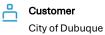City of Dubuque – Transportation AI Case Story

# City of Dubuque transforms traffic management with Milestone Systems and AI video technology from Vaidio

The future of smart city technology isn't being shaped in Silicon Valley — it's taking root in Dubuque, Iowa. With a population of about 60,000, this mid-sized city has become a live testbed for AI-driven traffic management thanks to a unique public-private collaboration led by Milestone Systems. Project Hafnia demonstrates how cities can transform urban mobility and safety through Responsible Technology—without costly infrastructure overhauls.
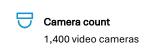


**Customer**
City of Dubuque

**Location**
Iowa, USA

**Milestone products**
XProtect® Corporate VMS
XProtect® Smart Wall

**Camera count**
1,400 video cameras

**Integrations**
Vision AI by Vadio®
License Plate Reader LPR
NVIDIA NeMo™ Curator

**Partner**
Vaidio®, NVIDIA

## Challenge: high-potential AI; low-quality data

Despite extensive camera deployments, cities often struggle to derive real-time intelligence from video. AI models trained on synthetic or generic datasets frequently underperform in complex, real-world environments. High false-positive rates make them impractical for daily operations, especially in time-critical applications like traffic management, preventing municipalities from gaining the real-time insights needed to improve mobility, safety, and emergency response.

## Solution: public-private innovation; 95% accuracy

Project Hafnia, led by Milestone Systems, brought together the City of Dubuque and Vaidio (formerly IronYun) to develop a high-performance, real-world AI model. Milestone led the 12-month project from initial concept to full-scale deployment, investing in cloud-based AI training and professional video annotation. Unlike conventional vendor-customer setups, this collaboration was structured with shared value in mind: each party contributed expertise, resources, and infrastructure, aligning toward a common goal.

At the heart of this success story is Milestone's investment in creating a secure, high-quality, and legally compliant data library that supports transparency and data traceability requirements in evolving AI regulations. Milestone transformed the city's raw traffic footage into valuable AI training material. This investment paid off dramatically, with **model accuracy jumping from 80% to over 95%**. Below that threshold, false positives are too frequent, undermining usability. Above it, cities unlock new levels of accuracy and insight.

## Results: scalable, transferable, trusted

With more than 100 dedicated traffic cameras participating in the trial, Project Hafnia validated AI performance in the field across a range of changing light, weather, and traffic patterns. The resulting platform is scalable and transferable, giving other cities a tested blueprint for AI-enhanced urban operations. AI models originally developed for traffic monitoring (vehicle classification, pedestrian tracking, anomaly detection) can now be repurposed to support public safety, emergency response, and infrastructure planning across departments.

"What makes this project unique is our approach to data. The public-private innovation structure gives us access to real-world scenarios that simply can't be replicated in a lab. We've invested thousands of hours in annotating video data so Vaidio can train their models on footage that precisely matches what they'll encounter in production environments."

Søren Raagard Jensen
Executive Product Enablement Manager
Milestone Systems

"A couple of decades ago, we started out with just 20 cameras for traffic detection. Now we have over 1,400 cameras citywide, with access to many more when you include our partners like the county and school district. After seeing the success of the AI initial deployment, we're planning to expand this technology across hundreds more cameras throughout the city in the coming months."

Dave Ness
Traffic Engineering Manager
City of Dubuque

◆ milestone

## A new framework for public-private innovation

Beyond the technical achievements, the project established a new template for collaboration between cities, technology vendors, and platform providers. Rather than a traditional vendor-customer relationship, the collaboration operated on balanced value exchange principles.

The collaboration brought together diverse perspectives and created a forward-looking solution that evolved organically. From concept to working prototype to full-scale deployment, every participant helped shape the outcome.

## Harnessing the power of high-quality data

Dave Ness, Dubuque's Traffic Engineering Manager, has overseen the evolution of the city's camera network — from a modest traffic detection system to a sophisticated AI-ready video infrastructure.

This transformation reflects Dubuque's long-standing commitment to smart infrastructure and Milestone's approach to building capabilities incrementally, not through sweeping, disruptive overhauls, but through focused, collaborative innovation.

## Regulation compliance and transparency at the core

As regulatory frameworks like the EU AI Act continue to evolve, data traceability and legal compliance have become essential. Milestone addresses these challenges by creating a transparent, documented data supply chain that future-proofs analytics solutions against evolving regulatory requirements.

Milestone's data library stands apart by offering complete traceability. Every frame of video used in AI training — thousands of hours of footage — is documented with its source, processing history, and usage permissions.

This approach also empowers municipalities to prepare for future transparency requirements under AI regulations such as the EU AI Act. In parallel, Milestone adheres to established data protection regulations like the EU GDPR, which provide foundational safeguards for processing and handling personal data. This meticulous process not only ensures compliance, it establishes a foundation for ethical, responsible AI development.

## The road ahead: a model for cities worldwide

Project Hafnia not only demonstrated that real-world AI can work, it showed that it can scale, ethically and collaboratively.

Project Hafnia is more than a traffic management success story. It's a living prototype of how cities — big or small — can unlock the full potential of AI by investing in data, partnerships, and transparency. The Dubuque project has also been part of the foundation for Milestone's Project Hafnia which was announced together with NVIDIA in March.

Dubuque's success in integrating intelligent video analytics serves as an example for other municipalities looking to enhance traffic management through technology.

"The City of Dubuque's use of AI-powered video analytics for traffic management aligns with Milestone's broader innovation initiatives. Project Hafnia leverages NVIDIA NeMo™ Curator, aiming to build next-generation AI models for transportation by curating and training on high-quality, compliant video data. Insights from deployments like Dubuque's smart traffic system contribute valuable real-world data that can help enhance future AI-driven urban mobility solutions."

Thomas Jensen, CEO
Milestone Systems

"At Milestone, we believe that AI innovation starts with trusted data and open collaboration. Project Hafnia proves that with the right platform, even mid-sized cities like Dubuque can lead the way in responsible, data-driven transformation. This is a blueprint for cities everywhere how to harness AI to improve safety, mobility, and quality of life while staying in control of the data."

Thomas Jensen, CEO
Milestone Systems

"We're just scratching the surface of what's possible. As we continue to refine and develop new features with Milestone and Vaidio, we're opening up possibilities we hadn't even considered before. The power of AI to transform urban management is remarkable. It's giving us insights and capabilities that would have been impossible with traditional methods, all while helping us make our city safer and more efficient for residents."

Dave Ness,
Traffic Engineering Manager
City of Dubuque

milestone

# Recognize the challenges?

Do you also need to see what is happening in your city, so you can respond in time?

Get in touch with us at milestonesys.com/book-a-demo/ and let's talk about what type of solution is right for you.