Data for Public Good:

How Virginia's VAST Overcomes Human Trafficking's Data Deficit to Improve Response Time

The UN defines human trafficking as the recruitment, transportation, transfer, harboring, or receipt of people through force, fraud, or deception, with the aim of exploiting them for profit. From bustling cities to remote corners of the world, this global trade thrives, preying on vulnerability and despair.

Combating trafficking is particularly difficult as it encompasses complex networks, entrenched criminal organizations, a variety of victims, geography, and systemic inequalities. Hence, data plays a crucial role in uncovering the hidden patterns and connections that enable human trafficking networks to operate. The invaluable trafficking data can help law enforcement agencies identify details like hotspots, trafficker profiles, vulnerable populations, victim indicators, and available resources, enabling targeted interventions and preventive measures.

This knowledge also helps state and local government (SLG) leaders, policymakers, and other stakeholders allocate resources, enact legislation, establish comprehensive anti-trafficking strategies, and respond to trafficking incidents. As per government sources, human trafficking is prevalent in all 50 US states, Washington DC, and some US territories.

Initiating a data-driven approach towards curbing trafficking, the Commonwealth of Virginia Department of Criminal Justice Services (DCJS) launched VAST, the Virginia Analysis System for Trafficking, in July 2022. VAST was developed by Qlarion, a GCOM company, and on the Amazon Web Services (AWS) Cloud. It was designed to provide state policymakers, law enforcement personnel, and community leaders with actionable intelligence and answer questions regarding human trafficking within the Commonwealth. VAST helps identify key performance indicators (KPIs) for the trafficking response coordinator to prepare for future escalations in trafficking activity and identify triggers.

These KPIs help Virginia transform its mitigation response from a reactive to a proactive posture. In addition, the platform supports the Commonwealth's outreach efforts to help educate and inform the public.

VAST was built on the Framework for Addiction Analysis and Community Transformation (FAACT). It is a statewide data sharing and analytics platform (also developed by Qlarion/GCOM) that brings together previously siloed data from different types of agencies and systems. FAACT was launched in 2019 to enable community leaders from public safety, law enforcement, health, and social services to leverage statewide data sharing to mitigate the opioid crisis. This initiative led to a statewide data-governance structure and a data-trust framework enabling commonwealth agencies to share their data securely and appropriately.

The data-sharing framework not only brings together different state agencies, but also different secretariats (e.g., public safety, health and human resources, administration, etc.), local jurisdictions, social service systems, and private entities like associations and coalitions that are working towards solving a variety of complex, multidisciplinary problems.

DEVELOPING A PLATFORM TO SHARE, DEMOCRATIZE, AND LEVERAGE DATA

Angella Alvernaz, State Trafficking Response Coordinator for the Virginia Department of Criminal Justice Services says, "There's a lot of proactive ability when you're looking at data sharing. It (VAST) utilizes advanced analytics and an intuitive interface, and has pre-built visualizations that help users and policymakers without a background in data analytics understand and create reports and answer questions. The data sharing helps us see a holistic picture and a real view of what is going on and what people are dealing with in their communities and their lives in general."

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Angella Alvernaz

AWS supported a multi-domain approach to building the statewide data program. With this approach, the concerned departments are not thinking only about health, public safety, or education, but thinking holistically across different disciplines to build the data program that really connects government services to constituent outcomes.

From a technology and investment standpoint, Carlos Rivero, executive government advisor at AWS, says the idea is to move away from monolithic architectures and de-couple functions and capabilities to make it as modular as possible. The cloud technologies used to support the state-wide data platform include Amazon Elastic Compute Cloud (EC2), Amazon Relational Database Service (RDS), Amazon Simple Storage Service (S3), AWS Lambda, and Amazon Workspaces.

"We can swap out technology components whenever necessary based on customer needs. This allows you to create an environment where you realize exponential benefits with incremental investments and as you continue to invest in that platform with additional business use cases, you create real value for the organization. For example, FAACT was established statewide over a two-year period with an initial $2.5M investment while VAST was deployed within six months for $350K," says Rivero.

Rivero was the first chief data officer for the Commonwealth of Virginia. He was instrumental in developing the statewide data program that leveraged the 'data trust' as the legal framework to facilitate data sharing across public and private entities. At AWS, he is part of the Worldwide Public Sector State and Local Government Executive Advisory team. He provides coaching and consultative services to his former peers in government, helping them take advantage of the technology offerings at AWS to enable their respective organizations to become data-driven.

VAST is a game-changer for the DCJS. The collected and correlated data from the platform allows agencies to understand trends in offenses, contextualize risk factors, and better target services to victims. The visualization features like charts and graphs enable users to quickly understand details like victim and offender demographics, their relationships, additional crimes, and other previously hidden correlations. The platform makes it simple to correlate trafficking with crimes in other areas such as gang activity, prostitution, alcohol and drug offenses, among others.
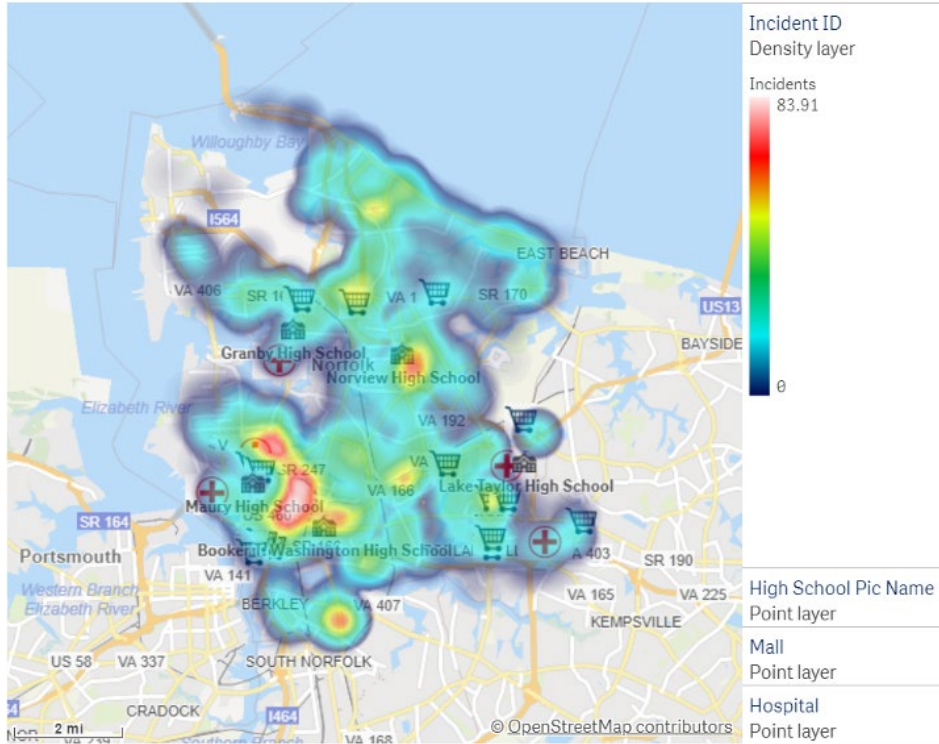
Incident Areas of Concentration

Figure 1: *Incidents Related to Human Trafficking or Human Trafficking Risk Factors in Norfolk from 2020 to August 2022.*

Top Offense Categories by Top Streets

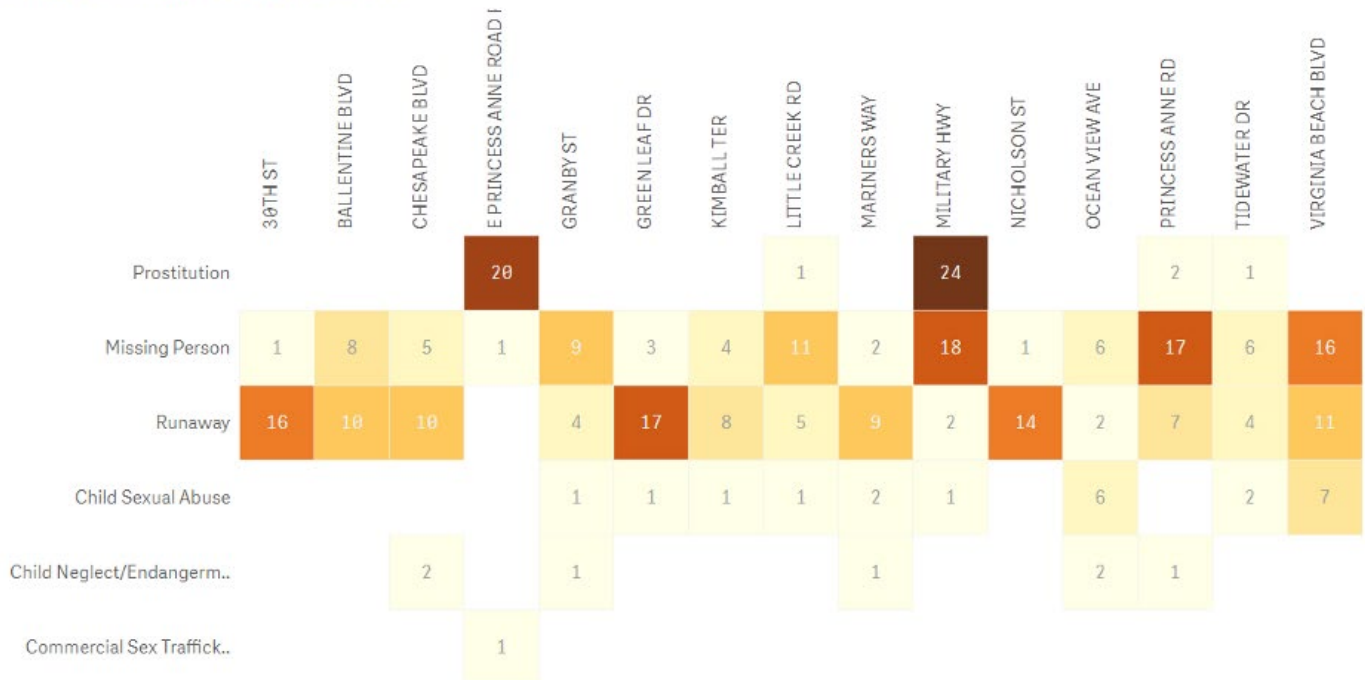|	30TH ST	BALLENTINE BLVD	CHESAPEAKE BLVD	E PRINCESS ANNE ROAD	GRANBY ST	GREEN LEAF DR	KIMBALL TER	LITTLE CREEK RD	MARINERS WAY	MILITARY HWY	NICHOLSON ST	OCEAN VIEW AVE	PRINCESS ANNE RD	TIDEWATER DR	VIRGINIA BEACH BLVD
Prostitution				20				1		24			2	1	
Missing Person	1	8	5	1	9	3	4	11	2	18	1	6	17	6	16
Runaway	16	10	10		4	17	8	5	9	2	14	2	7	4	11
Child Sexual Abuse					1	1	1	1	2	1			6	2	7
Child Neglect/Endangerm..			2		1				1				2	1	
Commercial Sex Traffick..				1											

Figure 2: *Top Offense Categories by Top Streets in Norfolk from 2020 to August 2022*

The platform not only uses aggregate, open-source data, which anyone can access, use, and share, but it also provides case-level data from state agencies serving real trafficking survivors. This allows for truly reliable data that does not currently exist anywhere in the nation, granting the organization the ability to answer questions like:

- How many trafficking cases for each type of human trafficking?
- What are the trends in human trafficking across different geographic areas and time periods?
- Where are people being recruited?
- Where are they being taken or sold?
- Where are the hotspots of activity and how often do they change?
- What is being used as items of influence in their trafficking (weapons, physical harm, or narcotics)?

The answers to such questions are crucial for deciding where to place and how to implement law enforcement resources to mitigate the impact of this illegal activity.

VAST also includes a Missing Child dashboard that provides visibility into missing children in the state. It has details of each child including the date they went missing, the date they first appeared on the registry, the date they were last listed, and how long they have been missing. It is also possible to delve even further into a child's profile, uncovering demographic information such as age, gender, and ethnicity.

Carlos Rivero

Additionally, it is viable to monitor the fluctuations in the number of missing children across different locations, identifying trends, and quantifying patterns. The platform also quantifies how often individual children are declared missing due to repeated instances of running away from their homes.

While VAST provides analytics solutions, it also provides a daily email report of missing children, which consists of all the children who are currently active cases. This information enables government personnel to quickly identify the most recent activity, assess appropriate next steps, and respond accordingly.

For example, before the implementation of VAST, the coordinator responsible for searching for missing youth would get a spreadsheet once a month. It would require a manual search through the spreadsheet to see which cases were still active. In an active crime scenario like trafficking, the month-old data was rarely useful. VAST now provides the coordinator a daily digest of every missing child in Virginia which has, in turn, improved recovery times and made the coordinator's job much more efficient.

Alvernaz from the Virginia DCJS states, "The missing children's section has already improved the real-time response to missing children."

In 2023, the number of children recovered was **1,742** but their average days missing was **42.06** representing a **21.6%** decrease in the average number of days it took to recover a missing child.

During the data collection period immediately preceding the launch of VAST (March through July 2022), the number of missing children recovered was 1,777 and the average number of days missing was 53.36. During the corresponding period in 2023, the number of children recovered was 1,742 but their average days missing was 42.06 representing a 21.6 percent decrease in the average number of days it took to recover a missing child.

Alvernaz adds the data from the VAST system also assists the Commonwealth in determining where additional and specialized resources are needed to eradicate human trafficking within Virginia. It assists localities directly in determining where to deploy law enforcement resources, locate missing children more efficiently, and identify the specific types of human trafficking that are occurring within their communities.

She mentions the data provided by the platform enables her to justify budget requests which would otherwise be impossible. Adding, "Without real data, that's (budget approval) not going to happen. Without real data, we're also not going to understand where we need to place our resources and what types of resources are needed to be placed in each region. Without data, I'm going on my gut instinct and experience. It's like throwing darts at a dart board hoping that they'll land in the right place."

THE URGENT NEED FOR TRANSFORMATION IN THE SLG SECTOR

Now, VAST's success story is only one of a myriad of possible use cases demonstrating the value of cross-agency data sharing in state and local governments. Many public sector organizations are now realizing the power and benefits of bringing their data assets together. As a result, there is a lot of interest in enterprise data sharing, governance, integration, consolidation, analytics, and intelligence.

From a digital transformation perspective, there is an urgent need for these organizations to transform their business processes from an analog-based environment to a digital environment that ties in a multitude of data assets, providing a holistic picture of a constituent's journey as they engage with multiple government services.

THE TRANSFORMATION ROADBLOCK AND HOW TO SOLVE IT WITH AWS

Based on his prior experience working in the government sector, Rivero asserts many SLG organizations do not know where to start. They tend to begin with analytics, intelligence, Robotic Process Automation (RPA), or even machine learning (ML). They do this without realizing data
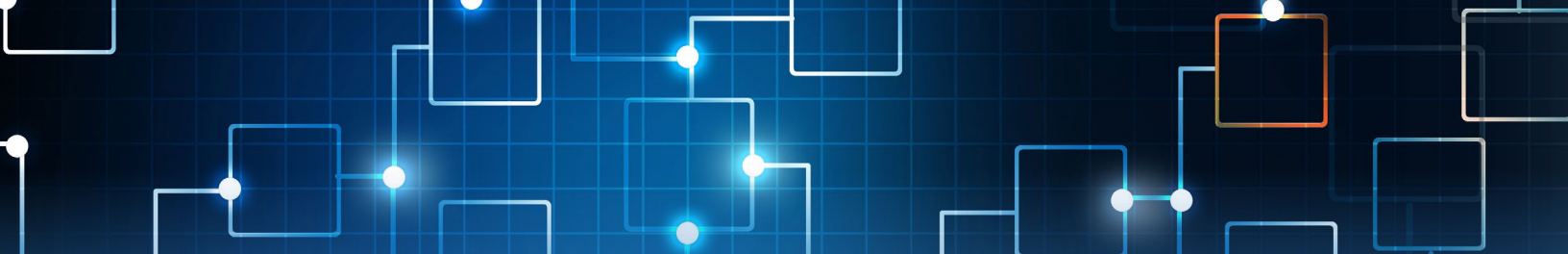
assets across agencies, departments, and other branches of government must be integrated to connect government services to constituent outcomes. "That's where the organization's culture needs to shift to be able to adopt these changes. Government data initiatives often focus on the analytics and intelligence capabilities without addressing the legal framework, governance model, and secure technical architecture that builds trust among government stakeholders," he says.

Rivero maintains transformation is very much possible with the right relationships, culture change, organizational maturity, and investment support. He explains that among people, process, and technology, organizations usually begin with technology and then perhaps consider engaging people and developing robust reusable processes. The AWS advisory team shifts the focus toward people and process, helps the organization develop a modern data strategy, and drafts a roadmap the organization can follow to become data-driven. This foundational approach helps government organizations mature where they can drive mission value through the implementation of business use cases.

The advisory team comprises of a data specialist, a cyber-security specialist, a digital transformation specialist, a procurement specialist, an education specialist, and two CIOs, one from the local level and one from the state level for additional support.

"You get access to a team of experienced professionals that have been successful at the highest levels of government. We're able to speak to the cultural changes and shifts that need to be made in public sector organizations prior to the adoption of any new technologies," Rivero says.

Sharing his experience of working with AWS, Adam Roy, VP, analytic solutions at GCOM Software, says, "AWS was an obvious choice for the platform as the services provided the required flexibility and scalability. This accompanied by the simplicity and innovative services available when requirements evolve and change."

"Our architects understand and trust AWS. It offers a high level of control of the environment and services which are backed by excellent support, ensuring our team never gets stuck," Roy adds.

A SECURITY AND PRIVACY FIRST APPROACH

AWS recognizes the criticality of security and privacy in handling sensitive data. The VAST platform implements security and privacy by design, ensuring that data is automatically de-identified to protect individual identities. The integration of data assets within a separate, internal system of the Commonwealth of Virginia adds an extra layer of security. Furthermore, AWS provides digital clean rooms, enabling researchers and nonprofit organizations to access restricted-use data sets without compromising security.

Speaking further on the data sharing aspect, Rivero says, "In Virginia, we were able to use AWS Workspaces to create digital clean rooms allowing approved Data Trust Users the ability to access restricted-use data assets in a secure environment that is completely locked down. Approved users cannot even copy and paste from that environment to their local computer. The most anyone can do is take a screenshot of de-identified data."

Virginia's VAST platform stands as a shining example of how data-driven approaches can reshape the fight against human trafficking. By connecting agencies, breaking down silos, and revealing hidden patterns, VAST has transformed the way stakeholders respond to this grave issue. It has empowered decision-makers to allocate resources effectively, expedite recoveries of missing children, and tackle human trafficking head-on.

The success of VAST serves as an inspiration for state and local governments across the nation to harness the power of data, paving the way for a safer future. To explore how you can incorporate this innovative approach to help mitigate human trafficking or other challenges within your community, please connect with an AWS expert today.

Want to learn more about the 'data trust' and how to enable data sharing in the public sector? We'll take a deeper dive into the topic in our next brief. Stay tuned!

For more thought leadership pieces from our executive government advisor, Carlos, and others, visit our executive advisory team website.

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The Virginia Department of Criminal Justice Services (DCJS) is charged with planning and carrying out programs and initiatives to improve the functioning and effectiveness of the criminal justice system as a whole.

DCJS is unique in state government because of its system-wide perspective on criminal justice. While it directs programs and services to each component of the system, it has an overarching responsibility to view the system as a whole, to understand how changes in one part of criminal justice will affect other parts, and to work to assure that plans and programs are comprehensive.

The Virginia Department of Criminal Justice Services is one of 11 agencies within the Secretariat of Public Safety and Homeland Security.