wings.

TECHNOLOGY TO ELEVATE YOUR BUSINESS

WINGS CEF projects

5GSC WG1, May 22nd, 2025

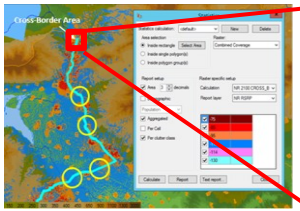
WINGS – CEF Digital Projects

- WINGS is coordinator in 6 and partner in 1 more CEF Digital 2021, 2022 & 2023 calls' projects.
- In the CEF Digital 2024 call, we participated with 6 proposals which are currently under evaluation.

5G-SEAGUL | **5G-TERRA** | **SEA-SPINE** | **BEGONIA**

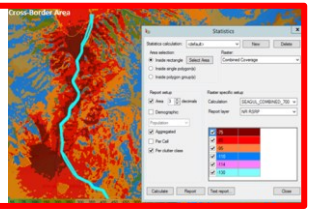
5G-SHEAL | **5G SAMITEA** | **5G-TRACE**

5G SEAGUL: 5G Seamless Roaming for the Greece-Bulgaria Cross-Border Corridor



COSMOTE 2100MHz COSMOTE predicted coverage in GR/ Serres segment of the CBC, depicting coverage gaps

COSMOTE 2100 MHz predicted coverage in the Promahonas/ Kulata border depicting performance weaknesses



COSMOTE 700 MHz predicted coverage in the Promahonas/ Kulata border

- Provide uninterrupted 5G connectivity, based on 3GPP Rel.16 SA, capable of supporting select advanced **CAM UCs, focusing on the Orient/East-Med corridor traversing the GR-BG borders, including the border-crossing of Promahonas/Kulata.**
- Support the effective interconnection of the COSMOTE and A1BG PLMNs (Public Land Mobile Network) and investigate the optimal roaming configurations to support CAM traffic.
- Validate the network (and applications) performance and the usefulness of 5G connectivity.

Problems / Use cases

- Uninterrupted communication service and continuity during the inter-PLMN handover
- Supporting use cases for safety, convenience, autonomous driving

WINGS Role

- Providing 5G-enabled On-Board Units (OBUs), UEs and the extended sensors application
- Taking detailed network level and application-level measurements
- Post-processing and analysis of measurements to evaluate the performance of use cases

5G SEAGUL project has received funding under grant agreement No 101094584.

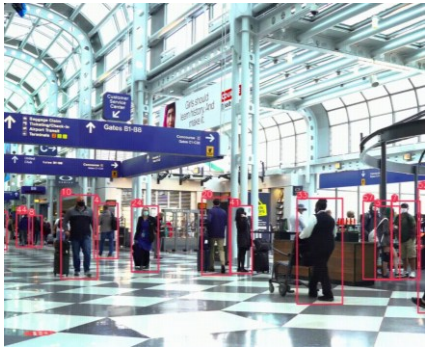
5G SAMITEA - 5G Sofia Airport Mobile PrIvate NeTwork PowEred by A1

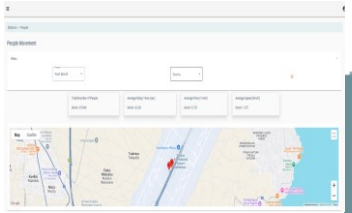
Build and operate a 5G MPN in Sofia International Airport to

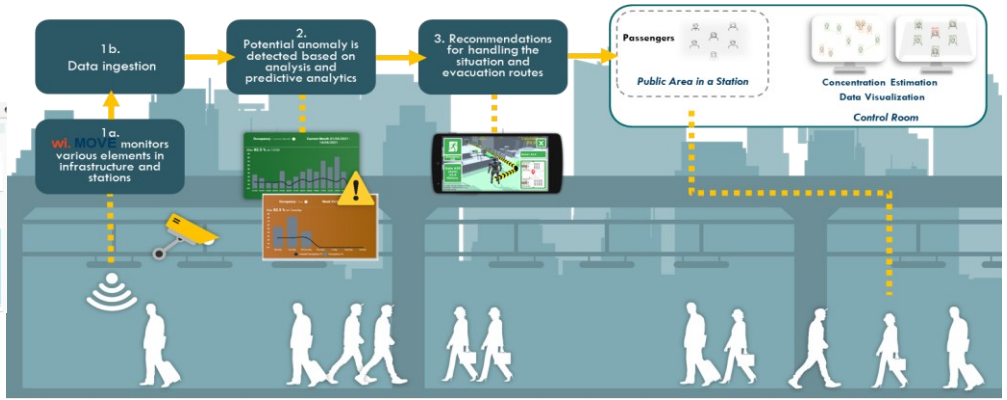
- improve passengers' **comfort** and **safety,** particularly during **congested** and **critical** situations and
- implement a set of measures to **increase operational efficiency** of the airport through innovative 5G applications.

Indicative examples of Use Case scenarios:

- airport monitoring and AR/VR-based evacuation in case of emergency
- crowd and assets tracking and AI-enabled robots to assist/inform/entertain passengers
- video surveillance for protection of outdoor critical areas and improved proactive security in terminals

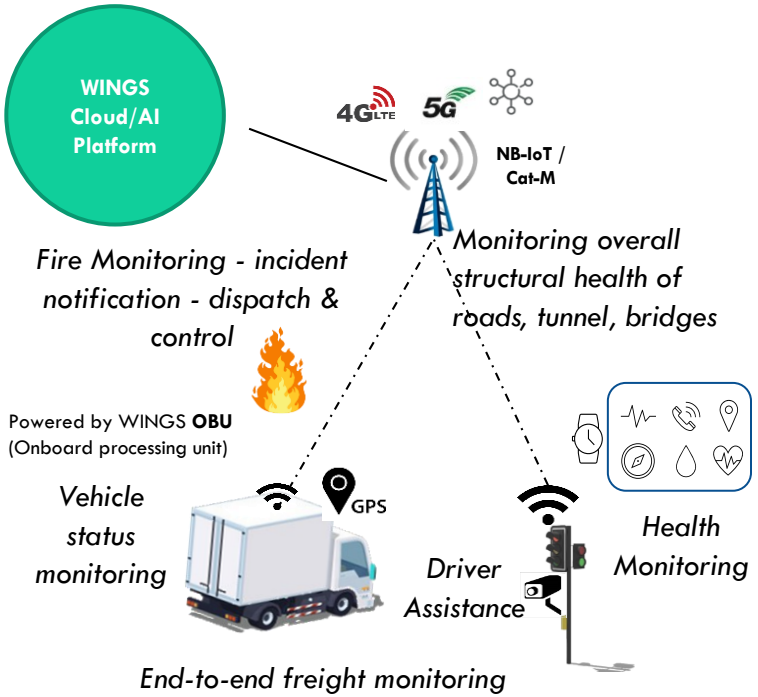




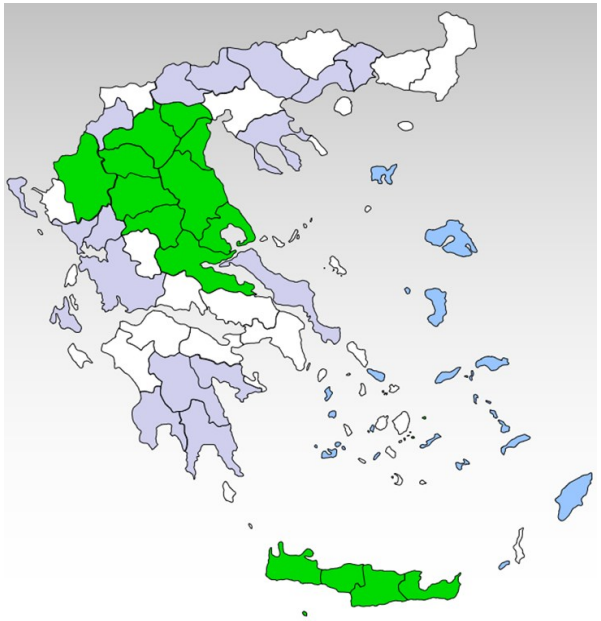


Corridor Services

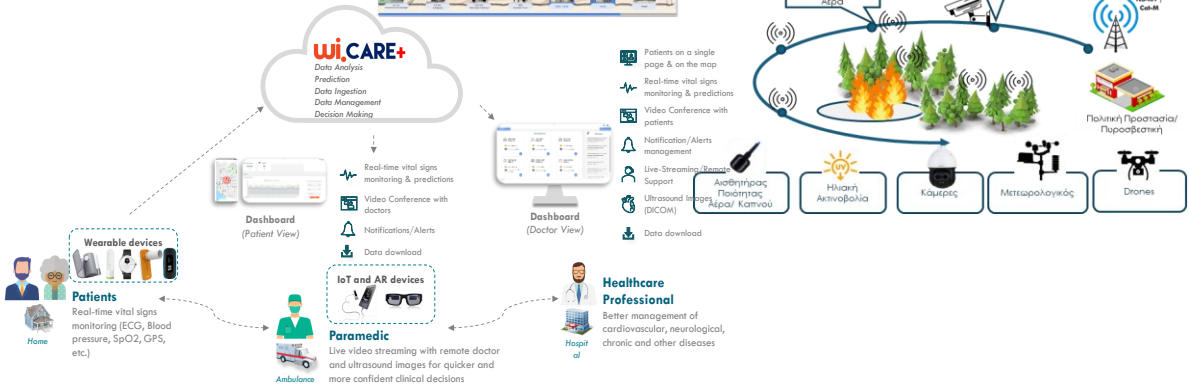
- **Road Infrastructure Monitoring**
  - Augmented CCAM
  - Collecting data from various sources such as security cameras, drones, municipal vehicles, and weather information
  - AI and Deep Learning (DL) mechanisms to provide relevant information about the condition of public infrastructure assets
  - Real-time dashboard for monitoring the infrastructure's health
- **Healthcare Monitoring**
  - Wearable devices which collect vital signs: Heart Rate, Cardiac Rhythm (Electrocardiogram/ECG), Blood Pressure, Oxygen Saturation (SpO2), Body Temperature, Blood Glucose.
  - Devices that provide other measurements and features, e.g., GPS (geofencing), SOS buttons (emergency calls), Altitude, Acceleration, Activity, etc.
- **Logistics Automation**
  - AI enhancements of WINGS platform for efficient handling of freight transport
  - Route optimization/congestion reduction
- **Fleet Monitoring and Safety**
  - Carbon footprint and air quality monitoring
  - Fire detection and early warning/ alerting
  - Vehicle Performance and Status
  - Ability to process heterogeneous data (e.g., from Galileo localization trackers, IoT sensors for cargo status such as vibration, temperature, humidity, etc.)



5G-TERRA: 5G infrastrucTure and sERvices foR public interest and sociAl inclusion



5g terra

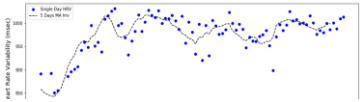


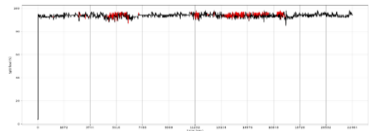
- ☐ Expansion of COSMOTE's 5G network with almost **50 new 5G base stations,** for rural and sparsely populated areas in Greece, as shown on the map.
- ☐ Activation and demonstration of advanced use cases such as **Health, Education, Civil Protection,** utilizing the new 5G infrastructure.

5G-TERRA project has received funding under grant agreement No 101133544.

5G-SHEAL – 5G- enabled Surgery Planning with Holograms and Educational Streaming for NKUA Aretaieio HospitaL

- The project will deploy a **5G Mobile Private Network (MPN) based on 5G-SA technology**, along with the required upgrades in the backhaul equipment, antennas and links to the rest of the OTE network, supporting exclusively and only the needs of the **ARETAIEIO University Hospital** operating rooms, Surgical Wards, Education centre and Radiology-Radiotherapy Departments, providing 5G coverage, high capacity, reduced latency, and high reliability mobile services.
- The network will be accessible only by the users/devices (e.g. VR/XR glasses or smart wearable devices) equipped with designated SIM provisioned cards.
- Use Cases in scope:
  - **Patient Monitoring:**
  - **Surgical Planning:**
  - **Oncology Imaging in Operating Rooms:**
  - **Surgical residency core training:**
  - **Medical Students and Patients education**

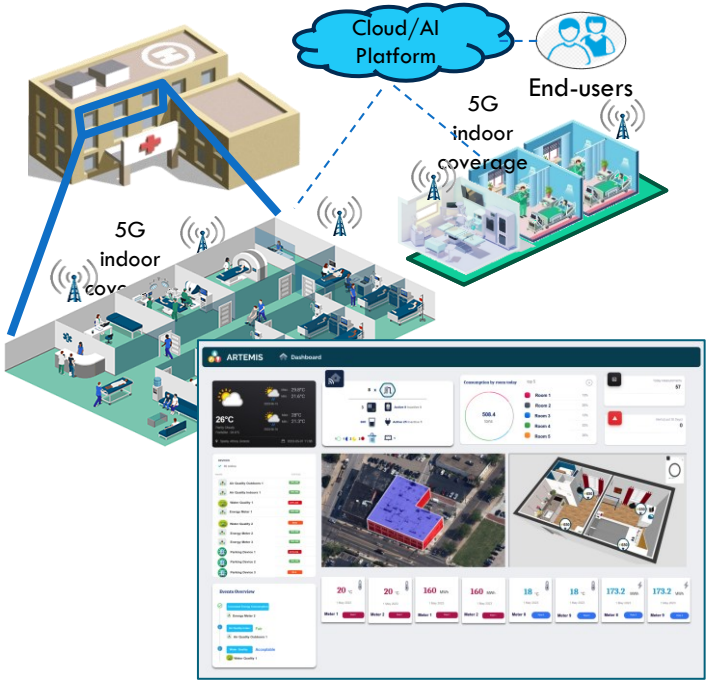




Requirements: 24/7, Indoor Coverage, Capacity, Latency, Security of data

5G-TRACE - 5G-based TRAnsformation of a CanCEr Hospital to support patients' treatment in a "home like" environment

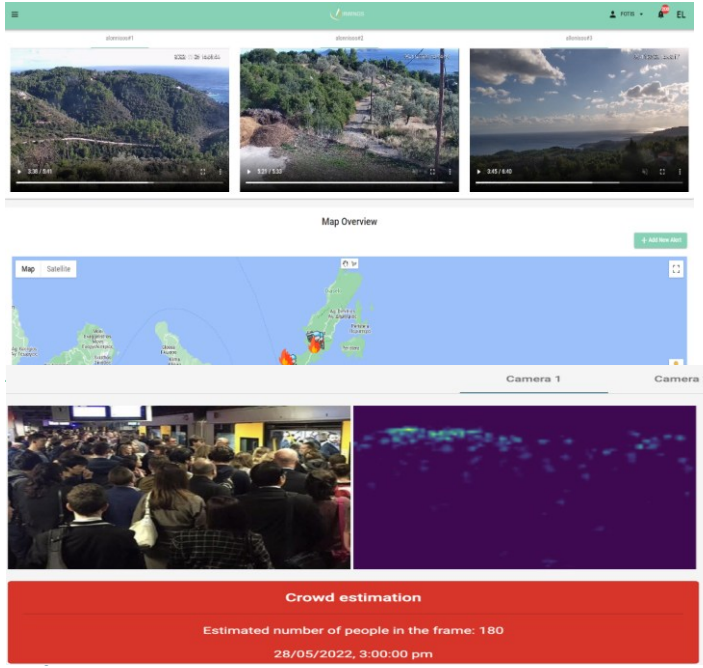
- The project will build **5G Mobile Private Networks (MPNs)** to provide indoor connectivity at two locations of cancer healthcare facilities in Thessaloniki, Greece, the main medical centre **Theageneio Hospital** and a separate and remote home-care unit, **Nikos Kourkoulos.**
- The new networks will be validated through innovative and demanding **patient monitoring** and **medical diagnosis services** use cases:
  - patient vital signs' remote monitoring,
  - remote support of rescuers and/or first-aid providers from doctors,
  - remote advice of doctors to patients through conferencing tools,
  - fusion and analysis of signals,
  - personalized notifications
- Furthermore, **Smart and Green applications for building facilities** will be validated, which are monitoring the hospital environment through **AI analytics** by processing data from **smart sensors** for parameters such as consumption and level of heating oil tanks, **electricity metering & drinking water consumption monitoring** and **smart air quality measurement systems.**

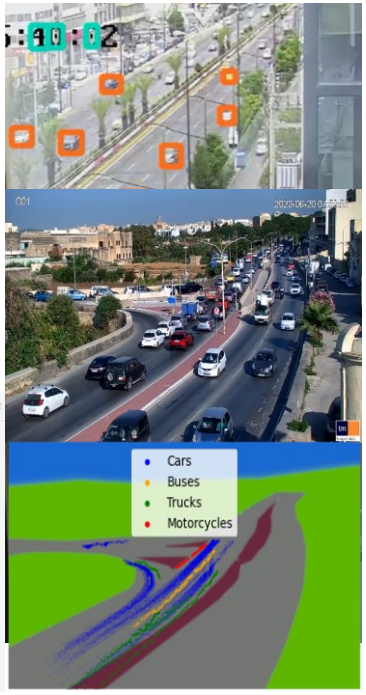


Digital Transformation of Cities

Covering all important factors for liveability

- **Air, Environment** / **Civil** Protection, **Water** / **Energy** / **Gas, Transportation** optimization, Culture, Education, **Health** / **Wellness** aspects
- Products engaged: wi.BREATHE, wi.SENSE, wi.LIVE, wi.MOVE, wi.CARE+





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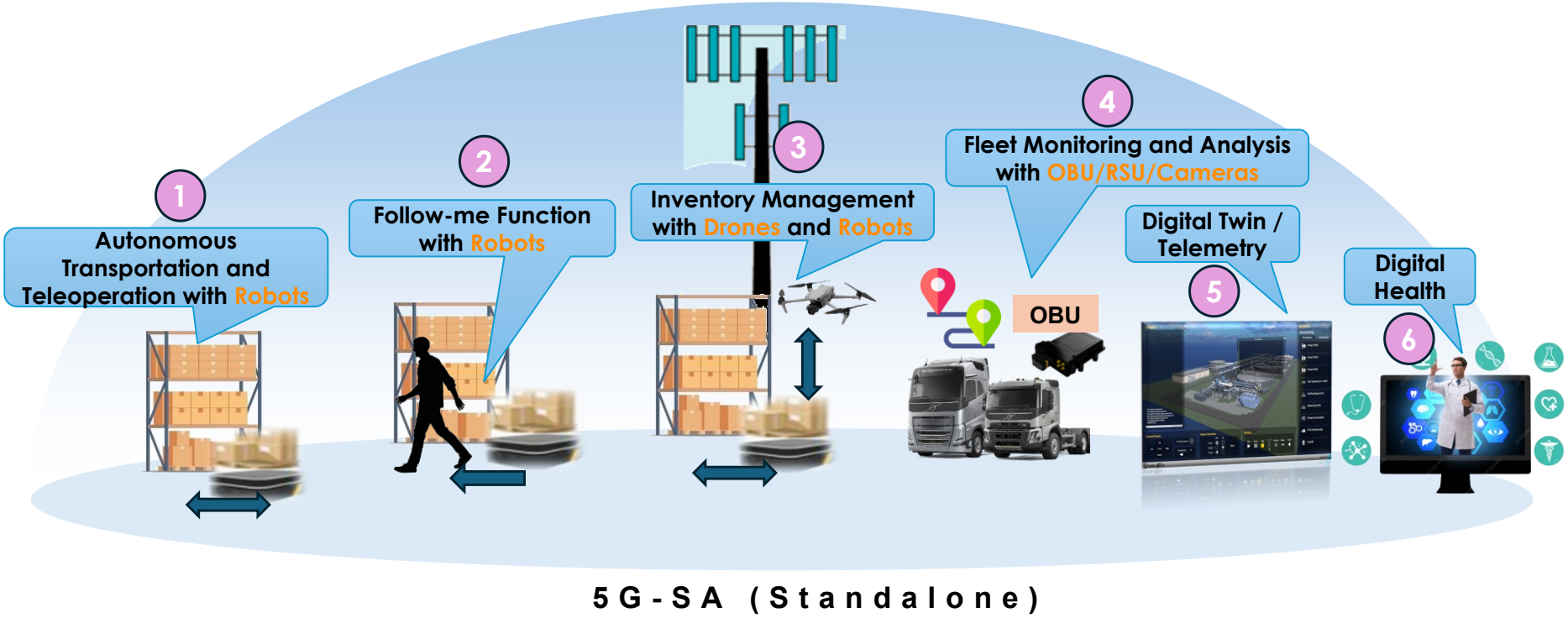
INNOVATION FOR SUSTAINABILITY AND GROWTH

We develop the technology of tomorrow to improve our cities today

5G-SA Use Cases examples for Manufacturing/Logistics

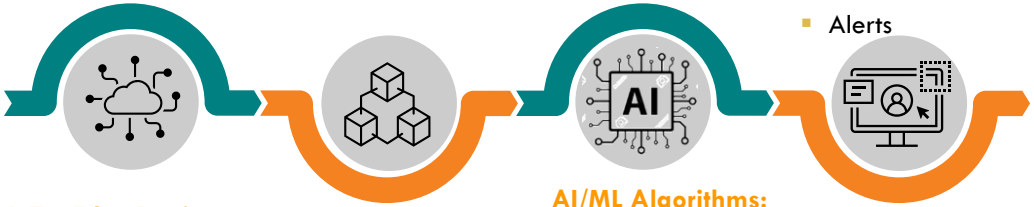


wi.BREATHE-air

Motivation: "… improving **Air Quality** can deliver substantial health benefits; reducing air pollution levels means reducing premature deaths and diseases from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma … ", link, WHO, 2017

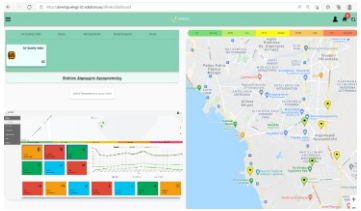
Scope - Monitoring:
- 15+ **Air quality** params
- **Health** hazards

Dashboard capabilities:
- Predictive Analytics
- Geospatial Data Visualization
- Device Management
- Alerts

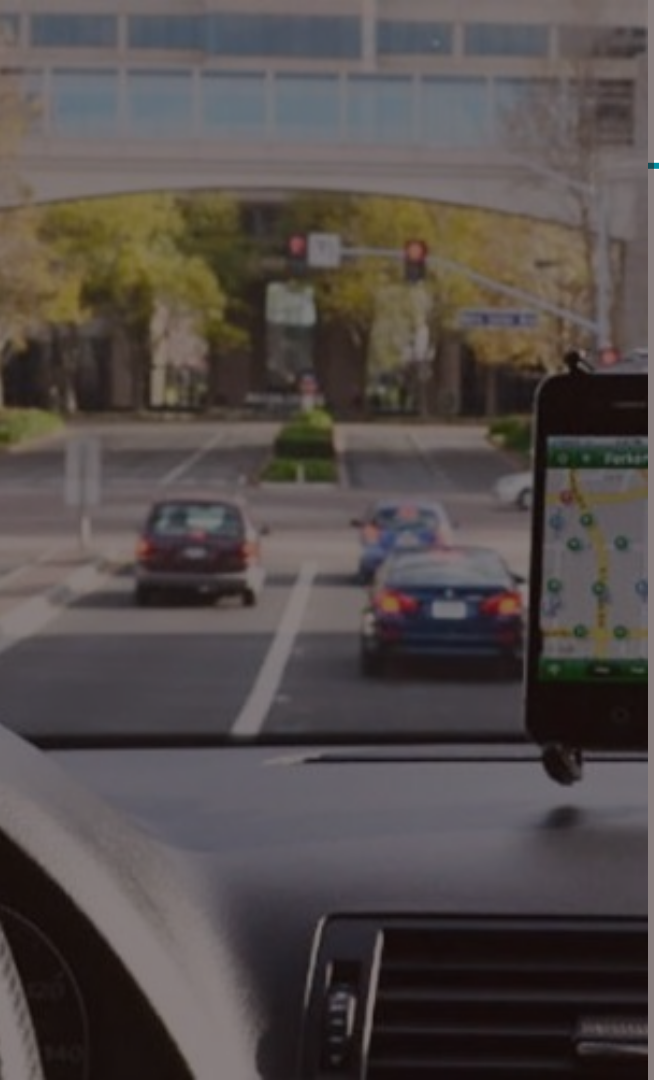


IoT – Edge Devices:
- **Sensors**
- **Weather Stations**
- **Solar radiation**
- **EMF**

AI/ML Algorithms:
- Monitoring
- Forecasting
- Risk prediction
- Notifications and alerts



APPLICATION AREAS:
- **Indoor**: Noise, Temperature, Humidity, CO/CO_2, VOC, O_3, NO_2, PM1/2.5/10
- **Agriculture**: Weather, Solar radiation, other outdoor parameters
- **Livestock**: Temperature, Humidity, NH_3, CO_2, H_2S
- **Industry/Mining**: Noise, Temperature, Humidity, Air particles, specialized ones



wi. MOVE

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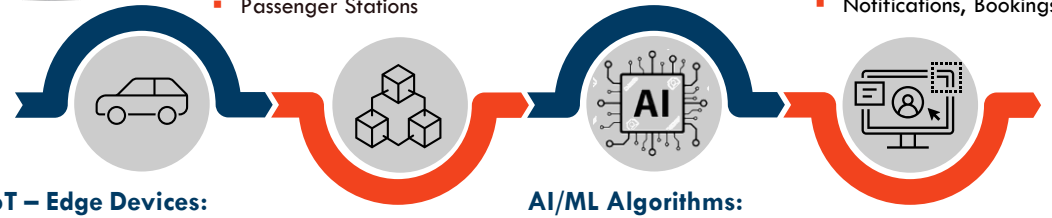
Scope - Monitoring:

- Infrastructure and Traffic
- Vehicle Stations (Parking / Charging), …
- Passenger Stations

Dashboard capabilities:

- Geospatial Data Visualization
- Predictive Analytics
- Notifications, Bookings, Allocations

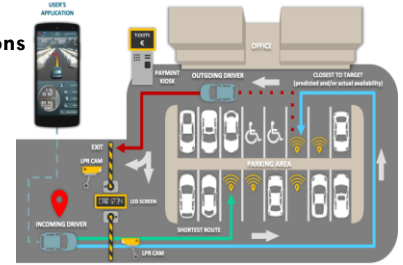


IoT – Edge Devices:

- **Sensors, Cameras, Drones**
- **Roadside units (RSUs),**
- **Vehicle mounted cameras**
- **Supplementary sources, including user applications**

AI/ML Algorithms:

- **Structural Health**
- **Traffic Analysis, Violations**
- **Occupancy Predictions, Bookings**
- **Passenger Flows**
- **Vehicle status**



APPLICATION AREAS:

1. **Infrastructure:** Structural health, Traffic levels
2. **Stations: Vehicles** (parking, charging), **Passengers** (crowd flow), **Ships**
3. **Vehicles:** Maintenance, Environmental sensors

wi.CARE+

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Data Analysis
Prediction
Data Ingestion
Data Management
Decision Making

Dashboard
(Patient View)

- Real-time vital signs monitoring & predictions
- Video Conference with doctors
- Notifications/Alerts
- Data download

Dashboard
(Doctor View)

- Patients on a single page & on the map
- Real-time vital signs monitoring & predictions
- Video Conference with patients
- Notification/Alerts management
- Live-Streaming/Remote Support
- Ultrasound Images (DICOM)
- Data download

Wearable devices

Patients

Real-time vital signs monitoring (ECG, Blood pressure, SpO2, GPS, etc.)

Home

IoT and AR devices

Ambulance

Paramedic

Live video streaming with remote doctor and ultrasound images for quicker and more confident clinical decisions

Hospital

Healthcare Professional

Better management of cardiovascular, neurological, chronic and other diseases

Thank you

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