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TO: The Honorable Detroit City Council

FROM: David Whitaker, Director   
Legislative Policy Division Staff

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RE: **SMART CITIES**

Council Member Coleman A. Young II requested the Legislative Policy Division (LPD) provide a report on the city of Detroit's journey to become a smart city. Please accept the following as our response.

The city of Detroit, though making strides, still has a way to go before it can be considered a leader in the integration of smart technologies into the city's daily operations. Smart cities are described as urban areas where technology and data collection help improve quality of life, as well as the sustainability and efficiency of city operations. It is estimated that by 2050, 68% of the world's population will live in urban areas.<sup>1</sup> Therefore, making these technological advances even more necessary in the future.

Smart cities utilize certain core technologies that work to collect, analyze, and act on huge amounts of data. Some of these technologies include the Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning (ML) and Big Data Analytics.

The IoT refers to a network of interconnected devices that communicate with one another to collect and exchange data. In smart cities, IoT devices such as sensors, cameras, and meters are deployed across the city to monitor traffic, energy usage, pollution levels, and public spaces.

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<sup>1</sup> <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects>.

AI enables the automation and optimization of city services. Through machine learning algorithms, smart city systems can predict trends, such as energy consumption or traffic patterns, and implement solutions in real-time. AI plays a vital role in improving public safety (e.g., smart surveillance), healthcare (e.g., predictive diagnosis), and transportation systems (e.g., autonomous vehicles).

Smart cities generate massive amounts of data from various sources, including IoT devices, social media, public transport systems, and environmental sensors. Big data analytics helps city managers and government officials process and analyze this data to uncover trends, patterns, and anomalies.

Information and Communication Technology (ICT), IoT and other smart technologies increasingly play an important role in transportation, energy and infrastructure. As a city updates its systems and structures to incorporate these technologies, it becomes smarter.<sup>2</sup>

Municipalities worldwide are embracing “smart city” concepts and tools. Here are some of the smartest cities and how they are utilizing technologies to improve the health, safety and infrastructure for all those that live there.

## **Singapore**

When it comes to the smartest cities around the world, Singapore often tops this list. Since launching its Smart Nation initiative in 2014, Singapore has introduced a wide range of smart technologies in both its public and private sectors. Contactless payment technology has been widely adopted too efficiently direct movement and payments for Singapore’s 7.5 million passengers who use public transports. To help elevate the pressure of an aging population, a digital health system was introduced – normalizing video consultations at the same time – as well as wearable IoT devices to monitor patients. In addition, Singapore announced in 2021, its plans for a new eco-smart city that is entirely vehicle-free. The planned city will be home to five residential districts with 42,000 houses, as well as safe zones for both pedestrians and cyclists.<sup>3</sup>

## **New York, New York**

New York City hosts an annual Smart City New York Conference, and it is not surprising that NYC appears on just about every list of smart cities in US and global surveys.

NYC’s smart city initiatives are many, including:

- Water management
- Waste management
- Traffic management
- Tourism, navigation and mobility

New York uses a billion gallons of water a day. In order to get a better idea of how exactly that water is being used, the city has deployed an automated meter reading system to keep track of water usage as well as give city residents a clear snapshot of their water consumption.

In addition to water sensors, New York City has installed hundreds of other smart sensors to monitor

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<sup>2</sup>What is a Smart City? | IBM

<sup>3</sup> Singapore which is rated number 1 or the top 7 smart cities in the World in 2024, earth.org/top-7-smart-cities-in-the-world

everything from waste levels in trash bins to air quality. Hundreds of touchscreen kiosks have also been installed on city streets, where residents can find out information about the city as well as charge their phones.

New York City recently completed the largest urban traffic management upgrade in the world to overhaul aging infrastructure, improve efficiency and reliability, reduce congestion on surface streets and save costs. The project, which utilizes cellular routers at intersections throughout the city, is designed too not only improve traffic flow, but also to integrate connected vehicle technology to improve safety on city streets.

### **Pittsburgh, Pennsylvania**

A lot of smart city projects in US municipalities focus on reducing traffic congestion. Once Pittsburgh implemented their smart traffic system they've found that emissions have been reduced by 21% and wait times have been reduced by 41%.

Sensors throughout the city measure traffic flow and communicate that data back to a central location. An AI (*Artificial Intelligence*) system analyzes the data and then creates a plan to move vehicles through the city with minimal wait times at intersections. The AI can control smart stoplights and adjust the timing to efficiently control traffic flow.

### **Washington DC, District of Colombia**

Washington is one of America's number one smart cities. Their movement analytics program uses data from video cameras to identify who and what is moving through the city, including cars, buses, pedestrians, and bikes.

This data is then analyzed to make better decisions about how to direct traffic and identify where more resources are needed, such as bike lanes. The more data a smart city can collect and analyze, the more city officials can find ways to improve the infrastructure. <sup>4</sup>

Not only are many cities utilizing smart city tools. Tech companies all over the world are busy developing cutting edge technology. Some of these innovations are currently being used, helping city's function more efficiently and providing services to the public at a higher level.

The CENTEGIX Crisis Alert is a wearable mobile panic button that was used by staff during the recent Apalachee High School shooting in Georgia. The badge empowers staff to get help instantly in an emergency. With a push of a button, users discreetly alert responders in seconds with precise incident location details. One week after staff members at Apalachee High School were outfitted with the wearable panic buttons for the new school year, the devices were used to alert law enforcement of the shooting that resulted in the deaths of two students and two teachers. Authorities said the devices played a role in law enforcement's swift response. The shooter was apprehended at 10:26 a.m. Wednesday, "moments" after the shots fired call came through, according to the Georgia Bureau of Investigation. A single button activation alerts local responders and administrators immediately of an "I need help incident," displaying a map showing who needs help and where they're located on campus. <sup>5</sup>

"PREPARED" is an AI-powered system to assist emergency (911) dispatchers. It provides summaries of every call and displays highlighted key information like person descriptions, addresses, and license plates. The system also recognizes audio in 19 languages and allows communication by voice or by text in 140+

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<sup>4</sup> Top 12 Smart Cities in the U.S. - Smart Cities Examples | Digi International

<sup>5</sup> Panic buttons like those used by Apalachee staff on the rise (usatoday.com)

languages. Through Prepared Live, smartphone callers can use a secure chat to text with the dispatcher when it is unsafe to speak. Further, activating Prepared Live gives the dispatcher and caller live stream capabilities, providing eyes-on-scene in the early stages of an emergency. Lastly, it removes the funnel mechanism by ensuring that first responders receive the same, detailed information that the dispatcher receives.<sup>6</sup>

Concerns relative to privacy, custody and use of data are legitimate and will have to be addressed before a city of Detroit's size and demographic can move forward in a full-fledged effort to become a smart city. In a 2021 published report, The U.N. warned AI can pose a threat to human rights. Further stating AI's use as a forecasting tool, could have an impact on "rights to privacy, to a fair trial, to freedom from arbitrary arrest and detention and the right to life". Acknowledging that AI can be a force for good, helping societies overcome some of the great challenges of our times, but suggest that the harms it could bring outweigh the positives.<sup>7</sup>

Although the advantages instituting these technologies have a high impact on an urban area, a smart city also comes with some notable disadvantages, some of which play a major role in Detroit's ability to achieve smart city status. Issues involving Data Security, Privacy and Social Control, and High Investment, as well as lack of access to technology, and poor web connectivity could lead to communities being left out of the smart-cities trend.

### **Data Security**

An important issue for a smart city is the secure management of sensitive information. In order to make efficient decisions and predictions, many different types of information must be collected. Whether it is building data like energy consumption and occupation, or personal data such as CCTV recordings and travel information. To gain trust from its citizens, the local government of the smart city must prove that they are able to handle this information with the highest level of security.

### **Privacy and Social Control**

Privacy is also a big concern since data is being collected about a person by security cameras and information is shared about private buildings. It is also important who is handling the private data, as this authority might have much control over public opinions and decisions.

### **High Investment**

Many buildings have to be renovated or refitted with IoT sensors and a high-speed internet connection. Public transport and infrastructure need to be equipped with smart technology as well in order to make the concept of a smart city work. All of these improvements will come at a high cost and cities need to be aware of what is necessary to really transform their urban area.<sup>8</sup>

Detroit is not currently on the list of top smart cities in America. However, the city recognizes the benefits these technologies bring and has embarked on the journey to become a much smarter city. In fact, in 2021 the City of Detroit's Department of Information Technology (DOIT) achieved Gold Status Certification from the Bloomberg Data Alliance, recognizing Detroit as one of the top cities for using data to help drive decisions.

Most recently, the Michigan Department of Transportation (MDOT), and the City of Detroit in conjunction with the technology company Electreon, introduced a new quarter mile stretch of road in Corktown that can

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<sup>6</sup> <https://medium.com/prepared-app/congress-wants-to-modernize-911-heres-how-prepared-is-leading-the-way-1ff7cf5d6921>

<sup>7</sup> <https://www.npr.org/2021/09/16/1037902314/the-u-n-warns-that-ai-can-pose-a-threat-to-human-rights#>

<sup>8</sup> <https://smart-cre.com/smart-city-crucial-advantages-and-disadvantages/>

charge electric vehicles as they drive down the street. According to project leaders, this is the first of its kind in the nation.<sup>9</sup>

According to the DoiT, the city is pushing towards continuing to increase its technology capability to be a smart city by collaborating with city departments to make sure they continue to leverage tech. The City's Department of Transportation (DDOT) has established Wi-Fi on the buses. Through partnerships with the City's General Services Department (GSD), the Digital Equity Team is working to launch free Wi-Fi in city parks. While city recreation centers have been equipped with free Wi-Fi, the department is also working to upgrade computer labs to connect citizens with technology.

Additionally, the City's Mobility team is currently working to establish a testing area for new mobile technology and how it integrates with vehicles. And the City's Department of Public Works team is increasing smart signals technology and connecting our traffic lights back to a centralized center to make the city operations more efficient.<sup>10</sup>

The potential applications of IoT, machine learning, and big data analysis are vast. Their impacts are already being felt across a wide range of industries, including manufacturing, transportation, healthcare, and agriculture. Detroit's transformation to become a smart city will require extensive community outreach and buy-in. In addition to the issues revolving around privacy, Detroit will have to shoulder significant costs associated with the introduction of these new technologies and the development of infrastructure necessary to achieve the desired outcomes.

As the city of Detroit continues to expand its capacity to institute these technologies through public conversations and the creation of the funding mechanisms, these technologies will play an increasingly important role in shaping our city.

If we can be of further assistance, please do not hesitate to contact us.

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<sup>9</sup> Detroit road is first in the U.S. to charge an EV, project leaders say (detroitnews.com)

<sup>10</sup> Art Thompson, City of Detroit, Chief Information Officer 9/3/24