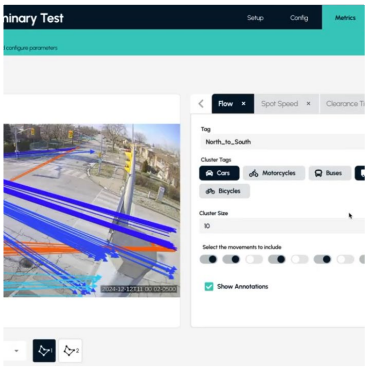
Demonstration Zone

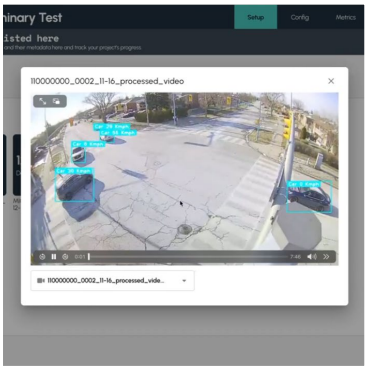
2024

Traffic Safety Innovation

Demonstration Project: AI Traffic Safety Intervention

Innovator: Msafe Solutions Inc.
Product: Urban AI
Demonstration Period: December 5, 2024 – March 28, 2025





Executive Summary

The City of Vaughan is testing leading-edge technology to evaluate how innovative solutions can address real-world mobility and transportation challenges.

Through the Ontario Vehicle Innovation Network (OVIN) Demonstration Zone, Msafe Solutions Inc. tested their Urban AI traffic analysis platform to evaluate its ability to analyze multimodal traffic activity at the intersection of Martin Grove Road and Woodbridge Avenue.

The OVIN Demonstration Zone is an initiative that is part of Vaughan's Transportation Innovation Program (TIP), which aims to test smart mobility solutions in real-world environments. This demonstration was completed in partnership with **Vaughan's Transportation and Fleet Management Services** team, and in alignment with the objectives of **Vaughan's MoveSmart Mobility Management Strategy**.

The Innovator

Msafe Solutions Inc. (Msafe Solutions) is a Canadian technology company specializing in AI-powered video analytics for traffic monitoring and safety analysis. Their Urban AI platform is designed to extract actionable insights from video footage to support data-driven transportation planning and infrastructure improvements. The system can analyze vehicle speeds, pedestrian activity, micromobility usage, and potential conflict points at intersections.

Demonstration Overview

The demonstration involved the temporary installation of Miovision's Scout cameras at a signalized intersection to record two weeks of video footage. The Urban AI software then processed this footage offline to extract key traffic metrics, including:

- Vehicle speeds by lane
- Micromobility device counts and speeds
- Pedestrian wait times and crossing durations
- Turning movement counts
- Aggressive left-turn movements
- Near-miss incidents

Key Outcomes

The demonstration confirmed that the Urban AI platform can perform offline video analytics and generate valuable traffic insights. The demonstration was developed by the Project Advisory Team with specific traffic metrics as a foundational test to evaluate the effectiveness of the Urban AI system.

Key outcomes include:

- Msafe Solutions analyzed traffic movement of an intersection for 13 days, identifying four vehicle types: cars (80%), trucks (17.5%), buses (1.7%), and bicycles (0.8%).
- Traffic flow insights showed that clearance speeds were lowest from north-to-south before noon and highest from south-to-east during the same period. Average speeds

peaked from south-to-east and intersection clearance time was highest from north-to-south.

- The system demonstrated how it could support studies for traffic counts and safety analysis.
- The analysis software detected traffic metrics outlined in the scope of the project
- Urban AI's system identified aggressive driving behaviours, though further development is needed to enhance these capabilities and improve the clarity of reporting outputs.
- Further development is needed to detect near misses' incidents.
- The Project Advisory Team provided insights to Msafe Solutions on municipal operations for routine traffic studies for traffic safety analysis
- The demonstration provided the city with insights on how auto AI-powered analysis solutions could be potentially incorporated into operations, and allowed for an understanding about how it affects our best practices

While the software successfully captured vehicle and pedestrian speeds and generated visual outputs, it was not able to detect aggressive left turns or near-miss events during this demonstration. It is unclear whether these features were not fully developed or if the data was not made available for reporting.

Exclusions

Demonstration projects through the OVIN Demonstration Zone are temporary and limited in scope and duration due to the time constraints of the OVIN Demonstration Zone program. The project evaluated key features of Msafe Solutions Urban AI, as determined by the Project Advisory Team.

Real-time video analysis was not tested during this demonstration. Additionally, the system's ability to detect near misses and aggressive manoeuvres was not validated due to either software limitations or data availability.

Conclusions and Recommendations

The Urban AI platform shows promise as a tool for supporting data-informed transportation planning analysis. While the software captured certain traffic metrics, it was not able to detect aggressive left turns or near-miss events during this demonstration.

Future demonstrations should focus on enabling real-time analytics, refining reporting outputs, and validating advanced features such as conflict detection. Msafe would benefit from additional technical support and funding to develop standardized camera and communications specifications, enabling a turnkey solution for municipal clients. The OVIN Demonstration Zone and participating municipalities may also consider advocating for regulatory and procurement frameworks that support the adoption of AI-based traffic analysis technologies.

Demonstration Zone Project Profiles: www.vaughanbusiness.ca/demozone/projects