



# Strategic Asset Management: An Infrastructure Plan for the Future

## INTRODUCTION

**The United States faces** a staggering infrastructure backlog of nearly \$2.6 trillion — enough to cost the average American household \$3,300 a year. If unaddressed, this backlog is predicted to increase by a half-trillion dollars over the next decade, a challenge faced by governments of all sizes.<sup>1</sup> “Even the smallest city has a million assets in bridges, pavements, facilities, sidewalks and more competing with each other for the scarce dollar,” says Ashay Prabhu, founder of Assetic (now Brightly). “These governments need to decide how to spend these funds wisely.”

Unprecedented federal funding from the 2021 Infrastructure Investment and Jobs Act (IIJA) provides state and local governments a generational opportunity to address these longstanding infrastructure deficits and begin making good on overdue smart city aspirations. However, doing so will require governments to approach capital planning in new ways to make the most of their investments.

“The time is now for government to rethink capital planning to optimize these short-term stimulus funds and resources to reduce ‘infrastructure creep,’ bring budgets back into balance and allow these benefits to last for decades,” says Prabhu.

This paper outlines government infrastructure challenges and identifies how strategic asset management can help leaders chart a sustainable course for their communities.

## Opportunity Amid Challenge

**The nation’s infrastructure** challenges are succinctly summarized in the American Society of Civil Engineers (ASCE) Infrastructure Report Card. Every four years, ASCE evaluates the condition and performance of American infrastructure in the familiar form of a school report card — assigning letter grades based on physical condition and needed investments for improvement. In 2021, the nation’s grade was a C-. That letter grade represents growing challenges — nearly half (43%) of public roadways are in poor condition, and a water main breaks somewhere in the country every two minutes.<sup>2</sup> Even so, the state of infrastructure is not a lost cause, according to Prabhu.

“It does not mean every bridge, street, water pipe and community infrastructure is a C-,” he says. “What it does mean is we need to invest smartly so we end up with a lower infrastructure backlog in the future, not a higher one.”

Doing so will require a new strategy for addressing infrastructure needs as even the full value of the IIJA and earlier stimulus packages is eclipsed by the nation’s overall infrastructure deficit.

Traditional approaches to infrastructure challenges — including addressing the oldest or worst-performing assets first, for example, or taking a “fix it when it breaks” approach — can result in missed opportunities to repair or address infrastructure needs at lower costs earlier in the life cycle. The mindset in many departments that manage infrastructure can also hinder efforts at being more proactive, says Center for Digital Government Senior Fellow Justin Marlowe.

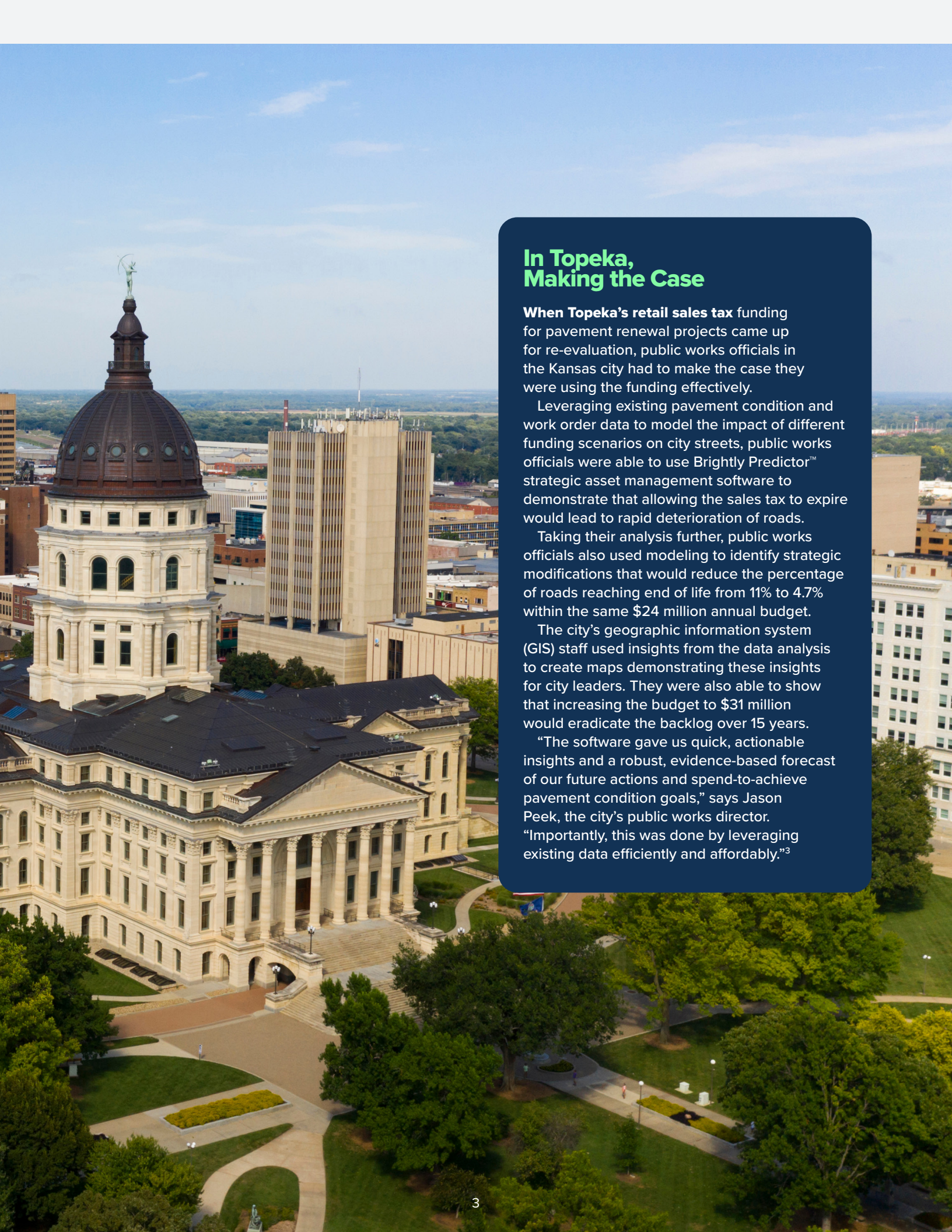
In the absence of a strategic plan, political pressures often mean that only the most visible problems — those that generate the largest public outcry — get addressed. That results in lost opportunities to invest in preventive maintenance or align capital projects with other strategic priorities, including ones geared toward addressing past inequities in infrastructure investments, spurring economic development, or mitigating the impacts of climate change.

Marlowe, a research professor at the University of Chicago’s Harris School of Public Policy, likens the capital budgeting process to an inverted funnel, in which a wide range of needs are winnowed down

### Introducing Brightly

**After more than two decades** serving the U.S. market, Dude Solutions changed its name to Brightly in March 2022. The name change establishes an expanded vision that combines our foundational computerized maintenance management system (CMMS) offerings with enterprise and strategic asset management solutions for a future where efficient operations and smart assets power sustainable communities.

“Real-time asset data is necessary to survive in today’s world. Sustainable assets are becoming an even more essential part of how our world works. The world around us is evolving in ways many of us could have never imagined,” says Ashay Prabhu, founder of Assetic (now Brightly). “We’ve expanded our vision and solutions to help our clients navigate through this change.”



## In Topeka, Making the Case

**When Topeka's retail sales tax** funding for pavement renewal projects came up for re-evaluation, public works officials in the Kansas city had to make the case they were using the funding effectively.

Leveraging existing pavement condition and work order data to model the impact of different funding scenarios on city streets, public works officials were able to use Brightly Predictor™ strategic asset management software to demonstrate that allowing the sales tax to expire would lead to rapid deterioration of roads.

Taking their analysis further, public works officials also used modeling to identify strategic modifications that would reduce the percentage of roads reaching end of life from 11% to 4.7% within the same \$24 million annual budget.

The city's geographic information system (GIS) staff used insights from the data analysis to create maps demonstrating these insights for city leaders. They were also able to show that increasing the budget to \$31 million would eradicate the backlog over 15 years.

"The software gave us quick, actionable insights and a robust, evidence-based forecast of our future actions and spend-to-achieve pavement condition goals," says Jason Peek, the city's public works director.

"Importantly, this was done by leveraging existing data efficiently and affordably."<sup>3</sup>

to a smaller number that are ultimately funded. All told, “maybe half of the projects that make their way farther down the line get there on their own merits,” says Marlowe. “The other half get there for any other reason. The question is whether that is good enough.”

Strategic asset management can address these challenges. By modeling future outcomes to identify the best options for capital planning, it can help government leaders reduce longstanding infrastructure deficits and improve the overall level of service and livability of their communities. This approach lets decision-makers easily see the effect of any changes they make to budgets, service levels, deficit targets or potential future borrowing. “The future isn’t about hoping the problem will go away, or printing more money or raising taxes, but looking at a data-driven model that can simulate and provide alternative ways to reduce the deficit and provide a significantly better asset base,” Prabhu says.

## Strategic Asset Management: A Primer

---

**Strategic asset management**, or SAM, involves leveraging data about infrastructure assets for use in models that determine better long-term outcomes, simulations that predict the impact of spending money at different stages of an asset’s life cycle, and evaluations of the tradeoffs between addressing different asset types or conditions. SAM lets agencies “take what we have and envision what that data will look like five to 10 years from now, and how different investments will change that trajectory,” Marlowe says.

Virtually all municipalities and asset-based agencies already have the information required for strategic asset management. “You’ve got the data,” Prabhu says. “Your engineers are drinking data through a firehose.”



“The future isn’t about hoping the problem will go away, or printing more money or raising taxes, but looking at a data-driven model that can simulate and provide alternative ways to reduce the deficit and provide a significantly better asset base.”

— Ashay Prabhu, Founder, Assetic (now Brightly)

Sets of data are typically stored in an asset register or a GIS solution, but some may be scattered across disparate systems, including standalone databases or even Excel spreadsheets. The institutional knowledge of staff in the field who identify degrading architecture also represents a critical source of data. Even so, “data hasn’t been the challenge,” Marlowe says. “The challenge really is taking all that data and being able to say something other than the asset condition and performance levels today, and being able to forecast performance levels two, three or five years down the road.”

Governments that have adopted strategic asset management have done so methodically over several years, as they implement systems and build internal capacity to model different scenarios. “It’s a journey, not a race,” Prabhu says.

The first step is to consolidate all asset data into a single register, such as a GIS solution. Then, governments that have been successful with SAM have added a predictive analytics platform that can draw from this data to model future outcomes. That’s a key distinction, Prabhu says.

“Data is information — it will tell me I’ve got 3,000 buildings, and how many are green, yellow and red,” he says. “That’s information. The game changer is to see what those buildings’ state of assets will look like in five, 10 or 20 years if you changed budgets, traded service levels or altered funding strategies. Predictive platforms convert that information into wisdom.”

The benefits of a SAM approach are numerous. Capital budgets take far less time to develop, and the scenarios generated by predictive modeling can provide convincing presentations for elected officials and stakeholders. In particular, the ability to map capital projects to areas of interest to lawmakers and constituents can be a critical differentiator. “When you talk about specific benefits in specific neighborhoods or on specific blocks, then you’re speaking the language that elected officials speak,” Marlowe says.



## In California, Optimizing the Flow of Infrastructure Replacement

**The Rancho California Water District** used to replace water meters like clockwork — every 15 years, or when consumption reached a set level. But the district’s leaders set out to see if SAM could help address the more than \$11 million slated for meter replacements over the next seven years.

Officials reviewed the meter replacement program through a SAM lens using life-cycle models provided in the Brightly Predictor™ software, assessing the impact of different flow rates, meter sizes and types. Comparing and analyzing different strategies ultimately resulted in an optimized replacement strategy yielding 60% savings over 10 years. The district has since used modeling to identify savings in wastewater pump upgrades and is exploring strategies for drinking water reservoirs.

“Our results really improved once we started using asset management software and adopted a life-cycle approach to our long-term strategic asset management strategies,” says Jeff Krishberg, RCWD water resource manager.<sup>4</sup>

Prabhu estimates that a typical municipality could unlock \$2 million to \$5 million per year from implementing SAM practices. Over time, that could halve the annual infrastructure creep of renewal costs, and help address the nation's broader infrastructure challenges across multiple jurisdictions, lifting the national report card grade to a B or higher, he says.

That's why it's so important to approach current funding windfalls through a strategic process, Prabhu says. "The opportunity when monies are available is the best one to get the foundations solid and the house in order," he says.

Looking forward, demonstrating SAM practices will become increasingly critical for both regulators and the capital markets that fund large-scale infrastructure. "They are now paying very careful attention to whether state and local governments have asset management systems in place," says Marlowe.

Noting the growing imperative to meet environmental, social and governance (ESG) goals, Marlowe adds that SAM "is becoming a really critical part of the 'G' in ESG. Your bonds aren't going to make it into those portfolios if you don't have the ability to document careful asset management. Citizens come first, but the market is an important second."

And addressing market needs is critical to meet the ultimate goal of infrastructure asset management — the optimization of scarce resources to

meaningfully address infrastructure deficits and improve the quality of life in communities.

## Strategies and Lessons Learned

**Across the globe,** thousands of governments have made the transition to SAM. Among the key lessons learned:

■ **Data is critical, but it's never perfect.** While it's important to aggregate data about all assets and their characteristics, it's also important to recognize that no data set will be perfect. "Don't wait until your data is 100% accurate to proceed," Prabhu says.

■ **Don't develop models alone.** Predictive modeling platforms should reflect the experience of multiple municipalities, and they should include a range of information about assets to accurately calculate their life cycle. "A pipe built in the 1960s is different from one built in the 1980s and will degrade differently," Prabhu says.

Look for systems "based on models, user experiences and trends that are proven versus a mathematical model that may or may not make sense for a jurisdiction," Marlowe says. "To leverage data not just from your jurisdiction but from hundreds or

## In Ann Arbor, Shedding Light on New Infrastructure

**When the city of Ann Arbor,** Michigan, lifted a longstanding moratorium on new streetlights, city officials were faced with addressing pent-up demand for improved lighting and pedestrian safety — all with funding levels inadequate for even maintaining the existing streetlights.

City officials used SAM to analyze the existing streetlight infrastructure and funding opportunities over a 25-year period, taking into

consideration factors such as traffic, location, critical users and existing lighting levels. The key assets under consideration — the streetlights themselves — were also broken down into their fundamental components, including electrical systems, lighting, posts and more to improve the analysis.

This complex analysis resulted in an optimal investment strategy that city officials presented to elected officials, who approved

a 137% funding increase. The new funds will allow Ann Arbor to add 30 new streetlights per year while ensuring that no more than 10% of all lights reach end-of-life conditions.

"The multi-component analysis allowed the city to leverage existing streetlight condition information to present data-driven budget needs to [the city] council," says Chris Elenbass, Ann Arbor public works engineer.<sup>5</sup>

“When you talk about specific benefits in specific neighborhoods or on specific blocks, then you’re speaking the language that elected officials speak.”

— Justin Marlowe, Senior Fellow, Center for Digital Government

thousands of other jurisdictions can be persuasive in ways a statistical model may not be. The shared wisdom of many other jurisdictions and user experiences will go a long way in taking the data we have and being comfortable using it in more forward-looking ways.”

■ **Focus on collaboration.** Challenges such as modernizing outdated transportation infrastructure or mitigating the effects of climate change cross jurisdictional boundaries. It’s important to ensure asset data can be shared in ways that can inform regional or statewide planning and capital projects.

“So many of those big investments are regional systems, and you have to understand how what you’re doing fits into those efforts,” Marlowe says. Platforms that can exchange data across multiple jurisdictions “go a long way toward promoting

cooperation and being aware of overlapping levels of government with different infrastructure capabilities,” he adds. “Five years ago, this would have been unthinkable. Now it’s part of the deal.”

■ **Look for opportunities to draw from institutional knowledge.** Organizations like the Government Finance Officers Association (GFOA), the American Public Works Association (APWA) and its Oceania counterpart, the Institute of Public Works Engineering Australasia (IPWEA), have developed frameworks and metrics that can keep municipalities from “reinventing the wheel,” Prabhu says. They can also help build internal capacity. IPWEA, for example, has developed a pathway to train staff on effective infrastructure asset management. “The rhetoric around infrastructure needs to change — it is people, skills and education that are at the core of infrastructure stimulus being successful, for now and over the long term,” IPWEA Chief Executive David Jenkins says.<sup>6</sup>

■ **Focus on transparency.** With a growing shift in both public administration and constituent expectations, transparency is non-negotiable, particularly if capital projects are expected to go through a resident approval process. The ability to



display information in a geographic context is critical. “Maps and visualizations make a big difference,” Marlowe says. “You can go literally block by block and talk about disparities in investments and how capital improvements can address them.”

Educating elected officials and stakeholders may take more time. “Don’t expect them to buy your story the first time,” Prabhu advises. “Bring them along on the journey.”

## What’s Next

**As governments are charged** with looking further ahead — over decades instead of years — to determine the impact of infrastructure projects, adopting strategic management will allow them to ensure their communities remain resilient in the face of unanticipated changes.

One longstanding promise — the potential of “smart cities” to ensure that infrastructure is more responsive to residents’ needs — relies heavily on SAM. But the proliferation of connected sensors and other devices will also provide government leaders with more data — everything from traffic flows to the physical condition of assets such as stormwater drains — to inform better decision-making about all infrastructure.

“A smart project is truly a smart project when it’s cost effective and encourages a more positive citizen experience.”

— Marc Evans, Vice President of Government Solutions, Brightly

“A smart project is truly a smart project when it’s cost-effective and encourages a more positive citizen experience,” says Marc Evans, Brightly vice president of government solutions. “The underlying foundation to building a smart community should always be to implement flexible ways to collect data and marry those data silos to make more informed investments.”

It’s also important to keep the end goal in mind. SAM will ultimately result in better managed cities with higher levels of service, which will instill greater public confidence.

“The cities that make this shift will have a substantial advantage and will be magnets for people who want to live and work there,” Prabhu says.

**To learn more, visit [www.brightlysoftware.com/products/predictor](http://www.brightlysoftware.com/products/predictor).**

This piece was written and produced by the *Government Technology* Content Studio, with information and input from Brightly.

<sup>1</sup> <https://infrastructurereportcard.org/resources/investment-gap-2020-2029/>

<sup>2</sup> <https://infrastructurereportcard.org/>

<sup>3</sup> <https://www.brightlysoftware.com/sites/default/files/file/2022-04/CS-GOV-Topeka.pdf>

<sup>4</sup> [https://www.brightlysoftware.com/sites/default/files/file/2022-02/Brightly\\_GOV\\_Rancho%20California%20Water%20Districtn%20case%20study%5Bfinal%5D.pdf](https://www.brightlysoftware.com/sites/default/files/file/2022-02/Brightly_GOV_Rancho%20California%20Water%20Districtn%20case%20study%5Bfinal%5D.pdf)

<sup>5</sup> <https://www.brightlysoftware.com/sites/default/files/file/2022-04/CS-GOV-AnnArbor.pdf>

<sup>6</sup> <https://thefifthstate.com.au/jobs-news/market-pulse-peak-body-ipwea-tackles-infrastructure-skills-shortage-as-well-as-job-movements-and-availabilities/>

Produced by:

**government  
technology**

Government Technology is about solving problems in state and local government through the smart use of technology. Government Technology is a division of e.Republic, the nation’s only media and research company focused exclusively on state and local government and education. [www.govtech.com](http://www.govtech.com)

For:

**Brightly**

Brightly, the global leader in intelligent asset management solutions, enables organizations to transform the performance of their assets. The Brightly sophisticated cloud-based platform leverages more than 20 years of data to deliver predictive insights that help users through the key phases of the entire asset lifecycle. More than 12,000 clients of every size worldwide depend on the Brightly complete suite of intuitive software – including CMMS, EAM, Strategic Asset Management, IoT Remote Monitoring, Sustainability, and Community Engagement. Paired with award-winning training, support, and consulting services, Brightly helps light the way to a bright future with smarter assets and sustainable communities. For more information, visit [brightlysoftware.com](http://brightlysoftware.com)