

INFRASTRUCTURE AND TRANSPORTATION:

GOVERNMENT FINDS
ITS IoT FOOTING



Infrastructure and transportation agencies lead the way in public sector adoption of Internet of Things (IoT) technology. These agencies are responsible for the most fundamental physical and economic components of any state or municipality — highways, bridges, water systems, electric grids and more — and their enthusiasm for IoT technology has great potential to strengthen asset management, address workforce challenges, improve quality of life and reduce costs.

The Center for Digital Government (CDG) recently conducted a series of surveys of state and local government leaders on smart cities and the IoT. The purpose was to gain insight into adoption trends, policy and strategy development, stakeholder involvement, procurement plans and network preparedness. This report, based on the survey results, looks at the needs and concerns of infrastructure and transportation officials as they adopt IoT technologies to help fulfill their mission.

Respondent Demographics

CDG surveyed 121 state and local government professionals in October 2018. The following data shows respondent demographics by the level of government they work in and the population size of their jurisdiction.



Everybody's on Board

Agencies involved with infrastructure, transportation, water, garbage and other operations understand the value of IoT, and a majority of those surveyed are starting to use it to transform their operations and services. Fifty percent of respondents are deploying IoT technologies or actively discussing them with stakeholders and decision-makers. The remaining 50 percent are considering IoT implementations.

Smart street lighting is one of the most popular use cases — not only because it provides immediate cost savings through LEDs and other controls, but also because it serves as a potential backbone for other smart city projects. With 180 million global LED street light conversions predicted by 2019, some industry analysts believe street light infrastructure will be the key smart city platform for connected IoT devices.¹

How would you assess your jurisdiction's/organization's maturity in adopting IoT technologies?



Foundational Elements Provide Tangible Benefits

When asked to identify the IoT-related technologies that are most needed within the infrastructure and transportation sphere, the top choices were sensors to gather real-time data (37 percent), intelligent traffic management tools (36 percent), geospatial technology (27 percent) and analytic tools (27 percent).

Many organizations are already using sensors (65 percent) and geospatial technology (60 percent). These technologies support some of the most popular IoT use cases and often provide immediate, tangible benefits. For example, the use of sensors to monitor the condition of vehicles and other mechanical equipment can cut overall maintenance costs and reduce breakdowns.

About one-fifth of respondents said supervisory control and data acquisition (SCADA) was a focus of their strategy for IoT expansion. This approach makes sense, as “industrial” IoT systems can be built on top of SCADA systems, and thereby improve them by providing the scalability, standardization, data analytics and interoperability they typically lack.

Organizations also are taking steps to make more use of data they’re collecting through the IoT. Seventy-eight percent of organizations plan to procure artificial intelligence (AI) solutions within the next 18 months to support their IoT and smart city initiatives. AI will be critical to sift through mountains of smart city data to support everything from traffic and parking management improvements to the safe integration of autonomous vehicles.

What types of IoT-related technologies are most needed within the transportation and infrastructure vertical?

Sensors to gather real-time data



Intelligent traffic management tools such as smart traffic signals



Geospatial technology



Analytic tools to understand data



Cloud storage solutions



Data storage



Smart LED lights



SCADA systems



Security tools/solutions



Advanced metering infrastructure (AMI) systems



Cloud management tools



Automatic meter reading (AMR) technology

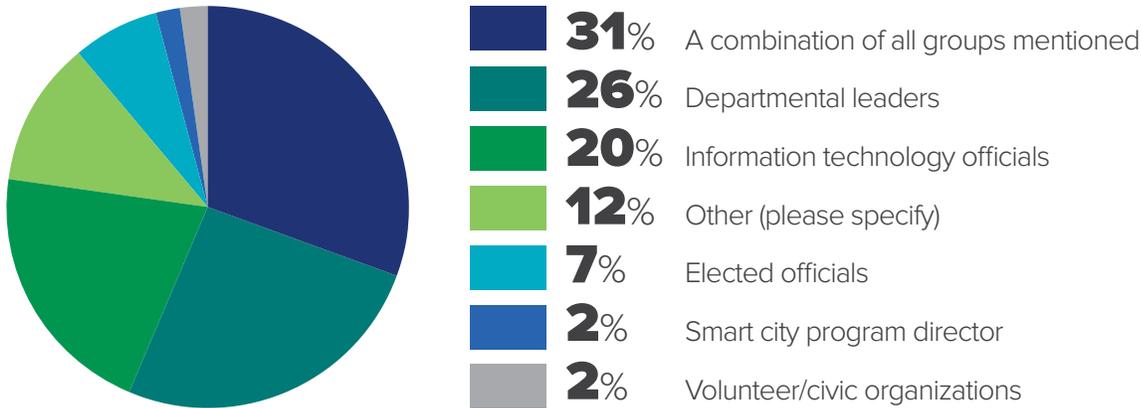


Wide Embrace of Smart Technologies

IoT is no longer the sole province of the IT department and is top of mind for business decision-makers and other stakeholders too. When asked which group leads discussions related to smart technology initiatives, 31 percent of respondents said multiple stakeholder groups are involved, 26 percent said department heads are leading the way and 20 percent chose IT officials.

Given that many of the earliest IoT and smart city implementations — and successes — have involved transportation and infrastructure projects, it's not surprising that multiple stakeholder groups in this arena are taking an active interest in the IoT. Clearly, there is growing recognition among departmental leaders and other stakeholders that the IoT is a key enabler for their mission and goals. Collaboration and coordination among these stakeholder groups will become increasingly important for jurisdictions that want to sustain their smart city vision over time.

Which group is leading the discussions toward smart technology initiatives?

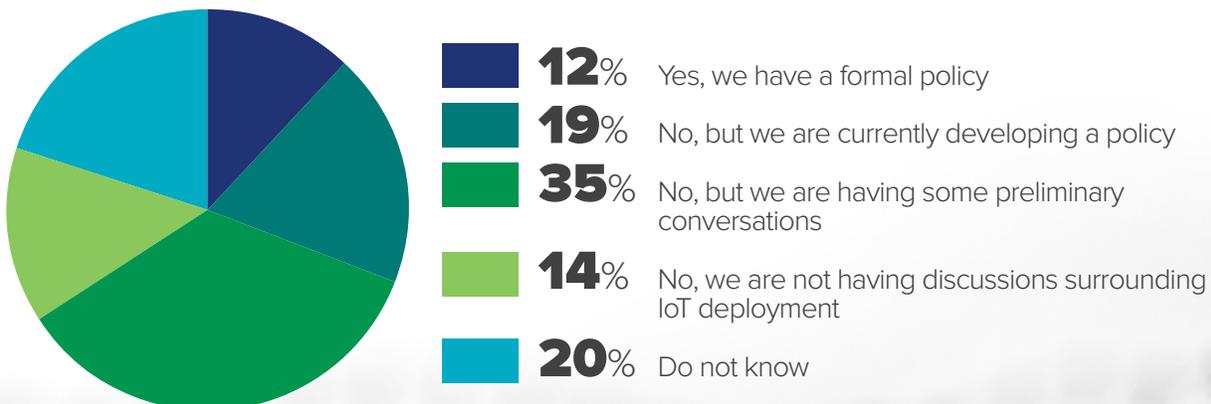


Formal Policies Will Lay the Groundwork for Sustainable Transformation

As is common with emerging technologies, IoT deployment has outpaced policy development. But that appears to be changing. Just 12 percent of respondents said their organization has a formal policy governing the deployment of IoT technologies today, but 54 percent are either developing policies or are in preliminary conversations about them. Not surprisingly, IoT isn't well integrated into overall IT strategy either. Only 30 percent of respondents said their jurisdiction's current IT strategy addresses smart city initiatives by using IoT technologies, while 41 percent didn't know whether it did.

Although most organizations lack plans, policies and strategies to move forward on the IoT in a deliberate way, the growing attention on policy development suggests agencies are moving beyond specialized use cases and pilot projects and taking a long-range view of IoT and smart city technology. They are preparing to institute formal practices that help them take full advantage of data and IoT technology, maintain the momentum of transformation, spend dollars wisely and ensure long-term success.

Does your organization/jurisdiction have a formal policy on the deployment of IoT technologies?



Network Upgrades are Underway

Infrastructure and transportation agencies recognize they will need intelligent networks that provide the performance, flexibility and scalability to support smart city infrastructure and transportation projects — especially as the number of sensors explodes and organizations implement new use cases.

When asked what types of network technologies are needed to implement smart city initiatives, respondents' top three choices were WiFi (64 percent), cellular (58 percent) and fiber (50 percent). More than 80 percent of organizations already have implemented WiFi and cellular technologies, and 60 percent have implemented fiber. They're also exploring more specialized network technologies to support IoT installations. Sixty-six percent said they plan to procure RF mesh within the next 18 months, and more than three-quarters plan to procure ZigBee, a low-power, low-bandwidth technology often used to create personal area networks.

These activities show that agencies are implementing or planning to procure the core capabilities needed for intelligent connectivity: interoperability, flexibility, reliability, high capacity, high speed and low latency.

Please describe your jurisdiction's/organization's approach towards the following network technologies, as related to implementing smart city initiatives.

| Network Technology | Currently Utilized | Planned for Procurement Within 18 Months |
|------------------------------------|--------------------|--|
| Cellular/Mobile | 84% | 16% |
| WiFi | 83% | 17% |
| Cable | 72% | 28% |
| Plain Old Telephone Service (POTS) | 73% | 27% |
| Fiber/FTTH | 60% | 40% |
| Microwave | 45% | 55% |
| Other | 39% | 61% |
| Satellite | 48% | 52% |
| RF Mesh | 34% | 66% |
| ZigBee | 24% | 76% |

From Foothold to Launching Pad

As infrastructure and transportation agencies adopt IoT technology, they have an opportunity to build a launching pad for future innovation. The key will be involving all stakeholders, formalizing policies and strategies, and establishing an intelligent network. In doing so, these agencies will move from isolated “smart” solutions that provide basic functionality to “intelligent” platforms that support a long-term vision to improve the lives of citizens for decades to come.

Learn more about advanced connectivity solutions to support IoT at <https://enterprise.spectrum.com/solutions/government.html>

Endnotes

1. IDC Worldwide Semiannual Smart Cities Spending Guide. <https://www.idc.com/getdoc.jsp?containerId=prUS43576718>

Produced by:



The Center for Digital Government, a division of e.Republic, is a national research and advisory institute on information technology policies and best practices in state and local government. The Center conducts e.Republic's annual Digital Cities and Counties Surveys; the biennial Digital States Survey; and a wide range of custom research projects.

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