

COLORADO EVALUATION AND ACTION LAB

# Leaning In:

Process Improvement in Colorado State Government

Report Five of a six-report series exploring the performance improvement initiatives of the Hickenlooper administration

#### **Report Highlights:**

This report examines Colorado's utilization of Lean methodology for process improvement in state government.

Drawing insights from the state's Lean project database, interviews with state government leaders and implementers, and employee engagement surveys, we find that Colorado has been active with its implementation of Lean on a statewide basis, attempting to reduce waste, inefficiencies, and costs in government operations.

Still, there is room for improvement, especially in ensuring greater resource availability to support Lean projects and training, increasing employee awareness about Lean, consistently tracking activities and outcomes, and pursuing more challenging Lean projects tied to performance goals.

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# Abstract

Colorado's state government actively instituted and expanded efforts to improve government through performance management, process improvement, and talent development during the Hickenlooper administration (2011-2019). The administration's four major performance improvement initiatives included: the revised SMART Government Act; the Governor's Dashboard; Lean process improvement; and the Performance Management Academy, among others. The efforts to make government "effective, efficient, and elegant," the so-called "3 E's," were guided by a focus on goals and results alongside a reinvigorated desire to better serve the state's diverse customers.

This report, Report Five in a six-report series, examines Colorado state government's utilization of Lean process improvement, a process improvement methodology borrowed from the private sector that helps organizations develop a culture of continuous improvement and become more efficient and effective at creating value for customers.

Drawing insights from the state's Lean project database, interviews with state leaders and implementers, and employee engagement surveys, we find that Colorado has actively implemented Lean on a statewide basis, attempting to reduce waste, inefficiencies, and costs in government operations. Still, there is room for improvement, especially in ensuring greater resource availability to support process improvement projects and training, increasing employee awareness about Lean, consistently tracking activities and outcomes, and pursuing more challenging Lean projects tied to performance goals. This report concludes with practical recommendations for improving process improvement efforts in Colorado.



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## **Related Research Reports**

This study is part of a broader project looking at performance improvement initiatives in Colorado during the administration of Governor John Hickenlooper, 2011-2019. With this project, we play the role of outside observers looking back on the administration's performance improvement initiatives in order to document the experiences, elevate successes, identify challenges, and inform current and future public officials in Colorado and beyond. The following reports are all available on the website of the Colorado Evaluation and Action Lab at the University of Denver, which supported this work:

**Report One:** Looking Back, Thinking Forward: Leading Performance Improvement Initiatives in Colorado State Government

**Report Two:** Making it Work (Better): Implementing Performance Improvement Initiatives in Colorado State Government

**Report Three:** Institutionalizing Performance: Colorado's SMART Government Act

Report Four: Public Display of Performance: The Governor's Dashboard in Colorado

**Report Five:** Leaning In: Lean Process Improvement in Colorado State Government

**Report Six:** Good Government in the States: Placing Colorado in the National Landscape of Performance Improvement Initiatives

### Note

Throughout the report, all quotations (if not cited) indicate a direct quote from an interviewee.

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# Introduction

When Colorado Governor John Hickenlooper took office in 2011, his first performance improvement initiatives aimed at enhancing the "efficiency, effectiveness, and elegance"<sup>1</sup> of state government by reducing inefficiencies and waste in government. The tool that the state adopted is known as Lean. Lean is a process improvement methodology borrowed from the private sector that helps organizations develop a culture of continuous improvement. Lean is a process improvement methodology borrowed from the private sector that helps organizations develop a culture of continuous improvement.

Developing trust in government was a cornerstone of the Hickenlooper administration. By making government more efficient from a cost and operational perspective, the governor believed that citizens would be more likely to trust that their government was working hard for them and not the other way around.

Lean was originally developed in the private sector for Toyota's production system. The purpose of Lean is to enable organizations to better create value for their customers by eliminating waste, inefficiencies, and burdens in production and operations through a continuous improvement cycle where the customer is front and center. While applied historically in the private sector, the proliferation of Lean in the public sector began in the early 2000s, mostly in health care services. Currently, many state and local governments utilize Lean or a similar process improvement technique such as Six Sigma.

In 2011, the Hickenlooper administration implemented Lean on a systematic, cross-agency level with funding from the 2009 American Recovery and Reinvestment Act (ARRA) State Fiscal Stabilization Fund, private contributions, and state funds, for a total program budget of \$2.7 million.<sup>2</sup> Lean efforts were led by the Office of State Planning and Budgeting (OSPB), which reported directly to the governor's office. In 2013, the state published a nearly 200-page report detailing their progress with process improvement. The highlights provided in the report described:

From October 2011 through June 2013, OSPB directly supported 81 projects in 16 executive branch departments to improve government processes, with another 60 to 70 projects completed by departments. OSPB also has provided training for more than 2,400 state employees in Lean tools and practices with the goal of transforming the mindset from one of 'this is how we've always done it' to 'how can we do it better?'<sup>3</sup>

Since 2013, Colorado state government continued to make progress in process improvement. The present review examines Colorado's utilization of Lean process improvement in state government from 2011-2018. Drawing insights from the state's Lean project database, interviews with state leaders and implementers, and employee engagement surveys, we find that Colorado has been active with its implementation of Lean on a system-wide basis, aiming to reduce waste, inefficiencies, and costs in government operations. Yet there is room for improvement, especially in ensuring greater resource availability for projects, staff, and training; increasing employee awareness about Lean; tracking activities and outcomes consistently; and, pursuing more challenging Lean projects tied to performance goals. This report concludes with practical recommendations for improving process improvement efforts in Colorado.





### What is Lean?

Lean is a process improvement tool utilized by organizations to reduce waste, inefficiencies, and costs, with the aim of creating greater value for customers or citizens with fewer resources.

Lean methodology is a management system that has been applied widely across sectors in the last century. Lean is an operational process improvement tool that organizations utilize to better serve their customers, clients, or citizens. Simply put, Lean means creating more value for customers with fewer resources.<sup>4</sup>

Lean was first developed in the 1940s to promote a culture of continuous improvement in Japanese manufacturing plants, most notably in automobile maker Toyota's production system. Lean aims to achieve continuous improvement by systematically minimizing organizational waste, inconsistencies, and burdens without sacrificing productivity and value creation for a product or service's end user—the customer. The customer, or citizen in the public sector, is at the center of the Lean process, which assumes any organizational activity that does not add value for the customer is inefficient and thus wasted energy. Lean is

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uniquely aligned with both Frederick Taylor's "scientific management" approach to organizations—which led to an emphasis on efficiencies, standardization, and performance metrics in industry and government work—and the human relations school which developed out of frustration with scientific management's lack of attention to social needs in organizations.<sup>5</sup> As such, the Lean philosophy puts respect for people first in its quest for continuous improvement and minimization of waste in organizations.

Figure 1 summarizes the key principles of Lean. First, organizations attempt to "identify value" by understanding what their customers want and what problems can be solved for customers. Second, organizations "map the value stream" by taking inventory of all work processes, including all tasks and personnel involved in delivering goods or services to customers, and identifying which processes produce (and do not produce) value. Third, Lean involves creating and visualizing "flow" through the work processes that produce value. In complex organizations, creating flow often involves identifying cross-functional teams to more effectively and efficiently produce value for customers. Fourth, organizations must create a "pull system," or a demand from the customer for the work being produced. Without customer demand, there is no purpose for the organization to serve. Finally, the system must be improved on a continuous basis, as all systems incur problems and can break down at times.<sup>6,7</sup>

By following these five principles, organizations can expect to reduce waste, inefficiency, and costs; free up resources for better and more productive use; and better focus their work processes on enhancing value for their customer.



Source: Adapted from Kanbanize.com. "What is Lean Management? Definition & Benefits." Accessed June 5, 2019. <u>https://kanbanize.com/lean-management/what-is-lean-management/</u>

Lean applies to not only the production and manufacturing of goods, but also to service delivery. Health care organizations and hospitals, information technology services, call centers, and other services have employed Lean or other process improvement tools to reduce wasted effort, eliminate inefficiencies, and better serve customers. However, services in the public sector bring a different set of challenges when implementing Lean.

### Lean in the Public Sector and State Government

Lean is increasingly used in the public sector but faces challenges in adapting its focus on the "customer" to the "citizen" and the broader public service context.

While utilized historically in industry, Lean methodology has also been employed, alongside other process improvement methods (Six Sigma, Kaizan, Total Quality Management, etc.) in the public sector for decades. Lean was first adopted in public health services in the early 2000s in both the United States and the United Kingdom, although challenges were encountered due to the different nature of public sector work.

Radnor and Osborne argue the challenges associated with translating Lean to the public sector typically revolve around: (1) public service organizations having to deliver services to citizens, not goods to customers; (2) operating systems in public service organizations are often focused internally and not externally; and (3) indicators of success are different in public service work. Radnor and Osborne contend that public service organizations should embrace a "public service dominant business logic" not only in the



utilization of Lean methodology, but more broadly as an approach to governance. Only then will Lean have its intended effect on continual improvement in the public sector.<sup>8</sup>

Nonetheless, the prevalence of Lean and similar process improvement systems in state governments appears to have grown in recent years. Based on public-facing information from state government websites, our research identified 18 states that currently utilize Lean or similar process improvement tools across state government agencies, and three states that use Lean in a more limited capacity.<sup>9</sup> Colorado is one such state that utilizes Lean on a statewide level, which we discuss in greater detail in the following section.

## How Did Colorado Lean?

#### A Review of Colorado's Lean Activity

Nearly all state agencies reported implementing at least one Lean project, while three agencies (Public Health and Environment, Transportation, and Health Care Policy and Financing) implemented the majority of projects. Projects used time and quality metrics with greater frequency than cost metrics, and very complex projects were implemented less frequently than simple or moderately complex projects.

Colorado state government first adopted Lean in 2011. With the help of funding from the ARRA, Governor Hickenlooper and his administration used Lean to promote process improvement and better serve Coloradans. Lean process improvement is one of the major performance initiatives implemented by the Hickenlooper administration. Although state employees still refer to process improvement efforts as Lean, Colorado rebranded this work as SOLVE, which stands for: 1) **S**cope the Opportunity, 2) **O**rganize the Resources, 3) Lean It!, 4) Verify the Impact, and 5) Ensure Sustainment.

Lean process improvement has been one of the most active performance initiatives in Colorado to date, helping state employees attempt to reduce inefficiencies, cut costs, streamline work processes, identify demands of citizens, and build a culture of performance in state government. Colorado has completed hundreds of Lean projects across nearly every agency and trained more than 3,000 state workers in process improvement. Harvard University's Ash Center for Democratic Governance and Innovation recognized the state's process improvement work as a "Bright Idea" by the Innovations in Government Program in 2015.<sup>10</sup>

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In this section, we draw data from the state's Lean project database provided to our research team by the governor's office. This database contains information on most Lean projects undertaken by state agencies and offices and serves as a repository of project experiences for state employees. Included are project descriptions, the agencies and offices responsible for the projects, level of project complexity, dates when the projects started, and whether the projects were completed. This database contains information on completed Lean projects initiated between 2011 and 2018. Lean projects were categorized into three primary types: mission critical, customer service, and support services.<sup>11</sup>



#### Who Leaned? Activity Reported by State Agencies and Offices

The Lean project database contains information on all completed Lean projects reported by state agencies and offices from 2011 to 2018, although a small percentage of the projects were completed prior to 2011. In total, the database contains 32 Lean projects completed prior to 2011, 28 of which were completed by the Department of Labor and Employment (CDLE). Of important note, the database includes only the projects actively entered by departments and offices and likely presents an incomplete and conservative view of Lean activity.

Figure 2 displays the completed Lean projects reported in the database, and the upward-sloping gray curve indicates the cumulative percentage of projects. For example, the Colorado Department of Public Health and Environment's (CDPHE) 306 completed Lean projects constitute approximately 35% of all completed Lean projects, and once the Colorado Department of Transportation's (CDOT) 226 completed Lean projects are added in, those two agencies' completed Lean projects constitute over 60% of all completed Lean projects.

CDPHE, CDOT, and the Department of Health Care Policy & Financing (HCPF) are the three most active state agencies, representing 70% of all completed Lean projects reported.



Figure 2: Completed Lean Projects Reported by State Agencies and Offices

Source: Colorado State Government Lean Project Database. *Note:* OEDIT is the Office of Economic Development and International Trade.

These data support the claim that Colorado took a system-wide approach with the application of Lean. Governor Hickenlooper mentioned in his 2012 State of the State Address, "We [Colorado] initiated the Lean program in almost every state agency, where employee teams are now actively identifying waste and inefficiency to create savings."<sup>12</sup> In total, 18 out of 19 executive-level state agencies and offices—under



the governor's authority—implemented at least one Lean project, and 14 implemented at least 10 Lean projects during the Hickenlooper administration.

#### **Project Descriptions**

To provide context for what a Lean project entails, a sample of four Lean project descriptions<sup>13</sup> from different state agencies are included:

- **Transportation (CDOT):** CDOT's Office of Financial Management and Budget (OFMB) and the Governor's Office of Information Technology (OIT) partnered to streamline a time-consuming function, regarding reporting requirements from the Federal Funding Accountability and Transparency Act (FFATA). Previously, this function required several staff-days of effort every month at CDOT. Now, that same function requires just a few minutes, savings [sic] staff time that is worth over \$11,000 per year.
- **Regulatory Agencies (Department of Regulatory Agencies):** The Call Center serves more than 10,000 customers monthly. We reduced the amount of transfers and utilized technology to optimize customer experiences. The new system reduced the number of prompts, shaved one minute off the customer's time in the queue, and allows the caller to access accurate information faster.
- Public Health and Environment (CDPHE): In 2011, we in-sourced the creation of CCR [Consumer Confidence Rule] drafts for ~900 water systems. Prior to 2011 an outside company was generating these for us at a cost of \$10,000/year. In addition to the \$80,000 we have saved over the years, we were also able to increase the quality and accuracy of the report as well as making modifications to handle new rules (don't have cost savings, but I imagine the contractor would not do updates free of charge).
- Labor and Employment (CDLE): Update OPS [Oil and Public Safety] website to provide greater service and functionality.

Even within this small sample, Lean project descriptions vary in the level of provided information in the Lean project database. For example, CDOT's description explains what the waste/problem is (time-consuming reporting requirements, which required several staff-days of effort every month); what was Leaned (that same function now requires just a few minutes); and what savings were achieved (staff time worth over \$11,000 per year). Other descriptions are simpler and perhaps more difficult to determine cost savings, such as CDLE's update and improvement of the Oil and Public Safety website. These project descriptions illustrate the variety of outcomes, beyond just cost savings, produced by Lean projects.

#### **Project Metrics**

The state recognized the need to account for different dimensions of Lean project outcomes. Frequently, outcome metrics represent the perspective of state government, the customer, or both. Formally, the types of metrics to capture project outcomes include:

• *Time metrics*: involves "time to government" (the time for government to complete process steps) and "time to customers" (the time for the customer to see completed process steps)



- Cost metrics: involves "cost to government" and "cost to customers" (reduction in costs of services; reduction in operational expenses; freed capacity in terms of full-time equivalents)
- **Quality metrics**: involves "quality improvement to government" (reduction in the error rate) and "improvement to customers" (measurement of customers' attitudes, feelings, or opinions)
- **Other metrics**: involves all other measures (e.g., reductions in: administrative processes; steps in a review or application process; steps in fulfilling a data request; etc.)

Figure 3 displays trends in completed Lean projects by primary metric type from 2011 to 2018. Projects using time metrics were the most prevalent in 2011, representing nearly 70% of completed Lean projects. However, by 2016, quality metrics began to exceed time metrics for completed projects. Cost metrics were used the least overall, with other metrics used slightly more.



Figure 3: Types of Lean Measures Used in Completed Lean Projects (2011-2018)

Source: Colorado State Government Lean Project Database.

Overall, out of 920 completed Lean projects reported in the Lean project database (from 2011-2018), 368 (40%) established time metrics, 370 (40%) adopted quality metrics, 76 (8%) used costs metrics, and 106 (12%) attempted other metrics.

The Lean project database indicates room for improvement of its metrics. First, only 29% of projects (264 out of 920) had a baseline measure that served as a comparison point for process improvement progress. In addition, less than half (45%) of projects included a target measure. While they may be difficult to assign, baseline and target measures are essential for assessing the performance of Lean projects. The database provides a valuable repository of project information for the state, but the project-by-project variation in details and level of completeness limits a holistic view of the Lean efforts and outcomes. This is one area where the state's process improvement efforts can significantly improve.

#### **Process Complexity**

The Lean project database also tracks the *process complexity* of each project, including "simple" (targets everyday issues; small-scale projects; quick wins); "moderately complex" (requires more coordination and



planning such as collaboration across multiple divisions, higher cost, higher visibility and sensitivity); and "very complex" (requires advanced planning and formal facilitation such as collaboration across multiple agencies, highest cost, highest visibility and sensitivity).

Completed Lean projects varied by process complexity. Figure 4 displays the complexity level trends from 2011 to 2018. Moderately complex Lean projects were most common until they were surpassed by simple Lean projects by 2017. The completion of very complex Lean projects significantly lagged behind both simple and moderately complex projects. Simple and moderately complex Lean project activity moved in tandem over the years, with spikes in 2012—when ARRA funds were available—and a large climb in 2016. The number of very complex projects has stayed below 10 new projects annually with the exception of 11 projects in 2016. The spike in 2016 activity coincided with the naming of David Padrino as Colorado's chief performance officer in late 2015 and Donna Lynne taking on the dual roles of lieutenant governor and chief operating officer in May 2016.



Figure 4: Lean Projects Started by Process Complexity Type

Source: Colorado State Government Lean Project Database.

#### **Examples of Completed Lean Projects**

In his 2014 State of the State Address, Governor Hickenlooper highlighted some examples of agencies' success with Lean:

Colorado's Department of Transportation recently reported a 19% decrease in contracting timelines. Combined with other improvements, their efforts are saving more than \$2 million. In 2008, only 33% of property assessment appeals were resolved within one year. Now, 79% are. The Division of Real Estate reduced the average time it takes to complete an investigation of a mortgage loan by 44%.<sup>14</sup>

To learn what a completed Lean project looks like, we pulled three illustrative examples from the Lean project database. Table 1 displays the project title and description, process complexity, outcome metric,



verified outcome, and percentage change in relation to baseline value, for each project. The three examples of Lean projects vary in terms of the agency responsible, process complexity, and type of outcome metric used.

The first Lean project listed was undertaken by the Department of Natural Resources (DNR) and aimed to reduce the amount of hours per month spent processing monthly and quarterly reports for the State Board of Land Commissioners. This was considered a simple project. DNR spent 13 hours per month processing monthly and quarterly reports at baseline and aimed to reduce this to six hours. They reached their target, reducing the time spent on processing by 54%.

Second, the Office of Economic Development and International Trade (OEDIT) engaged in a moderately complex Lean project aimed at reducing the amount of time that customers (citizens) spend reapplying for Colorado Creates grant funding. OEDIT simplified the application and lengthened the grant period from one to two years so customers wouldn't have to reapply as frequently. OEDIT determined the application process took customers 20 hours at baseline and set a target of reducing that time to 15 hours. The office reported that they exceeded their target by two hours with a verified outcome of 13 hours. This represents a 35% reduction in hours spent by Colorado Creates grant reapplicants, which understates the gain because customers had to complete the application half as often.

An example of a very complex project comes from the Colorado Department of Human Services' childcare licensing appeal process. The agency aimed to reduce the time and waste associated with the appeal process and improve applicant or licensee experience by providing more up-to-date information on the status of their request. The agency held a Rapid Improvement Event, a team-based problem-solving event that usually lasts a week or less.<sup>15</sup> This Lean project included three metrics: cost to government (paper, printer ink, mailing, envelopes, etc.); time to customer (steps to complete the appeal process); and quality improvement to government (submitted requests). For simplicity, we report only the first metric, cost to government, in Table 1. Human Services determined that paper, printing, mailing, and envelopes for processing childcare licensing appeals cost them \$20,196 and aimed to reduce this to \$10,000. They succeeded in reducing this cost to \$8,544, achieving a 58% reduction in cost to government for this service.

While these three examples show how to effectively report Lean project progress, the vast majority of projects in the Lean project database do not contain complete information, even for projects using a single metric. While more complete information is available for simple projects, metric information is increasingly absent as the complexity of Lean projects grows and is almost entirely absent for very complex projects. Missing metrics are likely due to the difficulty of assigning metrics, baselines, and targets, as well as assessing outcomes for the most complex projects. Nevertheless, perseverance and support are needed in this area if the state aims to systematically assess the outcomes of Lean projects.



#### Table 1: Examples of Lean Projects from Start to Finish

Agency/	Project Name and Description	Process	Mastria				Verified	%
Office	(Start Date/Verified Outcome Date)	Complexity	IVIETIC			Outcome	Change	
			Туре	Unit	Baseline	Target		
Natural	State Board of Land Commissioners—Board	Simple	Time to	Hours per	13	6	6	-54%
Resources	Reports and Expiring Lease Reports. Create and		Government	month				
	implement a plan to improve the processing of							
	monthly and quarterly reports. (22-Jun-2016-							
	/17-Mar-2017)							
Office of	Leaning of Colorado Creates Grant Application	Moderately	Cost to	Hours	20	15	13	-35%
Economic	<b>Process.</b> Move from a 1-year to a 2-year grant	Complex	Customer					
Development	period so that successful applicants only have to							
and Trade	reapply for funding every 2 years versus every 1							
	year. The grant application was also simplified							
	and has fewer questions. (1-Jul-2016/30-Jun-							
	2017)				400.000		40.044	
Human	Child Care Licensing Appeals and Waivers. The	Very	Cost to	Cost of	\$20,196	\$10,000	\$8,544	-58%
Services	current licensing appeal process is not executed	Complex	Government	paper,				
	in the most efficient and timely manner, and, as			printer ink,				
	a result, customer needs are not always met in			mailing,				
	the best way possible Furthermore, the			envelopes,				
	current process does not have a standard or			etc.				
	consistent process in place to provide the							
	applicant/licensee with any up-to-date							
	information regarding the status of their							
	the extensive amount of time required to							
	manually process and review the large volumes							
	of submitted materials (photos, floor plans							
	letters of support etc.) In an effort to reduce							
	the time and waste associated with the rule							
	appeal and waiver process and to improve the							
	customer experience for child care licensees/							
	applicants the Child Care Licensing unit							
	performed a Lean Rapid Improvement Event							
	(RIF) in December 2016. (3-Oct-2016/1-Mar-							
	2017)							

Source: State of Colorado Office of State Planning and Budgeting. (2019). Colorado Lean Project Database [Google Sheets]. Unpublished Raw Data.



## What Colorado State Government Thinks About Lean

Interviews suggest Lean was generally well-received in state government, but the state's top-down approach with insufficient resources, use of jargon, and lack of attention to inequity between small and large agencies presented challenges. Employee engagement surveys indicate declining interest in Lean and focus on customers, as well as a need for greater resources to promote innovation.

In this section, we report the findings from our interviews with leaders and implementers in Colorado state government, as well as identify trends in perceptions about Lean and process improvement from state employee engagement surveys. Findings suggest that although Lean was generally well-received among Colorado state employees, there is room to improve utilization and awareness, as well as leverage greater value from process improvement.

#### **Findings from Interviews with State Government Leaders and Implementers**

Some leaders in Colorado state government believed the most progress in improving performance during the Hickenlooper administration was achieved using Lean. According to one such leader:

In the first term, our primary elements [of performance improvement initiatives] started with process improvement. And that's really where our initial passion was, and where we thought we would make the most difference over the course of the long term.

In the implementation of Lean, the Hickenlooper administration faced a critical decision: should state government focus narrowly on "Leaning" a small subset of agencies, or should the state implement more broadly and introduce Lean principles statewide across all agencies? Some believed the former, narrower focus would have been more beneficial, although ultimately, the Hickenlooper administration and OSPB opted for the latter and went wide with Lean. As one leader said:

[M]y feeling was that we needed to pick three departments who were ready to move and go deep, and take those \$2 million [in ARRA funds] and just really drive a holistic performance management culture through an organization that was ready to receive it, which meant not just Lean, but also a true look at where your customers are, what are the processes that we use to serve them.

To build capacity for system-wide process improvement, the state emphasized training for employees. The state's State Measurements for Accountable, Responsive, and Transparent Government Act (SMART Government Act) (see Report Three) requires the state's adoption of a process improvement methodology and associated training of employees. The Performance Management Academy and an online learning platform provided process improvement and performance management training, while the Talent Challenge program provided matching funds for such skill development using external providers later in the administration (see Report One). "Lean Champions," who were state employees with existing Lean expertise, became the go-to resources for Lean process improvement within departments and "Lean Fellows" shared their expertise across Colorado state government.



According to one leader, the philosophy of the state's leadership was that:

Lean Fellows was an investment in operational process improvement. We took state resources and, instead of going out and saying 'we're going to hire consultants to do Lean projects,' let's take people who are really good at Lean in the state already, pay them a little extra, pay their department some money for their lost productivity, and have them go do X number of projects, trainings, or coaching sessions, and track how much that is, and demonstrate that it's less than if we'd gone to the market to buy it.

This employee-centered approach was consistent with Lean's principle of putting people first—both on the service-provider side and the customer or citizen side. One leader, highlighting the role of employees in Lean, said:

We picked up a customer-focused tool that engaged the front-line people who are actually doing the work, instead of just saying here, top-down, go focus on your customer.

Employees also discussed the importance of front-line empowerment in Lean process improvement. One interviewee commented that, "When you engage people and solve problems to serve customers better, it's a really rewarding experience for them."

The Hickenlooper administration emphasized that, consistent with the values of the management tool's founders, Lean process improvement would never be used in a punitive way (i.e., to layoff or eliminate state employees from the payroll). According to interviews, one of the key reasons why Lean was generally positive experience in Colorado is because its use respected and valued government employees, and it was not a threat to existing jobs. Instead, Lean was used to identify where efficiencies could be achieved and, if necessary, move state employees to different positions to better serve customers. As one leader pointed out:

I think we were able to find a way to get everybody a new job through the attrition of different agencies and so forth, where we followed up on what we said: Lean is not going to be a way to cut the budget.

This strategy enabled state government to initially generate buy-in from front-line staff and better engage them in process improvement. Colorado followed the advice of process improvement experts and made Lean fit with its organizational culture—not the other way around. State government leaders embraced the notion of bottom-up change and employee empowerment. As one leader put it:

In most cases, we asked people to pick their own project—again, not wanting to have a top-down approach, as much bottom-up as possible—you guys figure out who your customer is, you guys pick a process that's frustrating you, you guys apply some of these new tools, because it makes life better. Perhaps the ultimate objective for a performance management system is to integrate all performance activities, such as process improvement, metrics, and strategic planning and budgeting, across the organization. The Hickenlooper administration had this in mind when designing and implementing Colorado's performance improvement initiatives.



One leader described how state government was able to use the Performance Management Academy to begin linking activities to induce a more synergistic effect:

Our "Aha! Moment" was when you take Lean process improvement stuff to improve the processes of what your strategy goals are. No one had ever combined the two to our understanding...So the [Performance Management] Academy ended up trying to connect those dots where people take a Lean toolkit and apply [it] to your processes that drive your performance plan. That was the "Aha! Moment" of our unified work.

Although we learned from the interviewees that this integration was not nearly complete across state agencies, we did hear from some implementers that this integrated thinking and top-down mandate to consider performance in decision making enabled performance initiatives to work better. For example, one implementer mentioned:

[The administration] forces us to find process improvements. Now that we have performance metrics, now that we're looking at the data, we have targets that we're trying to lean towards. Now that I've mapped out—here are my process steps, here is the customer, here's my product—I can begin looking at how I can improve.

However, not everyone we interviewed had the same perception of how Lean was implemented across state agencies. Some implementers viewed Colorado's Lean approach as overly top-down, at least at some points during the administration. One such implementer remarked: "some people had a really bad taste in their mouth, because [Lean] felt top-down, like, 'I'm from Lean, I'm here to fix you...' well, that's not really the essence of Lean." Another implementer said:

That was kind of how Lean has been rolled out in a lot of places, I think, because that's easy, right? Just train them, do some projects. But if you don't address those pillars of Lean as respecting people, continuous improvement, looking at your management, none of that [process improvement] really [gets] done.

The "big tent" approach was a key driving factor for Lean's initial success with staff buy-in. But there were challenges going wide with Lean. First, this approach demanded greater resources, which became an issue as ARRA funding expired. As one leader described:

We went wide, and we gave every department in the state a certain degree of Lean training and consultation to do two or three projects in the hope that we would get a snowball rolling downhill. And then we ran out of money.

A second challenge was preventing state employees from getting caught up in the jargon and esoteric terms, as well as any negative connotations, associated with Lean.<sup>16</sup> One implementer described using plain language and framing Lean as a tool to help employees do their jobs better. "That's why I called it 'process improvement' instead of Lean. I'm trying to get away from that stigma," said the implementer. "I'm just trying to make it easier for staff so that they're not so overwhelmed with all of these terms and things that they don't understand." Another implementer added: "[Lean] this is just really figuring out how to do what I do better and more efficiently."



A third challenge involved inequities between small and large state agencies for staffing and training employees in Lean and other performance improvement techniques. Large agencies such as CDOT, the Colorado Department of Human Services (CDHS), and CDPHE had dedicated staff for leading performance management and process improvement. They could find room in the budget for matching funds from the governor's office to train their employees in Lean and other performance management skills, or train their own employees in-house such as in the case of CDHS. Smaller agencies typically required staff to play a multitude of roles in the organization to meet top-down performance demands. As one implementer described the situation in mandatory quarterly performance meetings:

You'll see the same people at the meetings. In some cases, it's because we have multiple jobs. I would say that's more applicable to smaller and medium sized departments within the state than larger ones; they'll have more specialists.

#### **Findings from Employee Engagement Surveys**

We examined state employee engagement surveys to learn more about employee perceptions of Lean and process improvement. The surveys, conducted by a third-party firm, asked state employees questions about Lean, process improvement, workforce development, and innovation in state government.

Figure 5 shows how employee familiarity with Lean increased slightly from 58% to 60% of respondents between 2013 and 2015, but such familiarity declined to 54% by 2017. Meanwhile, both the visible support for Lean among department leaders and current level of work on Lean projects steadily declined from 2013 to 2017. Percentage changes in those currently working on a Lean project and leaders visibly supporting Lean decreased by 13% (from 45% to 32%) and 10% (from 49% to 39%), respectively, from 2013 to 2017.



Figure 5: Lean Familiarity, Activity, and Support Levels

We suspect that these trends are attributed to at least two factors. First, the ARRA funds used to support Lean expired over this time period, which could have reduced activity levels. Second, the number of projects and support for Lean may have declined due to agencies selecting simpler Lean projects before

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Source: Colorado State Employee Engagement Surveys (2013, 2015, 2017).



attempting more complex projects. Support for and attention to Lean could have dissipated due to this transition from simple (easier to complete) to complex (harder to complete) Lean projects.

The customer (e.g., the citizen, other state agencies, or local governments) is at the center of Lean methodology, and thus employee perceptions about customers are important in process improvement. Yet employee engagement surveys show declining trends in customer focus, which are displayed in Figure 6.



Figure 6: Customer Focus Perceptions

Source: Colorado State Employee Engagement Surveys (2011, 2013, 2015, 2017).

Employee agreement that customer feedback is used to make improvements to processes declined 5%, from 57% to 52% from 2011 to 2017. The percentage of employees agreeing that customer feedback is used to make changes to meeting customer needs decreased 4%, from 58% to 54%. Fewer employees agreed that customer problems get corrected quickly, declining 6%, from 63% to 57%. Agreement on whether efforts to improve customers' experience have been working over the last year declined 5%, from 2011 to 2017, shifting from 55% to 50%. Finally, the percentage of employees agreeing that their department makes it easy for citizens to use the services offered experienced the greatest decline, decreasing 10% from 67% to 57%. These declining customer focus trends suggest that while the state was active in process improvement, state employees did not perceive that such improvements were translating to a greater customer focus in state government.

In terms of talent growth and development, which is a key part of the Lean philosophy, the vast majority of employees believe they have sufficient capacity to do their job well (74%, not shown) when averaging responses across the surveys. Yet only about 50% of employees indicated that new employees get the training they need to do their job well over the same time period. Both of these categories remained stable from 2011 to 2017.



Innovation is also an important facilitator and byproduct of Lean process improvement. Figure 7 shows how employee perceptions of innovativeness trended from 2011 to 2017. While a majority of employees feel encouraged to come up with new and better ways of doing things, and encouraged to participate in decision making, a considerably lower percentage of employees agree that their working groups have the capacity to act on their new and innovative ideas. This gap may indicate that state employees are coming up with novel and innovative ideas but have few resources to implement them.





#### **Key Takeaways from State Employee Perceptions**

Interviews with state government leaders and implementers suggest several reasons for the success of Lean process improvement in Colorado: initial financial support from ARRA funds; the strategic decision to implement Lean on a system-wide basis; the establishment of the Performance Management Academy; the bottom-up and top-down integration of Lean with other performance initiatives; the development of a common language around process improvement; and reducing knee-jerk opposition to Lean.

Yet these achievements did not come without challenges. To some, Lean still felt too top-down, prescriptive, and lacking concern for people working in government. Expanding Lean and process improvement efforts system-wide was also made difficult after ARRA funds expired. Also, Lean was not implemented in such a way to ensure all agencies, regardless of size and budget, could engage equitably. Larger agencies were able to have dedicated Lean specialists and train more employees in process improvement, while smaller agencies had difficulties matching funds from the governor's office to train their employees, and they required their Lean Champions to assume multiple job responsibilities.

Analyzing state employee engagement surveys over time, we observed further challenges associated with the implementation of Lean, including: declining support for Lean among agency leaders; declining work on Lean projects; declining customer focus; unmet resource needs for new employees; and disparities

Source: Colorado State Employee Engagement Surveys (2011, 2013, 2015, 2017).



between employees being encouraged to think innovatively but having little capacity and resources to act on those innovative ideas.

As noted in Reports Two and Three, three additional factors may also be at work. First, the individuals selected through purposeful sampling for the implementer interviews may have been more closely aligned with the optimism of leaders due to the interviewees' positions as upper-level managers, rather than front-line employees. Second, positive systems-level changes in policy and practice may not be visible to the front-line staff responding to the employee surveys. Lastly, those with particularly strong feelings in either direction (optimistic or pessimistic) may have been more likely to respond to the employee engagement surveys.

### **Conclusions and Recommendations**

This report aimed to assess what progress has been made in Lean process improvement, what challenges were faced, and where advances in process improvement can be made in Colorado state government. From analyzing data from the state's Lean project database, interviews with state leaders and implementers, and employee engagement surveys, we conclude that Colorado was very active in implementing Lean on a statewide basis during the Hickenlooper administration.

Our findings suggest that while Colorado completed over 800 Lean projects and trained thousands of state employees, either through its online learning platform, Performance Management Academy, or Talent Challenge, the state also made a concerted effort to integrate Lean process improvement with other aspects of performance management, from both a topdown and bottom-up perspective. Although there were issues with buy-in at the implementer and front-line staff level, most interviewees generally agreed that process improvement is a valuable technique for making employees better at their job, and it was used in a way that respected people and workers.

However, there were key challenges in the implementation of Lean, some of which remain. First, Lean tied its initial funding to a source with an

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expiration date: the American Recovery and Reinvestment Act of 2009. While the infusion of ARRA funds helped launch the initial Lean activity on a systematic scale, the temporary funding source dried up for training employees in Lean and expanding process improvement efforts. Second, the top-down push from the administration that required state agencies to perform process improvement was not consistent with Lean's emphasis on bottom-up employee empowerment, and there was some confusion among state workers regarding the jargon and negative connotations of Lean in the public sector workplace. Third, the state overlooked agency inequity when implementing Lean. Larger agencies with more staff and resources had the opportunity to benefit relatively more from process improvement training and project implementation, than smaller agencies that could not as easily afford Lean training costs and dedicated staff lines to process improvement and performance management. Some of these issues, such as reducing



jargon and increasing empowerment, were starting to be addressed by the Hickenlooper administration; other issues, such as the lack of equity between large and small agencies, were not resolved.

State employee engagement surveys and the state's Lean project database shed light on areas for possible improvement in Colorado's Lean process improvement. Even while familiarity with Lean remained relatively high among state workers, the perceived number of current projects and the support for Lean among agency leaders decreased from 2013 to 2017. Also, all customer service categories in the engagement surveys showed decline during this time period, with the greatest decline in the item, "Customer problems get corrected quickly." In addition, while resource support for employees is generally adequate, such support for new employees has room for improvement. Similarly, although state workers generally feel they are encouraged to think innovatively in their work group, the majority of workers do not believe they have the capacity to act on innovative ideas in the workplace.

Improvements can also be made in terms of choosing Lean activities that potentially deliver more value to citizen customers. Although Lean projects with quality metrics are beginning to surpass projects with time metrics, increasing attention to cost metrics in process improvement projects is warranted. Also, while moderately complex Lean projects have often kept up with and surpassed simple Lean projects, the number of very complex Lean projects continues to lag behind. Very complex Lean projects may hold the greatest potential value-add for citizen customers, but they also likely have the highest risk of failing to achieve their objectives, especially without devotion of adequate resources. Very complex Lean projects may hold the greatest potential value-add for citizen customers, but they also likely have the highest risk of failing to achieve their objectives, especially without devotion of adequate resources.

It is appropriate to focus on Lean in terms of culture change, customer focus, quality improvement, and continuous improvement mindset. But, if an analyst wanted to try to estimate the total cost savings from Colorado state government's Lean activities, it would not be possible from the available data. Some Lean projects do not have cost saving estimates or alternative outcome measures; some outcomes are spread over multiple years, while others are all in one year. Similarly, the time savings and quality estimates are not easily aggregated. We can imagine that a citizen or taxpayer might want to know how much money and/or time the Lean processes actually saved overall, as well as the actual costs of carrying out the projects, and that is not currently possible to ascertain.

We summarize our recommendations for leaning forward with Lean process improvement as follows:

- Identify and ensure a dedicated and sustainable funding source for Lean process improvement activities and employee training.
- Continue to reduce barriers associated with jargon and negative connotations by continuing to simplify Lean process improvement language and concepts and building trust and awareness among state workers about the pro-social intentions of Lean process improvement.



- Lower financial barriers to Lean process improvement training for smaller agencies and investigate ways implementers in smaller agencies can reduce their job complexity and responsibilities so that they can focus more on process improvement.
- Investigate why employees increasingly believe their agency leaders are not supportive of Lean projects and why employees believe that citizen customer service is declining. Emphasizing the citizen customer more in Lean training efforts may be needed.
- Continue to survey state employees about process improvement, customer service, and innovation, but make sure that the survey questions and response format provide the intended information to support decision making.
- The discrepancy between our small sample of interview responses and the broader employee engagement surveys suggests that Lean and continuous process improvement has been well received by those regularly engaged in the work but less so by the state's much larger number of front-line employees. The state could look into ways to help employees act on their innovative ideas for process improvement and performance management. Resource-sharing and friendly inter-departmental competitions may be effective strategies for enabling employees to act on their innovative ideas without having to reallocate resources.
- Focus on the "higher-hanging fruit" of Lean projects. This could mean dedicating more resources to Lean projects with cost and quality measures, as well as focusing greater attention to very complex and moderately complex Lean projects, assuming adequate resources are provided to support the process.
- To measure progress in process improvement, baseline and target measures for all Lean projects should be identified and reported in the Lean project database. This is especially important for moderately and very complex projects. Projects labeled "very complex" in the Lean project database had very few baseline, target, or outcomes verified.
- The integration of a process improvement methodology, such as Lean, into the revised 2013 SMART Government Act intended to link process improvement to performance measures. Such a linkage can be made more explicit in the Lean project database reporting.
- Look to how other states with prominent Lean programs (e.g., Arizona, Michigan, Nebraska, Ohio, Pennsylvania, and others) are innovating with process improvement, and consider what will work for Colorado.
- Finally, where possible, establish consistent estimates of time and cost savings and more complete project reporting for future Lean projects so that an approximate estimate of projects' outcomes can be communicated to both policy makers and the public.



# Appendix A: Data Sources and Methodology

#### **Qualitative Interviews**

Officials from the lieutenant governor's office assisted in identifying a purposive sample of individuals involved in leading Colorado's performance improvement initiatives. The initial list suggested 19 individuals representing leaders who served in both of Governor Hickenlooper's terms, in key roles overseeing the work at the statewide and department levels, and in the executive and legislative branches. We ultimately conducted interviews with 13 of the 19 individuals using an interview protocol of 10 open-ended questions (see below). Interviewees were affiliated with the governor's office, the lieutenant governor's office, the Office of State Planning and Budgeting (OSPB), and various other departments. In addition, one interviewee was a former legislator involved in these initiatives.

The 10 open-ended questions were as follows:

- 1. In your experience, what are the primary elements of the performance improvement initiatives of the Hickenlooper Administration (both formal and informal)?
- 2. What is/was your role related to these performance initiatives?
- 3. During this period, how would you describe the underlying culture, philosophy, or principles of the performance improvement work?
- 4. How would you describe the evolution of performance improvement during the Hickenlooper Administration?
- 5. Where did the ideas for the performance improvement efforts come from? Other states, national programs, individual champions within state government?
- 6. Which efforts or initiatives had the most impact in making government work better? How do you know?
- 7. What challenges have been encountered during the design and implementation of these performance-based initiatives?
- 8. Have some state agencies or programs made more progress than others?
  - a. Which are exemplars?
  - b. If there are differences in performance improvement, do you have any ideas why?
- 9. If you were providing advice to future state leaders, both within Colorado and outside, what would you tell them about undertaking performance management and improvement initiatives?
- 10. Who else should we talk to, in or outside of government about these programs?

The research team recorded and transcribed the interviews with these leaders, which averaged 37 minutes in length.

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Officials from the lieutenant governor's office also assisted in identifying an initial list of 51 individuals representing staff involved in implementing Colorado's performance improvement initiatives from a variety of state departments and offices.

Specifically, most individuals played one or more of the following roles: Lean Champion, Performance Planning Lead, or Subject Matter Expert. They were contacted via email with an initial interview request and a follow-up request if needed. We ultimately conducted interviews with 24 state employees representing 14 agencies and offices, including representatives from the Office of the State Auditor and Joint Budget Committee staff, using an interview protocol of eight open-ended questions:

- 1. What is/was your role related to performance improvement initiatives?
- 2. How did these state-level efforts translate to your specific work?
- 3. What were the successes from your perspective?
- 4. What were the challenges?
- 5. Were there attempts to institutionalize efforts across administrations?
- 6. Are these performance-related activities well known and understood throughout the department?
- 7. What advice and best practices for others undertaking performance improvement initiatives do you have?
- 8. Who else should we talk to, in or outside of government about these programs?

The team recorded and transcribed the interviews, which averaged 39 minutes in length.

Following best practices for qualitative research, two members of the research team coded the interview transcripts to ensure inter-coder reliability. Themes in the responses were identified by each coder independently, along with representative quotations. These initial themed codes were transferred into the coding forms and consolidated across coders based on team discussions. The coding generated counts of themes raised by interviewees for each question. The frequency of mentions was used to gauge the importance of the themes in our analysis.

We did not specifically ask each interviewee about Lean process improvement, but noted when it was mentioned, in what context, and representative quotations.

#### **Employee Engagement Surveys**

The Hickenlooper administration instituted a biennial employee engagement survey beginning in 2011.

All employee engagement survey results come from the following sources: OrgVitality, LLC. (October 2011 & February 2014). *Results Report Employee Engagement Survey: Report for Overall State of Colorado* (001); The Gelfond Group. (November 2015). *Employee Engagement Survey Briefing Report: Report for Total State of Colorado*; PwC. (n.d.). *2017 State of Colorado Employee Engagement Survey: Executive Results Report.* 

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Survey respondents averaged 17,680 in each wave. Responses totaled 20,466 for the 2011 Survey; 16,061 for the 2013 survey; 16,902 for the 2015 survey; and 17,291 for the 2017 survey. Reported survey response rates were 48% in 2015 and 63% in 2017 (response rates for 2011 and 2013 were unavailable). The scale used for survey responses includes the following categories: 'Strongly Favorable', 'Favorable', 'Neutral', 'Unfavorable', and 'Strongly Unfavorable.' Reporting combines the 'Strongly Favorable' and 'Favorable' responses to represent 'Favorable' responses. The percentage shares reported in the aggregated survey results are rounded to whole percentage points, so the calculated differences presented in this report are approximate amounts.

#### **Colorado Lean Project Database**

Lastly, we draw data from the state's Lean project database provided to our research team by the governor's office. This database contains information on most Lean projects undertaken by state agencies and offices, and serves as a repository of project experiences for state employees. Included are project descriptions, the agencies and offices responsible for the projects, level of project complexity, dates when the projects started, and whether the projects were completed. This database contains information on completed Lean projects initiated between 2011 and 2018. Lean projects were categorized into three primary types: mission critical, customer service, and support services.



# **Endnotes**

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