IoT Vertical Solutions

USE CASE Examples

NW TECS

www.nwtecs.com

Jan, 2022

NW TECS – End to End IoT Solutions at a snap

- NW Tecs has the ability to quickly architect complex solutions, using off-the-shelf, interconnected components including devices and applications connected across enterprise networks fitting to existing asset management and security practices.

Smart City leveraging IoT to provide better services

| SMART WASTE MANAGEMENT | SMART PARKING | SMART STREET LIGHTING |
| ENVIRONMENTAL MONITORING | SAFETY AND SECURITY | TRAFFIC & FLEET CONTROL |

- Many cities are challenged by aging infrastructure, increasing air pollution and traffic congestion, spiraling energy prices and scarcity of natural resources. Cities are becoming smarter, however, they need a structured approach to better manage existing resources and to make their activities on behalf of their citizens more efficient.

- **Providing** a **unique LPWAN platform for cities**, using IoT to enable new services. Building on a dedicated **long-range low-power network for IoT**, city authorities can connect a countless battery powered « things » into a single network, enabling data collection from parking sensors, environmental monitoring equipment, flood detection sensors or smart meters. The data is then fed to centralized intelligent systems which can make recommendations to optimize city service management.

Efficiency and sustainability for Smart Energy and Utilities

- With constant urbanization as well as demand for greater efficiency, utility companies need to augment capacity while developing new solutions to optimize management of their existing utility assets. When it comes to how we manage the delivery and use of energy and water, or how we run our cities, there's a lot of **opportunity for improvement.** The introduction of s**mart grids, smart meters** and new ways of generating and transporting energy are being driven by the IoT. It enables **smart utility services** where **energy, gas and water use is being monitored and proactively managed for waste reduction, conservation, and sustainability goals.**

- **D**eploys **unified, scalable, multipurpose IoT network infrastructure for utilities and cities,** providing well-defined points of interoperability between systems, and greatly simplifying and reducing integration costs and difficulties. So **electricity, gas and water utilities and cities can focus on creating business value** through outcomes that improve services and enhance the lives of customers and Residents.
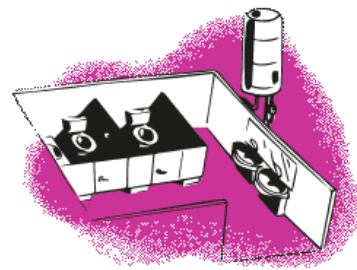
SMART WATER

SMART GAS

SMART ELECTRICITY

Smart Buildings and Digital Facilities Management

EFFICIENT ENERGY MANAGEMENT

WATER LEAKAGE DETECTION

INDOOR ENVIRONMENT

STRUCTURAL HEALTH MONITORING

SMART BUILDINGS SECURITY

IoT enabling energy-efficient buildings
Energy consumption represents a large part of the operating costs of a building. IoT technology is making it easier for buildings with the legacy infrastructure to **save energy and improve their sustainability.** For that purpose, the **consumption of electricity, gas, and water must be recorded** transparently, and **LoRaWAN™** allows you to combine all energy-relevant areas for **continuous monitoring and holistic analysis**. **Smart building energy management** systems also use **IoT devices** to connect disparate heating, cooling, lighting, and fire safety systems to a central management application, highlight areas of high use and energy drifts and correct them.

IoT putting water leaks under control
A great amount of water is being lost through leaks in the piping infrastructure. Water is becoming a scarce and expensive resource that needs to be monitored closely. Water leakage and meter reading represent two of the biggest operational costs for operators of buildings and facilities. Today, the **IoT allows reducing the operational cost related to water leakage, by implementing a smart water infrastructure, comprised of sensors, gateways, automated meter readers and low-power LoRaWAN™ network.**
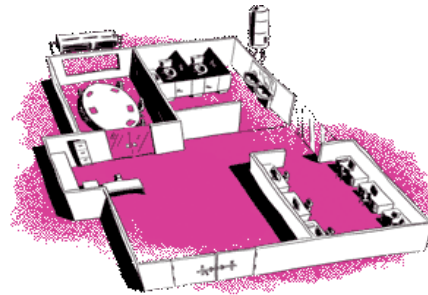
IoT improving comfort by monitoring building environment
To make commercial and residential buildings healthy, safe and enjoyable for people to spend time in, building and facility operators have to **monitor air quality, humidity, temperature,** and even **space occupation.** Not only is it an IoT trend to use **environmental sensors**, but also an absolute necessity. **LoRaWAN™-based sensor technology** can be used in a wide variety of applications within a building. Is the humidity in the mall too high, are meeting rooms occupied and is the CO_2 level in the office still within the normal range? Use connected sensors and you will have the answers.

Monitoring of building structure safety and integrity enabled by IoT
IoT allows an inexpensive and easy way of deploying **Structure Health Monitoring system** with **LoRaWAN™** technology for monitoring a variety of safety indicators **remotely and in real-time,** including mechanical parameters (stress, displacement, deformation), physical (temperature, humidity) or chemical (pH, oxidation of metal). This data allows **detecting, locating and quantifying vulnerabilities** early on (fatigue cracking, degradation of boundary conditions, etc.) thereby **improving, the resilience of the critical infrastructure.**
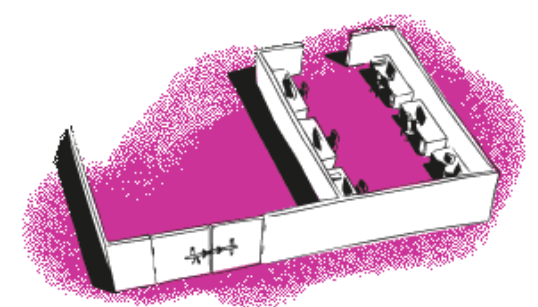
IoT making connected buildings secure
No building can be smart without the proper **safety and security measures** in place. Smart building providers stress the importance of integrating **fire, security, intrusion and access control systems**, as they are key components of a smart, connected building. Redundantly designed LoRaWAN™ systems based on connected IoT sensors can contribute significantly to creating a well-rehearsed alarm chain: by **connecting doors and windows and emergency buttons, fire alarms, motion detection for passage calculation, and using tracking devices** to locate and protect assets.
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Indoor Air Quality Monitor

Monitor your indoor areas with LoRaWAN® to ensure their occupants' safety, health, and wellbeing!

- Focused on enabling safer and healthier indoor environments, to help protect employees, students and workers by meeting air quality regulation levels. The solution also seeks to **protect against COVID-19 spread**, by controlling and monitoring CO2 levels and people's presence in closed areas.

- This **Indoor Air Quality Monitoring Solution**, allows to control and monitor CO2 concentration, temperature, humidity, light and people's presence in real time. The IAQ Monitoring Starter Kit provides the required hardware, software and connectivity services to assess this integrated plug-and-play solution.

- The solution has an **extremely easy configuration**. It can be used for any indoor space like, for example, **classrooms, offices, meeting rooms, shops, industrial facilities, public buildings, and much more.**

Package Bonus: the kit also includes 1 Parametric PCR2 sensor allowing directional people counting (left/right), mounted sidewise or overhead to detect people passing by.

Measure the indoor concentration of CO2, temperature, humidity, and light in an automatic manner and in real-time.

Get automatic mitigation actions based on people's presence and flows.

Reduce the spread of COVID-19, by restoring the indoor air quality based on alerts

Covid – Policy Enforcement Solutions

Proximity Alert & Monitoring

Distance Too Close (e.g. 1 meter, 3 min.)

- 2 levels of audio feedback: warning and immediate danger
- Optional centralized monitoring of contact events
- Contact event logs can help **back-trace contamination chains**
- Help button provides additional safety to lone workers in case of accident.

Density Enforcement

2 meter
5 min.
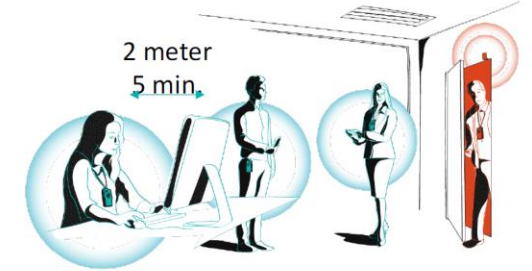
- Audio warning help employees respect maximum density of shared areas (e.g. rest & food areas, meeting rooms)
- Employee to employee proximity monitoring takes in account distance and time
- Optional centralized monitoring and violation reporting
- Optional back-tracing of infection chains

Policy Enforcement Solutions (2)

Zoning Enforcement

Zone A

Zone B
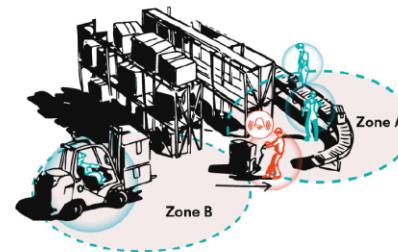
- Factory floor is sub-divided into zones to limit spread of Covid-19
- Help workers remain within their assigned zones by audio notification
- Optionally inform management if worker repeatedly violates the zoning policy

Disinfection scheduling

Clean now
Usage
Time
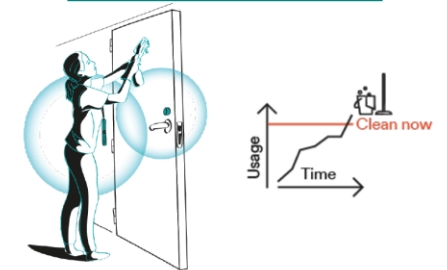
- Worker presence in front of shared-use asset can be analysed using proximity detection
- Asset requires only inexpensive Bluetooth beacon
- Disinfect assets based on usage metrics
- **Ensure traceability** of cleaning operations with a list of visited WiFi/BLE SSIDs or another Abeeway device

Smart Industries – Smart Construction

- **The construction site of the future is built on the IoT**

- IoT provides many solutions to the problem of site management, the monitoring of the use of construction equipment, the prevention of theft, and the work done by men. Construction companies are now able to optimize their on-site activities .

Construction equipment tracking, anti-theft detection, fleet management

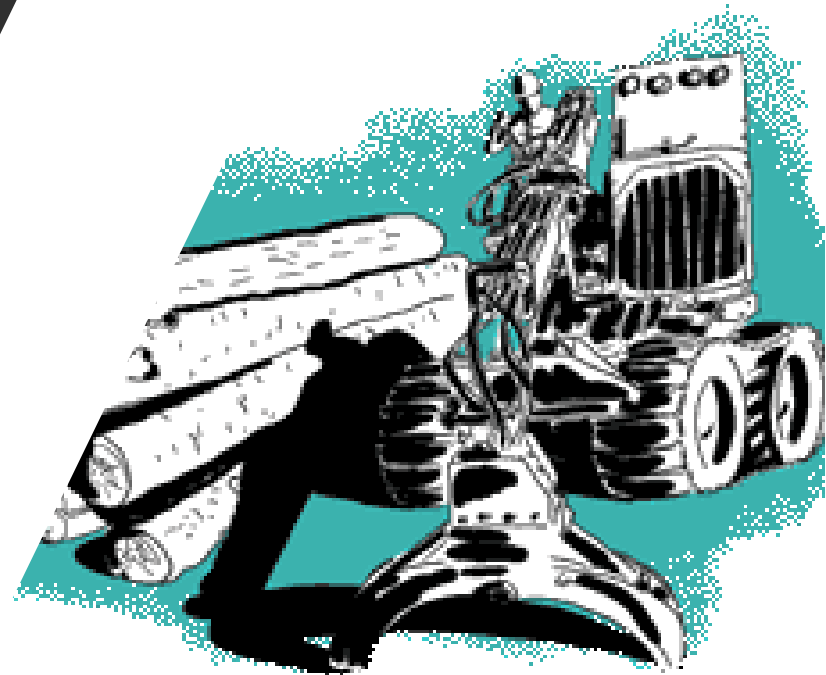Heavy construction machinery use monitoring and maintenance

Electrical power consumption monitoring

Site metrics monitoring: temperature, humidity, noise, vibration

Workers safety using wearables

Smart Industries – Smart Factory

- **Use IoT to make your factory smart**

- Industrial IoT solutions for smart manufacturing, allow to harness the power of data in order to streamline operations, reduce maintenance costs and ensure quality in the manufacturing process.

Backup batteries capacity & machines energy consumption

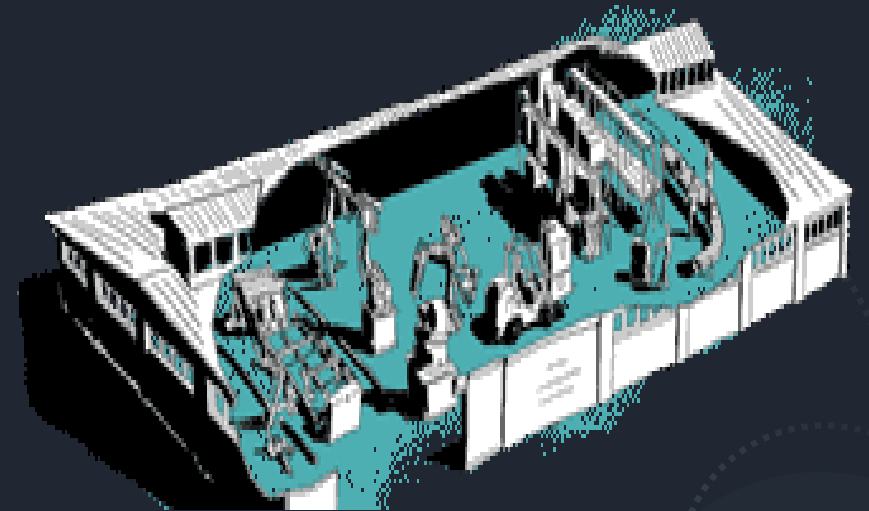Fire, flood, smoke, air quality, temperature monitoring

Backup batteries capacity & machines energy consumption

Liquid presence detection, tank level and flow monitoring

Workers safety and well-being, security of assets

Logistics 4.0 & Digital Supply Chain Management

LOGISTICS WITHIN FACILITIES - INTRALOGISTICS

ASSET TRACKING AND FLEET MANAGEMENT

MONITORING OF GOODS IN TRANSIT

- As production and transportation of goods are now widely globalized, increasingly complex supply chain routes intensify the need for real-time localization and dynamic tracking of goods through the transport system on land, sea, and air, and during storage in warehouses. **The Internet of Things** based on low power connectivity is bringing the key to the future of Logistics 4.0 and Supply chain. Smart logistics solutions allow companies to **evaluate and improve their supply chain networks** with an unprecedented level of accuracy. **Digitization** is providing companies with new ways of networking and **automating their supply chains** and deriving more value from them, and specifically it helps with a more efficient decision making process in case of issues in the supply chain process.

- allows deploying a **unified, scalable, multipurpose IoT network infrastructure** managing both private and public LoRaWAN™ networks, and enabling an ecosystem of IoT sensors and applications for Smart Logistics and Supply Chain. Not only offers the connectivity solutions, but also the **best-in-class reliable and flexible low-power IoT location platform**, enabling global tracking.

Public Sector

- Smart connectivity applications in the public sector are enormous. **Mobilizing comparatively modest budgets, IoT provides immediate returns in key domains such as facility management, smart transportation, smart parking, street lighting or water management.** Municipalities report savings over 10% for public garden watering, over 20% for heating costs for schools, and similar figures for waste collection and many other use cases.

- A **unique LPWAN platform for the public sector**, using IoT to enable new services. Building on a dedicated **long-range low-power network for IoT**, local governments and city authorities can connect a countless battery powered « things » into a single network, enabling data collection from parking sensors, environmental monitoring equipment, flood detection sensors or smart meters. The data is then fed to centralized intelligent systems which can make recommendations to optimize city service management.

- IoT also has a **positive impact on quality of life**, through better functioning, cleaner and better maintained infrastructure but also indoor air quality control for offices and schools. **Healthcare** systems can be improved by optimization of hospital logistics, leveraging in-home patient care, improved elderly assistance or automated instant contact back-tracing to better fight epidemics. **Local governments are empowered to act preventively**, e.g. by early action in noisy areas before riots happen, or public policies that mandate tracking of shared scooter systems and enforce parking in predefined areas.

- IoT technologies contribute to **increased safety and security.** Structural monitoring detects problems with buildings or bridges before they cause casualties and verify that new constructions and tunnels do not impact existing buildings. Connected fire/gas sensors improve the response time of firefighters and connected fire hydrants make sure they will find a functional water supply. Road temperature monitoring optimizes de-icing operations. Manhole surveillance prevents thefts and intrusions into the sewer system. Online water quality monitoring detects and stops chemical terrorist attacks. Electronic ID badges monitor kids as they go out for school activities. In some countries emergency call buttons have been used as part of women protection policy. Public services **use IoT geolocation systems** to localize lost equipment, secure security guards during guard tours and prevent intrusions in public areas.
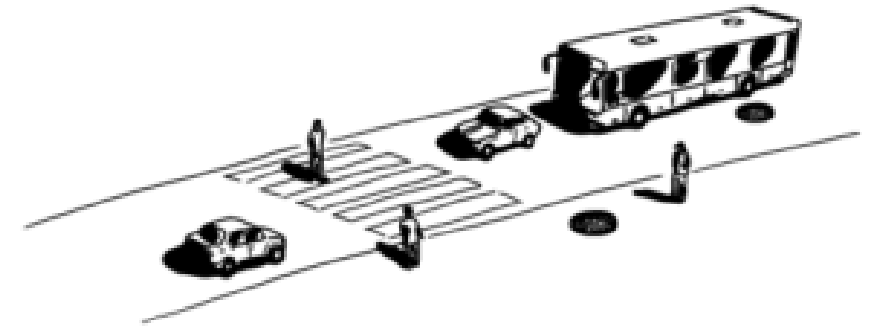
Transportation & Infrastructure

Waste

Optimize waste collection routes with connected dumpsters
Although public services and waste management companies have been around for a long time, they have seen only limited innovation with **operational efficiency** – until now. With the **Internet of Things**, you can integrate even the simplest waste bins into an **intelligent waste management system** with **smart LoRaWAN™ sensors**, allowing to **optimize collection routes, to save time and money** while ensuring a clean environment.

Parking

IoT allows to easily locate available parking spots
Parking is becoming an expensive resource in almost any major city in the world. City authorities struggle to provide convenient parking service, and sometimes they have to close streets, re-route traffic and notify the public about roadworks, disrupting traffic and parking patterns. Using **smart parking sensors** with **LoRaWAN™** and well-connected control systems allow drivers to easily find free parking spots, avoid congestion and reduce fuel consumption and pollution. And this IoT solution can be implemented with a **fast infrastructure setup** without transforming the entire city into a construction site.

Street Lighting
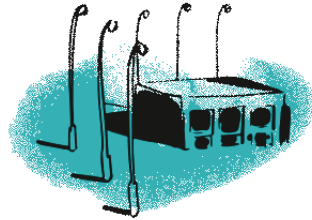
Use IoT for a sophisticated street lights control Reduce costs and make the city safer with intelligent lighting, **LoRaWAN™** technology. Install **IoT-enabled light intensity sensors to remotely control light intensity** for energy savings. Monitor and maintain street lighting networks to ensure city **efficiency and sustainability**, without compromising the safety of streets for pedestrians and drivers.

Environment

IoT helping cities to look after themselves
Cities are the centers of consumption of energy, materials, thus having a high **environmental impact** from greenhouse gas production, waste, and emissions of pollutants in water and air. To improve peoples lives, cities now use IoT for **air quality monitoring, water quality monitoring, ambient noise level monitoring, and flood detection**. By implementing a **network of LoRaWAN™ sensors and gateways** across urban regions, **environmental indicators can be measured** in real-time, **detecting issues** before they become crises.

Safety & Security
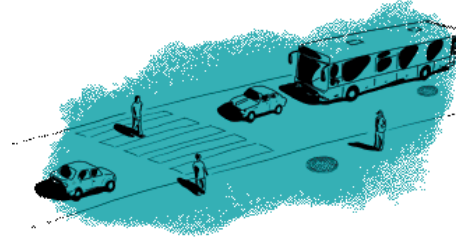
**IoT ensuring public safety and urban security**
Building a Smart City is not possible without making it **Safe**. City authorities can employ the IoT to increase the **efficiency of processes** in the field of **safety of city assets and citizens** by using various connected IoT sensors. **LoRaWAN™-based system** allows **real-time monitoring and protection** of such assets as **manholes** which have a lot of **theft issues**, both for the cover's metal content and the valuable assets down below like fiber cables. It also enables **people and item location, restricted access control,** and **life care**.

Traffic
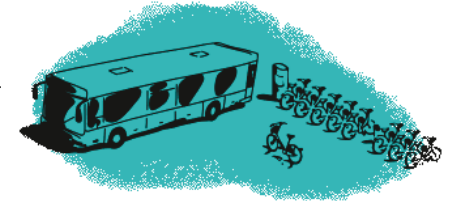
IoT bringing innovative solutions to traffic congestion
Smart city traffic control and fleet management applications are very beneficial for the urban environment, allowing to **optimize city's vehicles use**, to divert traffic in the case of an incident and keep people moving. **Reducing traffic congestion brings millions** in **higher productivity** and **decreased carbon footprint**. **LoRaWAN™-enabled tracking devices** bring the opportunity to monitor in real-time the city's vehicle fleet like **buses and bicycles**, to **optimize routes and protect the assets** using geolocation. Also, when linked to air quality monitoring, it helps to understand and prevent pollution spikes.
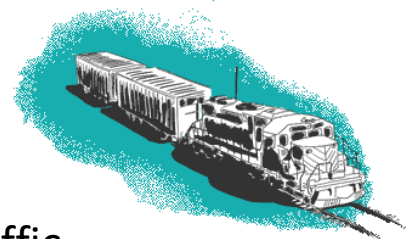
Precision agriculture and smart farming

- **Farming the future today**

- Global population is expected to grow by 70% by 2050, putting ever-increasing pressure on agriculture to feed the world. At the same time land and water shortages, changing consumer patterns and a global trend toward preserving natural environmental resources such as soil quality add to the burden on farmers to balance the various demands. So far, farmers have had to monitor manually the condition of their livestock, environment or agricultural produce, even on large farms. Their property also requires safety controls and security protection against natural disasters, theft, and accidents.

- Until now, the implementation of automated monitoring and control systems has been limited by the poor coverage of cellular networks in many highly productive but sparsely populated rural areas. Thanks to LPWA technologies like LoRaWAN™, **IIoT now enables detection, monitoring and control over very long distance** (over 15 km) of a wide variety of key agricultural data: **soil temperature and moisture; weather, rainfall and water quality; airborne pollution; crop growth; livestock position, condition and feed levels; smart connected harvesters and irrigation equipment; fire, theft and flood detection**… LoRaWAN™ technology's long-range, low-power wireless qualities enable the **use of low-cost sensors to send data from the farm to the Cloud** where it can be analyzed to improve operations. Enables agricultural companies to deliver various services using a **common IoT enabler platform, providing LoRaWAN™ network server and software to manage public or private networks, under a unified, scalable, multipurpose IoT network infrastructure.**

SOIL HEALTH MONITORING

ENVIRONMENTAL MONITORING

IRRIGATION CONTROL

Contact Us

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