Case Study

Reducing Rail Crossing Delays by 25%

Chattanooga's experience using TRAINFO's Rail Crossing Information System

TRAINFO

EXECUTIVE SUMMARY

In 2024, the City of Chattanooga, Tennessee, partnered with TRAINFO to address long-standing traffic delays and safety risks caused by rail crossings at Hamill Road and Hickory Valley Road. These crossings, located near the Norfolk Southern DeButts Classification Yard, serve thousands of vehicles daily and frequently experience train-related blockages. Traditional solutions such as grade separations were deemed too expensive and time-consuming. Chattanooga needed a cost-effective, quickly deployable, and data-driven alternative—leading to the implementation of TRAINFO's Rail Crossing Information System (RCIS).

Project Goals and Strategy

The project had two clear objectives:

1. **Reduce vehicle delays** at rail crossings, particularly during peak hours.
2. **Enhance safety** by discouraging risky driver behavior and reducing vehicle exposure to trains.

To achieve these outcomes, TRAINFO deployed a tailored RCIS that integrated predictive train detection, real-time traffic data, and dynamic roadside messaging. The system used sensors to forecast train arrivals and clearances with high accuracy, while Dynamic Message Signs (DMS) provided drivers with timely, actionable updates and alternate route suggestions.

Solution Design and Implementation

The implementation followed a structured five-step process:

Step 1: Evaluate Origin-Destination Patterns – Traffic flow and land use data were analyzed to identify key sources of vehicle movement through the crossings.

Step 2: Assess Alternate Routes – Travel times with and without train delays were compared to validate the effectiveness of rerouting strategies.

Step 3: Define Information Requirements – Messaging templates were created based on train type, movement status, and predicted delay durations.

Step 4: Design and Install Equipment – TRAINFO sensors and DMS boards were placed strategically to maximize visibility and lead time.

Step 5: Real-Time Integration – Sensor data and predictive analytics fed directly into the DMS system, refreshing messages every 30 seconds for real-time accuracy.

Performance Validation

A before-and-after validation study was conducted over a seven-week period. The system achieved:

- **100% accuracy** in detecting crossing activations.
- **92% accuracy** in predicting train arrivals within one minute.
- **91% accuracy** in predicting when crossings would clear.

These metrics provided the City with strong assurance of the system's reliability and real-time capabilities.

Traffic and Safety Improvements

Performance results revealed a significant reduction in the number of vehicles impacted by train delays:

- ✓ **Hamill Road: 25% fewer vehicles affected per minute of train event duration.**
- ✓ **Hickory Valley Road: 21% fewer vehicles affected per minute.**

These improvements were achieved with minimal changes in train frequency or event duration, confirming that the RCIS—not external factors—was responsible for the gains. By reducing delays and improving predictability, the system also lowered the risk of unsafe driving behaviors, such as gate running or illegal U-turns.

Data Analytics and Strategic Insights

Beyond real-time alerts, TRAINFO's analytics platform provided Chattanooga with advanced tools for transportation planning:

- **Blockage Insights** identified patterns in train activity and its impact on different road users.
- **Congestion Analytics** quantified vehicle delays and helped optimize traffic signal timing.
- **Response Intelligence** analyzed how train blockages affected emergency vehicle routing and response times.

These analytics helped city planners prioritize future investments, optimize emergency dispatch strategies, and evaluate long-term trends in rail crossing performance.

Lessons and Next Steps

The project surfaced several important lessons:

- Site-specific challenges—such as sightlines and right-of-way limitations—require early, tailored planning.
- Community education builds trust and encourages compliance with real-time messaging.
- Flexibility in procurement (e.g., using wood poles instead of steel) can accelerate deployment timelines.

With strong performance and public support, Chattanooga is now planning to expand the RCIS to additional crossings, integrate it with emergency dispatch and ESRI GIS systems, and explore trespass mitigation strategies.

Conclusion

Chattanooga's RCIS initiative demonstrates how cities can leverage smart infrastructure to address rail-related traffic and safety challenges. By combining predictive analytics, real-time communication, and data-driven planning, the city delivered measurable results at a fraction of the cost of traditional grade separations—setting a national example for intelligent rail crossing management.

Transforming Rail Crossing Management in Chattanooga

In 2024, the City of Chattanooga, Tennessee, took a decisive step toward addressing long-standing transportation bottlenecks by launching a Rail Crossing Information System (RCIS) in partnership with TRAINFO. Like many urban areas intersected by active rail lines, Chattanooga grappled with recurring delays and safety concerns at several critical rail crossings. Nowhere was this more evident than at Hamill Road and Hickory Valley Road—two vital transportation arteries feeding into the Norfolk Southern DeButts Classification Yard, one of the city's busiest rail facilities.

Each day, thousands of vehicles traverse these corridors, only to be routinely halted by freight trains, leading to unpredictable travel times, increased driver frustration, and elevated safety risks. **For years, the only long-term solution on the table was costly and disruptive: grade separations**, which require building bridges or underpasses to separate rail and road traffic. But with multi-million-dollar price tags and timelines measured in years, these infrastructure projects were out of reach for an immediate fix.

Faced with these constraints, Chattanooga turned to innovation. **TRAINFO's RCIS provided a smarter, faster, and more cost-effective alternative.** This real-time system leverages predictive train detection, advanced analytics, and dynamic message signs to keep drivers informed and moving—without the need for concrete and steel.

This case study explores how Chattanooga used TRAINFO's RCIS to achieve measurable results in traffic flow and safety, with a particular focus on implementation strategy, performance outcomes, data validation, and lessons learned. From understanding origin-destination patterns to integrating real-time train data with roadside communication, the project reflects a shift in how cities can manage rail crossings in the age of smart infrastructure.

By the end of this case study, transportation planners, city engineers, and public safety officials will gain insight into an actionable model for mitigating rail-related delays—and a compelling case for why the future of rail crossing management may no longer rely on the most expensive solution, but the most intelligent one.

The Need For Innovation

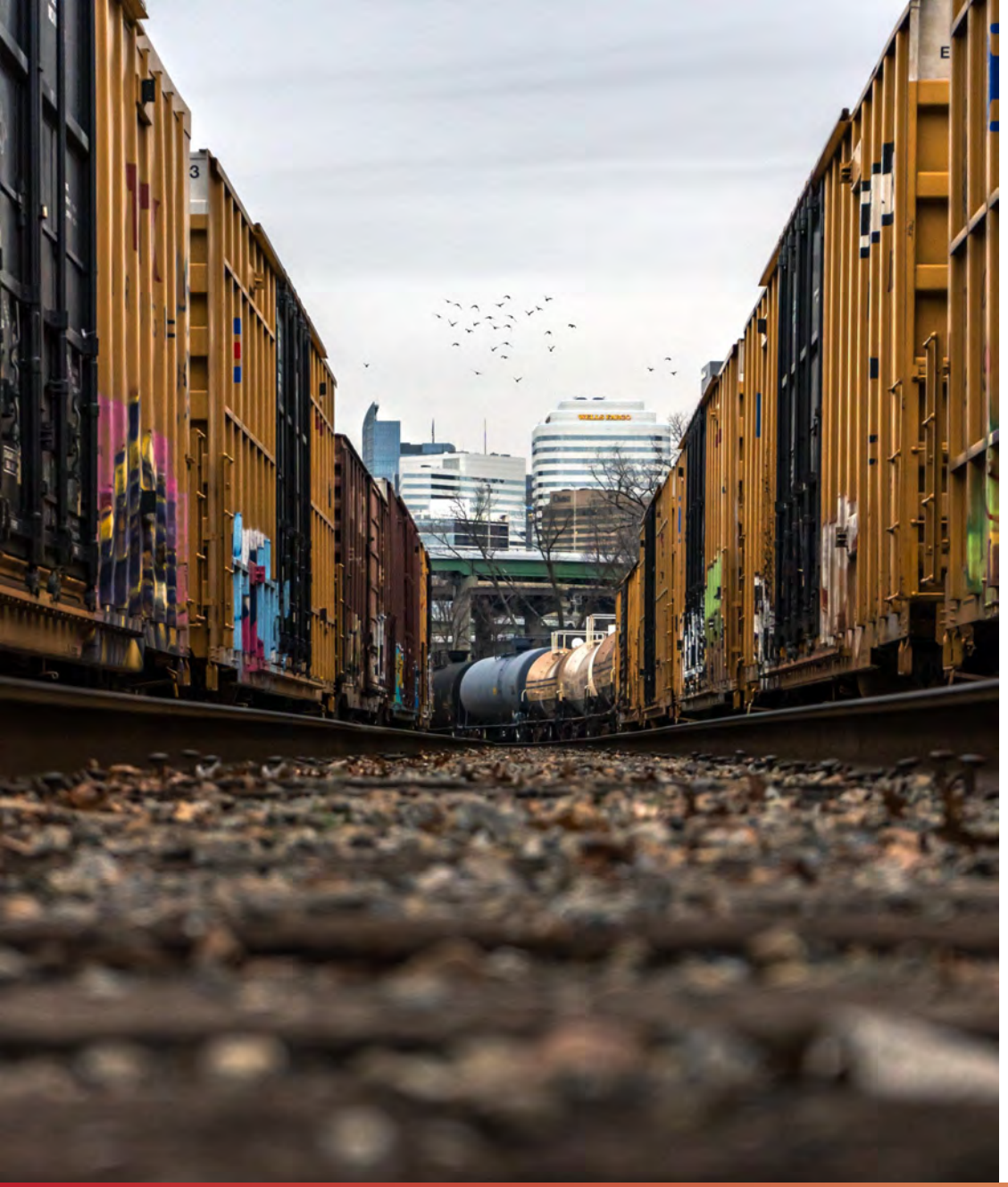
Traffic congestion at rail crossings is a persistent issue for cities across North America, and Chattanooga, Tennessee, was no exception. Two locations—Hamill Road and Hickory Valley Road—stood out as particularly troublesome. These crossings are more than simple intersections between road and rail; they are vital connectors within Chattanooga's transportation network, linking residential neighborhoods, commercial areas, and regional roadways. But they also sit adjacent to the Norfolk Southern DeButts Classification Yard, a major rail facility responsible for generating a high volume of train movements through the area.

The Hamill Road crossing handles **over 7,600 vehicles daily** and serves as a primary connector to State Highway 153. During peak hours, frequent train activity leads to significant backups and unpredictable delays. Meanwhile, the Hickory Valley Road crossing sees **more than 6,300 vehicles each day** and plays a crucial role in linking residential areas with commercial zones and regional arteries. Like Hamill Road, it experiences frequent interruptions due to train movements into and out of the DeButts Yard.

Traditional traffic management tools—such as traffic signal optimization or preemption systems—offered limited relief. **The unpredictable nature and frequency of train activity meant that vehicles could be stopped for lengthy periods with no warning, and traffic signals could not adjust quickly enough to reroute drivers or alleviate growing queues.** The risks went beyond inconvenience: prolonged delays often led to aggressive driving behavior, including drivers attempting to beat the gates or making unsafe turns to avoid queues. This created serious safety hazards for motorists, cyclists, and pedestrians alike.

While grade separation was explored as a potential long-term solution, the financial and logistical challenges were daunting. Such projects can cost tens of millions of dollars and take years to complete—if funding can even be secured. In the case of Chattanooga, these barriers made grade separation an impractical option in the short term.

City planners and engineers needed an innovative, technology-forward solution that could be deployed quickly, address both traffic delay and safety, and operate cost-effectively. That search led them to TRAINFO and its Rail Crossing Information System (RCIS)—a smarter way to manage rail crossing impacts using predictive technology, real-time data, and strategic driver communication.



Project Objectives

With the mounting challenges at Hamill Road and Hickory Valley Road, Chattanooga's transportation leaders were looking for a solution that could deliver tangible results—quickly and affordably. Their collaboration with TRAINFO centered around two clear and measurable objectives:

Objective 1. Reduce Vehicle Delays

The primary goal was to minimize the amount of time vehicles spent waiting at rail crossings. Delays during peak traffic hours were causing major disruptions to daily commutes and freight movement. By accurately predicting train activity and sharing this information with drivers in real time, the City aimed to help motorists avoid unnecessary wait times and keep traffic flowing more efficiently across the network.

Objective 2. Enhance Safety

Reducing the risk of collisions and discouraging unsafe driving behaviors—such as gate running or illegal U-turns—was equally important. The City sought to limit vehicle exposure to trains by enabling drivers to make safer routing decisions. A system that could reliably communicate when and where delays would occur had the potential to deter high-risk behaviors and reduce the likelihood of crashes or trespassing incidents.

These goals shaped the design and implementation of the Rail Crossing Information System. Rather than relying on costly infrastructure changes, Chattanooga embraced a data-driven, real-time approach. TRAINFO's proven expertise in rail crossing prediction, combined with its experience working with public agencies, made it a natural partner to deliver on these objectives.

As the project moved forward, everything—from sensor placement to message board content—was designed to support these two overarching goals: getting drivers moving again, and keeping them safe while doing it.

A Tailored Approach

To meet Chattanooga's dual goals of reducing delays and enhancing safety, TRAINFO developed a Rail Crossing Information System (RCIS) tailored specifically to the city's transportation environment. This solution blended predictive analytics, real-time sensor data, and strategically placed messaging infrastructure to give drivers timely, actionable information they could trust.

A Data-Driven Framework

At the core of TRAINFO's approach was the use of data to understand and manage the impact of train activity on road traffic. Rather than applying a one-size-fits-all template, TRAINFO designed a system based on local traffic patterns, road network dynamics, and crossing characteristics. The result was a flexible and scalable platform capable of delivering measurable improvements.

The solution combined five integrated steps:

Step 1: Evaluate Vehicle Origin-Destination (OD) Patterns

Step 2: Assess Alternate Routes

Step 3: Define Information Requirements

Step 3: Design and Install Equipment

Step 4: Integrate Real-Time Data

Infrastructure Optimization

TRAINFO's system wasn't just about technology—it was about applying that technology intelligently within Chattanooga's physical and logistical constraints. For example, signs were installed at points where drivers still had viable options to reroute. Sensor locations were carefully chosen to optimize both coverage and prediction accuracy. Every component, from data analytics to sign placement, was designed with purpose.

Step 1: Evaluate Vehicle Origin-Destination (OD) Patterns

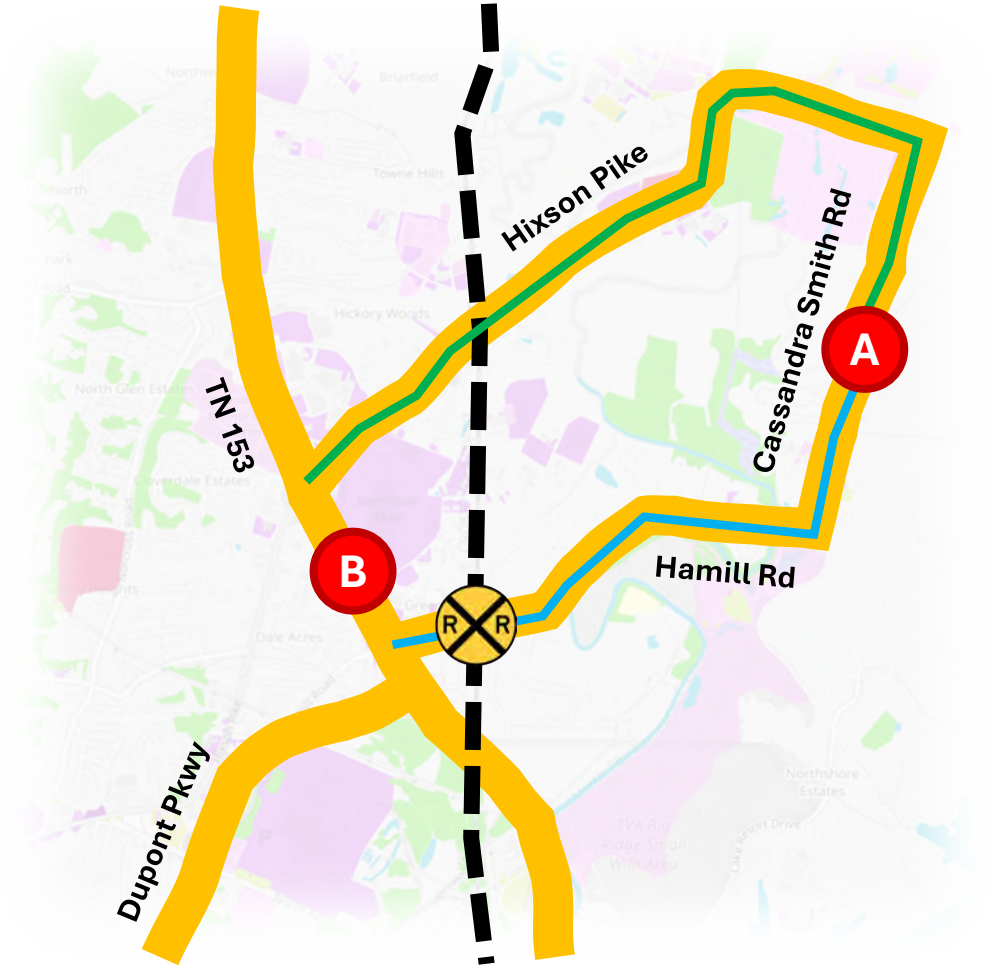
Using land use data and road network analysis, TRAINFO mapped how vehicles moved through the area. This revealed two primary sources of traffic: residential neighborhoods northeast of the crossings and regional traffic entering from arterial roads. Understanding these OD patterns allowed TRAINFO to pinpoint which trips were most affected by train activity and tailor the system accordingly.

Origin-Destination Zone B
Regional traffic from TN 153 and Dupont Pkwy are two major sources of traffic at the Hamill Rd crossing

Origin-Destination Zone A
Traffic from this residential area is a major traffic source at the Hamill Rd crossing

Step 2: Assess Alternate Routes

Next, TRAINFO compared the total travel time of existing routes—including train delay time—with alternate paths around the crossings. The analysis demonstrated that during train activations, alternate routes consistently offered faster travel times. This validation provided the green light for redirecting traffic via real-time notifications.



Route	Origin-Destination	Crossing Clear	Crossing Blocked
Default via Hamill Rd	A → B	8 min	13 min
	B → A	8 min	13 min
Alternate via Hixson Pike	A → B	n/a	9 min
	B → A	n/a	8 min

Step 3: Define Information Requirements

Working with city engineers, TRAINFO identified exactly what information drivers needed: Is the crossing active? Is the train moving continuously or stopping? How long will the delay last? These insights were distilled into a set of dynamic message templates tailored to each situation. Messages alternated between Phase 1 and Phase 2 based on the situation as shown below. This real-time, context-sensitive messaging helped drivers make informed decisions—reducing idle time and discouraging risky maneuvers.

Phase 1

This message is displayed when the crossing is currently activated or will be activated by the time the driver arrives at the crossing.

Phase 2 – Continuous Train

This message is displayed and updated every 30 seconds when the crossing is activated by a continuously moving train with predictable movements.

Phase 2 – Non-continuous Train

This message is displayed when the crossing is activated by a non-continuous train (e.g., switching) with unpredictable movements.

Step 4: Design and Install Equipment

With the messaging logic in place, TRAINFO deployed its proprietary sensors to predict train movements with high accuracy. These were paired with Dynamic Message Signs (DMS) and Blank-Out Boards installed upstream of each crossing. The signs were placed strategically to give drivers enough lead time to choose alternate routes before reaching the queue.

Signs strategically placed at locations that enable drivers to re-route when crossing is activated

Train sensors strategically placed at locations that enable accurate crossing activation predictions

- Train sensor
- DMS board
- Blank-out board

Step 5: Integrate Real-Time Data

The final step brought everything together: TRAINFO's predictive algorithms were connected to the live sensor feed to drive real-time updates on the DMS boards. Messages were refreshed every 30 seconds to reflect current conditions, maintaining driver trust and system reliability.

Train sensor installed on utility pole next to Hamill Rd rail crossing

DMS board installed on Hamill Rd

Data Validation Process

Before celebrating results, Chattanooga and TRAINFO set out to rigorously validate that the Rail Crossing Information System (RCIS) was working as intended. Reliable performance wasn't just a nice-to-have—it was essential to building public trust, refining future deployments, and proving that a technology-first solution could stand up to traditional traffic infrastructure in both accuracy and effectiveness.

A Before-and-After Validation Approach

TRAINFO deployed a structured validation process to assess how well the system performed. This process followed a **before-and-after methodology** to measure impacts both with and without real-time driver notifications.

Baseline Data Collection (Pre-Deployment)
For two weeks before activating the signs, TRAINFO gathered baseline data using a combination of pre-emption signal emails and video cameras. This established a control dataset to understand how traffic and train interactions occurred when drivers had no visibility into train activity.

System Testing (Post-Deployment)
After installation, a five-week testing period began. During this time, the system's predictions and detection events were carefully logged and compared to actual train movements. This allowed the team to determine how accurately the RCIS was detecting activation events and predicting train arrival and clearance times.

Hamill Rd video camera validation

Hickory Valley Rd video camera validation

Performance Metrics and Targets

TRAINFO and the City established three metrics to measure the RCIS:

Metric	Description	Target	Result
Activation Detection Accuracy	Detect when a crossing warning system activates	100% within a 5-second margin	✓ **Achieved** 100% accuracy
Prediction Accuracy – Train Arrival	Predict train arrival within 1 minute for continuous movements	≥90% accuracy	✓ **Achieved** 92% accuracy
Prediction Accuracy – Train Clearance	Predict train clearance within 1 minute of actual time	≥90% accuracy	✓ **Achieved** 91% accuracy

These results validated the reliability of the system's core capabilities—train detection, real-time communication, and predictive analytics.

Results That Built Trust

The RCIS achieved its benchmarks across all key metrics:

100% activation detection meant that every time a train engaged the crossing warning system, the RCIS picked it up in real time—an essential baseline for system integrity.

Over 90% accuracy in predicting both train arrival and clearance ensured that drivers could trust the messages they saw on dynamic signs. When a sign told them they'd be delayed for five minutes, they could plan around that—and most importantly, avoid dangerous behavior born from uncertainty.

These validation results proved that Chattanooga's decision to adopt a real-time, tech-based solution was not only innovative but also effective and dependable.

System Performance

With the RCIS validated as accurate and reliable, the next question was simple: **Did it make a measurable difference?** For the City of Chattanooga, performance wasn't just about technology working correctly—it was about whether the system actually reduced delays and improved traffic flow. TRAINFO's post-deployment performance analysis confirmed that the RCIS did exactly that.

Measuring the Impact

To assess the system's effectiveness, TRAINFO conducted a before-and-after study comparing traffic delays at the Hamill Road and Hickory Valley Road crossings. The key metric was the **number of vehicles impacted per minute of train event duration**—a measure that controls for fluctuations in train frequency and event length over time.

TRAINFO used the following formula:

$$V_{i,m} = V_{i,d} / (T \times D)$$

Where:

$V_{i,m}$ = Average number of vehicles impacted per minute of event duration

$V_{i,d}$ = Average number of vehicles impacted by a train per day

T = Average number of trains per day

D = Average event duration (in minutes)

This allowed the team to normalize performance across different operational days and focus specifically on whether the system helped reduce the number of drivers affected during each train event.

These reductions occurred despite only modest changes in train frequency and event duration—reinforcing that the improved outcomes were directly attributable to the RCIS rather than external variables.

Location	Before	After	% Change
Hamill Rd			
Trains per Day	32	28	-12.5%
Avg Event Duration (min)	5.9	5.8	-1.7%
Vehicles Impacted/Day	821	528	-35.7%
Vehicles Impacted per Event-Min	4.3	3.3	-25.2%
Hickory Valley Rd			
Trains per Day	34	36	+5.9%
Avg Event Duration (min)	6.1	5.2	-18.8%
Vehicles Impacted/Day	906	621	-31.5%
Vehicles Impacted per Event-Min	4.2	3.3	-21.4%

Interpretation of Results

- **Reduced Vehicle Delays**
  Both crossings saw a significant decrease in the number of vehicles delayed per train event—25% at Hamill Road and 21% at Hickory Valley Road.

- **Improved Traffic Flow**
  By giving drivers advance notice and alternate routing options, the RCIS distributed traffic more evenly across the network, minimizing congestion hotspots.

- **Resilience Across Conditions**
  The system delivered results even as train activity fluctuated, demonstrating that its performance was not dependent on ideal or static conditions.

A Safer and More Efficient Network

The efficiency gains also translated into safety improvements. With fewer vehicles stuck at crossings, the likelihood of impatient or aggressive driving behavior was reduced. The smoother flow of traffic helped ease driver frustration, decrease emissions from idling, and enhance the reliability of the road network—especially during peak hours.

Overall, these performance metrics provided clear, data-backed evidence that TRAINFO's RCIS didn't just function—it delivered real-world benefits aligned with Chattanooga's core transportation goals.

6. DATA ANALYTICS

A Holistic Mobility Analytics Suite

While real-time predictions and dynamic messaging were the most visible features of TRAINFO's Rail Crossing Information System (RCIS), one of the most powerful aspects of the solution was behind the scenes: **data analytics**. TRAINFO's analytics tools gave Chattanooga the ability to move beyond reaction and into strategy—using deep insights to inform planning, prioritize investments, and address community concerns.

The RCIS platform included an integrated analytics dashboard that allowed Chattanooga's planners, engineers, and emergency managers to monitor system performance and understand the broader impact of rail crossing activity on city life. This dashboard was divided into three key modules: **Blockage Insights, Congestion Analytics, and Response Intelligence**.

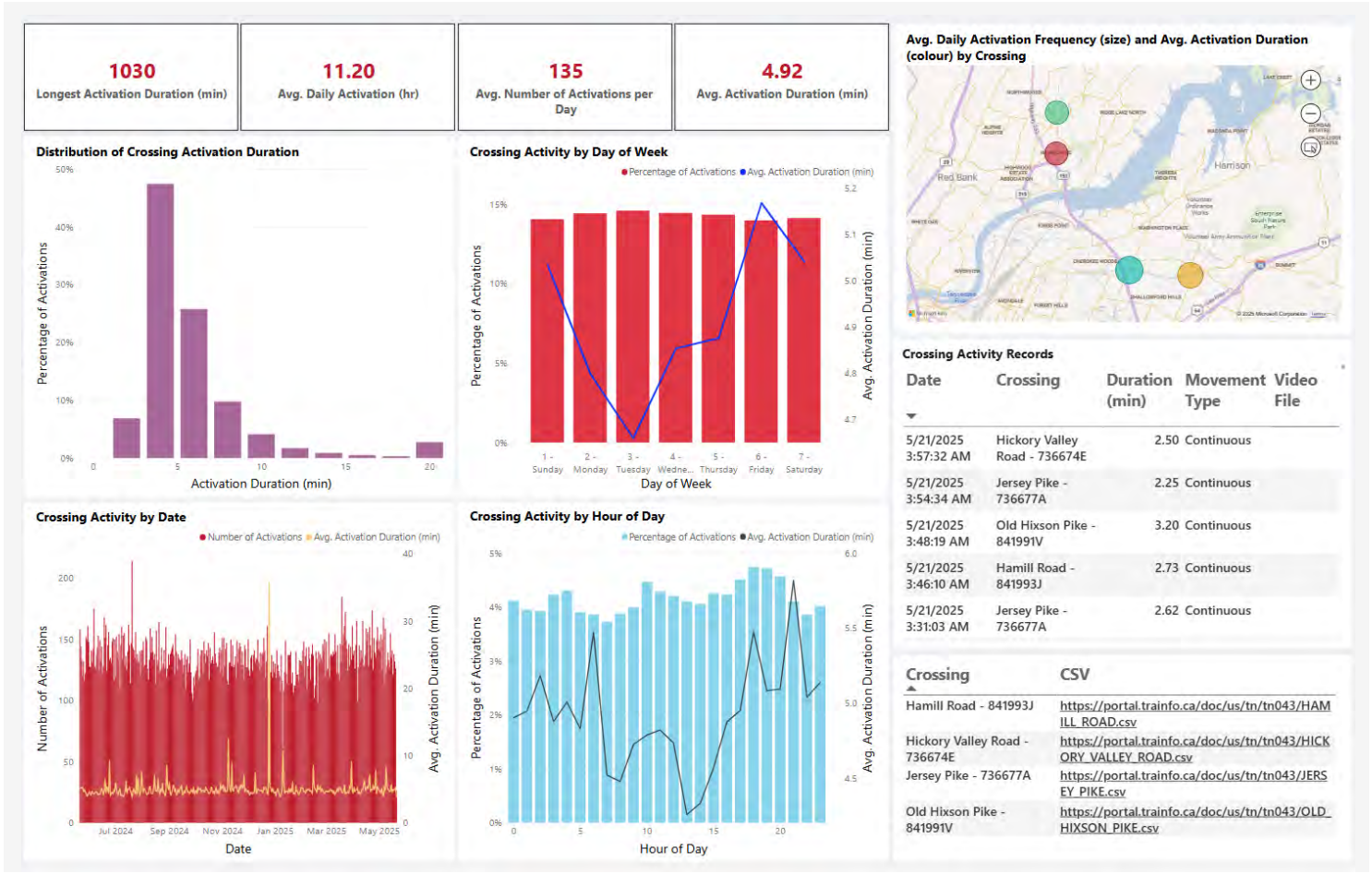
Information	Description	Blockage Insights	Congestion Analytics	Response Intelligence
Crossing Activation Frequency & Duration	See how often each crossing is active and how long these events last, broken down by time of day and day of week.	✓	✓	
Behavioral Patterns	Distinguish between continuous and non-continuous train movements, helping planners identify which types of train activity are most disruptive.	✓	✓	
Delays per Crossing	Total and average delay time for vehicles during train events.		✓	
Traffic Volume Affected	Number of vehicles delayed during activations.		✓	
Peak Delay Patterns	Identifies times of day when train-related congestion is most severe.		✓	
Delayed Response Zones	Maps areas where emergency vehicles are frequently delayed due to train activity.			✓
Impacted OD Paths	Identifies high-risk routes where delays are common and alternative paths can be explored.			✓

Strategic Value of Analytics

Beyond real-time operations, TRAINFO's analytics enabled Chattanooga to adopt a proactive and data-informed approach to managing its transportation network. Key benefits included:

- ✓ **Smarter Planning**: Data-backed decision-making for prioritizing infrastructure improvements.
- ✓ **Improved Communication**: Better tools for informing residents, elected officials, and emergency personnel about why and how specific interventions were made.
- ✓ **Scalability**: The analytics framework could be applied to additional crossings, ensuring that as the RCIS network grows, so does the city's ability to manage it effectively.

By transforming raw data into strategic insight, TRAINFO's analytics platform elevated Chattanooga's traffic management capabilities from responsive to predictive—and laid the groundwork for continuous improvement.



TRAINFO's Blockage Insights dashboard

7. LESSONS LEARNED

Implementing Chattanooga's Rail Crossing Information System (RCIS) was not just a technical exercise—it was a learning experience. From planning and installation to public engagement and integration, the project surfaced valuable lessons that will inform future RCIS deployments both in Chattanooga and beyond.

Lesson 1. Site-Specific Challenges Matter

No two rail crossings are identical. In Chattanooga, the visibility, road curvature, and surrounding infrastructure at Hamill Road and Hickory Valley Road all influenced how and where TRAINFO's equipment could be installed.

- **Sign Placement Limitations**: Limited sight lines and restricted right-of-way (ROW) access posed challenges for Dynamic Message Sign (DMS) installation. Ensuring that signs were visible while preserving driver decision-making time required creative adjustments in placement and equipment orientation.

Takeaway: Conduct early site evaluations to identify physical constraints and design around them. Involve traffic engineers and field crews during planning to uncover potential issues before deployment.

Lesson 2. Public Engagement Is Critical

For any smart infrastructure project, public understanding and buy-in are crucial. TRAINFO and the City of Chattanooga recognized this early and prioritized proactive communication with residents.

- **Education Pays Off**: Explaining how the RCIS worked—and how it would benefit drivers—reduced skepticism and increased compliance with sign recommendations.
- **Trust Drives Usage**: When drivers trusted the system's accuracy, they were more likely to follow suggested detours and adapt their routines.

Takeaway: Engage the community early and often. Transparency builds public confidence, which in turn boosts adoption and effectiveness.

Lesson 3. Third-Party Mapping Integration Can Be Slow

Although TRAINFO's system delivers live crossing information to roadside signs, full integration with popular navigation apps (e.g., Google Maps, Waze) wasn't immediate.

- **Approval Bottlenecks**: Integration with third-party platforms requires approval and customization on a case-by-case basis, which can delay full digital rollout.
- **Workaround Value**: In the meantime, physical DMS boards ensured that critical information still reached drivers.

Takeaway: Start discussions with mapping platforms early and design redundancy into your communication strategy to ensure drivers stay informed even without app integration.

Lesson 4. Flexibility in Materials and Procurement Is Essential

Originally, the project team planned to use steel poles to mount DMS boards. However, procurement timelines for steel materials delayed deployment.

- **Local Adaptation**: Switching to wood poles allowed the project to move forward without compromising performance or safety.
- **Faster Implementation**: This simple change accelerated installation and kept the project on schedule.

Takeaway: Be flexible with equipment specifications based on local availability. Sometimes, simpler solutions offer the fastest path to deployment.

These lessons underscored an important truth: deploying a high-tech traffic system isn't just about the tech. It's about adapting that tech to the real-world conditions of roads, communities, and procurement systems. Chattanooga's experience offers a playbook for other cities seeking innovative yet practical solutions for rail crossing challenges.

Expanding the Chattanooga Project

The successful deployment of TRAINFO's Rail Crossing Information System (RCIS) at Hamill Road and Hickory Valley Road was not an endpoint—it was a beginning. With strong data validation, measurable performance gains, and community support, the City of Chattanooga is now charting a path toward expansion. The next phase will deepen the system's integration, extend its reach, and multiply its benefits across the city's transportation and emergency response networks.

ESRI Integration for Citywide Planning

To support long-term planning and decision-making, Chattanooga is integrating TRAINFO's RCIS data with its existing ESRI Geographic Information System (GIS).

Planned Actions:

- Display live rail crossing activity, predicted delays, and traffic impacts on the city's GIS maps.
- Overlay this data with traffic signal networks, land use plans, and capital project maps.

Expected Benefits:

- Enhanced ability to visualize congestion and blockage patterns.
- Smarter prioritization of infrastructure upgrades and safety improvements.
- A single unified interface for planners, engineers, and policy makers.

Emergency Response Integration

One of the most promising areas for expansion is real-time integration with emergency services. Trains blocking a road aren't just a traffic nuisance—they can become life-threatening barriers during time-sensitive emergencies. Chattanooga plans to close that gap.

Planned Actions:

- Share live crossing status and predicted clearance times directly with 911 dispatch systems.
- Use RCIS data to analyze past response delays and optimize emergency routing protocols.

Expected Benefits:

- Faster, more reliable response times—especially during critical incidents.
- Improved situational awareness for emergency crews.
- A reduction in life-threatening delays caused by blocked crossings.

Trespass Analysis and Safety Campaigns

Another high-impact initiative focuses on analyzing and reducing trespassing behaviors—where pedestrians or vehicles cross tracks illegally during train activity.

Planned Actions:

- Use RCIS analytics to quantify trespass events and identify hotspots.
- Pair data with video footage (where available) to understand risk factors.
- Support targeted public education, enforcement, or engineering interventions.

Expected Benefits:

- Fewer pedestrian and vehicle-related rail incidents.
- Data-driven safety campaigns aimed at behavior change.
- More effective deployment of resources to reduce risks at high-threat locations.

Expansion to Additional Crossings

With proof of concept firmly established, Chattanooga is exploring how to scale TRAINFO's RCIS to other critical rail crossings across the city.

Planned Actions:

- Evaluate priority crossings—such as Thrasher Pike—for feasibility and impact potential.
- Conduct localized traffic studies to tailor each deployment to site-specific needs.
- Develop a phased rollout plan based on available funding and resource capacity.

Expected Benefits:

- Citywide reductions in traffic delay and safety risk from rail crossings.
- Scalable benefits without the high cost and long timelines of grade separations.
- A blueprint for regional expansion or replication by other municipalities.

Through these initiatives, Chattanooga is moving from a pilot project to a fully integrated rail-crossing management strategy. By layering in emergency systems, GIS platforms, trespass analysis, and additional deployments, the City is maximizing the value of its investment—and setting a new standard for how mid-sized cities can tackle rail-related congestion and safety.

9. CONCLUSION

Chattanooga's Rail Crossing Information System project represents a new model for managing the complex intersection of rail and road in urban environments. Faced with persistent delays and growing safety concerns at two of its busiest crossings, the City chose a smarter path forward—one that didn't rely on massive infrastructure investments or multi-year construction timelines. Instead, Chattanooga partnered with TRAINFO to implement a scalable, data-driven solution grounded in predictive technology and real-time communication.

The results speak for themselves. The system achieved **over 90% accuracy in predicting train arrivals and clearance times. It reduced the number of vehicles impacted by train delays by more than 20%** at both sites. More importantly, it gave drivers reliable, timely information—empowering them to make safer and more efficient decisions.

But this project was about more than reducing congestion. It laid the foundation for a citywide transformation in how rail impacts are understood, managed, and mitigated. With TRAINFO's analytics tools, **Chattanooga now has insights into blockage patterns, congestion dynamics, and emergency response delays.** These insights are not only improving day-to-day traffic management—they're shaping long-term planning, policy, and investment decisions.

The Chattanooga case study demonstrates that cities don't have to choose between cost and innovation. With the right partner and the right technology, it's possible to deliver meaningful improvements in traffic flow, safety, and public confidence—without breaking the budget.

As Chattanooga looks to expand the system to additional crossings, integrate it into emergency dispatch and GIS platforms, and tackle safety risks like trespassing, the impact of this project will only continue to grow. For cities across North America facing similar challenges, Chattanooga offers a powerful blueprint: one that proves intelligent infrastructure isn't just the future—it's already here.

TRAINFO

Safe and seamless mobility at rail crossings

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