



DIGI 

# SMART CITIES: IS YOUR CITY KEEPING UP?

# What Makes a City Smart?

Smarter cities of all sizes are capitalizing on new technologies and the diminishing cost of IT infrastructure to create a ubiquitous network of connected devices, smart sensors, and big data analytics to transform their systems, operations and service delivery.

Competition among cities to engage and attract new residents, businesses and visitors means constant attention to providing a high quality of life and vibrant economic climate. Forward-thinking leaders recognize that although tight budgets, scarce resources and legacy systems frequently challenge their goals, new and innovative technologies can help turn challenges into opportunities.

Digi helps make your city smart by adding connectivity and intelligence to critical government systems. Get the real-time information and remote management you need for transit, traffic control, intelligent street lighting, waste and recycling, all while keeping budgets under control. Being smarter can change the way our cities work and help deliver on their potential as never before.

With Digi Smart Cities solutions you can:

- **Exceed Public Expectations:** Integrate data from thousands of remote sensors and cameras to reduce traffic congestion, optimize transit performance, and maintain services availability.
- **Maximize Public Budgets:** Use data collected from city systems to analyze performance, plan maintenance, lower energy costs, and dynamically adjust transit and parking prices.
- **Manage Complex Systems:** Proven Digi wireless modules and gateways connect existing infrastructure for remote monitoring and management in real time.
- **Reduce Response Times:** Track the location and condition of public safety vehicles to predict maintenance needs and ensure operational readiness.

The number of urban residents is growing by nearly 60 million every year. In addition, more than 60% of the world's population will be living in cities by 2050.<sup>1</sup>

<sup>1</sup>UN State of World Cities report, 2012/13, <http://www.unhabitat.org/pmss/listItemDetails.aspx?publicationID=3387>

## Why Now?

Smart cities are accelerating their adoption of a new generation of information technology and big data, based on the network combination of the Internet, high bandwidth Wi-Fi and cellular connectivity, low-cost RF networks and other sensor networks. Cities stand to benefit the most from connecting people, process, data and city assets. Given these trends, it is critical for city managers to understand where we are, and take advantage of opportunities of these technologies.

- **Secure, Reliable and Affordable Systems:** More cities and agencies are able to leverage an expanding array of smart applications than ever before. Having off-the-shelf platforms and applications puts intelligent systems within the reach of most agencies and municipalities.
- **Sensor Efficiency:** Sensors are cheaper, smaller and more energy efficient than ever before, allowing more sensors to be installed in more places and maintained for longer periods of time at the edge of networks, without the need to service or replace them for years.
- **Communication Standards:** Communication standards make it easier to integrate into existing networks, allowing for more localized and real-time decisions at the edge of networks.
- **Ubiquitous Bandwidth:** High-bandwidth wireless communications are now common in most cities. This bandwidth combined with mesh technologies and resiliency, guarantees high service quality and relatively low maintenance.

## Why Digi?

Digi has been a driver of bringing purpose-built, mission-critical M2M solutions to the market for 30 years. Within Smart City projects, Digi technology is enabling new operational efficiencies, reduced response times and new levels of citizen services.

Following are Smart City applications where Digi has demonstrated success:

- Bus / Rail Transit
- Street Lighting
- Traffic Management
- Meter Reading
- Public Safety
- Environmental Monitoring
- Water / Wastewater
- Electric Vehicle Charging
- Security Cameras
- License Plate Reader
- Information Kiosks
- SCADA-Remote Monitoring
- Waste & Recycling
- Positive Train Control (PTC)
- Remote Office
- Smart Parking Systems
- Digital Signage
- Bicycle Sharing System
- Tank Level Monitoring
- Variable Message Signs

The following selected case studies highlight some of the solutions and customers investing in Smart City technologies.





## Case Study: City of Visalia

Public transportation use is on the rise as the number of miles driven in vehicles decreases at a significant rate. In 2013, more travelers used busses, trains and subways than any year since 1956 in the United States. These trends create opportunities for cities that provide efficient solutions for residents and tourists who seek alternatives to driving.

### The Solution

As part of the selection process, Visalia Transit compared Digi TransPort® WR44 R cellular routers to a variety of options. The ability to equip each bus with a consistent and reliable 4G Verizon connection paired with Digi's dedicated tech support made the decision to select the Digi TransPort WR44 R easy.

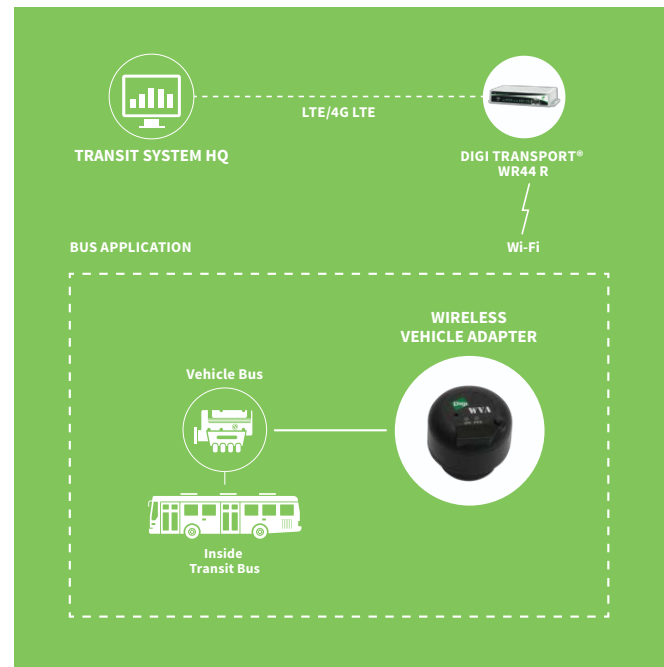
### The Results

Today, 100% of the bus fleet can be tracked in real-time. The Digi TransPort WR44 R acts as the heartbeat of the bus by running mission-critical tasks such as currency tracking and remote video access.

*“Digi is the heartbeat of the bus transit connection, which enables tracking of cash receivables, the video security system and passenger Wi-Fi.”*

- Joe Vela, Office Systems Analyst, City of Visalia

Visalia





## Case Study: South Shore Line

Northern Indiana Commuter Transportation District serves more than 7,000 riders each day in Northwestern Indiana, 95 percent of whom are commuting to work in downtown Chicago. These commuters have increasing expectations for connectivity and productivity as they make their way to and from the office.



### The Solution

The NICTD management team decided to provide connectivity and make it a free service for train riders. The foundation of this solution is the Digi TransPort® WR44 router, which provides internet access for up to 120 clients while simultaneously maintaining secure priority links for onboard systems. Optional transparent integration with third-party content filtering and embedded in-browser content messaging keeps out unwanted content and provides a path for network monetization. Also, the Digi TransPort WR44R's 50-channel high-performance GPS receiver delivers reliable service, even in tough urban environments, supporting location-based applications.

### The Results

The Digi pilot program has been so popular, that NICTD is moving forward with full implementation of the Digi WR44R across all 82 cars.

*“As people start to realize that they can get on the train and get meaningful work done, the value of a ticket on our transit line increases significantly.”*

- Boris Matakovic, Chief Information Officer, NICTD





## Case Study: Big Belly Solar

BigBelly Solar is transforming one of the least efficient and resource-intensive industries on the planet — waste collection. Cities were either collecting too often and wasting fuel and labor while creating CO2 emissions or they were not able to keep up with the demands and overflowing trash cans created litter, health and safety issues.

### The Solution

In order to use real-time data to drive their operational decisions, BigBelly needed to embed wireless sensors into their system. The company turned to Digi for wireless design and development services.

- Custom embedded cellular radios from Digi Wireless Design Services into solar powered trash and recycling compactor units.
- BigBelly gained access to real-time information about their stations, allowing remote monitoring from any computer or smart phone to determine whether collection is needed.
- BigBelly customers now see their entire portfolio of waste and recycling stations and have the ability to send alerts and communicate with drivers to schedule pickups.

### The Results

- BigBelly customers save time and fuel by monitoring waste and recycling stations to optimize collection activity, eliminate unnecessary truck rolls and free workers from on-street status checks
- Since stations are monitored remotely and the risk of overflow in the field is eliminated, also reducing related public health concerns.
- The knowledge empowers BigBelly customers with information they've never had before, so they can implement new programs like recycling and just-in-time-collection.



“Waste and recycling collection is a resource intensive process. The wireless BigBelly Solar solution delivers real-time data to make trash collection more efficient saving us time and money.”

-Dan DiLillo, Albany Assistant Commissioner of General Service



## Case Study: AddÉnergie

AddÉnergie develops, manufactures and operates charging solutions for market segments such as the public sector, workplace, multi-residential, fleets, residential and others.

### The Solution

AddÉnergie designs its networks with Digi's XBee®, ConnectPort® X4 cellular gateway, and the ConnectCard™ i.MX28. When development first began in 2008, AddÉnergie wanted to create a network that differed from conventional charging stations. Rather than have a master charging station in a parking lot that had its own gateway, they sought to create a system that could cover the entire parking lot.

### The Results

**Operational Efficiencies:** AddÉnergie recharging stations not only makes for a seamless driver experience, but they also allow network providers to easily monitor all activity.

**Scalability:** Digi's scalable solution enabled AddÉnergie to rapidly deploy and maintain more than 1,700 charging stations.

**Preventive Maintenance:** Because the stations are cloud-based, they all transmit data back to the providers. This allows them to monitor every charging station, and in some cases, fix problems remotely.



“Our strategy was to develop an architecture where the gateway is on the building and can cover the whole parking lot, while being able to interface with a third party system in the building (i.e., an energy management system). And, we needed technology that could communicate in a busy, urban environment.”

-Louis Tremblay, CEO, AddÉnergie



## Case Study: SEPTA and Federal PTC Requirements

Serving more than one million riders each day, the Southeastern Pennsylvania Transportation Authority (SEPTA) is the nation's sixth-largest public transportation system, providing bus, subway, light rail, paratransit services in and around Philadelphia.

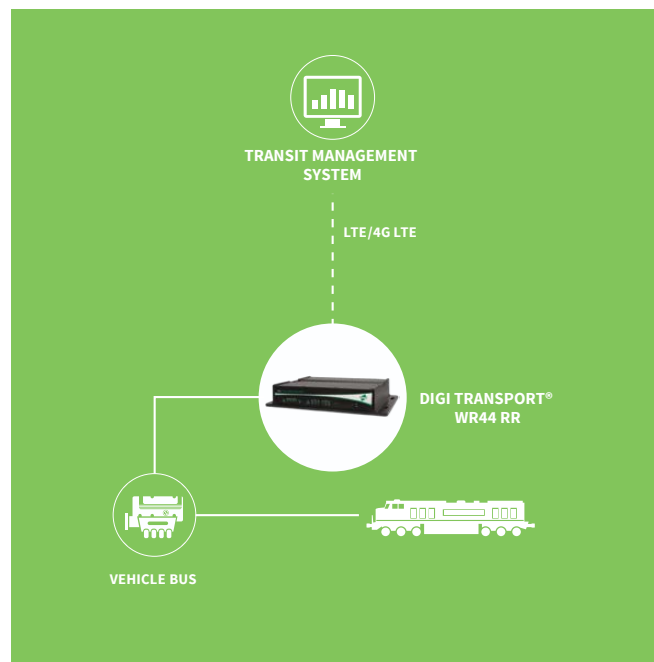
SEPTA has committed to establish a safety-first culture for riders and employees alike. One of their key initiatives has been compliance with the U.S. Congressional mandate for Positive Train Control (PTC), a sophisticated train-signaling system designed to prevent crashes, derailments and track worker injuries.

### The Solution

On board SEPTA vehicles is the Digi® WR44 RR mobile access router. PTC wireless message routing uses a Mobile Communications Package (MCP), an integrated assembly that houses the Digi router, 220 MHz TDMA radio, power supply and RF filters. Digi WR44 RR is the integral communications hub in locomotives, relaying PTC data messages to and from waysides via 220 MHz radio and enabling system maintenance, configuration and network management over a cellular link.

### The Results

In 2016 SEPTA became the second commuter railroad in the nation to fully implement PTC compliance, including lines that operate on Amtrak-owned track (by 2017). Moreover, the increased network reliability and rail system visibility extends operational performance beyond PTC toward Communications-Based Train Control (CBTC), which leads to more efficient scheduling, increased capacity and fuel savings. So while rail safety is the principal objective, there are significant ancillary benefits as well.





## Conclusion

Cities investing in the long-term efficiency of their infrastructure aim to make their systems intelligent through increased connectivity. These cities not only see their energy usage and carbon footprint diminish — they also enhance their livability as safe, vibrant cities, thus attracting both citizens and tourists.

Digi is a proven partner in delivering connectivity and intelligence to critical government systems. Digi has helped cities and counties to benefit from the real-time information and remote management necessary to drive efficiencies across all municipal functions.

- Bus / Rail Transit
- Street Lighting
- Traffic Management
- Meter Reading
- Public Safety
- Environmental Monitoring
- Water / Wastewater
- Electric Vehicle Charging
- Security Cameras
- License Plate Reader
- Information Kiosks
- SCADA-Remote Monitoring
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- Remote Office
- Smart Parking Systems
- Digital Signage
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- Tank Level Monitoring
- Variable Message Signs

## Contact a Digi expert and get started today

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