



# Transform Transportation Safety, Security, and Operations with Computer Vision AI

## Safety and Security Challenges

The transportation industry increasingly relies on live video and sensor data across roads, water, air and railways. Computer vision AI is transforming the industry by addressing a range of challenges with safety and security, traffic management and incident analysis, infrastructure inspection and maintenance, and autonomous vehicle perception.

However, degradation of visual and sensor data occurs due to factors such as poor lighting, low resolution, or adverse weather and environmental conditions. Like humans, even the highest quality cameras and sensors don't see through rain, snow, fog, pollution, dust, poor lighting and other obstacles. And most often, computer vision AI solutions are trained on pristine imagery and unobscured objects.

## Enter Computer Vision Restoration

Applying real time, AI-enabled video restoration to new and existing video and sensor data can immediately address a wide range of complex operational and safety problems. ProHawk AI solves the challenges with high and low-quality live videos due to environmental factors that arise from from particulates of varying sizes that obstruct videos, and challenges related to lighting conditions including both excess and insufficient light.

ProHawk AI's vision restoration solution uses NVIDIA frameworks and parallel processing on NVIDIA GPUs to restore clear video and sensor quality on live camera streams, video management system streams, and recorded video, through all challenging conditions.

## Key Benefits and Outcomes

ProHawk AI video restoration software in the video workflow addresses key visual and sensor challenges with lighting, adverse weather, and other obstructions. This enhances situational awareness, and enables faster and better quality actions at the decisive time and place, including:

- **Traffic management and safety:** By analyzing in real-time restored video from traffic cameras, computer vision systems can detect and respond to incidents, road hazards, and traffic congestion. This leads to safer and more efficient roadways in all weather and light conditions.
- **Security monitoring:** Computer vision AI and human operators using restored footage, can more effectively identify security threats, unauthorized access, and suspicious activities. This facilitates quicker response times and bolsters overall security awareness and measures.
- **Incident analysis:** Clearer, restored video footage enables computer vision AI to better detect and analyze accidents, providing crucial forensics details for forensics investigations and that help in understanding causes and preventing future incidents.
- **Infrastructure inspections:** Restored video and images allow humans and vision AI applications to detect infrastructure issues and wear and tear on vehicles, ensuring timely maintenance and compliance with safety regulations. This prevents potential failures and keeps transportation systems running safely and smoothly.

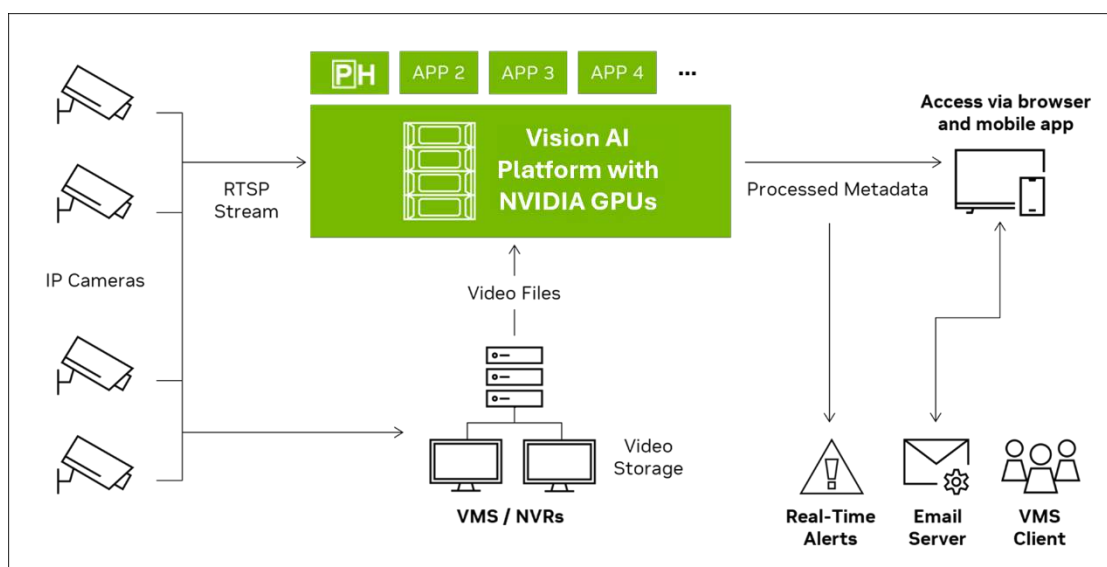
## Better Business Outcomes Powered by NVIDIA Accelerated Computing

By using accelerated computing solutions with NVIDIA GPUs, ProHawk AI Vision transforms video in real time, on a pixel-by-pixel basis, overcoming all environmental obstacles and lighting conditions to restore live video and images. Previously unseen objects and their details are revealed for humans and AI tools, as can be seen in images below from before and after video restoration by ProHawk AI.



Downstream video workflow processes and AI inferencing can then always perform at unobstructed, daytime safety levels, allowing for earlier and greater object detection and confidence levels, and reduced false positives.

*ProHawk AI uses the NVIDIA Metropolis stack for computer vision AI deployments to analyze video and sensor data in real time, restore clear video for live camera and VMS streams, and restore images and recorded video.*



Validated through deployments and benchmark testing on standard GPU accelerated systems, ProHawk AI has demonstrated robust performance improvements. Agnostic to sensors, ProHawk enables visibility 20x farther and 20x faster, to detect 15x more objects with 95% confidence across the electromagnetic spectrum.

The integration of computer vision AI workflows with ProHawk AI video restoration creates a safer, more secure, and efficient transportation environment, including for smart cities and spaces.