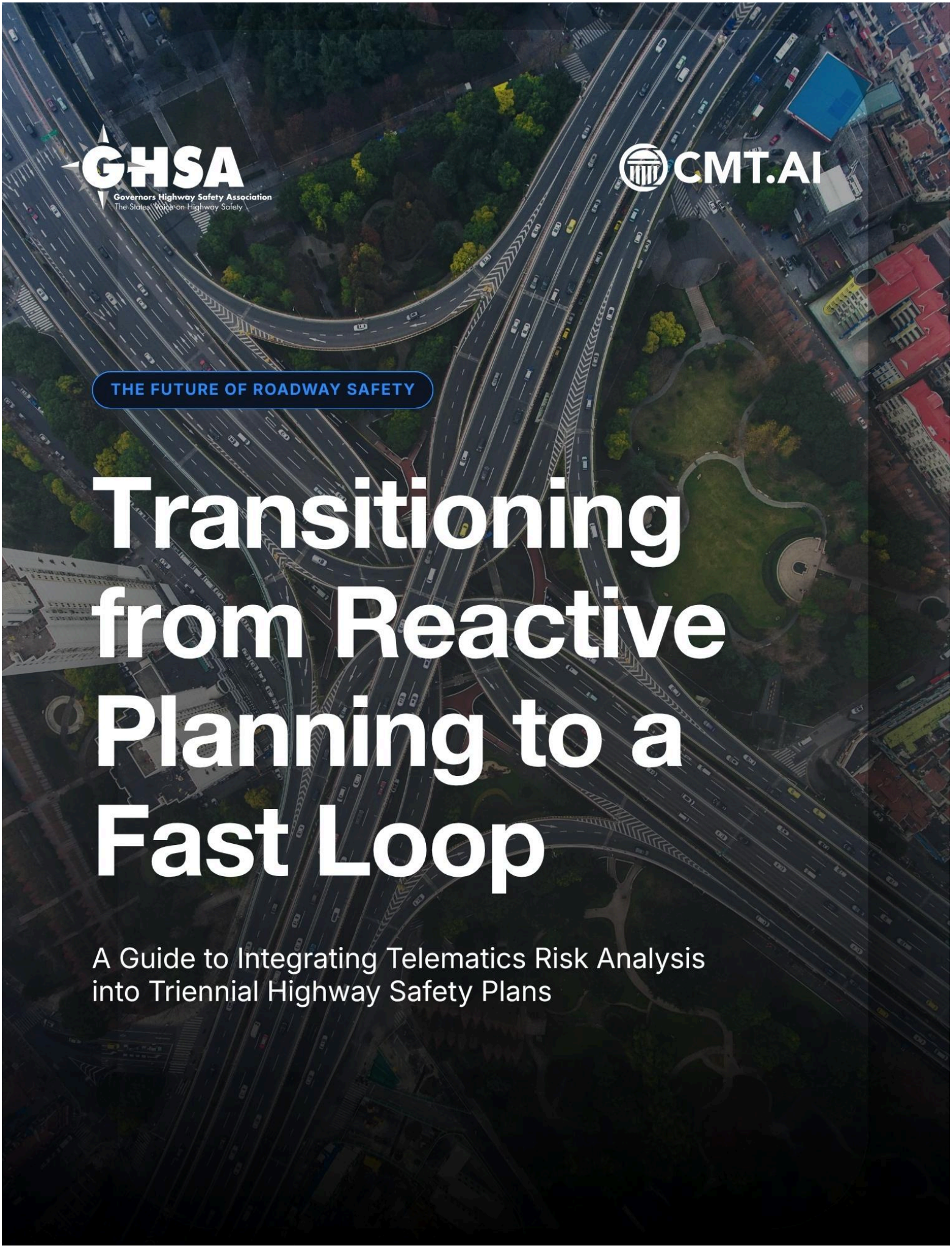
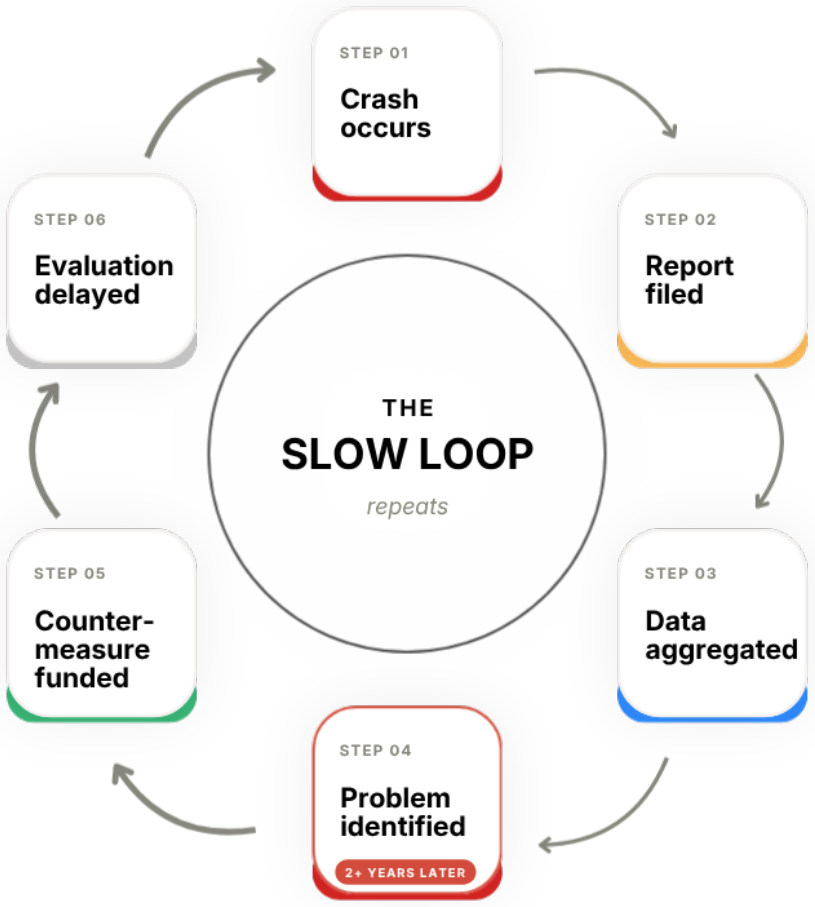

GHSA
Governors Highway Safety Association
The States' Voice on Highway Safety
CMT.AI
THE FUTURE OF ROADWAY SAFETY
Transitioning from Reactive Planning to a Fast Loop
A Guide to Integrating Telematics Risk Analysis into Triennial Highway Safety Plans

THE THSP DATA CRISIS

Moving from a "Slow Loop" to a "Fast Loop"

The transition to the Triennial Highway Safety Plan (THSP) mandates a fundamental shift in how State Highway Safety Offices (SHSOs) operate. By moving to a three-year planning cycle, SHSOs are expected to develop multi-year strategic blueprints to address the behavioral safety issues that result in traffic fatalities and serious injuries.



Effectively developing a THSP requires accurate and timely problem identification. Currently, highway safety planning relies on a fragmented and largely reactive data system. The biggest challenge is the delay in the national Fatality Analysis Reporting System (FARS) and other legacy databases, which forces SHSOs to make decisions using information that is already two or more years old. As a result, they are effectively planning "half-blind," responding to past events rather than current risks. This creates a "Slow Loop" mechanism illustrated above.

This reactive cycle prevents SHSOs from addressing what is happening on the road today and from assessing how well interventions are working within the three-year THSP planning cycle.

To match safety investments with real-world risk, SHSOs need to shift to a faster, more proactive planning cycle – a "Fast Loop." Telematics Risk Analysis (TRA) is the key to making this shift possible. TRA uses physics and AI-based tools to measure patterns of risk on the road. Unlike traditional traffic safety data systems that rely on historical trends, TRA analyzes roadway behaviors, such as phone handling, speeding, hard braking and aggressive cornering as they are happening. This anonymized, aggregated information is then combined to form predictive safety indicators and assess risk. Insurance companies have used this process to predict risks for decades. The same opportunity to better predict risk and make smarter choices on how to prevent crashes and save lives is now available to the highway safety community. By tracking actual patterns of risk, SHSOs can actively deploy TRA to build, implement and evaluate their THSPs.

Moving from a reactive Slow Loop to a proactive Fast Loop enables an SHSO to:

- Improve Problem Identification and Prioritization: Continuously screen the road network for potential high-risk hot spots when there are too few crashes to reveal dangerous patterns.
- Deploy Limited Dollars Strategically: Allocate resources to corridors with the highest current risk to prevent crashes before they happen.
- Rapidly Evaluate Intervention Effectiveness: Measure changes in driving behavior within weeks of countermeasure implementation so adjustments can be made mid-cycle.
- Justify Spending to Policymakers and the Public: Provide clear, evidence-based explanations for where and why safety investments are needed.
- Support Innovation and Reduce Burden: Replace or supplement survey-based measurement with real behavioral evidence to get off the "compliance treadmill" of unproven programs.
- Sustain Long-Term Gains: Institutionalize faster learning cycles that make the THSP a continuous system for preventing crashes and saving lives.

This report, the third in a series, explains how SHSOs can put TRA into practice to modernize the THSP.

DEVELOPING THE THSP

8

Guiding Principles for TRA Integration

To make the most of the three-year planning cycle, SHSOs can structure their THSPs around eight core applications of Telematics Risk Analysis. The principles discussed below provide an actionable blueprint for identifying current problems, selecting and deploying countermeasures, allocating federal funds and evaluating impact.

01 | **Network Screening**

02 | **Hotspot Analysis**

03 | **Distracted Driving Analysis**

04 | **Speed Studies**

05 | **School Zone Risk Assessment**

06 | **Work Zone/Detour Risk Assessment**

07 | **Intersection Analysis**

08 | **Countermeasure Impact Analysis**

01 Network Screening

During the core "Problem Identification" phase of THSP development, SHSOs are required to analyze statewide data to identify where crashes are happening, who is involved and why, and to prioritize funding accordingly. Traditional crash data limit this process due to a small sample size, particularly on rural and local roads, where fatal crashes are too infrequent. This means that statistically reliable patterns can't be established until multiple years of data are accumulated.

HOW SHSOS CAN APPLY IT IN THE THSP

TRA enables SHSOs to conduct comprehensive, proactive network screening at both high-level and highly granular geographic levels. By capturing daily crash-precursor data across millions of trips, TRA allows SHSOs to identify systemic vulnerabilities across the entire network. Planners can map predictive safety indicators statewide to establish accurate behavioral baselines, allowing them to confidently set realistic three-year performance targets based on actual risk exposure – without waiting years for sufficient crash data to accumulate.

The Massachusetts Department of Transportation (MassDOT) is partnering with Travelers Marketing to implement the latter's Community Voices for Roadway Safety project in several towns. The community-driven initiatives are leveraging engagement, education and technology to educate residents about road safety. TRA is being used to collect, analyze and measure driver behavior patterns before, during and after the community campaigns in high-traffic areas

02 Hotspot Analysis

Once network screening establishes a statewide baseline, the THSP requires SHSOs to target their resources effectively to address the most critical behavioral safety problems on state and local roadways. Relying on FARS and other older data often means an SHSO is funding countermeasures based on motor vehicle crashes that happened two or more years ago.

HOW SHSOS CAN APPLY IT IN THE THSP

TRA identifies dangerous conditions with highly granular geographic and behavioral precision. SHSOs can use hotspot analysis to isolate corridors where risks are occurring now. For example, if TRA identifies a sudden, localized spike in risk at a specific location, the SHSO can immediately prioritize that corridor in the THSP for grant funding and deploy the most appropriate intervention to help prevent crashes from happening.

The first town participating in the MassDOT/Traveler's Marketing project is Holyoke, with the goal of helping the community reduce distracted driving. One of the planned awareness efforts is the placement of three temporary digital signs around town displaying messages for passing drivers. To help determine the most effective locations for these signs, TRA was used to conduct a preliminary hotspot analysis of phone use by drivers operating in Holyoke. These high-risk locations are intended to serve as candidate sites for the temporary digital signs, ensuring the messages reach drivers where distracted-driving risk is most prevalent and where the safety impact is likely to be the greatest.

03 Distracted Driving Analysis

Distracted driving is a primary target for behavioral highway safety grants, yet it is chronically under-reported due to its reliance on self-reporting or officer observation post-crash. This makes it incredibly difficult for SHSOs to set accurate benchmarks for anti-distraction programs using traditional data.

HOW SHSOS CAN APPLY IT IN THE THSP

TRA actively measures phone handling while driving (screen tapping, typing and swiping), giving SHSOs a reliable, population-level proxy for distracted driving prevalence.

The Ohio Department of Transportation and Ohio Department of Public Safety use telematics risk analysis to analyze millions of driving trips. Aggregate behavioral insights are revealing localized distraction hot spots, particularly in southern counties bordering states without comparable hands-free laws. By integrating these specific behavioral metrics into their problem identification, Ohio is conducting public awareness campaigns and directing countermeasures in the locations where risk is highest. This proactive approach has contributed to four consecutive years of declining roadway fatalities.

04 Speed Studies

Speed management is a foundational element of road safety. Traditionally, highway safety professionals conduct speed studies by deploying pneumatic road tubes, while law enforcement officials use radar equipment at a single location for a limited time. In both cases, a brief, localized snapshot of driver behavior is captured.

HOW SHSOS CAN APPLY IT IN THE THSP

TRA offers a comprehensive alternative, enabling broader and more continuous analysis to support countermeasures that rely on or require speed data.

The Washington Traffic Safety Commission (WTSC) used advanced TRA to accurately and comprehensively measure driver speeding behavior. For the first time, WTSC was able to quantify and analyze speeding trends across broad regions and detailed local areas. Specifically, the agency could measure 85th- and 50th-percentile speeds on nearly all roads in its network. This comprehensive, continuous analysis serves as a robust alternative to traditional single-location equipment, providing the necessary depth to justify and support THSP countermeasures that require speed data.

05 School Zone Risk Assessment

Federal regulations require SHSOs to engage in meaningful public participation and engagement (PPE), with particular attention given to road users and communities that are overrepresented in crash data. This includes vulnerable road users (VRUs) such as school-age children.

HOW SHSOS CAN APPLY IT IN THE THSP

SHSOs can use TRA to assess risks directly around schools, capturing hyperlocal data that serve as an invaluable tool for fulfilling the PPE mandate. This evidence-based behavioral data can be presented to local communities to garner buy-in for safety interventions addressing speeding and distraction, which put children and all pedestrians at risk.

The Texas Department of Transportation (TxDOT) used TRA to measure phone distraction near school zones in the Leander Independent School District. Severe phone-distraction hotspots were analyzed and shared directly with school district stakeholders, including the PTA. The platform validated distraction trends in areas frequently traveled by younger drivers. This gave parents and administrators the data-driven support needed to produce and air targeted video messages on football game jumbotrons that encouraged students to put their phones down while driving.

06 Work Zone/Detour Risk Assessment

Because the THSP covers three years, the roadway environment will change significantly over the life of the plan. Multi-year construction projects and temporary detours introduce sudden changes to road geometry and traffic flow that legacy crash data will miss entirely.

HOW SHSOS CAN APPLY IT IN THE THSP

TRA enables SHSOs to build operational agility into their THSPs by monitoring dynamic conditions and temporary detours in real-time. This enables grant resources to quickly and effectively be redirected where most needed.

Following a 2024 landslide on Highway 22, a mountain pass in Wyoming's Teton Mountains, the Wyoming Department of Transportation (WYDOT) used TRA to measure risk along a mandated detour route. The closure forced drivers to reroute for several weeks, and the platform immediately revealed a massive behavioral shift: an 83% increase in excessive speeding and a 21% increase in phone tapping. New speeding hot spots emerged along the route, and once the highway reopened to single-lane traffic, a severe hard-braking hot spot immediately appeared as drivers rounded a corner and encountered the lane restriction. By monitoring these dynamic shifts, WYDOT was able to proactively deploy warning signs, adjust detour routes and conduct countermeasures to effectively reduce speeding and distraction.

07 Intersection Analysis

Intersections are complex, high-conflict zones that may require the use of engineering, education and/or enforcement strategies to improve their safety. To break down the silos between behavioral programs (funded through the National Highway Traffic Safety Administration) and infrastructure (funded through the Federal Highway Administration), SHSOs can bridge the gap between why a project is constructed and how it should be used to advance safety.

HOW SHSOS CAN APPLY IT IN THE THSP

By measuring behavioral crash precursors, such as hard braking or sudden acceleration, SHSOs can work with state DOTs and local partners to determine whether a high-risk intersection can be addressed via an educational campaign, increased police presence and/or a structural redesign.

TxDOT used TRA to evaluate the safety and efficiency of a roundabout compared to a traditional four-way signalized intersection located just a few miles away. By capturing many of the same vehicles traveling through both locations, the granular telematics analytics were striking. The signalized intersection experienced twice as many hard-braking events and 15 times more hard-acceleration events, often associated with drivers aggressively rushing right turns on red to avoid rear-end collisions. At the roundabout, drivers maintained higher yet more consistent speeds; approximately 15–20 mph, accelerating smoothly to 40–45 mph upon exit. In addition, only 6% of drivers came to a complete stop prior to entering the roundabout, compared to 58% at the signalized intersection. Using these deep analytics, TxDOT is able to demonstrate through public education and outreach the safety and flow benefits of roundabouts.

08 Countermeasure Impact Analysis

A key requirement of the THSP is the submission of an Annual Grant Application, which includes evaluating the effectiveness of funded countermeasures year-over-year. In the traditional "Slow Loop," data delays make it impossible to determine in real-time whether an intervention deployed in year one of the plan is effective by year two.

HOW SHSOS CAN APPLY IT IN THE THSP

TRA enables rapid evaluation. By tracking changes in speeding, hard braking and distraction rates before, during and after countermeasure implementation, SHSOs can validate its effectiveness within weeks rather than years. If an SHSO funds a localized media campaign TRA can show whether driver behavior changed in the targeted area. This allows SHSOs to dynamically pivot, abandon ineffective strategies or scale successful ones in that location and possibly statewide within the THSP cycle.

Strategic Recommendations for THSP Integration

To fully operationalize TRA within the THSP, state safety leaders and federal regulators are encouraged to adopt the following strategic practices:

Institutionalize Real-Time Dashboards In Problem Identification

SHSOs are encouraged to integrate TRA and predictive analytics directly into their core THSP strategy development. Safety dashboards should be updated to display real-time, aggregated risk indicators (e.g., granular 85th-percentile speed maps or specific distraction hot spots) to supplement lagging crash statistics. Relying on anonymized insights safeguards individual privacy while offering the depth and precision needed to stop crashes before they happen.

Establish a Dynamic Infrastructure Feedback Loop

Use TRA to bridge the operational gap between behavioral interventions and infrastructure improvements. When TRA creates a "dynamic feedback loop," data showing high-risk behaviors, such as a 15-fold spike in hard accelerations at a specific crosswalk, can automatically trigger the right response, with the SHSO leading efforts to identify community-level risk.

Educate Subrecipients About TRA and Pilot its Use

Given the disparity in subrecipient size and sophistication, SHSOs should not assume all will embrace TRA. Building a fast loop or proactive culture will take time. Educating subrecipients about what TRA is and how to use it to reduce risk is critical and can help an SHSO identify likely candidates for TRA operationalization.

For example, WTSC is working with select law enforcement agencies across the state to better understand patterns of distracted driving using TRA. WTSC is funding 12-month TRA licenses so participating agencies can access aggregated and anonymized driving insights within their jurisdictions and providing technical assistance to support the pilot.

Participating agencies review the data regularly and submit quarterly reports to WTSC on how the insights inform their road safety initiatives. By pairing traditional traffic safety metrics with TRA insights, the pilot will help agencies move beyond crash statistics and citation counts to better understand where and when distracted driving occurs. These insights can guide education campaigns, community outreach and broader traffic safety programs, while also providing feedback on how driver behavior changes over time.

Fund Performance Over Compliance (Rapid Evaluation)

Revise state grant criteria to prioritize funding for projects based on TRA to target interventions and validate their effectiveness in near real-time. Instead of waiting for annual fatality reports to justify continued funding, state THSPs should prioritize finding grantees that can demonstrate effectiveness by partnering with the SHSO to measure reductions in TRA-tracked risky behaviors. This will require the SHSO to collaborate with the grant recipient to build a measurement plan into the intervention and then assess its impact using TRA.

Conclusion

The transition to the Triennial Highway Safety Plan was designed to foster strategic, long-term thinking, but it cannot succeed if states are forced to build their strategies on outdated, reactive data.

By integrating the eight guiding principles of Telematics Risk Analysis into their planning processes, SHSOs can transform the THSP from a backward-looking documentation process to a dynamic, "Fast Loop" strategy. Continuous, high-resolution behavioral data supports faster, more nuanced problem identification, strategy deployment and rapid evaluation – helping states uncover hidden risks, address them systematically and verify results. The outcome is a continuous cycle of safety improvements that help prevent crashes and save lives.

CMT's mission is to make the world's roads & drivers safer.

Cambridge Mobile Telematics (CMT) is the world's largest telematics and AI company for safer mobility. Its mission is to make the world's roads and drivers safer. The company's AI-driven platform, DriveWell Fusion®, proactively identifies and reduces driving risk, leading to fewer crashes and injuries. To date, CMT's technology has helped prevent over 100,000 crashes worldwide. CMT enables partners to measure risk, detect crashes, provide life-saving assistance, and streamline claims. Headquartered in Cambridge, MA, CMT operates globally with offices in Budapest, Hungary; Chennai, India; Seattle, Washington; Tokyo, Japan; and Zagreb, Croatia. Learn more at www.cmt.ai.

The Governors Highway Safety Association (GHSA) is a nonprofit association representing the highway safety offices of states, territories, the District of Columbia, and Puerto Rico. GHSA provides leadership and representation for the states and territories to improve traffic safety, influence national policy, enhance program management, and promote best practices. Its members are appointed by their Governors to administer federal and state highway safety funds and implement state highway safety plans. Visit ghsa.org for more information.

Authors:
Pam Shadel Fischer, Governors Highway Safety Association
Ryan McMahon, Cambridge Mobile Telematics