



# CASE STUDY

## City of Bentonville, AR

### City of Bentonville Deploys Multimodal Detection and Traffic Data Collection Program for Safer, More Efficient Streets

#### Summary

**Challenge:** Improve signal maintenance and operations efficiency for a high-growth city, streamline the collection of traffic data for planning and outside stakeholders and enhance overall road safety for all modes of transportation.

**Solution:** Updated intersections with existing Iteris Vantage Edge2 systems and installed Vantage EdgeConnect communications modules to send high-resolution video to the TMC. Installed VantageNext detection systems with Vantage Vector hybrid video/radar sensors at new intersections.

Implemented VantageLive! data analytics solution at all intersections.

**Benefits:** Bentonville has significantly improved operating efficiency, enhanced roadway safety for bicycles, pedestrians and vehicles and embraced data-driven planning to prepare for future growth.

#### Background

Located in Benton County, Arkansas, Bentonville is a small but thriving town. With the addition of a regional airport in 1998 and the opening of the Crystal Bridges Museum of American Art in 2011, Bentonville has seen rapid growth to both its population and daily commuter traffic. Home to the Corporate Office of Wal-Mart Stores, inc., Bentonville has transformed itself from a relatively unassuming small town to a bustling tourist center of commerce and a place for people to visit from all over for business and leisure.

#### Challenge

In May 2019, Walmart announced plans to build a massive new headquarters campus on a 350-acre plot located just blocks from the city’s downtown district. Once the Walmart project is completed by 2024, the city expects 13,000-17,000 workers commuting to Bentonville daily.

With rapid new developments and a thriving tourism economy, Bentonville’s traffic management team was already faced with addressing the city’s population growth, as well as daily



fluctuations in heavy commuter traffic. The busiest intersection averaged over 70,000 vehicles in one day.

**Detection Limitations:** Bentonville had over 50 signalized intersections with existing Iteris detection systems – many of which were nearly 20 years old with outdated firmware. The equipment functioned properly for basic signal operations but offered limited capabilities and could not stream video from the intersection to the traffic management center (TMC).

**Maintenance Overextended:** Without the ability to monitor and diagnose intersections remotely, the city had to rely on the public’s feedback and complaints to identify signal failures or other traffic problems. One of only two signal technicians on staff would be required to physically drive out to inspect every situation to see whether or not a problem existed. This would leave the TMC short-handed.

**Changing Traffic Patterns and Users:** The transportation network and usage were also changing. The massive Walmart project involved building more roads, which resulted in rapidly changing traffic patterns. In addition, cycling and walking were becoming increasingly popular modes of transportation for work and pleasure, thereby adding another layer to the traffic makeup in Bentonville.

**Limited Count Data:** Data was important to Bentonville. As part of the city’s re-timing program, the city had to hire a 3rd party contractor to conduct manual turning movement counts once a year. However, this was expensive and was not an accurate picture of road usage throughout the entire year.

Having limited staff, the city knew it had its hands full with everyday traffic monitoring and operations. And now with additional roads and intersections being built resulting in rapidly changing traffic patterns, it recognized the need to enhance its detection technology and leverage data to help it improve operating efficiency, traffic flow and safety for all road users.

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Safety is our number one concern, so we want to make sure our intersections are safe for all.

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- Honorable Stephanie Orman,  
Mayor of Bentonville

## Solution

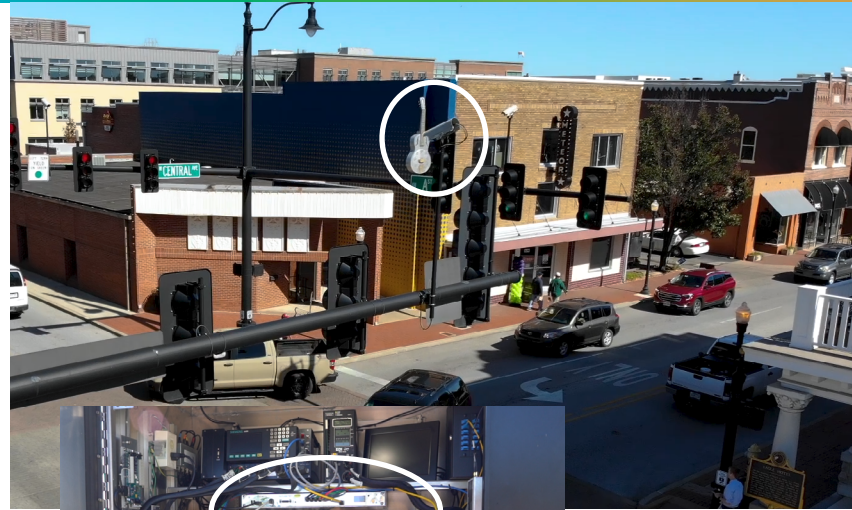
As a long-time Iteris detection user and having a close relationship with Iteris distribution partner, Temple Inc., Bentonville turned to Iteris for guidance.

The first step was to get the right equipment in place to allow the city to monitor its intersections remotely from the TMC. Since the existing Iteris equipment was still operational, the city preferred to augment rather than swap out its existing hardware, so that it could remotely monitor its detection systems as it could with its traffic control system.

The team upgraded Bentonville's existing Vantage Edge®2 systems with the latest firmware that enhanced detection accuracy and offered new features, including pedestrian and bicycle detection, differentiation and tracking. They replaced the encoders with Vantage EdgeConnect™, an Ethernet communications module, at each intersection to send traffic data and high-resolution video back to the TMC.

Bentonville outfitted its newest intersections with Vantage Next®, Iteris' powerful next generation video detection system capable of multimodal detection, automatic turning movement counts, high-resolution video streaming and remote upgrades and camera zone setup.

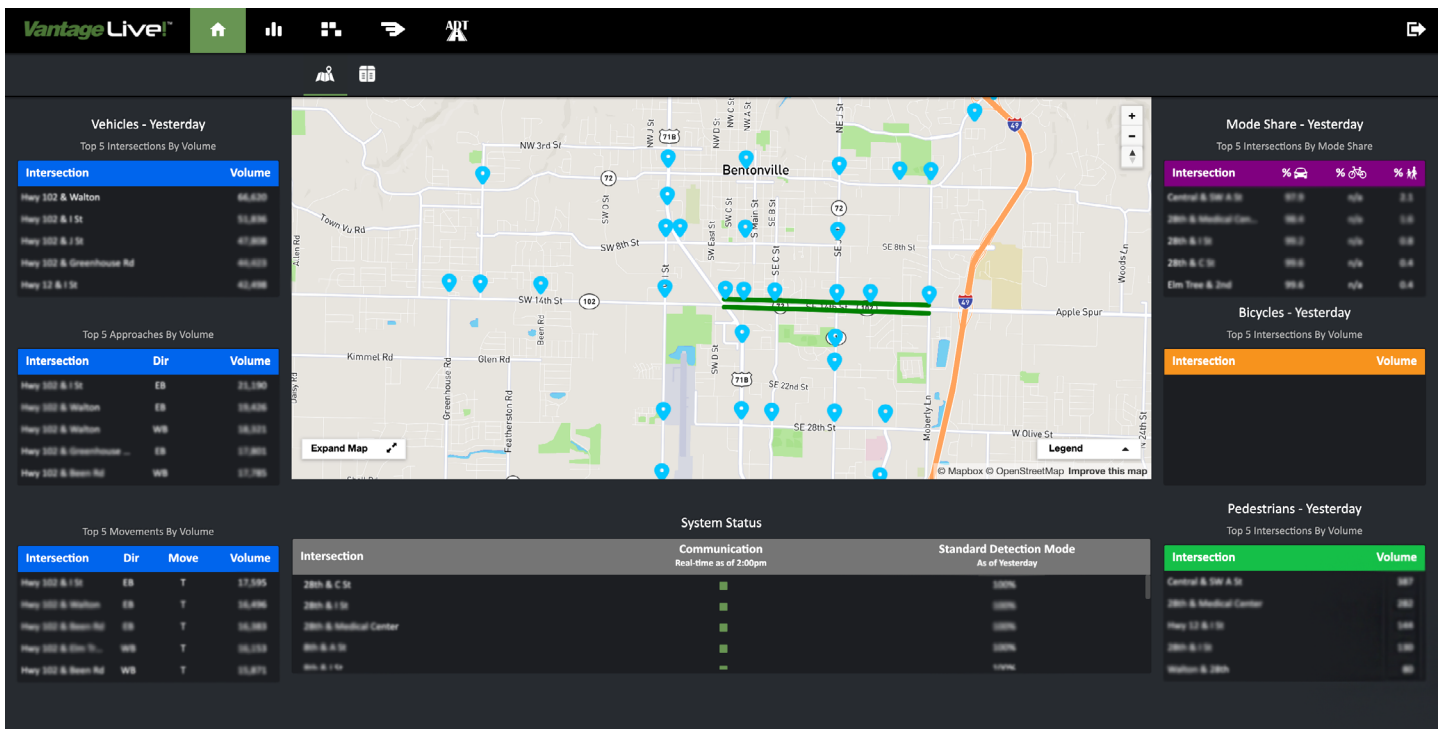
As the Walmart campus progressed, Vantage Next systems were combined with the Vantage Vector® hybrid video and radar



Vantage Next processor (left)  
Vantage Next Camera (above)

sensor to provide accurate stop bar and advance detection (up to 600 feet) in a single sensor. Together, the Vantage Vector and Vantage Next provide lane-by-lane detection, bike and pedestrian detection, dilemma zone coverage and hi-resolution data for adaptive and signal performance measures (SPM) systems.

The city also implemented VantageLive!™, a cloud-based data analytics solution, allowing for the automatic aggregation and analysis of all vehicle, bicycle and pedestrian data from the intersection, including turning movement counts, annual daily traffic (ADT) and annual average daily traffic (AADT).



## Results

With the latest video detection technology at all signalized intersections and access to real-time traffic data, Bentonville's traffic management team has improved operating efficiency, enhanced roadway safety and embraced data-driven planning as the city grows.

The city can now stream live high-resolution video to its TMC from over 50 intersections. This has allowed the traffic management team to remotely monitor traffic conditions and verify traffic issue complaints without having to physically drive to the site. Bentonville also uses the "Communication Status" feature in VantageLive! every day



to monitor intersection issues and prioritize daily operations. Together with live video monitoring, the city has saved time and reduced the number of citizen complaints. VantageLive! has replaced the city's annual four-week long data collection process, which was done through the city's timing contractor, with automatic 24/7/365 multimodal data — thereby saving the city thousands of dollars annually in data collection costs.

Data accessibility has allowed the city to share valuable data insights internally and with multiple agencies. For example:

- Turning movement counts with the city's timing contractor
- Bicycle data with the regional bicycle safety organization
- Bicycle and pedestrian data with the local metropolitan planning organization (MPO)
- Annual average daily traffic (AADT) data with Bentonville's Planning Department

Having adopted a culture of technological innovation over the years, Bentonville has updated all intersections with existing video detection, removed any remaining inground induction loops and installed Vantage Next systems in their place along with VantageLive! for traffic data collection.

“

Complaints have gone down dramatically since introducing video detection with the communications.

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- Brad Conley,  
Traffic Signal Technician



Watch the four part video series

[Bentonville: A New Era of Traffic Detection](#)

[Bentonville: A New Way of Counting Traffic Data](#)

[Bentonville: A New Global Headquarters](#)

[Bentonville: A New American Town](#)