

# The 2012 State CIO Survey

OCTOBER 2012



# Advancing the C<sup>4</sup> Agenda

**BALANCING LEGACY AND INNOVATION**

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Founded in 1969, the National Association of State Chief Information Officers (NASCIO) represents state chief information officers (CIOs) and information technology (IT) executives and managers from the states, territories, and District of Columbia. NASCIO's mission is to foster government excellence through quality business practices, information management, and technology policy. NASCIO provides state CIOs and state members with products and services designed to support the challenging role of the state CIO, stimulate the exchange of information, and promote the adoption of IT best practices and innovations. From national conferences to peer networking, research and publications, briefings, and government affairs, NASCIO is the premier network and resource for state CIOs. For more information, visit [www.NASCIO.org](http://www.NASCIO.org).



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## Executive summary

Since our last survey of state chief information officers (CIOs) in 2011 – *A New C<sup>4</sup> Agenda (Consolidation, Collaboration, Clout, and Change)* – we find that CIOs continue to be confronted with myriad responsibilities and leadership challenges. Some of these focus on continuing to provide many high-quality IT services to state agencies and employees (such as email and networking) as well as to citizens (such as online registration and licensing). Others focus on procuring, implementing, and managing new IT services, such as Cloud platforms, mobile devices and applications, and social media. CIOs must maintain a balancing act, not allowing either the old or the new to dominate their attention.

### Leadership and governance

Our survey finds that CIOs are generally satisfied that state IT governance structures align well with state strategic goals, making it somewhat easier to stay strategic. We also find that the CIO is the person to contact before making important decisions, whether you are a governor, legislator, budget officer, or agency/department head.

### Transparency and accountability

Transparency and accountability are key catch phrases when dealing with state information. These initiatives have become political and policy priorities for many governors. CIOs indicate that their states already do a good job at making information on budgets, spending, and contract awards accessible to citizens, and citizens respond by accessing this information often. However, in other areas, such as performance information relating to state programs and activities, less activity is evident, so the information may not be available or there may not be an overwhelming demand for it by citizens.

### Keeping up with the old

Last year's survey identified IT service consolidation as a big cost saver. This was clearly driven by budget pressures and the need for operational cost savings. The consolidations continue even though some of the anticipated cost savings may be unrealized. Similarly, CIOs focus on health and human services modernization and integration because these systems tend to be some of the largest and oldest in the state, and because they are directly affected by federal health care legislation. The majority of these systems support federal programs delivered by the state, and they receive substantial funding from federal sources. In addition, health care and support for health care reform is a major component of the state budget, and so it bears special attention.





### **Bringing in the new**

The Cloud is moving from being an innovation to being widely accepted, and CIOs focus on moving services to the Cloud and managing them once they are there. Typical early adopter services – such as email and storage – have already migrated, and now come the more difficult IT services migrations compounded by issues of security, lack of control, cost, and procurement.

Mobile devices and applications are no longer a novelty, but half of CIOs say their efforts to manage them are still fragmented. Citizen use is already exceeding expectations, and continued expansion is the obvious course.

Social media are ubiquitous, with some applications like Twitter, Facebook, and YouTube much more in use than others. Half of the CIOs already have state policies for the use of social media, and another quarter are working on them.

Big Data seems like it would have obvious applications in many state systems, but CIOs indicate that only 35% of them have already addressed the use and management of Big Data in their states. Three-quarters of the CIOs say their staffs are untrained in, and unprepared for, Big Data.

### **Support**

Human capital and procurement support are essential for CIOs as they deliver IT services, but many say they are not getting the support they need. Hiring continues to be problematic because of funding shortfalls, competition with private industry, and the need to combine technologists with contract managers to deal with a growing contractor presence in IT service delivery.

Most CIOs are not satisfied with the support and understanding they receive from the central procurement office. This is a longstanding pain point for CIOs. They are particularly concerned when technical experts are not making key procurement decisions. Where feasible, some CIOs are responding by moving the IT procurement function into the CIO's office.

### **Emerging trends**

CIOs often find themselves performing as the business process transformation leads because they try to introduce innovation to solve business problems. To some people, innovation means IT. CIOs also deal with defining their roles and responsibilities under the implementation of the nationwide public safety broadband network. Because of infrastructure demands and requirements for interoperability, CIOs will be substantially involved even when the overall state lead is assigned to public safety, emergency services, or homeland security.

# About the Survey

## Survey purpose

The National Association of State Chief Information Officers (NASCIO), TechAmerica, and Grant Thornton LLP have collaborated for the third year to survey state government IT leaders on current issues. These survey sponsors seek to provide state chief information officers (CIOs) with an opportunity to voice their thoughts and opinions on matters of high importance. Governors, legislative leaders, and business executives can all benefit from these knowledgeable insights about essential state IT services.

## Methodology

In the spring of 2012, the sponsors jointly developed a series of questions reflecting both the new issues of the day as well as follow-up on some questions that were asked in the 2011 survey. The questions were made available to state CIOs in an online tool. Between June and August 2012, CIOs individually logged in and addressed the 44 multiple-choice and open-ended questions.

Every state with an enterprise CIO organization, as well as the District of Columbia and three U.S. territories, completed the survey, giving us an unprecedented response rate. Respondents included state CIOs and deputy CIOs. Throughout this report we refer to them all as state CIOs. Many of the respondents also participated in the 2011 survey, but a number of the respondents are new because of the normal turnover that occurs in state CIO positions.

This survey occurred during a time of continuing national fiscal uncertainty. Despite incredible budget pressures, state CIOs continue to provide technology leadership and support to assure that their states provide essential services to their citizens.

## Anonymity

This report reflects the responses and opinions of the survey respondents to the maximum extent possible. To preserve anonymity, we do not attribute responses to any specific individuals.

To obtain a copy of the survey report or questionnaire, please refer to the inside back cover of this report for directions to the sponsor organizations' websites.



# Leadership, governance, and funding

To begin this year’s survey, we asked a variety of general questions to lay a foundation for more detailed questions later. The first question asked about the level of satisfaction with the statewide IT governance structure; the results are in Figure 1.

The state CIOs are generally satisfied that their statewide IT governance structures are aligned with the state’s goals, with 57% being satisfied or very satisfied and only 19% being dissatisfied or very dissatisfied. Almost a quarter of respondents selected “neither satisfied nor dissatisfied,” which can be difficult to interpret.

While CIOs may be generally satisfied that the governance structure is aligned with state goals, they are less satisfied that the governance structure is effective in managing IT investments throughout their lifecycles. Only 45% are satisfied or very satisfied, 27% are dissatisfied, and 29% are neither satisfied nor dissatisfied. Another way to look at this is that fewer than half are satisfied, more than a quarter are dissatisfied, and almost a third have no opinion. Part of this can be attributed to the lack of a defined IT governance structure in law or limitations on CIO authority. One could conclude that statewide IT governance

structures are not uniformly performing effectively in managing IT investments throughout their lifecycle.

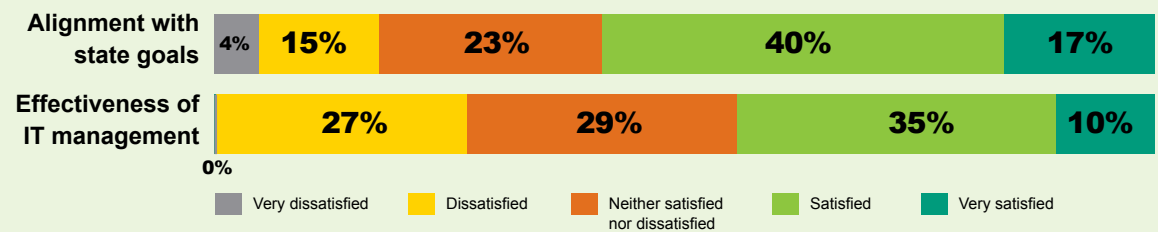
The next question asked about the state CIOs’ influence with other state officials; the results are in Figure 2.

**Figure 2:** Which of the following seek your input or opinion on policy or operational decisions? (check all that apply)

State officials/staff	Percent responding
Executive branch heads	92%
State budget officer	90%
Chief of staff/COO	79%
Governor	75%
Legislators	71%
Legislative staff	69%
General counsel	50%

We gave the CIOs seven officials from which to choose, and told them to check all that apply. The average respondent selected more than five of the seven choices. This gives a clear indication

**Figure 1:** How satisfied are you that your statewide IT governance structure is aligned with the state’s goals and is effective in managing IT investments throughout their lifecycle?





that key state officials are conferring with the CIO before making policy or operational decisions. With about 90% of the CIOs indicating that executive branch heads and budget officers seek their input or opinion, state CIOs have demonstrated their value in the decision-making process. In fact, the majority of every group except the general counsels seeks out CIOs' input.

With state revenues still lagging, we wondered what CIOs were doing to find new funding sources for critical IT investments. Our next question asked about the use of public-private partnerships (P3) as one possible source; the results are in Figure 3.

**Figure 3:**  
**To what extent is your state pursuing public-private partnerships as a way to fund IT capital investments?**

	Percent responding
Have already executed at least one public-private partnership arrangement	47%
Are planning public-private partnership arrangements but have yet to execute any	19%
Are interested but not actively planning	28%
Not interested or planning	4%
Don't know/does not apply	2%

With 47% of CIOs having already executed at least one P3 arrangement, and another 47% planning or interested in them, it appears that just about all CIOs are considering P3 as potential funding sources. Since states are still recovering from fiscal stress, the need for alternative capital

funding options is still prevalent. Now that 66% of CIOs have already executed an arrangement or are planning to, the future of P3 seems certain.

Another approach to dealing with funding shortfalls is to have state agency customers budget for their IT services as a utility or service-on-demand. IT service-on-demand is now commonly available for private firms and consumers, so we expected to see this trend influence the state CIO business model. We asked CIOs how many were using this approach; the results are in Figure 4.

**Figure 4:**  
**Has your state implemented utility-based or service-on-demand pricing for IT services?**

	Percent responding
Have implemented at least one utility-based or service-on-demand pricing service	62%
Planning utility-based or service-on-demand pricing services but have yet to execute any	25%
Interested but not actively planning	13%
Not interested or planning	0%
Don't know/does not apply	0%

Every CIO expressed some level of interest in the approach, and only 13% are not yet actively planning or implementing it. Utility-based pricing appears to be an emerging practice for providing at least some IT services in the states.

Before asking questions about state-level transparency and accountability to the public, we asked CIOs about transparency with their state

customers (departments, agencies, and other jurisdictions) when it comes to services and chargeback rates; the results are in Figure 5.

Excluding the 14% of CIOs who do not use chargeback to fund IT services, the overwhelming majority of CIOs provide at least some level of information on how the chargeback rates are calculated. Using chargeback rates without rate justification had been a common practice for years. The complexity of the services portfolio, federal cost allocation requirements for rate setting, and a constantly changing list of services all combine to create serious impediments to achieving full transparency. However, along with utility-based pricing, fully justified rates reflect a trend toward a more customer-oriented relationship between the CIO organization and state agencies.

**Figure 5:**  
**How do you publish the service catalog and chargeback rates for IT services?**

	Percent responding
Services and rates are published, with full transparency as to how rates are calculated	30%
Services and rates are published, with some level of transparency on how rates are calculated	35%
Services and basic rates are published, but with no supporting information	21%
Chargeback is not used to fund IT services in my state	14%





## Consolidation

In last year's state CIO survey, CIOs identified consolidation as one of the items in *A New C4 Agenda*. In this year's survey, we wanted to follow up and see how consolidation efforts were faring. We asked about consolidations the state had considered and the status of each. We then took those results and compared them with the results we obtained in 2011; the results are in Figure 6.

Comparisons between years can be difficult. For example, the people who completed the surveys in 2011 are not necessarily the same people who completed the 2012 surveys. Nonetheless, we can draw some conclusions.

The averages give us the first clue that there has not been much change in total between 2011 and 2012. If you combine the 2012 averages for "Planned" and "DK/DNA," to compare to the

2011 average for "Planned," there is only a 1 percentage point difference between years in any average. The 2012 "Done" percentages highlighted in red are those IT services where the percentage has decreased from 2011 to 2012; those "Done" percentages highlighted in green are those where the percentage has increased from 2011 to 2012. The 2012 "Done" percentages without a highlight are within 1 percentage point of the 2011 percentages.

The largest decreases from 2011 to 2012 are in content management (9 percentage points), backup/disaster recovery (7 percentage points), and imaging (6 percentage points). The largest increases are in email (14 percentage points) and servers (12 percentage points). So, what does this all mean? Perhaps significant decreases relate to overoptimistic estimates in 2011, different perspectives by the various people who completed

**Figure 6:**  
What is the status of IT consolidations?

IT Consolidations	2012 Survey				2011 Survey		
	Done	Ongoing	Planned	DK/DNA	Done	Ongoing	Planned
Backup/disaster recovery	22%	53%	24%	2%	29%	54%	17%
Business applications	8%	47%	24%	22%	8%	57%	35%
Content management	16%	43%	29%	12%	25%	43%	33%
Data centers	31%	46%	17%	6%	32%	48%	20%
Desktop support	24%	41%	18%	18%	26%	37%	37%
Email	52%	29%	15%	4%	38%	42%	20%
Imaging	11%	35%	27%	27%	17%	26%	57%
Security	43%	37%	12%	8%	43%	35%	22%
Servers	33%	48%	10%	10%	21%	58%	21%
Staff	28%	36%	12%	24%	23%	34%	43%
Storage	27%	57%	8%	8%	26%	46%	28%
Telecom	62%	28%	8%	2%	65%	27%	8%
<b>Average</b>	<b>30%</b>	<b>42%</b>	<b>17%</b>	<b>12%</b>	<b>29%</b>	<b>42%</b>	<b>28%</b>

the 2011 and 2012 surveys, or just the fact that some consolidations are never finished because new assets are constantly added. Significant increases probably do represent real increases in consolidations. We know that there was significant progress in email and server consolidation last year, and several CIOs issued press releases reporting on their migration to a consolidated Cloud service for email. The fact that so many of the percentages are similar between years

**Figure 7:**  
**Is IT consolidation delivering the expected cost savings?**

	2012	2011
The cost savings have been greater than expected	15%	14%
The cost savings have been about what was expected	33%	41%
The cost savings have been less than expected	11%	2%
The state has not yet measured the cost savings	27%	37%
Other	10%	6%
Don't know/does not apply	4%	n/a



probably means that the consolidation of IT services stabilized from 2011 to 2012, possibly related to continuing fiscal problems.

Next, we considered whether IT consolidations were delivering expected cost savings. This was also a question that we asked in the 2011 survey, so we compared the responses from both surveys. The results are in Figure 7.

While the 2011 survey question did not offer a DK/DNA option, we can still see a general agreement between the two years. It would appear that some of those states that had not yet measured the cost savings in 2011 found that the savings were less than expected when the measurement was finally done. Perhaps there was also a reassessment in some of the states where the cost savings had been about what was expected in 2011, leading to a different conclusion. Still, about 60% of states have measured the savings, and most of them find the savings are either about what was expected or greater than was expected.

Our final question relating to consolidation of IT services asked about the barriers CIOs encountered in trying to consolidate, how they could overcome those barriers, and who needed to lead the efforts to overcome them. In the 2011 survey, we asked about challenges to IT consolidations that CIOs faced. We gave them a list of choices from which to choose, and the highest-ranking answers were governance issues at 51% and obtaining upfront capital to fund consolidations at 45%. In the 2012 survey, the question was open-ended, and we obtained many interesting answers, only a few of which were similar to the choices we had presented in 2011.

Many CIOs discuss how organizational culture, resistance to change, lack of executive leadership and buy-in, and politics are often barriers to



consolidation. They also note that state agencies have a desire for autonomy and a fear of losing control when IT services are consolidated. One CIO noted, “Centralized solutions are usually suboptimal to agency specific solutions.” However, the most common barrier that CIOs identify is some aspect of cost. It could be the cost of implementing the consolidation or identifying where various costs are currently incurred. Some identify concerns about the agencies’ ability to pay the chargeback after losing control of the assets. There is also identification of human costs in job losses and skill shortfalls.

Among the ways to overcome these barriers, CIOs primarily identify executive orders or legislative mandates. They do not want to negotiate agreements with unhappy agency heads; they just want to get the job done. Some suggest leadership and communication with the agencies. Another common suggestion is to work out mutually agreeable funding arrangements. Since consolidations should ultimately save money, there should be enough funding to satisfy all the parties,

although not necessarily at the same time. Other suggestions include education, sound governance processes, and the use of service-level agreements.

The final part of the question asked who should lead the specific efforts to overcome barriers. As expected, CIOs suggest many different leaders, but the CIO is involved in just about every effort. Since there is considerable support for executive orders and legislative mandates, it is not surprising that about half of the CIOs identify the Governor or his/her staff as the leader; another 30% identify the legislature or legislative staff. Since various aspects of costs are identified as barriers, it is also not surprising that the state budget officer or the budget office staff are identified as leaders of the effort by about half of the CIOs. About 30% of the CIOs also identify state agency heads as important contributors to overcoming the barriers, especially those concerning office politics, organizational culture, and resistance to change.

Consolidation is one of the four “Cs” in the C<sup>4</sup> Agenda, and CIOs are continuing to advance it.

## Transparency and accountability

Although a handful of states had begun transparency initiatives earlier, the American Recovery and Reinvestment Act of 2009 (also known as the federal stimulus) demanded a high degree of transparency and accountability from the states, and more states now endorse transparency and accountability. The survey asked CIOs whether their state had enacted laws, executive orders, or policies for providing online information for a wide variety of subjects. It must be acknowledged that CIOs are not generally the business owners of these initiatives, but they are certainly involved in the decision making, design, and execution of the initiatives. The results are in Figure 8.

CIOs indicate that almost all states are providing online information about state budgets, state spending, and contract awards. Almost

**Figure 8:**  
Has your state enacted laws, executive orders, or policies for providing online information?

Subject	Provides		
	Yes	No	DK/DNA
State budget	94%	4%	2%
State spending	90%	6%	4%
Contract awards	98%	2%	0%
Employee salary data	72%	24%	4%
Travel reimbursements	41%	35%	24%
Investments	53%	20%	27%
Performance information on government services	47%	39%	14%
Open/raw data on government activities	39%	47%	14%

three-quarters of states provide online information on employee salaries, and about half provide online information on investments and performance information on government services. However, 27% do not know about investment information or it does not apply, and 39% say their states do not provide performance information. Bringing up the rear are travel reimbursements and open data on government activities, although 24% do not know about travel reimbursements or it does not apply, and 47% know that their states do not provide open data on government activities. While there is a considerable amount of information being freely shared, there is clearly room for more sharing, especially with performance information and open data.

Providing the information is one thing, but we also wanted to know about its use. Therefore, we asked how frequently the public actually accessed this type of information, and whether the cost of providing public access to this type of information has delivered a good return on investment (ROI). The results are in Figure 9.

State CIOs believe public use of information on state budgets, state spending, and contract awards ranges from 82% to 76% for combined fair/good. Even employee salary data show 60% fair/good usage, although a third of respondents say “don’t know/does not apply.” For public use of the other four categories, however, about 60% of respondents say “don’t know/does not apply.”

With respect to ROI for state budgets, state spending, and contract awards, 63% to 57% of respondents found it fair/good, although 23% to 31% say “don’t know/does not apply.” For ROI on employee salary data, 44% found it fair/good, but 40% say “don’t know/does not apply,” and the other four subjects all have over 60%



**Figure 9:**  
How would you rate the public use and ROI of online information?

Subject	Public Use				ROI			
	Poor	Fair	Good	DK/ DNA	Poor	Fair	Good	DK/ DNA
State budget	6%	24%	58%	12%	10%	20%	43%	27%
State spending	4%	34%	44%	18%	6%	25%	38%	31%
Contract awards	6%	30%	46%	18%	10%	21%	46%	23%
Employee salary data	6%	25%	35%	33%	16%	13%	31%	40%
Travel reimbursements	7%	19%	12%	63%	5%	7%	23%	65%
Investments	6%	15%	21%	57%	2%	9%	25%	64%
Performance information on government services	13%	13%	13%	60%	7%	14%	14%	65%
Open/raw data on government activities	11%	16%	16%	58%	0%	21%	16%	63%

“don’t know/does not apply” and combined fair/good ROI only around 30%.

In conclusion, it appears that most states are providing information on state budgets, state spending, and contract awards, and the public is generally using this information, thereby generating a fair/good ROI. Employee salary data are on the cusp, but the other four subjects are not provided often enough to get good usage and thus a good ROI. Many states do not publish employee salary data online because newspapers and other third parties already make that information easily available and searchable. There is an ongoing debate in other states regarding the privacy rights of state employees with respect to publication of their salary data. It remains to be seen if the public would use more information if more states provided it.

Our final question in this section asked what state government could do to increase the value to public users of the types of information listed

above. From their responses, it is clear that CIOs want to get the data out to citizens in accessible and usable ways. There are many comments about helping the public locate whatever they are looking for more easily, and a number of CIOs suggest asking the public what they want and how they want it. This is another way CIOs advance the C<sup>4</sup> Agenda. CIOs recognize that there is a wide range of public users of this information, some very sophisticated who just want open data sources that they can access with their own tools, and some who need very specific reports. One CIO said, “While the information is already available for public access, maximizing the value of the information for citizens requires state government to employ innovative approaches both to presenting data in meaningful ways and in making the data available in formats that the public can use to create new value for themselves. GIS mapping, new approaches to data visualization, and further integration with social media can help state government engage and educate the public.”

## Health and human services modernization and integration

**Between the ongoing emphasis on health care and the impact of the fragile economy on the growing need for social services, states are heavily involved with the modernization and integration of statewide health and human services systems. We asked CIOs about the status of various major projects in their states; the results are in Figure 10.**

What we can see in the data is that most health and human services modernization and integration efforts are far from complete. The average percentage that CIOs report as “Done” is only

**Figure 10:**  
**What is the status of modernization and integration efforts?**

Modernization or integration effort	Done	On-going	Planned	DK/DNA
Medicaid Management Information System (MMIS) modernization	8%	50%	28%	14%
Medicaid Management Information System (MMIS) replacement	12%	35%	37%	16%
Integrated eligibility determination	6%	55%	35%	4%
Health information exchange	8%	73%	16%	4%
Health insurance/benefits exchange	0%	47%	35%	18%
Unemployment insurance/claims	20%	49%	20%	12%
Temporary Assistance to Needy Families (TANF)	16%	37%	41%	6%
Supplemental Nutrition Assistance Program (SNAP)	14%	35%	37%	14%
Other	15%	31%	31%	23%

11%. However, there is a lot of work ongoing (average 46%) and planned (average 31%). This is not surprising because the Medicaid Management Information System (MMIS) modernization and replacement as well as the health exchanges are relatively new efforts, and these projects tend to be quite large and inherently complex.

We asked CIOs about their role in the governance of current health and human services integration efforts. We presented them with a range of options; the results are in Figure 11.

Over 70% of CIOs report that they are actively engaged in an advisory capacity or have a leadership role in these efforts. The comments from CIOs on this question point out the difficulty in picking only one role; usually they serve multiple roles on these projects. One CIO said, “Depending on the issue, my role is a mix of advisory, leadership, and investment/spending, but we are always at the table.”

Building on the question of the CIO’s current role in these projects, our final question in this section asked CIOs what their role should be. This was an open-ended question, so CIOs responded with a wide range of roles. In many cases, they point out that they have multiple roles. However, in general, the most often mentioned role is active engagement. CIOs believe that, at a minimum, they should always be somehow involved in the projects. The next most often mentioned role is leadership, although some qualify this as “technical” leadership. One CIO said, “Our state uses subject matter experts to lead the effort, and the CTO provides an active leadership role in the technology architecture.”

The role of controlling and approving projects and funding is mentioned about as often as

leadership. After all, these are IT projects, and the CIO needs to manage the technical elements. In this same vein, about 10% of CIOs mention the role of IT expert. These health and human services systems are generally some of the largest systems in the state, and CIOs must ensure that the state is procuring systems that are technically capable of doing what they are supposed to do. These CIOs also mention the ability to create shared systems and ensure interoperability. About 10% of CIOs mention an oversight role. This role is definitely further removed from the project than involvement, leadership, or control. Summing up much of the input on this question, one CIO said, “These projects need to be seen as business projects first and IT projects second.”

**Figure 11:**  
**What is the role of the state CIO in the governance of current health and human services integration efforts?**

	Percent responding
Not at all involved	4%
Somewhat engaged in an advisory capacity	19%
Actively engaged in an advisory capacity	38%
Leadership role in these efforts	33%
Control planning and spending for these systems	6%



# Mobility

The popularity of mobile devices and applications (apps) continues to grow. In the 2011 survey, we asked how CIOs were adapting to this, and in this year's survey we continue the discussion. We began by asking about the priority of mobile devices and apps in the CIO's strategic agenda and operational plans. We had also asked this question in the 2011 survey; the comparison of results is in Figure 12.

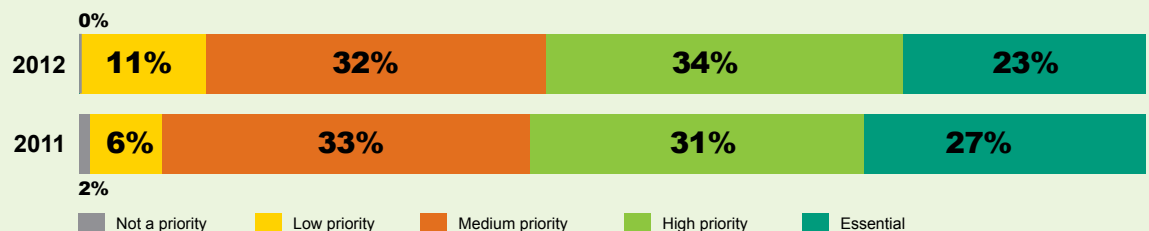


The 2012 results in themselves seem expected; for example 57% of CIOs see mobile devices and apps as high priority or essential. However, the comparisons with 2011 are unexpected. Almost twice as many CIOs characterize them as low priority in 2012 than characterized them that way in 2011, although one CIO said, "It is a low priority only in comparison to all of our other priorities, e.g., health care." Similarly, it appears that some CIOs who saw them as essential in 2011 now characterize them as high priority. This may be part of the overall maturation process and advancing the C<sup>4</sup> Agenda, where what was once seen as innovation on the cutting edge has become common or expected. One CIO said, "Constituents have come to expect mobility."

Next, we asked about the readiness of the CIO organization to deploy and support mobile devices and applications, a question that we also asked in 2011. The results for both years are in Figure 13.

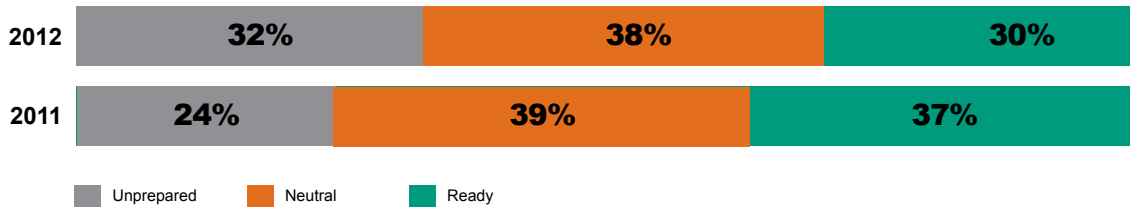
As with the question of priority above, the comparison between years is somewhat unexpected. However, based on the CIOs' comments, this appears to be a situation where the growth of mobile device use and apps has outpaced the ability of CIOs to support them. A number of CIOs have

**Figure 12:** Within the state CIO's strategic agenda and IT operational plans, how would you characterize mobile devices and applications?





**Figure 13:**  
**How would you rate the readiness of the CIO organization to deploy and support mobile devices and applications?**



comments like the one who said, “We are ready to support devices but not ready to develop and deploy apps.” Other CIO comments address skill gaps in this area, dealing with risk management, and keeping up with a rapidly evolving technology.

We asked how the states are managing mobility; the results are in Figure 14.

This supports the results in the readiness question above, with 50% of CIOs saying that their states have totally or mostly fragmented efforts when it comes to managing mobility. Another 31% are well or mostly coordinated, so some CIOs are keeping up with this rapidly changing area. The CIOs’ comments about this question note a key difference between managing mobility for state workers (mostly devices) and managing mobility for citizens (mostly apps).

We asked CIOs about their role in the governance of mobile technology. This was an open-ended question, and we received a wide range of answers. The most common responses deal with policy development, including standards and guidelines. Mobile devices and apps are IT, so the CIO should set policies. One CIO said, “The CIO is ‘all in,’ as with any other technology investment.” The next most common responses deal with security issues. After security,

there were multiple mentions of strategist, architect, procurer, leader, facilitator, and advisor. One CIO said, “The CIO should be the mobile technology evangelist.”

Mobile apps are rapidly becoming a key way that state government connects with its citizens. We

**Figure 14:**  
**How is your state managing mobility?**

	Percent responding
Totally fragmented and uncoordinated	12%
A few coordinated government-wide projects and initiatives, but mostly fragmented efforts	38%
About half of mobility projects coordinated, half uncoordinated	15%
Mostly coordinated government-wide projects and initiatives, a few fragmented efforts	25%
All mobility projects well-coordinated government-wide	6%
Don't know/does not apply	4%

asked which mobile apps appear to be the most popular with citizens; the results are in Figure 15.

It appears that traffic/roads/DMV and parks/recreation/etc. are by far the most popular, followed at a distance by finding state agencies or services. The “Other” category has a wide range of items, with only transit applications and lotteries

having more than a single mention. Most of the other choices weigh in at around 10% (which equates to five states), except for loans and grants. It is not clear whether the relatively low popularity of certain apps relates to the fact that they are not generally available, or to the fact that citizens have not yet chosen to use mobile apps to access these state services. It should also be noted that many citizen transactions with state government only occur annually (e.g., professional license renewal or business filings), so it may take some time for the popularity of the app or service to grow.

We also asked about the general adoption level of mobile apps based on their states’ experience; the results are in Figure 16.

**“Some folks in my state ride horses to work; others work cybersecurity missions in national labs. The adoption rate [for mobile apps] is as diverse as the demographic.”**

**Figure 15:**  
**In your state government, which mobile apps or services appear to be the most popular with citizens? (select no more than three)**

	Percent responding
Traffic, road conditions, DMV	60%
Parks, recreation, hunting, fishing, boating, outdoor activities	58%
Finding a state agency or services	26%
Other	22%
Professional license search, renewals	16%
Public safety, emergencies	14%
Tax and payment services	14%
Employment assistance (job finding)	12%
Government benefits (public assistance)	12%
Business, corporate filing search	10%
Law enforcement, corrections, parole	10%
Government contract or sales opportunities, procurement, vendor sites, auctions	8%
Government spending (budgets, accounts, outlays, expenses)	8%
Government/education loans and grants	0%



It is interesting that only 52% of CIOs see citizen use at the anticipated level or higher, but it is not surprising that 32% choose “don’t know/does not apply,” given the relatively fragmented and uncoordinated nature of mobile management. The CIOs’ comments do not provide additional information about these relatively high percentages. Many of the CIOs’ comments about this question indicate that this is still a new technology and it will grow quickly. One CIO said, “When we introduce an app, the adoption rate grows 25% a month.” However, another CIO said, “Some folks in my state ride horses to work; others work cybersecurity missions in national labs. The adoption rate is as diverse as the demographic.”

The final question in this section dealt with “bring your own device” (BYOD), the practice of allowing employees to use their personally owned mobile devices for state government work. The results are in Figure 17.

With almost three-quarters of the states permitting BYOD either statewide or by agency, it appears that BYOD is now the norm for state government. The fact that 20% of respondents lack a formal policy is remarkable, given the known security and management issues with mobile devices. It remains to be seen what will happen with the 6% (3 states) that currently prohibit BYOD.

Mobile devices and apps provide ample opportunities for CIOs to advance the C<sup>4</sup> Agenda.

**Figure 16:**  
Based on your state government’s experience so far, what is the general adoption level of mobile apps?

	Percent responding
Citizens use hardly any of our mobile apps	0%
Citizen use of mobile apps is lower than anticipated	16%
Citizen use of mobile apps is about the same as anticipated	34%
Citizen use of mobile apps is higher than anticipated	10%
Citizen use of mobile apps is much higher than anticipated	8%
Don't know/does not apply	32%

**Figure 17:**  
What is your state’s general policy approach toward BYOD?

	Percent responding
State policy prohibits BYOD	6%
No formal policy	20%
Enterprise policy permitting BYOD covering all agencies	54%
Individual agency policies permit BYOD	18%
Don't know/does not apply	2%

## Social media

**This section of the survey focuses on how state government uses social media and the role of the CIO in defining policy and dedicating resources to it.**

**We asked CIOs which social media platforms their government agencies use for interacting with citizens and the level of use for each type. The results are in Figure 18.**

When it comes to types of social media, we see significant diversity. Combining moderate and wide use from Figure 18, some types are well used, such as Twitter (81%), Facebook (83%), and YouTube (81%). Another group falls in a middle category, including Blogs (55%), Flickr (50%), and LinkedIn (45%). Finally, there is a group of emerging platforms with high numbers when combining

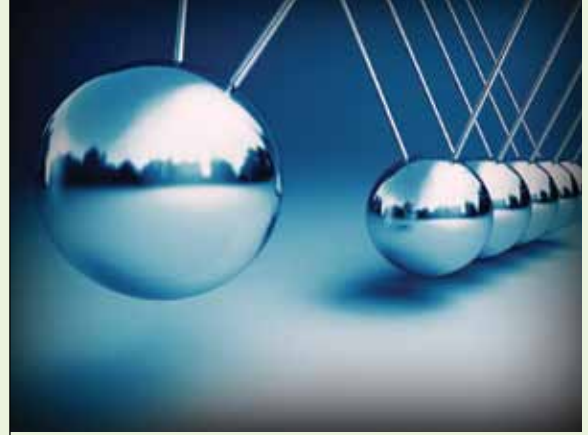
no and very little use, including Yammer (61%), Microblogs (48%), Google+ (49%), Slideshare (55%), and Pinterest (60%). The final three types in this grouping also have “don’t know/does not apply” ratings of about one-third. One CIO characterizes the mentality for his organization’s relationship with social media as “trying to evolve from a ‘push’ information society to a ‘pull’ information society.”

We asked CIOs to tell us about their state’s use of social media; the results are in Figure 19.

Three key points come out of this information. First, no states are prohibiting the use of social media by their agencies. Second, more than half the states already have policies and standards in place and another quarter are working on them. Last, non-CIO state organizations use social media more than CIO state organizations. This last point is not

**Figure 18:**  
**What is your state’s level of use for each type of social media?**

	Not at all	Very little	Moderate amount	Widely used	DK/DNA	# of responses
Twitter	0%	15%	58%	23%	4%	52
Facebook	0%	15%	52%	31%	2%	52
Yammer	42%	19%	10%	0%	29%	48
Blogs	4%	31%	41%	14%	10%	49
Microblogs	21%	27%	15%	4%	33%	48
Internet forums	17%	37%	19%	8%	19%	48
Wikis and other collaborative products	6%	38%	24%	15%	17%	47
YouTube	0%	15%	48%	33%	4%	52
Flickr	12%	19%	42%	8%	19%	48
Google+	22%	27%	12%	6%	33%	49
LinkedIn	12%	29%	31%	14%	14%	49
Slideshare	33%	22%	6%	2%	37%	46
Pinterest	32%	28%	4%	2%	34%	47



surprising because CIO organizations lack regular and direct citizen interaction. However, CIOs could certainly exploit social media channels for their customer communications.

When we asked CIOs about their role in defining policy and dedicating resources to social media, the overwhelmingly common answer is that the state CIO defines policy. Beyond defining policies, though, answers differed. Some CIOs also promote policy or, they said, *should* promote policy. There is some difference of opinion about whether CIOs should have a role in dedicating resources to social media. Some CIOs do not believe that they should be involved in deciding who uses social media or for what it is used, and thus they should not play a role in deciding on resources.

Next, we asked an open-ended question about whether social media support innovative state services. CIO responses to this question are somewhat mixed, but tend toward yes, with some rather enthusiastic responses. The majority of CIOs believe that social media are working to promote innovative state services. Some categorize the use of social media as still in flux, with its value yet to be determined. Those who do not believe that social media support innovative state services include one CIO who said, “Seems to be much ado about nothing; more hype than substance.”

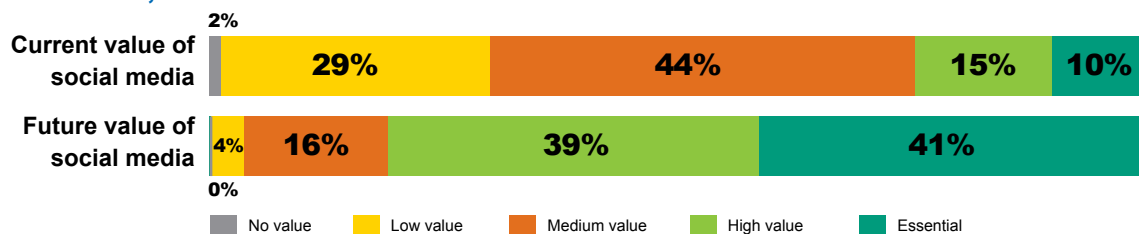
**Figure 19:**  
How would you characterize your state’s use of social media? (check all that apply)

	Percent responding
Statewide policy prohibits the use of social media by state government entities	0%
We do not prohibit the use of social media, but have no statewide standards or policies about it	23%
We are preparing statewide policies and standards for social media	25%
We already have statewide policies and standards in place for social media	54%
The CIO organization uses social media	37%
Other state agencies are using social media	56%
Don't know/does not apply	2%

We asked CIOs how they would rate the value of social media to their state governments both now and in the future; the results are in Figure 20.

While only 25% of CIOs rate the current value of social media as high or essential, that percentage grows to 80% when they rate future value. There is clearly strong agreement that social media hold untapped future value, which is consistent with social media trends generally both in the United States and around the globe.

**Figure 20:**  
How would you rate the value of social media to your state government as it is used now, and how it could be used in the future?



## Big Data

**Big Data lacks a commonly accepted definition. A NASCIO white paper says, “The common themes for Big Data are Volume – Variety – Velocity – Complexity – Variability.” More colloquially, the New York Times says that Big Data is a shorthand label that typically means applying the tools of artificial intelligence, like machine learning, to vast new troves of data beyond those captured in standard databases. Another approach is that Big Data refers to datasets so large and complex that they require high computational capabilities and are difficult to manipulate using the usual database management tools. Whatever its meaning, there seems to be agreement that Big Data requires special analytical tools and employees trained in computational manipulation and analytics, and possessing other advanced skills.**

**We asked CIOs whether Big Data was in their strategic plans; the results are in Figure 21.**

**Figure 21:**  
**Where is Big Data in your state IT strategic plan?**

	Percent responding
Not in the plan at all, no plans to add it to the plan	23%
We are discussing adding Big Data to the plan	36%
In the plan indirectly	17%
Addressed directly in the plan	10%
A central part of the plan	8%
Don't know/does not apply	6%

Although 35% of CIOs have Big Data addressed in their strategic plans, 59% say they are only discussing plans for Big Data or they have no plans to add Big Data to their strategic plans. While there has been considerable discussion about the importance of Big Data, the limited understanding and use of this emerging technology is yet another example of the state CIOs' balancing act in advancing the C<sup>4</sup> Agenda. Even if Big Data seems compelling, more pressing and immediate demands take precedence. Respondents indicate that states are not currently in the forefront of the Big Data movement, even though they might logically be big users and have a need for managing Big Data. However, one CIO said, “We only have a few agencies that have the need to analyze and use Big Data.”

Perhaps there is not yet a state imperative for Big Data. Summarizing a number of respondents, one CIO said, “This is becoming a bigger topic with new emphasis. We have some analytical tools, but not of the scale that we need to use for these capabilities.” The need for more involvement with Big Data is clear to some CIOs, but others may overlook the opportunities and benefits that come with Big Data because of competing priorities.

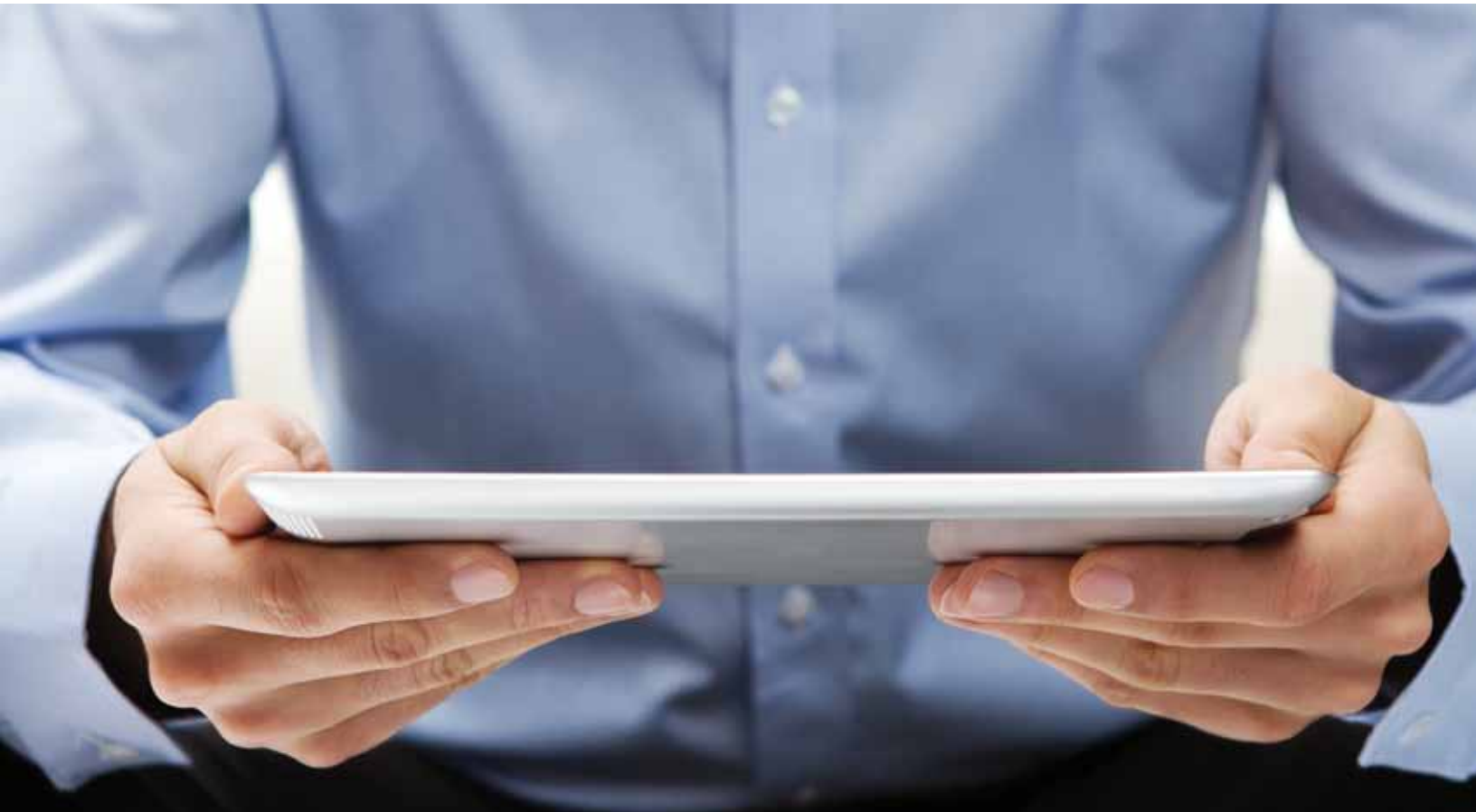
We probed further into how prepared states are for handling Big Data, asking them to gauge their level of preparedness to handle this kind of data. About three-quarters of CIOs indicate that their staffs are not trained and experienced enough to assist state agencies with handling Big Data. However, a number of CIOs also indicate that training is coming or they are currently working to improve employee skills.

## Cloud computing

We asked respondents about the status of their state's use of Cloud computing; the results are in Figure 22. There is a significant change from last year's survey. While the number of CIOs who describe themselves as highly invested remains about the same, the number who categorize themselves as having some applications in the Cloud and considering other applications has increased significantly. Even more interesting is that no respondents in either year have considered and rejected the use of Cloud computing. Like some of the other technologies discussed in this survey, it appears that what was previously considered a leading-edge technology has now become widely accepted.

**Figure 22:**  
What is your state's status regarding Cloud computing?

	2012	2011
The state is already highly invested in Cloud computing	15%	14%
The state has some applications in the Cloud and is considering others	56%	35%
The state is still investigating Cloud computing	19%	47%
The state has already considered Cloud computing and rejected it	0%	0%
Other	10%	4%



**Figure 23:**  
**What categories of services have you migrated or do you plan to migrate to the Cloud? (select all that apply)**

	Percent responding
E-mail and collaboration	64%
Storage	48%
Geographic Information Systems	48%
Disaster recovery	44%
Program/business applications (e.g., licensing, unemployment insurance, workers' compensation, etc.)	42%
Office productivity software (e.g., word processing)	37%
Digital archives/electronic records	31%
Citizen relationship management	25%
Open data	25%
Enterprise Resource Planning	23%
Imaging	15%
Other	15%

**Figure 24:**  
**How have you procured Cloud services? (select all that apply)**

	Percent responding
Used an existing procurement vehicle not specifically designed for Cloud	65%
Created a specific procurement vehicle for Cloud services	44%
Leveraged Cloud services procurement vehicles created by multijurisdictional consortia	15%
Leveraged Cloud services procurement vehicles created by the federal government	6%
Other	8%

We wanted further details on where specifically Cloud computing is being used or is going to be used; the results are in Figure 23. We allowed respondents to select multiple categories, and the most popular categories are those that have typically migrated to the Cloud first, like e-mail and disaster recovery. It is probably only a matter of time until states migrate other categories of services to the Cloud as well.

We asked how CIOs were obtaining Cloud services; the results are in Figure 24. It appears that CIOs are generally not leveraging existing Cloud services procurement vehicles, instead using existing non-Cloud-specific vehicles or creating their own Cloud-specific approach to procure this technology.

We asked CIOs what were the major barriers in their state governments to migrating infrastructure, applications, or services to the Cloud. We also asked how they could overcome these barriers and who were the most likely officials to lead efforts to overcome them. This was an open-ended question, and CIOs identify many barriers. However, a few barriers receive multiple mentions. Over 60% of the CIOs mention security concerns, even though multiple studies have concluded that Cloud security is no bigger an issue than security in other platforms. CIOs may be indicating that their state agencies do not necessarily see it that way. About 36% of the CIOs mention lack of control and fear of consequences, which is a typical concern when moving to a new technology – especially one that involves shared resources and shared governance. Cost is mentioned by 29% of the CIOs, indicating that there is no general acceptance that Cloud services are less costly. Finally, 26% of CIOs mention procurement issues. These cover a range of issues from the lack of a state-approved contract vehicle



to the need to define unique terms and conditions better. Some of the other barriers identified by only one or two CIOs include jurisdictional problems, reliability, and what to do with existing IT infrastructure investments.

CIOs go on to identify a number of ways to overcome these barriers. For security, some suggest that they start by migrating noncritical applications to the Cloud. They also discuss the need for educating state agencies and creating standardized business processes. Some suggest using a private Cloud or a government Cloud. To deal with the problem of lack of control and fear of consequences, CIOs suggest the use of pilot projects and clear wording about accountability in the Cloud contracts. They also see a need for education, change management, and adjusting the state culture in cases where that culture fears the Cloud.

Most of the CIOs' comments on overcoming cost barriers relate to demonstrating the cost-effectiveness of the migration before undertaking it. This includes understanding all of the costs related to migrating to the Cloud, especially the cost to exit the Cloud should that prove necessary. CIOs believe they can overcome procurement barriers by creating statewide Cloud contracts with standard terms and conditions. They would also reconcile state contracts with generally accepted Cloud contract clauses and leverage federal General Services Administration (GSA) and Western States Contracting Alliance contracts when possible.

As expected, CIOs view themselves as the primary leaders of just about every effort to overcome barriers. Some of the other leaders they identify include NASCIO and the National Association of State Procurement Officials



**Over 60% of the CIOs mention security concerns, even though multiple studies have concluded that Cloud security is no bigger an issue than security in other platforms.**

(NASPO) to deal with jurisdictional barriers, governors and legislatures to deal with governance issues, and attorneys general, general counsels, chief acquisition officers, and state budget officers to deal with procurement and cost issues. CIOs also identify state agency heads, chief human capital officers, and industry and trade associations as potential leaders for overcoming selected barriers.

Our last question in this section asked about the CIO's role in state government Cloud computing. This was an open-ended question, and the most common response is having the CIO as directing or establishing policy. The second most common response is that the CIO needs to be the leader in Cloud computing, with one CIO describing the CIO as needing to "lead and drive the charge." Other common responses include the CIO providing oversight and vision and being an advisor and an educator as well as an implementer. One response describes the CIO as a "technology evangelist."

## Human capital

**This section refers to the information services or IT personnel who work in state governments. Now that the overall economy has started to improve, governments may find it harder to recruit new IT staff or retain old ones, who may instead be drawn to jobs in the private sector. Some state salaries have been capped and even reduced (as a result of furloughs), and benefits have been curtailed in recent years, resulting in state government employment being less competitive.**

Given this situation, we wanted to know what CIOs are doing to recruit new talent as well as to retain existing talent. This question has a very strong response, indicating that recruitment and retention are issues at the forefront of CIOs' minds. A fair number of CIOs indicate that states are hiring younger or more inexperienced workers, including interns. This is possibly because the more experienced individuals are too expensive given current state budget constraints. Many respondents have creative solutions for recruitment and retention in these challenging economic times, such as offering training, unique work opportunities, better technology to work with, and flexible hours and working environments, all of which tend to cost less than simply paying higher salaries. One respondent said, "This is a real problem for us. We still have a pay freeze in place so we have very few incentives to offer new recruits or to keep talent."

Next we wanted to know what skills were important for the CIOs' professional employees if they are to help agency programs meet the challenges of tight budgets. Interestingly, CIOs identify many skills that are not typical IT-related skills, primarily program management. Other skills CIOs commonly cite are creativity, innovation, and good



problem-solving skills. With the increase in Cloud computing and outsourcing, fewer IT professionals are actually doing IT implementation work. Their jobs are becoming more of a contract and service-level management function. These professionals are the kind who can run a contract and manage a service-level agreement instead of fulfilling a more traditional software development role. One CIO sees budget awareness as an important skill for employees: "We need to instill a culture of thrift in all employees." Another said, "Great technical skills are tough to recruit for, and it's tough to retain great people. The battle is constant." Some respondents indicate that, while they desire these skills, their employees do not currently possess them.

We asked CIOs what recommendations they would make concerning the use of contractors in government IT services. Generally, CIOs have a common view on the use of contractors: There are appropriate ways to use contractors, who have become an essential ingredient in providing state IT services. Summing up what many CIOs expressed, one CIO said, "Leveraging the private sector appropriately is invaluable in achieving public goals." CIOs understand the value that contractors can bring, but ultimately they want long-term capabilities inherent in their own staffs. Another CIO outlined the appropriate roles for contractors, "Contractors should be used to 1) support outdated technology until replaced, 2) support cutting-edge technology until state employees can be properly trained, and 3) provide additional resources when existing state employees cannot meet expectations." Therefore, the CIOs' task is to maintain the balance between contractors and state employees, ensuring that state agencies receive the IT support they need now by using contractors, but limiting costs in the long term by using state employees.

# IT procurement

**A significant portion of state procurement relates to IT; according to NASPO, 32 central procurement offices are responsible for procurement of IT goods in the states, 30 for IT services, and 34 for IT software. We asked CIOs how satisfied they were with the current system of IT procurement in their states; the results are in Figure 25.**

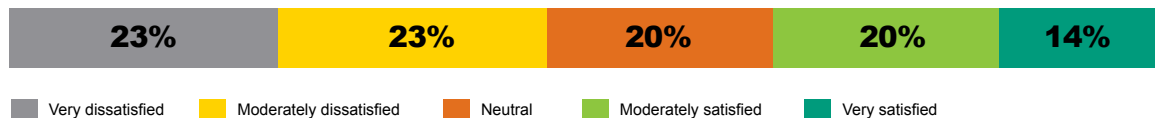
The best that could be said here is that there is a wide range of opinions, with 34% of CIOs expressing some form of satisfaction, 46% expressing some form of dissatisfaction, and 20% having no view. CIOs’ comments on this question provide some useful information. One CIO said, “The toughest business to be in is IT procurement.” Many of the comments focus on the intrinsic problems with standard procurement processes that do not grasp technology issues. Another CIO said, “Purchasing IT equipment and services is treated the same as buying paper products, with no consideration for the complexities and subtleties of IT systems.”

Following up on satisfaction, we next asked CIOs about the laws, policy changes, process improvements, or practices that would improve IT procurement in their states. A number of CIOs suggest that current procurement procedures are process-based rather than performance-based. As a result, procurement officials are making decisions that should be made only by technical experts. A few CIOs suggest that the procurement emphasis

on the need for a “level playing field” ignores the requirements for agility and innovation and ignores the fact that there are quantum differences between companies and technologies. One CIO had a long list of suggestions, including “Proof of value; demos with free-form questions and answers before writing the RFP; picking two winners and negotiating with both at the same time; and all scoring and selection decisions done by people most knowledgeable about the issue.”

For the final check on IT procurement, we asked CIOs what they had done to improve IT procurement in their state during their tenure as CIO. From their responses, it is clear that they have not been sitting on their hands. The most common improvement is re-engineering and streamlining the IT procurement process. CIOs also mention leveraging consortium procurements and enterprise agreements and establishing category contracts for others to use. A number of CIOs specifically mention partnering and collaborating with the procurement office or improving their relationships with that office. Other improvements include helping procurement offices obtain additional staffing, changing approval limits to allow for more expedited purchases, and moving the IT procurement function from the procurement office to the CIO’s office. While CIOs are advocating for additional changes, they are not waiting for change to be mandated when there are things they can address themselves.

**Figure 25:**  
**How satisfied are you with the current system of IT procurement in your state?**



## Public safety broadband

We asked CIOs if they had statutory authority or jurisdiction for any elements of the state’s public safety radio network (infrastructure, microwave towers, etc.); 56% say yes, and 44% say no. If they answered “yes,” we asked what elements were included in their authority or jurisdiction. About 45% of those answering “yes” indicate that just about everything is in their jurisdiction. Some indicate that they own only the towers and radio networks; some indicate that they operate the network, and some approve funding for the projects. In those instances where the CIO is not the primary authority, they identify the departments of transportation, public safety/state police, homeland security, or emergency services as the primary authority.

We also asked about the CIOs’ role in implementation of a recent federal law regarding deployment of the nationwide public safety broadband network; the results are in Figure 26.

Overall, 80% of CIOs are active members of the leadership team or personally leading the state’s effort, although this is considerably higher than the 56% who say they have statutory authority or jurisdiction for elements of the state’s public safety radio network.

**Figure 26:**  
**Characterize the CIO’s role in the recently enacted federal law for deployment of an interoperable nationwide public safety broadband network.**

	Percent responding
Leading the state's effort as the designated point of contact	23%
Engaged and active member of the state's leadership and planning efforts	57%
Participating as advisor	6%
Ad hoc, will serve a supporting role as needed	12%
Not involved at this time	2%





# Innovation and transformation

**We asked CIOs if innovation is a funded activity in their CIO budgets; only 26% say yes, while 74% say no. We went on to ask CIOs if, as part of their CIO role, they seek out innovative approaches and drive innovation for the enterprise. While their responses are overwhelmingly positive, they cover a wide range. One common theme is the effort to institutionalize approaches to innovation. This is expressed by “innovation programs,” “innovation budget targets,” “innovation conferences,” and creation of “Chief Innovation Officer” positions. Other CIOs take a less explicit approach, including having regular meetings with agency program leaders to discuss potential innovations, engaging their stakeholders in lessons learned and best practices for innovation, and working with the private sector to partner in solving challenges. One CIO said he drives innovation “through a collaborative governance structure and by co-opting customers into the exploration of innovative technologies.” Another CIO said, “State government is seldom on the cutting edge of technology, but when innovative opportunities are presented, the CIO fully engages with the program.”**

Our final survey question asked CIOs if they play an active role in business process transformation with their customers, and if so, do they focus primarily on process automation or also on transforming state government operations through technology. Slightly more than half the CIOs chose to answer this question, and those that did generally indicate that they do play an active role. There is probably no one state

organization that is the logical lead for business process transformation, but when technology is involved, the CIO organization is the logical lead. A number of CIOs specifically mention that they “use technology to improve business processes and outcomes.” In some cases, this ties directly to technology improvements. It is a best practice to analyze and re-engineer business processes before automation or automation change. As one CIO noted, “When business process re-engineering and workflow analysis are done prior to implementing automation, the resulting streamlined business processes and workflow can improve agency program effectiveness, speed the delivery of services, and significantly reduce operating costs.” In some cases, CIOs are acting independently from specific technology projects, thereby establishing themselves as the leader for business process transformation even without technology. One CIO said, “By bringing innovative solutions and product demonstrations to state agencies, we serve as the catalyst for business process transformation.”

CIOs provide some examples of their successes in this area. One CIO gives an example of a state-wide permitting platform used by all state agencies involved with permitting, licensing, inspection, and related case management services. Another example is a state bureau of motor vehicles where the original project was simply to automate most branch transactions through online services. However, because the project included business transformation, it ended up creating several registration renewal dates each month to balance transaction volume throughout the month, resulting in one of the lowest average statewide wait times in the United States.

## Conclusion: Innovation – the new CIO imperative?

**State CIOs are in a precarious situation, balancing delivery of legacy services while they advance the C<sup>4</sup> Agenda – consolidation, collaboration, clout, and change – through innovation. On the one hand, they face the continuing challenges of providing timely, high-quality IT services to state agencies and citizens, all the while providing good governance, transparency, and accountability, often with inadequate budgets. Their charter also includes managing the ongoing consolidation of state IT services as well as the modernization and integration of health and human services systems. On the other hand, they need to introduce, manage, or be thoroughly engaged in a wide range of innovations and new IT services, including mobile devices and apps, social media, Cloud computing, Big Data, and the public safety broadband network. It cannot be one or the other.**

At the same time, demands on the CIOs' workforce are changing. Traditionally, state CIO staff dealt primarily with technical challenges such as server maintenance and application development. These same staff must now be conversant in a wide range of business and management skills, ranging from contract and service-level management to social media policy and data analytics. CIOs are also increasingly dealing with inexperienced and lower paid employees because of budget shortfalls and other hiring problems. CIOs need to use contractors, but they must use all outside vendors appropriately, while they continue to build a strong, professional state workforce. In this time of continuous change, traditional procurement roles and processes do not always permit CIOs to respond expeditiously to today's demands. This problem sometimes leads to restructuring the IT procurement function, or to CIOs doing whatever they can to streamline and re-engineer procurement processes to achieve better results.

The continuing democratization of information technology - with services provided as a utility, devices belonging to users, and information created and managed by the public - creates new challenges for state IT organizations. Meanwhile, CIOs must continue to deliver traditional services, often with a reduced workforce and inadequate budget. What is a CIO to do? Taken together, these trends require CIOs to innovate across all dimensions of the CIO function: governance and funding, infrastructure and applications, human capital and procurement. Innovation is indispensable both to meet today's demands and to keep pace with the blistering pace of change in the technology landscape. Balancing legacy service delivery and innovation may be the defining challenge for today's state CIO.



## List of states and territories participating in the survey

### Jack Doane

Director  
State of Alabama

### Pat Shier

Director  
State of Alaska

### Easter Bruce

Chief Information Officer,  
IT Director  
Government of American Samoa

### Aaron Sandeen

Deputy Director & State Chief  
Information Officer  
State of Arizona

### Claire Bailey

Director & Chief  
Technology Officer  
State of Arkansas

### Carlos Ramos

Secretary & Chief  
Information Officer  
State of California

### Kristin Russell

Secretary of Technology &  
Chief Information Officer  
State of Colorado

### Mark Raymond

Chief Information Officer  
State of Connecticut

### James Sills III

Secretary & Chief  
Information Officer  
State of Delaware

### Rob Mancini

Chief Technology Officer  
District of Columbia

### Calvin Rhodes

Executive Director & State  
Chief Information Officer  
State of Georgia

### Ed Cruz

Chief Information Officer  
Government of Guam

### Sanjeev “Sonny” Bhagowalia

Chief Information Officer  
State of Hawai‘i

### Teresa Luna

Director & Chief  
Information Officer  
State of Idaho

### Sean Vinck

Chief Information Officer  
State of Illinois

### Brian Arrowood

Chief Information Officer  
State of Indiana

### Robert von Wolfradt

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### Anthony Schlinsog

Chief Information  
Technology Officer  
State of Kansas

### Lori Flanery

Secretary & Interim Chief  
Information Officer  
Commonwealth of Kentucky

### Edward Driesse

Chief Information Officer  
State of Louisiana

### Jim Smith

Chief Information Officer  
State of Maine

### Elliot Schlanger

Secretary & Chief  
Information Officer  
State of Maryland

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Commonwealth Chief Information  
Officer & Assistant Secretary for  
Information Technology  
Commonwealth of Massachusetts

### David Behen

Chief Information Officer  
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### Carolyn Parnell

Chief Information Officer  
State of Minnesota

### Craig Orgeron, PhD

Chief Information Officer  
& Executive Director  
State of Mississippi

### Tim Robyn

Acting Chief Information Officer  
State of Missouri

### Richard “Dick” Clark

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State of Montana

### Brenda Decker

Chief Information Officer  
State of Nebraska

### David Gustafson

Chief Information Officer  
State of Nevada

### Bill Rogers

Commissioner & Chief  
Information Officer  
State of New Hampshire

### E. Steven Emanuel

Chief Information Officer  
State of New Jersey

### Darryl Ackley

Secretary & Chief  
Information Officer  
State of New Mexico

### Daniel Chan

Acting Chief Information  
Officer & Director  
State of New York

### Jonathan Womer

State Chief Information Officer  
State of North Carolina

### Lisa Feldner, PhD

Chief Information Officer  
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### Stu Davis

Chief Information Officer  
& Assistant Director  
State of Ohio

### Alex Pettit

Chief Information Officer  
State of Oklahoma

### Dugan Petty

Chief Information Officer  
State of Oregon

### George White

Chief Information Officer  
Commonwealth of Pennsylvania

### Juan Rodriguez de Hostos

Chief Information Officer  
Commonwealth of Puerto Rico

### Jack Landers

Chief Information Officer  
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### Jimmy Earley

Chief Information Officer  
& Division Director  
State of South Carolina

### Jim Edman

Acting Chief Information  
Officer & Commissioner  
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Chief Information Officer  
State of Tennessee

### Karen Robinson

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State of Texas

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Interim Chief Information Officer  
State of Utah

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Chief Information Officer  
& Commissioner  
State of Vermont

### Sam Nixon

Chief Information Officer  
Commonwealth of Virginia

### Bharat Shyam

State Chief Information Officer  
State of Washington

### Gale Given

Chief Technology Officer  
State of West Virginia

### Chris Sarandos

Chief Information Officer  
State of Wisconsin

### Flint Waters

State Chief Information Officer,  
Director  
State of Wyoming

## Acknowledgments

We thank state CIOs for participating in this year’s survey – the response rate was extraordinary. We also acknowledge the support and contributions of the sponsoring organizations and the time and expertise of the individuals listed below.

To obtain copies of this report and the survey questionnaires, go to any of the websites listed below.

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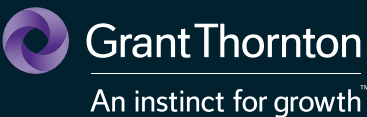
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