



## WHITE PAPER

# Introducing the Smart State: Illinois Leads the Way

Sponsored by: The State of Illinois

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## IN THIS WHITE PAPER

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There has been a tremendous focus on Smart Cities over the past years and with good reason. Cities are the economic, social, and political hubs of the world; they contribute the most to the world economy and consume most of the world's resources. People working in U.S. cities contribute up to 90% of the nation's GDP and constitute 83% of the population. But U.S. cities operate with the support and influence of U.S. states, and states have an important triple role to play in the Smart Cities movement. IDC and the state of Illinois have identified this triple role as:

- **Transforming state government:** States have responsibilities, challenges, and inefficiencies similar to those of many large cities; they need to become more efficient and "smarter" themselves.
- **Supporting the development of Smart Cities:** States play a major role in supporting the creation of Smart Cities in their jurisdiction through policies and funding.
- **Creating smart and connected regional clusters:** States can connect Smart Cities within their jurisdiction to create smart and connected regional clusters of economic development.

States that strive to do these things successfully are Smart States. This white paper introduces the concept of the Smart State and discusses how the state of Illinois, under the combined leadership of Governor Bruce Rauner and State CIO Hardik Bhatt, is putting this concept into action.

## THE DIGITAL TRANSFORMATION TO A SMART STATE

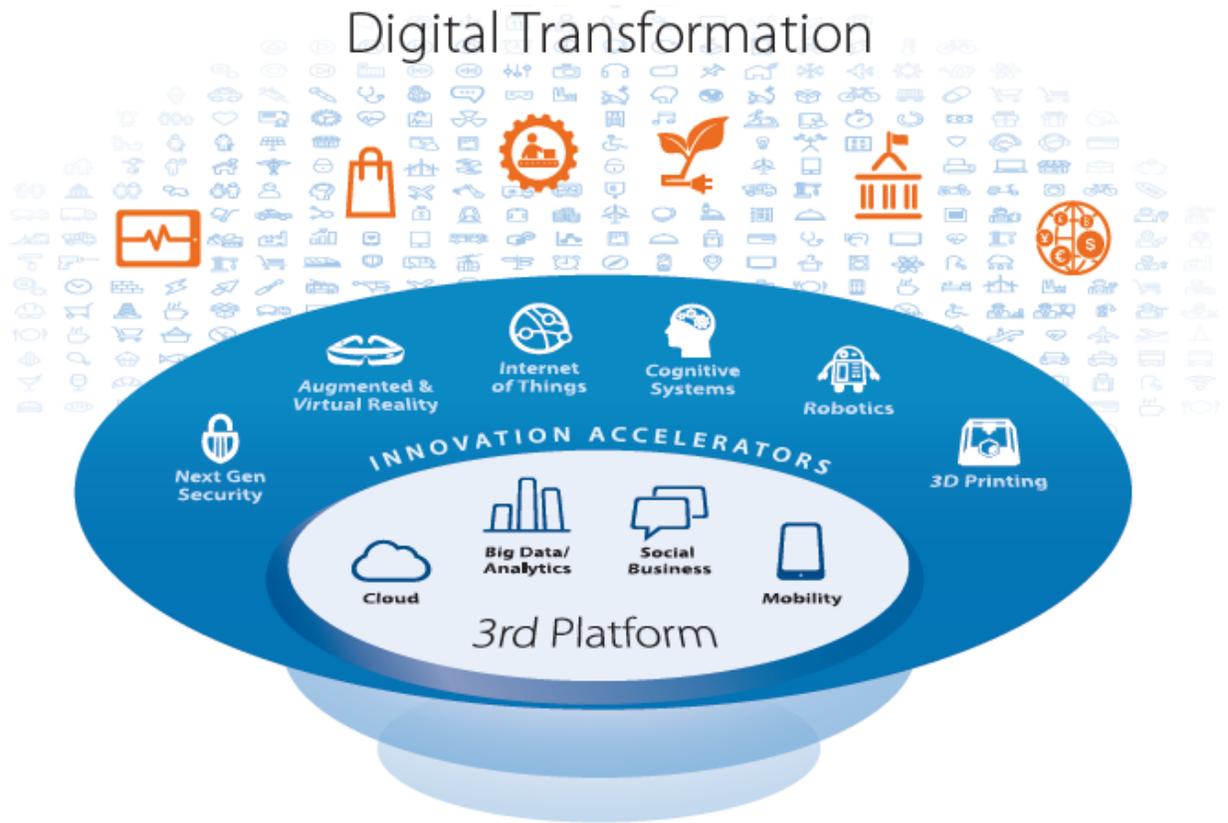
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### What Is a Smart State?

A Smart State is a state with a vision, a plan, and an execution road map to enact the digital transformation of government by investing in a 3rd Platform – information and communications technology (ICT). This 3rd Platform includes mobile technologies, big data analytics, social networks, and cloud services as its foundation for a set of *innovation accelerators*, such as the Internet of Things (IoT), cognitive computing, and robotics, that enable potentially radical new work processes, services, and products (see Figure 1).

FIGURE 1

Technologies Enabling Digital Transformation



Source: IDC Government Insights, 2016

The term *digital transformation* has become so pervasive that it could easily be dismissed as generic. However, IDC believes that state government leaders who recognize the impact of digital technologies on their operations, business practices, residents, partners, and industries in their state stand to gain a real advantage in growing their GDP, attracting business investment, developing and retaining a trained workforce, fostering a robust digital economy, and providing infrastructure and services that make their states more attractive places in which to live and work.

To fully embrace digital transformation, Smart States must embrace the changes to key processes and experiences for government workers, state businesses, educational institutions, tourists, visitors, and state residents.

This transformation is a multifaceted approach to take full advantage of the 3rd Platform and innovation accelerator technologies, such as those currently enabled with the Internet of Things, and includes:

- **Leadership transformation:** Statewide leadership that develops the vision for digital transformation of its services to provide the optimal value to employees and partners as well as residents and businesses
- **Experience transformation:** An omni-channel, ecosystem approach that focuses on providing superior products and services, resulting in a better overall experience and quality of life
- **Information transformation:** A focused approach to extract and develop the value and utility of information relative to residents, transactions, services, physical assets, and business experiences (For a Smart State, this is heavily dependent on IoT solutions and big data analytics.)
- **Operations transformation:** The ability to make operations more responsive and effective by leveraging digitally connected products/services, assets, people, and trading partners
- **Workforce transformation:** The ability to create 21st century jobs by attracting corporations, fostering innovation, encouraging entrepreneurs, and producing 21st century talent that will result in overall workforce transformation
- **Ecosystem transformation:** Transformation of major economic regions into Smart State ecosystem enablers by effective policy changes, funding prioritization, and leveraging the state's role as a powerful convener of resources

These areas of transformation, which are illustrated in Figure 2, are connected to the Smart State's triple role in Smart Cities.

**FIGURE 2**

**Digital Transformation Is Multifaceted**



Source: IDC Government Insights, 2016

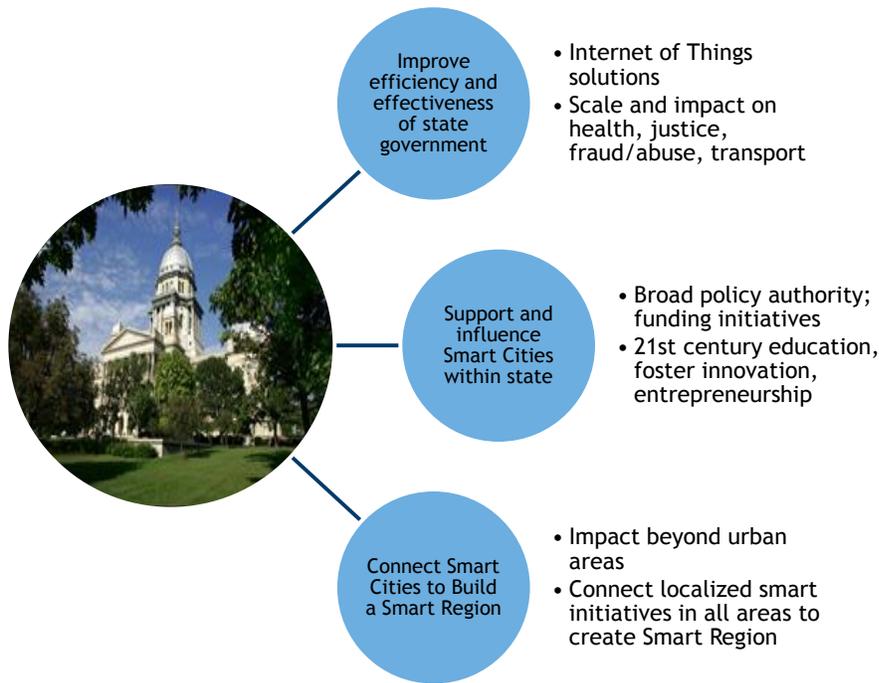
## The Impact of Smart States and the "Triple Role"

A Smart State has a triple role to play in digital transformation and the Smart Cities movement, and as Mr. Bhatt outlines below, that role is tied to the key areas of transformation (see Figure 3):

- **Improve efficiency and effectiveness of the state government:** Smart States have many similarities to Smart Cities in terms of broad goals of data-driven digital transformation but with some key differences in scale and impact. This role of states in internally transforming themselves is directly tied to operations transformation and information transformation. A Smart State that uses the IoT and big data analytics can run much more efficiently by improving average asset and employee productivity. Improved healthcare with Telemedicine and TeleHealth can provide better results for a state's healthcare consumers. Use of TeleVisitation and TeleJustice can improve both correctional and justice systems. Use of sensors and video-based analytics can immensely improve how states provide public safety services while keeping the workforce safe as well. Long stretches of expressways and toll highways can benefit from real-time traffic information, alerts, and road conditions through connected transportation corridors. State assets such as buildings and fleet can be managed more efficiently with effective use of sensors and Integrated Operations Centers. A state government enabled with better big data analytics will significantly eliminate waste, fraud, and abuse from its system and provide much better return on taxpayer investment.
- **Support and influence Smart Cities within the state:** A Smart State has a unique role to play in the context of Smart Cities that relies on new leadership thinking to develop transformations in the customer experience. States, with their broad policy authority and influence, can create and support large-scale initiatives that can boost a smart school district or a Smart City within its jurisdiction. Smart State policies can also enable 21st century education, entrepreneurship, and innovation for workforce transformation.
- **Connect Smart Cities to build a Smart Region:** Smart City solutions focus on areas of high population density and high job density, potentially leaving out areas of lower population and job density, such as rural areas. A Smart State can connect multiple localized Smart City initiatives to create a Smart Region by transforming its ecosystem and partnership models, enabling more wide-reaching consistency of services such as transportation, safety, education, and health and wellness.

**FIGURE 3**

## The Triple Role of Smart States



Source: IDC Government Insights, 2016

How do states take action on these priorities and address the challenge of digital transformation? These priorities, and the promise of digital transformation, center around the opportunities that emerging technologies can and will provide.

### The "Smart" in Smart State

3rd Platform technologies are the foundation for a digital, information-based, and connected economy in which next-generation networks, the Internet of Things, and big data analytics technologies help create vertically specific products and services. Various technologies work together in the Smart State: the IoT and big data analytics, civic technologies to engage residents, and vertical operational technologies that connect IT to the operational layer and enable solutions for connected vehicles, intelligent transportation, telemedicine, connected public safety, precision agriculture, and smart grids.

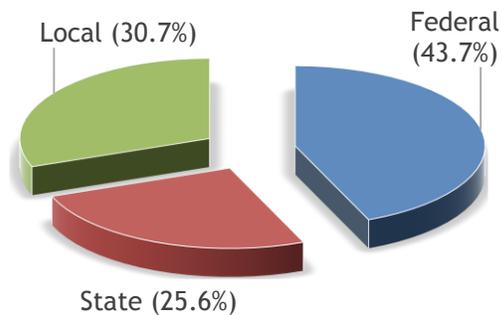
We are in the midst of a rapid growth in the deployment of connected "things," which include the sensors, RFID, smart cards, body cams, wearables, GPS, and embedded systems that are connected to the Internet. These connected things form the basis of IoT solutions and provide a tremendous amount of data that can create better state services, policies, and regulations.

The premise of IoT solutions is that they provide a significant return on investment (ROI) from this improved access to information. There will be not only a financial return from efficiencies and cost savings but also a social and environmental return by enabling departments and agencies to meet specific targets, outcomes, and policy goals. The IoT can help state and local governments reduce traffic congestion, respond more quickly to emergencies, reduce greenhouse gas emissions, and serve the residents more effectively.

The Smart State will harness technology and turn this data into useful information by providing the infrastructure (e.g., fiber backbone) not only for the state itself but also for its municipalities and industry. States are expected to spend \$5.2 billion on IoT solutions in 2016 and generate more than a fifth of the global benefits from the IoT (see Figure 4).

## FIGURE 4

### U.S. Government Spending on IoT, 2016



**Total = \$20.4 billion**

Source: IDC Government Insights, 2016

Smart States will use the IoT for their own internal transformation, improving the services that states provide in law enforcement and the prison/judicial systems, public education, public health, environmental monitoring, food supplies, transportation, and infrastructure. The most prominent use case benefits are shown in Figure 5. Smart States' investments and policies will be instrumental in supporting the growth of the digital economy, which includes supporting those services provided by Smart Cities.

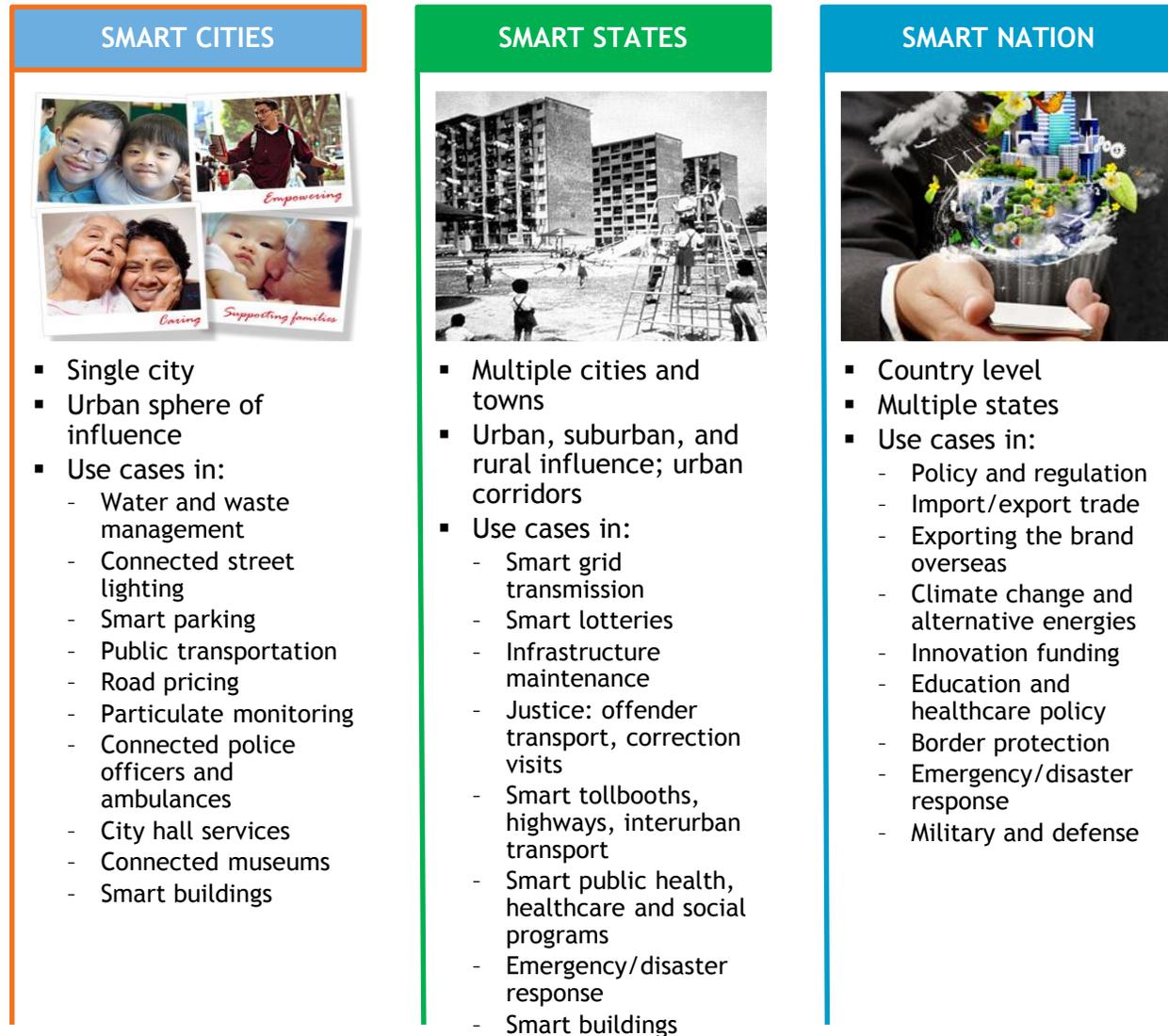
States have the power to bridge the gap and enable collaborative innovation:

- Bring together multiple universities and medical centers for technology and data science research and talent development
- Attract venture capital or create funds of their own with private partners for entrepreneurship and start-up growth
- Get commitment for R&D investments
- Create their own innovation centers for technology testing

- Open up large and important data sets for use by academics, the tech community, and other government agencies
- Develop a statewide formal ecosystem that supports Smart Cities as major state economic hubs (i.e., bringing together state universities, large state employers and industries, and multiple cities)

**FIGURE 5**

**Smart State Services**



Source: IDC Government Insights, 2016

## HOW ILLINOIS IS STARTING TO BECOME A SMART STATE

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The state of Illinois has taken the first step toward becoming a Smart State by articulating its vision for a Smarter Illinois. The initiative is being led by Mr. Bhatt and has executive buy-in from Governor Rauner. The state's first efforts have focused on getting a baseline of projects at the department and agency level, determining needed projects that could leverage existing network infrastructure assets, and convening an Advisory Board made up of private sector leaders, academics, industry researchers (IDC has an executive member on the Advisory Board), and other public sector participants. The Advisory Board is co-chaired by Deputy Governor Trey Childress, who leads overall transformation efforts for the state, and Mr. Bhatt.

For the state of Illinois, the goals around the concept of the Smart State are to:

- Improve overall efficiency, effectiveness, and accessibility of government services
- Create an attractive environment for businesses and entrepreneurs
- Increase GDP/economic value of Illinois over a decade
- Establish leadership position across the nation and world as a Smart State
- Create a tangible platform for global competitiveness

### Developing a Baseline

In starting its journey, the state of Illinois needed to understand its current "as is" situation. The state conducted an internal survey of 45 agency CIOs and business leaders to determine the level of adoption of Internet of Things and Smart Cities initiatives or technologies. The results showed, as confirmed by large-scale surveys IDC has conducted, that adoption at this point in time is low.

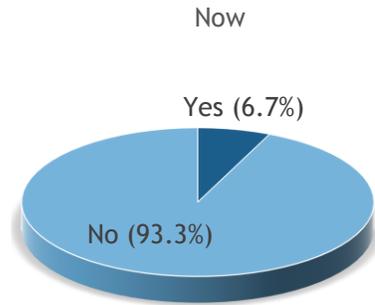
While only 7% of respondents indicated that they have Smart State or IoT projects under way, there was significant interest in this initiative as demonstrated by the growth in expected projects to 24% of agencies over the next one to two years (see Figure 6). Having established a baseline, Illinois is now in the position to assess growth in Smart State projects over time.

## FIGURE 6

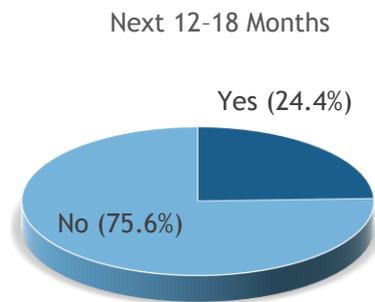
### Current and Future Smart State/IoT Plans for Illinois Agencies

Q. Are you currently doing anything in the IoT/Smart State arena?

Q. Is your agency planning to do anything in this area in the next 12-18 months?



n = 45



n = 45

Source: Illinois Department of IT, 2015

However, the results also showed a lack of full awareness and understanding of IoT and Smart Cities applicability given that the state has implemented several Smart State IoT initiatives. For example, the Illinois Toll Highway Authority is considered a leader in national toll highway systems, and the Illinois Department of Transportation (IDOT) has partnered with five other Midwestern states to create a connected highway system throughout the Midwestern United States. In reality, adoption of IoT is higher, but there is a lack of clarity around which projects are IoT projects and which are not.

The state has also begun to consider key future project areas. Table 1 shows a summary of projects in progress or under consideration. The state has access to 2,000 miles of owned or leased fiber, a key asset that it can use to implement these projects and thus connect agencies and partners with data as well as provide services to constituents.

**TABLE 1**

**Current and Potential Illinois IoT Projects**

Functional Area	Agency	Smart State Initiative or IoT Project	Status
Smart Transportation	Transportation	Illinois DOT and regional Transit Authority to use existing sensors on road networks in integrated transportation management centers	Pending
TeleJustice Services	Corrections	TeleJustice services between Illinois State prisons and county courts to save millions of dollars with improved productivity and increased safety by avoiding inmate transport	Current
Prison Visitation Services	Corrections	In high-risk cases, offer TeleVisitation to prisoners to reduce contraband in prisons and security requirements	Current
Agriculture	Environmental Protection	Supporting state agriculture industry with connectivity for BYOD for fieldworkers, sensor networks for soil, and climate monitoring	Pending
Connected Lighting/ Transportation	Transportation	Using connected streetlights on highway systems for operational savings and better monitoring and maintenance	Pending
Critical Infrastructure	Emergency Management	Internal surveillance cameras	Current
Critical Infrastructure	Emergency Management	Nuclear remote monitoring system (RMS)	Current
Transportation	Transportation	Traffic flow: CCTV, side-fire radar, Bluetooth, true cut loops	Current
Transportation	Transportation	Advanced Traffic Management Systems	Current
Transportation	Transportation	Managed Smart Corridors: I-94, I-55, and I-290	Current
Public Safety	Military Affairs (National Guard)	Utility metering for power, electricity, and gas throughout state facilities	Current
Social Services	Children and Family Services	Electronic Visit Verification — GPS to determine if an actual in-home visit was made	Current
Public Health	Insurance/Get Covered Illinois	Kiosks to disseminate information about health insurance marketplace	Current
Citizen Services	Lottery	Kiosks to file winning claims	Current

Source: State of Illinois, 2015

IDC believes that the list provided in Table 1 just scratches the surface of initiatives that could be undertaken considering the coverage of the state's fiber backbone.

Along with IoT solutions, the state of Illinois is also on its way to using big data analytics. It has a vast amount of data that will be put through analytics engines to make informed real-time decisions and to provide better customer service. The state recently set up a new data analytics practice that will be led by an accomplished statewide chief data officer.

Another key area that the state is impacting is the Array of Things project in the city of Chicago. Chicago's innovation ecosystem has been positively impacted by the state of Illinois' early investments in successful incubators such as 1871. Illinois has also remained at the forefront of research through two national labs, STEM schools such as Illinois Mathematics and Science Academy, and the University of Illinois system. The state of Illinois is a founding partner of the IoT Midwest Council run in partnership with the Illinois Technology Association (ITA) (<https://www.illinoistech.org/iot-council>). The mission of the ITA Internet of Things Council is to drive advancement of IoT technology, policy, and industry, establishing Chicago and the Midwest as an epicenter of IoT.

Along with entrepreneurship and innovation, cultivating IoT talent is key to taking a leadership position in this new industry. A talent management initiative with a triumvirate of partners – the state of Illinois, the private sector, and the Illinois education system (universities and community colleges) – has begun to design 21st century curriculums around IoT and big data analytics. The state of Illinois is a board member of the IoT Talent Consortium (<http://www.iottalent.org>), which aims to shape the educational and recruitment solutions that accelerate IoT workforce preparation in pursuit of three primary organizational objectives:

- To accelerate the trained prospect pool by growing an IoT-specific talent development ecosystem
- To establish a leadership voice in the consortium's resource platform to aid preparation of the emerging IoT workforce
- To build the capability to match trained talent to jobs within the developing IoT ecosystem in the consortium's membership

This alignment between the state's IoT and Big Data economy and its academic research on the impact of IoT on its residents and businesses can provide important lessons to the state as well as ensure that state and city initiatives are coordinated.

## The Smarter Illinois Advisory Board

Taking the important step in partnership development, the state has convened a Smarter Illinois Advisory Board, which will help build an executable strategy. Having stakeholders from major IoT and smart technology companies along with government leaders and industry researchers, such as IDC, is a key best practice for developing the maturity of Illinois' Smart State vision. Such an informal partnership ecosystem not only serves to prioritize initiatives and advise on implementation but also can help leverage new and innovative financing models designed in other parts of the world.

## Future Steps for Illinois

Having collaborative partnerships, including and beyond the Advisory Board, is key to the future plans of the state of Illinois. Industry organizations, the private sector, federal agencies, and other states are all potential collaborators on developing road maps, best practices, and guidelines for projects. Under the leadership of Marian Cook, Chief Strategy Officer for Enterprise IT, the state has developed a successful process that it will continue to leverage. The process, which involves conducting a baseline survey and then creating an Agency CIO working group that evolves into an enterprise Center of Excellence that is paired with an external Advisory Board of global experts, provides the state with a template it can use to continue to foster innovative new plans. The state of Illinois plans to move forward by:

- Inviting private/academic/financial sector partners as advisors
- Studying further the economic value of the Smart State
- Building an executable strategy
- Identifying high-value, low-effort projects to get off the ground
- Identifying high-value, high-effort projects for potential private financing options
- Drafting appropriate forward-looking policies/legislation to enable IoT/Smart State businesses to thrive in Illinois

## CONCLUSION

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Efforts described previously will position Illinois as a leader in the Smart State and IoT space. However, economic growth powered by digital transformation doesn't just happen. Energized leaders with a vision drive it. This transformation requires investment in new technologies, the creation of new start-ups and the growth of existing businesses to create jobs, and the buy-in of key partners. The state of Illinois, with its Smart State plan, has begun this transformation during a time of exciting opportunities afforded by emerging technologies.

The state of Illinois invites government and business leaders, cities, academics, innovators in public services, and ICT and infrastructure organizations to join its journey as Illinois transforms itself into a Smart State.

## About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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