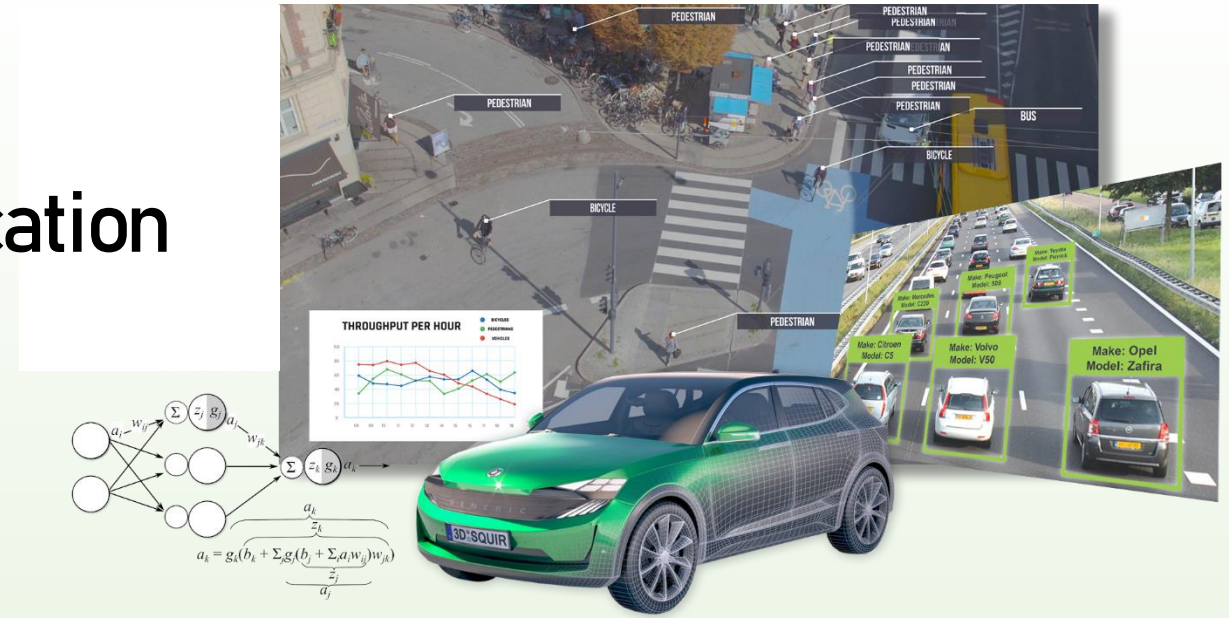
Problem statement

- Traffic intensity is increasing globally (post-Covid)
  - World-wide climate agreement to reduce pollution
  - Cities are closing access for vehicles and opening for bicycles
- What are the driving sources for CO2 pollution?
  - Which cities/roads are most polluting?
  - Recognize vehicle type and fuel (gas/diesel/electric)
- Tax/toll outdated: fixed based on fuel/weight
  - Desire to move from fix vehicle taxes to pay-per-use
  - Make the polluter pay

- State-of-the-art
  - No accurate sensors available, on-vehicle unit are easy to spoof
  - Pollution sensors measure global surrounding: inaccurate

Solution: Gi-Trac

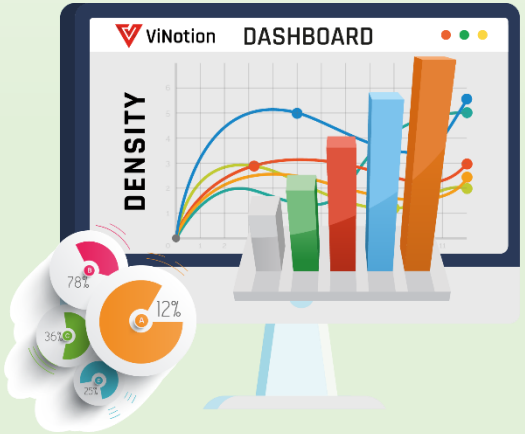
Green Intelligent Traffic Classification



- Solution
  - Fully automatic AI-based road-side multi-modal classification system

- Measure vehicles and bicycles
  - Video sensors — advanced classification size/type
  - Sound sensors — diesel/gas/electr. vehicles, normal/electr. bicycle
  - Chemical sensors — overall pollution CO2/NO2/temperature/wind
  - **Artificial Intelligence to combine low-level data**

- Dashboard to combine/visualize data
  - Smart City / ITS platform
  - Reporting/actions towards municipalities/road authorities



Use cases

1. Tolling
   - Pay-per-use traffic tax/toll in free-flow model
   - Ferries capacity planning and measurements
   - Capacity measurements of roads
2. Zero-emission traffic
   - City pollution measurement (environmental zones)
   - Measure vehicle exhaust gases + noise pollution
3. Car-free cities
   - Restrict vehicles, reduce pressure on public transportation
   - Bicycle highways to motivate bicycle use for daily commute
   - Measure bicycle usage, speeds and type (manual/electrical)

Project results

- Pay-per-mile vehicle tolling/taxing
  - First product with novel AI system for multi-modal vehicle sensing
  - Free-flow: non-intrusive sensing without traffic interruption
  - Sensing detailed vehicle properties : type, weight, size and emissions

- Pay-per-pollution
  - Enable eco-friendly city access for clean vehicles
  - Detailed insights in the source of pollution per vehicle

- City access regulation
  - Access for special vehicles classes (suppliers, emergency)
  - Prioritize bicycles and pedestrians for ecofriendly cities
  - Create detailed insights in transition from car-to-bicycle

Partners

- ViNotion (Netherlands) — video AI
- Sorama (Netherlands) — audio sensors + AI
- Unconfirmed (Sweden) — traffic measurement system
- Unconfirmed (Canada, unfunded) — vehicle classification system

- We are looking for
  - Road authority that can facilitate field lab
  - Dashboard/backend development
  - System integrator: interconnect all project contributions
  - Large Industrial partner: active tolling or other use cases
  - Advisory board: end-users that understand needs