

ITEA PO Days 2024

SMART

Geo-spatial traffic analytics and congestion reduction for Smart Cities

ITEA Award of Excellence 2024 ceremony
10 September 2024
Egor Bondarev, TU/e, Netherlands

SMART Rationale

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- Traffic congestion costs cities, citizens and environment
- With estimated 75% increase of EU population by 2050, congestion costs will skyrocket
- Cities have little insights on traffic for road re-design

- High amount of accidents costs lives and injuries of drivers, cyclists and pedestrians
- Existing transportation Digital Twin solutions are fragmented and siloed

SMART Objectives

- Reduce urban traffic **congestion** and emissions
- Enable efficient road **re-design** and management
- Improve urban mobility with better **safety**
- Facilitate global **data sharing**, AI analysis and insights on traffic

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Facilitate improved traffic throughput for all modes



Enable improvements in urban mobility



Common shared tools: data collection, analysis and visualization



SMART Project consortium

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- 2 large industry
- 4 SMEs
- 1 University

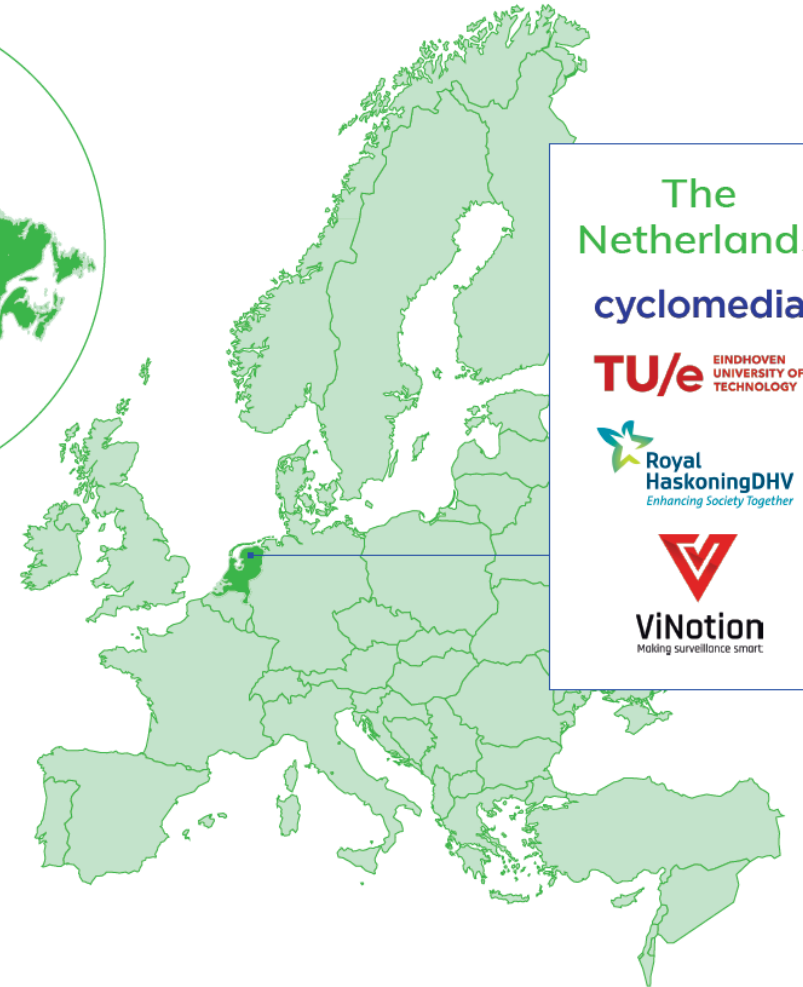


Canada


 esri Canada


 GEOTAB ITS


 international road dynamics




The Netherlands

 cyclomedia

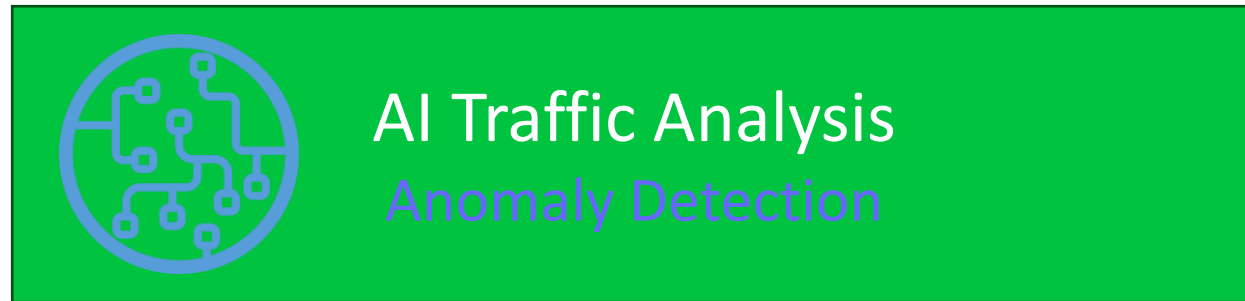
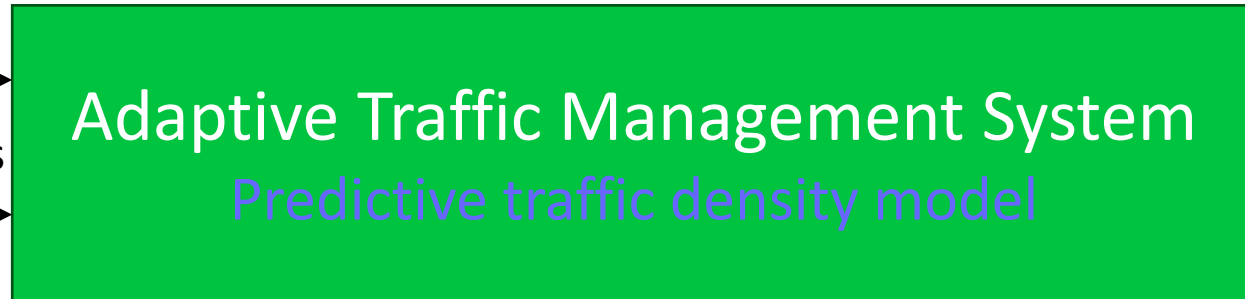
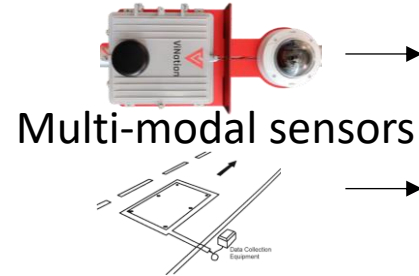
 TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

 Royal HaskoningDHV
Enhancing Society Together

 ViNotion
Making surveillance smart.

SMART Innovations

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Data from other sources:

- ArcGIS
- Emergency services
- Logistics
- Public safety services
- etc

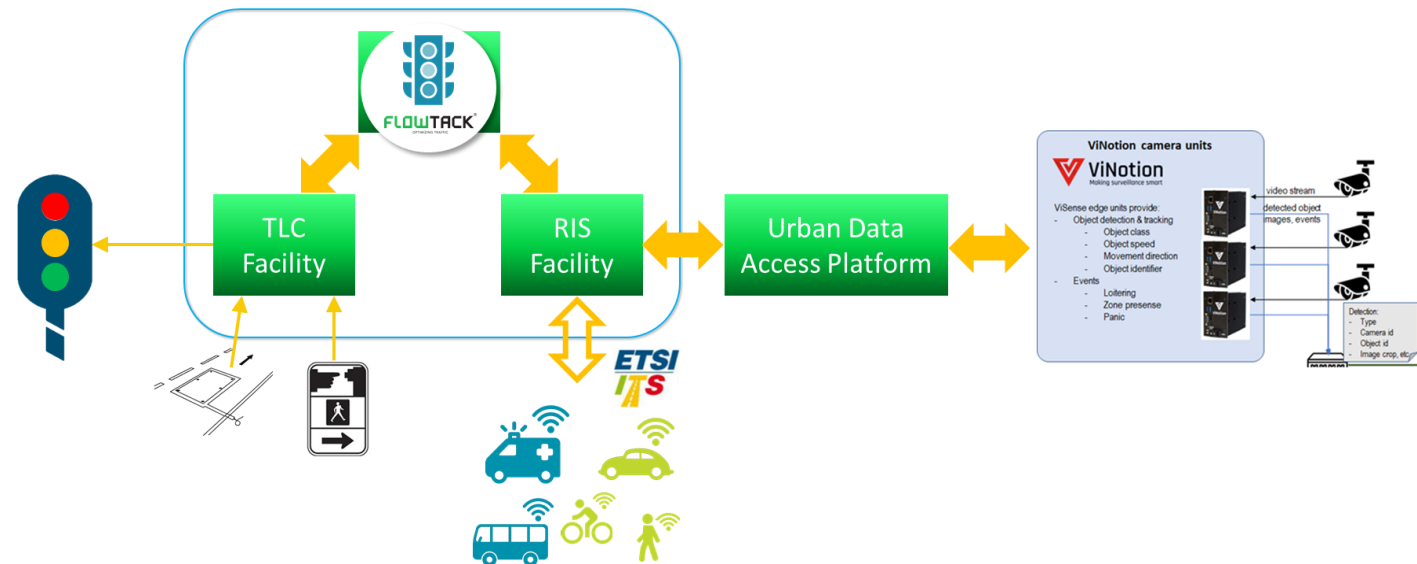


3D city models



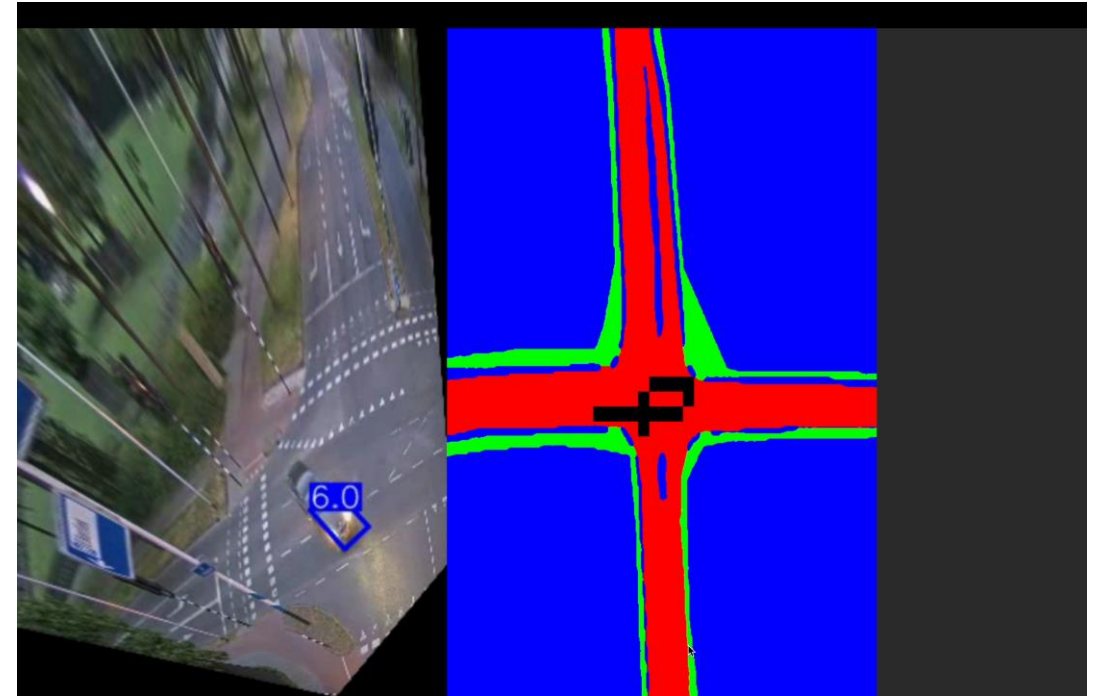
Adaptive Traffic Management System (Flowtack)

- Reduction of congestions by smart control of traffic lights (by 20-50%)
- Real-time traffic analysis based on multi-modal sensors (optical, in-vehicle, in-road)
- Adaptive policies for sustainable transportation, high throughput
- Pedestrian and bicycle flows are included
- AI detection of traffic anomalies



Demo: Anomaly Detection System

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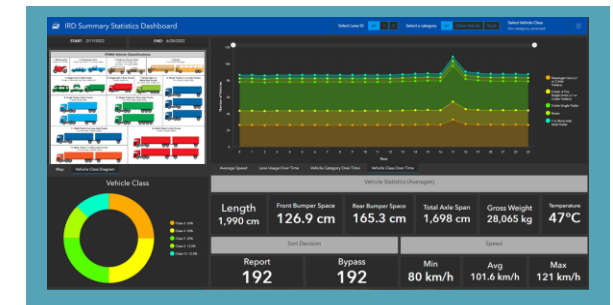
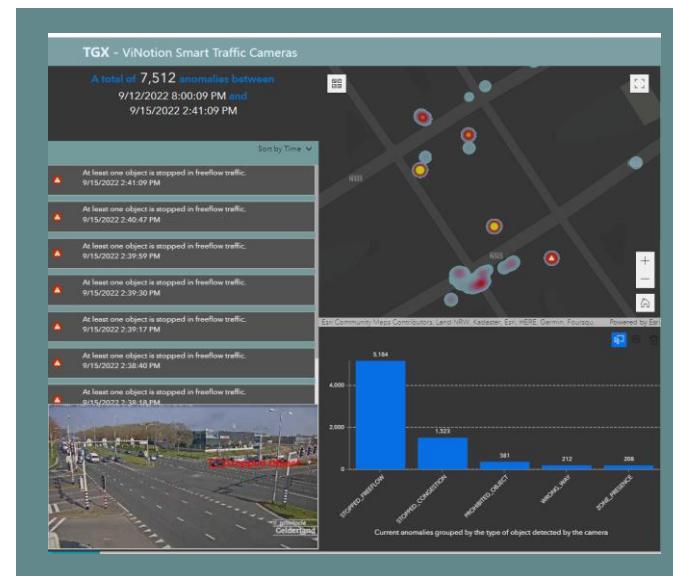


SMART Achievements

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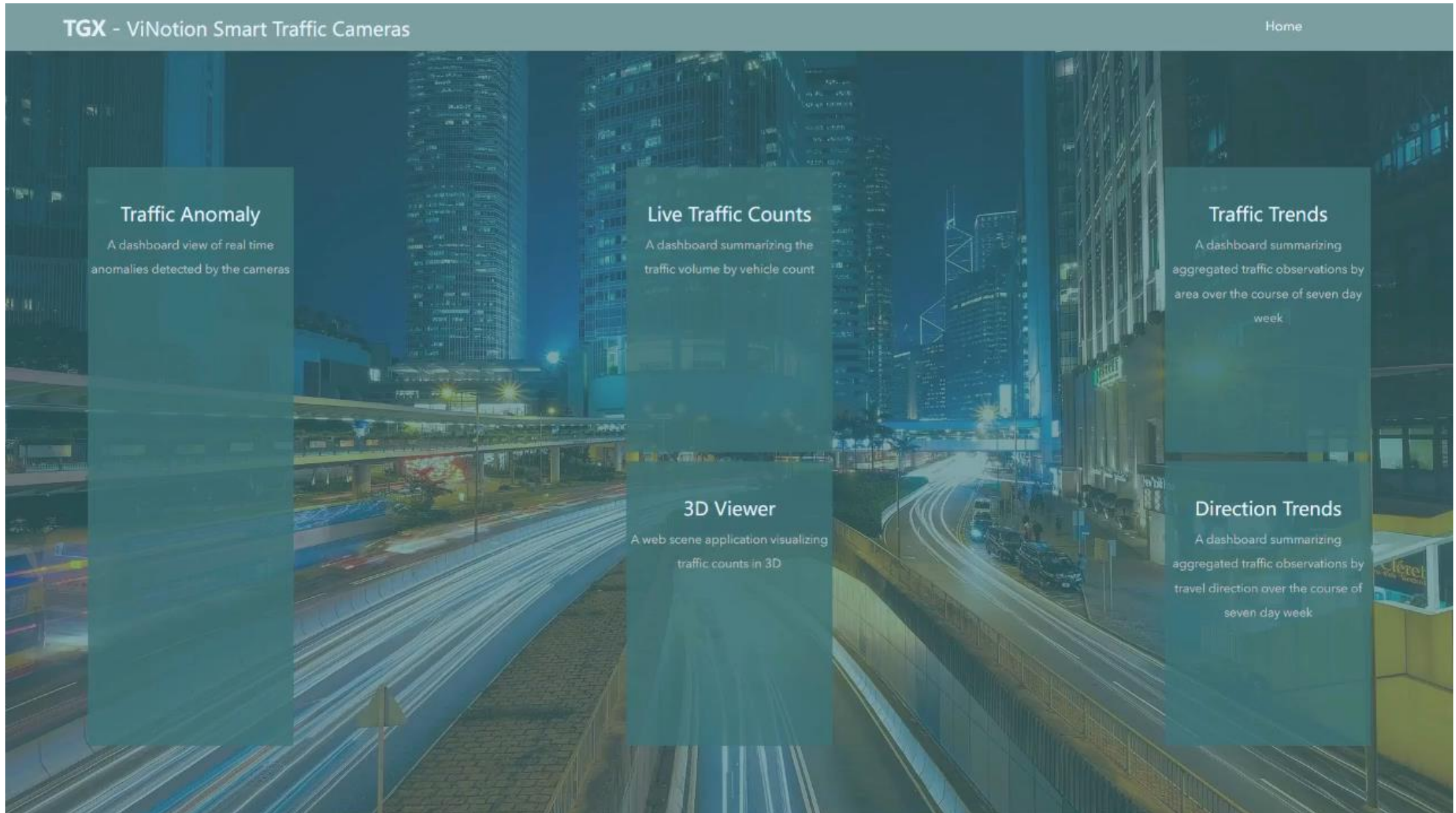
Common 4D GIS Transportation Platform (TGX)

- Sharing real-time data from PAs, sensors, vehicles, transportation providers
- All-integrated traffic analysis, visualization and modelling
- Tools for road management for efficiency and safety
- Integration with non-traffic (smart city) data layers
- Detailed 3D city models



Demo: TGX 4D GIS platform

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Impact & Exploitable Results

- Project prototype built in Helmond (NL) and Victoria (CA)
 - Additional pilots in 6 cities: Hengelo, Breda, 's-Hertogenbosch, Delft, Amersfoort, Utrecht
- Standardization
 - Contribution to development of CSA EXP150.1 and CSA EXP150.2 standards
 - Prove of concept for the coming Intelligent Traffic Light Controller (i-TLC) standard
- TGX – 4D GIS Transportation system (ESRI)
 - Exploited to several municipalities in US and Canada
- Cloud-RIS of Flowtack (RoyalHK) is released to NL and BE market
- First ministry-certified i-TLC camera (Vinothion) on the market

Conclusions and lessons learned

Conclusions

- Synergy between partners has empowered the innovations
- Project results are validated on real-world test sites
- Several project outcomes are already on the market

Lessons learned

- Find a **dedicated end-user** already at the project idea phase
 - We were searching for the first 1.5 project years
- Start building your **test/validation site** right from the project start
 - It took us 2.3 project years to get through all the regulations
- A partner drop during project execution is not a disaster
 - Find a replacement and submit a Change Request

Thank you