

2022 NASCIO Award Submission
State of Tennessee: Department of Finance & Administration
Strategic Technology Solutions Division

The State of Tennessee's Vaccination Registration and Administration Solution



In December 2019, the world was impacted by the uptick of persons infected by COVID-19. The virus swept the nation and was deemed an airborne disease that was highly contagious amongst humans. To combat the surge of infections associated with the COVID-19 pandemic, the Food and Drug Administration issued Emergency Use Authorizations (EUA) on December 11, 2020 (Pfizer-BioNTech) and December 18, 2020 (Moderna). In response to the pandemic, the State of Tennessee launched a Vaccination Registration and Administration Solution (VRAS) to support the statewide administration of COVID vaccinations and eliminate the use of paper and manual processing.



NASCIO Award Category: Data Management, Analytics & Visualization

Contacts: Addy Newsom, Project Coordinator – CIO Office &

Greg Turner, Business Domain Director of Health and Human Services

Background

Prior to the implementation of the Vaccination Registration and Administration Solution (VRAS) appointment scheduling system, individual staff members at DHS were manually setting up appointments and acting as schedulers for around 100-200 citizens -- each who were attempting to obtain their first-dose vaccines each week. After booking, they were also tasked with calling each citizen to remind them of their vaccine appointments. These staff came in early and stayed late each day to ensure that the appointment slots were filled, while also still completing regular job duties as assigned. This process was not sustainable, and citizens were beginning to express frustrations.



Accordingly, the Tennessee Department of Health engaged Strategic Technology Solutions (STS) to procure and implement a system that would simplify citizen vaccination interaction and administer vaccinations targeting 5 million State of Tennessee citizens in 89 counties eliminating the use of paper and manual processing. Collaboration between STS (Direct IT support team, Operations, Information Security, Infrastructure, etc.), Central Procurement Office (CPO), Legal, and several other states resulted in the plan for a solution that was deemed the Vaccination Registration and Administration Solution (VRAS) for the State of Tennessee.

Requirements and Design

Tasked with finding a way to distribute vaccinations more effectively, Tennessee Department of Health's collaborated with Strategic Technology Solutions and the vendor partner Microsoft. Individuals from these parties made up the VRAS project team. This collaboration was pivotal in the fight against COVID-19 in Tennessee with the implementation of VRAS. Strategic Technology Solutions facilitated demos with top candidates and once top options were identified, then worked in lockstep with Tennessee Department of Health's Commissioner's office to present to the Governor's office. Once approval was granted, Strategic Technology Solutions led the procurement process for VRAS (see 2021 [Request for Proposal](#)).

Establishing a standard process across the state's 89 rural counties was a critical requirement to manage the then limited supply of available vaccine. To fully understand the operations and workflow of the locations distributing the vaccine, a site visit was scheduled for project team members. This served two main purposes: 1) To connect with the individuals who would eventually utilize the system to get their insight and 2) complete a clean handoff to the Strategic Technology Solutions Enterprise Project Management Office (EPMO) -- who ultimately lead the project to successful fruition.

The STS EPMO partnered with TDH's Community Health Services division and their Communicable and Environmental Diseases & Emergency Preparedness division in order to design and implement the solution. The team set expectations of success with the vendor partner that included minimal viable product (MVP) delivery goals and a strict project deliverable timeline (see Figure A).

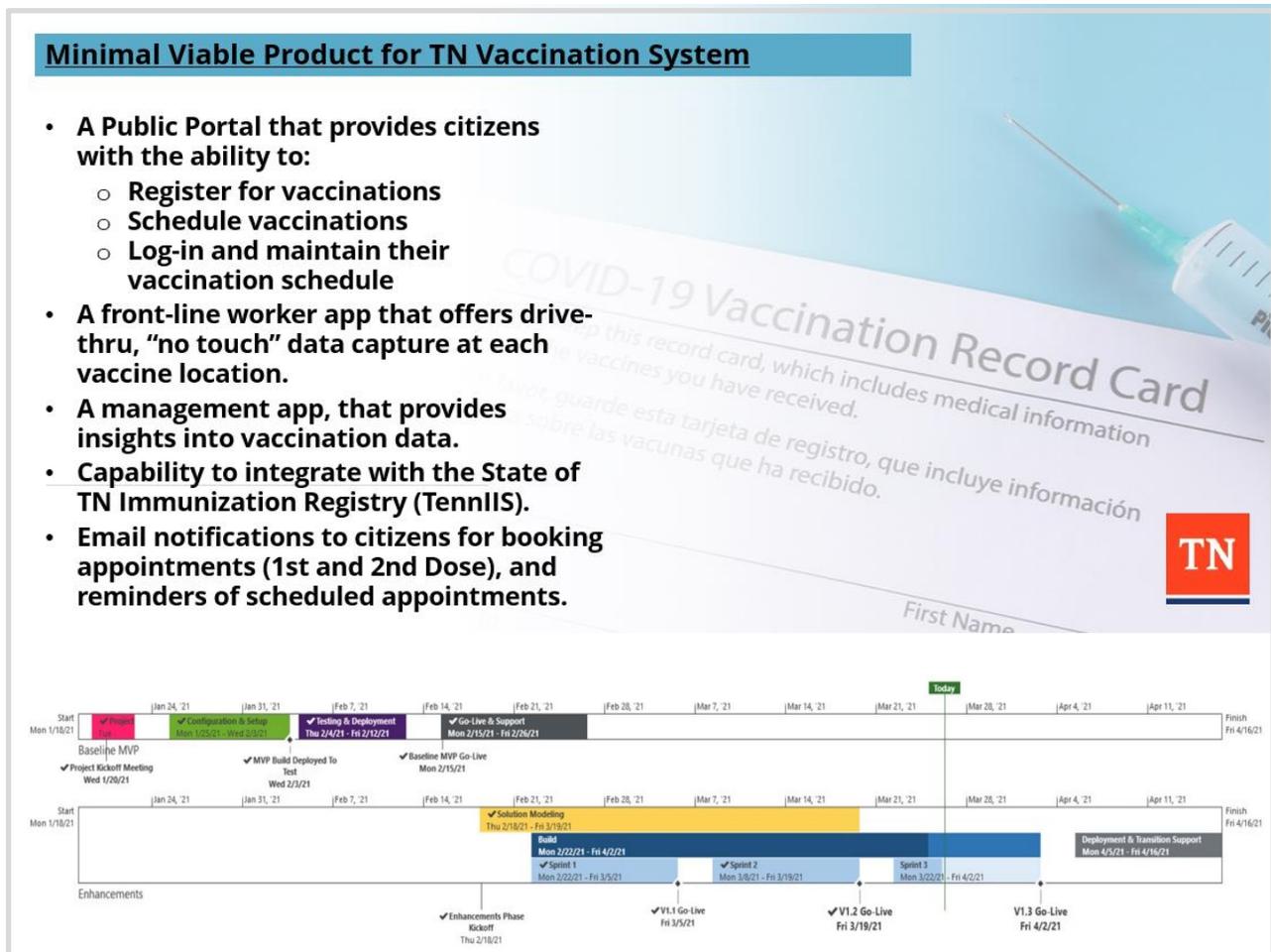


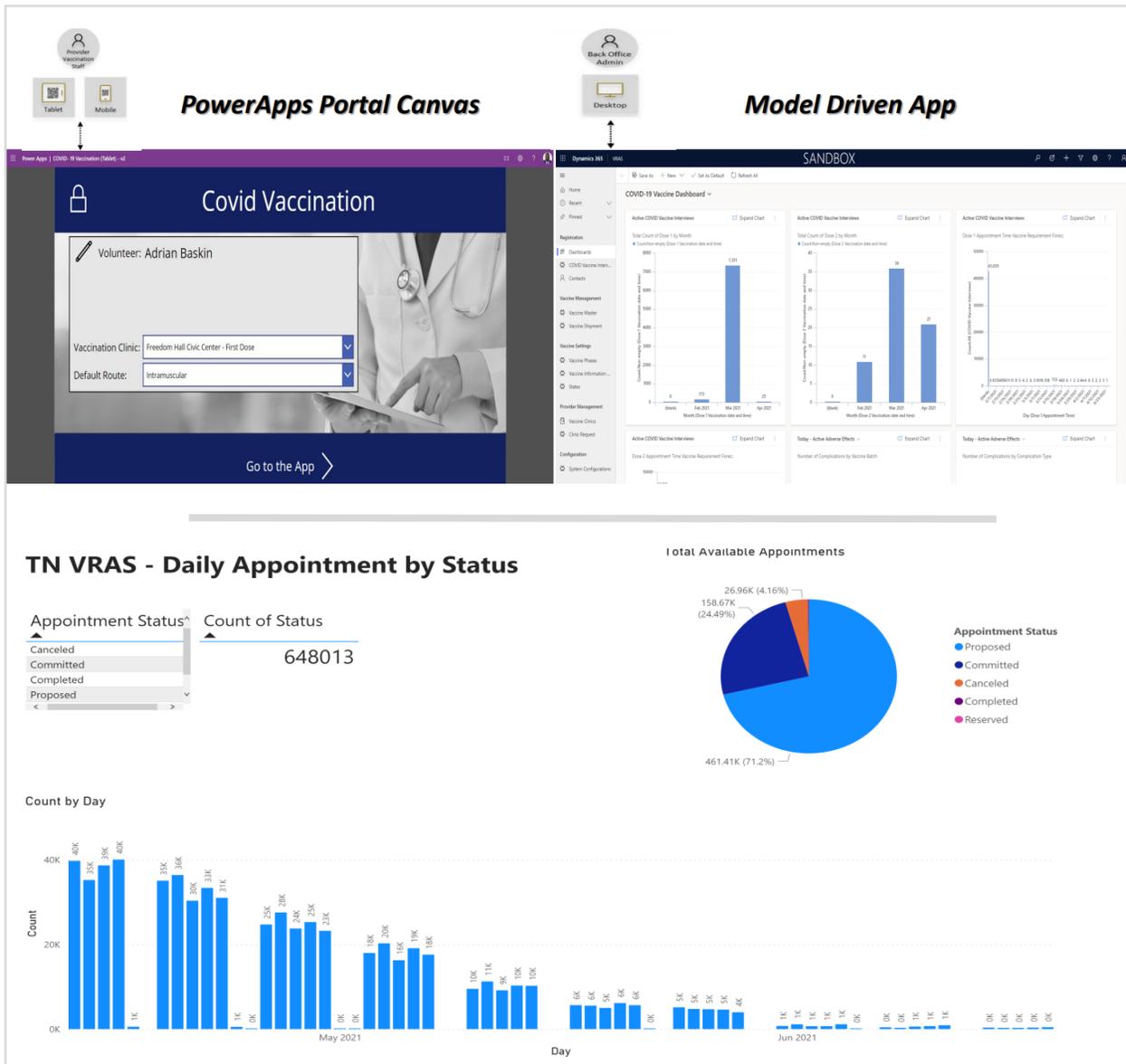
Figure A: VRAS MVP & Project Timeline

The design of VRAS provides a configurable solution to connect eligible citizens with vaccination facilities through online registration and appointment scheduling. The solution offers vaccine inventory data management, an app to check-in patients with a QR code, and data insights through a centralized dashboard. The application also helps staff manage the details, tracks dose number and vaccine batch, and notes post-vaccine reactions.

VRAS provides citizens with an online portal where they can register to check if they are eligible for the COVID-19 vaccination ([online portal registration process](#)). Citizens are prompted with a series of questions to determine their eligibility. After responding, the citizen is given a few choices based on eligibility: Residents can do one of the following steps: 1) If eligible and depending on configuration, the resident is notified to make an appointment or proceed to schedule an appointment for getting the vaccination; or 2) If not eligible, the resident can preregister to be notified through email when they become eligible for the vaccination; 3) They can also select to be placed on a waiting list until they are eligible. If they are placed on the waiting list, they receive an email two days prior to their eligibility date to go in and schedule their appointment.

Data Analytics and Visualizations

The solution also provides a healthcare staff application for workers at the vaccination sites to distribute and administer vaccinations safely and effectively. With the Healthcare Staff application, they have access to citizens information to check them in manually or by scanning a touch-free QR code provided to the citizens when they register for their vaccination. The VRAS healthcare staff application provides the vaccinator the ability to manage the details of the vaccine, including the dose number and vaccine batch, and lets the vaccinator note post-vaccine reactions. The system leverages Microsoft Power BI Data Analytics, to turn raw data into holistic visualizations and charts that are easy for the provider to understand. This data and information is being better connected, analyzed, and visualized so that it can be used to achieve both individual health sites' goals and Department-specific goals (see Figures B1-B3). These visualizations impact real-time operational decisions and outcomes.



Figures B1-B2: VRAS Data Analytics and Visualization samples

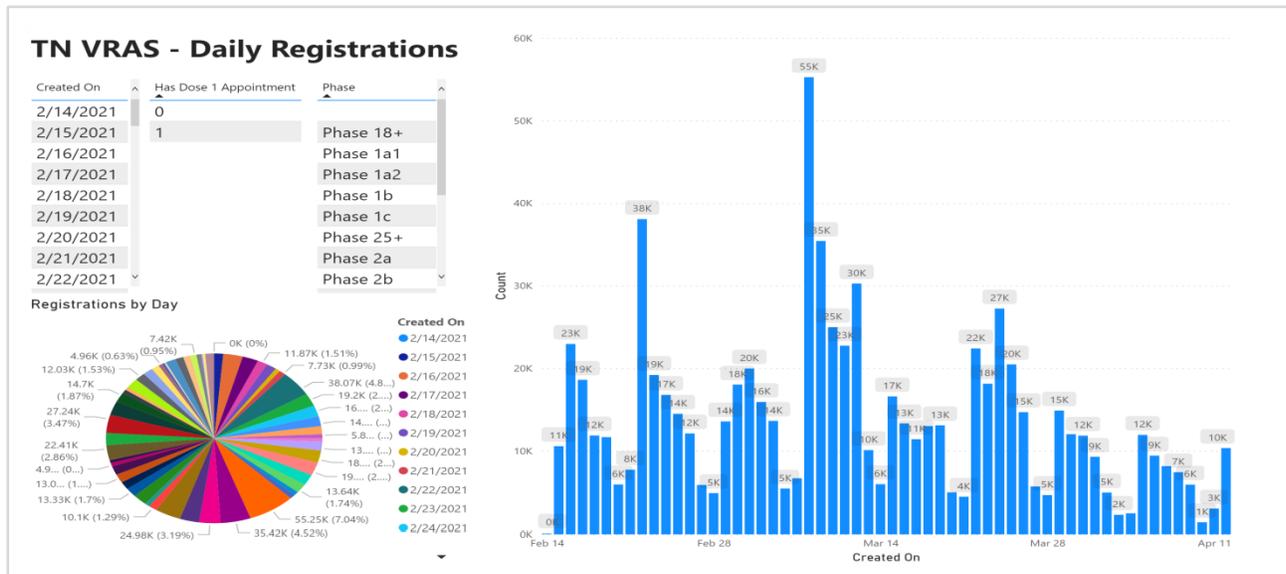


Figure B3: VRAS Data Analytics and Visualization samples

Implementation

The VRAS project was run with an AGILE methodology and phased rollout approach based on Microsoft’s 365 “Sure Step” Methodology (see figure C). The project had five sprints with two-week durations and delivered the base model for citizen to schedule online after the first two sprints within approximately three weeks. The project team met three days during the week for solution design, and an offshore development team designed each evening. Each Thursday, a prototype was delivered in the test environment for the quality assurance team for functionality and regression testing. The project team moved new VRAS functionality to production on a bi-weekly basis.

Phase	Description
Mobilization	This phase focuses on identifying the proper resources from both Microsoft and the customer.
Project Initiation	This phase focuses on formal kickoff, project plan creation, and workshop scheduling. Customer Project Manager will participate in this process to provide workshop locations and attendee availability.
Solution Modeling	This phase focuses on design, verification of requirements and loading Azure DevOps (ADO) will user stories and requirements. Additionally, requirements that are a fit will be configured during this phase, creating a baseline solution and entity schema. Customer will provide SME’s that will participate in the Modeling sessions.
Build	This phase focuses on configuration and supported customization needed to meet the gap requirements defined in Solution Modeling. Items that are a fit will be configured in Solution Modeling. Customer will provide Functional Testing of all Configurations upon completion of Unit Testing by the Microsoft Team.
Solution Testing	This phase focuses on solution testing (UAT) and is led by the customer and select SMEs. Microsoft will assist in categorizing and troubleshooting issues, but the customer will lead test cases and business scenarios.
Deploy	This phase enables the organization for usage in Dynamics 365 for Customer Engagement online. This is formal go live. Customer will lead the Deployment of the Solution to Go Live with the assistance of the MCS team.
Support Transition	This phase focuses on support after go-live. Assist in providing a smooth transition into the new environment, including enabling monitoring tools such as Azure App Insights, knowledge transfer to Premier Support and customer team. Customer will provide key Support Resources for this transition process.
Operate	This phase includes the partial deployment team, for a limited timeframe. MCS staff to troubleshoot any major issues that may arise after go-live. This phase is not in scope for this SOW.

Figure C: VRAS Project Methodology

The team also secured over 600 iPads, and each was loaded with VRAS software and a mobile device management solution to be able to manage them with the highest level of security. The iPads were deployed statewide to all 89 counties for use at Tennessee vaccination sites, and information for

VRAS was placed online for citizens at [TDH's website](#). The trainings and information that are available include:

- [Add a Schedule Block](#)
- [Manage Existing Schedule](#)
- [Vaccine Shipment](#)
- [View Bookings](#)
- [Adding Existing Users](#)
- [Adding Provider Admin to Locations](#)
- [Adding Canvas App Healthcare Vaccinators to a Location](#)
- [JOB AID](#)

With the project team’s hard work and dedication, the team successfully met the condensed timeline on time and under budget. The team regularly went above and beyond what was required. It was not unusual to see members of this team working 18-hour days to either test new functions for VRAS, fix issues, or make last minute changes requested by the Department of Health. The result of their dedication was an end-to-end touch free solution (via iPads, Laptops, and Phones) to register and administer COVID-19 vaccinations for approximately five million State of Tennessee citizens in 89 counties and one major metro county, eliminating the usage of paper and manual processing.

Impact

VRAS was a high priority statewide project, that has made a large impact. Once the solution was launched publicly on February 15th, 2021, citizens began using it to register and manage their vaccination appointments right away. An overview of this process is shared below (see Figure D).

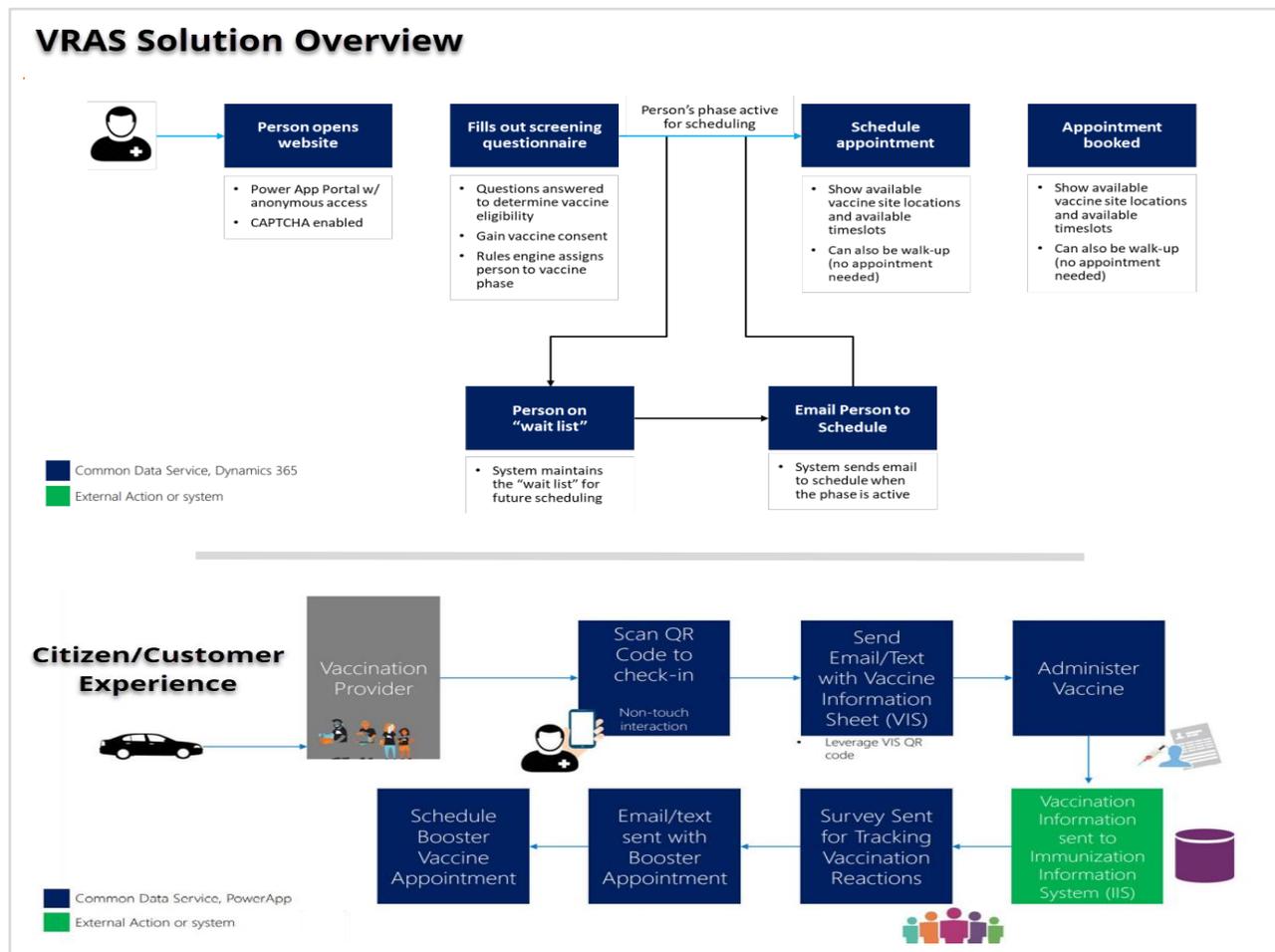


Figure D: VRAS Solution & Customer Experience Model

Upon completion of registration, citizens received confirmations via email with a QR Code. The QR Code was utilized to check them in upon arriving to their appointment. This touchless process was not only efficient, but it also made Tennesseans feel safer. Within the first week of utilizing Vaccination Registration and Administration Solution, there was a 30% increase in the number of citizens being vaccinated in the State of Tennessee.

The implementation of this solution reduced the amount of time healthcare workers check-in and vaccinate citizens from six minutes per patient to three minutes per patient (50% reduction). VRAS has been a significant resource that drastically improved the COVID-19 vaccination process for Tennesseans – both for TDH healthcare professionals, business users, and our citizens.

Industry Recognition

VRAS was such a successful project, that it was nominated and then selected as the winner of the 2021 IT Business & Collaboration award category of the Tennessee Information Technology Professionals Association (TN ITPA). This award recognizes the IT and Business partners who work in collaboration with other state government employees to improve business processes and/or services to Tennesseans.

Individual team members were also nominated for their contributions to the project at other organizations and award programs -- and several of them were selected as finalists, including a TDH employee for the Governor's Excellence in Service recognition program.

Conclusion

In summary, it is safe to say that Tennessee's VRAS project made a significant impact in lowering the spread of COVID-19 and lessened the number of hospitalizations through the State of Tennessee. It facilitated the data-driven administration and tracking of over 9.6M vaccine doses given to date (5/27/22). It has improved the time to vaccinate a patient by 50%. from six minutes per patient to three minutes per patient. VRAS streamlined internal business operations and data collection, improved the external customer experience, and helped support a healthier Tennessee. This solution has not only been life-saving, but it also has provided a state-of-the-art solution that adheres to Governor Lee's strategic priority "to promote healthy behavior and provide high-quality services to Tennessee's most vulnerable populations."

Kudos to the TN VRAS project team!

