment so they do not have to rely on their friends or family.	P	Essential			X		X	X
TRV-10	Return-trip booking	Travelers need to have the ability to view transportation availability in real time so they can spontaneously modify their return trip if their medical appointment is delayed or ends early.	N	Essential	X	X	X	X	X	X
TRV-11	Booking for same day follow-up appointments	Travelers need to be able to book transportation for follow-up medical appointments the same day if needed at a partner facility, so they are able to address their follow-up care needs in a timely way.	N	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-12	Rebooking medical appointment	If Travelers have to modify their medical appointments, they need to be able to view the next available medical provider availability and transportation service provider availability at the same time without contacting multiple entities so they can book both appointments simultaneously.	N	Desirable	X	X	X	X	X	X
TRV-13	Telehealth appointments	Travelers need to be able to book telehealth appointment if advised as such by the healthcare providers since healthcare providers may refer Travelers to follow-up care services such as behavioral therapy and discussion on lab results that do not require in-person visits.	N	Optional					X	X
TRV-14	Personal companion to accompany	Travelers need to be able to book trips for themselves and for personal companions (PCA)/caregivers assisting them with their appointment in case Travelers have language barriers or are not able to make the trip independently.	P	Essential	X	X	X			

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-15	Booking trips with family members	Travelers need to be able to book trips for themselves and their family members (more than one person) if they want them to accompany them even if those trips are not covered by funding sources. This may be needed if Traveler does not have childcare support or if Traveler may have other situations that require more than one family member to travel with them.	P	Essential	X	X	X	X	X	X
TRV-16	Information on pick-up location	Travelers need to be informed regarding the physical location where they must board the vehicle.	N	Essential	X	X	X	X	X	X
TRV-17	Vehicle arrival notification	Travelers need to be provided advance notification about upcoming vehicle to pick them up or if there are updates to the pick-up time or location due to delays so they have enough time to get ready and meet the driver. In the event of delays, healthcare providers will be able to check on the Traveler's trip status through the online portal.	N	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-17A	Traveler feedback on arrival notifications	Travelers need to be able to confirm the pick-up time and location upon receiving the imminent arrival notification.	N	Desirable	X	X	X	X	X	X
TRV-18	Real-time location	Travelers need to be able to view real-time location of their vehicle so they can meet the driver at the correct location.	N	Essential	X	X	X	X	X	X
TRV-19	Boarding the right vehicle	Travelers need to be able to independently recognize and board the correct vehicle upon its arrival particularly when multiple vehicles may be arriving at the pick-up location (e.g., at a medical or senior center facility).	N	Essential	X	X	X	X	X	X
TRV-20	In-vehicle information	Once inside the vehicle, customers need to be informed about their trip progress without relying on drivers so they can take appropriate actions (e.g., notify doctor's office in the event of a delay).	N	Desirable	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-21	Wayfinding at the facility-outdoor	Travelers need to be able to locate the correct facility and entrance upon getting dropped off at the destination location without any support from any other individual.	N	Essential	X	X	X	X	X	X
TRV-21A	Wayfinding at the facility-indoor/floor levels	Travelers need to be able to locate the correct floor through appropriate access (e.g., elevator or escalator) without any support from any other individual.	N	Essential	X	X	X	X	X	X
TRV-21B	Wayfinding at the facility-indoor-offices	Travelers need to be able to locate a provider's office after arriving at the correct floor level without any support from any other individual.	N	Essential	X	X	X	X	X	X
TRV-21C	Wayfinding at the facility-inside offices	Travelers need to be able to locate appropriate customer care services, as needed prior to appointment, (e.g., check-in desk, information resources) within the provider's office upon arrival without any support from any other individual.	N	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-22	Notification to healthcare staff upon arrival	Travelers need to able to notify healthcare staff upon arrival so they are able to take any appropriate actions based on Traveler request.	N	Desirable	X	X	X	X	X	X
TRV-23	Return trip upon discharge	Travelers need to be able to book a return trip upon completion of check-out/discharge process if return trips were not booked earlier.	P	Essential	X	X	X	X	X	X
TRV-24	Trip modification due to referral	Travelers need to able to modify return trip for a different destination if a referral to another facility is provided.	P	Desirable	X	X	X	X	X	X
TRV-25	Trip modification due to an additional destination	Travelers need to be able to insert a new destination if they have to stop by pharmacy to pick up medicines or for other relevant travel needs to book a multi-legged trip.	P	Desirable	X	X	X	X	X	X
TRV-26	Real-time information on return trip vehicle	Travelers need to be able to stay informed about the progress of upcoming vehicle for their pick-up for the return trip.	N	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-27	Notification on pick-up location for return trip	Travelers need to be notified of the pick-up location for their return trip.	N	Essential	X	X	X	X	X	X
TRV-28	Wayfinding from provider's office to the pick-up location	Travelers need to be able to navigate to the pick-up location from the healthcare provider's office independently.	N	Essential	X	X	X	X	X	X
TRV-29	Boarding the correct vehicle for return trip	Travelers need to be able to locate and identify the correct vehicle for their return trip prior to boarding.	N	Essential	X	X	X	X	X	X
TRV-30	Trip payment	Travelers need to be able to pay for their co-pay amount for transportation after the trip completion by cash, check, ticket, or an electronic method, as preferred.	P	Essential	X	X	X	X	X	X
TRV-31	Payment methods	Travelers need to be able to use eligible funding source (e.g., Medicaid) for trip payment or pay out of pocket.	P	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
TRV-32	Discount coupons	Travelers need to be able to apply discount coupons as offered by HIRTA or participating entities (e.g., healthcare providers) to their trips to partially or fully cover the cost of their trips. Specific discount codes may have eligibility criteria that will be determined by providers, but all customers will be able to utilize such feature.	N	Essential	X	X	X	X	X	X
TRV-33	Maintaining debit account	Unbanked/underbanked Travelers need to be able to setup and maintain a prepaid cash balance account with HIRTA that they can debit for co-payments amount for a trip.	P	Essential				X		
TRV-34	Debit account replenishment	Travelers need to be able to replenish prepaid accounts by providing check or cash and without having to maintain a bank account.	P	Essential				X		
CSR-1	Traveler registration	If Travelers are not registered with HIRTA, CSR needs to be able to help customers with the registration process and guide them about applicable next steps.	F	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
CSR-2	Entry of Traveler details	As part of the registration, CSR needs to be able to add relevant customer details in their profile as necessary to book transportation for medical appointments.	F	Essential	X	X	X	X	X	X
CSR-3	Eligibility Traveler assessment	As part of the registration, CSR needs to be able to complete necessary eligibility assessment per requirements from funding sources.	F	Essential	X	X		X		
CSR-4	Eligibility type and details	CSR needs to be able to include details and type of eligibility (e.g., conditional or temporary) in the customer profile.	F	Desirable	X	X		X		
CSR-5	Assisting Travelers having difficulty with self-service tools	CSR needs to be able to assist Travelers who may be having difficulty using the self-service tools with all aspects of their trip. Difficultly may occur due to a variety of reasons (e.g., no internet access, disability issues, technical difficulties with the system).	F	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
CSR-6	Assist with future or same day trip	CSR needs to have the ability to assist Travelers for their travel needs on a future date or on the same day.	F	Essential	X	X	X	X	X	X
CSR-7	Assist with third-party contractor trips	CSR needs to be able to inform Travelers on vehicle arrival time, trip delays and any other status information for trips scheduled with HIRTA vehicles or with third-party contractors (CTR).	N	Essential	X	X	X	X	X	X
CSR-8	Assist with broker-coordinated trips	CSR needs to be able to inform Travelers on vehicle arrival time, trip delays and any other status information for trips even if trips are booked by third-party systems (e.g., Access2Care brokerage system).	N	Desirable	X	X	X	X	X	X
CSR-9	Contact Travelers	CSR needs to be able to connect with customers according to the method of their preference to follow-up at any point during their trip.	N	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
CSR-10	Contact healthcare partner	CSR needs to be able to find out the status of healthcare appointment at any given point until the trip is complete.	N	Desirable	X	X	X	X	X	X
CSR-11	Assist with translation needs	CSR needs to be able to assist Travelers looking for translation services.	P	Essential			X			
CSR-12	Override eligibility restrictions	CSR needs to have the ability to override if Traveler eligibility has expired for a funding source, so the trip is not denied.	P	Desirable	X	X	X	X	X	X
CSR-13	Review past trips	CSR needs to be able to view the recent trips taken by Travelers under a given funding source.	P	Optional	X	X	X	X	X	X
CSR-14	Review past no-shows	CSR needs to be able to view statistics on no-shows on record for the Traveler requesting for a trip.	P	Optional	X	X	X	X	X	X
CSR-14A	Review cancellation	CSR needs to be able to view statistics on cancellations on record for the Traveler requesting for a trip	P	Optional	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
CSR-15	Refer to other providers/referral services	CSR needs have access to information database to be able to connect/refer Travelers to another provider or a referring entity (RFR) if the request for Trip falls outside their jurisdiction so Travelers can contact them to make their own arrangements.	P	Desirable	X	X	X	X	X	X
CSR-16	Eligibility verification	CSR needs to be able to verify eligibility in real time with funding sources as needed so there are no delays in payments when the funding source is invoiced.	N	Optional	X	X				
CSR-17	Complaints Log	The system needs to be able to keep a record of complaints or commendations received from customers.	F	Desirable	X	X	X	X	X	X
OPS-1A	Driver and vehicle assignment	OPS staff needs to be able to assign trips to available driver and vehicle pool.	P	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
OPS-1B	Addressing service capacity issues	Operations (OPS) staff needs to be able to utilize contractor vehicles if HIRTA does not have the capacity to meet a Traveler's request with its own vehicles.	N	Essential	X	X	X	X	X	X
OPS-2	Availability of wheelchair accessible vehicles (WAV)	OPS staff needs to be able to assign non-ambulatory Travelers to wheelchair-equipped vehicles, either using HIRTA or contractor vehicles.	P	Essential		X				
OPS-3	Trip status	OPS staff needs to be able to view the status of trips in real time for both HIRTA and contractors-provided services.	P	Essential	X	X	X	X	X	X
OPS-4	No-show confirmation	OPS staff needs to be able to compare Traveler location against the pick-up location and/or vehicle/driver location to confirm no-shows reported by drivers. Alternatively, OPS staff needs to be able to contact Travelers to confirm no-shows reported by drivers.	P	Desirable	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
OPS-5	Medical appointment status	OPS staff needs to be able to find out any delays in a Traveler's medical appointment at any given point during the trip in the event a return trip time has to be adjusted.	N	Desirable	X	X	X	X	X	X
OPS-6A	Dynamic vehicle reassignment	OPS staff needs to be able to make dynamic vehicle reassignments in the event of a vehicle breakdown.	P	Essential	X	X	X	X	X	X
OPS-6B	Driver manifest management	OPS staff needs to be able to modify driver manifest in real time to insert, modify, or delete trips on the manifest and manage the capacity.	P	Essential	X	X	X	X	X	X
OPS-7	Connecting with healthcare customer care	OPS staff needs to be able to notify healthcare customer care (HCR) in the event of an anticipated delayed arrival of a vehicle for Traveler pick-up or drop-off.	P	Desirable	X	X	X	X	X	X
OPS-8	Communicating with drivers	OPS needs to be able to communicate with drivers at all times while they are actively performing a run using voice and data communications methods.	F	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
OPS-9	Arranging emergency medical transportation (EMT)	OPS staff needs to be able to arrange an EMT service in the event of a medical emergency during a trip reported by drivers according to the safety operational procedures as established by HIRTA.	P	Desirable	X	X	X	X	X	X
OPS-10	Addressing non-medical emergency	OPS staff needs to be able to monitor and address any non-medical emergencies reported by drivers according to the safety operational procedures as established by HIRTA.	P	Essential	X	X	X	X	X	X
OPS-11	Driver navigation assistance	OPS staff needs to be able to assist drivers with navigation assistance if requested.	P	Desirable	X	X	X	X	X	X
OPS-12	Assistance with translation service	OPS needs to be able to assist drivers with translation needs if requested.	P	Essential			X			
DRV-0	Terminal	Driver needs to have access to a terminal to communicate with the OPS staff in real-time.	P	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
DRV-1	Identifying customers	Drivers need to be able to verify that the customer boarding the vehicle indeed has a trip booked and has been assigned to their vehicle.	P	Desirable	X	X	X	X	X	X
DRV-2	Customer payment	If a co-pay is required for a trip, drivers need to be able to view the amount due and collect the payment from the Travelers.	F	Essential	X	X	X	X	X	X
DRV-3	No-show event	Drivers need to be able to view Traveler location when arriving at the pick-up location. In the event driver is not able to locate a Traveler, they need to be able to notify OPS staff accordingly to mark the pick-up as a no-show event.	F	Desirable	X	X	X	X	X	X
DRV-4	Communication with OPS	Drivers need to be able to communicate with OPS staff at all times during their runs using voice and data communication methods.	F	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
DRV-5	Reporting emergencies to OPS	Drivers need to be able to report medical and non-medical emergencies to OPS for a prompt action according to HIRTA's safety operating procedures.	P	Desirable	X	X	X	X	X	X
DRV-6	Navigation assistance	Drivers need to be able to get navigation assistance when driving to a Traveler origin or destination location.	F	Essential	X	X	X	X	X	X
DRV-6A	Wayfinding assistance	Drivers need to be able to use wayfinding capability to locate a Traveler if the turn-by-turn navigation does not provide detailed direction to the pick-up location (e.g., unmapped roads, indoor location)	N	Desirable	X	X	X	X	X	X
DRV-7	Translation services	Drivers need to be able to request translation service when serving a Traveler with LEP.	P	Essential			X			
DRV-8	Wheelchair status	Drivers need to be able to find out the actual functional status of wheelchair/lift using the on-board telemetry data so they can notify the OPS staff for vehicle swap.	P	Optional		X				

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
DRV-9	Trip status	Drivers need to be able to view the on-time status of the trips on their manifests at all times so they can take appropriate actions.	F	Desirable	X	X	X	X	X	X
DRV-10	Trip details	Drivers need to be able to provide any necessary details (fare paid, odometer reading) when trips are complete for reporting within the central system.	F	Essential	X	X	X	X	X	X
DRV-11	Delayed arrival	Drivers need to be able to notify OPS in the event of an anticipated delayed arrival at the medical facility so they can take appropriate actions (e.g., adjust appointment time).	F	Desirable	X	X	X	X	X	X
SCH-1	Advance scheduling	Scheduling staff needs to be able to conduct advance (batch) scheduling of trips and protect those schedules from changing (i.e., anchoring of trips for subscription trips).	F	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
SCH-2	Batch schedule optimization	Scheduling staff needs to be able to adjust parameters used for optimizing trip schedules to account for field performance of trips (e.g., actual dwell time, actual on-board time, actual travel time, street closures).	F	Desirable	X	X	X	X	X	X
SCH-3	Real-time optimization	Scheduling staff needs to be able to optimize trips in real time to be able to make better use of available resources.	P	Desirable	X	X	X	X	X	X
SCH-4A	Manifest Creation	Scheduling staff needs to be able to create a manifest for driver/vehicle assignments.	F	Essential	X	X	X	X	X	X
SCH-4B	Labor/work rules	Scheduling staff needs to be able to account for labor/work rule guidance when scheduling trips/runs.	F	Essential	X	X	X	X	X	X
SCH-5	Account for personal companion or family members	Scheduling staff needs to be able to account for requests where Travelers are looking to bring a personal companion or a larger group of family members.	F	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
SCH-6	Grouping of trips	Scheduling staff must be able to review and modify schedules for better grouping of trips to make the most of available resources.	F	Desirable	X	X	X	X	X	X
ADM-1	Trip verification	Administrative staff needs to be able to verify trip details using data reported in real time (e.g., fare paid, mileage).	F	Essential	X	X	X	X	X	X
ADM-2	Cost allocation	Administrative staff needs to be able to perform cost allocation when multiple sources may be used for funding different trips that are part of a driver manifest in a shared ride scenario.	F	Essential	X	X	X	X	X	X
ADM-3	Billing/invoicing	Administrative staff needs to be able to generate invoices based on preconfigured billing rules.	F	Essential	X	X	X	X	X	X
ADM-4	Electronic billing/invoicing	Administrative staff needs to be able to electronically bill funding sources if such capability is offered by a given funding organization (e.g., Medicaid).	P	Desirable	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
ADM-5	Electronic reimbursement	Administrative staff needs to be able to request electronic payment if such capability is offered by a funding source.	P	Desirable	X	X	X	X	X	X
ADM-6	System performance reports	Administrative staff needs to be able to run reports to measure system performance as defined per key performance indicators (KPIs) for this project.	N	Essential	X	X	X	X	X	X
ADM-7	Reports on project outcomes	Administrative staff needs to be able to run reports to measure project/health outcomes as defined per key performance indicators (KPIs) for this project.	N	Essential	X	X	X	X	X	X
RFR-1	Information resources	Referring entity needs to be able to identify healthcare and transportation services per request from Travelers.	N	Optional	X	X	X	X	X	X
RFR-2	Connecting with all parties	Referring entity needs to have access to information database for travelers (TRV), HIRTA customer service (CSR) and/or healthcare customer care (HCR) so they are able to contact them for Information and Referral services.	P	Optional	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
RFR-3	Measuring outcomes	Referring entity need to be able to document result of the referral activity by individual Traveler. This will help RFR staff document whether or not an attempt to connect a Traveler with services was successful.	P	Optional	X	X	X	X	X	X
HNV-1	Coordination with HIRTA and healthcare providers	Health navigator needs to be able to book and manage (e.g., modify, track trip status, cancel) transportation to medical appointments on behalf of Travelers.	P	Essential	X	X	X	X	X	X
HNV-2	Translation service request	Health navigator needs to be able to request translation service when working with Travelers with LEP constraints.	P	Essential			X			
HNV-3	Future appointment booking	Health navigator needs to be able to view future appointments for Travelers and book transportation service as needed.	N	Essential	X	X	X	X	X	X
HNV-4	Wait time	Health navigator needs to be able to find out the amount of wait time for a medical appointment upon Traveler's arrival.	N	Optional	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
HNV-5	Medical appointment status	Health Navigator needs to be able find out status of a medical appointment for Travelers.	P	Desirable	X	X	X	X	X	X
HNV-6	Medical appointment follow-up	Health navigators need to be able to follow-up with Travelers on the medical transportation experience.	P	Essential	X	X	X	X	X	X
HAD-1	Measuring outcome	Health administrator needs to be able to measure the outcome of health navigation services provided. HAD will focus on measuring if there is a provider that is able to meet the Traveler's needs. Also, they would like to measure the type of healthcare services for which appointment/ transportation is needed.	P	Desirable	X	X	X	X	X	X
HCR-1	Transportation booking by healthcare customer care	HCR staff needs to be able to view transportation service availability in real time to book transportation for Travelers lacking transportation access for return trips or future medical appointments.	N	Desirable	X	X	X	X	X	X
HCR-2	Single event or recurring appointments	HCR staff needs to be able to book both single event and recurring appointments.	N	Desirable	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
HCR-3	Disability needs	HCR staff needs to be able to identify any disability needs when booking appointments.	N	Essential		X				
HCR-4	Translation services	HCR staff needs to be able to request translation service when booking appointments.	N	Essential			X			
HCR-5	Booking transportation for patient referrals to new facilities	HCR staff needs to be able to book transportation for Travelers seeking transportation service for immediate/same-day referrals to another facility.	N	Desirable	X	X	X	X	X	X
HCR-6	Coordination with HIRTA	HCR staff needs to be able to coordinate with HIRTA customer service (CSR) as necessary.	N	Essential	X	X	X	X	X	X
HCR-7	Booking of multi-leg return trips	HCR staff needs to be able to book multi-leg return trip to account for trip to a referral facility or pharmacy.	N	Desirable	X	X	X	X	X	X
HCR-8	Tracking missed-appointments due to lack of transportation	HCR staff needs to be able to document patient no-shows as a direct result of transportation-related issues (unavailability, delays).	N	Desirable	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
HCR-9	Trip status	HCR staff needs to be able to view vehicle arrival status for a requested patient trip.	N	Desirable	X	X	X	X	X	X
FND-1	Billing	Funding entity needs to be able to receive electronic billing/invoicing if such capability exists (e.g., Medicaid)	P	Desirable	X	X	X	X	X	X
FND-2	Reimbursement	Funding entity needs to be able to reimburse for billed amount electronically if such capability exists (e.g., Medicaid).	P	Desirable	X	X	X	X	X	X
FND-3	Measuring outcome	Funding entity needs to be able to find out required reports as needed related to effective utilization of their funding program (e.g., number of no shows)	N	Desirable	X	X	X	X	X	X
GPA-1	Measuring outcome of grants and services provided to communities	GPA needs to be able to measure the outcome of grants funded or coordinated by them or for their communities.	N	Desirable	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
CPS-1	Measuring outcome for services provided to communities	CPS needs to be able to measure the outcome of health outcomes and other KPIs (to be determined) for the communities represented by them.	N	Desirable	X	X	X	X	X	X
SYS-1	Data collection	Systems needs to be able to collect demographic information through surveys or system logs without violating data privacy as defined in the Data Privacy Plan.	N	Desirable	X	X	X	X	X	X
SYS-2	Communication between users	System needs to be able to allow direct communication between users to avoid follow-ups through third-party channels.	N	Desirable	X	X	X	X	X	X
SYS-3	Data privacy	The system needs to be able to protect user information according to current regulatory requirements.	P	Essential	X	X	X	X	X	X
SYS-4	Secure access	The system needs to authenticate users prior to granting them secure access.	P	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
SYS-5	Safety	The system needs to be able to maintain safety for drivers and passengers during a Health Connector trip to minimize safety risks per safety scenarios defined in the Safety Management Plan.	N	Essential	X	X	X	X	X	X
SYS-6	Reliability	The system needs to be able to operate reliably at all times and according to the standard guidelines as set per the modes of operations.	N	Essential	X	X	X	X	X	X
SYS-7	Productivity	The system needs to be able to help HIRTA meet or exceed at least the current level of systemwide productivity.	N	Essential	X	X	X	X	X	X
SYS-8	On-time performance	The system needs to help in providing 95% on-time performance on average across all trips.	N	Essential	X	X	X	X	X	X
SYS-9	Resource management	HIRTA needs to be able to manage driver and vehicle resources.	N	Essential	X	X	X	X	X	X

Need ID	Need Area	User Need Statement	Addressed in Current System?	Priority	SNR	DIS	LEP	INC	RLP	VET
SYS-10	Data logging	HIRTA needs to able to keep a persistent record of data exchanged between various user groups and a record of trip performance.	N	Essential	X	X	X	X	X	X
SYS-11	Data sharing and reporting	HIRTA and its partners need to be able to obtain data and reports as authorized.	N	Essential	X	X	X	X	X	X
SYS-12	Wayfinding Infrastructure	System needs to be able to access infrastructure for accomplishing indoor and outdoor wayfinding functions	N	Essential	X	X	X	X	X	X
SYS-12A	Wayfinding central application	System needs to be able to manage in-field wayfinding devices/visual markers (e.g., Wayfinding Codes) and the associated data to provide advanced wayfinding solution.	N	Essential	X	X	X	X	X	X
SYS-13	Maintainability	The system needs to include modular components and subcomponents to allow troubleshooting, repair, and/or replacements.	N	Essential	X	X	X	X	X	X

3.3 Priorities among Changes

Please see Table 3.

3.4 Changes Considered but not Included

The following changes were considered but are currently not included:

- **Medicaid broker integration**: According to Access2Care, the Medicaid-funded trips must be booked via their member application. HIRTA then enters those trips manually into the Via system after receiving them from Access2Care. MOD-Medicaid Middleware will aim to simplify this process for HIRTA and Access2Care, but booking will not be integrated into a single app.

  Example use case - Medicaid/MCO: ***Traveler is approved to take Medicaid eligible trip, but they would like family to accompany them so can be helped. Outbound trip is 45 mins long so they may be looking to be dropped off at a friend's house so they can rest and arrange their own transportation later for ride home. Medicaid will pay for only eligible portion of the trip which will only cover Traveler's visit to the doctor's office.***

- **Direct integration with all healthcare partner systems:** Each EHR system requires a proprietary interface to accomplish data exchange with external systems. Given the complexity, at this time the HIRTA team is considering interfacing with Epic, which supports and has published open application programming interface (APIs). Other systems do not have published APIs using the same standard. The interface with EHR systems is limited to appointment data only and no health or privacy related information will be exchanged as part of the interface.

  Example use-case: A Traveler is looking to book an appointment for same day medical appointment and would like to be able to take HIRTA service to any hospital which is the closest.

- **Providing details such as wait time at hospital:** While we considered notifying Travelers of expected wait time upon arrival for their doctor's visit or other medical needs, we currently do not have any indication of availability of such data at hospitals.

3.5 Assumptions and Constraints

The following presents discussion of assumptions and constraints in advancing the system change scenarios presented herein.

Current system environment: The current system, as configured, is not optimized to be used for same day response trips. Also, some of the other capabilities needed for Health Connector, for example, engaging third party providers, are currently not configured. Further, Traveler access to real-time information is available through limited channels.

Complexity of Medicaid program: Medicaid trips are booked using systems provided by Access2Care, and the system determines the appropriate transportation mode, which may or may not be HIRTA. Also, given Travelers will be using two separate applications, the experience may not be seamless.

Smart device and data plans: Health Connector provides alternate methods but assumes that Travelers will be able to utilize smart devices using internet data plans to get the most benefit out of the proposed solution. Based on stakeholder discussions, while smartphone penetration is high (85%+), the senior population may not be comfortable with small devices and some may not have data plans that allow them to benefit from all of the features provided.

Fragmented nature of electronic health record (EHR) platforms: The heterogeneous nature of EHR platforms used by the Dallas County health community may present a challenge in developing an interface to better coordinate transportation booking and medical appointment booking.

Partnership with third party/non-dedicated service providers (NDSP): HIRTA will have to rely on NDSP vehicles (e.g., TNCs, taxis, volunteer drivers) if same day demand grows after the launch of Health Connector. However, there is limited pool of such providers in rural areas.

Training customers to use non-HIRTA vehicles: It was identified in stakeholder discussions that some customers (e.g., refugee population) may not be comfortable with vehicles that do not have the HIRTA logo. The training and outreach programs will have to address such concerns.

Wayfinding: Most wayfinding systems require a companion smart device. However, some of the underserved population (e.g., senior, LEP) may not be comfortable with that approach. Also, most wayfinding solutions require extensive installation of infrastructure (e.g., beacons or visual markers), which will require approval from healthcare partners.

4 Concepts for the Proposed System

This section provides a description of the technical concepts for the proposed Health Connector system, provides a list of stakeholders and actors, identifies the supporting environment, defines modes of operations, and describes operational policies and constraints.

4.1 Background and Scope

As summarized in Section 3 in the needs summary, the disconnect between healthcare and transportation systems impacts customer experience for those looking for transportation services for their medical appointments given, currently, those appointments have to booked and coordinated through separate phone calls or web transactions. Also, health navigators and social workers coordinating such transportation services on behalf of customers have to interact with multiple entities, mostly via phone or emails. Further, customers have difficulty navigating outdoors and indoors as part of their trip (e.g., finding vehicle on its arrival for pick-up, or finding the actual building after drop-off at the medical facility). Health Connector combines individual capabilities available within the HIRTA's transportation management system, EHR/medical record systems at hospitals, and a state of the art wayfinding system.

The high-level capabilities of Health Connector are described in Section 1.4. Figure 11 provides a context diagram of Health Connector, identifying the core subsystems and data flows between those subsystems. These subsystems are:

- **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, 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 System (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 of 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, 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. For a visual representation of their interconnections please refer to Figure 11.

- **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 pick up), 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. NaviLens is the commercially available wayfinding system that will be used to support this project.

- **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 TMS 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 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 currently 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 – Epic EHR, Epic EHR provides a publicly available API

        - Dallas County Hospital – Transitioning to Epic EHR
        - Other regional clinics – Veradigm 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 11 provides a system context diagram for HIRTA Health Connector along with data flows. Data flows are labeled according to the data ID used in Table 4 to provide the context for data exchange between systems and for data-related discussion (please see Data Management Plan (DMP) [5] for further reference).

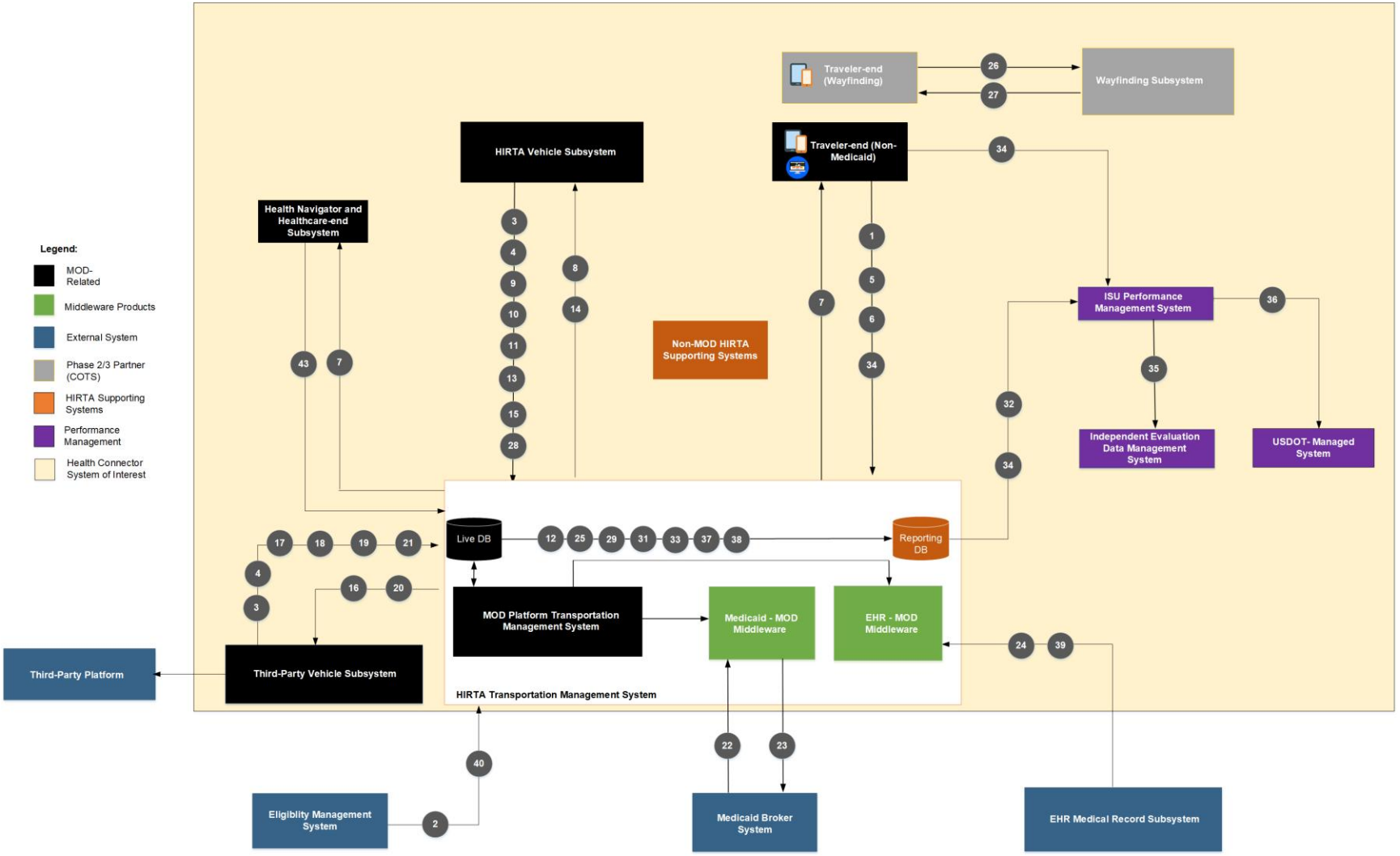

Figure 11. Detailed System of Interest Diagram (Source: HIRTA Team)

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.

Table 4. 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. These details may be entered by the Traveler or by HIRTA CSRs. The Traveler profile may be accessed by the MOD Platform TMS and third-party transportation providers in the course of providing service but cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	MOD Platform TMS
2	Traveler eligibility	Traveler's eligibility for a funding source or programs. These details may be entered by the Traveler or by HIRTA CSRs, will be verified with funding entities (e.g., Medicaid). Traveler eligibility may be accessed by the MOD Platform TMS and third-party transportation providers in the course of providing service but cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	Eligibility management system/funding source
3	Fleet information	Details on HIRTA's vehicles; also, details on third-party vehicles. These will be entered by HIRTA operations staff and third-party transportation providers. Fleet information will be used by the MOD Platform TMS and HIRTA administration and accessed by Travelers through the MOD Platform TMS.	MOD Platform TMS; third-party platform

ID	Data	High-level Description	System(s) of Interest Involved
4	Driver information	Details on HIRTA's drivers; also, details on third-party vehicles. These will be entered by HIRTA operations staff, HIRTA drivers, and third-party transportation providers. Driver information will be used by the MOD Platform TMS and HIRTA administration and accessed by Travelers through the MOD Platform TMS. This information can only be accessed and used for required reporting and for the provision of service to Travelers and cannot be accessed for other purposes.	MOD Platform TMS; third-party platform
5	Trip request	Traveler request for a trip from a web or mobile device. These details may be entered by the Traveler, HIRTA CSRs, health navigators, or healthcare customer care staff. Trip request information will be used by the MOD Platform TMS and accessed by HIRTA operations staff and third-party transportation service providers through the MOD Platform TMS in the course of providing service or fulfilling reporting requirements. Details also may be provided by Travelers via the middleware that connects with the Medicaid Broker-generated trip requests. Trip request information cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	MOD Platform TMS
6	Trip cancellation	Traveler's request to cancel an existing trip. These details may be entered by the Traveler, HIRTA CSRs, health navigators, or healthcare customer care staff. Trip cancellation information will be used by HIRTA administration and the MOD Platform TMS and accessed by HIRTA drivers, HIRTA operations staff, and third-party transportation services providers through the MOD Platform TMS in the course of providing service or fulfilling reporting requirements. Trip cancellation information cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	MOD Platform TMS

ID	Data	High-level Description	System(s) of Interest Involved
7	Trip status	Current information on upcoming trip made available through the MOD Platform TMS, including automated information from third-party transportation service providers. Travelers may request status updates directly via the MOD Platform TMS or through HIRTA CSRs, health navigators, or healthcare customer case staff. Trip status information cannot be accessed or used for any purposes outside of providing transportation services to the Traveler.	MOD Platform TMS
8	Manifest	Time and location details on Travelers to be picked up and dropped off by a driver during a shift. This information will be generated through the MOD Platform TMS with input from HIRTA operations staff and will be accessed by HIRTA drivers. The manifest cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	MOD Platform TMS
9	Vehicle location	Location and heading along with other details for a vehicle in service made available through the MOD Platform TMS. Travelers may request status updates directly via the MOD Platform TMS or through HIRTA CSRs. Vehicle location cannot be accessed or used for any purposes outside of providing transportation services to the Traveler.	MOD Platform TMS
10	Trip performance	Trip-level log of actual time and location for trips on the manifest along with any no-shows and cancellation events made available through the MOD Platform TMS, including information entered by HIRTA drivers. Information will be used by HIRTA administration and by CSRs when cancellation or no-show events impact the Traveler profile. Trip performance information cannot be accessed or used for any purposes outside of required reporting, invoicing, evaluating Health Connector performance, and providing transportation services to the Traveler.	MOD Platform TMS

ID	Data	High-level Description	System(s) of Interest Involved
11	Driver performance	Driver-level log of operational performance on log on, on-time performance, manifests completed made available through the MOD Platform TMS, including information entered by HIRTA drivers. Information will be used by HIRTA administration. Driver performance information cannot be accessed or used for any purposes outside of required reporting and providing transportation services to the Traveler.	MOD Platform TMS
12	Travel time	Time needed to perform on-board component of a trip made available through the MOD Platform TMS, including information entered by HIRTA drivers. Information will be used by HIRTA administration and by the ISU team for performance evaluation. Travel time information cannot be accessed or used for any purposes outside of evaluating Health Connector performance and providing transportation services to the Traveler.	MOD Platform TMS
13	Driver messages	Messages sent by drivers to dispatchers made available through the MOD Platform TMS. Information will be used by HIRTA operations staff and by ISU and HIRTA admin staff to provide insight into events that impact performance. Driver messages cannot be accessed or used for any purposes outside of evaluating Health Connector performance and providing transportation services to the Traveler.	MOD Platform TMS
14	Dispatcher messages	Messages sent by dispatchers to drivers made available through the MOD Platform TMS. Information will be used by HIRTA operations staff and by ISU and HIRTA admin staff to provide insight into events that impact performance. Dispatcher messages cannot be accessed or used for any purposes outside of evaluating Health Connector performance and providing transportation services to the Traveler.	MOD Platform TMS

ID	Data	High-level Description	System(s) of Interest Involved
15	Fare payment log	Log of amount paid for a trip and method of payment that will be entered directly by Travelers or drivers into the MOD Platform TMS. This information will be accessed directly by HIRTA administration and used for invoicing external organizations that fund trips. Fare payment information cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	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. This information will be made available through the MOD Platform TMS and will accessed by third-party drivers and by HIRTA administration for performance evaluation. The manifest cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	MOD Platform TMS
18	Vehicle location (third party)	Location, heading of, and other details of a third-party provider vehicle in service, made available through the MOD Platform TMS. Travelers may request status updates directly via the MOD Platform TMS or through HIRTA CSRs. Vehicle location cannot be accessed or used for any purposes outside of providing transportation services to the Traveler.	Third-party platform
19	Driver messages (third party)	Messages sent by drivers to dispatchers, made available through the MOD Platform TMS. Information will be used by HIRTA operations staff or third-party dispatchers (depending on system configuration) and by ISU and HIRTA admin staff to provide insight into events that impact performance. Driver messages cannot be accessed or used for any purposes outside of evaluating Health Connector performance and providing transportation services to the Traveler.	MOD Platform TMS
20	Dispatcher messages (third party)	Messages sent by dispatchers to drivers made available through the MOD Platform TMS. Information will be used by HIRTA operations staff or third-party dispatchers (depending on system configuration) and by ISU and HIRTA admin staff to provide insight into events that impact performance. Dispatcher messages cannot be accessed or used for any purposes outside of evaluating Health Connector performance and providing transportation services to the Traveler.	MOD Platform TMS

ID	Data	High-level Description	System(s) of Interest Involved
21	Fare payment log (third party)	Log of amount paid for a trip and method of payment that will be entered directly by Travelers or third-party drivers into the MOD Platform TMS. This information will be accessed directly by HIRTA administration and used for invoicing external organizations that fund trips. Fare payment information cannot be accessed or used for any purposes outside of required reporting, invoicing, and providing transportation services to the Traveler.	Third-party platform
22	Medicaid trip requests	Traveler request for Medicaid-funded trips from a web or mobile device through the Medicaid Broker; some Travelers may request over phone and use concierge service. Information will be transferred to the MOD Platform TMS via Health Connector middleware, used by the MOD Platform TMS, and accessed by HIRTA operations staff and third-party transportation services providers through the MOD Platform TMS in the course of providing transportation services, invoicing, or fulfilling reporting requirements. Medicaid trip request information cannot be accessed or used for any purposes outside of those listed.	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. Information will be made available through the MOD Platform TMS. Information will be used by HIRTA administration and by CSRs when cancellation or no-show events impact the Traveler profile. Medicaid trip performance information cannot be accessed or used for any purposes outside of required reporting, invoicing, evaluating Health Connector performance, and providing transportation services to the Traveler.	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. Data will be provided by Traveler or by healthcare customer care staff and will be used by MOD Platform TMS to allow for identification of appointment changes and accompanying transportation needs. Medical appointment details cannot be accessed or used for any purposes outside of providing transportation services to the Traveler.	EHR

ID	Data	High-level Description	System(s) of Interest Involved
25	Aggregated summary	Aggregated data on driver, vehicle, and trip performance, automatically generated by the MOD Platform TMS and used by HIRTA administration and ISU for performance evaluation. Trip summary will be made available to ISU as described in Table 2 for the provision of data for public access (Data ID #36).	MOD Platform TMS
26	Traveler wayfinding request	Requests initiated by Travelers to the wayfinding system. Traveler wayfinding requests cannot be accessed or used for any purposes outside of providing wayfinding services to the Traveler.	Wayfinding subsystem
27	Traveler wayfinding guidance	Log of wayfinding information provided to Travelers. Traveler wayfinding guidance cannot be accessed or used for any purposes outside of providing wayfinding services to the Traveler.	Wayfinding subsystem
28	Safety event	Log of incidents and accidents by vehicle/driver/trip. Safety event data will be made available to ISU as described in Table 2 for the provision of data for public access (Data ID #36).	MOD Platform TMS
29	Safety event report	Detailed reports by a safety event (incident, accident) with response. Safety event report data will be made available to ISU as described in Table 2 for the provision of data for public access (Data ID #36).	HIRTA supporting systems
31	System performance	Email notifications of system wide failures and or downtime.	MOD Platform TMS; HIRTA supporting systems

ID	Data	High-level Description	System(s) of Interest Involved
32	Anonymized and/or aggregated data for performance evaluation	Anonymized/aggregated Traveler, trip, and operations data to support Health Connector performance evaluation. Data will be automatically generated by the MOD Platform TMS and created through other HIRTA systems and will be provided to ISU.	MOD Platform TMS
33	Traveler complaints log	Log of Traveler complaints received and actions taken. Information will be provided by the Traveler, drivers, or HIRTA CSRs and will be used by HIRTA operations and administration.	MOD Platform TMS; HIRTA supporting systems
34	Traveler survey results	Traveler data and survey conducted by ISU of human use participants. Information will be provided by Travelers directly and through Health Connector and will be used by ISU for performance evaluation. Final results will be shared back with Travelers.	MOD Platform TMS; local data system at ISU
35	Processed data for controlled sharing	Data based on Data ID #32 and #34, processed, hosted, and made available by ISU. Data will be accessible to researchers, independent evaluation team, and USDOT.	Local data system at ISU
36	Public data for USDOT – managed system	Trip summary data and performance measurement results aggregated by time period will be provided. Other aggregated data such as fleet, vehicle, and safety event (incident/accident) information will also be provided.	Local data system at ISU
37	Cost and revenue summary	Cost and revenue data by trip, including actual cost, fare paid, funding source share, automatically generated by the MOD Platform TMS or created through other HIRTA systems based on MOD Platform TMS and other data.	MOD Platform TMS; HIRTA supporting systems

ID	Data	High-level Description	System(s) of Interest Involved
38	Wheelchair failure log	Summary of events referring to situations when wheelchair lift could not function at the time of pick-up or drop-off. Wheelchair failure log data will be made available to ISU for the provision of data for public access (Data ID #36).	MOD Platform TMS; HIRTA supporting systems
39	Medical appointment status	Real-time status of progress on a medical appointment resulting in an impact on the pick-up time. Data will be provided by healthcare customer care staff and made available to the Traveler and driver through the MOD Platform TMS via Health Connector middleware.	EHR
40	Discount coupon/credit	Discount coupons or credits applied by trip. Aggregated and/or anonymized Discount coupon/credit data may be accessed by ISU for evaluating Health Connector performance.	Eligibility management system/funding source
41	Call center log	Call center statistics available from HIRTA, DCHD and healthcare providers, as available from phone systems or manual logs. Log of Traveler complaints received and actions taken. Information will be used by HIRTA operations and administration.	HIRTA supporting systems
43	Trip request (partners)	Trips manually requested by DCHD and healthcare providers using the MOD Platform TMS. To be tracked separately to assess the benefit of such capability. Trip request information cannot be accessed or used for any purposes outside of required reporting, invoicing, evaluating Health Connector performance, and providing transportation services to the Traveler.	MOD Platform TMS

During Phase 2, Data ID 32: 'Anonymized and/or Aggregated data for Performance Evaluation' was broken down and defined to include the data described in Table 5.

Table 5. Detailed Breakdown of Data ID 32: Anonymized and/or Aggregated Data for Performance Evaluation

ID	Variable	Resolution	Source	Format
32.1	Age	Trip	MOD Platform TMS	CSV
32.2	Gender	Trip	MOD Platform TMS	CSV
32.3	Income	Trip	MOD Platform TMS	CSV
32.4	Race	Trip	MOD Platform TMS	CSV
32.5	Veteran	Trip	MOD Platform TMS	CSV
32.6	Date of service interruption	Trip	MOD Platform TMS	CSV
32.7	Time of service interruption	Trip	MOD Platform TMS	CSV
32.8	Trip request date (date when Traveler made request)	Trip	MOD Platform TMS	CSV
32.9	Trip date	Trip	MOD Platform TMS	CSV
32.10	Trip cost	Trip	MOD Platform TMS	CSV
32.11	Payment method (i.e., Traveler, third party)	Trip	MOD Platform TMS	CSV
32.12	Trip request time (time when Traveler made request)	Trip	MOD Platform TMS	CSV
32.13	Pick-up time requested	Trip	MOD Platform TMS	CSV
32.14	Transportation provider	Trip	MOD Platform TMS	CSV
32.15	Trip distance	Trip	MOD Platform TMS	CSV
32.16	Original pick-up time offered (and accepted)	Trip	MOD Platform TMS	CSV
32.17	Actual pick-up time	Trip	MOD Platform TMS	CSV
32.18	Original estimated vehicle travel time	Trip	MOD Platform TMS	CSV

ID	Variable	Resolution	Source	Format
32.19	Updated estimated vehicle travel time	Trip	MOD Platform TMS	CSV
32.20	Original estimated drop-off time	Trip	MOD Platform TMS	CSV
32.21	Actual drop-off time	Trip	MOD Platform TMS	CSV
32.22	Mobility needs identified	Trip	MOD Platform TMS	CSV
32.23	Mobility needs accommodated	Trip	MOD Platform TMS	CSV
32.24	Traveler perception of accessibility (language, mobility)	General	In-app survey, focus group survey	CSV
32.25	Number of vehicles offered		MOD Platform TMS	CSV
32.26	Actual in-vehicle travel time	Trip	MOD Platform TMS	CSV
32.27	Seat unavailable and 'other error' alerts	Daily, weekly, monthly	HIRTA, vendors	CSV
32.28	Travel time for each option offered	Trip	MOD Platform TMS	CSV
32.29	Traveler rating of pre-vehicle wayfinding	Trip	In-app survey	CSV
32.30	Traveler rating of post-vehicle wayfinding	Trip	In-app survey	CSV
32.31	Traveler perception about privacy	General	Traveler group survey	CSV
32.32	Traveler perception about self-reliance	General	In-app survey, Traveler group survey	CSV
32.33	Customer satisfaction	General	MOD Platform TMS , focus group survey, info from HIRTA survey	CSV

4.2 Description of the Proposed System

This Section describes system capabilities under the core subsystem definitions identified in Section 1.4.

4.2.1 Traveler-end Subsystem

The system will provide the following capabilities either via a smart device application or via customer care professionals that are requesting such services via a phone call. The wayfinding application will be available only to those customers that have access to smart devices given reliance on built in device capabilities (e.g. audio guidance).

Figure 12 provides a context diagram for Traveler-end Subsystems.

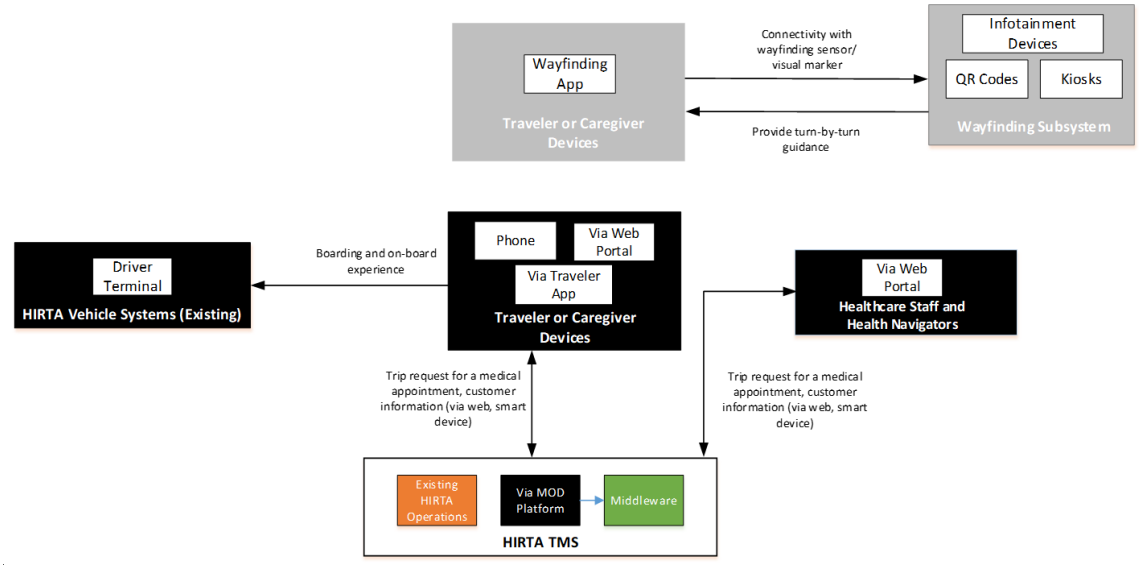

Figure 12. Traveler-end Subsystem (Source: HIRTA Team)

Health Connector will provide access to medical appointment information only, which will include date, time, and location of a medical appointment for a Traveler along with their first and last name and a unique identifier. All other services (e.g., lab results, communication with provider) will be completed in the healthcare provider applications.

4.2.1.1 Booking and Modification of Medical and Transportation Appointments

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).

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

3. *Trip Request:* Provide customers the capability to request a transportation service for a medical appointment. Also, provide the capability to book a return trip if needed.

4. *Trip Discovery:* Provide the capability to discover transportation mode options.

5. *Trip Status:* Provide real-time information related to the trip to Travelers on-request. Also, provide notification alerts if such service is requested by Travelers according to their preferences.

6. *Return Trip Booking:* Provide the ability to book return trip using on-demand transportation modes available after the Traveler is discharged.

7. *Follow-up Appointment and Trip Booking:* If follow-up care is needed the same day at another facility or at a later date, Traveler will have the ability to book medical and transportation appointments at the same time for those needs.

8. *Trip Booking for Alternate Destination:* Provide the capability to book a trip to another location other than home should such need arise even if such a trip may not be covered by a funding entity.

9. *Reminder:* Provide day-before reminder for upcoming trips. Allow cancellation of transportation appointment using the same interface if such trip is no longer required.

4.2.1.2 Translation Services

1. *Translation Services as Needed*: 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.

4.2.1.3 On-board Vehicle Experience

1. *Vehicle Identity Verification:* Provide the capability for Travelers to identify the correct vehicle for boarding.

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).

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

5. *Notifying on Delayed Arrival:* Provide the capability for healthcare provider to check on trip status (e.g., traffic delay).

4.2.1.4 Payments

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

2. *Account Debit*: Traveler will be allowed to pay for their trip by debiting their HIRTA account. They will have the capability to replenish the account if balance goes below a certain limit or on-demand.

3. *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.

4. *Unbanked/Underbanked:* Travelers will be able to replenish their debit account by providing cash or check.

4.2.1.5 Real-time Information

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

2. *Arrival Notification*: Provide the capability to notify of upcoming vehicle at a pre-determined interval.

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

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

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

4.2.1.6 Wayfinding

1. *Locate Correct Building after Drop Off*: Provide the capability to locate the correct building and provide guidance as needed.

2. *Locate Correct Office after Entering the Building:* Provide the capability to locate the correct office and provide guidance as needed. Distinguish between ambulatory and non-ambulatory Travelers for guidance (e.g., use of escalator/stairs versus elevator).

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

4. *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.

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

6. *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. 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.

4.2.2 Transportation Management Subsystem

This section describes the capabilities needed within the system to be used by HIRTA, Access2Care, healthcare providers and Health Navigators, and third-party service providers for managing the transportation services used for delivering medical trips.

Figure 13 provides a context diagram for Transportation Management Subsystem.

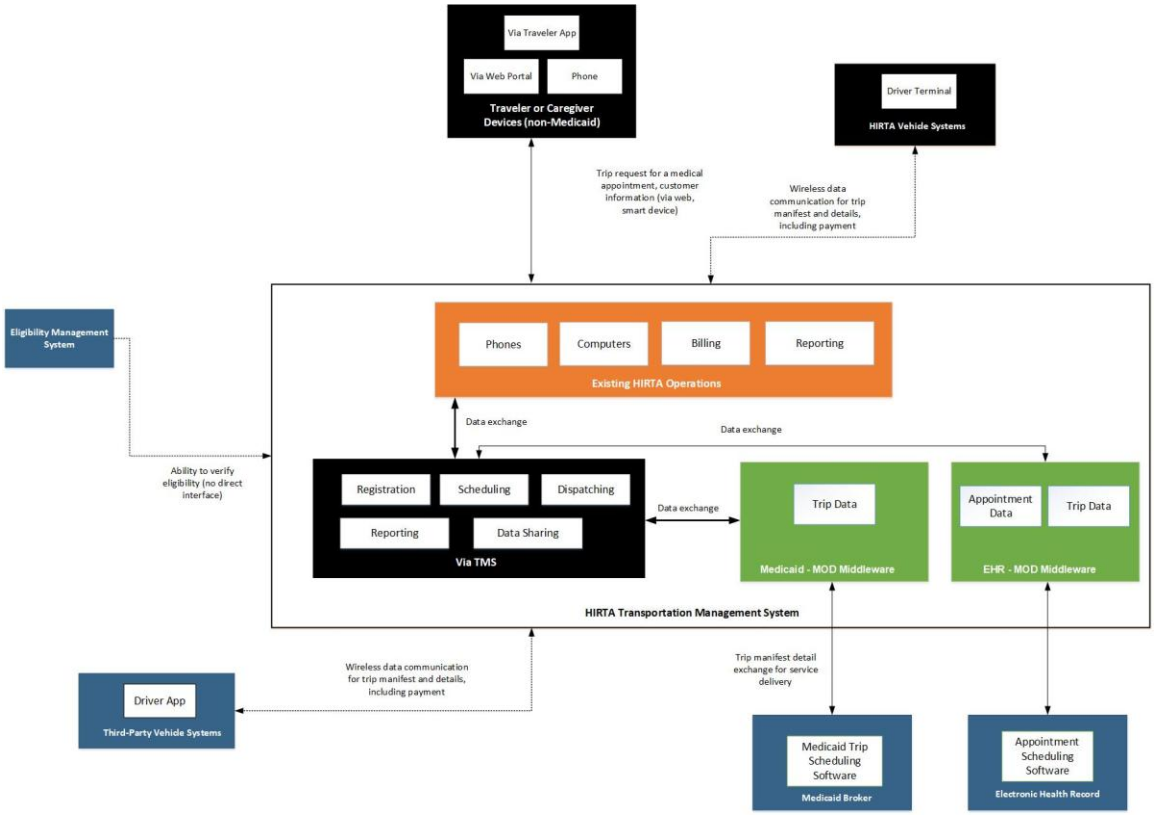

Figure 13. Transportation Management Subsystem (Source: HIRTA Team)

4.2.2.1 HIRTA

HIRTA's system capabilities are described by customer care staff, scheduling staff, operations staff, and administration staff. As described in Section 1, most of these capabilities currently exist but those are designed to work for trips booked in advance only and do not have the capabilities to do any coordination in real time with external entities, as intended by Health Connector.

4.2.2.1.1 Reservations and Customer Service Module

1. *Traveler Registration:* For Travelers not registered with HIRTA, provide the capability to perform the registration.

2. *Customer Profile:* Add pertinent details in the Traveler profile as provided, including funding eligibility and expiration details.

3. *Trip Booking:* Provide the capability to 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.

4. *Trip Modification:* Provide the capability to modify transportation service requests related to time of pick-up or drop-off on Traveler's behalf, as requested.

5. *Trip Cancellation:* Provide the capability to cancel transportation services on Traveler's behalf, as requested and per allowed policy.

6. *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 the trips that were booked by HIRTA but are being provided by a third-party service provider (e.g., Uber TNC).

7. *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).

8. *Contact Travelers:* Provide tools to connect with Travelers according to their preference to assist with any aspect of their trips.

9. *Translation Service:* Provide tools to request translation service when needed to assist customers.

10. *Trip History:* CSR 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).

4.2.2.1.2 Scheduling Module

1. *Advance and Real-time Scheduling:* Provide the capability to schedule trips in advance or in real time. Even with advance booking, pick-up time will be confirmed in real time.

2. *Driver/Vehicle Assignment:* Provide the capability to assign trips to drivers/vehicles per labor/work rules as configured in the system.

3. *Batch Optimization for Trips Booked in Advance*: Provide the capability to optimize trips booked in advance the day before 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) will be configurable.

4. *Real-time Optimization*: Provide the capability to optimize trips in real time to better utilize the driver/vehicle resources.

4.2.2.1.3 Operations Management Module:

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.

3. *Managing Access2Care Trips:* Trip requests from Access2Care 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 the 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.

7. *Communication with Driver:* Provide the capability to communicate with the driver when needed.

8. *Traveler Safety*: If safety message is received from the Traveler, provide the capability to follow appropriate actions per HIRTA's safety protocol.

4.2.2.1.4 Billing and Administration Module

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.

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

4.2.2.1.5 Reporting and Data Module

1. *Reporting*: Provide the capability to report per defined KPIs for measuring system performance and measuring the project (and service delivery) outcomes.

2. *Data Sharing:* Provide the capability to share data per data sharing agreements in the Data Management Plan.

4.2.2.2 Healthcare Providers and Health Navigators

4.2.2.2.1 Reservations and Customer Service Module

1. *Traveler Registration:* For Travelers not registered with HIRTA, provide the capability to perform the registration.

2. *Customer Profile:* Add pertinent details in the Traveler profile as provided, including funding eligibility and expiration details.

3. *Trip Booking:* Provide the capability to 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.

4. *Trip Modification:* Provide the capability to modify transportation service requests related to time of pick-up or drop-off on Traveler's behalf, as requested.

5. *Trip Cancellation:* Provide the capability to cancel transportation services on Traveler's behalf, as requested and per allowed policy.

4.2.2.2.2 Scheduling Module

1. *Advance and Real-time Scheduling:* Provide the capability to schedule trips in advance or in real time. Even with advance booking, pick-up time will be confirmed in real time.

4.2.2.3 Access2Care

1. Manage Medicaid Trips: Provide the capability to manage trips booked by Access2Care.

4.2.2.4 Third-Party Service Provider

1. *Manage Trips Served by Third Party Providers:* Provide the capability to view the real-time status of trips served by third-party providers.

2. *Communicate with Third Party Providers:* Provide the capability to communicate with third-party providers in real time.

4.2.3 Vehicle Subsystem

This section provides the capabilities to be provided in the subsystem installed on board that will include a driver terminal with communication capabilities.

Figure 14 provides an overview of Vehicle-end Systems.

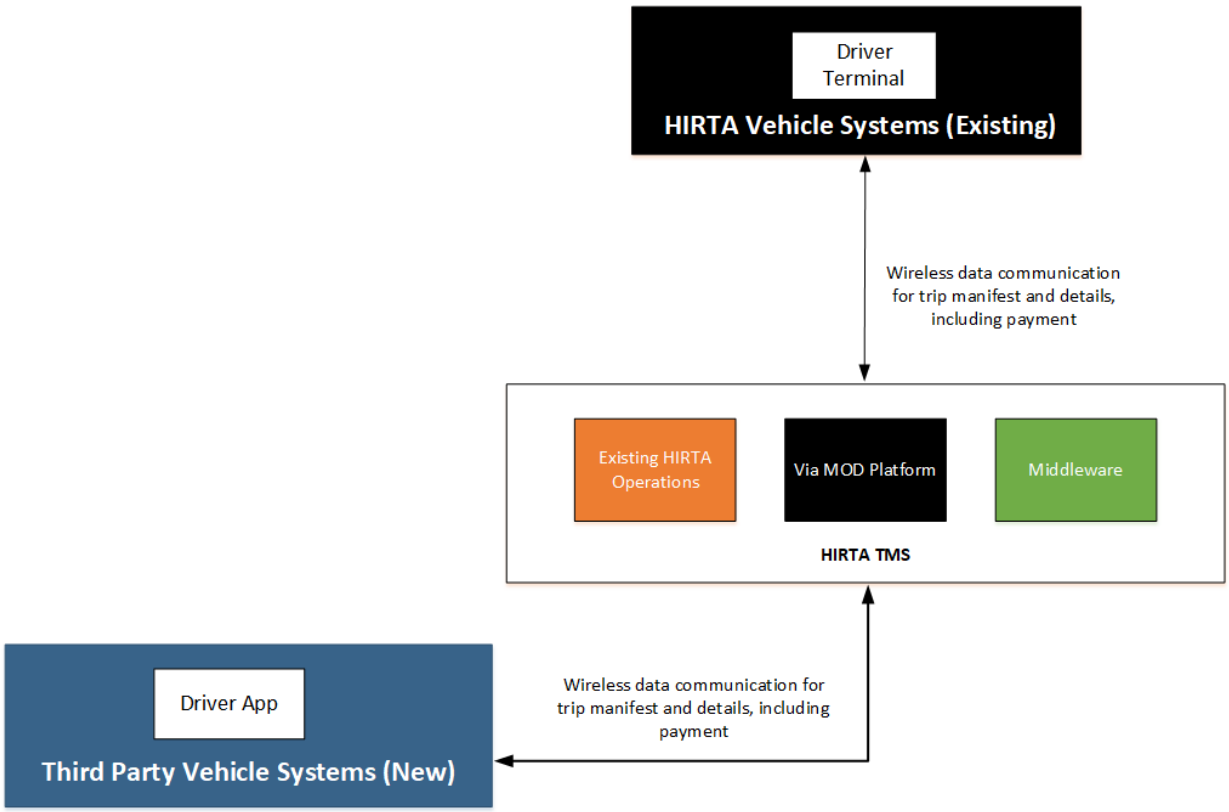

Figure 14. Vehicle-End Subsystem (Source: HIRTA Team)

1. *Identifying Travelers*: Provide the capability to verify Traveler boarding the vehicle.
2. *Trip Details and Status*: Provide the capability to view details of a trip at any point. Also, provide the trip status when the trip is in progress.
3. *Communication with HIRTA Operations*: Provide the capability to communicate with HIRTA operations.
4. *Performing Trips:* Provide the capability to perform required activities on arrival for pick up or drop off. Allow drivers to report no-show and take action per HIRTA policy.
5. *Turn-by-turn Navigation*: Provide turn-by-turn direction for the pickup or drop-off locations as requested by the driver.
6. *Translation Service*: Provide translation service to assist a driver when requested.
7. *Notification on Delayed Arrival:* Provide the capability to notify HIRTA operations in the event of an expected delayed arrival.
8. *Payment Status Update*: Provide the capability to view required payment for a trip and update fare paid (if not automated).

4.2.4 Wayfinding Subsystem

This subsystem will include the following:

1. Wayfinding infrastructure: This includes the physical assets that will be installed for the wayfinding application to detect the object (visual marker inside a building or on a vehicle) and provide translation assistance and general guidance, along with the application used to scan the visual markers.
2. Central wayfinding software: The central software will guide the application used by the Travelers with indoor and outdoor wayfinding. Also, this software will be used to manage the physical assets used for providing wayfinding capability.
3. Wayfinding kiosk: The kiosk will be deployed at a care facility and assist Travelers with return trips that were not previously booked.
4. Infotainment devices: These devices will be deployed on vehicles and can assist with notifying Travelers of their impending arrival, presenting digital wayfinding codes, or relaying other critical information relevant to a trip.

4.2.5 Interfaces

Health Connector is intended to interface the following external systems as follows:

- **Access2Care Software**: Access2Care uses its own proprietary application to schedule Medicaid-funded trips for its customers. The application has both a Traveler component and a central component for customer care staff. This ConOps defines the capabilities that will be accomplished through new middleware connecting the MOD Platform TMS with the Access2Care software.

- **EHR Software**: HIRTA's partners use the following EHR/medical record software:

    - Dallas County Hospital (DCH): Veridigm (Note DCH plans to transition to Epic within the next few years)

    - MercyOne: Epic

  As stated earlier, interface with each of these products is available through custom interfaces only. HIRTA team will further define the level of interface needed and data exchange needs in the system requirements. However, at this time, the team is planning to develop middleware to interface with EHR systems that provide open API (e.g., Epic) and use an alternate approach for other systems (e.g., a secure web-based access to a central system provided by Health Connector) where healthcare staff will be able to use Health Connector application for simultaneous booking of medical and transportation appointments.

- **DCHD/Health Navigation Information and Referral System**: DCHD has built and maintains an Access database for managing the needs and services provided to Dallas County residents. This system currently does not connect with any medical record systems. HIRTA project team does not see a need to interface with this system at this time but will work with DCHD to access relevant data for Health Connector performance evaluation.

Further details on desired interfaces are provided in the following subsections.

4.2.5.1 Access2Care Software

1. *Trip Ingestion*: Provide the capability automatically ingest trips when submitted by Access2Care into Health Connector.

2. *Trip Status Reporting:* Provide the capability to monitor the status of trips as other trips and provide updates to Access2Care system.

3. *Billing*: Provide the capability to perform cost allocation and billing for Medicaid funded trips and submit billing to Access2Care/Medicaid system electronically.

4. *Reimbursement*: Provide the capability to get reimbursed electronically by Access2Care/Medicaid.

5. *Access to Data/Reporting:* Provide the capability access reporting and needed data as defined for Medicaid trips.

4.2.5.2 Electronic Healthcare Record (EHR) Software

1. *Access to Appointment Data: Provide the ability to pull appointment data and patient names using an API to compare with transportation data.*

4.2.6 Stakeholders and Actors of the Proposed System

A detailed list of user group for the proposed system is provided in Section 3 since needs are organized by those groups.

4.3 Support Environment

Apart from the core systems, subsystems and system interfaces described in Section 1.4, the following systems will support Health Connector functions:

- *Data Communication System:* A cellular carrier will be used for performing data communication between vehicles and the central system (similar to current system environment).

- *Voice Communication System:* A two-way voice communication system will be used for communication between vehicles and the central system (similar to current system environment).

- *Vehicle Maintenance System:* A maintenance software will assist with preventative and ad-hoc maintenance of vehicles.

- *Accounting System:* An accounting software will assist with recordkeeping on billing, reimbursements, and revenue management.

- *Mapping and Geocoding System:* A geographic information system (GIS)-based mapping system that is part of Via will provide geocoding and mapping capabilities. Web-based mapping will be used for Uber platform.

- *Phone and Email Communications:* Phone and email communications systems will be used where automated capabilities are not available.

- *Server Infrastructure:* Systems will be cloud hosted.

- *Arrival Notification Platform:* An interactive voice response (IVR) service, currently in use today will provide day-before and real-time email and phone-based notifications.

- *Medical Record Systems:* Medical record systems in use at hospitals/clinics will store the health records and provide appointment, discharge, and referral information as needed.

- *Information and Referral Systems:* Information and referral systems used by DCHD and other social care organizations will provide referrals to HIRTA.

- *Physical Environment:* Physical facilities as currently available will be utilized.

4.4 Modes of Operations for Proposed System

The following modes of operations apply to Health Connector:

4.4.1 Normal

In normal mode, all capabilities will be available as intended. Travelers will be able to book both medical and transportation appointments simultaneously, monitor appointment status and use wayfinding functions.

4.4.2 Degraded

A degraded mode will likely apply in the event of partial system failure when one or more subsystems of Health Connector is not operational due to communication, network or computer/server infrastructure failure.

4.4.3 Weather Emergency

A limited capability system will apply when external events such as weather emergency may enforce changes in standard operating procedures.

4.4.4 Medical Emergency

A medical emergency mode will be limited to a driver/vehicle or Traveler when such incident occurs during transporting a Traveler for a medical appointment. In this event an emergency medical transportation service will be used and none of the functions provided by Health Connector will apply.

4.4.5 Complete Failure

A complete failure will occur when Health Connector system is not available due to network connectivity, server/storage infrastructure failure, power failure, severe weather event or other reasons. In such case, HIRTA standard operating procedures for a two-way voice communication-based approach will apply.

4.5 Anticipated Operational Policies and Constraints

Anticipated constraints and changes in operational policies for HIRTA, DCHD, and healthcare partners are listed below.

4.5.1 HIRTA

Operational polices and constraints for HIRTA as anticipated in the context of Health Connector are as follows:

- **Hours of operation:** Currently, HIRTA's services are available 7AM-5PM Monday through Friday. Given HIRTA is planning to provide after-hours services through Health Connector, new policies will have to be developed and published by HIRTA.
- A key factor for finalizing hours of operation will be healthcare facility hours. Our understanding is that most trips will be covered during HIRTA service hours. Only under rare circumstances will trips be requested during care facility hours outside of HIRTA service hours. On such occasions, HIRTA will also have to consider third-party service providers that may be available in the area to provide after-hours services. Also, HIRTA will have to determine the need for having at least one HIRTA dispatch staff on standby to assist in the event of delays or incidents. All these factors will drive the determination of hours of operation.
- Any future changes in service hours must be automatically communicated to appropriate parties (e.g., healthcare providers, DCHD) and communicated to customers through appropriate channels.
- **Third-party service providers:** With the deployment of Health Connector, HIRTA will have the capability to partner with third-party providers for providing services after office hours. However, detailed policies and procedures will have to be developed with third-party providers when third-party agreements are finalized.
- **IT-related policies:** No major IT infrastructure-related changes are anticipated as part of this project, but partners will have to be provided access to Health Connector and HIRTA will be responsible for providing access and maintaining appropriate security and access levels for those partners. Security and access restrictions are discussed in the Phase 2 Data Privacy Plan.
- **Staffing:** The project will not result in increased staffing levels, but roles may have to be adjusted given efficiency gains observed due to reduced level of coordination per trip.
- **Budget/financial constraints:** Budgeting as determined during Phase 2/3 proposal development will be used for deployment and long-term operations.
- **Definition of standard operating procedures** (**SOPs) for Health Connector:** While Health Connector will be part of HIRTA's demand response service, detailed SOPs will have to be developed, describing roles and responsibilities and organizational structure prior to system launch during Phase 2**.** This process began Task 2-B during system design, and will be finalized during Task 2-L.

- **Service level agreements (SLAs):** The following types of SLAs will have to be developed:
  - SLAs with vendors will have to be made available for providing Health Connector service to meet the required system performance needs.
  - Partnership agreements will have to be made with healthcare partners for certain business functions (e.g., exchange of medical appointment data), and appropriate SLAs will be developed and agreed upon.
  - Additional SLAs may have to be identified and developed as part of the development of SOPs for Health Connector.
  - Also, once third-party contractors are determined, SLAs will have to be established for the provision of services through them.

4.5.2 Healthcare Providers

Constraints and changes to operational policies as applicable to healthcare providers are listed below:

- **Access to Health Connector:** As discussed earlier, HIRTA will have to provide an appropriate level of access to Health Connector system to authorized staff at healthcare providers for management of healthcare appointments and monitoring of transportation services for those appointments.

- **Access to appointment data:** Either using the currently established process for information release at healthcare providers or through new release authorization terms and conditions that healthcare providers are willing to adopt, healthcare providers will have to provide access to medical appointment data which will at least include 1) customer identifier; 2) customer/caregiver contact; 3) time of appointment; 4) day of appointment; 5) location of appointment; 4) doctor's office contact information. Required details, including a consent form regarding data release, will be collected during Health Connector registration.

  HIRTA has been including healthcare providers as part of stakeholder engagement sessions (e.g., ConOps walkthrough, SyRS walkthrough), so they are aware of the data needed for coordinating medical and transportation appointments. HIRTA will continue to engage with healthcare partners throughout Phase 2 design for establishing the terms for informed consent form to be signed by the patients who will use Health Connector. Stakeholder input from healthcare providers is being documented in meeting minutes and any online meetings are recorded. Also, HIRTA team will closely follow the currently established terms used by the healthcare partners to share data with caregivers to avoid any deviations from the currently established practices.

- **Funding source definition and billing:** Most healthcare providers have mentioned that they have access to funds which can be used towards covering the transportation cost for persons with low income. HIRTA has the capability to define funding sources in its system, and healthcare providers can be listed as a funding source. For eligible trips, such funds will be used, and the healthcare providers will be billed per agreed upon terms and conditions. Accounting for such funding source will

follow the same tools and established processes used by HIRTA for other funds in use today.

- **Coordination on hours of operation:** When there is a change in healthcare provider service hours for non-emergency visits, Health Connector system will be updated and HIRTA will be notified.

- **Staffing:** HIRTA already coordinates with dedicated social worker and health navigator staff at healthcare providers. However, this process will have to be finalized, and enhanced communication access through Heath Connector solution will be made available to minimize any manual coordination.

- **Tracking transportation access and missed appointments:** Currently, there is limited capability in linking missed appointments with transportation access and subsequent impact due to lost patient opportunities. With access to Health Connector, healthcare providers should define appropriate and relevant KPIs and track and analyze data for measuring the KPIs. The HIRTA team is developing relationships with healthcare providers in Phase 2 and will assist with defining KPIs as needed.

4.5.3 DCHD

Constraints and changes to operational policies as applicable to DCHD are listed below:

- **Access to Health Connector:** As discussed earlier, HIRTA will have to provide appropriate level of access to DCHD to authorized staff for management of healthcare appointments and monitoring of transportation services for those appointments, as authorized by their customers.
- **Access to data and reporting as relevant to measuring health outcomes:** DCHD currently relies on data in their information and referral system for measuring the success of efforts in linking Dallas County residents with resources. Health Connector will provide the ability to track not just successful connections but will also allow follow-ups after appointments are complete and take any subsequent actions if necessary. However, polices for such additional efforts will have to be defined by DCHD as conversations between the HIRTA team and DCHD take place in Phase 2.

5 Operational Scenarios

Health Connector system will interact with at least 4 distinct operational environments: HIRTA, third-party service providers, healthcare providers, and health navigation/social care providers. Therefore, the HIRTA project team has developed scenarios considering situations faced by specific user groups pertaining to those operational environments.

For Travelers, scenarios play out differently if their healthcare is paid through Iowa's Medicaid program. For Medicaid participants, whether enrolled in traditional (fee-for-service) or managed care, transportation is centralized through the State's broker, Access2Care. There are specific practices and procedures that will need to be followed, and there can be issues around the need to ensure that an eligible person is receiving allowable care or services from an approved provider (see Scenario 5, as an example), and challenges around what to do if proper procedures are not followed, even if the transportation would otherwise be eligible. For persons not covered by Medicaid, the scenarios are more complex, and include the risk that needed medical transportation might not be available, accessible, affordable, or appropriate. The five scenarios below (Scenarios 3 – 6) illustrate a few of these complexities.

Scenarios 1-2 describe how system will perform in normal and degraded/failure modes as part of overarching discussion of system operations.

Degraded or System Failure Scenarios

1. **Scenario 1**: A Traveler has requested a trip for a routine exam at a hospital. The system is operating in degraded mode, since the MOD Platform TMS server is down due to an unexpected maintenance issue during the Traveler's return trip.
2. **Scenario 2**: A Traveler has an appointment scheduled for a routine exam at a hospital. The trip is taking place during a complete system failure caused by communication outage after a severe weather event.

Travelers (Non-Medicaid)

3. **Scenario 3**: A Traveler is looking for transportation for a recurring medical appointment (e.g., dialysis) scheduled with a hospital/clinic.
4. **Scenario 4**: A Traveler is looking for a prenatal appointment and will need transportation. It is recurring but not on a fixed schedule.
5. **Scenario 5**: A Traveler is looking for a preventive care appointment.
6. **Scenario 6**: A Traveler is looking for a medical appointment for a one-off procedure. They will not be able to take taxi/TNC home and will need someone to accompany them.

Travelers (Medicaid/MCO)

7. **Scenario 7:** A Traveler is approved to take a Medicaid-eligible trip, but they would like family to accompany them to provide assistance. The outbound trip is 45 mins long, so they may be looking to be dropped off at a friend's house so they can rest and arrange their own transportation later for ride home. Medicaid will pay for only eligible portion of the trip.

DCHD/Health Navigators

8. **Scenario 8**: A Traveler just moved to Dallas County and needs to schedule a medical appointment but does not know doctors in the area and does not have transportation.

Hospital/Clinic

9. **Scenario 9**: A blind Traveler was dropped off by a friend for a routine medical appointment but does not have return transportation. The Traveler is not comfortable with a taxi or TNC and prefers HIRTA service. Hospital customer care staff requested to book directly using the HIRTA system.
10. **Scenario 10**: A Traveler has a planned discharge, based on the progression of their recovery, for the next day. The discharge planner will set up transportation to the Traveler's residence or skilled care facility.

HIRTA

11. **Scenario 11**: HIRTA is not able to find out if a Traveler who was dropped off for a medical appointment has already been discharged. The Traveler had booked the return trip, and the driver is waiting at the medical facility to pick up the Traveler. The Traveler does not use the Health Connector app and is relying on HIRTA service for coordination.
12. **Scenario 12**: A Traveler was a no-show for their outbound trip to a medical appointment (or cancelled without providing a reason), but the Traveler had also booked a return trip, and HIRTA has to follow up with both customer and the hospital to find out if the Traveler needs the return trip before their trip back to home can be cancelled.

Third party Service Providers

13. **Scenario 13:** A third-party service provider (taxi/volunteer or another agency in the region such as DART) would like to be part of this solution, particularly when trips are outside of the HIRTA service area. The third-party service provider would like to be integrated so their services are available to Travelers per terms and conditions agreeable to HIRTA.

Each of the above scenarios are explained further below. Each of the tables provides a description on a scenario, identifies goals, constraints, and actors (systems or users involved) for that scenario, and provides an illustration of step-by-step workflows along with a description, as applicable to the scenario.

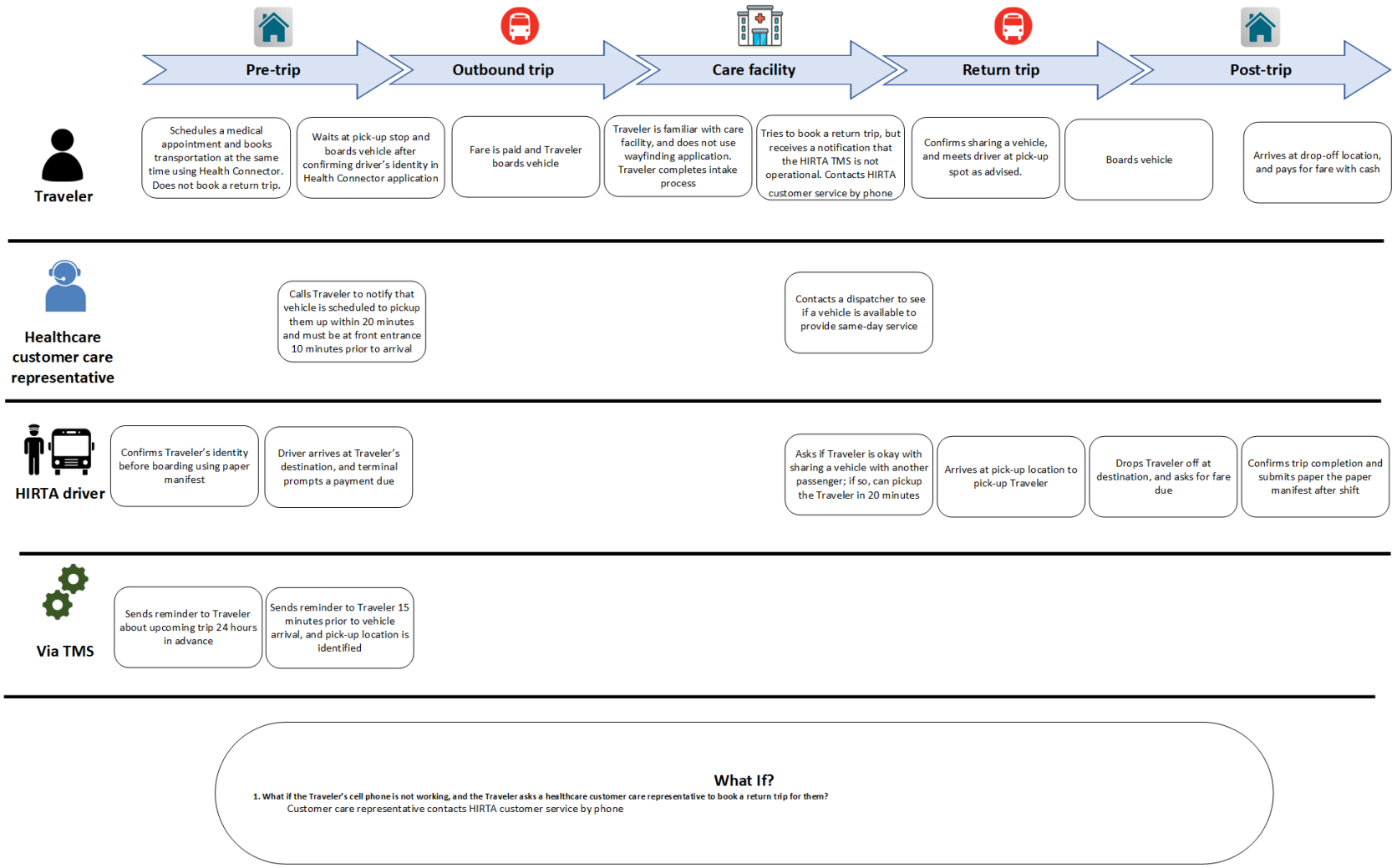

Figure 15. Scenario 1 - Degraded Operation (Source: HIRTA Team)

Table 6. Scenario 1- Degraded Operation

Topics	Description
Short Description	In this scenario, the Traveler is looking to book a transportation appointment for a routine medical visit. The Traveler is able to use Health Connector to book their trip to and from the healthcare facility, but the MOD Platform TMS is down during the Traveler's return trip.
Goal	The goal of this scenario is to identify operational flows when the MOD Platform TMS is down.
Constraints	Paper manifest needed.
Geographic Scope	• Covers travel area with an origin or destination within Dallas County • Requires walking on sidewalk after the drop off. • Need to take stairs or elevator for the appointment inside the facility.
Preconditions	• On-board vehicle system is operational. • Vehicles are equipped with wayfinding technology for identification. • Hospital is equipped with wayfinding infrastructure to support the wayfinding application. • EHR and HIRTA central software interface is functional. • Two-way radio is functional. • Phone system is operational.
Post-conditions	• HIRTA dispatcher manually enters the trip completion details in the system.
Information Requirements	• Trip progress status and real-time information on vehicle delay/arrival.
Related User Needs	TRV-8, TRV-9. TRV-10, TRV-11, TRV-17, TRV-17A, TRV-18, TRV-22, TRV-23, TRV-26, TRV-27, TRV-30, TRV-31, TRV-32 CSR-5, CSR-6, CSR-7, CSR-8, CSR-9, CSR-10 OPS-1, OPS-8 DRV-4 HCR-6

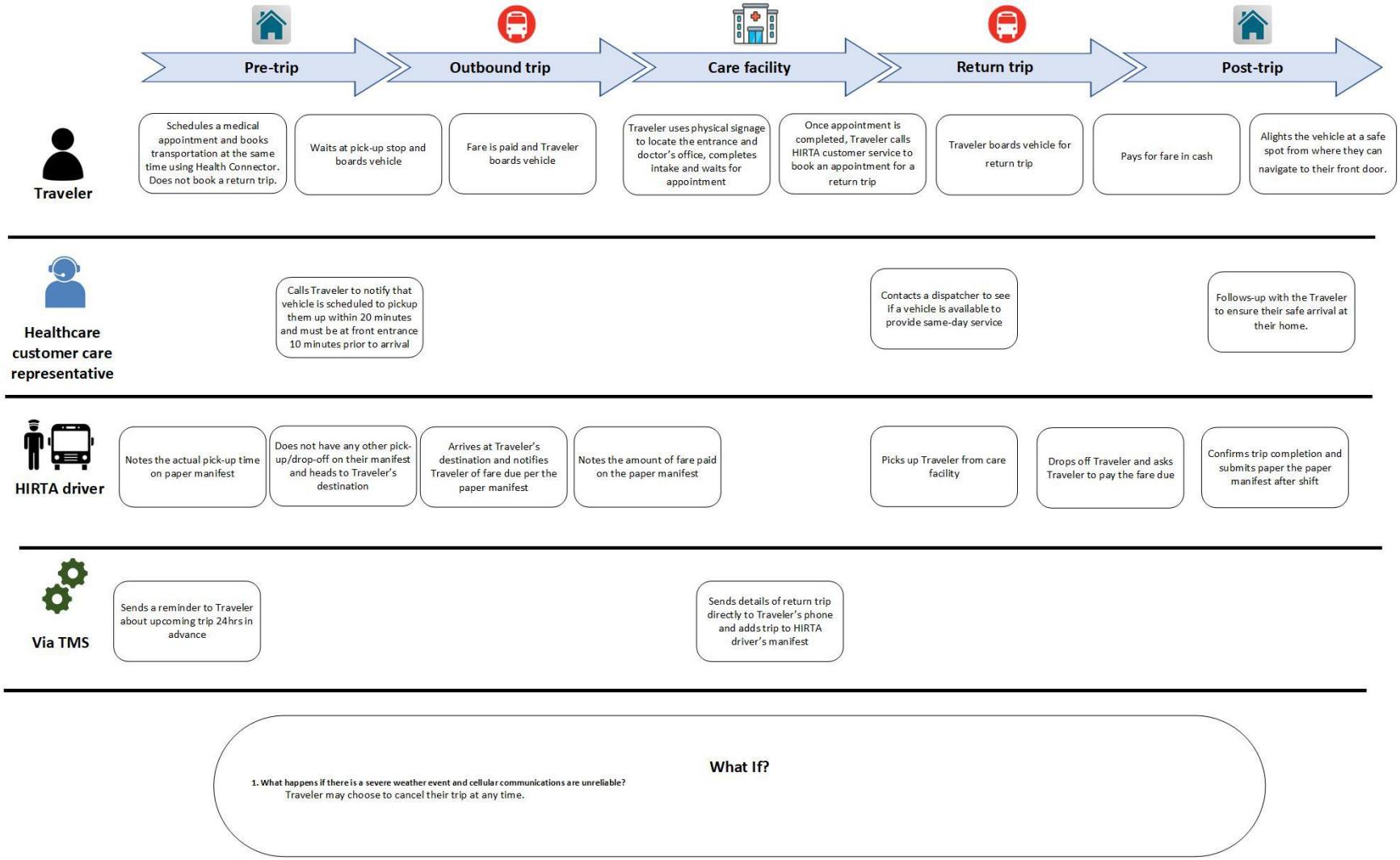

Figure 16. Scenario 2 - System Failure Mode (Source: HIRTA Team)

Table 7. Scenario 2. System Failure Mode

Topics	Description
Short Description	In this scenario, the Traveler had scheduled an appointment, but on the day of the appointment there are intermittent issues with cellular communications due to severe weather events within the past few days. Health Connector is completely non-operational. MOD Platform TMS can still be accessed to view trip details of previously-scheduled trips, but no real-time updates are available due to lack of vehicle-to-central connectivity.
Goal	The goal of this scenario is to identify situations when Health Connector falls back on two-way radio and phone system.
Constraints	Paper manifest needed
Geographic Scope	• Covers travel area with an origin or destination within Dallas County • Require walking on sidewalk after the drop off. • Need to take stairs or elevator for the appointment inside the facility.
Preconditions	• Two-way radio is functional. • Phone system is operational. • HIRTA is able to access central system to access details of scheduled trips, as the communication network at the HIRTA headquarters is operational. However, no real-time updates are available due to disruption in cellular communication.
Post-conditions	None.
Information Requirements	None.
Related User Needs	TRV-8, TRV-9. TRV-10, TRV-11, TRV-17, TRV-17A, TRV-18, TRV-22, TRV-23, TRV-26, TRV-27, TRV-30, TRV-31, TRV-32 CSR-5, CSR-6, CSR-7, CSR-8, CSR-9, CSR-10 OPS-1, OPS-8 DRV-4 HCR-6

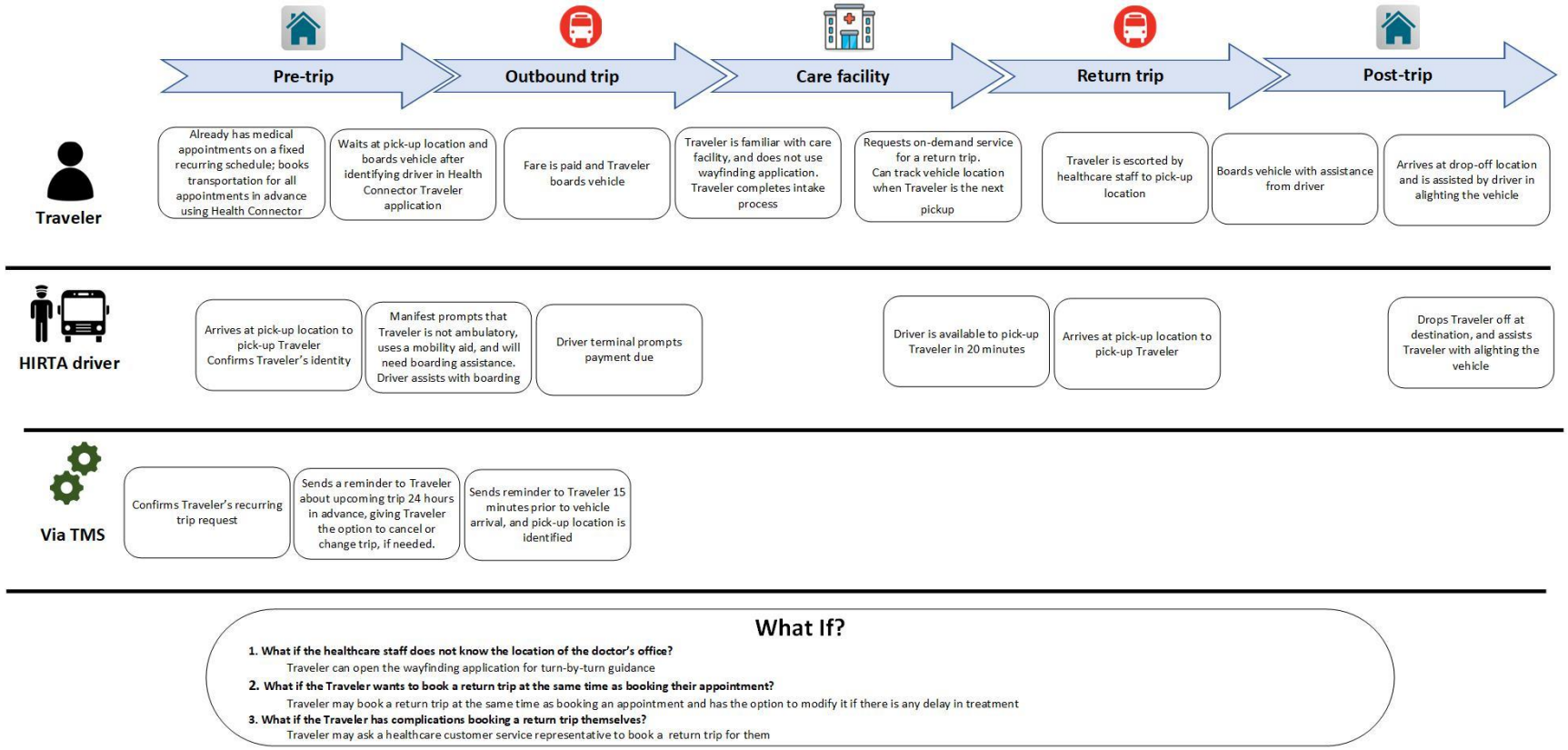

Figure 17. Scenario 3 - Traveler Looking for Transportation for a Recurring Medical Appointment (Source: HIRTA Team)

Table 8. Scenario 3 - Traveler Looking for Transportation for a Recurring Medical Appointment

Topics	Description
Short Description	In this scenario, the Traveler has already scheduled a recurring medical appointment with a healthcare provider for dialysis treatment that will require 3 visits per week, The Traveler would like to book transportation on the same schedule. The return trip will also have to be booked on-demand after each treatment is over and the Traveler is discharged.
Goal	The goal of this scenario is to identify situations that Health Connector will have to address when trips are booked on a recurring and fixed schedule for a defined period.
Constraints	• Traveler may not be ambulatory. • Traveler may be elderly. • Return trip is typically not scheduled since there may be wait time after check-in and timeframe for treatment may vary.
Geographic Scope	• Covers travel area with an origin or destination within Dallas County • Require walking on sidewalk after the drop off. • Need to take stairs or elevator for the appointment inside the facility.
Preconditions	• On-board vehicle system is operational. • Vehicles are equipped with wayfinding technology for identification. • Hospital is equipped with wayfinding infrastructure to support the wayfinding application. • EHR and HIRTA central software interface is functional.
Post-conditions	• Funding source is billed the incurred transportation expense.
Information Requirements	Trip progress status and real-time information on vehicle delay/arrival.
Related User Needs	TRV-2, TRV-3, TRV-4, TRV-5, TRV-8, TRV-9. TRV-10, TRV-14, TRV-15, TRV-17, TRV-18, TRV-20, TRV-22, TRV-23, TRV-25, TRV-26, TRV-27, TRV-30, TRV-31, TRV-32 CSR-5, CSR-6, CSR-7, CSR-8, CSR-9, CSR-10, CSR-12, CSR-13, CSR-15, CSR-16 OPS-1, OPS-2 SCH-1, SCH-2, SCH-5 RFR-1, RFR-2 HNV-1, HNV-3 HCR-1, HCR-2, HCR-6, HCR-7, HCR-9

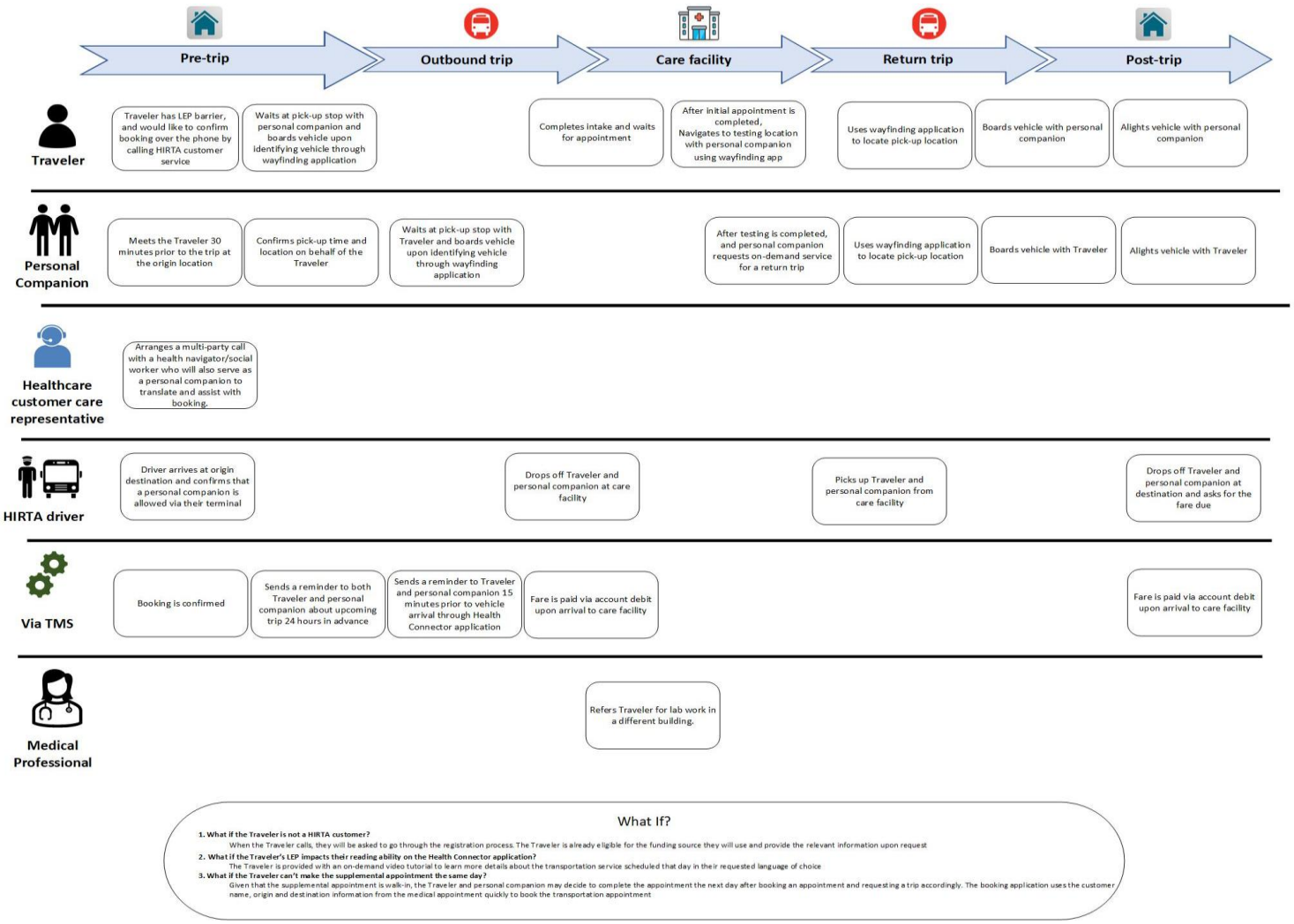

Figure 18. Scenario 4 - Traveler Looking for Transportation for a Recurring Medical Appointment on Irregular Schedule (Source: HIRTA Team)

Table 9. Scenario 4-Traveler looking for Transportation for a Recurring Medical Appointment on Irregular Schedule

Topics	Description
Short Description	In this scenario, the Traveler has recurring appointments for prenatal care, but those appointments are not on a fixed schedule. The Traveler has difficulty communicating in English and will need assistance with the trip. In addition, a return trip will have to be booked once the appointment is over and follow-up lab work is complete.
Goal	The goal of this scenario is to identify situations that Health Connector will have to address when trips are scheduled on a recurring but irregular schedule and the Traveler speaks limited English.
Constraints	• Return trip cannot be scheduled. • Traveler needs a companion due to LEP. • Follow-up lab work needed after the visit. • Transportation paid out of pocket.
Geographic Scope	• Covers travel area within the Dallas County • Traveler will need assistance with wayfinding inside medical facilities.
Preconditions	• On-board vehicle system is operational. • Vehicles are equipped wayfinding technology for identification. • Hospital is equipped with wayfinding infrastructure to support the wayfinding application. • EHR and HIRTA central software interface is functional. • Translation service is available. • Health navigator has access to the system. • A personal companion can be accommodated.
Post-conditions	None
Information Requirements	• Medical appointment and transportation availability for later appointment • Medical appointment progress status • Trip progress status and real-time information on vehicle delay/arrival
Related User Needs	TRV-1, TRV-2, TRV-6, TRV-9, TRV-11, TRV-13, TRV-14, TRV-16, TRV-17, TRV-18, TRV-19, TRV-21, TRV-22, TRV-23, TRV-26, TRV-27, TRV-28, TRV-29, TRV-31, TRV-33, TRV-34 CSR-6, CSR-7, CSR-11 DRV-1, DRV-2, DRV-7, DRV-8, DRV-10 SCH-5 HNV-1, HNV-2, HNV-3, HNV-6 HCR-4, HCR-6, HCR-9

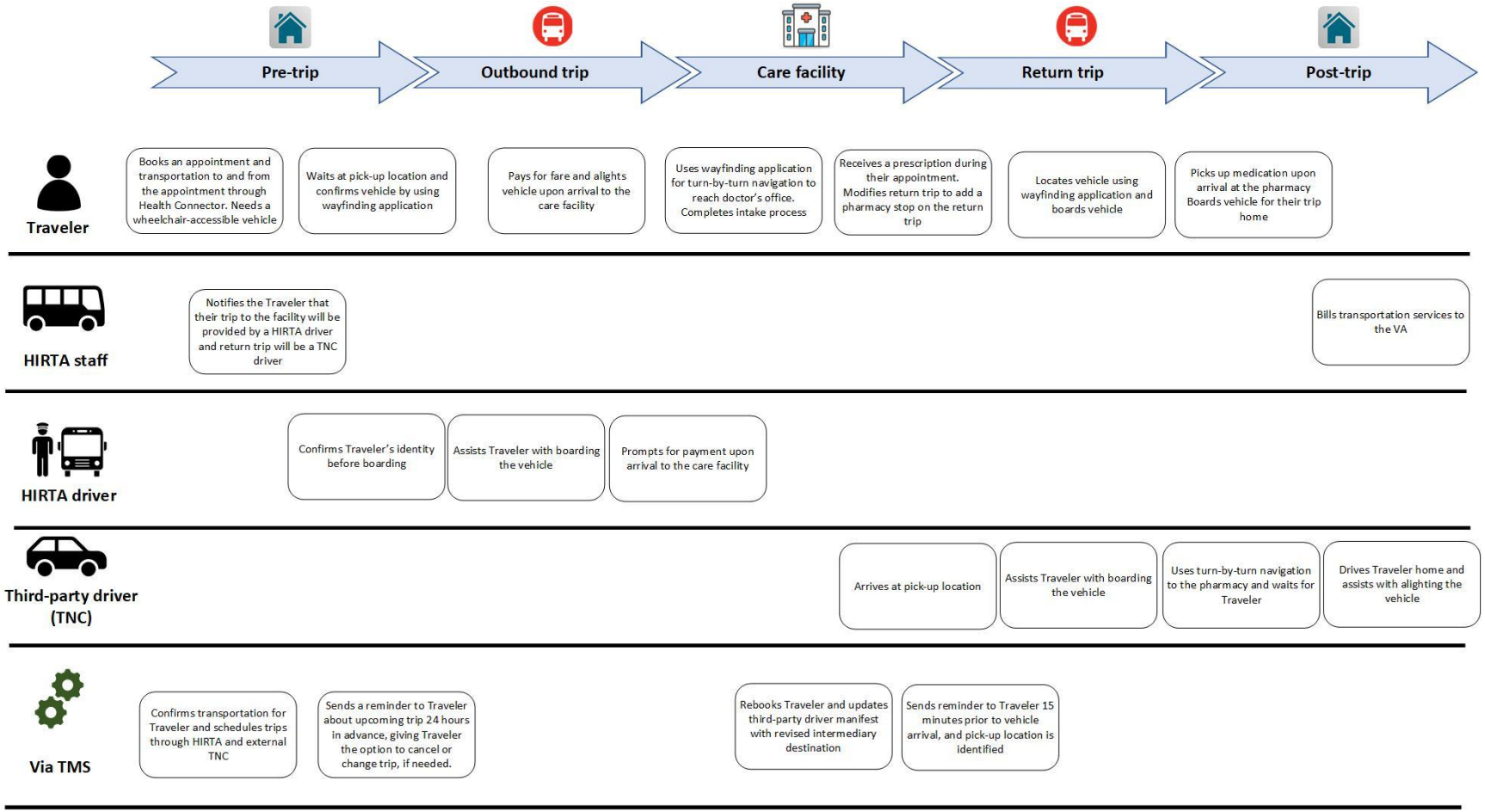

Figure 19. Scenario 5 - Traveler Looking for a Preventative Care Appointment (Source: HIRTA Team)

Table 10. Scenario 5 - Traveler Looking for a Preventative Care Appointment

Topics	Description
Short Description	In this scenario, the Traveler has an ad-hoc appointment for preventive care. The Traveler is a retired veteran and their healthcare is provided through the VA. The Traveler has a mobility limitation and uses a wheelchair. The Traveler lives in a rural area with limited access to a pharmacy and would like to stop by a pharmacy after the appointment.
Goal	The goal of this scenario is to identify situations where Travelers living in rural areas need healthcare access and prefer to avoid multiple trips.
Constraints	• The trip is almost an hour long, so the return trip may be provided using a TNC if a HIRTA vehicle is not available.
Geographic Scope	• Covers travel area with an origin or destination within Dallas County • Travelers will need assistance with wayfinding inside medical facilities.
Preconditions	• On-board vehicle system is operational. • Vehicles are equipped with wayfinding technology for identification. • Hospital is equipped with wayfinding infrastructure to support the wayfinding application. • EHR and HIRTA central software interface is functional.
Post-conditions	None
Information Requirements	• Medical appointment for video visit. • Medical appointment progress status. • Trip progress status and real-time information on vehicle delay/arrival.
Related User Needs	TRV-1, TRV-8, TRV-9, TRV-10, TRV-13, TRV-16, TRV-17, TRV-18, TRV-19, TRV-20, TRV-21, TRV-22, TRV-25, TRV-26, TRV-27, TRV-28, TRV-29, TRV-31, TRV-32 CSR-10 OPS-1, OPS-2, OPS-3, OPS-6, OPS-7 DRV-1, DRV-8 SCH-3 FND-1

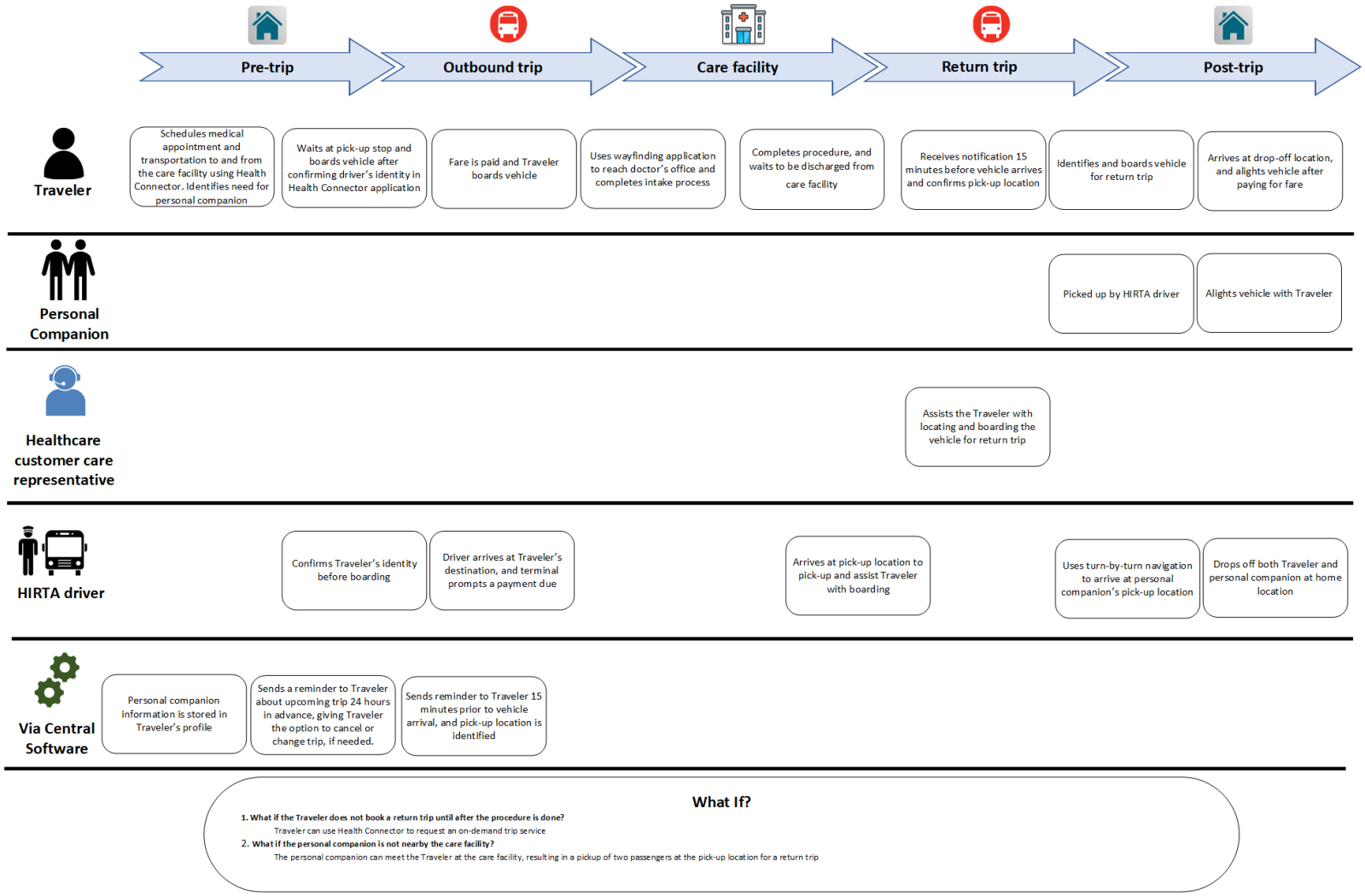

Figure 20. Scenario 6 – Traveler Looking for an Appointment for an Ad-Hoc Procedure Where a Companion is Needed for Return Leg of Trip (Source: HIRTA Team)

Table 11. Scenario 6-Traveler looking for an Appointment for an ad-hoc Procedure where a Companion is needed for Return Leg of the Trip

Topics	Description
Short Description	In this scenario, the Traveler has an upcoming appointment for an ad-hoc medical procedure. The Traveler can be discharged the same day, they will not be allowed to return home alone, thus they will need a personal companion on the return trip home. The Traveler coordinates with a friend to company them as a personal companion. The personal companion will have to be picked up at a location close to the healthcare provider.
Goal	The goal of this scenario is to identify situations where Travelers' needs may be different for a return trip than the trip to the healthcare provider.
Constraints	• Traveler needs assistance boarding the vehicle for return trip. • Traveler needs a personal companion for return trip. • May need follow-up care.
Geographic Scope	• Covers travel area with an origin or destination within Dallas County • Travelers will need assistance with wayfinding inside medical facilities.
Preconditions	• On-board vehicle system is operational. • Vehicles are equipped with wayfinding technology for identification. • Hospital is equipped with wayfinding infrastructure to support the wayfinding application. • EHR and HIRTA central software interface is functional.
Post-conditions	• Funding source is billed
Information Requirements	• Medical appointment progress status. • Trip progress status and real-time information on vehicle delay/arrival.
Related User Needs	TRV-1, TRV-9, TRV-14, TRV-17, TRV-18, TRV-19, TRV-20, TRV-21, TRV-22, TRV-25, TRV-26, TRV-27, TRV-31, TRV-32 OPS-7 DRV-1, DRV-9 SCH-5 ADM-4 HNV-1, HNV-5 HCR-1, HCR-7, HCR-9 FND-1

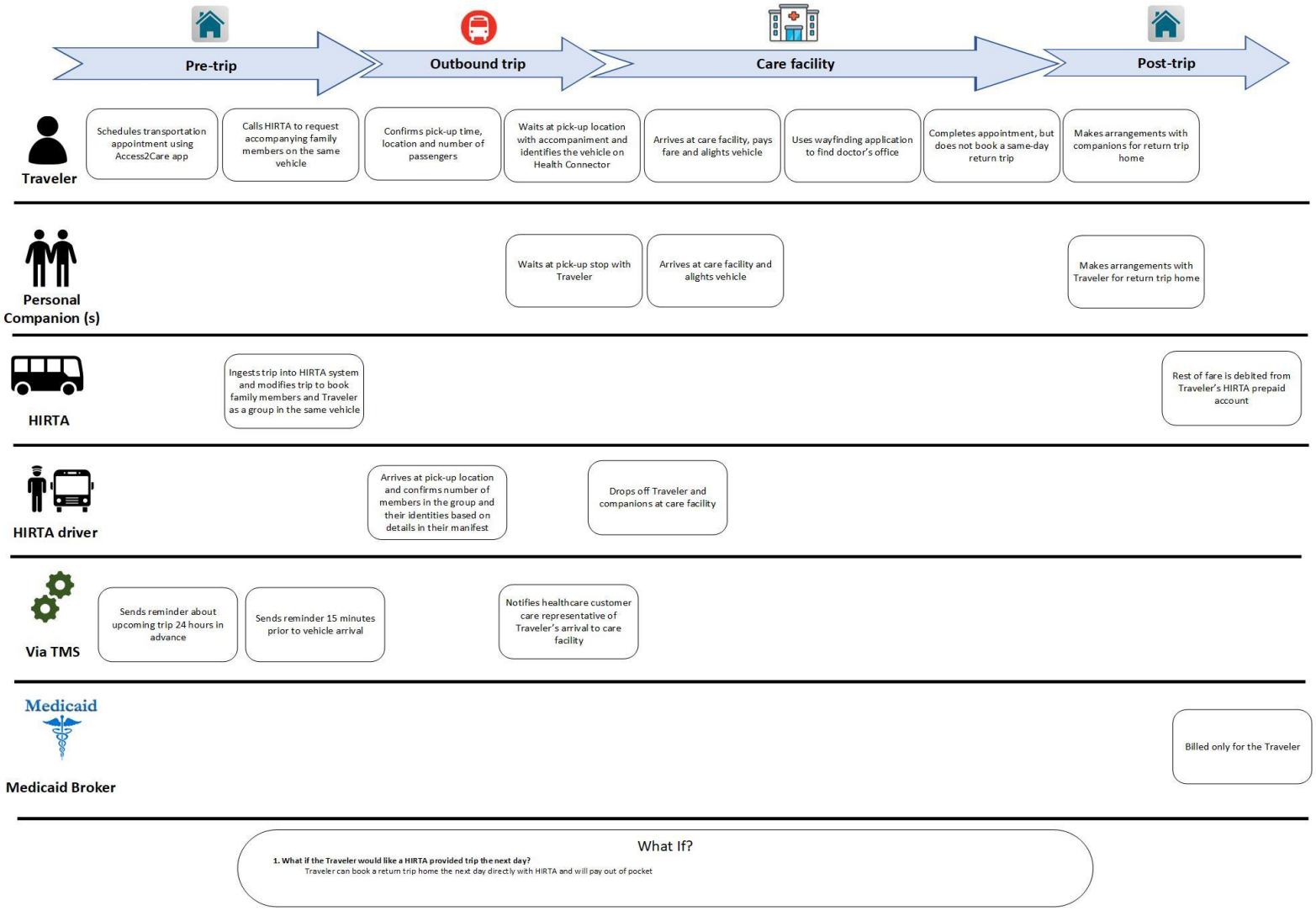

Figure 21. Scenario 7 - Traveler Looking for More than One Person as Accompaniment for a Medicaid Funded Trip (Source: HIRTA Team)

Table 12. Scenario 7-Traveler looking for more than one Person as Accompaniment for a Medicaid-funded Trip

Topics	Description
Short Description	A traveler is approved to take a Medicaid eligible trip but they would like family members to accompany them to assist with the appointment. The trip home from the care facility is 45 minutes long, so they would like to be dropped off at a friend's house to rest and plan to arrange their own transportation later for the ride home or may request a return trip on a later date. Medicaid will only pay for an eligible portion of the trip which is the Traveler's trip *to* the doctor's office.
Goal	The goal of this scenario is to illustrate situations where Travelers may have needs that are not supported by their funding sources.
Constraints	• Accommodating a large group of people • Funding source can be billed only for part of the trip. Rest will be paid out of pocket • May need a return trip at a later date
Geographic Scope	• Covers travel area with an origin or destination within Dallas County • Travelers will need assistance with wayfinding inside medical facilities.
Preconditions	• Access2Care system is functional and accessible to HIRTA • On-board vehicle system is operational • Vehicles are equipped with wayfinding application for identification • Hospital is equipped with wayfinding infrastructure to support the wayfinding application. • EHR and Via Central Software interface is functional
Post-conditions	• Medicaid requires follow-up to check if Traveler indeed went to the provider's office for the appointment. HIRTA can verify by looking at appointment status.
Information Requirements	• Medical appointment progress status • Trip progress status and real-time information on vehicle delay/arrival
Related User Needs	TRV-3, TRV-6, TRV-9, TRV-15, TRV-16, TRV-17, TRV-18, TRV-19, TRV-20, TRV-21, TRV-22, TRV-23, TRV-26, TRV-27, TRV-28, TRV-29, TRV-32, TRV-33 DRV-1, DRV-2, DRV-10 SCH-5 ADM-1, ADM-2, ADM-3, ADM-4 FND-1 GPA-1

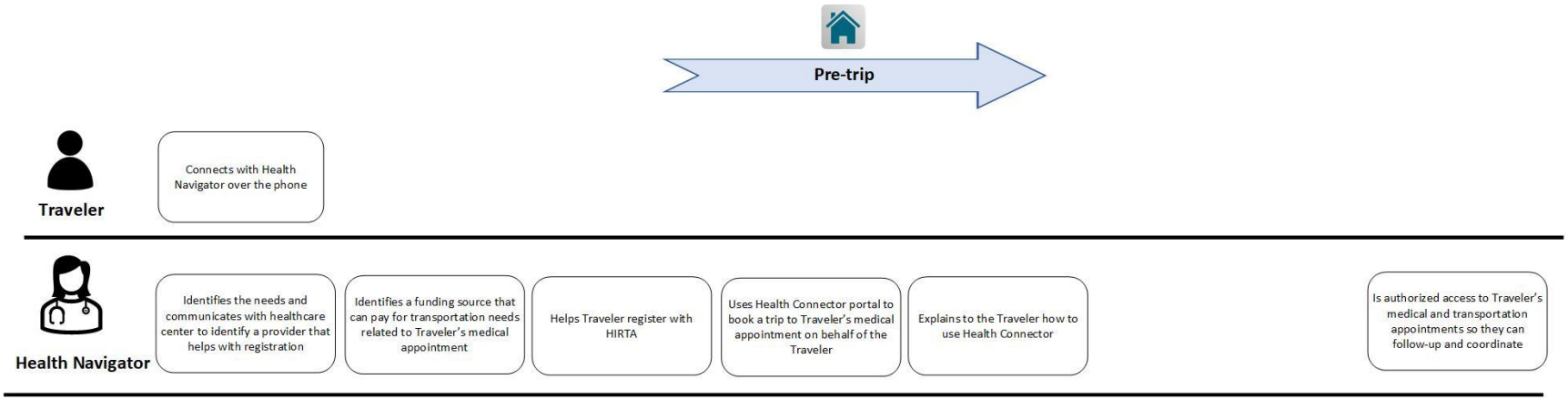

Figure 22. Scenario 8 - (DCHD) A New Dallas County Resident Looking for Information and Referral for Medical Care (Source: HIRTA Team)

Table 13. Scenario 8 (DCHD)-A New Dallas County Resident Looking for Information and Referral for Medical Care

Topics	Description
Short Description	An elderly Traveler just moved to Dallas County with their family and needs to get a medical appointment scheduled with an Endocrinologist but doesn't know providers in the area and does not have transportation. Further, the Traveler doesn't know who will pay.
Goal	The goal of this scenario is to identify situations where Travelers need help from a Health Navigator with their medical and transportation needs.
Constraints	• Traveler doesn't have medical and transportation resources identified • Traveler doesn't have funding source for transportation service
Geographic Scope	• Covers travel area with an origin or destination within Dallas County
Preconditions	• Traveler has reached out to DCHD for help
Post-conditions	Health navigator is notified of updates on medical and transportation appointments and can follow up.
Information Requirements	• Available healthcare providers • Available transportation providers • Status of medical and transportation appointments
Related User Needs	TRV-2, TRV-5, TRV-6, TRV-9 CSR-1, CSR-2, CSR-3, CSR-4 SCH-1 HNV-1, HNV-3, HNV-6 HAD-1 HCR-2, HCR-6

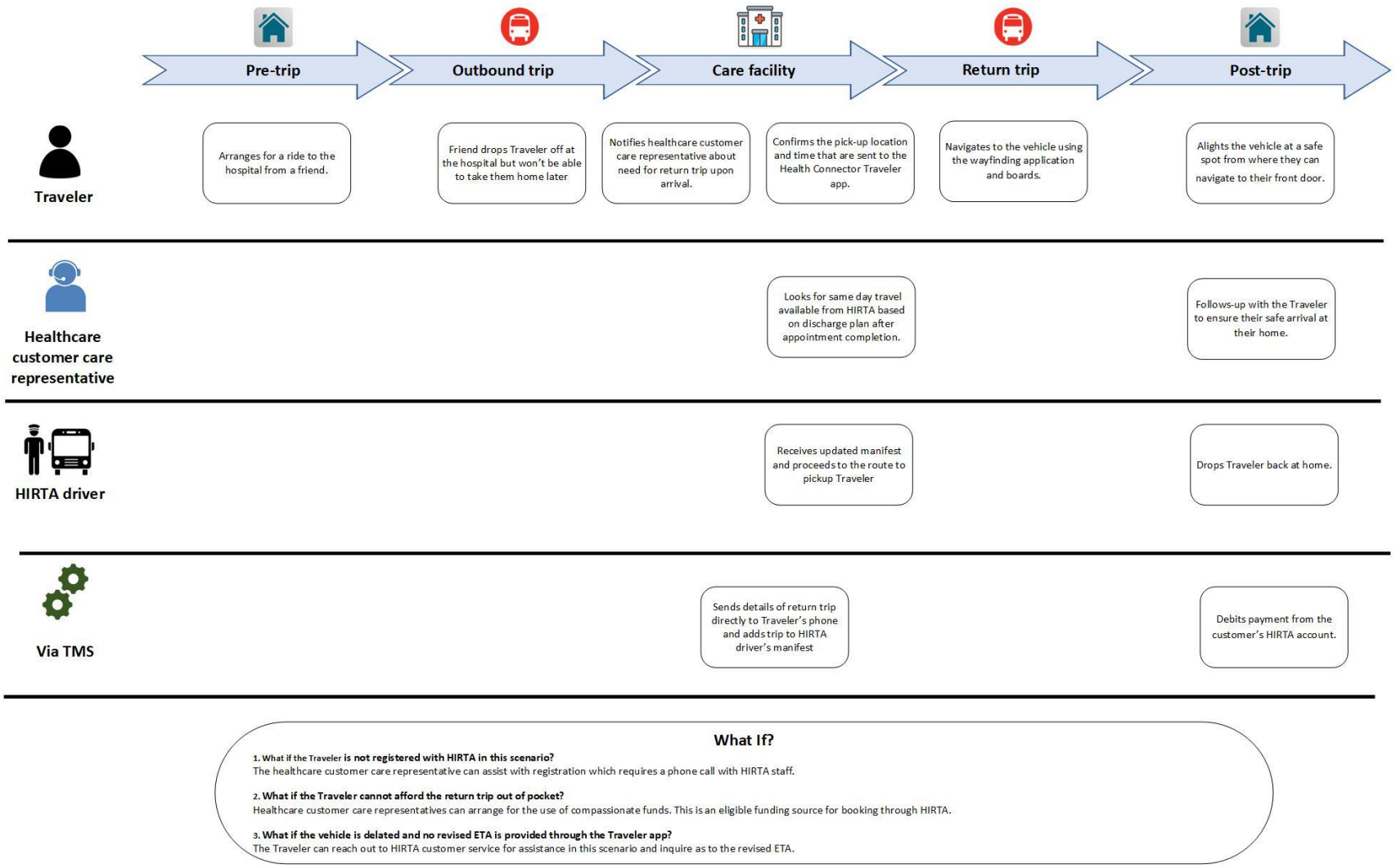

Figure 23. Scenario 9 - (Healthcare Provider) - Healthcare Provider Assists with Transportation Needs After the Appointment (Source: HIRTA Team)

Table 14. Scenario 9 (Healthcare Provider)-Healthcare Provider Assists with Transportation Needs after the Appointment

Topics	Description
Short Description	A blind Traveler was dropped off by a friend for a routine medical appointment but doesn't have return transportation; the Traveler is not comfortable with a taxi or TNC and prefers HIRTA service. Hospital customer care staff has requested a return trip directly using the HIRTA system.
Goal	The goal of this scenario is to identify situations where Travelers need help from the Healthcare provider's office only for return transportation.
Constraints	• Same day trip is requested • Traveler is blind and needs wayfinding • Traveler prefers services from HIRTA (or from their contractors)
Geographic Scope	• Covers travel area with an origin or destination within Dallas County
Preconditions	• Traveler is registered with HIRTA
Post-conditions	Healthcare customer care staff follows-up with the Traveler to ensure their safe arrival at their home destination.
Information Requirements	• Available HIRTA services • Status of vehicle arrival and trip progress
Related User Needs	TRV-6, TRV-9, TRV-21, TRV-27, TRV-28, TRV-29, TRV-31, TRV-33 CSR-5, CSR-7, CSR-9 OPS-3, OPS-9 DRV-1, DRV-11 HCR-1, HCR-5, HCR-6, HCR-9

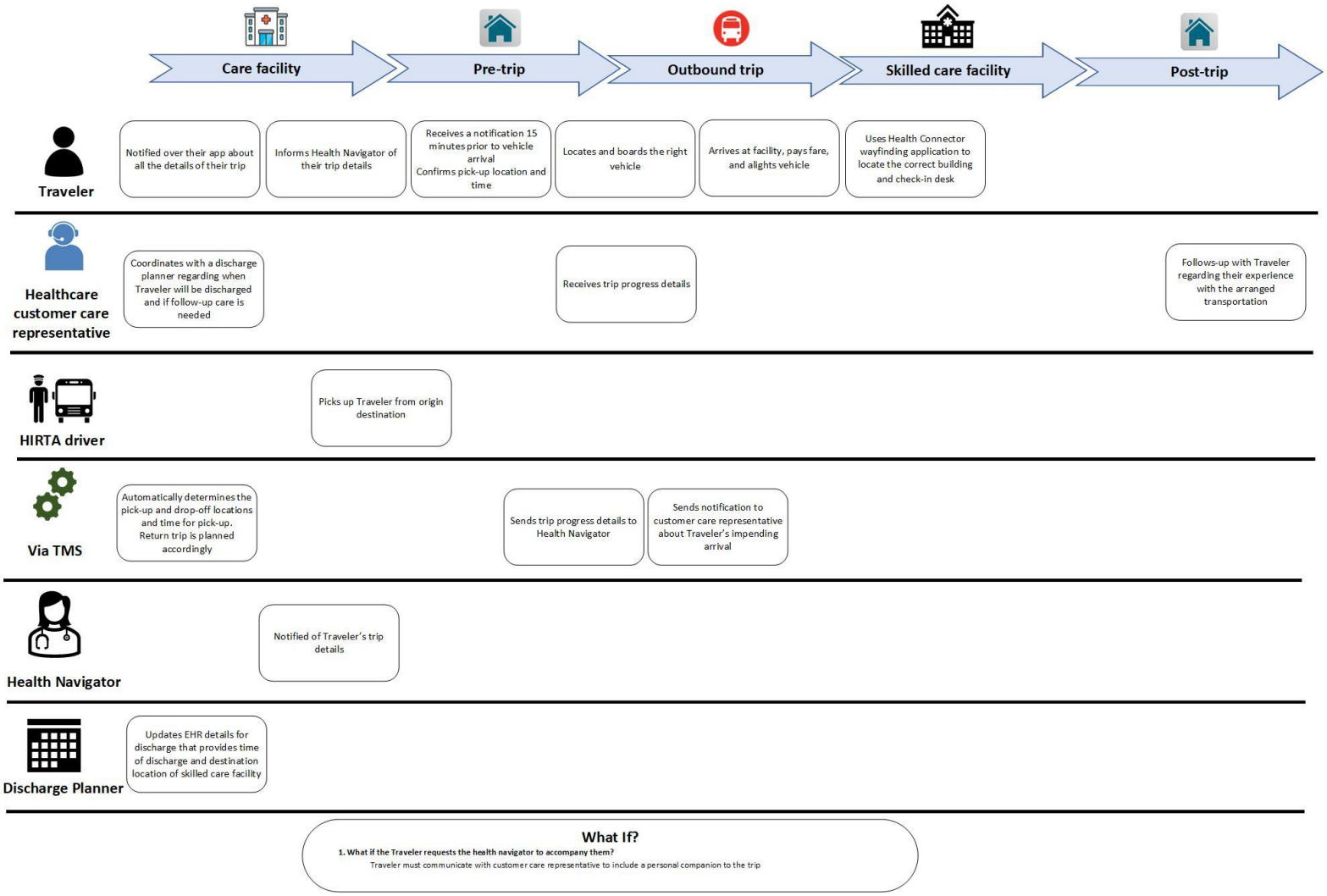

Figure 24. Scenario 10 - (Healthcare Provider) Healthcare Provider Arranges Return Transportation for Patient Prior to Discharge (Source: HIRTA Team)

Table 15. Scenario 10 (Healthcare Provider)-Healthcare Provider Arranges Return Transportation for Patient prior to Discharge

Topics	Description
Short Description	A Traveler has a planned discharge tomorrow based on the progression of recovery. A discharge planner sets up transportation to residences and/or skilled care facilities.
Goal	The goal of this scenario is to identify situations where a healthcare provider arranges transportation based on when Traveler can be discharged.
Constraints	• Timing for return trip unclear • Unclear if Traveler should be discharged to go home or sent to a skilled care facility.
Geographic Scope	• Covers travel area with an origin or destination within Dallas County
Preconditions	• Traveler is registered with HIRTA
Post-conditions	Healthcare staff the discharging facility follows-up with Traveler about their experience with the arranged transportation.
Information Requirements	• Available HIRTA services • Status of vehicle arrival and trip progress
Related User Needs	TRV-1, TRV-9, TRV-14, TRV-16, TRV-17, TRV-18, TRV-19, TRV-20, TRV-21, TRV-22 DRV-1 HNV-1, HNV-3 HCR-1, HCR-5, HCR-6, HCR-9

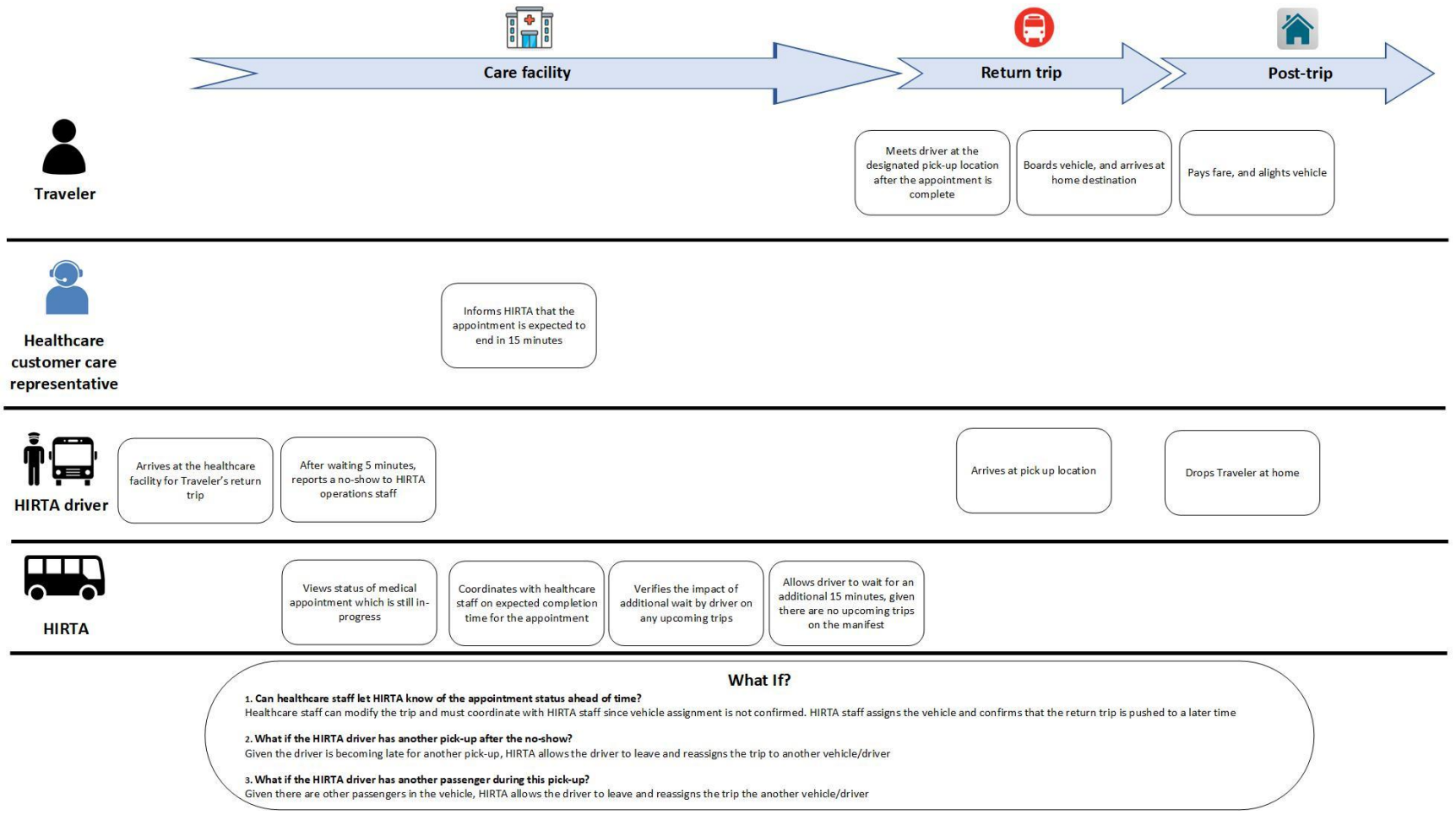

Figure 25. Scenario 11 - (HIRTA) HIRTA to be Aware of Medical Appointment Status to Arrange the Return Trip (Source: HIRTA Team)

Table 16. Scenario 11 (HIRTA)-HIRTA to be Aware of Medical Appointment Status to Arrange the Return Trip (Source: HIRTA Team)

Topics	Description
Short Description	HIRTA cannot find out if a Traveler who was dropped off for a medical appointment has already been discharged. The Traveler had booked a return trip and the driver is waiting for pick-up at the medical facility. The Traveler does not use the Health Connector app and is relying on HIRTA for coordination.
Goal	The goal of this scenario is to identify situations where HIRTA must coordinate services since the Traveler does not use smart devices.
Constraints	• Traveler does not use the app • Return trip booked but discharge timing is uncertain
Geographic Scope	• Covers travel area with an origin or destination within Dallas County
Preconditions	• Traveler is registered with HIRTA • Via Central Software and EHR software interface is functional • Driver can communicate using on-board systems
Post-conditions	
Information Requirements	• Available HIRTA services • Status of vehicle arrival and trip progress
Related User Needs	TRV-6, TRV-9, TRV-16, TRV-19, TRV-27, TRV-29 CSR-5, CSR-10 OPS-3, OPS-4, OPS-5, OPS-7, OPS-9 DRV-1, DRV-3, DRV-4, DRV-9 SCH-3, SCH-6 HCR-6, HCR-9

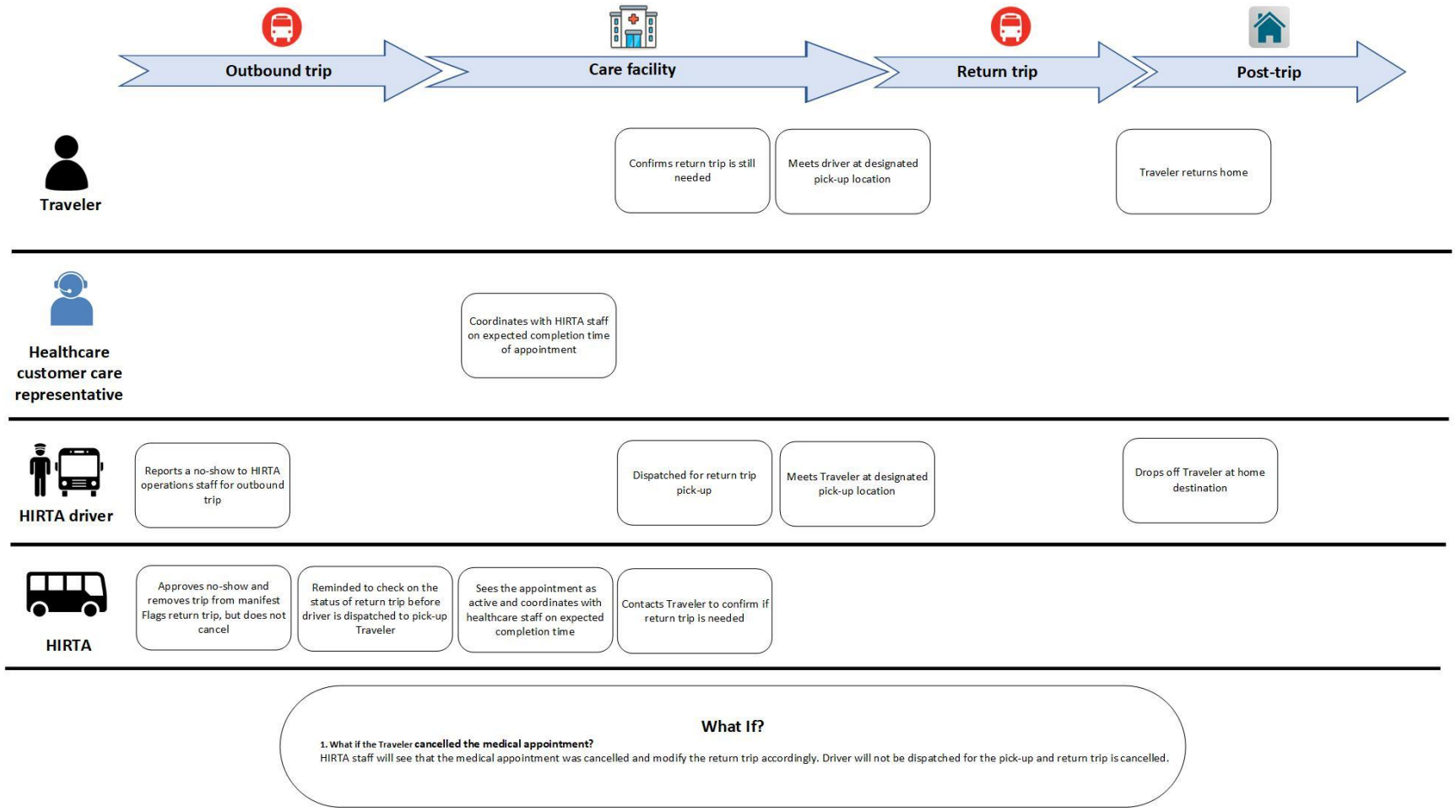

Figure 26. Scenario 12 - (HIRTA) HIRTA to Coordinate Regarding Return Trip Since Outbound Trip to Healthcare Facility a No Show (Source: HIRTA Team)

Table 17. Scenario 12 (HIRTA) - HIRTA to Coordinate regarding Return Trip since Outbound Trip to Healthcare Facility a No-Show

Topics	Description
Short Description	A Traveler was a no-show for outbound trip to medical appointment (or cancelled without providing a reason) but the customer had also booked a return trip. HIRTA has to follow-up with both the Traveler and the hospital to find out if the Traveler needs the return trip before their trip back to home can be cancelled. HIRTA policy is to typically cancel the inbound leg from a destination if the outbound leg to the destination was cancelled or was a no-show. HIRTA will contact the Traveler before cancelling the trip in the event of a no-show for the inbound trip to the healthcare facility.
Goal	The goal of this scenario is to identify situations where inbound leg to the destination was cancelled and a coordination may be needed for return leg before cancellation.
Constraints	• Given no-show on the on-bound trip, there is no information on appointment status • Return trip booked but status unclear
Geographic Scope	• Covers travel area with an origin or destination within Dallas County
Preconditions	• Traveler is registered with HIRTA • Via Central Software and EHR software interface is functional • Driver can communicate using on-board systems
Post-conditions	
Information Requirements	• Status of vehicle arrival and trip progress
Related User Needs	TRV-16, TRV-19, TRV-27, TRV-29 CSR-10 OPS-3, OPS-4, OPS-5, OPS-7, OPS-9 DRV-1, DRV-3, DRV-4 HCR-6

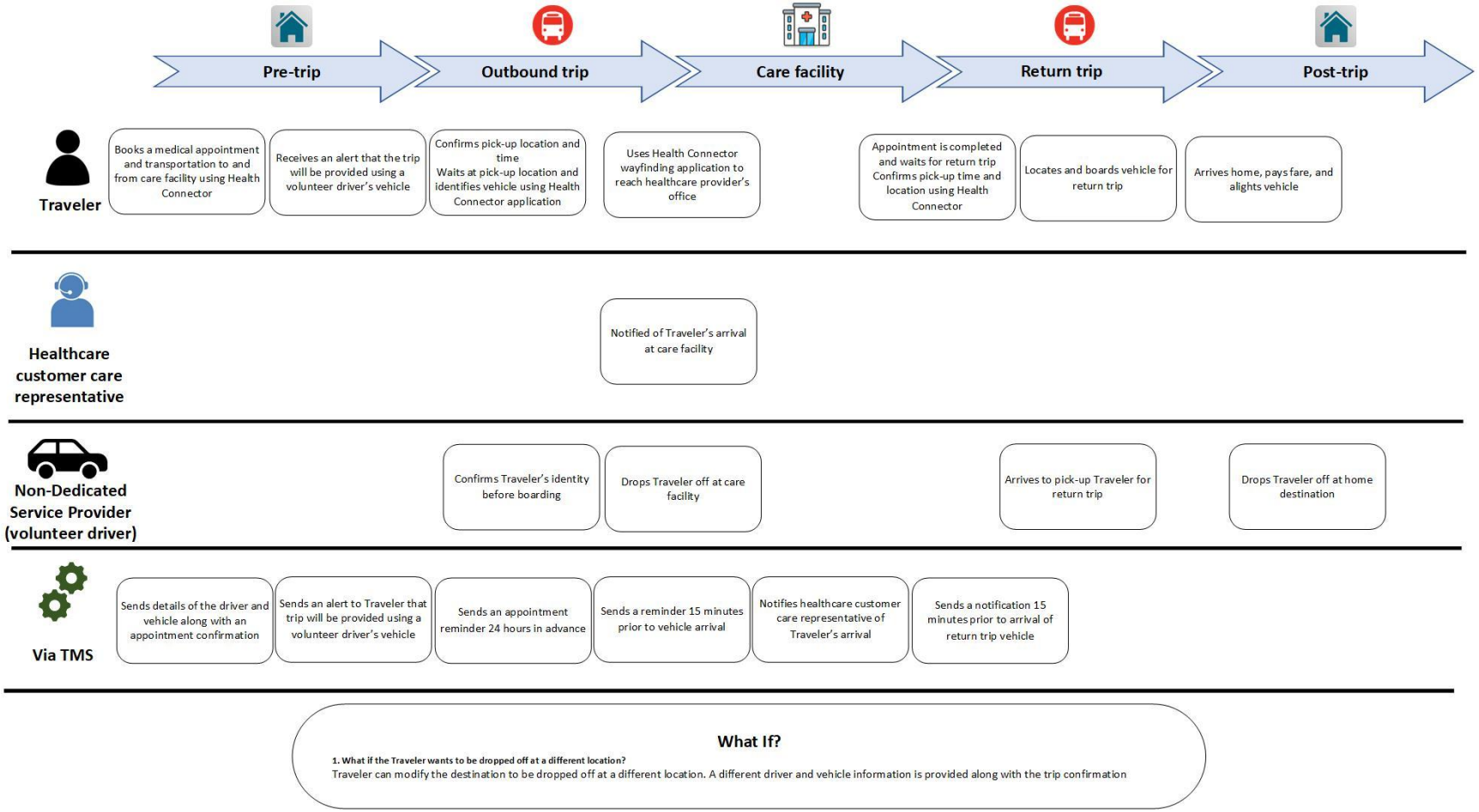

Figure 27. Scenario 13 - (HIRTA) HIRTA to Contract with a Non-Dedicated Service Provider (Taxi, TNC, Volunteer Driver) to Provide Trips During After Hours (TBD) (Source: HIRTA Team)

Table 18. Scenario 13 (HIRTA) - HIRTA to Contract with a Non-dedicated Service Provider (taxi, TNC, Volunteer driver) to Provide Trips During After Hours (TBD)

Topics	Description
Short Description	A Traveler has booked an appointment late in the day for a vaccination. HIRTA does not operate services during those hours but has contracted with a volunteer driver network to assist.
Goal	The goal of this scenario is to identify situations where HIRTA does not have capacity or its services are not available.
Constraints	• HIRTA services not available • HIRTA customer service staff is not available • Healthcare customer care staff is not available
Geographic Scope	• Covers travel area with an origin or destination within Dallas County
Preconditions	• Traveler is registered with HIRTA • Volunteer driver is trained to use the same platform as HIRTA drivers
Post-conditions	
Information Requirements	• Medical appointment availability. • Status of vehicle arrival and trip progress
Related User Needs	TRV-1, TRV-9, TRV-16, TRV-17, TRV-18, TRV-19, TRV-20, TRV-21, TRV-22, TRV-24, TRV-26, TRV-27, TRV-28, TRV-29 CSR-7 OPS-1 DRV-1 HCR-9

6 Summary of Impacts

This section summarizes business impacts brought in by Health Connector. This section provides information based on the team's current understanding and will be updated as we continue to discuss and discover further details on how healthcare operations will interact with this new system.

6.1 Operational Impacts

Anticipated impacts by user groups are as follows:

6.1.1 Travelers

Implementation of Health Connector will help HIRTA and its partners provide reliable, spontaneous, independent, safe, affordable, accessible, and efficient mobility options for all travelers. To make this transition seamless, HIRTA will establish a process for training Travelers as part of the on-boarding process using travel training or other outreach programs.

Anticipated impacts to be brought in by this implementation are discussed below:

- **Reliability**
  - Travelers will now have access to transportation services availability at the same time that they are booking their medical appointment, which will help improve the reliability of medical transportation delivery.
  - Advanced mapping algorithms that use real-time traffic information will help improve the reliability of predicted arrival information.
  - Reliability of information provided by different entities to Travelers will increase given they will all be able to access the same information related to medical appointment and transportation services.
- **Spontaneity**
  - Same-day response services will allow Travelers to make last minute reservations, often needed when the return trip schedule cannot be determined in advance.
  - Health Connector will allow Travelers to arrange transportation for medical appointments that may be outside of HIRTA's business hours.
- **Independence**
  - Health Connector will make transportation services available to residents in the rural or remote areas, allowing them to make their medical appointments without help from family or friends.
  - Wayfinding tools will allow Travelers to navigate unfamiliar environment without any support from others.
- **Safety and Security**

  - Access to real-time information on driver/vehicle and personal safety features within the application will help ensure Traveler safety.
  - Wayfinding tools will be able to help travelers with visual and hearing disabilities and those with language barriers in safely navigating unfamiliar areas.
  - Travelers may require training to alleviate any concerns related to privacy. Training will allow Travelers to understand that Health Connector collects and manages data according to guidance from HIPAA and relevant privacy regulations.
  - Traveler will have to share their medical appointment details with HIRTA and health navigators according to the currently established process for release for such data.
- **Affordability**
  - Often times Travelers have to utilize transportation services (taxi, personal vehicle, TNC and others) that are expensive. Trips booked through HIRTA will be according to the fixed fare structure and will make medical transportation affordable to all travelers.
  - Health Connector will allow HIRTA and its partners to utilize discount coupons, compassionate funds, and other funding sources to help low-income riders that may otherwise cannot travel transportation modes beyond family/friend vehicles.
- **Accessibility**
  - Access to wheelchair-equipped vehicles is a major concern with most commercial transportation options. Given all HIRTA vehicles are wheelchair-equipped, HIRTA will be able to make such vehicles available when needed while providing vehicles from contractors that may be able to meet the needs of other travelers.
  - Travelers with LEP rely on human assistance for translation needs. Health Connector will provide translation services within the wayfinding app, MOD Platform TMS or through the contacting customer care staff.
  - Travelers with visual or hearing disabilities currently do not have any tools to guide them during their trips. This solution will provide those capabilities.
- **Efficiency & Mobility**
  - Health Connector will provide a platform for enabling trip discovery, planning, booking, and payment through a single application which will substantially enhance seamless mobility for all travelers.

6.1.2 HIRTA

- HIRTA will have the capability to identify any delays in the medical appointment to determine any adjustments needed for return trips.
- This solution will allow HIRTA to be able to use third-party service providers.
- HIRTA will have to install and maintain infrastructure needed for wayfinding technologies on its vehicles and at designated pick-up and drop-off locations.
- HIRTA will assist Travelers according to its standard operating procedures when they may report personal safety alert when being transported.

6.1.3 Healthcare Providers

- Healthcare staff will have the ability to book transportation service if requested by Travelers (patients).

- Healthcare providers will share medical appointment data for customers on their permission so transportation can be booked by HIRTA.
- Healthcare providers will share medical appointment data for customers on their permission so their needs can be coordinated by health navigators.
- Healthcare providers will have to agree to install and maintain infrastructure needed inside their facilities to assist with wayfinding.

6.1.4 Health Navigators

- Health navigators will have access to medical appointment data and transportation services and their availability as relevant to their customers.
- Health navigators will also be able to obtain current status information (e.g., in progress, complete, delayed) for medical appointments and trips.

6.2 Organizational Impacts

Organizational changes as currently anticipated are as follows:

6.2.1 HIRTA

- Operations and customer service staff will have to be trained to be familiar with functions that will be available with Health Connector.
- Driver will be trained about new capabilities being offered so they are able to assist customers when asked.
- HIRTA will likely need a full-time liaison that coordinates needs related to medical transportation and is in constant touch with health navigators and healthcare providers. However, this requirement does not indicate a new hire. Efficiency gains due to automation will HIRTA to utilize existing resources for such needs.

6.2.2 Healthcare Partners

- Infrastructure needed to enable wayfinding applications (e.g., visual markers, beacons) will have to be installed and maintained by healthcare partner.
- Healthcare partner may designate a spot for pick-up and drop-off for better coordination with HIRTA and its contractor vehicles.

6.2.3 DCHD

No organizational changes are anticipated for DCHD.

6.3 Impacts During Development

Detailed assessment will be conducted during system requirements development, but we anticipate the following impacts:

- Participation in design discussions and any related stakeholder engagement activities

- Review and approval of usability of applications and alternate methods available to users for utilizing Health Connector system by stakeholders, users, and relevant advocacy groups.
- Participation in outreach programs.
- Participation in training sessions.
- Participation in testing.
- Parallel operation of existing and modified/new systems.
- Adjustments to modified standard operating procedures.

7 Analysis of the Proposed Systems

This Section provides an analysis of the benefits, limitations, advantages, disadvantages, and alternatives and trade-offs considered for the proposed system.

7.1 Analysis of the Proposed System

The following subsections describe system and the benefits and limitations/disadvantages of the system.

7.1.1 Benefits

Key benefits identified through discussions thus far by user groups are as follows.

7.1.1.1 Travelers

1. Improvements in the accuracy, reliability, and availability of real-time information on trip status through planned upgrades in central (e.g., better management of ETA) and customer-facing systems (e.g., provision of real-time information).
2. Increased access to transportation services through same day response and after hour services for healthcare needs given availability of third-party vehicles along with HIRTA vehicles.
3. Reduction in the amount of time spent coordinating healthcare transportation needs through integration in the systems managing medical appointment and transportation services.
4. Reduction in the number of missed healthcare appointments through increased availability of reliable transportation services, particularly for same day trip requests.
5. Better comfort level (and reduced stress) in going to medical facilities with large campus environment with availability of wayfinding tools.
6. Better capabilities to connect with health navigators and social workers for healthcare needs as they have seamless access to Traveler's medical appointment information and linked transportation services.
7. Measurable improvements in overall health and wellbeing through regular transportation access to preventive care and other appointments as and when needed.
8. Enhanced on-board experience due to additional capabilities provided to make Travelers familiar with medical campus environment, if requested.
9. Improvements in terms of reduction in times (or wait times) between booking and arrival of vehicle for same-day bookings.
10. Reliability of the transportation service schedule (e.g., delta between the predicted and actual arrival time of the vehicle).

11. Improvements to address translation needs through seamless integration of translation services with booking, real-time information and wayfinding services.
12. Ability to seamlessly execute trip cost allocation/split between different providers (depending on the trip purpose and eligibility) and out-of-pocket expenses.
13. Providing spontaneity in booking, cancelling, changing, or modifying a trip based on the Travelers' spontaneous needs via new customer tools.
14. Addressing the needs of specific underserved groups by focusing on the product design and implementation to account for their specific needs. For example, accompanying visual or audio formats when needed for a user interface for persons with disabilities; font size and color contrast for older adults; consideration for limited broadband for those living in rural areas; and features for unbanked/underbanked to address the challenges of low-income population.
15. Having a record of healthcare-related transportation activity/history at the palm of the Travelers' hands.
16. Ease of coordination and interaction with caregivers, companions, or translators through available of tools via Health Connector system.

7.1.1.2 HIRTA

1. Reduced number of no-shows with better coordination capabilities with travelers and healthcare providers.
2. Improved experience while coordinating return trip, given HIRTA, travelers, healthcare providers and caregivers all have access to the same set of information.
3. Better tools to assist underserved populations with incorporation of accessibility features within Health Connector, as discussed earlier.
4. Access to data for predictive analytics to enhance customer experience and potential for providing customized services based on Travelers' trip patterns, appointment time preferences, appointment durations, healthcare provider choices, cancellation, and no-show patterns, etc.
5. Increased on-demand capacity by engaging third-party providers for surge periods or service demands for outside of operating hours.

7.1.1.3 DCHD

1. Reduction in the number of missed appointments caused by lack of access to transportation.
2. Improved resources to identify transportation services.
3. Improved access to tracking medical and transportation appointments for customers.

7.1.1.4 Healthcare Providers

1. Reduction in number of missed appointments due to lack of access to transportation.
2. Improved patient experience due to transportation booking capability while booking a medical appointment.
3. Improved patient experience in locating vehicle, entrances, and office destinations due to availability of wayfinding capability.

4. Reduced level of effort expended in making transportation arrangements by healthcare staff or affiliated social workers.
5. Improved efficiency due to arrival tracking, real-time delay reporting, and other features that allow the healthcare providers to streamline schedules.
6. Improved healthcare experience by offering immediate/same-day appointments for follow-ups, lab work, or pharmacy visits without having to deal with complex transportation scheduling processes to postpone or reschedule return trips.

7.1.1.5 Community Partners

1. Improved ability to monitor general wellbeing of the community influenced by enhanced access to transportation.
2. Access to data and reporting which can help better planning for funding and programs designed by targeting specific underserved groups

7.1.2 Disadvantages and Limitations

The system has the following limitations:

- Custom interface with each EHR system or a middleware will be required to obtain medical appointment data. This limits the number of healthcare partners with which HIRTA can integrate the Health Connector application. The alternate approach of providing Health Connector central system to healthcare providers does not provide seamless integration and may still require some level of manual coordination.
- HIRTA project team is not integrating with information and referral systems used by DCHD or other referral entities, given that was considered optional during stakeholder discussions. A seamless integration in the future may eliminate unnecessary manual coordination.
- HIRTA team is exploring alternatives to the current wayfinding system, since that is completely reliant on use of smart devices. Also, extensive infrastructure will be required for indoor navigation.
- Given the limited number of HIRTA vehicles, on-demand trips will most likely be provided by third-party contractors. This may not be preferred by some Travelers.
- It has been noted during stakeholder engagements that elderly population may not be comfortable with smart device-based capabilities due to low vision and technology familiarity issues. While alternate methods through customer service staff are available, it may not provide the spontaneity and immediate access to context sensitive information readily available through smart devices.
- Technology adoption could be a big challenge due to a significant change in the current travel experience. Some Travelers may prefer to continue with human assistance as they may feel more comfortable. This may lead to limited adoption of Health Connector if outreach is not effective. Apart from outreach, HIRTA team will also incorporate any potential adoption-related concerns in the design, deployment, and testing stages, building on the system requirements that will address the specific needs of underserved groups.
- HIRTA will have to provide an appropriate level of access to Health Connector system to authorized staff at healthcare providers for management of healthcare appointments and monitoring of transportation services for those appointments.
- Either using the currently established process for information release at healthcare providers or through new release authorization terms and conditions that healthcare providers are

willing to adopt, healthcare providers will have to provide access to medical appointment data which will at least include 1) customer identifier; 2) customer/caregiver contact; 3) time of appointment; 4) day of appointment; 5) location of appointment; 4) doctor's office contact information. Travelers will need to provide informed consent at the time of enrollment in Health Connector**.** HIRTA has included healthcare providers as part of stakeholder engagement sessions (e.g., ConOps walkthrough, SyRS walkthrough), so they are aware of the data needed for coordinating medical and transportation appointments. Stakeholder input from healthcare providers is being documented in meeting minutes and any online meetings are recorded. Also, HIRTA team will closely follow the currently established terms used by the healthcare partners to share data with caregivers to avoid any deviations from the currently established practices.

7.2 Alternatives and Trade-offs Considered

As discussed in Section 3.4, the following alternatives and trade-offs were considered in the ConOps development:

- **Medicaid broker integration**: According to Access2Care, the Medicaid-funded trips must be booked via their member application. While Medicaid members will still book through Access2Care, once those trips have been assigned to and accepted by HIRTA, Medicaid members will have access to those trips through the Via app and will have the same experience from that point on as customers whose trips are not paid for by Medicaid.
- **Direct integration with all Healthcare partner systems:** Each EHR system requires a proprietary interface to accomplish data exchange with external systems (in this case Via). Given the complexity, at this time the HIRTA team is considering interfacing with Epic that supports and has published open APIs. Other systems do not have published APIs using the same standard. Also, the interface with EHR systems is limited to appointment data only and no health or privacy related information will be exchanged as part of the interface.
- **Advanced wayfinding tools:** HIRTA team is using a simplified wayfinding solution, as some of the technologies available for indoor navigation are still not mature. We have researched both infrastructure-based (visual markers, beacons) and infrastructure free (relying on sensors built in smart devices) to provide such capabilities.
- **Providing details such as wait time at hospital:** While we considered notifying Travelers of expected wait time upon arrival for their doctor's visit or other medical needs, we currently do not have any indication of availability of such data at hospitals.
- **Additional capabilities that are currently not included,** but the team will continue to explore during Phase 2 are as follows:
  - Partner with third-party infotainment service providers (through new in-vehicle screens) for multi-lingual customer-applicable information. Examples include: information on in-take process for new customers.
  - Explore integrated payment opportunities for third-party billing for transportation services and insurance billing from a single account. Explore any efficiency gains through integrated payments for all activities related to the trip (e.g., insurance billing, third-party billing).

Appendix A. Acronyms and Glossary

Acronym	Definition
Access2Care	A transportation broker for State of Iowa Medicaid program that performs booking and scheduling and works with service providers such as HIRTA for successful delivery of Medicaid-eligible trips.
ADA	Americans with Disabilities Act - Refers to the civil rights legislation passed and signed into law in 1990 to prevent discrimination against people with disabilities
API	Application Programming Interface
Billing	Refers to the process of invoicing third-party funding sources (e.g., Medicaid) after a successful delivery of a trip. Billing is typically done on a monthly basis.
CHNA	Community Health Needs Assessment - Refers to the Community Health Needs Assessment Report developed by Dallas County in 2019.
Cost Allocation	Refers to the process of associating a funding source that should be billed for a trip in a shared ride scenario when riders covered by separate funding sources share the vehicle for their trips and trip purposes at the same time.
DCHD	Dallas County Health Department - One of the project Partners who will lead integration with health care services.
DR	Demand Response – Refers to a service that is not run on a fixed route or a schedule (e.g., dial-a-ride, vanpool etc). This requires making trip booking by contacting the service provider (e.g., HIRTA). However, DR is different than an ADA Paratransit service which is provided as a complement to a fixed route and is governed by specific requirements provided in 49 CFR- Part F. HIRTA operates only DR Service in Dallas County and all discussion in this document is related to DR Service.
Dispatching	Refers to an operations management function which involves assigning vehicle, tracking fleet location, managing schedule adherence, managing trip manifests and other operational functions.
DMP	Data Management Plan - The Data Management Plan is Task 3 of Phase 1 and describes the approach for data collection, processing, storage and utilization. Data Management Plan has been updated as part of Phase 2.

Acronym	Definition
DOT	Department of Transportation - The government department responsible for transportation. In this report, this generally refers to either the State of Iowa's DOT or the United States DOT referred to as Iowa DOT and USDOT, respectively.
EHR	Electronic Healthcare Record - Refers to the healthcare information management system used by hospitals for patients' healthcare-related appointments, transactions, and records management.
HIPPA	Health Insurance Portability and Accountability Act of 1996 - Provides guidelines for data protection of sensitive patient health information
HIRTA	Heart of Iowa Regional Transit Agency - Rural, regional public transit agency in central Iowa. HIRTA will serve as Proposer/Applicant for the Complete Trip - ITS4US project.
HN	Health Navigator - Refers to services provided by Dallas County Health Department to Dallas County residents in identifying resources as necessary for improving social determinants of health.
Information and Referral	Refers to public and private entities that help their customers in identifying resources for health and human services and other needs.
IPFP	Institution, Partnership, and Financial Plan - The Institution, Partnership and Financial Plan is a deliverable of Task 10 under Phase 1.
ISU	Iowa State University - Iowa State University is a public research university with multiple campuses in the State of Iowa and will be engaged as the research and evaluation partner in Phases 2 and 3.
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.
NDSP	Non-Dedicated Service Provider – NSDP refers to operators providing a service under contract (e.g., taxis) to an agency (e.g., HIRTA).
NEMT	Non-Emergency Medical Transportation - The provision of transportation to patients for medical appointments, lab visits, and other routine care. Generally, used in the context of Medicaid service only.
PII	Personally Identifiable Information - Refers to any data that can distinguish an individual, either alone or when linked with other available data.

Acronym	Definition
Provider	Provider in this context mainly refers to an entity performing service delivery for requested trips, sometimes also referred to as service provider. We have also used healthcare partners as providers in some cases but referred as 'healthcare providers.'
Reservation	Refers to the act of booking a trip based on a request from a customer. Reservation is available to only registered customers.
Scheduling	Refers to the process of identifying driver and vehicle resources and their runs/shifts for a given workday. Scheduling is typically performed for all requests received until 24 hours in advance. Booking within 24-hour notice and on-demand is offered but not encouraged due to limited system capacity and resources.
Smart Device	Refers to smartphone, smartwatch and similar personal devices that may be internet enabled and are equipped with sensors.
TNC	Transportation Network Company - Encompasses a group of companies that provide on-demand ridehailing services.
Traveler	Refers to the customer using the Health Connector application.
Wayfinding	Refers to the tools and technologies that assist in orientation, locating objects, and step-by-step navigation to destinations in outdoor and indoor environments using visual markers, sensors or physical signage.

Appendix B. References

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