

TERRA Engineering creates a competitive traffic data mix with Miovision

Scenario

As a leader with over 20 years' experience, TERRA Engineering is focused on providing a full spectrum of engineering services using effective and innovative processes. They wanted to implement a solution that could reduce labor costs and safely collect bicycle and pedestrian data, alongside vehicle volume and classification data. TERRA strives to obtain high customer service and accuracy standards with their innovative data collection methods.

Miovision Scout
Video Collection Units
August 2013

Introduction

TERRA is a full-service engineering firm located in the Mid-West. Since its inception in 1992, TERRA has grown to over 60 employees across five offices in the United States. TERRA works with architects, engineers, developers, institutions, and local and state governments. Projects vary in size and scope and include site development, municipal engineering, structural engineering, transportation/traffic engineering, surveying, bridge inspection, construction engineering, landscaping and GIS.

Challenges

For projects that require traffic data collection, TERRA utilizes traditional counting equipment and manual counters for intersection counts and average daily traffic (ADT) counts. Both of these methods limit the results TERRA is able to obtain, specifically classifications for bicycle and pedestrian.

TERRA is often involved in the design of Complete Streets projects which incorporate all modes of transportation including vehicle, pedestrian, and bicycle traffic, providing a corridor to serve multi-purposes. Traditional counting equipment is costly due to the labor hours spent having field personnel collecting data on vehicle, pedestrian and bicycle usage. In order to meet their project requirements,

TERRA requires a solution that will:

- Collect traffic data such as intersection counts and road volume data with vehicle, bicycle and pedestrian classifications;
- Allow for collection of additional useful data such as gaps in traffic;
- Provide high data accuracy for all traffic studies, any time of day and during inclement weather such as thunderstorms, heavy precipitation, and snow events;
- Allow technicians to deploy equipment safely without entering the roadway or disrupting traffic
- Allow collection of data for longer, non traditional periods of time, up to several days at a time

Solution

In working on a Complete Streets planning and design process contract for the City of Peoria, Illinois, TERRA purchased Miovision's Scout Video Collection Units for traffic data collection. They also rented units to increase their capacity for a larger study. Using the Scout unit allowed TERRA to collect additional user data at a reasonable cost and to provide their clients with additional data to study for planning.

Not only did the Scout units provide the data they needed, TERRA also decreased study lead time while increasing data accuracy, safety and profitability. After their first study, they adopted the Scout solution for their other traffic data collection projects including a large yearly ADT contract for the State of Illinois Department of Transportation (IDOT).

In 2011, TERRA began collecting Intersection Count data at intersections and extrapolating Road Volume data from the Intersection Count reports to satisfy the needs of the IDOT contract while providing additional data. The unique solution was very well received and as a result, the Miovision Platform adopted a Road Volume reporting feature for 24-hour Intersection Counts.

Snapshot

ADT Reporting Feature

With the Miovision Platform, users have the capability of extracting Road Volume Data for any Intersection Count 24-hours or greater in duration.

For a four-leg intersection, this would result in five reports: one Intersection Count report, and four individual Road Volume Reports for each leg.

Bicycle and Pedestrian Counting Capabilities

TERRA is now able to collect bicycle and pedestrian data at intersections with sidewalk facilities by using the Scout unit. Many smaller municipalities are unable to collect this data on their own due to cost and lack of resources. This data is used for planning and design, specifically in school areas. Being able to collect this data allows TERRA to provide their clients with additional and valuable information at a reasonable cost.

Bicycle and pedestrian information is used for planning and designing a solution which incorporates multi-modal transportation within a corridor, but this data is often overlooked in the planning process even though it is an important piece of a Complete Street project. TERRA now provides accurate data on all modes of transportation and has a video record of existing pedestrian and bicycle activity which exists in the corridor. This video record often proves to be beneficial when presenting findings to their clients and the general public.



“We get so much additional useful data from having the video about how vehicles, pedestrians and bicycles interact”

- Lynn Moe, GIS Analyst

“The Miovision Scouts have revolutionized how TERRA collects, views and analyzes traffic data,” says Chris Hutchinson, PE, PTOE, Senior Traffic Engineer at TERRA. “We get so much additional useful data from having the video about how vehicles, pedestrians and bicycles interact with one another at a particular location. We can then use this data to plan effective solutions to the real field conditions, while at the same time reducing our overall cost versus traditional manual counts.”

Traffic Data Collection with the Scout solution Decreased Costs by 54%

TERRA decreased their costs by 54%, even more in some cases, by deploying the Scout solution for their intersection and road & highway volume counts. Less time is required by staff as setup is quick and they do not need to remain on-site during the data collection time period. Due to this efficiency, TERRA can complete more traffic data collection studies in less time. It’s also safer for their on-site technicians.

Multiple cameras were rented to collect data at numerous sites simultaneously which eliminates the need for data balancing. In one project, 21 intersections were setup with Scout solutions over a three day period. Based on a study time of eight hours at each intersection, this resulted in a 75% reduction in field technician time alone, not including the additional time that would be required for post-processing data balancing.

Efficient Data Collection Process Decreases Lead Time by 20%

Traffic data collection setup is completed in 10-15 minutes by one technician at TERRA. The Scout is non-intrusive and setup is done safely on the road side without requiring the technician to enter the roadway. Data collection is scheduled on the unit and once completed, it is uploaded and processed by Miovision.

Within days, traffic study reports are available on Miovision’s traffic data management Platform. They are available in various industry standard reports along with a video record of the count. This process is executed by one technician and can be completed in 20% less time than manual efforts. In turn, this creates direct cost savings.

“The Miovision Scouts have revolutionized how TERRA collects, views and analyzes traffic data.”

- M. Chris Hutchinson, PE, PTOE, Senior Traffic Engineer

Additional Traffic Analysis Benefits

TERRA has also used the Scout solution as a useful tool in their traffic engineering studies. Traffic data volumes are often input into traffic simulation and modeling software to analyze an intersection or corridor. The results of the simulation don't always match the field observed conditions. TERRA uses the video data to observe additional data such as traffic gaps, vehicle queues and driver and pedestrian behaviors.

One example was at a location of a proposed new high school in Chicago. TERRA modeled the traffic volumes and saw results that showed excessive delay and queuing at several of the side street locations. TERRA reviewed the videos and found that the delay for stop vehicles was actually much less than the model showed because there were gaps available and in the absence of gaps, drivers decided to accept smaller gaps to enter the traffic stream. It also revealed that the queues were much shorter than expected. TERRA was then able to modify the model to adapt it to better mimic existing conditions.

Another example was for a study which looked to analyze two mid-block crosswalks near a redevelopment. One location featured a signalized crosswalk while the other crossing was un-signalized. Review of the video allowed TERRA's team to observe pedestrian behaviors for comparison at the two locations and observe important factors that might not have been considered otherwise.

"By reviewing the video and count detector locations, we can ensure that the data is collected for all the necessary movements."

- Lynn Moe, GIS Analyst

"Many of our urban areas have complicated intersections with combinations of one-way and two-way streets, driveways, and pedestrian or bicycle facilities," notes Lynn Moe, GIS Analyst at TERRA. "By reviewing the video and count detector locations, we can ensure that the data is collected for all the necessary movements."

At the signalized location, very few pedestrians actually used the push-button to stop oncoming traffic and just crossed when a gap presented itself.

At the un-signalized location, vehicular traffic was much higher, causing pedestrians to complete dangerous crossing movements. TERRA used the Miovision technology to perform a gap analysis to identify and quantify the critical gaps in traffic to allow pedestrians to cross and determine what mitigation measures should be considered.

These are just a few of the many examples of creative ways TERRA has applied the Miovision technology to provide more than just raw data for analysis when conducting traffic studies.

Value-Added Features using the Miovision Platform

Miovision's online traffic data management Platform provides TERRA with additional value-added features which align with their goals and those of their customers.

TERRA's previous data collection methods provided classifications that were limited to cars, medium trucks and heavy trucks. With Miovision, TERRA collects classifications for vehicles, bicyclists and pedestrians. Classifications for bicyclists and pedestrians are important to their customers where sidewalks and trails are present as well as for future planning of areas such as school zones. As the movement to provide facilities for all users continues to gain momentum throughout the US, this data becomes increasingly more valuable.

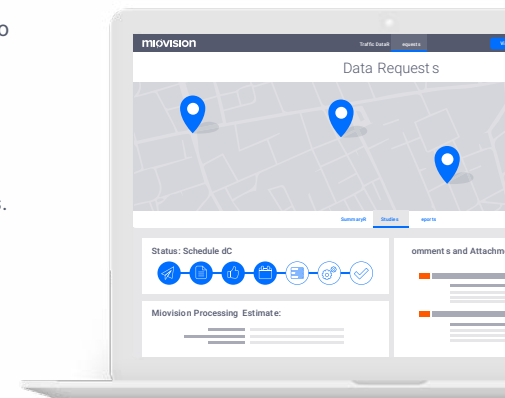
Video of the traffic count is also available on the Miovision Platform which is a substantial benefit for TERRA's customers. More customers are interested in utilizing camera counts as they provide insight into traffic count anomalies and ability for spot audits. They also provide the opportunity for traffic engineers at TERRA to view typical driver behaviors at an intersection to gain a better insight into how it operates.

The Miovision Platform stores and organizes all traffic data, reports and video. TERRA is able to access their data as well as share it using the online public portal with all of their stakeholders. This eliminates additional administrative work and provides visibility with their customers.

Snapshot

Client Data Sharing

With the Miovision Platform, many Miovision customers leverage the ability to share data across multiple Platform accounts (Client Data Sharing), or display publicly online (Public Portal). This eliminates the need to store and email large files and videos to clients and other stakeholders.



Summary

By adopting Miovision's Scout solution, TERRA was able to collect numerous classifications, increase their capacity and accuracy of traffic data collection while also providing customers with value added benefits, such as access to an online data management portal and videos.

Overall, TERRA achieved the following with their traffic data collection projects:

- Ability to collect **vehicle classifications and bicycle/pedestrian data**
- Ability to collect intersection data for **longer non-traditional periods**, up to several days at a time
- **Decreased costs by 54% or more** by automating traffic data collection for turning movements
- **Decreased lead time by 20%** for data collection
- Increased **visibility and accuracy** of data and video collected
- Gained **additional benefits to the traffic engineering team** when analyzing intersections



Customer Profile

M. Christopher Hutchinson PE, PTOE

Chris Hutchinson has been at TERRA Engineering since mid-2010 as the Senior Transportation Engineer. In this role, he is responsible for data collection, traffic analysis, traffic modeling, traffic signal design, roadway design, public engagement, project management, cost estimating and other engineering tasks. He has been in the industry for the past 15 years and completed a Civil Engineering degree from Washington University.

Lynn Moe MSc

Lynn has been the GIS Analyst at TERRA Engineering since 2009. She is responsible for GIS Mapping and Traffic Study projects throughout the organization. She excels in data management concepts, basic website design and development, and computer programming in several languages. Recent work includes creating a Traffic Sign Inventory system based in Google Earth with links to photos of every sign and large scale traffic data collection for the Illinois DOT using Miovision, HiStar data collectors and Diamond road tube technology. She has a Bachelor of Science, with a double major in Geography and Mathematics from the University of Wisconsin-Eau Claire as well as a GIS Certificate from Saint Mary's University of Minnesota.

For more information and to view webinars about Miovision TrafficLink, visit us online at miovision.com or call **1.877.646.8476**

miOVISION