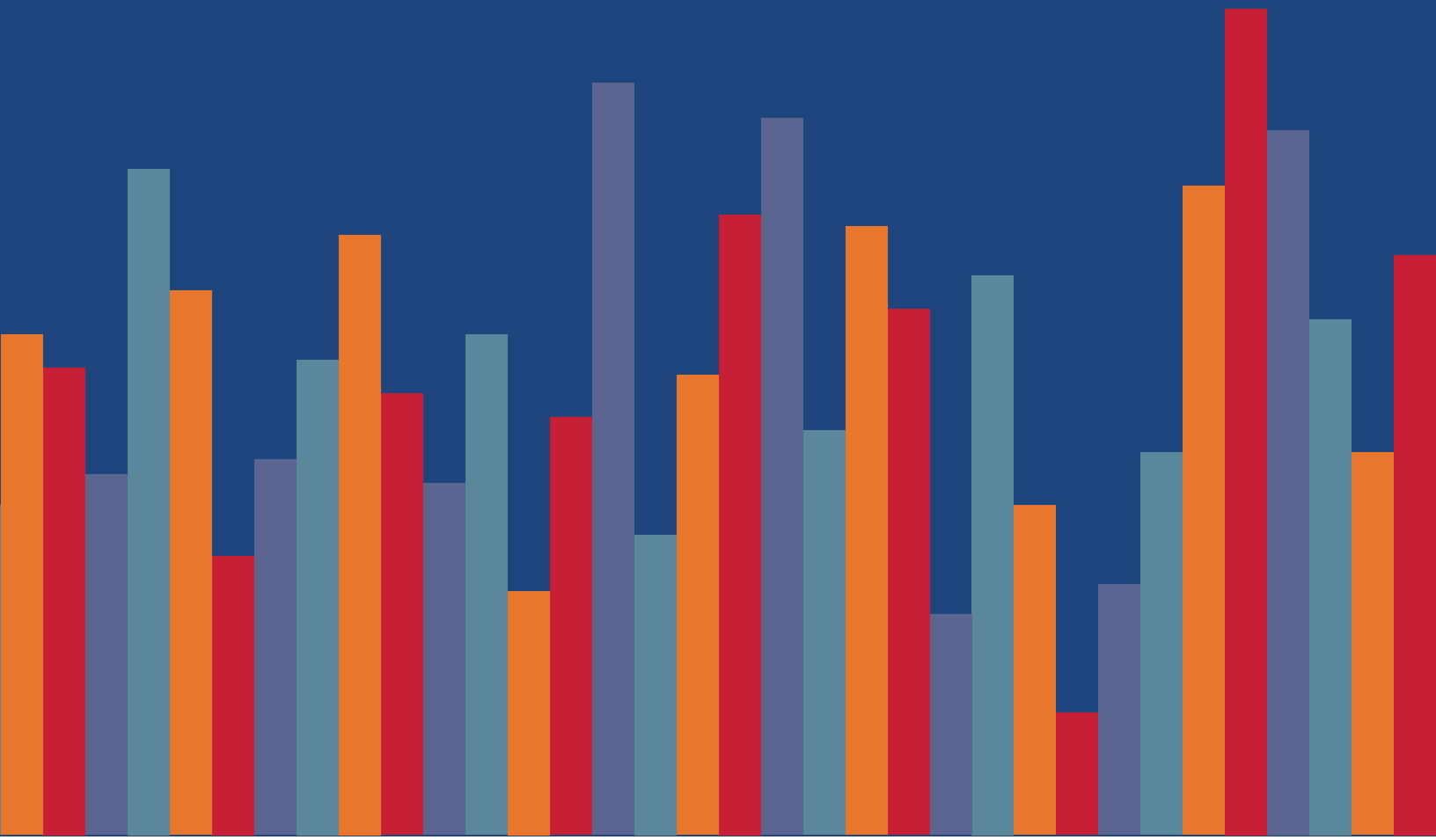
EMPOWERING AGENCY LEADERS WITH SELF-SERVICE DATA VISUALIZATION

INDUSTRY PERSPECTIVE



tableau®

INTRODUCTION

"What we want to do is empower **everyone** in the organization to intuitively **ask and answer** their own questions **anywhere, anytime.**"

CHRISTINE CARMICHAEL

MARKETING DIRECTOR OF GOVERNMENT AND EDUCATION, TABLEAU

What do Pixar, the creators of the animated films "Toy Story" and "Up!," and the Department of Defense (DoD) have in common? One thing: both organizations know how to harness the power of visualization. In fact, one of the founding employees of Pixar, Pat Hanrahan, helped the DoD realize how something that brought children's stories to life could also help people see and understand big data.

When the DoD needed to empower ordinary people — not just the data scientists, IT professionals or statisticians — with a means to analyze information, Hanrahan teamed up with a database programmer, Chris Stolte, at Stanford University to find a solution.

With the support of a DoD agency grant, the pair, alongside Christian Chabot, combined their distinct computer science disciplines of graphics and databases to create Tableau Software, a platform now widely used to help government organizations at the local, state and federal levels unlock actionable insights and trillions of tax dollars from their data.

The need for data insights within government organizations is massive. Cybersecurity experts use complex network data to better safeguard IT infrastructures, agency administrators use real-time building-sensor data to increase the efficacy of the government's physical infrastructure, and frontline managers make operational improvements with process and program performance data.

But even with so much data and emerging technologies, many agencies still struggle to make effective data-driven decisions.

This industry perspective explores how current public sector organizations use Tableau's self-service visualization technologies to answer critical data questions and ultimately improve performance management and transparency.

CHALLENGES TO ACCESS AND UNDERSTANDING

Having raw data alone doesn't necessarily make it useful. There are two ways to learn from data: access and understanding. But for government agencies, both are especially difficult to attain. In a recent interview with GovLoop, Christine Carmichael, Marketing Director of Government and Education at Tableau, explained why self-service data visualization is so important for government.

"Government is an industry that has some of the largest data repositories that exist, and also some of the messiest data in terms of how it is structured," Carmichael said. "And a lot of that data is also siloed. It is literally sitting all over the government, in different back-end repositories and different platforms."

To grapple with this large amount of disparate information, many agencies currently use manual tactics to consolidate and process it. "Many of these organizations are making their executive decisions based on no more sophisticated technology than spreadsheets," Carmichael said.

Simply put, columns and rows of numbers in a spreadsheet don't always offer understanding. Furthermore, given the complexities of consolidating disparate data, the spreadsheets are normally owned by IT staff, rather than the knowledge worker who understands the data best.

"[As an agency leader], every time there is a fundamental question in the organization about the data — what are our risks, how do we deliver our mission more efficiently and transparently, what are the costs to deliver that mission — I have to go to IT to get an answer to my question," Carmichael said.

As a result, the organizational decision-makers and knowledge workers are heavily dependent on IT to access and bring together data. This reliance directly impedes government executives from accessing necessary insights in real time.

Almost as important as having accessible data is the ability to make changes and updates to the metrics represented on a dashboard. If a user is stuck with an outdated metric, the analysis will also be outdated and flawed. Still, most frontline decision-makers are required to submit a change request to their IT staff any time they need updated or amended data sets.

"That heavy dependence on IT slows the fluency of a reporting cycle to a grinding halt," Carmichael said. With additional strain on IT recourses, this reporting cycle further hinders government IT departments from achieving their strategic and critical tasks.

"Right now, we want our IT departments to be focused on bigger issues like cybersecurity and technology value," Carmichael said. "We don't want our IT department supporting spreadsheet hell."

Without a more effective way to consolidate and analyze data, agency leaders are left without key information to drive critical operational and strategic decisions. But it doesn't have to be that way — and that's where self-service technology comes in.

MEETING GOVERNMENT'S DATA ANALYSIS NEEDS

In order to better leverage public sector data, agencies need solutions that can pull from multiple data repositories in real time and offer insights to decision-makers in easily digestible ways. That's what Tableau provides.

"What we want to do is empower the knowledge workers and leadership with easy-to-use and easy-to-understand technology that makes the reporting and answer cycle fluid and engaging," said Carmichael.

After a quick download, Tableau can access various data sets from many different network siloes, so long as the user has access privileges to those repositories. That means leaders can access their own data without relying on IT staff to manually compile different information streams.

"We want to put the power in the hands of knowledge workers and leaders inside the organization, without heavy dependence on technical resources," said Carmichael. "When you're dealing with the types of missions that government organizations are responsible for — very sensitive, critical issues — answers need to be found and easily understood in real time."

Tableau gives users quick access to data, so decisions are made 10 to 100 times faster. Then, users can drag and drop those data sets into a single, visual dashboard to consolidate, compare and analyze that information — zero programming skills required.

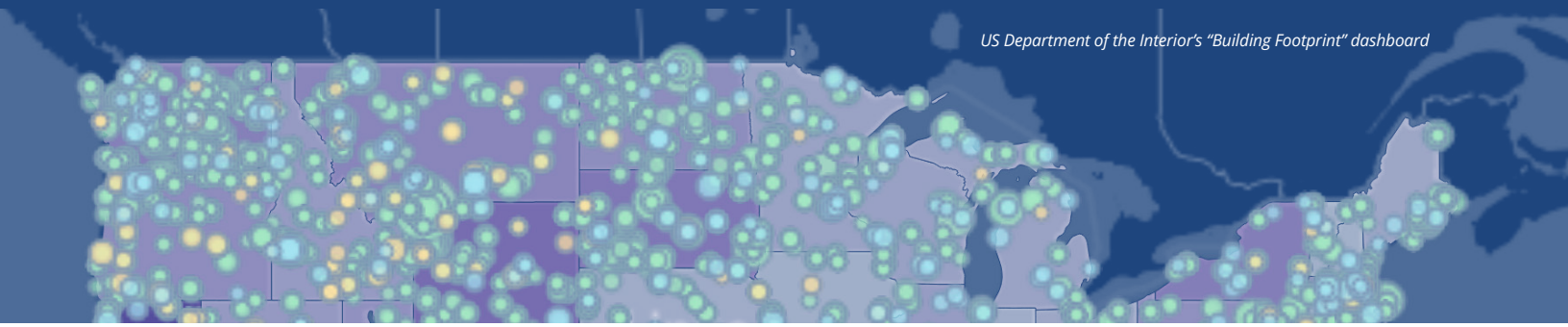
THE POWER OF VISUALIZATION

Because the human brain processes a visualization or picture as a single chunk of information, gaining comprehension and insight is dramatically faster when data is visually displayed on a dashboard in various graphs and charts. Number-based tables and spreadsheets often produce the opposite effect. When considering data, a picture really is worth a thousand words.

"Tableau gives you the ability to look at data in many different ways, and to highlight it graphically in whatever type of data visualization you desire," Carmichael said. "When you're looking at data in rows and columns on spreadsheets, and everything is black and white, it's extremely difficult to really take in that information. We live in a colorful, visual world. That's how we process things."

In the pubic sector, agencies can produce open data dashboards on their websites that aid transparency goals and are easily understood by citizen consumers. Building managers can use sensory data to streamline infrastructure management, department heads can use HR data to create more effective processes for their personnel and managers, and administrators can use citizen demographics with qualitative data to meet real user needs.

Here are a few case studies of how public sector organizations have applied self-service data visualization to achieve their internal and external missions.



US Department of the Interior's "Building Footprint" dashboard

FOR AGENCIES

In a discussion with one customer, Carmichael heard a powerful statement. "My cycle is seeing the data, imagining what I think the answer is, asking the next question and then answering it," said the customer. "That's seeing, imagining and answering."

At the **Department of Interior** (DOI), Tableau enables leaders to re-imagine operational data by presenting it in a new format. This large agency maintains thousands of locations and buildings, for which they must analyze the cost of operation and upkeep, all over the country. Previously, that analysis required comparing tabular data from each location, over different time frames, in different formats in a laborious, piecemeal process.

With Tableau, DOI leaders reference a single dashboard to understand this myriad information. Administrators can assess the age and size of the building, the number of workers employed in that space, which departments operate in that building and whether the building is filled to capacity. Now analysts can easily capture the various aspects of any DOI location in a single, map-based picture.

Users can also view this infrastructure information in composite view, to compare efficiency at one location versus another. Alternatively, an analyst can drill down into the minute details of a single location.

Similarly, a business systems analyst for the **city of Tallahassee**, Fla., created a data visualization dashboard for managers at a wastewater treatment plant that significantly increased productivity. The dashboard focuses solely on relaying phosphorous effluence data in real time, to compare with historic levels and current safety guidelines.

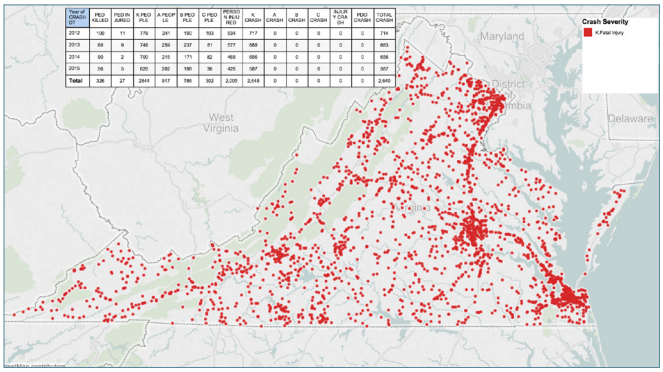
In another instance, the Virginia Department of Transportation uses a geographical map functionality to manage its entire roadway network – the third largest in the entire country. Across five regions and nine districts, Virginia DOT must analyze 58,000 miles of roadways and 20,000 bridges on a daily basis to ensure public safety is maintained and traffic disruptions are minimal.

Tableau's interactive feature allows users to drill down into the details in the underlying data to further inform management. Things like maintenance jurisdictions, weather conditions, school zones and traffic control types are all better understood with interactive data visualization.

Selections are then mapped to show comparative data. By visualizing current and historical data from car accident reports in a real-time, mapped format, agency leaders and chief district engineers can track high volume accident activity, injuries and fatalities to prioritize deployment of response teams.

FOR THE PUBLIC

The **Virginia DOT's** "crash book", an online data dashboard, is made available to the public so that citizen users can stay informed about road conditions and potential crashes.

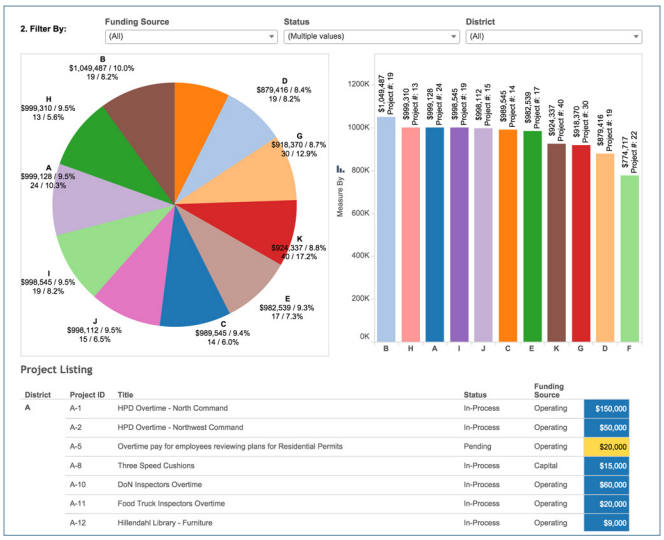


"Tableau has a product called Tableau Public, which is a public site that government organizations are pushing to citizen and constituent consumers to see their information," Carmichael explained. "They're also pushing Tableau dashboards externally on their own websites."

For transparency's sake, public access to government data visualizations is equally important. Agencies can better inform citizens by presenting data in a quickly accessible, understandable format.

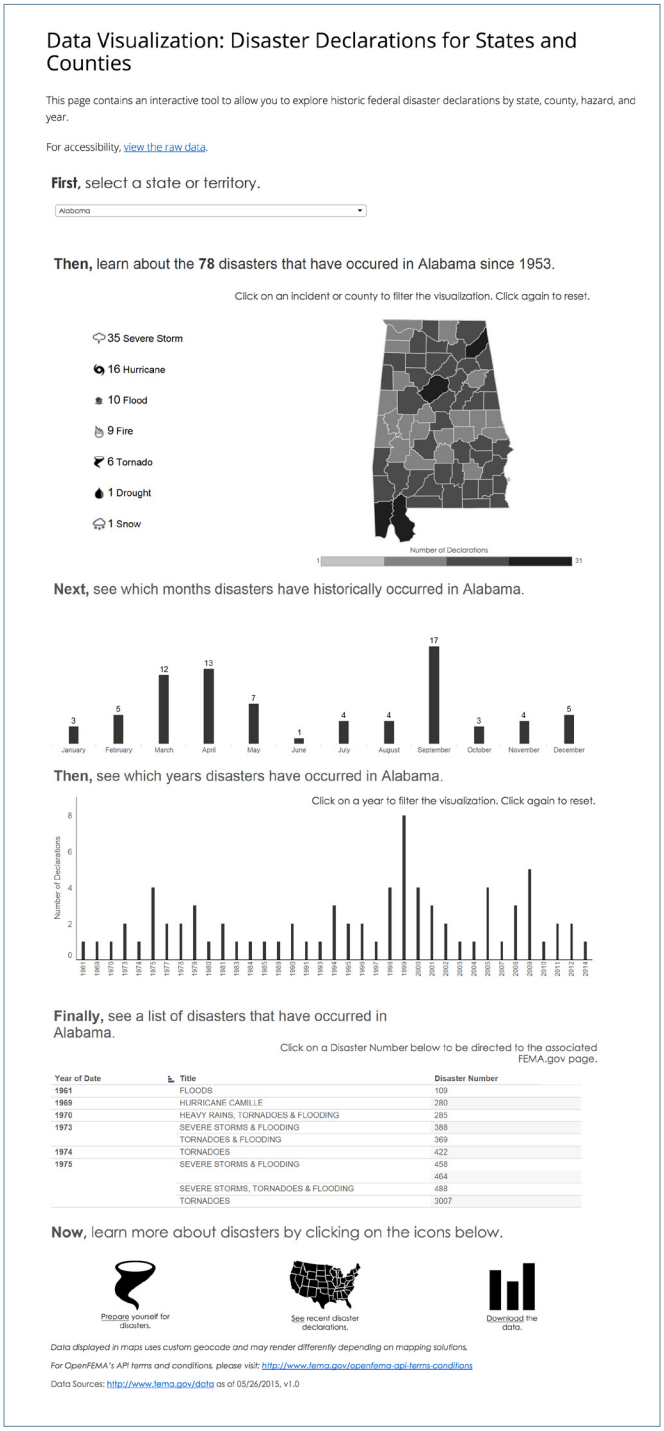
"Government organizations need to be highly accountable to the public and transparent in the way that they are delivering information in order to meet their missions," Carmichael said. And just like agency leaders want to quickly access and understand data, "consumers want their own reporting cycle to be fluid, too."

For example, the **city of Houston**'s Council District Service Funds program utilizes an online dashboard to track how council members allocate funding for projects. Users can filter data by district, funding source and project status to see where money is going in real time, rather than milling through dozens of disparate reports. Users can also see exactly where money is being spent on a geographical map.



District	Project ID	Title	Status	Funding Source	
A	A-1	HPD Overtime - North Command	In-Process	Operating	$150,000
	A-2	HPD Overtime - Northwest Command	In-Process	Operating	$50,000
	A-5	Overtime pay for employees reviewing plans for Residential Permits	Pending	Operating	$20,000
	A-8	Three Speed Cushions	In-Process	Capital	$15,000
	A-10	DoN Inspectors Overtime	In-Process	Operating	$60,000
	A-11	Food Truck Inspectors Overtime	In-Process	Operating	$20,000
	A-12	Hillendahl Library - Furniture	In-Process	Operating	$9,000

In another example, the **Federal Emergency Management Agency** (FEMA) captures even more data, covering the entire nation's emergency preparedness and response planning. That agency also leverages visualization to make sure important information is easily accessed and understood by users. On its data visualization page, the agency summarizes disaster declarations and grants for newcomers. For users in search of more specific information, they can drill down into maps of states, counties and tribal nations to explore historic federal disaster declarations by location, hazard and year.



CONCLUSION

Data has the potential to transform the way government agencies achieve their missions. However, that value can only be derived if decision-makers are able to access, see and understand the data they own.

"It's not just seeing the data, but it's analyzing the data," said Carmichael. "We want to put the power of analytical technology in the hands of knowledge workers without them having to be a Ph.D. statistician or a senior analyst in the organization in order to understand what they were looking at."

Dashboards with interactive data visualization and analytical technology are economically and operationally changing the way government leaders make critical decisions, meet their mission goals and interact with public organizations and private citizens. Tableau provides the solutions that agencies need to move forward with data.

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ABOUT TABLEAU

Tableau Software helps people see and understand data. Anyone can analyze, visualize and share information quickly. More than 26,000 customer accounts get rapid results with Tableau in the office and on-the-go. And tens of thousands of people use Tableau Public to share data in their blogs and websites.

See how Tableau can help you by downloading the free trial at www.tableausoftware.com/trial.

ABOUT GOVLOOP

GovLoop is the "Knowledge Network for Government" – the premier online community connecting over 200,000 public sector professionals. It's an essential resource to connect with peers, share best practices, and find career-building opportunities.

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www.govloop.com | @GovLoop

1152 15th St NW, Suite 800
Washington, DC 20005

Phone: (202) 407-7421 | Fax: (202) 407-7501

www.govloop.com
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