

Phase 3 Participation in Standards Development

Heart of Iowa Regional Transit Agency ITS4US Deployment Project

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Table of Contents

1. Introduction	1
1.1. Intended Audience	1
1.2. Document Purpose.....	1
1.3. Project Background	1
2. System Overview	3
2.1. Physical System Overview.....	3
3. Standards Landscape Update.....	7
3.1. HIRTA Team's Participation in Standards Efforts	7
3.2. Demand-Responsive Transportation Data Standards.....	8
3.2.1. Trip Discovery: GTFS-Flex and GOFS.....	8
3.2.2. Transactional Data: TDS Demonstration Results and Governance.....	8
3.2.3. Payment, Pricing, and Settlement	9
3.2.4. Curb and Pick-Up/Drop-Off (PU DO) Access Standards	10
3.3. Healthcare Transportation and NEMT Standards.....	10
3.4. Remaining Gaps from a Complete Trip Perspective	11
4. Cybersecurity Standards and Regulatory Developments.....	13
4.1. Healthcare Sector: HIPAA Security Rule and HHS Guidance	13
4.2. Transportation Sector: TSA and FTA	13
4.3. Cross-Cutting Frameworks and Vendor Requirements.....	14
5. Standards Considered and Implemented for the Health Connector Project	15
5.1. Data Standards.....	15
5.1.1. In-Vehicle Device Communication Standards.....	15
5.1.2. Wireless Data Communication Standards	16
5.1.3. Data Access Protocols	16
5.1.4. Data Security Standards	17
5.1.5. Data Sharing Standards.....	17
5.1.6. Open Data Standards for Transit.....	18
6. Participation in Future Standards Development Efforts	21
6.1. Activities Completed	21
6.2. Activities Recommended.....	22

1. Introduction

1.1. Intended Audience

The intended audience for this document is the Heart of Iowa Regional Transit Agency (HIRTA) project team, the United States Department of Transportation (USDOT), vendor teams, and Standards Development Organizations (SDOs).

1.2. Document Purpose

This document identifies the current state of practice regarding the use of specifications and standards for similar deployments. It lists the relevant specifications and standards used by the HIRTA team for the Health Connector deployment. Further, the document identifies the gaps and opportunities for standards development to promote replicability of similar deployments by other organizations in the future.

1.3. Project Background

The Heart of Iowa Regional Transit Agency (HIRTA) provides 300,000 customer rides and operates 95,000 hours (2019 estimates; pre-pandemic), covering 1.3 million miles of service within the seven-county region encircling the Des Moines urban area. HIRTA provides demand response services to customers for all trips booked from 24 hours to up to 14 days in advance. If capacity is available, HIRTA also provides trips to meet same-day requests. At the start of Phase 1, HIRTA also acted as a service provider for the State of Iowa Medicaid broker, Access2Care, who was later acquired by MTM Inc., the company who now brokers Medicaid rides in Iowa.

Health Connector is an innovative solution that addresses 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. The project has deployed emerging and innovative technologies and services through an inclusive customer-focused design process to engage stakeholders to address the related non-emergency medical transportation needs of underserved populations and their caregivers. The solution utilizes emerging technologies to enable the customer to schedule and manage medical appointments and transportation services through a smart device (e.g., smartphone) or an equally effective alternate method. Further, the application provides context-sensitive wayfinding and customer information to enhance end-to-end experience and guide customers through their trip. This solution leverages preexisting demand response service management technologies at HIRTA and brings other advancements as well.

This deployment provides enhanced transportation access to healthcare options for all Travelers in Dallas County. In addition to addressing mobility needs, the deployment also recognizes the net impact that access to healthcare 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 1 provides an overview of the Health Connector concept.



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

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

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

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

2. System Overview

2.1. Physical System Overview

The systems and interfaces involved in the context of Health Connector can be defined as follows:

- **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.

- **Transportation Management Subsystem (TMS):** TMS refers to any systems related to the operational backend functions involved in service delivery. Under this project, the following two transportation management subsystems are commonly referenced. Below provides a definition of each system.
 - **MOD 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.
 - **HIRTA TMS:** The HIRTA TMS includes the MOD TMS and functions that support Health Connector from outside of the MOD platform such as the call center software. The HIRTA TMS also hosts interfaces (middleware) that was 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 Electronic Health Record (EHR) system.
- **Vehicle Subsystem:** refers to the technologies deployed on vehicles to support driver-end functions for driver-dispatch communications, manifest management, support just-in-time dispatching, turn-by-turn navigation and outdoor wayfinding (e.g., to locate Travelers at the time of pickup), on-board information and fare payments. On all HIRTA-owned vehicles, drivers 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 used for providing outdoor wayfinding, indoor positioning, orientation, and navigation on request to Travelers. It also assists

with translation functionality. NaviLens is used as the commercially available wayfinding provider for this deployment.

- **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. At the start of Phase 2, Access2Care's system was used to book and manage Medicaid trips. HIRTA was one of the providers used by Access2Care. In October 2024, Access2Care was acquired by MTM who acts as the new Medicaid Broker. Medicaid trips will continue to be booked by the Medicaid Broker when requested by Travelers. The system was designed so that Medicaid trips would be ingested in the HIRTA system when assigned to HIRTA. At that point, a Traveler using Medicaid benefits would be able to use Health Connector Traveler tools. Due to the transition from Access2Care to MTM, which has delayed access to the APIs that provide ride data, deployment of this system is currently on hold. Communication with MTM is ongoing, however, API access has not yet been established.
 - **Health Navigator- and Healthcare-end Subsystem:** refers to the limited-access MOD platform available to health navigators and healthcare customer care staff to request trips, modify trip requests, and check trip status on behalf of Travelers. Additionally, health navigators and the health administrator at the Dallas County Health Department (DCHD) use a Microsoft Access-based information and referral (I&R) product to track the status of referral activities and for coordination with Dallas County residents' health navigation/social care services.
 - **EHR/Medical Record Subsystem:** refers to the systems used by partner hospitals and clinics for booking medical appointments and managing them, 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 use. Health Connector has developed an interface with the following healthcare partner's EHR system.
 - Dallas County Hospital – Currently using Veradigm EHR, transitioning to Epic EHR
 - Health Connector is looking to expand to additional partners over time, including:
 - McFarland Clinic – Epic EHR
 - MercyOne Hospital – Epic EHR
 - Other regional clinics – Veradigm EHR
 - **Eligibility Management System:** refers to the system that manages traveler registration and funding eligibility. Travelers register for Health Connector directly through HIRTA by completing a registration form hosted on HIRTA's Health Connector website. Funding eligibility is designated and managed with Via's system.

- **Other:** Additional relevant details for the system that are deployed are as follows:
 - **Supporting systems:** These are existing systems and are not part of the Health Connector project. 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.

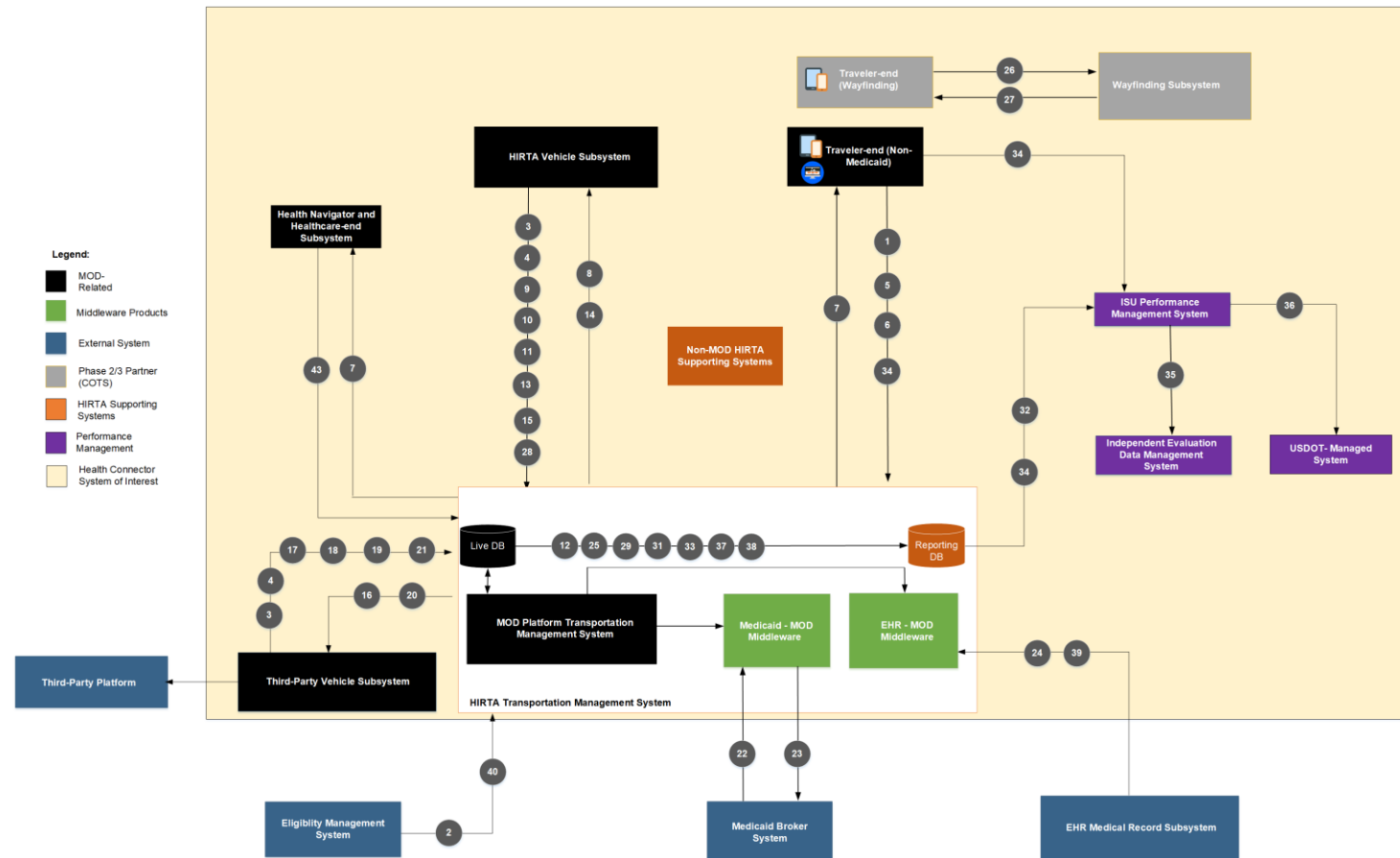


Figure 1. Health Connector System of Interest Diagram (Source: HIRTA team)

3. Standards Landscape Update

Since the May 2024 Phase 2 version of this memo, there has been significant activity across the demand-responsive transportation (DRT) data standards landscape and in adjacent healthcare and cybersecurity standards. This section provides a high-level summary of those developments as of June 2026, organized from a Complete Trip perspective, in which a healthcare transportation trip spans registration/eligibility, discovery, planning, booking, payment, travel (including curbside access at care facilities), and post-trip management/reporting. The most important structural observation is unchanged from 2024 since no single specification covers the full DRT trip lifecycle, and specifications remain divided between non-transactional standards (discovery and static data, such as GTFS-Flex and GOFS) and transactional standards, which require fundamentally different architectures.

3.1. HIRTA Team's Participation in Standards Efforts

HIRTA Team Systems Engineering Lead, Santosh Mishra, has been engaged in the following standards development activities over the past 18 months in a volunteer capacity:

- United States /American National Standards Institute appointed delegate at the International Organization for Standardization (ISO) Technical Committee 204 on Intelligent Transport Systems (TC 204). This includes involvement in the following capacities
 - Project Leader, ISO 7874- Multimodal pricing related rules (multiple part series)
 - Project Leader, ISO 26352-Edge ITS Data Quality (multiple-part series)
 - Convenor, Public Transport and Emergency working group (WG8)
- Co-Chair of the Reservation Scheduling and Dispatching (RSD) Subcommittee, Institute of Transportation Engineers (ITE), formed under the USDOT Multimodal Access for All Travelers (MAT) program. This includes facilitating standards development and engaging with stakeholders nationwide.
- Participation in the Demand Responsive Transport (DRT) Working Group is a community-led effort. More information is available at the DRT Working Group Website managed by the National Rural Transportation program (RTAP) (available at <https://www.nationalrtap.org/About/drt-data-specs-working-group> , accessed Jul 2026)
- Supporting the National RTAP in the development of informational materials for DRT standards. The end product was published as a Spotlight Article in June 2026 (available at <https://www.nationalrtap.org/Resources/Best-Practices-Spotlight/seamless-rides>, accessed Jul 2026).

Outside of Health Connector, Flexlynqs members of the HIRTA team have also been leading the implementation of projects that involve standards as follows:

- Transactional Data Specification (TDS) implementation for Southwest Ohio EZConnect project, NEORide, BCRTA, and SORTA
- TDS implementation for the Regional Paratransit Trip Booking Project, Metropolitan Transportation Commission, AC Transit, SamTrans, and VTA, San Francisco Bay Area.

This memo incorporates learnings from these efforts by updating the memo originally submitted as a Phase 2 deliverable.

3.2. Demand-Responsive Transportation Data Standards

3.2.1. Trip Discovery: GTFS-Flex and GOFS

GTFS-Flex, formally adopted by MobilityData, a non-profit organization focused on improving and extending transportation-related data formats, in 2024, has moved into mainstream use over the reporting period. It is now used by consumer trip planners (e.g., Transit App, OpenTripPlanner) and by state 511/trip-planning systems, with deployments across Vermont, Maine, Minnesota, Washington, and dozens of other states. National RTAP is working to identify GTFS-Flex tooling to support wider adoption by rural and Tribal agencies. The key limitation identified in 2024 remains: GTFS-Flex booking rules convey contact information only (a phone number or URL); there is no booking API, so the discovery-to-booking handoff remains manual. National Transit Database (NTD) guidance on GTFS-Flex reporting for demand-response services has still not been established. However, TIDES-DRT (Transit ITS Data Exchange Specification – Demand-Responsive Transportation), an extension of the TIDES specification for archived operations data, is under consideration by the U.S. DRT community for reporting purposes.

The General On-Demand Feed Specification (GOFS) has also matured. MobilityData assumed stewardship of GOFS-lite, which is continuing as GOFS, and the specification is in early production use in consumer journey-planning applications with on-demand services such as Pace On-Demand, Freebee Miami, and Taxi Montréal, providing real-time availability and deep links to providers and platforms. GOFS still does not support full booking, pricing, ETA, or post-booking state.

Implication for this project: For the Health Connector deployment, the May 2024 decision not to implement GTFS-Flex remains reasonable for a single-operator service; however, it may merit reevaluation as statewide trip-planner integration and GTFS-Flex tooling mature and NTD guidance emerges.

3.2.2. Transactional Data: TDS Demonstration Results and Governance

The May 2024 memo noted that TDS demonstration projects were underway but that no conclusive results were available. However, in August 2024, the Shared-Use Mobility Center (SUMC) and AARP Public Policy Institute published “Connecting Community Transportation: Lessons Learned from Transactional Data Specification Demonstration Projects”, documenting six demonstration projects and their outcomes:

- Minnesota DOT regional platform (live since January 2024): riders book rural DRT and ADA paratransit trips through a smartphone app, receive confirmations, and can cancel online; an open-source TDS module brokers requests to the agency's scheduling software.

- RideNoCo, Northern Colorado (in-service deployment fall 2024): trip and customer referrals exchanged electronically across four volunteer driver programs using three different scheduling platforms, with vendor APIs made TDS-compliant, including eligibility verification messages.
- NEORide EZConnect, Ohio (successful test fall 2024): TDS-compliant translation middleware enabling cross-county booking without duplicate entry between Trapeze and Via platforms.
- Additional projects at the Metropolitan Transportation Commission (Bay Area cross-jurisdictional paratransit transfers)
- RideSheet in Lake County, Oregon, and the King County Mobility Coalition.

The following two implementation pathways have been validated:

- A universal transactional data format, in which vendors make their software natively standard-compliant (preferred; avoids vendor lock-in and mirrors the FlexDanmark/SUTI model proven at the national scale in Denmark).
- Data translation middleware, which lowers vendor cost but requires ongoing public-sector maintenance.

The demonstrations also surfaced the most important institutional gap. TDS lacks a formal governance model, and implementations are diverging (e.g., RESTful APIs versus the single-endpoint architecture in TCRP Research Report 210, plus project-specific message sets). The DRT Data Specifications Working Group, now housed under National RTAP, is the primary practitioner forum working toward that governance framework, and National RTAP is funding related pilots, including a DRT service coordination framework with the Northern Kentucky Area Development District under the Community Rides Grant Program.

Separately, USDOT has sponsored a formal standards development effort for under the ITE-managed MAT-RSD Standards program. The MAT Standards Coordination Committee (SCC) and its RSD Subcommittee were launched in September 2024, and an ITE/MAT white paper on multimodal reservations, scheduling, and dispatching was released in May 2025. This effort is now the primary national venue for advancing the full-featured, industry-governed DRT transactional standard that the May 2024 version of this memo recommended, and it is explicitly coordinating with TDS, GOFs/GTFS-Flex, NEMTAC, and international standards communities.

Internationally, the TOMP-API (refers to Transport Operator to MaaS Provider) now has more than 50 implementations, primarily in Europe, with a first U.S. implementation by the San Joaquin Council of Governments (Vamos Mobility); it is informing how U.S. standard-setters approach the rider-facing side of DRT. The Nordic SUTI standard continues to demonstrate standards-based DRT coordination at national scale, commingling paratransit, medical, human-services, and general-public rural transportation across hundreds of private operators.

Implication for this project: Health Connector's current phone and web-based trip booking remains appropriate at HIRTA's single operator scale, and no TDS integration is planned at this time.

3.2.3. Payment, Pricing, and Settlement

Payment remains the most critical unstandardized area for healthcare transportation. Every comprehensive DRT specification either excludes payment by design (e.g., TDS) or limits it to business-

to-business settlement (e.g., TOMP-API). No consumer-facing or multi-payer fare standard currently exists today since payments require complex business rules overlapping transport and financial domains.

The most significant new development is ISO 7874, a multimodal pricing framework under development in ISO TC 204 Working Group 19 (working draft as of early 2026). ISO 7874 defines the rule sets governing eligibility (usage rules), fare calculation and discounting (pricing rules), and revenue splitting among operators, brokers, and payers (commercial rules), as well as a Common Service Rights Provider role for managing credentials and settlement. This architecture is directly relevant to subsidized healthcare transportation, where a single trip may involve Medicaid, health-system, and agency funding.

Implication for this project: ISO 7874 should be monitored as it matures since it is the first framework directly addressing the multi-payer settlement logic that a scaled or replicated deployment would eventually need.

3.2.4. Curb and Pick-Up/Drop-Off (PUDO) Access Standards

A cluster of adjacent standards addressing the curb layer has become relevant to the Complete Trip perspective, particularly for hospital pick-up/drop-off zones. ISO 25614 (ISO TC 204, committee draft) defines a transaction layer for curb slot reservation and vehicle orchestration at fixed locations, with hospital PUDO bays and multi-operator pick-up zones explicitly within its scope.

The Open Mobility Foundation's Curb Data Specification (CDS v1.0, published) and Mobility Data Specification (MDS v2.0+, adopted by 90+ agencies) also cover curb zone definitions, real-time curb events, and right-of-way policy publication.

The Alliance for Parking Data Standards (APDS) specification has been adopted as ISO TS 5206-1 (2023), providing a kerbside pricing data model.

Notably, no current DRT specification defines an interface to any of these curb standards, even though every DRT vehicle physically interacts with the curb on every healthcare trip; this is an emerging gap for future deployments.

Implication for this project: Curb standards are not directly applicable to Health Connector today, since PUDO coordination at Dallas County Hospital is handled through a manual, site-specific arrangement rather than a standards-based curb interface. Future deployments with higher trip volumes or multiple hospital partners should track ISO 25614 and CDS/MDS as this gap closes.

3.3. Healthcare Transportation and NEMT Standards

The NEMTAC 1000-series, developed by the only ANSI-accredited standards developer focused on non-emergency medical transportation, has advanced materially. NEMTAC 1001 (Levels of Service), 1002 (Modes of Transportation), and 1006 (Passenger Verification instead of Signature) were approved in October 2024, and NEMTAC 2001 (NEMT Provider Accreditation) is approved. NEMTAC 1003 (Data Definitions), 1004 (Trip Performance Metrics and KPIs), and 1005 (Data Exchange) remain in draft. However, no live NEMT API specification exists yet.

As a practical near-term step, agencies can adopt NEMTAC's approved common definitions in Medicaid broker contracts and interagency agreements to reduce disputes and simplify audits. They should monitor NEMTAC 1005 as the likely future data-exchange format for Medicaid middleware, such as the project's MOD-Medicaid interface.

On the healthcare information side, the HL7 FHIR ecosystem relevant to transportation coordination has continued to mature. SMART on FHIR Backend Services (system-to-system authorization using OAuth 2.0) and the FHIR Bulk Data Access specification (\$export) provide standards-based, replicable patterns for accessing appointment- and population-level data from certified EHRs with minimal per-site customization; these patterns are directly applicable to the MOD-EHR middleware approach and reduce reliance on proprietary or file-transfer integrations described in the 2024 memo.

In parallel, the HL7 Gravity Project's SDOH Clinical Care implementation guide standardizes the coding of transportation insecurity screening, which identifies the reasons behind inconsistent, unreliable, or absent transportation that's needed to meet essential needs, and referrals in EHRs, and the Trusted Exchange Framework and Common Agreement (TEFCA) networks have become operational nationwide. The X12 EDI transaction sets (270/271, 837, 835, 276/277) described in the 2024 memo are unchanged and remain inapplicable to HIRTA's brokered Medicaid arrangement.

Eligibility and service-rights portability, allowing a rider's verified eligibility to follow them across provider and jurisdiction boundaries, remains unsolved and has been independently identified as a priority gap by the MAT/RSD, NEMTAC, and TDS communities.

Implication for this project: The MOD-EHR middleware and any future MOD-Medicaid interface should track NEMTAC 1005 and the SMART on FHIR /Bulk Data Access patterns as the likely near-term, standards-based data-exchange formats, and the Gravity Projects SDOG coding for transportation insecurity screening is relevant to future referral intake if the project's rider population or partner EHRs expand SDOH screening.

3.4. Remaining Gaps from a Complete Trip Perspective

As of June 2026, the following gaps most directly affect replicable healthcare transportation deployments. These gaps have been determined based on the HIRTA project team's experience with the Health Connector system development and deployment, and through participation in standards development activities.

- The discovery-to-booking handoff remains broken. Riders can find services (GTFS-Flex/GOFS), but there is no standardized interface to create a live booking in transactional systems (TDS/TOMP).
- Payment, pricing, subsidy logic, and multi-payer settlement are not standardized; ISO 7874 is the first framework-level response but remains a working draft.
- Operator lifecycle standards are regionally fragmented (TDS in the U.S., SUTI in the Nordics, and TOMP in the EU) and lack harmonized interoperability profiles.
- Eligibility verification, digital credentials, and service rights for ADA, NEMT, and other programs lack interoperable frameworks and pose a significant barrier to a Complete Trip experience.

- Back-office dispatch/CAD systems remain proprietary and invisible to standards-based MaaS, and no DRT specification interfaces with the curb/PUDO access layer.
- TDS still lacks a formal governance model and dedicated funding for specification maintenance; this is the primary institutional barrier to scale.

4. Cybersecurity Standards and Regulatory Developments

Healthcare transportation deployments sit at the intersection of two designated critical infrastructure sectors: Healthcare and Public Health, and Transportation Systems. Both these sectors saw major cybersecurity regulatory and standards activity between late 2024 and mid-2026. This section summarizes, at a high level, the developments most relevant to Health Connector-type deployments and their replication.

4.1. Healthcare Sector: HIPAA Security Rule and HHS Guidance

On January 6, 2025, the U.S. Department of Health and Human Services published a Notice of Proposed Rulemaking to modify the HIPAA Security Rule, the first substantive update since 2013. The proposal would remove the distinction between “required” and “addressable” implementation specifications, making controls mandatory and auditable, including multi-factor authentication, encryption of electronic protected health information (ePHI) at rest and in transit, network segmentation, a continuously maintained technology asset inventory and network map of ePHI flows, defined incident response and restoration timelines, and annual verification of business associate safeguards. The comment period closed March 7, 2025, drawing over 4,600 comments; the final rule timeline has since been extended, with final action currently projected for 2027. The existing Security Rule remains in effect in the interim, and HHS’s voluntary Healthcare and Public Health Cybersecurity Performance Goals (January 2024) serve as a benchmark for future requirements.

Implication for this project: components that receive or process ePHI, most notably the MOD-EHR middleware and any TMS functions handling Medicaid or appointment data, operate under business associate obligations. Deployments and replication sites should design to the proposed controls now (MFA, encryption, asset/data-flow inventory, written policies, business associate verification), both to reduce risk and to avoid retrofits when the final rule takes effect. The project’s narrow-scope, data-minimization posture (e.g., holding only transient operational data) remains the most effective structural mitigation.

4.2. Transportation Sector: TSA and FTA

The Transportation Security Administration published the “Enhancing Surface Cyber Risk Management” Notice of Proposed Rulemaking on November 7, 2024, which would require higher-risk surface transportation owner/operators to establish comprehensive cyber risk management programs built on the NIST Cybersecurity Framework and CISA’s Cross-Sector Cybersecurity Performance Goals, and would require cybersecurity incident reporting to CISA within 24 hours, extending certain requirements to higher-risk bus-only public transportation operators. TSA also renewed Security Directive 1582-21-01

(Enhancing Public Transportation and Passenger Railroad Cybersecurity) in October 2024, which requires designated operators to name a cybersecurity coordinator, report incidents to CISA, conduct vulnerability assessments, and maintain incident response plans. Rural demand-response agencies such as HIRTA generally fall outside the current applicability thresholds of these instruments; however, they signal the clear direction of federal expectations for transit systems.

FTA has published practical resources scaled to smaller agencies, including the Cybersecurity Assessment Tool for Transit (CATT), the Transit Cybersecurity Framework Community Profile (based on the NIST Cybersecurity Framework), and the Surface Transportation Cybersecurity Resource Toolkit for operators with fewer than 1,000 employees. In addition, USDOT discretionary grant Notices of Funding Opportunity now incorporate Critical Infrastructure Security and Resilience (CISR) guidelines, making documented cybersecurity posture relevant to future grant competitiveness. Finally, the USDOT/ITE Multimodal and Accessible Transportation standards program explicitly pairs MAT standards development with cybersecurity coordination, so that security requirements are designed into emerging RSD/DRT standards rather than added afterward.

Implication for this project: HIRTA falls below the current TSA applicability thresholds, so neither the surface cyber risk management NPRM nor Security Directive 1582-21-01 creates a new compliance obligation today. However, both instruments signal where federal expectations are heading, and a replication site with larger fleets, high risk classification, or bus-only service could fall within scope as thresholds are finalized. Future deployments may benefit from adopting FTA's CATT and the Transit Cybersecurity Framework Community Profile now, while requirements are still voluntary so that a cybersecurity coordinator, incident reporting process, and vulnerability assessment practice are already in place if applicability expands.

4.3. Cross-Cutting Frameworks and Vendor Requirements

- NIST Cybersecurity Framework 2.0 (February 2024) adds a Govern function and small-organization guidance; it is the recommended organizing framework for agency cyber programs and underlies both the TSA proposal and FTA tools.
- ISO/IEC 27001:2022: organizations certified to the 2013 edition (including the project's MOD-TMS vendor as described in Section 3) were required to transition to the 2022 edition by October 31, 2025. Agencies should verify that vendor certificates reflect the current edition.
- API and transport security: project interfaces should reflect current practice. This includes TLS 1.2+/1.3 (superseding legacy "SSL" terminology used earlier in this memo), OAuth 2.0 with current security best practices, and least-privilege system-to-system authorization such as SMART on FHIR Backend Services for EHR access.
- Incident response planning should account for dual reporting pathways: HIPAA/OCR breach notification obligations on the healthcare side and CISA/TSA incident reporting expectations on the transportation side.
- Procurement: cybersecurity requirements (standards compliance, business associate safeguard verification, incident reporting service levels, encryption and MFA) should be explicit criteria in vendor contracts and RFPs, alongside open data standards compatibility.

Implication for this project: Health Connector's security posture is consistent with these frameworks. The MOD-TMS vendor operates under ISO/IEC 27001 certification and middleware interfaces rely on TLS, OAuth 2.0 and least-privilege access aligned with current practice.

5. Standards Considered and Implemented for the Health Connector Project

5.1. Data Standards

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

5.1.1. In-Vehicle Device Communication Standards

5.1.1.1. Driver Terminal

The Health Connector project has deployed tablets for Drivers that exchange data over cellular data network with the central system, MOD-TMS.

TLS-based protocols (TLS 1.2 or later) are used for data transport. Also, data transport occurs over a commercial Long-Term Evolution (LTE) network with carrier-level encryption using a private Access Point Name (APN).

5.1.1.2. Infotainment Device

The HIRTA team has deployed an infotainment device on vehicles to provide context-sensitive information to travelers (e.g., orientation information relevant to hospital visits). This device uses the following standards for communications:

- High-Definition Multimedia Interface (HDMI) for data transport between the in-vehicle media player and the infotainment video monitor.
- TLS-based protocols (TLS 1.2 or later) for data exchange between in-vehicle media player and the central CMS.

5.1.1.3. On-board Mobile Gateway Router

Vehicles are equipped with an on-board mobile gateway router (OMGR) that enables wireless communication between the in-vehicle media player and the central CMS via a built-in LTE modem. Also, the OMGR supports IEEE 802.1x for Wi-Fi connectivity with a nearby access point.

Further, the router provides USB for serial connectivity and Ethernet ports for local area network (LAN) using Cat 5/6 cables.

5.1.1.4. Vehicle Environment Standards for Devices

All devices comply with at least SAE J1455 for temperature, dust/water intrusion, humidity, shock and vibration. In addition, tablets are IP4x+ rated for dust and water intrusion.

5.1.1.5. Applicability for Vehicle Area Network

None of the planned features in the ongoing Health Connector deployment require a vehicle area network (VAN) as tablets are being utilized. These tablets do not provide physical connectivity ports to enable common VAN approaches in transit, such as OBD-II, Society of Automotive Engineers (SAE) J1708/1587, SAE J1939, or Ethernet.

When vehicles are equipped with more capable devices such as mobile data terminals (MDTs) that support standards-based VAN, the following functionalities can be supported:

- Vehicle health monitoring through collection and processing of fault codes (e.g., engine temperature, oil pressure, fault brakes, HVAC malfunction), as available, from vehicle on-board computers (e.g., engine control unit (ECU)). Such data is available over OBD-II or SAE J1708/1587.
- Connectivity between Digital Video Records (DVRs) and MDTs for tagging of on-board surveillance videos with operational metadata (e.g., driver ID, vehicle ID, run ID) over serial connection or Ethernet.
- Dynamic update of vehicle external signs to indicate destination or safety messages through integration between external sign controllers and MDTs using J1708/1587.

In Phase 1, the HIRTA team included a requirement to monitor the functional status of the wheelchair lift in real time. Technically, fault codes can be received over VAN if a wheelchair lift interlock module is available on a vehicle. However, based on further research, such solutions were found to be unreliable. Therefore, the requirement was eliminated. If a lift is not functional, drivers notify OPS staff via two-way radio or by using a canned message stored on the tablet.

5.1.2. Wireless Data Communication Standards

Vehicle-to-central communication is accomplished using Internet Protocol (IP)-based transport protocols, such as Transmission Control Protocol (TCP) or User Datagram Protocol (UDP).

5.1.3. Data Access Protocols

At least the following protocols are being used for data transfer:

- **Hypertext Transfer Protocol Secure (HTTPS):** HTTPS is used to access data over the web and in mobile browsers. TLS-based protocols (TLS 1.2 or later), as provided at the OS level, will be used by mobile apps.
- **Secure File Transfer Protocol (SFTP):** SFTP is used by the MOD-EHR solution to access medical appointment data, as available, from Dallas County Hospital's servers.

To enable programmatic data access for middleware and kiosk implementations, web application programming interfaces (APIs) are utilized. It includes APIs based on Representational State Transfer (REST) and Webhooks approaches. These APIs use the standards as described in this document (e.g., HTTPS and JSON).

5.1.4. Data Security Standards

The following information security standards are being used to protect the data:

- MOD-TMS vendor follows ISO 27001 for information security.
- OAuth2 for authentication when working with APIs for the MOD-EHR and MOD-Medicaid middleware.

5.1.5. Data Sharing Standards

5.1.5.1. General File Formats

The following standard file formats are being used on the Health Connector project:

- JavaScript Object Notation (JSON): JSON is the primary data format for sharing data between programs and utilities. JSON is also being used for data exchange by MOD-EHR and MOD-TMS middleware products.
- Comma Separated Value (CSV): non-spatial data is shared using text-based files using CSV format with third parties. Files include a header and data. Details on the header fields is available in the metadata.
- Shape File Format (SHP): Shape file format used for sharing spatial analysis.
- Keyhole Markup Language (KML): standard file format for sharing map data layers.

5.1.5.2. Data Exchange with EHR Software

The HIRTA team has developed the MOD-EHR middleware, which considers the following products and supported data formats.

5.1.5.2.1. Epic

HIRTA partner MercyOne is upgrading to Epic EHR software. MercyOne and its affiliates, including HIRTA team's project partner, DCH will switch to Epic in the future.

Epic's open API will be needed to access medical appointment data. Details of the API are available at <https://open.epic.com/> (accessed April 2024). Epic APIs are also compliant with the Fast Healthcare Interoperability Resources (FHIR) standard for information sharing and use Extensible Markup Language (XML) or JSON for data exchange.

5.1.5.2.2. Veradigm-All Scripts

DCH Clinic staff enter appointment details in Veradigm/Allscripts for the three family medicine clinic locations: Perry, Panora and Dallas Center.

Veradigm provides both an open API based on FHIR and its proprietary APIs (<https://developer.veradigm.com>). However, for the Health Connector deployment, Veradigm has suggested an alternative approach to sharing medical appointment data stored in AllScripts software to manage costs. This approach makes appointment data available using SQL Server Integration Services (SSIS)-based utility on Dallas County Hospital (DCH) servers. HIRTA team is accessing this data using SFTP for the middleware program.

5.1.5.2.3. Thrive EHR

DCH uses Thrive EHR to schedule appointments for radiology, ambulatory (e.g., infusions), and the Operating Room (OR). The HIRTA team currently has no plans to integrate with Thrive EHR due to time and resource constraints. However, an approach as described for Epic or Veradigm integration can be used.

5.1.6. Open Data Standards for Transit

5.1.6.1. Trip Discovery and Planning

Open data, currently practiced in the transit industry, applies only to fixed-route services and only to the open sharing of Traveler information.

For Health Connector, a demand-response and on-demand service, the only applicable standard is GTFS-Flex. While GTFS-Flex was officially adopted as a standard by Mobility Data in 2024, it is limited to trip discovery/planning. It is most useful when multiple agencies provide services in a region. Given the effort required in developing the feed, and limited utility to the project, GTFS-flex was not implemented for the Health Connector deployment.

5.1.6.2. Transactional Data: Trip Booking, Service Management, and Payments

Real-time or offline datasets that support trip booking, service management, and payments are collectively referred to as transactional data. Currently, there are no standards-based formats to support transactional data exchange. General on-Demand Feed Specification (GOFS) and Transactional Data Specifications (TDS) have been proposed in the past as alternatives by the transit software developer community, but both are currently at the specifications stage. TDS is currently being deployed and tested by several sites in the United States for its applicability and suitability. However, no conclusive results are available as of the writing of this document.

The HIRTA team has decided to take an API-based approach to implementing integrations between the MOD-TMS vendor and Access2Care, where a TDS-like standard could have been helpful. Access2Care was acquired by MTM in October 2024. As a result, the Access2Care APIs have been deprecated and are no longer supported. HIRTA is continuing to engage with MTM to gain access to their APIs and would follow a similar API-based approach, however access and integration have not yet been established.

A further TDS-like standard would help coordinate services with another agency in the region or with a vendor that will provide services to HIRTA under contract. In the absence of TDS, third-party service providers will use the Via platform for service coordination.

5.1.6.3. Wayfinding

In Phase 1, the HIRTA team explored using specifications such as GTFS-pathways to implement turn-by-turn directions to support Travelers during the before- and after-trip legs of their vehicle trips, helping Travelers to navigate from outside Dallas County Hospital (DCH) into and around the facility. However, it has been determined that there is no need for turn-by-turn directions for implementation at the DCH. As such, wayfinding needs are limited to localization/orientation, which will be accomplished using scanning visual codes provided by the HIRTA team's wayfinding solution provider, NaviLens. Therefore, no standards-based approach applies to current use cases.

5.1.6.4. Data Exchange with Funding Entities

5.1.6.4.1. Medicaid Brokers

The TDS can also support the exchange of transactional data related to booking, service management, and trip performance with Medicaid brokers. Therefore, the HIRTA team is using TDS as guidance to define the data schema for the native data storage of the MOD-Medicaid middleware to ensure replicability.

There are standard electronic data exchange (EDI) formats for exchanging HIPAA-compliant messages with Medicaid to deliver transportation services; however, these are not applicable to the Health Connector project, as HIRTA is not working with Medicaid directly. However, for reference, these standards include:

- EDI 270/271: Agencies can send EDI 270 to Medicaid for checking eligibility status before providing transportation services. Medicaid can respond with EDI 271.
- EDI 837: The claim document can be sent to Medicaid for services provided.
- EDI 835: Electronic remittance is sent by Medicaid in response to EDI 837.
- EDI 276/277: Agencies can send EDI 270 to verify the status of a claim. Medicaid can respond with EDI 277.

While these messages are typically used in the context of Medicaid-funded trips by transportation service providers/administrators, these formats are designed to exchange data between service providers and claim-processing/payment entities related to healthcare services.

5.1.6.4.2. National Transit Database (NTD)

The NTD now requires reporting transit schedule data in GTFS format. However, this format is relevant only to fixed-route services and will not be applicable to HIRTA. There is currently no guidance on the reporting of GTFS-Flex, which may apply to HIRTA.

NTD also requires reporting of performance, safety, and financial data in a required format; however, that does not follow any specific industry standard.

5.1.6.4.3. Other

Regional and state entities may ask agencies to provide data in a standard format for specific use cases. However, that does not apply to this project.

6. Participation in Future Standards Development Efforts

6.1. Activities Completed

The Federal Transit Administration (FTA) contracted with the American Public Transportation Association (APTA) and the Center for Urban Transportation Research (CUTR) to lead the Standards Development Program. This program involved the following activities:

- An assessment of industry needs in coordination with stakeholders.
- Analysis and prioritization of needs with recommendations for short-term and long-term solutions.
- Development of new standards or update of existing standards.
- Development of recommended practices and industry guidance to support the public transportation industry and address the high-priority needs of the FTA.

The HIRTA team responded to the survey request from the APTA/CUTR team in March 2024. An outcome of the standards research based on this work is now published as FTA Report 0267 (available at: <https://www.transit.dot.gov/sites/fta.dot.gov/files/2024-08/FTA-Report-No-267.pdf>, accessed July 2026).

Since the May 2024 version of this memo, the following forums and publications have advanced the standards work this memo recommended, and the HIRTA team has continued to monitor these efforts as part of its Complete Trip deployment:

- The DRT Data Specifications Working Group, co-founded by the authors of the TDS demonstration research, is now housed under National RTAP and meets regularly as an open practitioner forum focused on TDS implementation and governance.
- The USDOT-sponsored ITE Multimodal and Accessible Transportation (MAT) Standards Coordination Committee and its Reservations, Scheduling and Dispatching (RSD) Subcommittee launched in September 2024, with an ITE/MAT white paper on multimodal reservations, scheduling, and dispatching released in May 2025.
- The Shared-Use Mobility Center and AARP Public Policy Institute published detailed lessons learned from six TDS demonstration projects (August 2024), and National RTAP published “Seamless Rides,” a practitioner’s guide to DRT data standards (June 2026).
- NEMTAC approved standards 1001, 1002, 1006, and 2001 (October 2024) and continues committee work on the 1003/1004/1005 data definition, KPI, and data-exchange drafts.

6.2. Activities Recommended

As directly relevant to the Health Connector project, the HIRTA team recommends further development and adoption of TDS as an industry standard. The availability of TDS as the standard will allow agencies to coordinate services with other providers in the region, even if they are utilizing solutions from different vendors.

Based on developments through June 2026, the HIRTA team additionally recommends the following high-level actions for this project and for organizations seeking to replicate it:

- Participate in the National RTAP DRT Data Specifications Working Group and the ITE MAT-RSD Subcommittee, which together constitute the primary venues for establishing TDS governance and a full-featured national RSD standard.
- Adopt NEMTAC's approved common definitions (levels of service, modes of transportation, passenger verification) in Medicaid broker and vendor agreements, and engage in the public review of the draft NEMTAC 1003/1004/1005 data standards, which bear directly on future NEMT data exchange and the MOD-Medicaid middleware.
- Standardize EHR integrations on SMART on FHIR Backend Services authorization and FHIR Bulk Data Access, where supported, to maximize replicability across health systems and minimize per-site customization.
- Monitor ISO TC 204 work items relevant to the Complete Trip, particularly ISO 7874 (multimodal pricing, eligibility, and settlement rules) and ISO 25614 (curb/PUDO slot reservation, including hospital pick-up/drop-off zones).
- Reevaluate GTFS-Flex publication as statewide trip-planner integration, rural tooling, and NTD reporting guidance mature.
- Prepare for the pending HIPAA Security Rule update by aligning middleware and TMS controls with the proposed specifications (MFA, encryption at rest and in transit, asset and data-flow inventories, business associate verification), and use NIST CSF 2.0 and FTA's Cybersecurity Assessment Tool for Transit as the organizing frameworks for agency-level cyber risk management.
- Include open data standards compatibility (e.g., TDS/RSD, GTFS-Flex) and cybersecurity requirements as explicit criteria in future technology procurements.

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