Senstate

PRESENTATION

Next generation Life 4.0 and environmental solutions
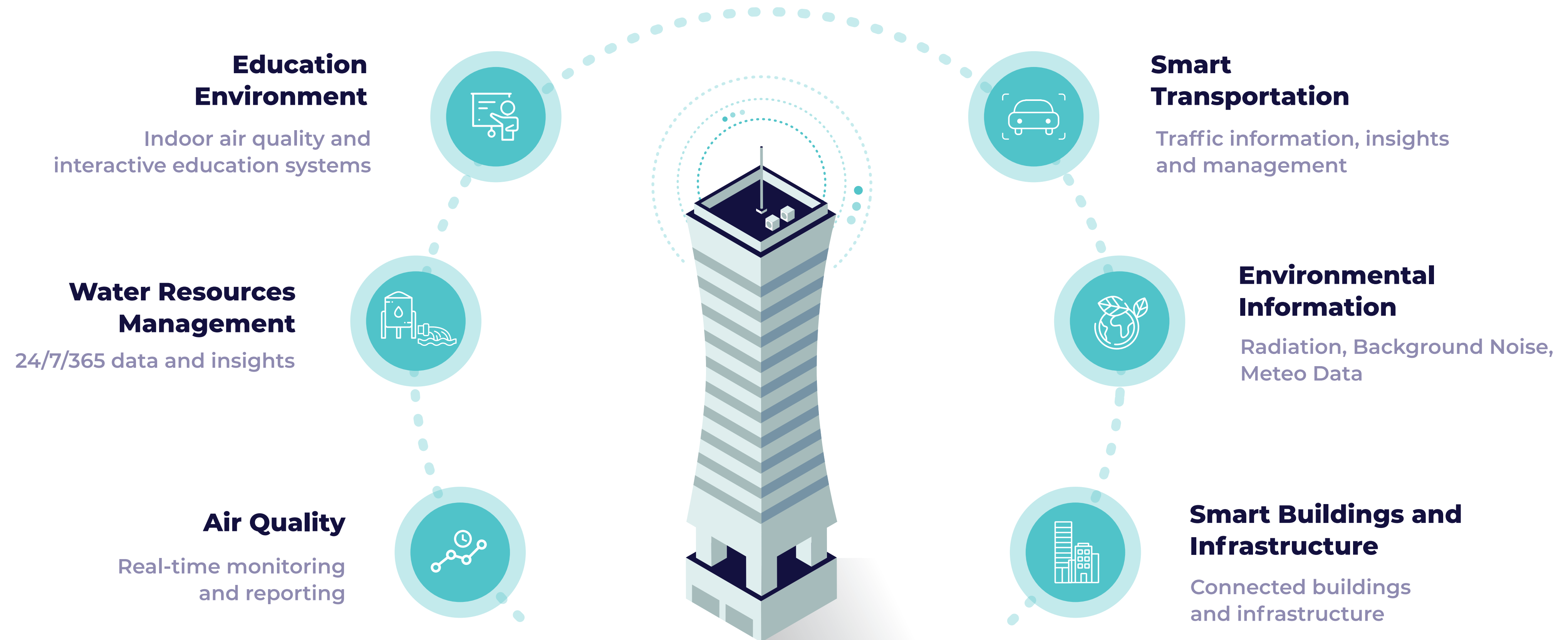
Senstate Technologies
www.senstate.com

First of a kind solution

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FULLY CENTRALIZED, NEXT GENERATION SOFTWARE INFRASTRUCTURE OF SERVICES AND APPLICATIONS
FOR COMPLETE MANAGEMENT OF SENSORY NETWORKS AND CITY'S DATA

Education Environment

Indoor air quality and interactive education systems

Smart Transportation

Traffic information, insights and management

Water Resources Management

24/7/365 data and insights

Environmental Information

Radiation, Background Noise, Meteo Data

Air Quality

Real-time monitoring and reporting

Smart Buildings and Infrastructure

Connected buildings and infrastructure

Senstate IntelligentCity IT Infrastructure

Modern centralized system for managing city's sensory networks

Intelligent City Platform

Senstate

MODERN SAAS PLATFORM FOR THE USE OF ALL STAKEHOLDERS IN THE INTELLIGENT CITIES OF THE FUTURE:
URBAN PLANNING EXPERTS, ENVIRONMENTAL SPECIALISTS, RISK MANAGERS, CITY MANAGEMENT AUTHORITIES

Distinctive Features

Rich dashboards

For visualizing variety of environmental data for cities

AI Trend Detection

For getting insights that cannot be detected in other ways

AI Anomaly Detection

For immediate actions and early event notifications

Events and Alerts

To allow instant notifications in case of pollution or anomalies

Powerful Data Analytics

To visualize data in the form of charts, diagrams and datatables

Open Data Access

To allow the building of third-party solutions with city's data in their core

Platform Technologies

AI (Artificial Intelligence) models for correlation analyses, trend identification and prediction

Modern multi-platform scalable service-oriented architecture

Distributed data endpoint concept to allow ultra-fast data access and high reliability

Open APIs for building third-party solutions

M2M (Machine-to-machine) communication technology and device interaction protocols
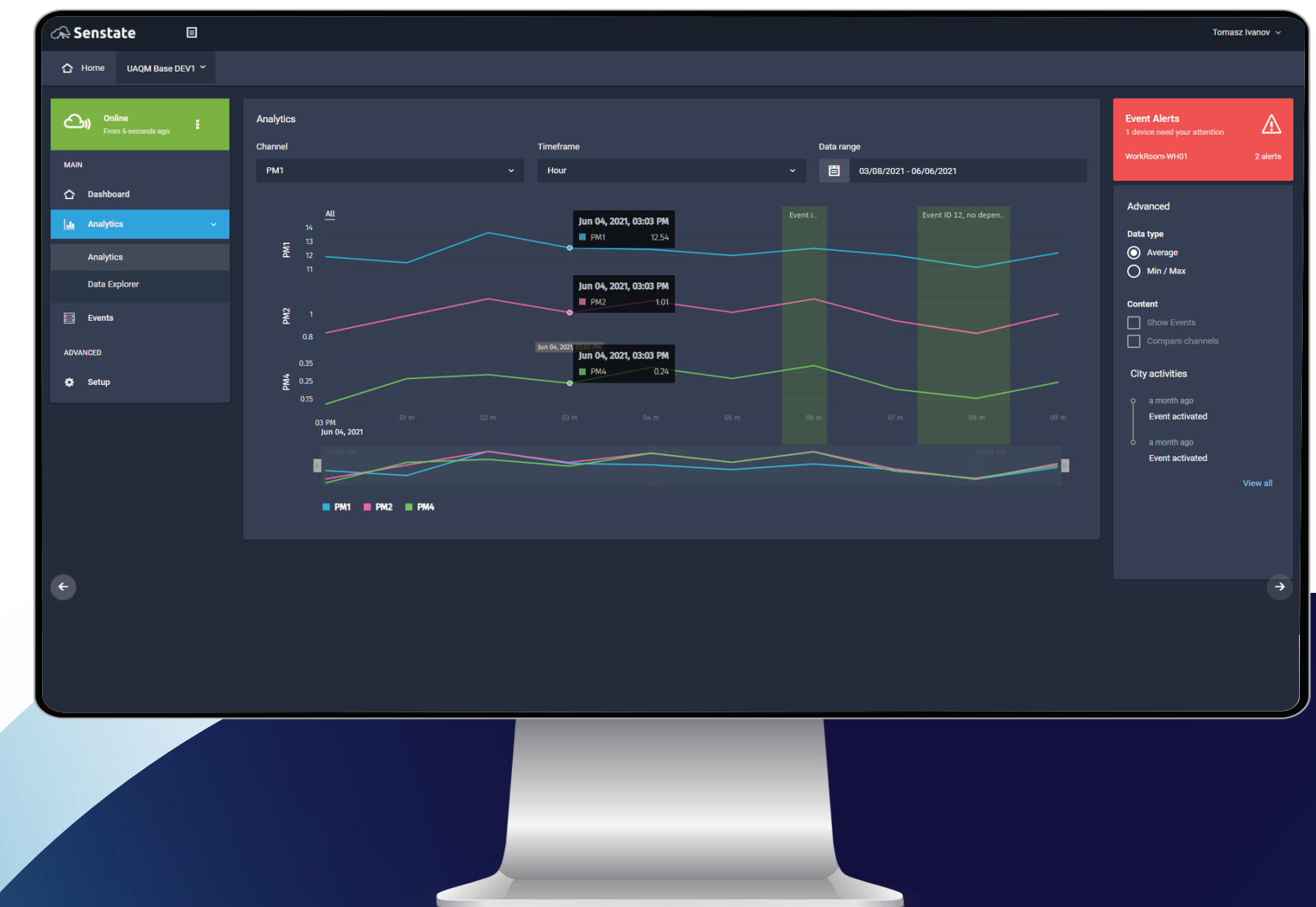
Dedicated Management System

Senstate

SYSTEM FOR COMPLETE MANAGEMENT OF INTELLIGENT CITY'S NETWORK OF DEVICES, USERS, DATA INTEGRATIONS AND SERVICES

City's Digital Assets

IoT and sensory devices

City's connected services

City's digital ecosystem

Next generation software infrastructure

www	Public applications mobile apps	Services

Data endpoint

Retrieval Service

Data Proccessing Service

Submission Service

Public Cloud Service

Event Service	Identify Service	Control Service
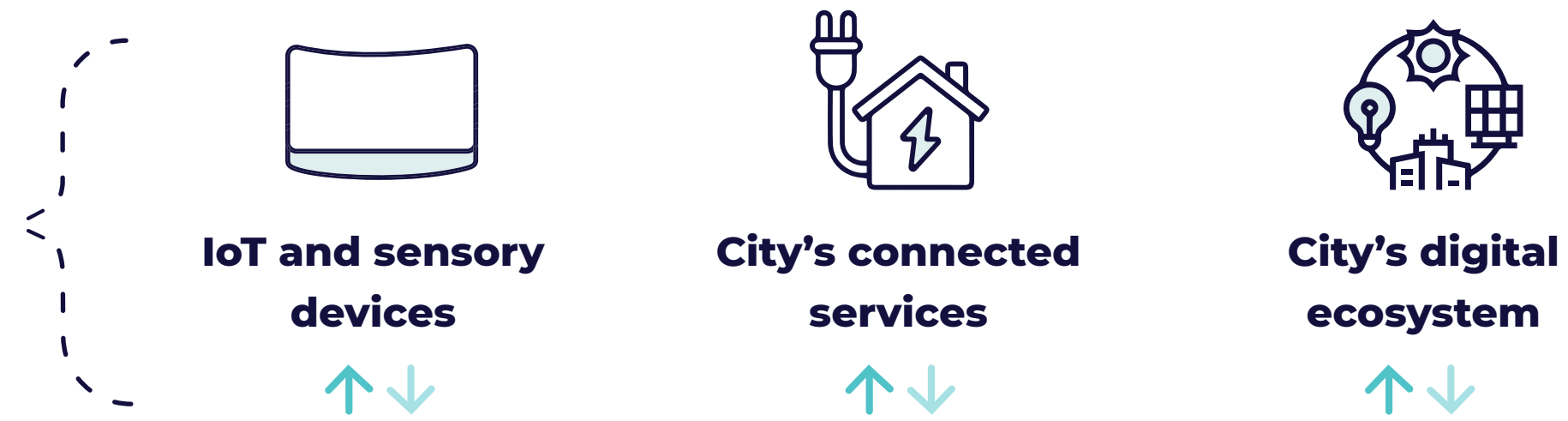
Manage all cities sensory networks in one platform
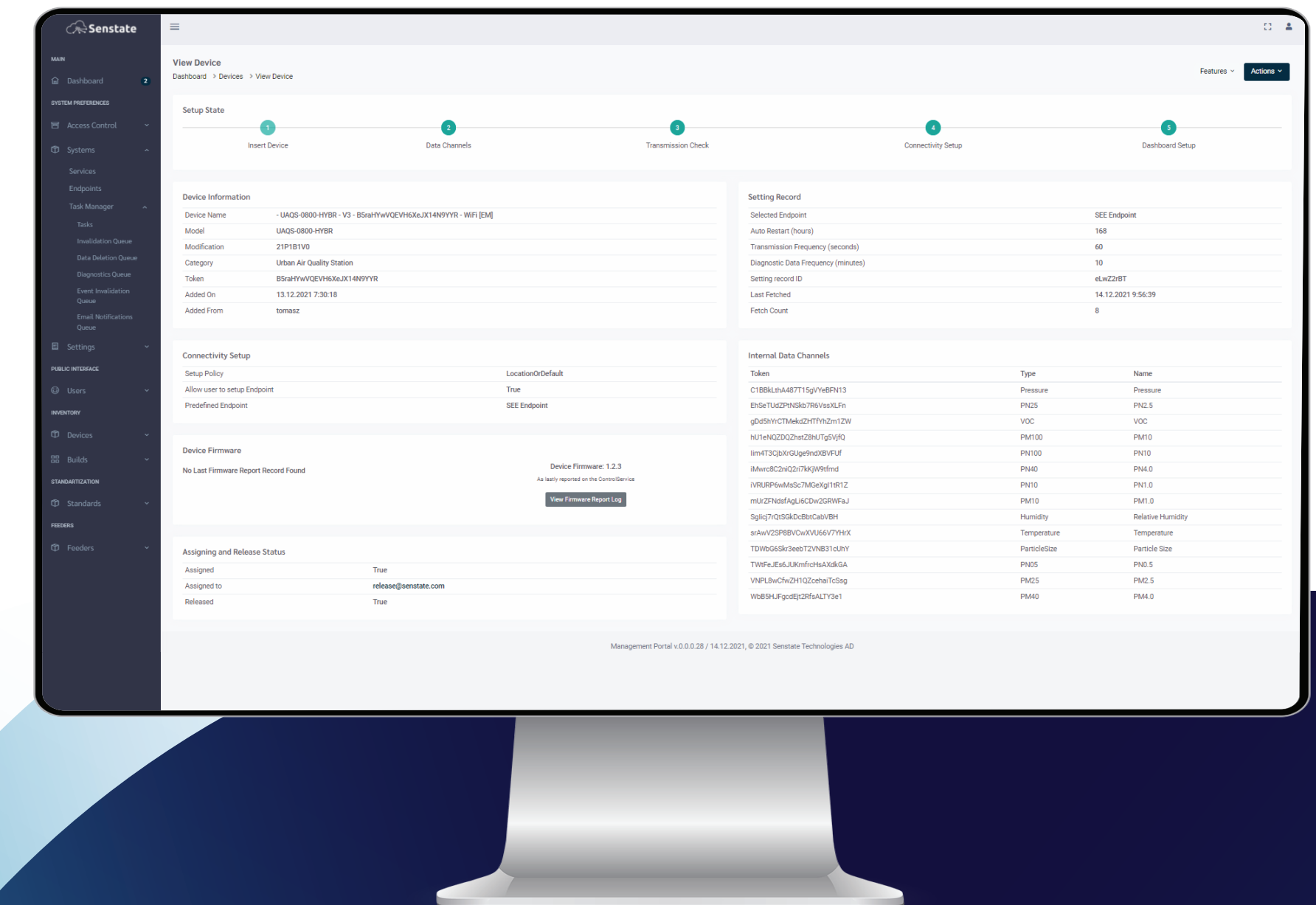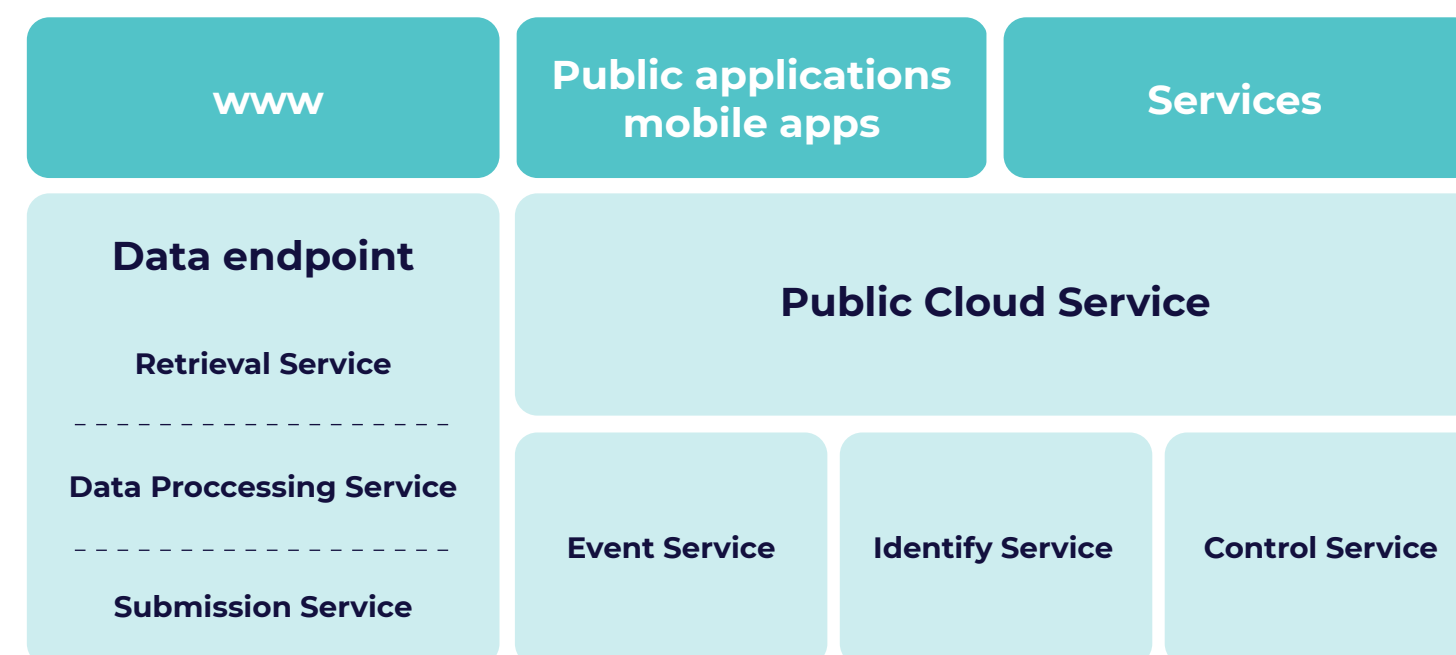
Urban Air Quality Monitoring

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COMPLETE SOLUTION FOR MONITORING OF AIR QUALITY IN CITIES

PRECISE SENSOR SYSTEM IN FULL COMPLIANCE WITH EUROPEAN AIR QUALITY REGULATIONS, PROVIDING INSTANT REAL-TIME INFORMATION ON POLLUTION LEVELS ACCORDING TO THE ADOPTED DIRECTIVES, AS WELL AS CALCULATION OF THE EUROPEAN AIR QUALITY INDEX.

Increasing awareness about the Air Quality problems. Supporting the creation of an innovative and digital ecosystem through public data interfaces and cloud services.

Urban environment
Monitoring of neighborhoods, central part and intersections to identify problematic areas

Schools and kindergartens
Monitoring the quality of the outdoor air and the air in the classrooms

Industrial zones
Indetification of pollution in industrial zones and parks

Parks and green areas
Monitoring of green areas, create engagement thanks to outdoor monitors for informing the citizens

Air Quality Statiation
Senstate UAQS

- Precise sensor system in full compliance with European regulations
- 24/7 real-time monitoring
- Cloud based data visualization and data analysis system

Gases Detection	
Particulate Matter Detection	
Background Noise Monitoring	
24/7 data in real time	

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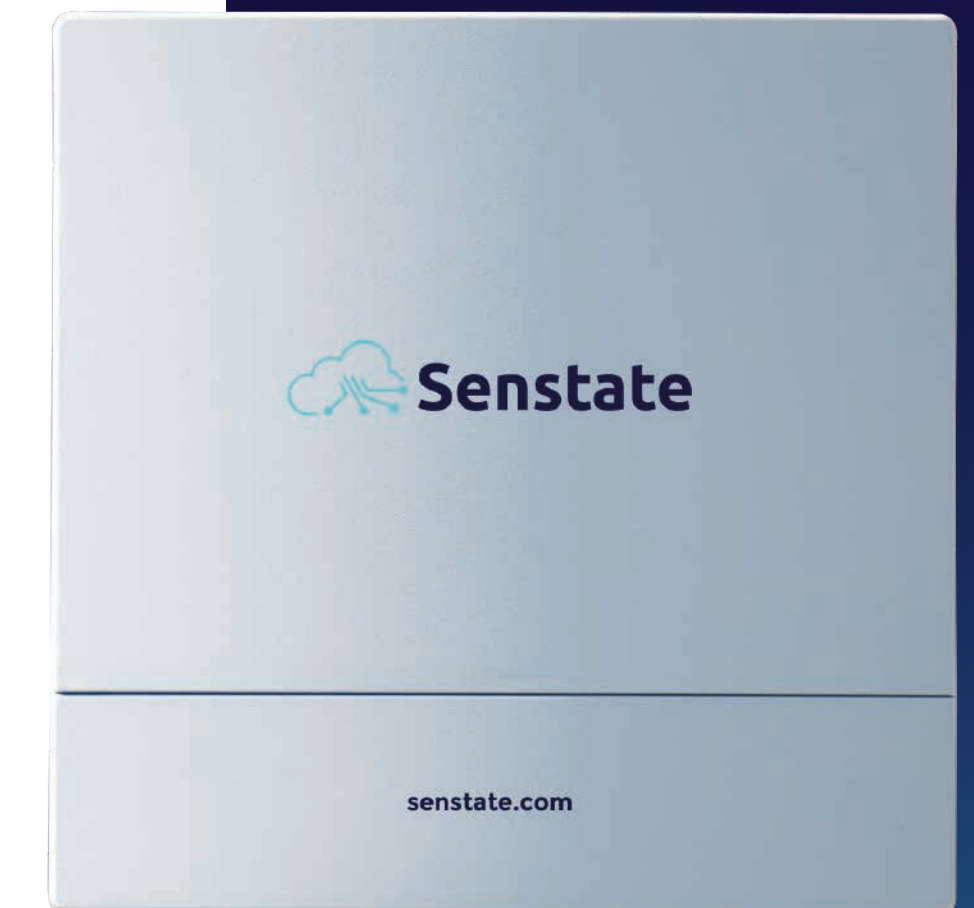
Benefits

- Obtaining comprehensive information on air quality
- Informing the population in case of increased pollution rates
- Immediate identification of pollutants and areas with increased pollution
- Creating a sense of security and awareness among citizens

- Increasing the interaction between citizens and the municipality
- Identification of periods of anomalies or increased pollution
- A significant step in implementing zero-emission policies

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Track and localize air pollution to continuously verify compliance with the EU and WTO regulations and guidelines. Show you are a responsible city taking advantage of the latest technologies to ensure the health and well-being of citizens.

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Water Resources Monitoring

COMPLETE SOLUTION FOR WATER QUALITY AND WATER LEVEL MONITORING

INTEGRATED REAL-TIME WATER QUALITY MONITORING SYSTEM FOR RIVERS, LAKES AND DAMS.
WATER LEVEL MONITORING AND EARLY FLOOD RISK OR LOW LEVEL IDENTIFICATION

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The management of water resources in cities is essential for the ecological, economic and social development of the territories. Statistics show that by 2030, the world will 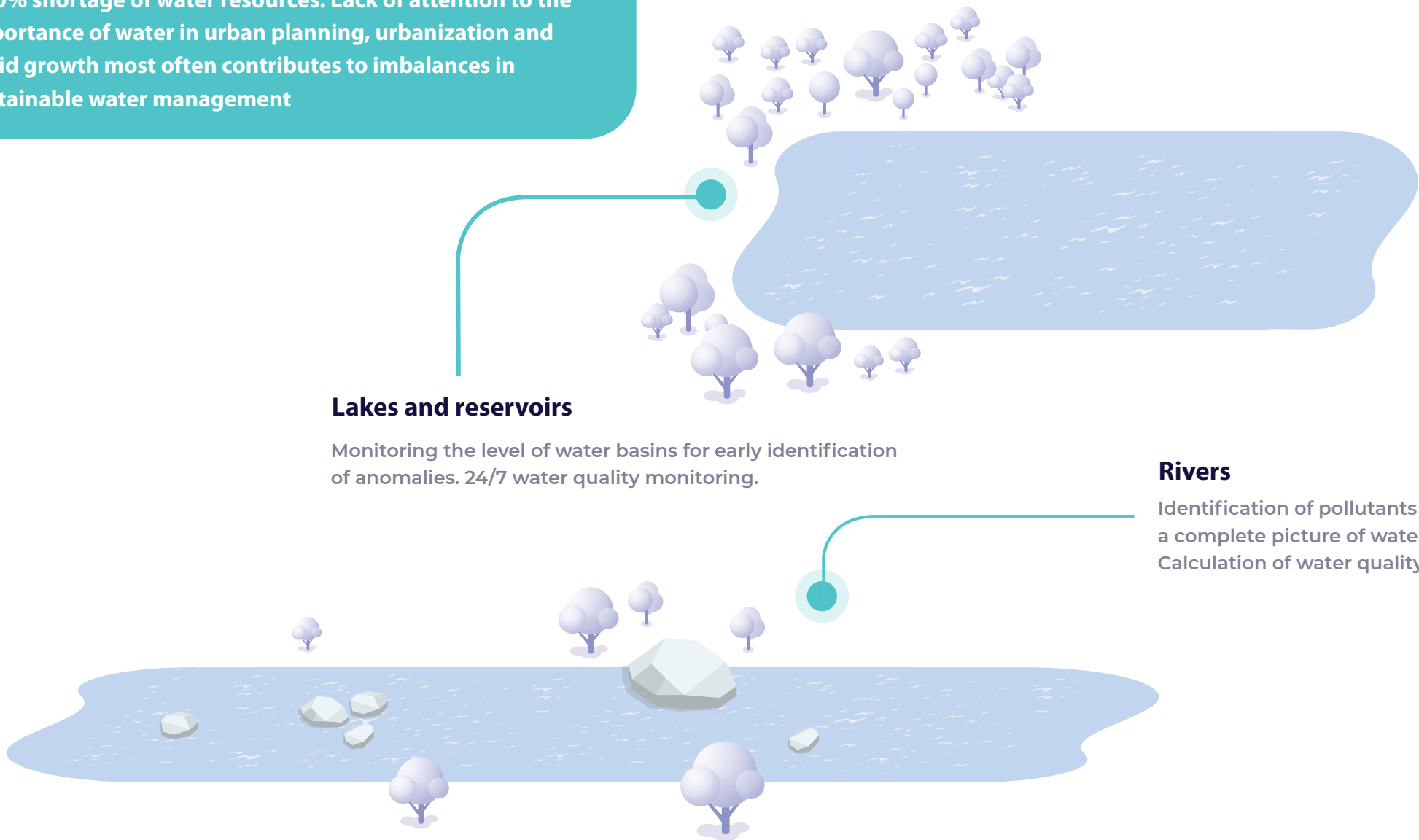have a 40% shortage of water resources. Lack of attention to the importance of water in urban planning, urbanization and rapid growth most often contributes to imbalances in sustainable water management

Lakes and reservoirs

Monitoring the level of water basins for early identification of anomalies. 24/7 water quality monitoring.

Rivers

Identification of pollutants and obtaining a complete picture of water quality. Calculation of water quality index.

Water Quality Monitoring Station **Senstate WQMS**

- ✓ Precise sensor system for measuring the main parameters of water quality
- ✓ Ultrasonic technology for monitoring the level of water basins
- ✓ 24/7 real-time data and cloud-based tools for data analysis and visualization

Real-time measurement of parameters like pH, ORP, Conductivity, Turbidity and others.

Permanent or mobile measurement by relocation

Real-time basin level monitoring with ultra-precise sonar technology

Water quality Index

Early identification of anomalies

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Benefits

- ✓ **24/7 water quality information**
- ✓ **Precise and instant localization of subjects of pollution**
- ✓ **Real-time data on water level**
- ✓ **Early identification of flood or drying risks**
- ✓ **Statistics for the purposes of more effective water resources management**
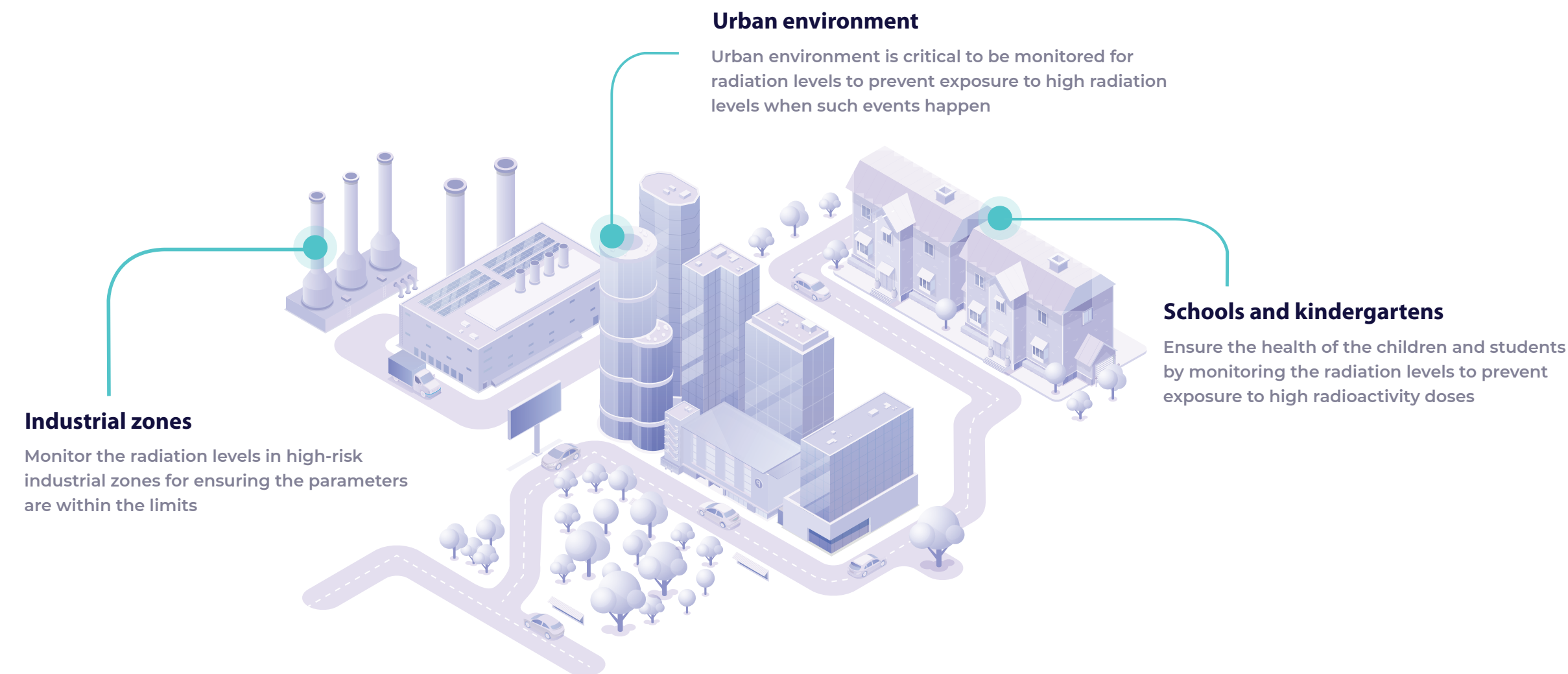
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Acquire an essential water resource monitoring system for achieving effective and sustainable management of the water resources in the city and implement modern solution for early warning of risks.

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Environmental Radiation Monitoring

COMPLETE SOLUTION FOR MONITORING RADIATION LEVELS IN INDOOR AND OUTDOOR CONDITIONS

REAL-TIME MONITORING OF ENVIRONMENTAL RADIATION FOR RADIOACTIVITY DETECTION AND EARLY WARNING OF RISKS

Senstate

Urban environment

Urban environment is critical to be monitored for radiation levels to prevent exposure to high radiation levels when such events happen

Schools and kindergartens

Ensure the health of the children and students by monitoring the radiation levels to prevent exposure to high radioactivity doses

Industrial zones

Monitor the radiation levels in high-risk industrial zones for ensuring the parameters are within the limits

Background Radiation Monitor
Senstate BRM

✓ Precision radiation detection

✓ 24/7 real-time monitoring

✓ Cloud based data visualization and data analysis system

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Municipality

Radiation level
0.100 μSv/h

Normal Level

Last data from: March 9, 2022, 14:22h

The control of the radiation state of the environment is performed with a modern sensor system, which detects beta radiation (electrons), gamma radiation (photons) and X-rays in real time.

24 hours history data

Early warning and public data reporting

Use the build-in features for alarms and events in the Cloud system to instantly notify the respective users about reaching predefined radiation levels or integrate with any third-party systems through our API.

Use Open Data to implement public data reporting in environmental portals, web apps, live maps or build simple widgets that can be used in websites or interactive dashboards.

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Ensure the safe environment conditions of the population and track the radiation dose in compliance with the radiation safety regulations. Detect instantly anomalies or high radiation levels to react instantly on any risks related to radiation pollution.

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Background Noise Monitoring

COMPLETE SOLUTION FOR MONITORING BACKGROUND NOISE IN CITIES

MONITOR AND LOCALIZE NOISE POLLUTION IN THE URBAN AREAS, TRACK COMPLIANCE WITH
THE REGULATIONS AND KNOW THE NOISE PROFILE IN THE CITY

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Urban areas

Localize and track peak level in the urban environment to take
effective measures to reduce the high noise level in the
problematic areas

Parks and green areas

Monitor the noise levels in parks and green areas
to ensure environment is healthy and appealing
for the citizens

Residental areas

Monitor the noise level in residential areas to ensure
regulation compliance and citizen well-being

Background Background Noise Monitor
Senstate BNM

✓ Precision noice detection

✓ 24/7 real-time monitoring

✓ Cloud based data visualization and
data analysis system

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Benefits

✓ Know the noise profile in any location of the city for accumulating knowledge for more
effetive policies and measures in the field of urban planning

✓ Detect annomalies and violations to react quickly and take measures

✓ Create engagement in citizens by broadcasting real-time noise data in your municipality's
website, on public maps or other apps

✓ Track comliance of local and national regulations for the noise levels to ensure your city
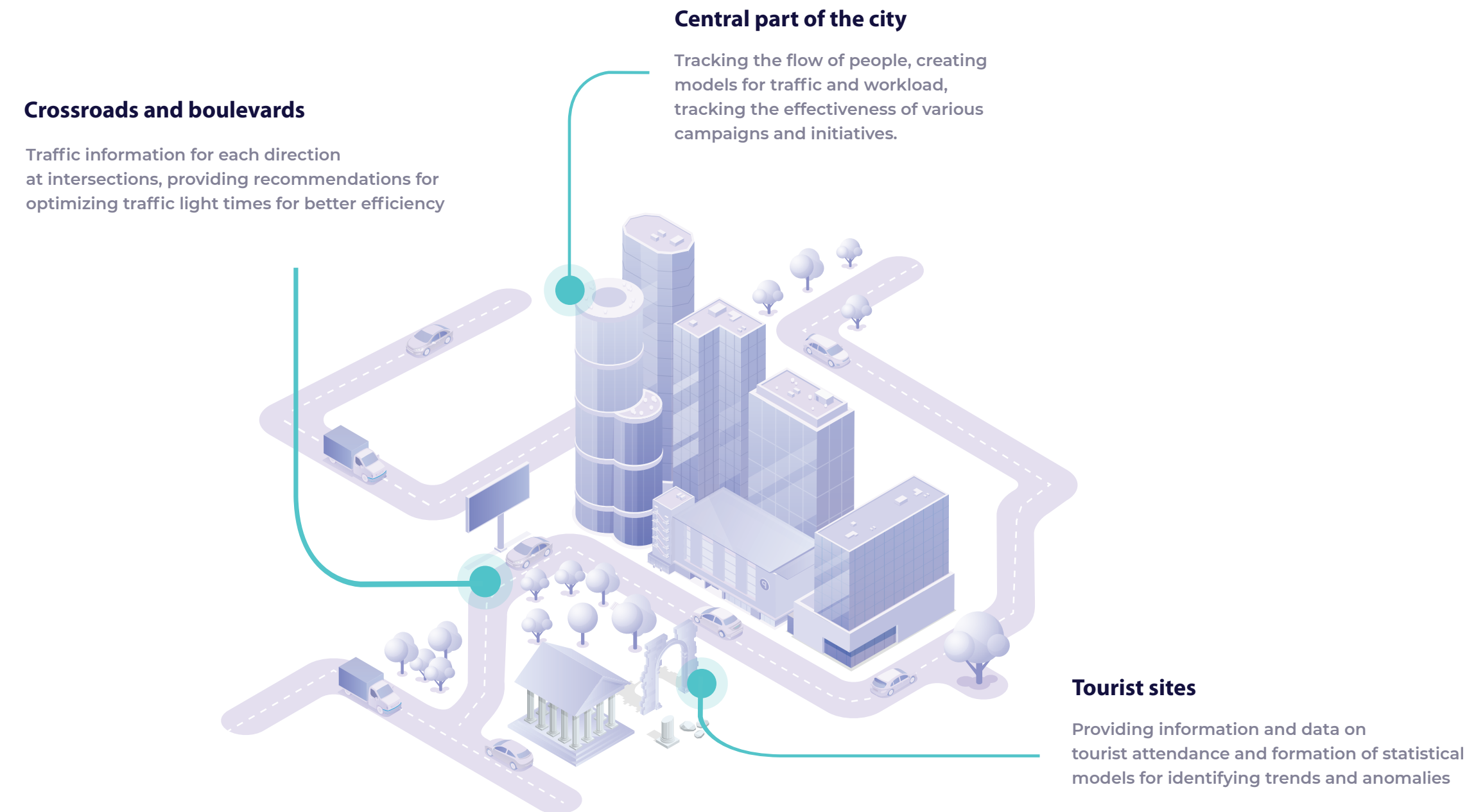has adopted all required measures to be in sync with the policies

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Monitor the noise levels in urban areas, parks and green areas and residential areas to ensure compliance with the regulations. Create noise maps and identify problematic areas to fight high environmental noise levels with policies and measures.

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Intelligent Traffic

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COMPLETE SOLUTION FOR MONITORING OF THE TRAFFIC PROFILE IN URBAN ENVIRONMENTS

COMPREHENSIVE MONITORING OF THE WORKLOAD PROFILE WITH SUBJECTS FROM THE TRAFFIC ENVIRONMENT - BICYCLES, CARS AND TRUCKS, PEDESTRIANS AND PUBLIC TRANSPORT FOR THE PURPOSES OF MORE EFFICIENT URBAN PLANNING AND DATA DRIVVEN DECISION-MAKING.

Crossroads and boulevards

Traffic information for each direction at intersections, providing recommendations for optimizing traffic light times for better efficiency

Central part of the city

Tracking the flow of people, creating models for traffic and workload, tracking the effectiveness of various campaigns and initiatives.

Tourist sites

Providing information and data on tourist attendance and formation of statistical models for identifying trends and anomalies

Edge Station for Intelligent Trafffic **Senstate IETS**

- ✓ EDGE technology for real-time video image analysis
- ✓ Detection and traceability of traffic objects
- ✓ 24/7 real-time data and cloud-based tools for data analysis and visualization

### Which are the traffic profile elements/actors
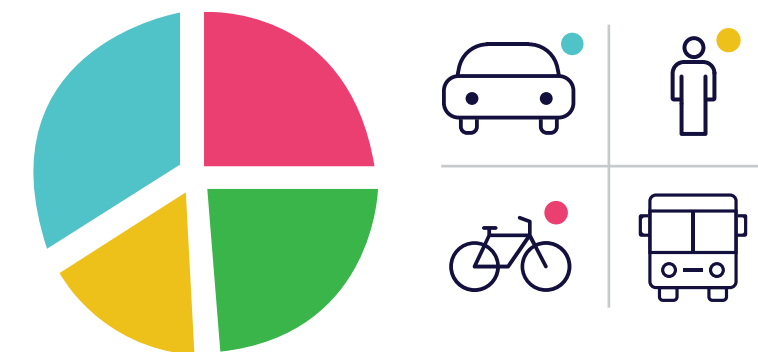
Statistical data in different sections: by days, by hours of the day, by periods of the year, during events, etc.

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Benefits

- ✓ Obtaining comprehensive information about the traffic load profile
- ✓ Identification of places with a conflict profile and identifying trends
- ✓ Accumulation of statistical data for all objects in the traffic
- ✓ Better urban planning decisions
- ✓ Better investment decisions
- ✓ Optimization of traffic light systems and traffic restriction systems
- ✓ Signi cant innovation in line with the trend for digitalizaiton of cities and industries

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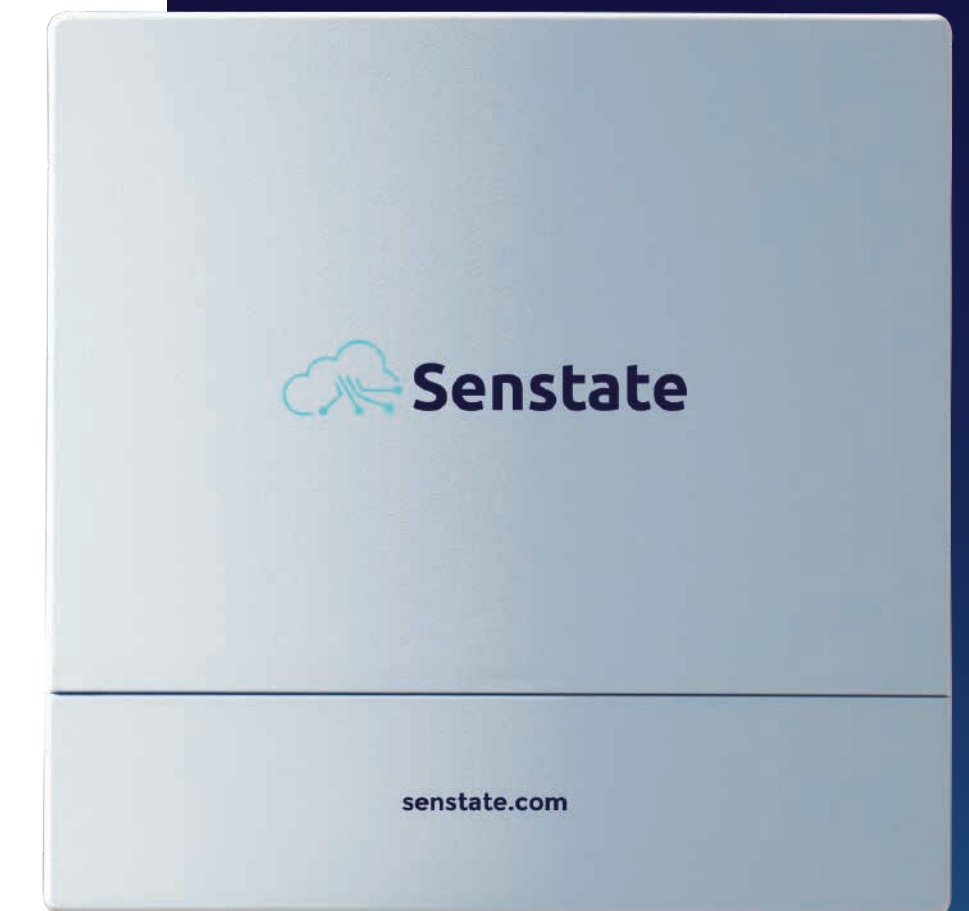
Intelligent traffic solutions contribute to efficiency and security in urban environments, as well as provide relevant information for better governance and environmental protection policies and decisions.

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Creating engagement in citizens

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MOBILE APPS, LIVE DASHBOARDS AND OTHER INTERACTIVE TECHNOLOGIES FOR
CREATING ENGAGEMENT IN CITIZENS

✓ **Modern apps for visualizing any city's data**

✓ **Keeping citizens engaged with real-time information**
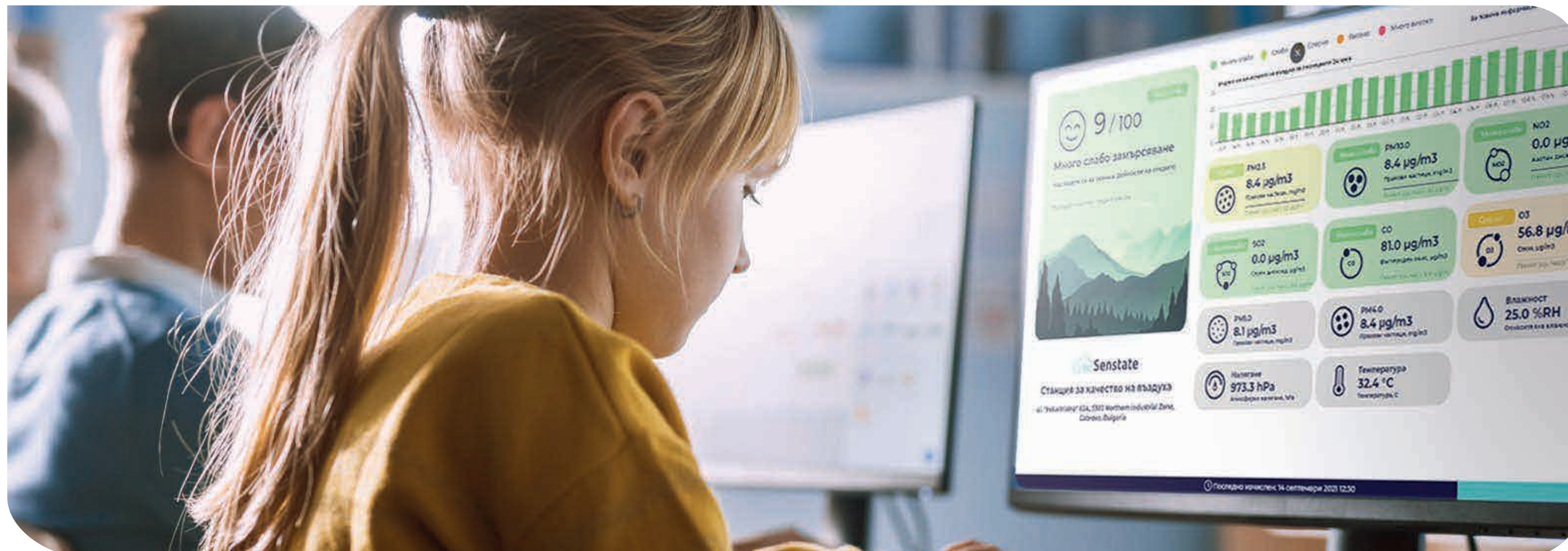
✓ **Creeating social engagement among all groups**

✓ **Best praactices of using digital technologies for making people's life better**

Live broadcasting of smart city information on any type of indoor or outdoor displays for creeating informational societies and keep citizens in sync with city's activities, status of the environment, transportation availability and many more...
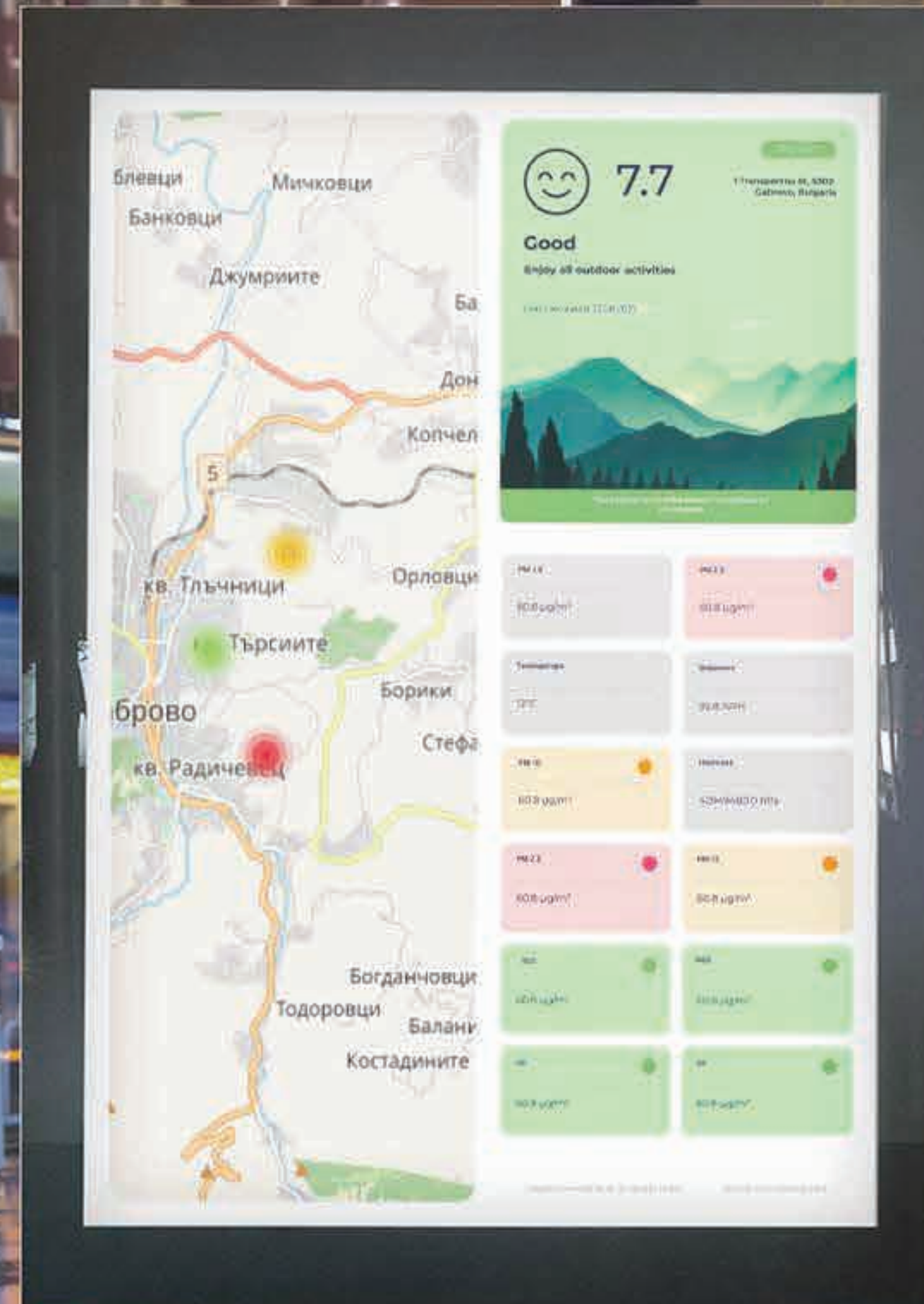
Who we are?

Senstate

A DEDICATED TEAM OF EXPERTS WITH FOCUS IN BUILDING NEXT GENERATION APPS AND DEVICES FOR THE INTELLIGENT CITIES OF THE FUTURE.

Dedicated hardware R&D and manufacturing teams

- Communication technologies:
  WiFi, LoRa, Mobile (LTE, GPRS, 2G, 3G, 4G etc.)

- Architectures: Xtensa, ARM

- Sensory: gas sensors, mics sensors, electrochemical sensors, lidar, radar and sonar components, IR, RFID and many others

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INTERNALLY BUILD SOFTWARE

A fully operational service-oriented infrastructure with servers in Bulgaria, Seoul/South Korea and Frankfurt/Germany. High availability and scalability by using Data Endpoints where devices from the respective area transmit the data and the respectively the users fetch the data from the closest location.

Services, systems and software: Aggregation Service, Retrieval Service, Submission Service, Public Cloud Service, Cloud System, Messaging Service, Control Service, Management System, Open Data Service, Live Data Apps Service, Identity Service and more.

Software team

Databases

- Relational: SQL / MySQL / Postgre

- Key/value and object: Redis, MongoDB

- Light ORM Systems like Dapper

Technologies

- NET, including .NET Core, C++, Python

- MVC, REST & WebAPI, Microservices

- M2M (machine-to-machine) communication, OAUTH & JWT Auth, Identity Server, ML.NET

Project & Software Management

- Git, JIRA

WE CARE ABOUT THE ENVIRONMENT!

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