



smartmicro

SMART MICROWAVE SENSORS

TRAFFIC SENSORS

**Super Resolution AI Tracking
Seamless Tracking at Intersections**



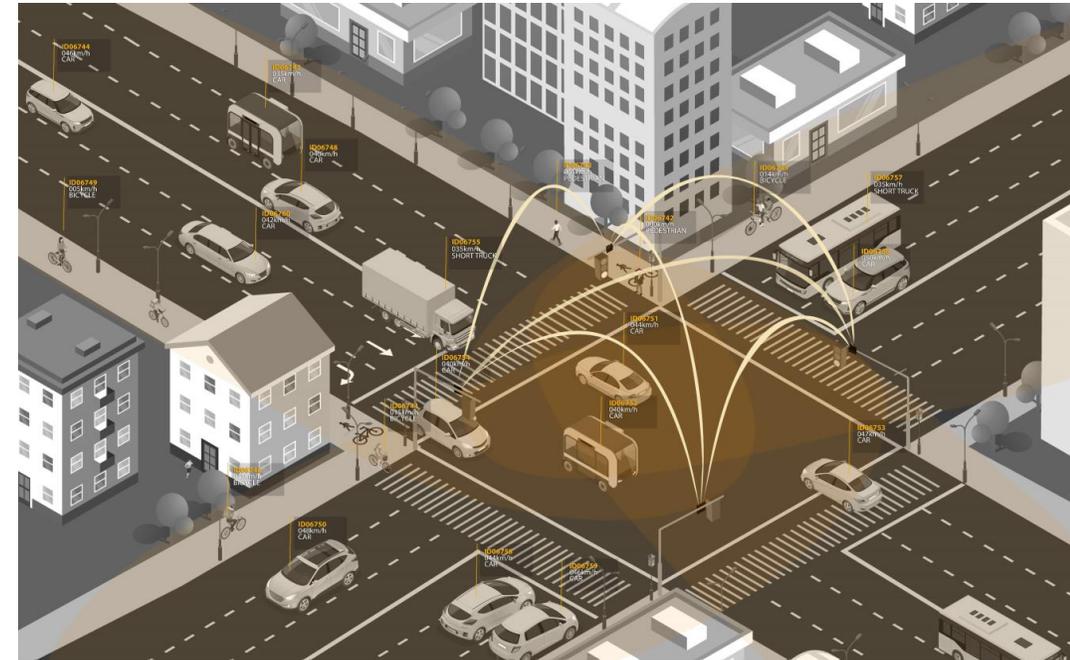
SUPER RESOLUTION AI TRACKING – SEAMLESS TRACKING AT INTERSECTIONS

- ✓ Super Resolution AI Tracking means
 - ✓ Combining Super Resolution for radar detection
 - ✓ With AI for tracking and perception
 - ✓ On powerful new processors
- ✓ Introducing Seamless Tracking at Intersections means
 - ✓ Precise time synchronization of all sensors
 - ✓ Combining the data from multiple radar sensors, on raw data level
 - ✓ Applying Super Resolution AI Tracking on that combined raw data



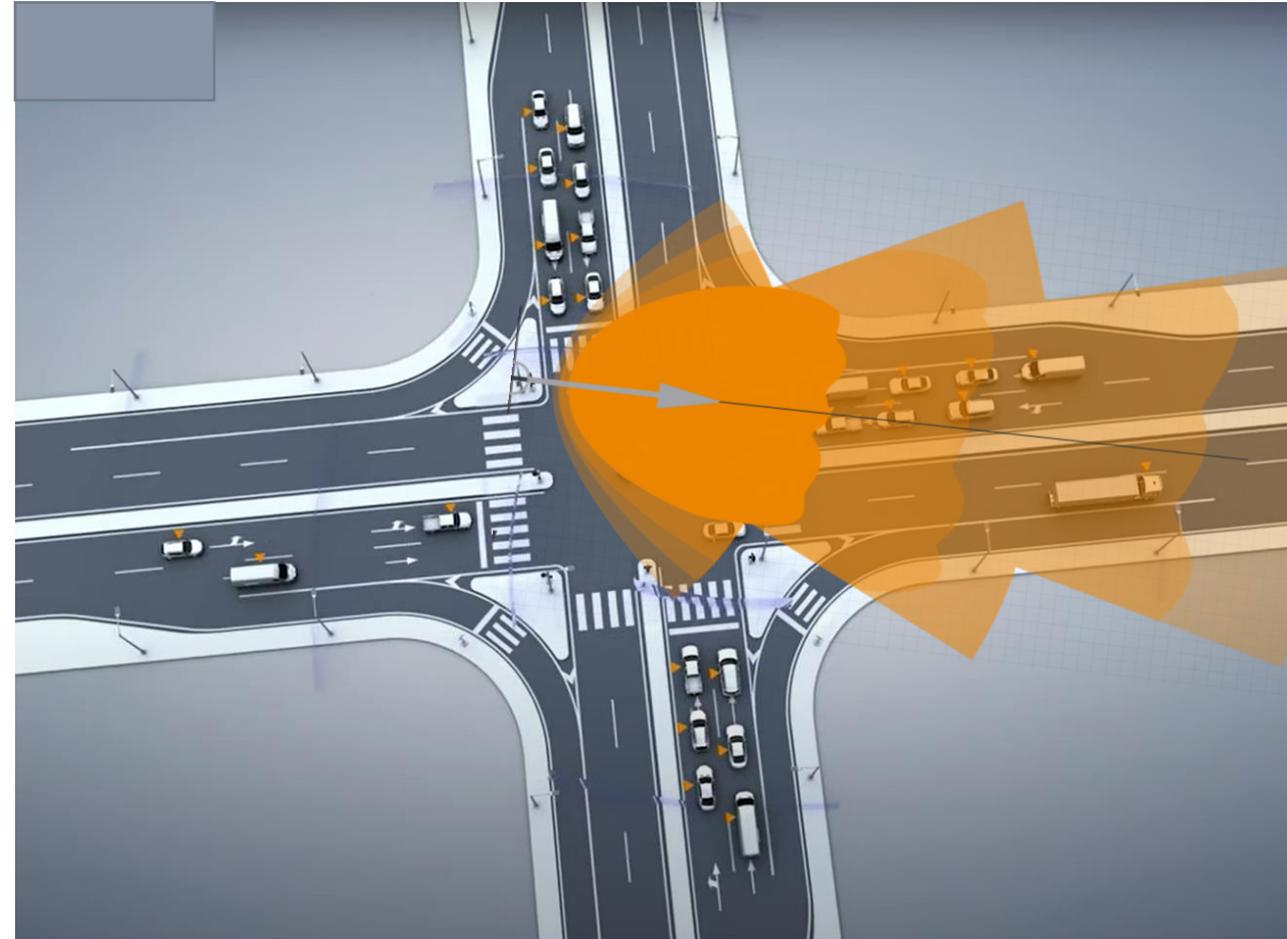
SEAMLESS TRACKING AT INTERSECTIONS - ADVANTAGES

- ✓ Seamless Tracking on the entire intersection, including turning vehicles
- ✓ Inner part of intersection is covered by four sensors
 - ✓ Full coverage, less occlusion, good redundancy
- ✓ Increased accuracy
 - ✓ Increased detection & classification accuracy
 - ✓ Excellent counting performance across many lanes, including turning counts
- ✓ One single object list available in real-time for Automated Vehicles (AV)
- ✓ 200m range: Any object is detected at 200m distance and will be tracked seamlessly
 - ✓ Over full intersection
 - ✓ Will only be dropped if object leaves 200m radius
- ✓ The Seamless Tracking through multi-sensor fusion at intersections is a unique feature only offered and patented by smartmicro



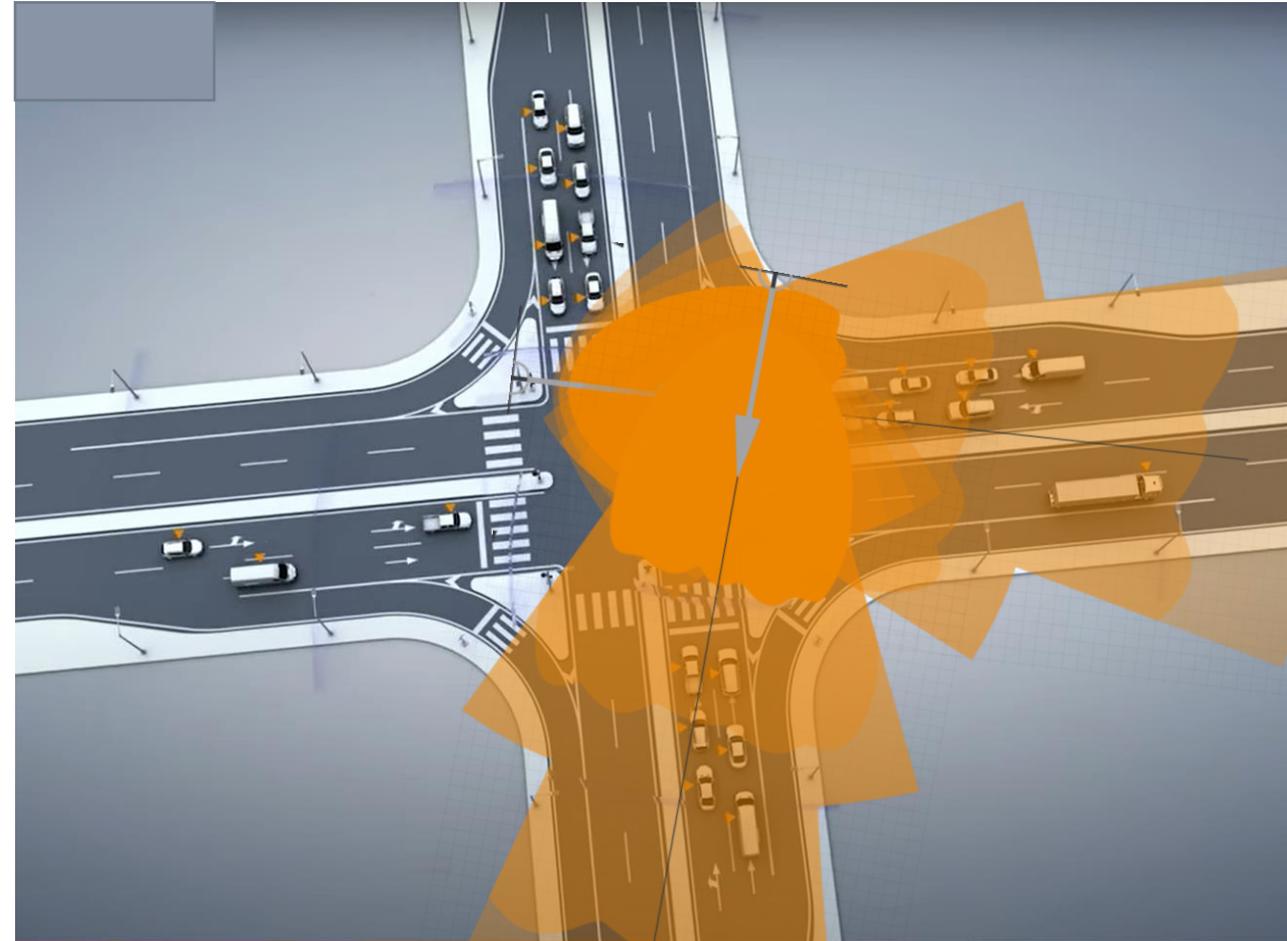
SINGLE SENSOR TRACKING

- ✓ **One sensor covers one approach**
 - ✓ Stop bar and advance detection with one single sensor, 200m range
 - ✓ Multi-lane coverage on the approach
 - ✓ Detection of stopped and moving objects
 - ✓ **Tracking uses data from only one sensor**
 - ✓ **Detection and tracking software run on sensor**
 - ✓ Application is limited to the one approach, because single sensor tracking does not work well for inner part of intersection (limited field of view, crossing traffic, occlusion)



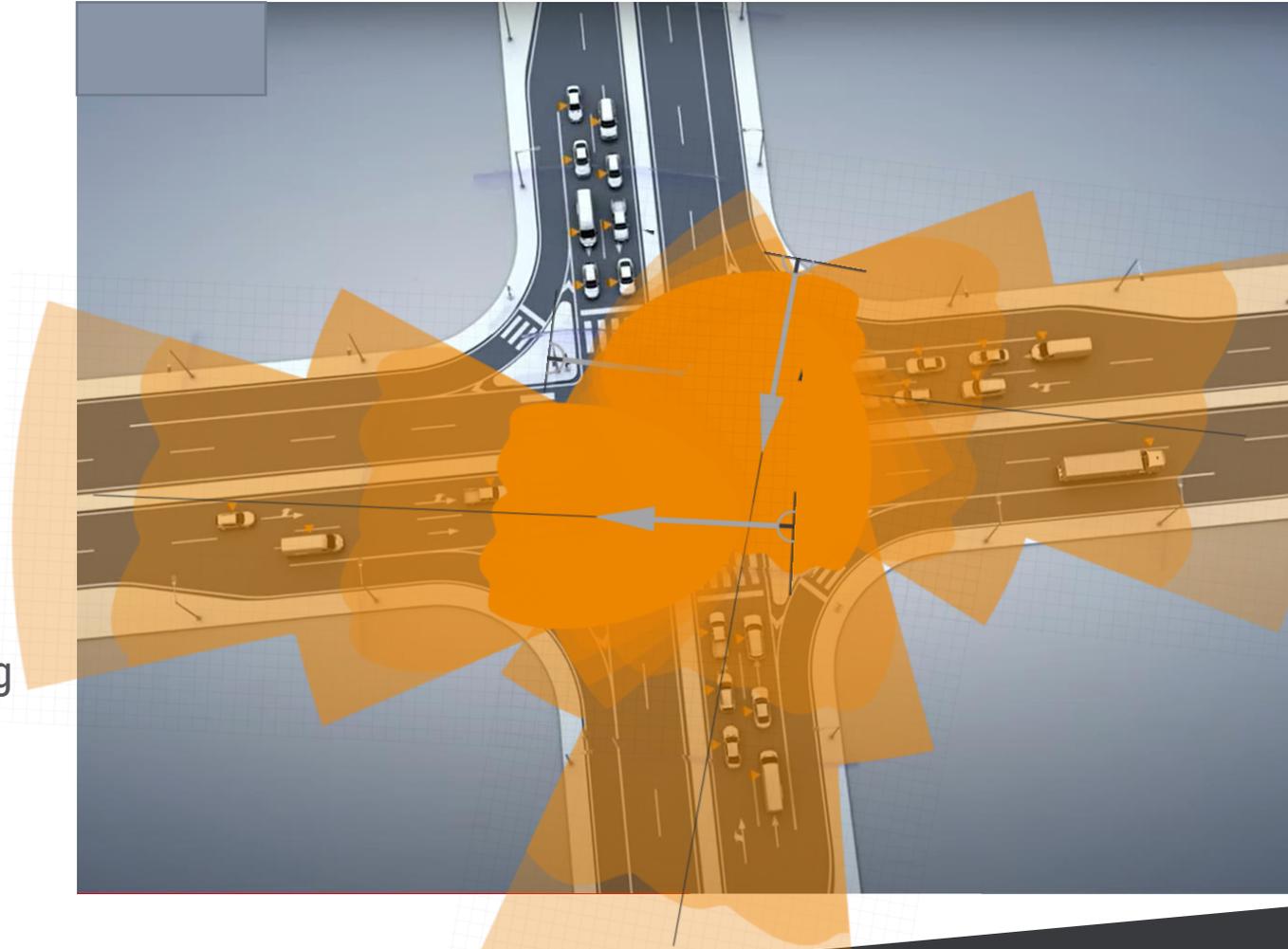
SEAMLESS TRACKING

- ✓ **Four sensors cover four approaches**
 - ✓ Stop bar and advance detection with one single sensor, 200m range
 - ✓ Multi-lane coverage per approach
 - ✓ Detection of stopped and moving objects
 - ✓ **Tracking uses data from all sensors**
 - ✓ **Detection software runs on sensor**
 - ✓ **Tracking software runs on COM HUB**
- ✓ Application now covers all approaches, including inner part of intersection
 - ✓ Overlapping fields of view, redundancy
 - ✓ Handles crossing traffic very well
 - ✓ No occlusion



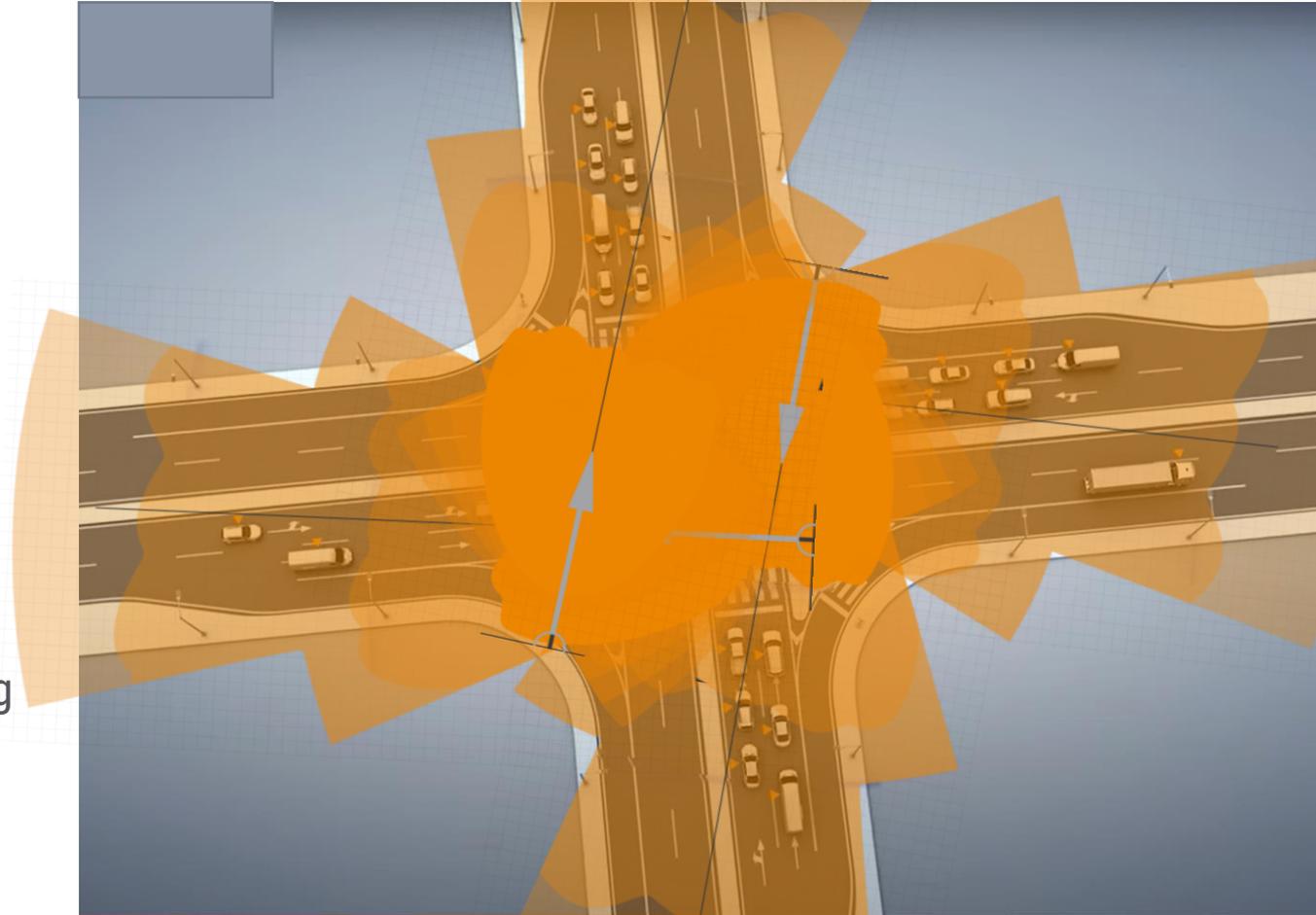
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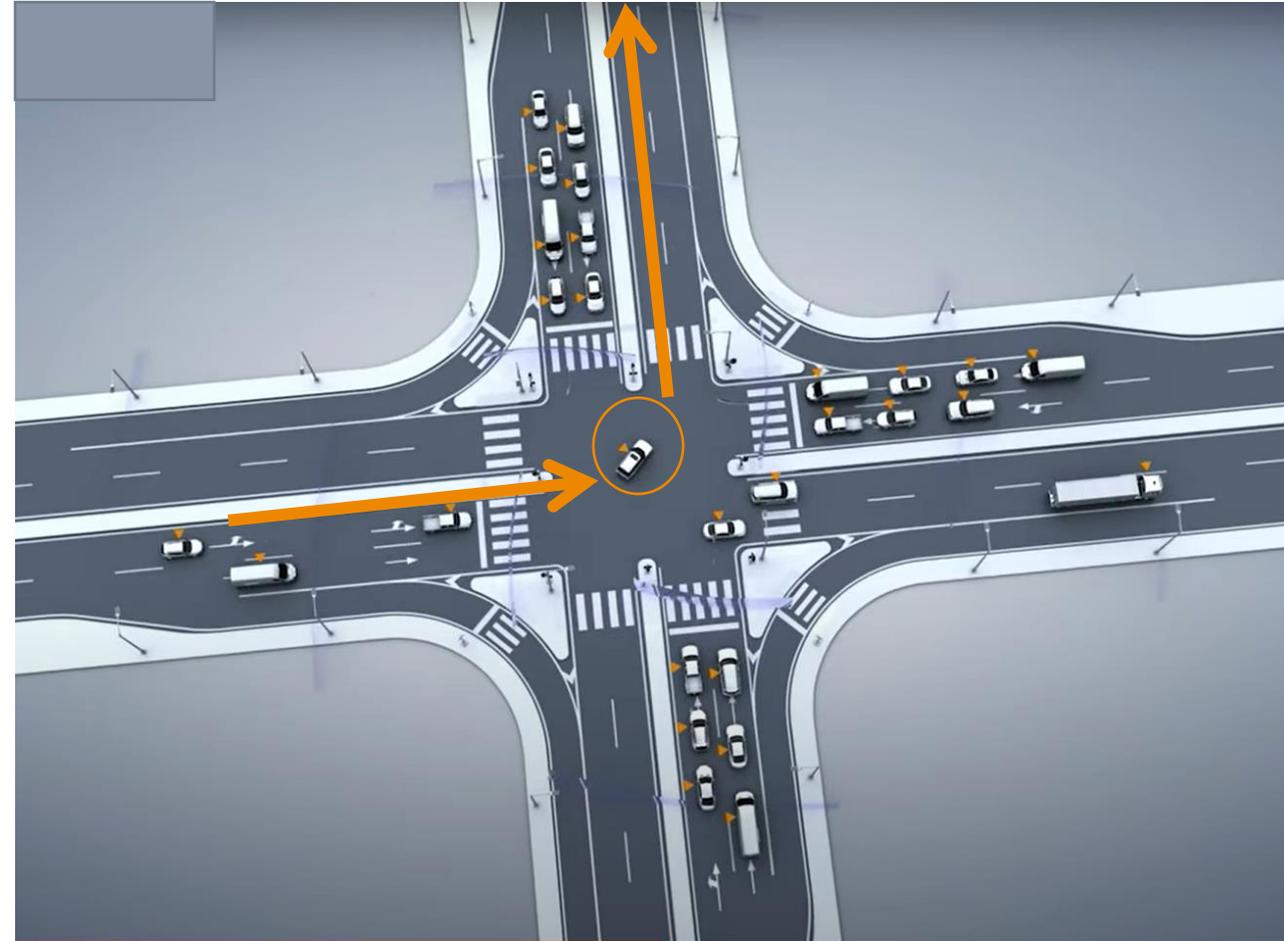
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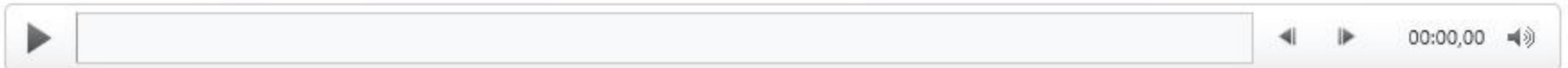


SEAMLESS TRACKING

- ✓ Seamless Tracking on the entire intersection (including turning vehicles)
- ✓ Any vehicle is detected by multiple sensors in the combined field of view
- ✓ An object (tracking) ID remains the same across the field of view covered by multiple sensors/beams
- ✓ One single object list in real-time
 - ✓ Precise data for V2X applications

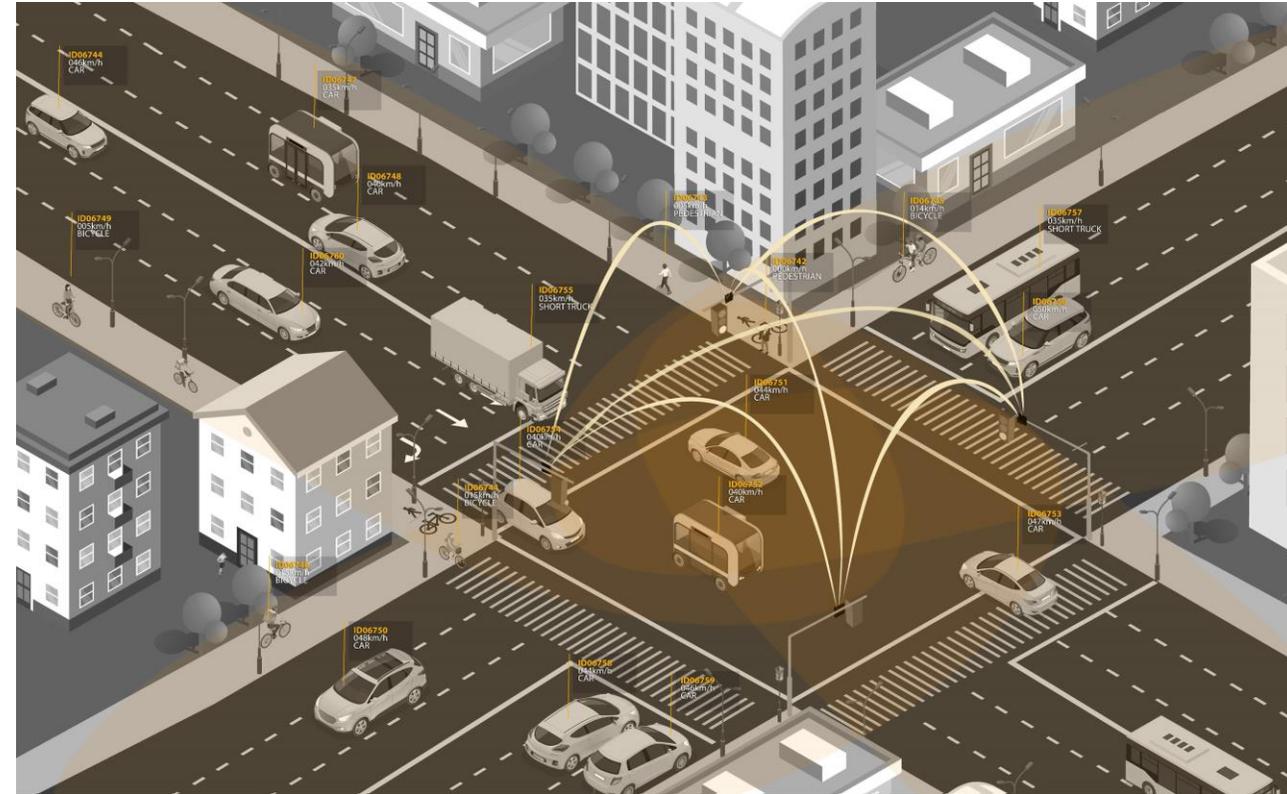


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SUPER RESOLUTION AI – SEAMLESS TRACKING AT INTERSECTIONS

- ✓ Increased safety for all road users
 - ✓ Especially Vulnerable Road Users (VRUs)
- ✓ Seamless Tracking on the entire intersection
 - ✓ Better detection, redundancy, no occlusion
 - ✓ Improved classification, length measurement
- ✓ Improved detection and tracking performance
 - ✓ The area near the intersection (walkways, pedestrian crossings, bike lanes, important for pedestrians and bicyclists) is covered by multiple sensors
 - ✓ The inner part is fully covered, allowing turning counts





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