A Holistic Approach in Implementation of Sustainable Smart Applications

Manthos Papamatthaiou
Senior Product Marketing Engineer
Services Business Division

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We envisage

a smarter connected world where innovative technologies enable life improving services.

Transforming Smart into Genius

Smart City solutions and enablers

Cross-Domain Apps enablement

Unified control & Monetization

Cloud Assurance

Pervasive connectivity

4G · NB-IOT · 5G · Wi-Fi · LoRa · BLE · Z-WAVE · LTE · LTE-M · 3G · LiFi · ZigBee · THREAD

A Smart City with an autonomous, **secure**, user friendly and low cost **"connected" infrastructure** to provide **targeted** services in real time.

Smart Lighting core

Replacement of legacy lighting with advanced energy efficient LED to reduce energy & maintenance costs, and increase illumination quality through:

▶ Intelligent on/off switching - calendar based dimming

▶ Remote Lighting Management

▶ Targeted dimming (event driven)

▶ Optimum energy management

▶ Preventive maintenance based on analytics

Case study in Greek municipality, replacement of 15.000 Street lights

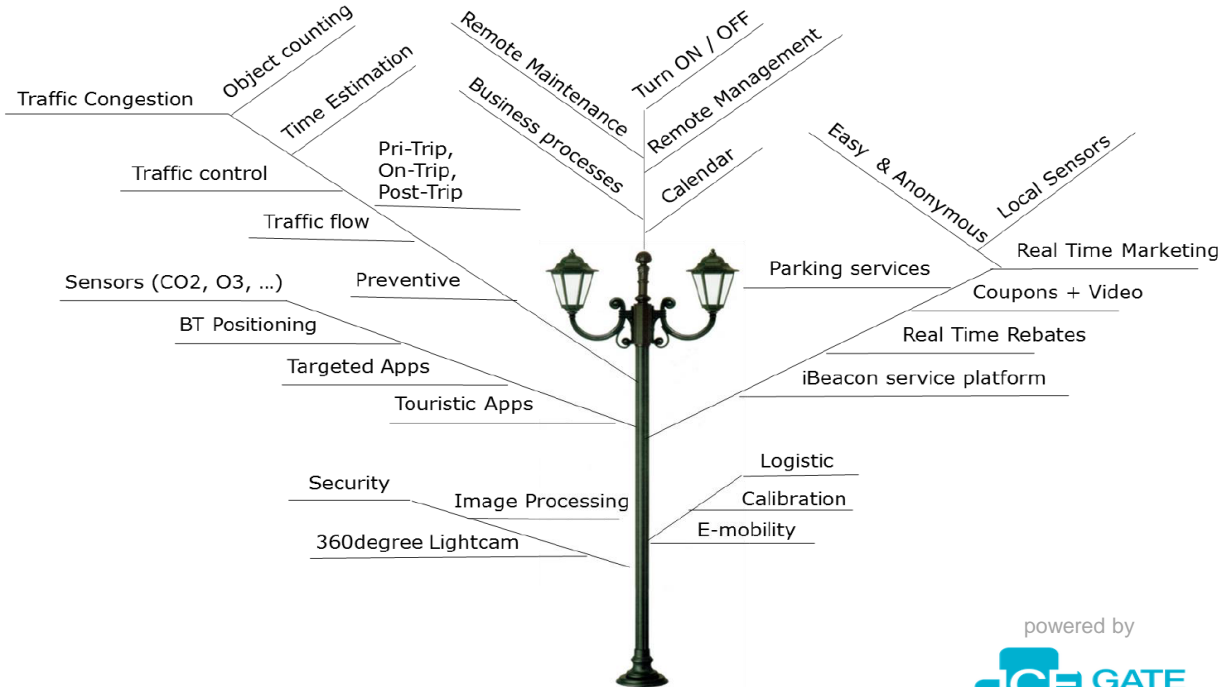| Energy consumption Before (kWh)	Energy consumption After (kWh)	Energy reduction in 12 years on average
49.455.316	12.043.074	75.65%

Energy reduction

CO_2 emissions Before (tonnes)	CO_2 emissions After (tonnes)	CO_2 emissions Reduction in 12y (tonnes)	CO_2 emissions Reduction (%)
56.824	13.838	42.987	75.65%

CO_2 emissions

Smart Lighting extended

The core network to develop smart cities & IoT solutions

- Wi-Fi hotspots
- Location Based Content Push
- People Counting/Traffic Flow
- Traffic Monitoring
- Parking Sensors
- Public Safety - SOS Button
- Remote Area Surveillance
- Air quality & Noise Sensors

Traffic Congestion — Object counting — Time Estimation — Remote Maintenance — Turn ON / OFF — Remote Management — Business processes — Calendar — Easy & Anonymous — Local Sensors — Traffic control — Pri-Trip, On-Trip, Post-Trip — Traffic flow — Real Time Marketing — Sensors (CO2, O3, ...) — Preventive — Parking services — Coupons + Video — BT Positioning — Real Time Rebates — Targeted Apps — iBeacon service platform — Touristic Apps — Logistic — Security — Image Processing — Calibration — E-mobility — 360degree Lightcam

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ICE GATE WAY CONNECTED CITY

Waste Management

- ▶ City authorities alerted for waste collection.

- ▶ Effective waste management in touristic and VIP areas

- ▶ Adaptive collection route planning

  - ▶ Clean urban environment

  - ▶ Traffic minimization

  - ▶ Emissions, maintenance & labor reduction

Ultrasonic technology

Waste sensors

- ▶ Ultrasonic technology compatible with all types of waste (e.g.: plastic, paper, clothes, oil, mixed, etc)

- ▶ Easy installation (on lid)

- ▶ Wireless Connectivity: 3G/4G, Zigbee, LoRa, NB-IoT

- ▶ Long Battery Life, typical 7-10 years

- ▶ Robust Design, IP67, IK10

- ▶ Operating Conditions: -20°C to 70°C

- ▶ Sampling Rate: configurable (20 min default)

Smart Parking – Spot & Area
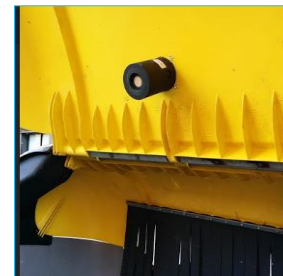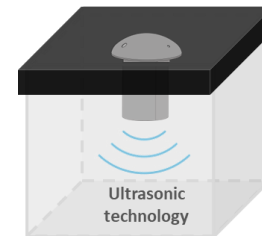
- **Wireless and autonomous** Parking sensors

- Magnetic & Ultrasonic technologies

- **Real time**
  - Detection of the entrance and exit of vehicles
  - Parking spaces **availability** awareness
  - Customized control/view of parking spaces

- **Parking time infraction** detection and notification

- Customized **statistics** and reports

- Advanced **payment** methods (station, mobile app, voucher)

Parking Sensors

- Magnetic / ultrasonic technology

- Easy installation (in asphalt / on poles)

- Wireless Connectivity: Zigbee, LoRa, NB-IoT

- Long Battery Life – typical 10 years lifetime

- Robust Design, IP67, IK10, 1.500kg pressure resistance

- Operating Conditions: -33ºC to 65ºC

- Sampling Rate: configurable (10 seconds default)

- **Indoor & Outdoor** solutions

Smart Parking – Video Analytics

- Top quality cameras

- Embedded CPUs – Local processing

- Reliable detection

- Integration with 3rd party

- ANPR option

- Outdoor & Indoor use

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- Anonymous Traffic counting with Ultrasonic technology

- Traffic flow monitoring – no privacy violation

- People counting using Bluetooth / Wi-Fi

- Objects classification and decision making using machine learning

- Security on fence

powered by

Traffic monitoring – Video Analytics

- Top quality cameras

- Embedded CPUs – Local processing

- Anonymous traffic counting

- Speeding & red light violation detection

- Traffic flow heat maps

- Objects classification

- ANPR option
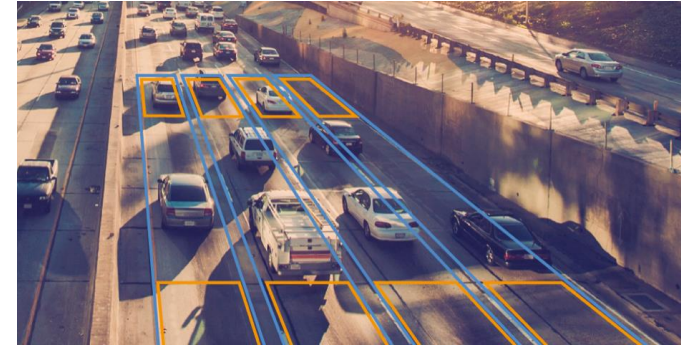
Detection and counting

Heat map creation

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MOBOTIX

Smart Surveillance & Fire Detection

Features

- Indoor & outdoor applications
- High reliability – no moving parts
- Video analytics
- Face & plate recognition
- Decentralized, local processing
- Encrypted & secure
- Low power consumption
- Image processing (rain, shaking)

SD Ring Buffer

NAS Ring Buffer

Video-sensor

Recording

Video Analysis

Alarms

RTSP/ Multicast

MJPEG

MxPEG

H.264

powered by

MOBOTIX
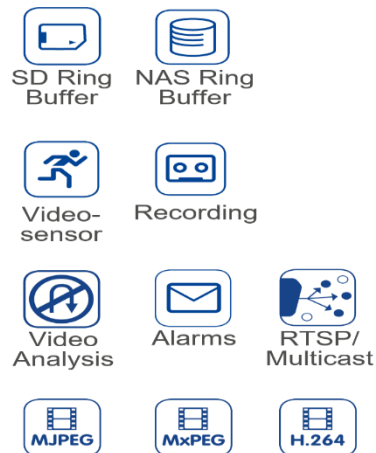
Applications

- Intrusion Detection
- Fire detection (thermal)
- Equipment fatigue detection (thermal)
- Facial recognition – access control
- Traffic analysis
- Left Object Detection

Conventional

Thermal

360º hemispheric

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Fire Detection

- Forest area 24/7 monitoring

- **Thermal** Cameras: 5mK accuracy

- Detection capability:
  32cm heat source at 350m

- No live feed – **no privacy issues**

- Wireless link: Intracom ® Streetnode

- Automatic sprinklers activation

- Bidirectional audio functionality

powered by

MOBOTIX
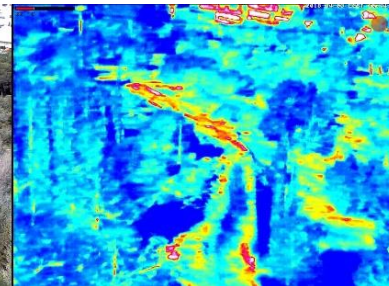
Watch Pole

Thermal image

Wide angle hillside coverage

Energy & Water Monitoring

- Energy & water consumption monitoring in near real time

- Alarms can be triggered when

  - consumption reaches a predefined threshold limit

  - the calculated expenses are about to reach a limit

- Customized statistics and reports
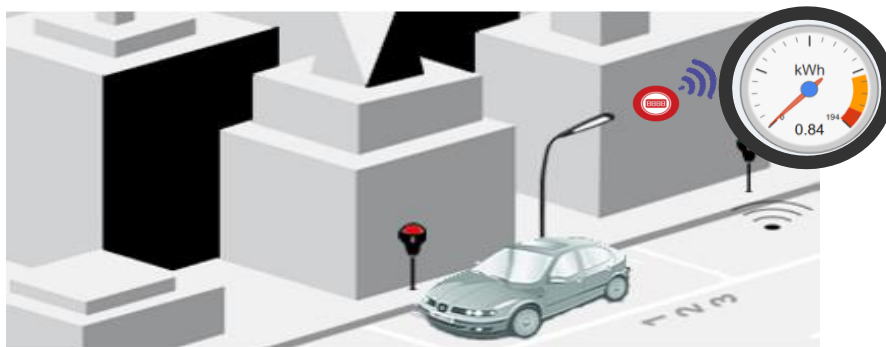
Monitoring allowing for:
- Resource and cost savings, minimizing GH emissions
- Detection of consumption abnormalities by analytics (e.g. leaks, fraud)
- Support in optimizing distribution at city level

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CO$_2$ levels @ MWC 2018
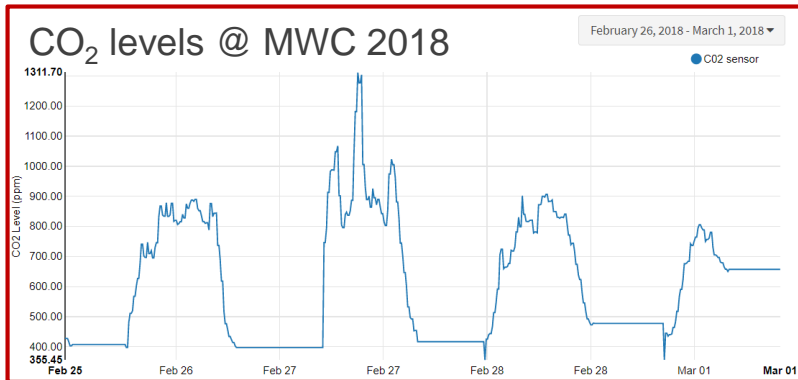
Environmental Conditions monitoring and Smart apps

▸ Easy installation in current urban infrastructure

▸ Real Time information on City map

▸ Grouping and smart rules engine

▸ Measurements of pollutants concentration, temperature, humidity, irradiation etc

▸ Dashboards presenting measurements and advanced reports

▸ Alarms & Notifications

▸ Emergency situation alert

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Noise Monitoring
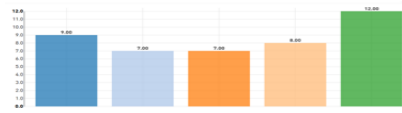
Noise/Sound Smart app:

▶ Real Time information on City map

▶ Dashboards presenting the noise level

▶ EU defined Noise Levels calculated (KPIs – e.g. L_{den})

▶ Automatic notifications sent to Authorities when noise limits reached or patterns identified

Actions taken

▶ Sound to image correlation

▶ Public Transportation plan improvement to reduce Traffic Noise Center

▶ Security dispatch – GPS location reported

Fast actions & identification of emergency and catastrophic situations

Quality of life

A comprehensive approach to Smart City

Unified IoT services Orchestration Platform

| Smart Lighting |
| Smart Parking |
| Waste Mgt |
| Noise Monitoring |
| Energy Mgt |
| Water Mgt |

| Traffic Monitoring |
| Environmental Mgt |
| Content push |
| SOS Button |

Smart apps

Smart Lighting · Smart Water · Smart Energy · Traffic Monitoring · Sound Monitoring · Smart Parking · Waste Mgt · Smart Environment
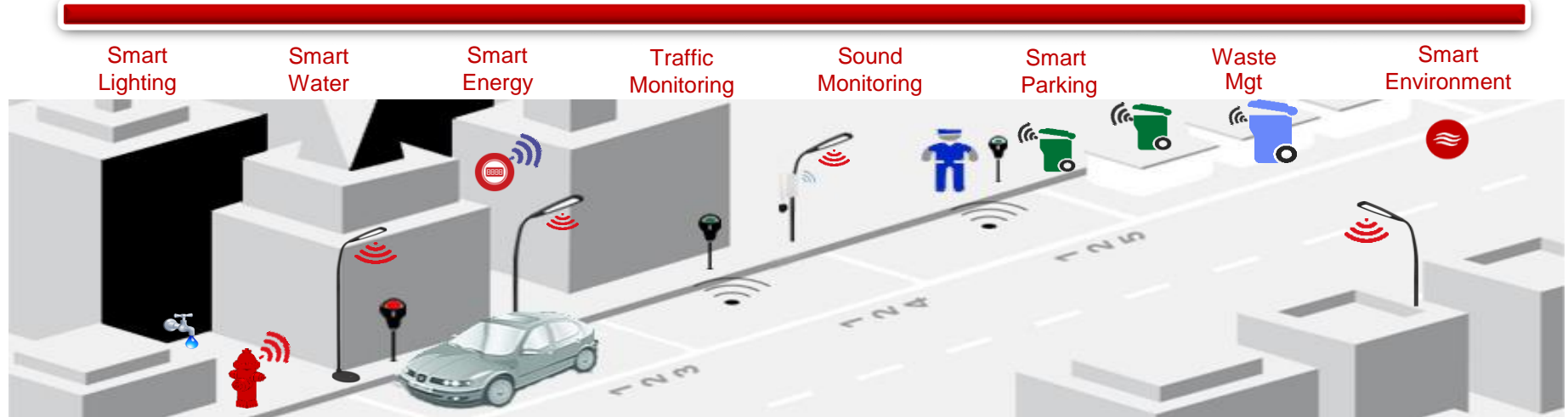
- Total Command & Control Environment for Smart City Applications and Services
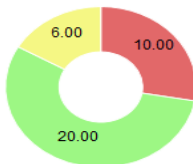
- Aggregated information in insightful dashboards with powerful Analytics capabilities
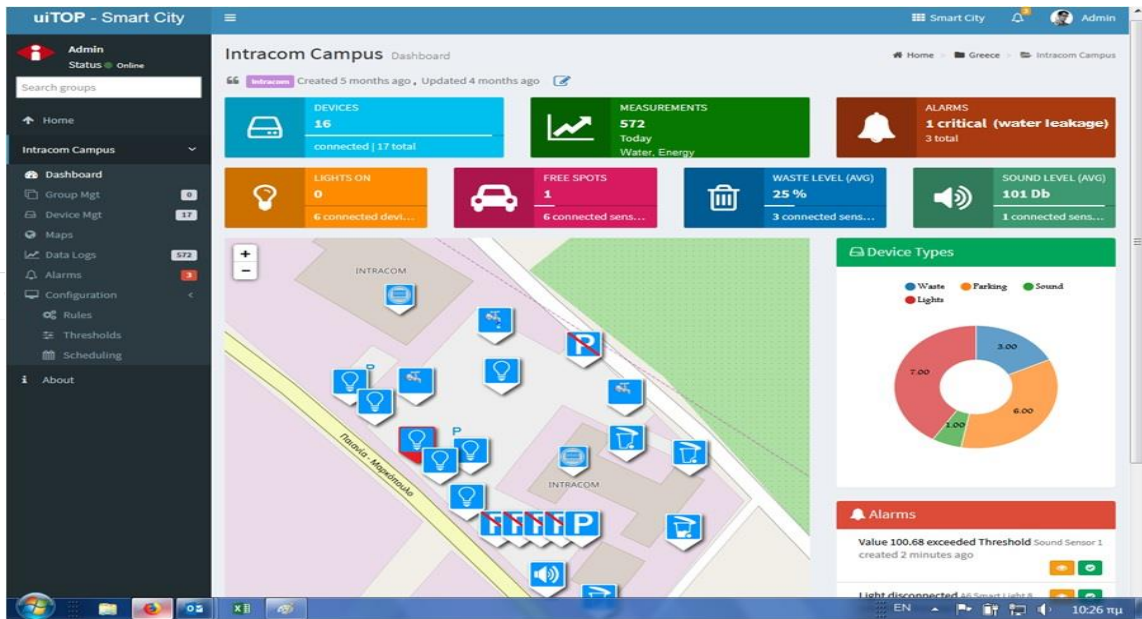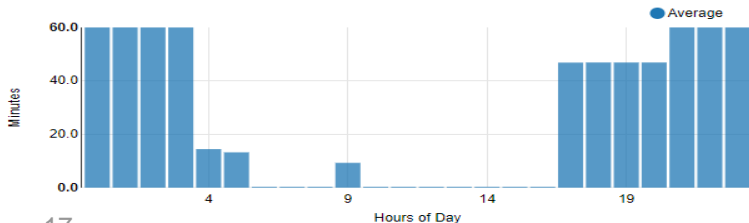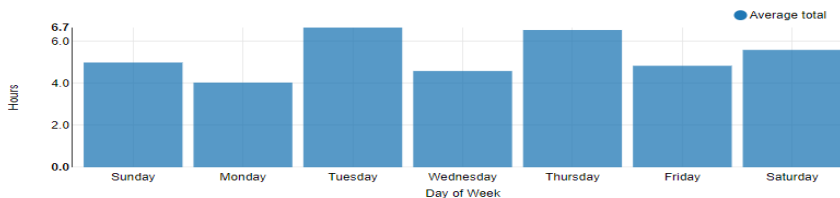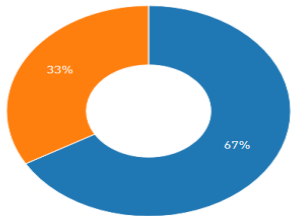
uiTOP: Centralized control of Smart City

- Custom Dashboards
- Custom Alarms and notifications
- Custom consolidated Map creation

DEVICES
45
connected | 55 total

ALARMS
1 critical
3 total

Dim Action

Devices | Groups

☐	A6 Smart Light 1	
☑	A6 Smart Light 2	0 %
☐	A6 Smart Light 3	0 %
☐	A6 Smart Light 4	0 %
☑	A6 Smart Light 5	0 %
☐	A6 Smart Light 6	

1 - 6 of 34   « 1 2 3 4 5 »

67% 33%

⚠ Value 63.0 exceeded Threshold ✓ Sound Sensor 1
created 28 days ago   Clear

⚠ Light disconnected ICE-006-000-000-007
created 23 days ago   Ack

⚠ Light disconnected ICE-006-000-000-002
created 23 days ago   Ack

⚠ Light disconnected ICE-006-000-000-008
created 23 days ago   Ack

References

- Deployment of Large scale, e2e, Smart Metering projects in Energy & Utilities

- Pilot Smart City projects: Smart Lighting, Smart Parking, Traffic Monitoring, Public WiFi and Beacon services

- Deployment of IoT gateway for connectivity monitoring in smart meter project

- Cross-domain solutions combining Waste Management, Sound monitoring and Smart Parking

Smart City Solution key differentiators
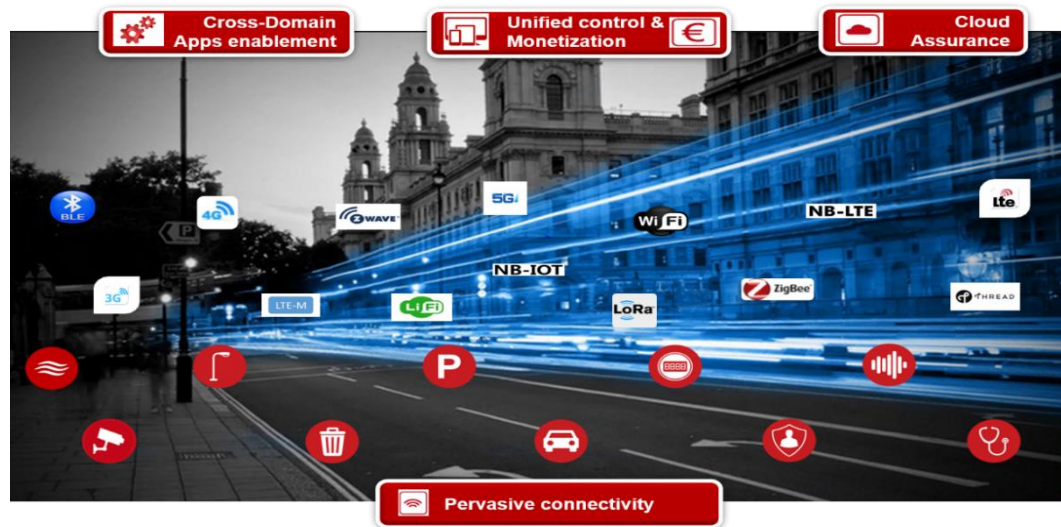
- e2e Solution with Unified City management and control

- Decoupling business from technology- No Device vendor lock - Multiple Connectivity options

- Ready to accommodate new Smart apps and devices – cross domain apps enablement

- Scalability to match increasing demands of IoT expansion

- Fully customizable to address specific City needs

- New business models and monetization options

- Core and optional modules – option to integrate the solution in existing IoT ecosystems

Why Intracom Telecom

- Comprehensive portfolio of own products complemented with strong delivery capabilities

- Strong expertise in key technological areas of:
  - IoT enablement and monetization
  - Energy Utilities and Smart Cities
  - IoT analytics & Data monetization
  - Network Function Virtualization & High Performance Computing

- Significant in-house experience in all aspects of O/BSS "best-of-breed" systems design, implementation, integration & support

- Thorough experience of Telco and IoT business models

We envisage
a smarter connected world where innovative technologies enable life improving services.

thank
you

For more information, visit

www.intracom-telecom.com

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Senior Product Marketing Engineer
Services Business Division