

Connecting Smart Cities to Limitless Possibilities

Across the globe, cities are becoming more populous. By 2030, another five percent of the world's population will live in a city compared to 2015, according to the World Health Organization. There are now more than 500 cities with over 1 million people.

More populated cities mean more traffic and greater demand on services such as water and electricity. To efficiently accommodate the influx of people, and better serve current residents, cities must become “smarter.” Smart cities use modern technologies to collect and share information, resulting in benefits that include:

- **Better resource management**
- **Enhanced services**
- **Operational efficiencies**
- **Increased safety**
- **Improved quality of life**
- **Significant money savings**

A smart city infrastructure includes the Internet of Things (IoT), sensors of many different generations, and platforms to enable connectivity, two-way data flows, and broad data sharing. The infrastructure requires a data analytic ecosystem capable of integrating massive volumes of data from a wide and ever-growing range of sources, then analyzing it and making it available to citizens and decision-makers alike across the city. The analytics go beyond simply informing smart phone apps—the analytics ultimately are about providing rich insights and giving context to questions, strategies, and opportunities.

City-Wide Enablement Via Analytics

City and state government agencies continue to face barriers with data silos. Smart cities knock down the silos and bring the data together in a single analytic ecosystem. This allows advanced analytics that produce the insights and understanding needed to enable automation or inform people who can take appropriate action. The data analytics lead to high-impact outcomes that include:

Making Resources Sustainable

Data is essential to tracking the use of water, electricity, and other resources. Data enables benchmarking to compare usage to other cities, past usage, and how one building or household compares to another.

Preventing Crime

Analyzing historical and geographic data helps city officials and police departments predict where crime is likely to occur. Combining analytics with real-time facial recognition and license plate reading can help identify people wanted by law enforcement.

Informing Traffic Decisions

One of the most touted aspects of a smart city is improved traffic flows. Data-enabled systems that monitor congestion can help develop insights into recurring versus non-recurring congestion. Analytics and context help city officials improve traffic flows, and reduce and manage incident recovery time by rerouting traffic onto adjacent roadways.

Improving Mobility

Smart parking meters and parking spots that notify drivers when they're open, automated bus location data, smart traffic signals, and other smart devices help citizens with greater mobility. While the data enables new applications, the analytics shine the spotlight on opportunities for new mobility-as-a-service options. Companies can then offer ridesharing, shuttles, or other

The Future of Smart Cities

- \$800B per year in economy opportunities for major cities upgrading public transportation.
- \$1.2T in savings in the U.S. if smart energy systems are widely implemented.

—New Jersey Institute of Technology

services. Mobility-as-a-service integrates transportation options, from public busing to ridesharing, to manage travel in the smartest way possible.

Driving Smart Transit Insights

At HackOHIO 2017, students responded to a Teradata Smart City Challenge by developing a data ecosystem for integrating the data needed to support mobility-as-a-service. Transity compiles proprietary and open data about Columbus, Ohio. This includes data from Google Maps, information on where people live and work, and data about how they use transportation, such as vehicles, bikes, or city buses. The data is integrated in an enterprise-grade software platform that's part of an analytic ecosystem. This breaks down silos to bring together data from thousands of data points.

Transity, like the entire smart city approach, can change the way people think about commuting. For example, analytics on the data can show the demand for transportation in specific areas and at certain times. This can prompt people to car pool, change their commute times, or bike instead of use a vehicle.

Traditional apps deliver actionable information, such as how commutes change by time of day. Transity goes one step further by integrating additional layers of data, including commute patterns. This allows deeper insights, such as which locations would be best served by public transportation or bike paths. Transity, and other technologies that operationalize and monetize data, are poised to make significant contributions to Columbus and other smart cities.

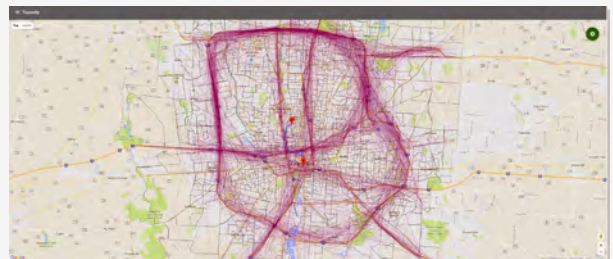
Smart Data Management is the Key to the Smart City

Although many cities are interested in exploiting smart city connectivity, more than half of smart city initiatives get stalled at the proof-of-concept stage, according to Cisco. About one-third of those completed are not considered a success. That's because planners do not have a sufficient understanding of how to implement the analytic ecosystem that informs users and technologies.

Like a Fitbit for the City

Most people are familiar with wireless wearable devices, like Fitbit, that measure data and share it with the user. Their value comes not only from knowing what's happening now, but they also put data into context that exposes patterns and enables goals. Smart Data Management uses a similar concept, but on a massive scale with advanced technologies that record a vast range of activities and share the data with those that choose to connect.

What cities need is Smart Data Management—the process of integrating, storing, analyzing, managing, and sharing data through a single analytic platform. A Smart Data Management strategy secures data and makes it available for advanced analytics that detect a variety of patterns that are actionable and support automation. This strategy addresses current needs while remaining flexible and scalable to manage future needs.



Vehicle journeys in Columbus; the “ground truth” of mobility choices, visible by origin, destination and mode of travel
Image: Transity from journey analytics on Teradata; Data: Cuebiqu

Creating New and Sustainable Value

Teradata has experience across IoT and related applications, deep industry knowledge, and broad expertise with complex analytics at scale. Using Smart Data Management as a focal point, we can help companies evolve from standalone or narrowly focused smart city projects to tightly integrated business driven operations. For more information, visit Teradata.com.