



Submitted To

Town of McCordsville, IN

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CONFIDENTIALITY STATEMENT

This proposal contains information proprietary to, and is the property of, TRAINFO Corporation and/or its subcontractors. This proposal and its contents are confidential and shall not be transferred or communicated to any third parties without the prior written consent of TRAINFO Corporation.

INTRODUCTION

This document summarizes a range of approaches for the Town of McCordsville to consider as they evaluate deploying the TRAINFO system. This document it is not to be considered as a formal proposal, but rather a summary of options to allow the Town of McCordsville to evaluate how they want to approach acquiring the TRAINFO system. Based on the approach selected, TRAINFO will deliver a formal proposal.

The remainder of this document details the following:

- Background and Need
- Proposed Solution
- Quote Options

BACKGROUND & NEED

The N 600 W crossing in McCordsville experiences, on average, 18 trains per-day. As a result, roughly 950 vehicles are delayed for a cumulative 48 hours of vehicle delay per-day (see Figure 1). The ultimate goal at the crossing is to implement a grade separation to reduce vehicle delays. The project proposed by TRAINFO will serve two outcomes in support of the goal. Firstly, it will implement a Rail Crossing Information system to reduce vehicle delays. Secondly, it will quantify the impact the rail activity has to support federal grant application to grade separate the crossing in the future.

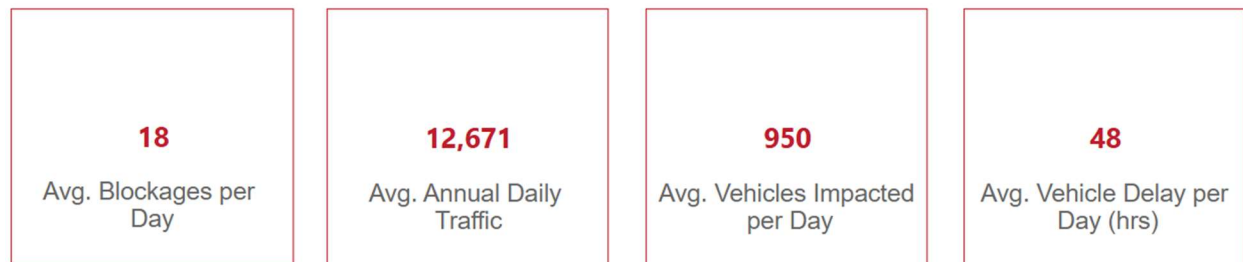


Figure 1: Summary of grade crossing impact for the N 600 W crossing

PROPOSED SOLUTION

With an unprecedented ability to quantify the impact grade crossings, TRAINFO is proposing its Mobility solution. The Mobility solution comes with the following analytical tools to help the Town of McCordsville understand the issues surrounding crossings and best strategize investments to reduce the impact:

- **Congestion Analytics** – summarizes the impact the grade crossing has on traffic (see Figure 2)
- **Blockage Insights** – summarizes the activity at the crossing, and trespass interactions by mode (i.e., pedestrian or vehicle) (see Figure 3)
- **Response Intelligence** – summarizes where responders are most frequently delayed at crossings and what origin destination paths are most impacted (see figure 4)



Figure 2: TRAINFO Congestion Analytics

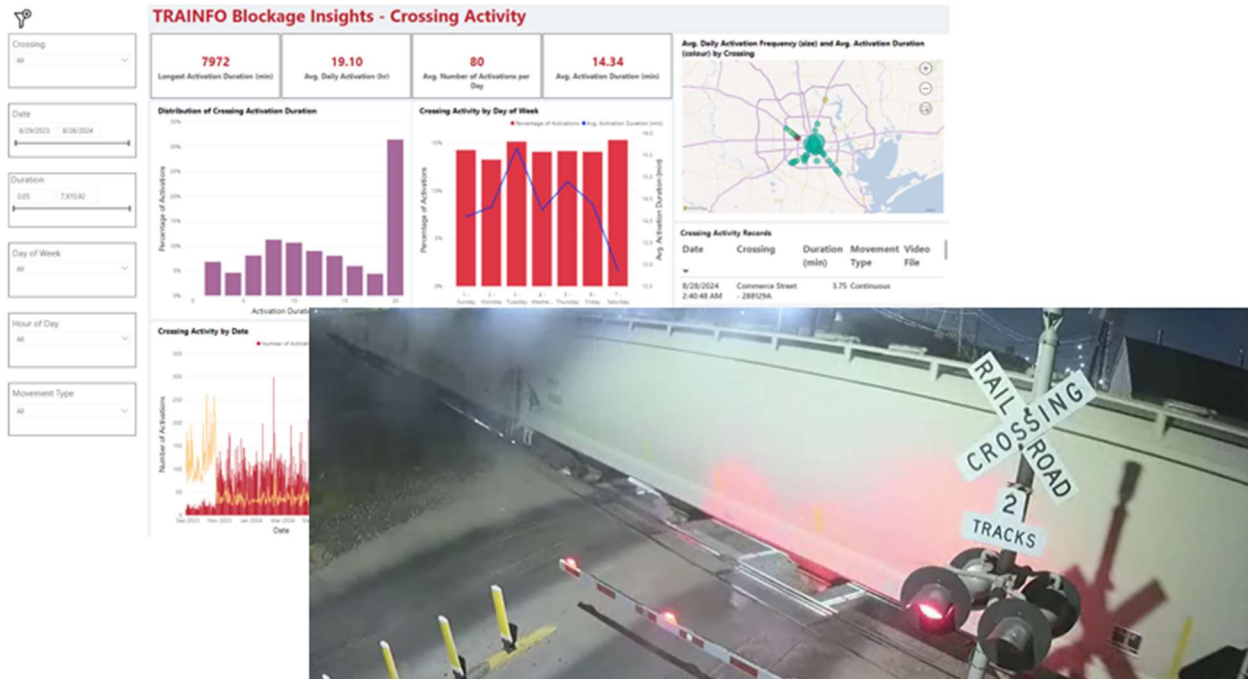


Figure 3: TRAINFO Blockage Insights

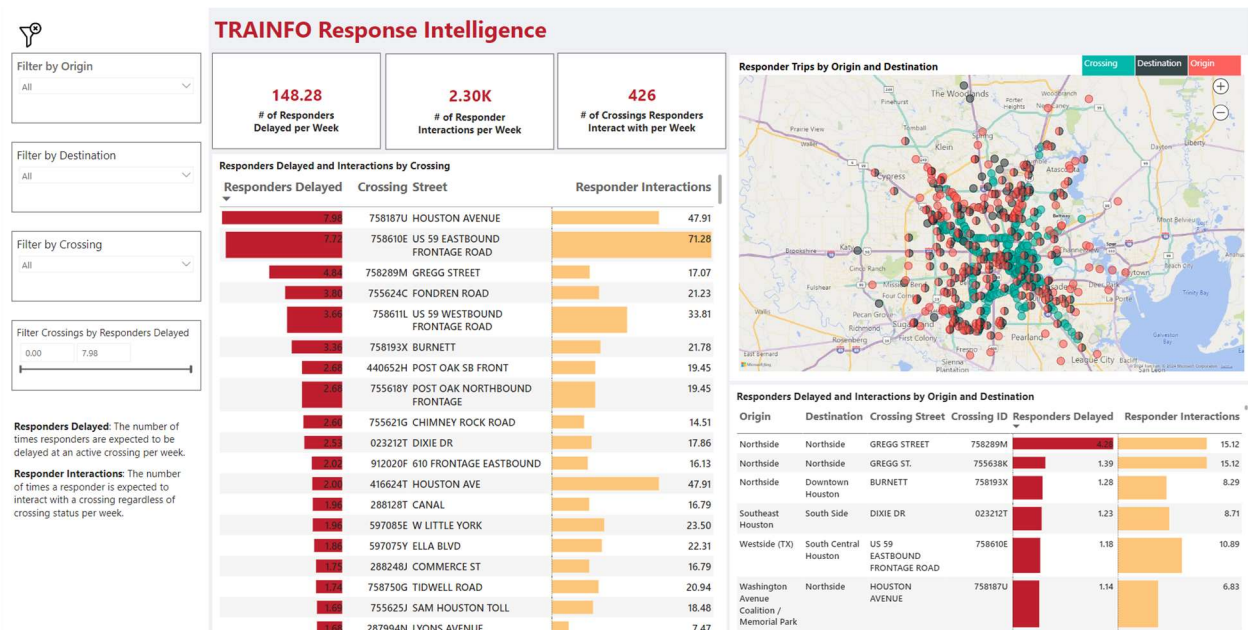


Figure 4: TRAINFO Response Intelligence

Beyond TRAINFO Mobilty’s analytical capabilities, it has demonstrated the ability to reroute more than 25% of vehicles to appropriate alternate paths. Figure 2 shows the equipment locations for the solution in McCordville, while Table 1 details the information being produced for each crossing. While the solution proposed is primarily focused on addressing traffic issues, the solution can be integrated into Transit , 911 and ATMS systems at no cost from TRAINFO.

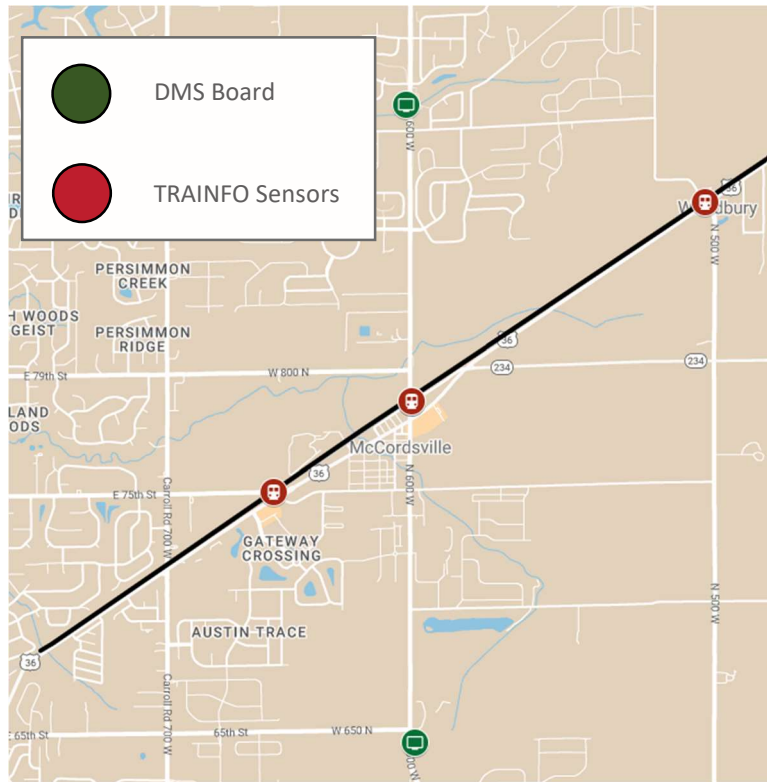


Figure 5: Solution option for Town of McCordville

Table 1: Description of the information uses

| Crossing | Information | Integrations | Notes |
|----------|---------------------|--------------|--|
| N 500 W | Crossing Prediction | DMS | Used to predict movements to N 600 W. No prediction will be available for movements from the north. Prediction lead times for continuous movements from the south are estimated to be 4-minutes. |
| N 600 W | Crossing Prediction | DMS | Prediction lead times for continuous movements from the north are estimated to be 4-minutes. Prediction lead times for continuous movements from the south are estimated to be 2-minutes. |
| W 750 N | Crossing Prediction | DMS | Used to predict movements to N 600 W. No prediction will be available for movements from the south. Prediction lead times for continuous movements from the north are estimated to be 2-minutes. |

QUOTE OPTIONS

Four quote options are being presented for evaluation:

- option 1 is the full scope solution described in Figure 1,
- option 2 is the full scope solution but with beacons instead of DMS boards,
- option 3 is a solution with no beacons or boards to support data collection and quantification of the issue at all 3 crossings, and
- option 4 is a solution with no beacons or boards to support data collection and quantification of the issue at 1 crossing

Each option provides value in data collection to support federal funding applications. The details of each option are detailed in Table 2 (project deliverables for each option), Table 3 (pricing for the option) and Table 4 (project schedule for each option).

Table 2: Deliverables in quote options

| Deliverables | Options | | | |
|--|---------|---|----|---|
| | #1 | #2 | #3 | #4 |
| TRAINFO Solar Sensors – with camera module | | 3 | | 1 |
| License type* | | Tier 2 (2 to 5 crossings)- City/County Data can be shared through TRAINFO’s API with any agency within geographical county. Provides a base integration into Waze, supported 911 and DMS systems. | | Tier 1 (1 crossing)- City/County Data can be shared through TRAINFO’s API with any agency within geographical county. Provides a base integration into Waze, supported 911 and DMS systems. |
| Information produced | | Crossing Prediction | | Crossing Status |
| Full Matrix DMS - 70" x 107" – Permanent w/Solar | 2 | NA | NA | NA |
| Flashing Beacon - Solar Power | NA | 2 | NA | NA |
| Maintenance and support description | | Remote install support and system calibration Installation and maintenance training for local technicians Provision of software updates Remote monitoring of systems General customer support | | |
| Data Plans | | 3 plans for 1-years of service | | 1 plan for 1-years of service |
| Software Term | | 1-Years | | |

*License tiers can be seen in the Appendix A of this document.

Table 3: Pricing for Quote Options

| | Option | | | |
|--------------------------------------|-----------|----------|----------|----------|
| | #1 | #2 | #3 | #4 |
| Initial Term | \$108,385 | \$79,385 | \$56,385 | \$22,795 |
| Annual Fee After Initial Term | \$10,200 | \$10,200 | \$10,200 | \$5,600 |

Table 4: Deployment Schedule

| Task | Description | Owner | Start Week | Duration (weeks)* | Required For |
|------|--|--------------------------|------------|-------------------|---------------------|
| 1 | Contract Initiated | McCordsville | 0 | 0 | Options:1 through 4 |
| 2 | Kick-off Meeting | McCordsville and TRAINFO | 1 | 1 | Options:1 through 4 |
| 3 | Technical Install Meeting | McCordsville and TRAINFO | 2 | 1 | Options:1 through 4 |
| 4 | Deliver TRAINFO Sensors | TRAINFO | 1 | 3 | Options:1 through 4 |
| 5 | Deliver DMS Boards or Beacons | TRAINFO | 1 | 8 | Options:1 and 2 |
| 6 | Install Hardware – TRAINFO Sensors | McCordsville | 4 | 2 | Options:1 through 4 |
| 7 | Install Hardware – DMS Boards or Beacons | McCordsville | 9 | 4 | Options:1 and 2 |
| 8 | System Calibration | TRAINFO | 6 | 7 | Options:1 through 4 |
| 9 | License Activated | TRAINFO | 13 | 1 | Options:1 through 4 |
| 10 | Transition to Support | TRAINFO | 13 | 2 | Options:1 through 4 |

*Duration to be determined by Task Owner

**Options 1 and 2 will result in an estimated 15 week schedule, while options 3 and 4 will result in an estimated 10 week schedule.

APPENDIX A: Definitions

Blockage Insights – TRAINFO proprietary methods for summarizing Rail Crossing Blockages.

Bluetooth Sensor – this is a sensor that is installed along a roadway to uniquely identify Bluetooth devices and determine the time that the device passed the sensor. When multiple sensors are installed along a roadway the travel time between sensors can be calculated.

Continuous Movements - A train traveling at a relatively continuous velocity near the max speed who is likely moving through a crossing.

Data Plan – a cellular data plan including a SIM card that is used to wirelessly transmit data from Train Detection Sensors and Bluetooth Sensors.

Data Portal – this is a website hosted by TRAINFO which provides the results of the Traffic Delay Study, including data and information about Rail Crossing Blockages and Travel Time Delays.

Information – the type of information produced in real-time that will be produced for a given crossing. Three classes of information exist:

- *Crossing Status* – the status of the crossing (i.e., active, or clear).
- *Crossing Prediction* – the information included in *Crossing Status*, but also includes predictions for when the crossing is expected to be occupied and for how long. Predictions only apply for trains with *Continuous Movements*.
- *Congestion Analytics* -the information included in *Crossing Status*, but also includes detail statistics on vehicle delay
- *Traffic Prediction* – the information included in *Crossing Prediction*, but also includes predictions on the travel time vehicles will expect to experience from a train with *Continuous Movements* until the queue recovers from the event.

Integrations – the integration of the data produced of by TRAINFO into external systems. Classes of integrations can include:

- ATMS (Advanced Traffic Management System) – integration into automated traffic management systems for the purposes of managing traffic signal response plans
- EMS – integration into a system used by emergency (i.e., Computer Aided Dispatch software and tactical map) to provide situational awareness in the emergency response process.
- DMS – Broad term to describe the integration into a sign (i.e., beacons and dynamic message signs) management system.

Non-Continuous Movements – A train whose movement is unpredictable and there is little certainty of it moving with any continuity through the crossing. Trains exhibiting non-continuous movements are typically one performing switching, stopping, and shunting movements.

Rail Crossing Blockage – anytime it is illegal for a vehicle to traverse a rail crossing. This includes instances when flashing lights, bells, and gates are activated or when a rail vehicle is occupying the rail crossing.

Rail Crossing Location – the point where a roadway and railway intersect as uniquely identified by the Federal Rail Crossing Inventory Database.

System Maintenance and Support – Service provided by TRAINFO to support and maintain the deployments for a given customer.

Train Detection Sensor – this is TRAINFO’s proprietary device that is installed next to rail crossings to determine when the crossing is blocked.

TRAINFO City/County License – an annual subscription for all departments within all public agencies operating within a county to use TRAINFO’s in accordance with the base integrations included in the license (Waze and a single 911 system and DMS system) and additional integrations purchased. The licensed has a tiered cost structure dependant on the number of TRAINFO sensors being deployed; the tiers are as follows:

| Tier | Min # of Sensors | Max # of Sensors | Annual Cost |
|------|------------------|------------------|-------------|
| 1 | 1 | 1 | \$10,000 |
| 2 | 2 | 5 | \$18,000 |
| 3 | 6 | 10 | \$26,000 |
| 4 | 11 | 15 | \$34,000 |
| 5 | 16 | 20 | \$42,000 |
| 6 | 21 | Unlimited | \$50,000 |

Travel Time Data – data sets that show the travel-time between a predefined origin and destination at a per-vehicles trip level.