

# City of Dubuque Unlocks Smarter Traffic with AI from Vaidio and Milestone

Vaidio | Milestone



We're opening up possibilities we hadn't even considered before. The power of AI to transform urban management is remarkable.

**David Ness**, Traffic Engineering Manager, City of Dubuque

## Challenge

Located on the banks of the Mississippi River, Dubuque, Iowa is a forward-looking mid-sized city of approximately 60,000 residents. With a growing population, evolving transportation needs, and a complex road network shaped by the region's hilly terrain, Dubuque has long invested in infrastructure to support smarter, safer urban living. The city operates an expansive network of traffic cameras and fiber connectivity across key corridors—positioning it as a national model for civic technology adoption.

However, as congestion, pedestrian safety, and incident response demands increased, city officials recognized a need to go beyond passive monitoring. They sought to turn existing video infrastructure into an intelligent platform capable of delivering real-time insights to support traffic engineering, emergency response, and long-term planning.

As Dubuque's transportation infrastructure evolved, the limitations of its legacy traffic monitoring systems became increasingly clear. Despite having deployed over a thousand surveillance cameras across intersections, highways, and pedestrian zones, the city lacked the tools to analyze video data in real time or surface meaningful operational insights. Monitoring was largely manual. Data-driven decision-making was slow. And available AI solutions often failed to meet the practical realities of dynamic urban environments.

City leaders faced a dilemma: How could they modernize citywide traffic intelligence without disrupting operations or investing in costly new hardware?

- Manual traffic studies were labor-intensive and outdated by the time they were complete
- Existing video systems required constant monitoring, creating inefficiencies and blind spots
- Traditional AI models underperformed in real-world conditions with variable lighting, weather, and congestion
- Many available solutions required expensive hardware overhauls or failed to integrate with the city's existing systems

To move forward, Dubuque needed a platform that could scale citywide, adapt to the nuances of local infrastructure, and deliver operational value from day one.

## Impact

By deploying the Vaidio AI Vision Platform in conjunction with Milestone technology, Dubuque converted its sprawling video infrastructure into a proactive traffic intelligence system—without the need for camera replacement or disruptive overhauls. For the first time, the city could visualize intersection flow, respond to real-time events, and analyze multimodal traffic trends continuously and automatically.

Vaidio provided Dubuque with the operational visibility and agility that traditional tools lacked, enabling a shift from reactive traffic management to predictive, data-informed decision-making.

- Gained continuous visibility into multimodal traffic flow, including vehicle and pedestrian activity
- Enabled faster response to incidents such as wrong-way driving, stopped vehicles, and unexpected congestion
- Empowered traffic engineers with automated analytics for turn counts, signal performance, and route usage
- Reduced dependence on manual data collection and improved collaboration across city departments.

Based on the success of the initial deployment, the city is now expanding the platform across hundreds of intersections to support its long-term mobility and safety goals.



Training our models on real-world video data rather than simulated scenarios made all the difference.

**David Jenkins**, VP of Software Architecture, Vaidio

## Solution

Dubuque's breakthrough came through a public-private partnership that brought together the city's traffic engineering team, Milestone's open-platform video technology, and Vaidio's advanced AI vision system. Rather than relying on synthetic training data or lab simulations, Vaidio's models were trained on actual video footage from Dubuque intersections—resulting in highly accurate analytics that reflect the city's real conditions and challenges.

This purpose-built deployment model allowed Dubuque to implement advanced video intelligence while maximizing the value of infrastructure it already owned.

- AI models were trained on actual video from Dubuque's streets to ensure reliable performance in local conditions
- The system works with existing IP cameras, preserving prior infrastructure investments
- A centralized dashboard provides real-time alerts, visualizations, and historical reporting across departments
- The open, scalable architecture allows for future expansion into public safety, emergency response, and urban planning

### Software Integration

- Vaidio AI analytics engine for facial recognition, LPR, and additional analytics
- Custom integration service built on Docker technology to connect systems
- Unified interface allowing access to all AI functions directly within Mirasys

As one city official described it, "This isn't just about technology—it's about using what we already have in a smarter way to make our city safer and more efficient."

## Conclusion

The City of Dubuque's collaboration with Vaidio and Milestone demonstrates how mid-sized cities can lead in smart mobility innovation—without the need for massive infrastructure overhauls. By leveraging the power of AI and the flexibility of open-platform video systems, Dubuque turned an existing camera network into a real-time, citywide intelligence engine that enhances traffic flow, improves safety, and informs better urban planning.

This project represents more than a technology deployment—it's a blueprint for scalable, responsible transformation. With the foundation now in place, Dubuque is positioned to expand video AI across new use cases, from emergency response to public safety and environmental monitoring.

Cities across the country face similar challenges. Dubuque proves that with the right partners and the right platform, even long-standing infrastructure can power the next generation of smarter, safer, more responsive city services.