CPS HR CONSULTING

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ASQ Government Division

The Global Voice of Quality™

# Achievements and Barriers:

## the Results of Lean and Quality Initiatives in Government


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## FIGURES & TABLES



*Rich Mallory's unique knowledge of government operations was obtained from years as a consultant to hundreds of jurisdictions and agencies around the United States, as the former Director of the California Department of Housing and Community Development, and as a former California-Nevada State Director for the US Department of Agriculture. Mallory served seven times as an Examiner for the Baldrige Quality Award, six times for the California State Award, and once at the National level; he is also the Immediate Past Chair of the Government Division of the American Society for Quality. Currently he is a Senior Project Manager for CPS HR Consulting. Mallory is author of Quality Standards for Highly Effective Government and Management Strategy: Creating Excellent Organizations. He holds a Master's Degree in Management and is a Certified Project Management Professional (PMP).*

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# Executive Summary

This is the second study on the use of Lean Process Improvement and Continuous Quality Improvement in government sponsored jointly by the American Society for Quality (ASQ) Government Division and CPS HR Consulting. Completed in February of 2015, the first such joint study concluded that an estimated 20% of all state agencies now have formal Lean Quality Improvement programs in place. It also found that quality in government initiatives have a short lifecycle, and that most do not survive more than three to five years due to a lack of structured support, both by political leadership and by top agency executives. The survey concluded that lean and continuous quality improvement efforts have a limited life span in government because there is no long-term incentive for maintaining successful efforts[1].

The current study was directed to Lean Process Improvement team leaders and facilitators believed to have completed a significant team-based improvement effort over the past three years. It was structured to obtain and comprehensively evaluate the overall results that Government Lean Process Teams have achieved, to document barriers encountered, and to evaluate the contemporary belief that once teams have been trained and have participated in a successful improvement effort, that the demonstrated positive results will result in a continuing growth and expansion of the agency's commitment to quality.

The current survey was developed cooperatively by the ASQ Government Division Leadership Council and was distributed in a web-based survey between July and September 2016. Survey invitations were provided to all known state offices of Lean and Continuous Quality Improvement, to the Federal Improvement Team[2], and to professional contacts and networks known to members of the Government Division Leadership Council resulting in 79 requests for participation, of which 24 provided responses that met acceptance criteria (i.e., ~65% completion of the survey instrument).

### Report Findings

A summary of the most significant findings follows:

- Respondents indicated that the average (median) improvement cycle was seven months, varying from a minimum of one month, to a maximum of 30 months. This indicates that shorter efforts were more common than longer ones among projects profiled by respondents.
- Overall, 54% of the problem statements were deemed to be externally focused and designed to improve the program output of the office, agency or department, while 46% were deemed to be internally focused on business problems within the agency. In other words, almost half of all lean process teams are commissioned to work on problems that do not directly impact the public and instead deal with problems that are primarily of concern to managers or employees within an agency.
- Primary hoped for benefits of lean process teams were the *timeliness* and *effectiveness* of the targeted process. Two-thirds of respondents (67%) stated that those two reasons were the basis of initially identified problems. Approximately 42% of respondents referenced a desire to promote *uniformity* and reduce *complexity.*

1 See *Quality Improvement in State Government: Survey Results (2015),* at http://www.cpshr.us/resources_whitepapers.html

2 The Federal Improvement Team (FIT) is an all-volunteer, member-run, collaborative community of practice. The FIT is composed exclusively of federal employees (uniformed services and government civilians) currently representing 175 members from 28 different federal agencies who share a passion for continuous performance improvement in the federal sector. They have no formal affiliation with any agency or service. All activities are member suggested and member led.

- Respondents identified 149 recommended improvements, with 75% of respondents providing a minimum of 5 improvement opportunities; approximately 83% were considered to be of "high" or "very high" feasibility for implementation.
- Of the recommended improvement opportunities, 74% had "high" or "very high" management implementation, and 76% of recommendations were either met or exceeded each team's estimate of its feasibility. At least five improvement solutions that were evaluated as having no or low feasibility had notable management support and implementation.
- Only 10% of recommendations had notably *lower* management implementation rates (or no implementation at all) than the team's estimate of feasibility.
- The three leading categories of waste identified by teams were *Waiting* (68%), *Defects* (58%), and *Extra Processing* (56%).
- Three primary reasons identified for a failure to implement recommended improvement opportunities were that it required 1) staff resources and support from another unit (including an IT solution); 2) another unit to reconfigure their staffing or work to support a new process; and/or 3) leadership approval to change process requirements. Of the 12 respondents who cited barriers to implementation, 100% found that lack of staff resources and support were factors, while 92% included reconfiguration and leadership approval as additional barriers.
- 27.3% of respondents said there was a concern regarding a possible reduction of jobs from improvement activities, and four of the six felt this concern had either a large or moderate impact on team recommendations.
- Approximately 18% of all respondents felt that a possible reduction of budget was of concern to the team in consideration of opportunities for improvement.
- Respondents reported significant positive benefits. Among the 12 teams represented, the initial average of 61 process steps was reduced to 24 steps, a reduction of 61%. The lowest reduction reported was 20%, whereas the highest reduction was 89%.
- Initial values for total process time (TPT) averaged 102 days with average post-implementation values of just 42 days, a 60% reduction in time. The process with the most significant difference in TPT values started with an initial value of 547 days that was reduced to 74 days.
- The six respondents who studied percent of process input occurrences that pass through the entire process without error (throughput yield) showed a 19% reduction in error rates. In one case, a 100% throughput rate (error free work) was achieved.
- Respondents indicated that since completion of the initial effort, 82% of improvements to operations are still in place and actively used. Only two respondents specified use of improvements at less than 60%, indicating a relatively high level of acceptance. Respondents were 81% confident that the team would be able to maintain the improved operations achieved at the end of the improvement cycle over the next three years.
- A majority of respondents estimated that less than half of their overall agency operations "are effectively using the principles of process/quality improvement." Four out of five respondents (82%) estimated their overall agency use of these principals was 50% effective or less. Overall, respondents estimated that just 38% of their "overall operations" were effectively using Lean Quality Improvement techniques.

These findings led to the following conclusions:

1) Lean Process Improvement is capable of producing substantial positive improvement in the efficiency and effectiveness of government. This is supported by an observed 61% reduction in process steps and 60% reduction in process time, combined with a 19% improvement in error free work. It is acknowledged that the process improvements reported in this study were in part nominated due to known and observed initial problems in their timeliness and effectiveness. As a result, it could therefore be argued that they had greater possible improvement potential than more typical government processes. However, this study supports the conclusion that Lean Quality Improvement has the potential to produce substantially improved results wherever problems are addressed.

2) A number of significant barriers to the success of Lean Process Improvement teams exist and limit both the development and adoption of improvement opportunities. Most significantly, employees of units considering Lean Process Improvement are sensitive to the fact that their efforts could reduce the numbers of positions required or result in budget reductions in their agency, and specifically in the office in which they work. Those who manage these agencies must ensure that those who create process improvement opportunities know they will not lose their own job as a direct result or the root causes of inefficiency will never be revealed.

3) Either the lack of resources to implement recommended improvements or a lack of support for recommended changes by leadership or other organizational units can prevent the realization of hoped-for improvements. The lack of a holistic organizational improvement focus is itself a barrier.

4) There is no evidence that Lean Process Improvement spreads throughout an agency based on practiced success in some of its programs and offices. This is based on the finding that even the agencies which have sponsored these highly successful Lean Process Improvement teams have not been successful at making Lean Process Improvement an integral part of their overall operational management – or even in a majority of its other program areas.

## RECOMMENDATIONS

Several recommendations are provided in response to each of the survey findings:

A) Government leaders everywhere should embrace Lean Process Improvement as an ongoing management strategy for all managers and supervisors, and as a *required management practice*. This is possible through the use of the Government Division's Process Management Standards and System Management Standard[3] that provide empirical and uniform measures of the practiced quality of any manager and supervisor.

B) High level support for process teams is required in several ways.

   a. Executive leadership must create a safe and beneficial career transition for employees that undertake recommendations or process improvements that lead to the elimination of existing jobs in government. This practice recognizes that employees take a personal career risk in recommending or working toward savings in their own program area, and that there is a strong

[3] Both are available at no cost in the Government Division online library: http://asq.org/gov/quality-information/library/. A further explanation of the need and structure of Quality Standards is available in the book: *Quality Standards for Highly Effective Government*, by Richard Mallory.

public interest in ensuring that such employees are rewarded with equal or greater positions rather than job loss.[4]

b. Executives and elected leadership must allow agencies the freedom to repurpose savings from achieved efficiencies and economies rather than attempting to annually reduce budgets. This includes the freedom to repurpose saved staff time for other agency needs. A longer-term approach to realize savings must be adopted so that each improvement cycle does not create a natural fear of future cycles.

C) A strategic and project-based focus to Lean Process Improvement teams is necessary to support a holistic organizational improvement focus. Creation of chartered teams with an executive sponsor are often the best way to ensure necessary change management and resource allocation to achieve the full benefit of process teams. Executive sponsorship benefits improvement efforts in several ways: ensuring the use of new process steps or work methods, working out interdepartmental issues, providing resources or permissions, and providing change management.

D) The use of empirical and uniform measures of the practiced quality within government organizations provides the most promising means of expanding and sustaining efficiency and effectiveness in government. Specifically, Government Division believes that a consistent and continuing focus on process quality can be achieved through the development and use of an organization-wide scorecard based on these quality maturity standards.

[4] Advice on doing so is provided by Government Division's *Professional Practices for Lean Quality Improvement in Government*, available at no cost at: http://asq.org/gov/quality-information/library/

# Study Purpose and Design

In conjunction with the American Society for Quality (ASQ) Government Division, CPS HR Consulting conducted a study of Lean Quality team leaders in government in the summer of 2016. The study was designed to obtain and comprehensively evaluate the overall results that a national cross-section of government lean process teams has achieved over the past three years, including identifying the magnitude of improvements, documenting the waste categories discovered, and identifying whether waste was eliminated or unable to be eliminated. The survey was designed to document and categorize the improvement ideas that were unable to be implemented and the reasons their teams were unable to move forward in those areas. It also contained a series of questions about the perceived sustainability of Lean Quality efforts[5] in government and the barriers to change.

This is the second study performed by Government Division in conjunction with CPS HR Consulting to advance the use and best practices associated with Lean Process Improvement efforts in government. It is also supportive of the mission of Government Division to identify, recognize, and support quality champions in government.

Completed in February, 2015, the first study found that an estimated 20% of all state agencies now have formal Lean Quality Improvement programs in place. It also found that quality in government initiatives has a short lifecycle, and most do not survive more than three to five years due to a lack of structured support, both by political leadership and by top agency executives. The average duration of reported statewide quality efforts was about two years, with 29% reporting being in place for less than one year. The study concluded that lean and continuous quality improvement efforts have a limited lifespan in government because there is no long-term incentive for maintaining successful efforts. These efforts are often initiated by a single executive leader in government, and do not survive changes in political administration[6].

The current study was directed to Lean Process Improvement team leaders and facilitators believed to have completed a significant team-based improvement effort over the past three years. It was developed cooperatively by the Government Division Leadership Council and was distributed in a web-based survey format between July and September 2016. Survey invitations were provided to all known state offices of Lean and Continuous Quality Improvement, to the Federal Improvement Team, and to the professional contacts and networks known to members of the Government Division Leadership Council resulting in 79 requests for participation of which 24 provided responses that met acceptance criteria (i.e., ~65% completion of the survey instrument).

Survey respondents represented teams from ten U.S. states, the District of Columbia, and Canada.

These teams were primarily from state governments (67%) with the remainder from Federal (17%) and local or regional governments (16%). Due to the nature of convenience sampling (as described above), the results cannot be considered a random representative sample of all state Lean Process Improvement team leaders or facilitators, therefore, reliability of the sample remains undetermined. Yet, based on the nature of the sample sources and the cross-section of states represented in the responses, the results of the survey have face validity as indicators of Lean Quality team practices occurring across the country in government.

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[5] The terms *Lean Process Improvement*, *Lean Quality efforts*, and *Continuous Quality Improvement* are considered similar terms in this study, and relate to the use of metrics and structured tools to identify and improve key processes in government, and to improve their efficiency and effectiveness.

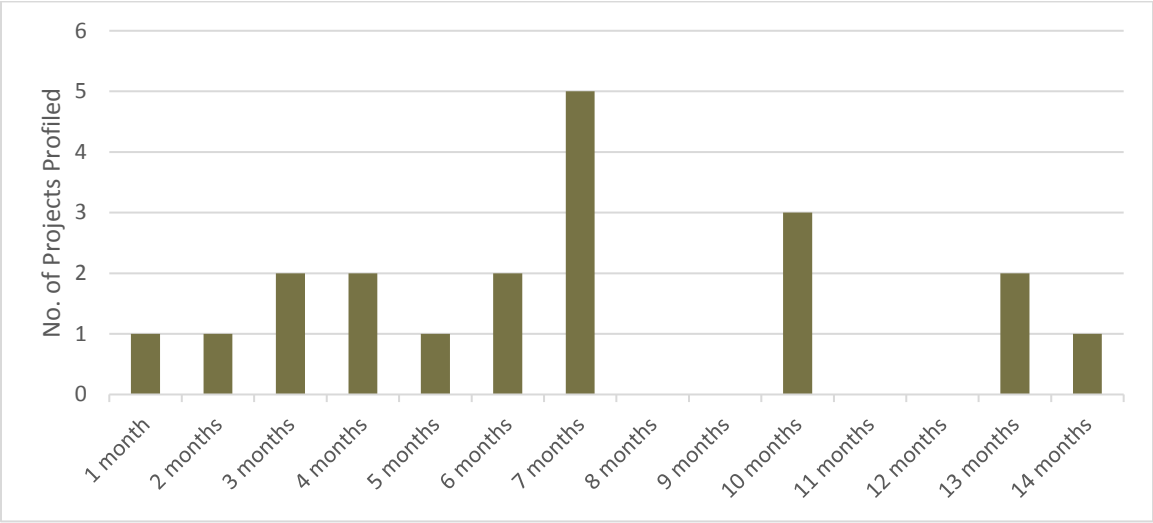
[6] Copies of this paper are available under the title, *Quality Improvement in State Government: Survey Results, Feb. 1, 2015,* at: http://www.cpshr.us/resources_whitepapers.html

# Findings

### Duration of Team Improvement Cycle

Respondents indicated that the average (median) improvement cycle was seven months, varying from a minimum of one month, to a maximum of 30 months[7] (Figure 1). This indicates that shorter efforts were more common than longer ones among projects profiled by respondents.

*Figure 1. Project Duration[8]*




### Problem Statements

Respondents each identified a problem statement for their team activity. Analysis of these statements was based on two key concepts:

- Whether the improvement opportunity was *internally or externally focused*. Internally focused would center on administrative support, whereas externally focused would center on direct program beneficiaries.
- The *nature* of the stated problem or why the problem was targeted, typically falling under the following broad categories:
    - took too long (timeliness);
    - did not delivery results effectively (effectiveness).
    - was not uniformly provided or standardized (uniformity); and/or
    - was too complex (complexity);

[7] Two of the responses were removed from analysis. One provided an end date but no start date. The other reported improvement cycles of more than three years which seemed to indicate a misunderstanding of what was requested or an error in reporting.

[8] Upper outliers of 28 and 30 months removed from chart for brevity.

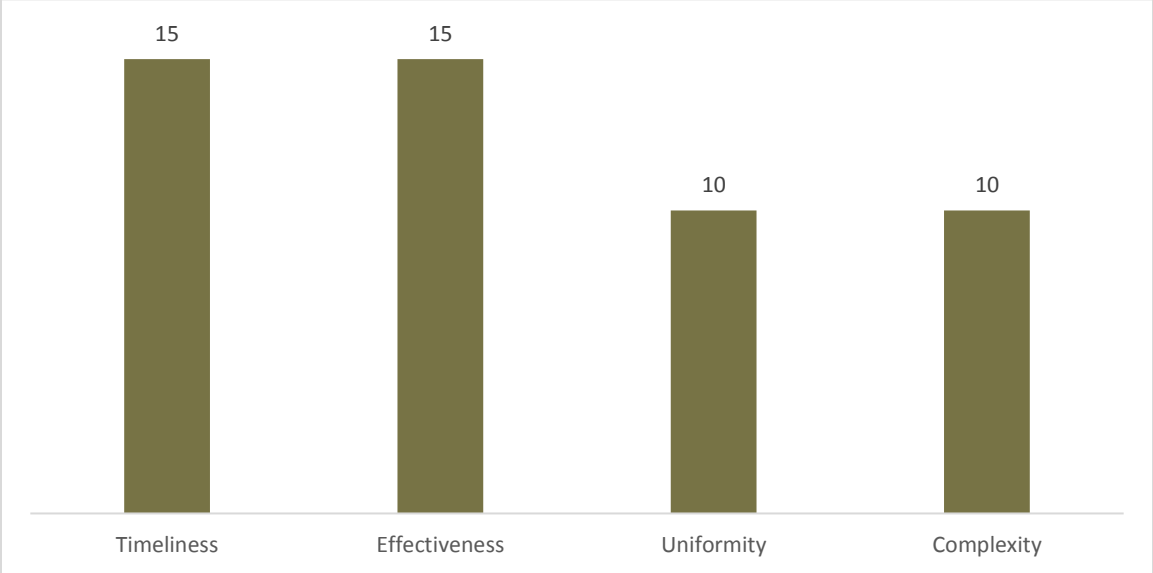
For example, one internally focused problem stated a goal of improving the availability of chemicals needed by energy program research staff, and was categorized as not being effective. Another internally focused problem said the goal was to "streamline the procurement process" to reduce the time between request and acquisition "from 16 to 7 days," and it was categorized as not being timely.

An external and program focused problem statement from a Health Resource Center handling Veteran's Health issues noted that the average time to answer a call had increased from 9 minutes and 30 seconds to 12 minutes, and that the need to conference callers into a "first party billing assist line" was a possible reason. This was also categorized as a problem of not being timely, but also of not being effective.

Overall, 13 (54%) of the problem statements were deemed to be externally focused and designed to improve the program output of the office, agency or department, while 11 (46%) were deemed to be internally focused on business problems within the agency. Based on both prior and current studies, about half of lean process teams are commissioned to work on problems that do not directly impact the public, and that are only of primary concern to managers or employees within an agency.

The leading benefits these teams desired were *timeliness* and *effectiveness* of processes, with 67% of respondents mentioning key indicators for these categories. In addition, 42% of respondents mentioned key indicators around *uniformity* and a desire to reduce *complexity* (Figure 2).

*Figure 2. Problem Statement Categories (n = 24)*[9]




[9] More than one category could be chosen for each problem statement.

## IMPROVEMENT OPPORTUNITIES IDENTIFIED/EVALUATED

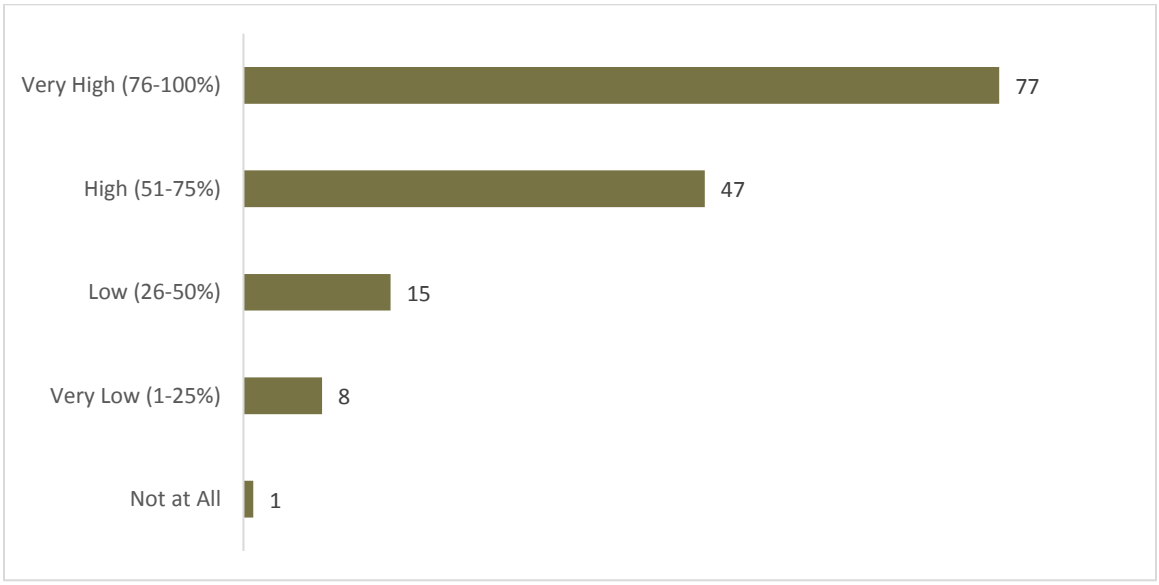
The usual first step of every process improvement team is the identification of possible causes and possible solutions to resolve or mitigate the initially identified problem statement. Its structured problem solving methodology will typically develop possible root causes of discovered problems and link those with feasible possible solutions. The linkage of possible solutions with largest impact causes results in development of improvement opportunities.

Respondents were asked to list up to ten improvement opportunities developed as a part of their project. Respondents identified 149 recommended improvements, with 75% of respondents providing a minimum of 5 improvement opportunities. Each respondent was asked to provide the team's assessment of the feasibility of implementing each solution using the following scale:

- Very High (76-100%)
- High (51-75%)
- Low (26-50%)
- Very Low (1-25%)
- Not at all
- Don't Know/ No Answer

Of the 148 improvement recommendations with responses, 83% were considered to be of "high" or "very high" feasibility for implementation (Figure 3). Survey instructions told respondents to rank improvement recommendations "in order of importance."

*Figure 3. Improvement Opportunities: Team Estimate of Feasibility (n = 148)*



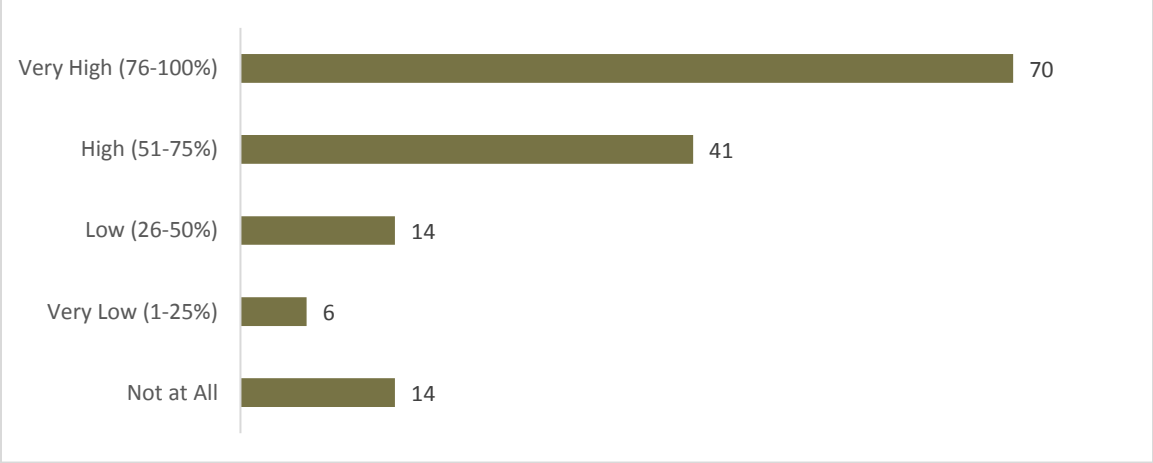
Although there was a weak positive correlation ($r$ = .32) between the importance and the feasibility of implementing an improvement recommendation, respondents indicated overall that the items of highest impact on a problem are not always the most feasible to implement. This underlines the difficult balance of problem solving teams' ability to match solutions with the highest impact with actions that are feasible to implement within the organization.

## Management Reaction and Response

It is our assumption that a problem solving team often does not have sufficient resources and authority to implement its "most feasible" solutions alone, and will necessarily have to request permission to implement from a higher level of management. As a result, respondents were asked to rank the actual level of implementation of the solution by management for each opportunity using the same scale used when rating team estimate of feasibility. This was done both to evaluate the ready acceptance of team recommendations, and to identify any measurable discrepancy between the team's perceived feasibility of implementation and the actual record of implementation.

Of the recommended improvement opportunities, 74% had "high" or "very high" management implementation, and 76% of recommendations were rated as either meeting or exceeding the teams' estimate of feasibility (Figure 4). At least five improvement solutions that were considered as having no or low feasibility had notable management support and implementation. This is reflective of management that welcomes and works within its authority to ensure the maximum result from improvement opportunities. On the other hand, 10% of recommendations had notably *lower* management implementation rates (or no implementation at all) than the team's estimate of feasibility.

*Figure 4. Improvement Opportunities: Management Implementation (n = 145)*




Initial communications regarding this survey requested that it be distributed to "Lean Process Improvement Team Leaders and/or Facilitators who have recently completed a significant team-based improvement effort." Given that these teams were already thought to have achieved significant results, we can assume that they were also likely to have had significant management support in their establishment. As such, the implementation rates of improvement recommendations are likely higher than for those teams that spontaneously adopt Lean Process Improvement tools without first having obtained management buy-in.

## Waste Categories

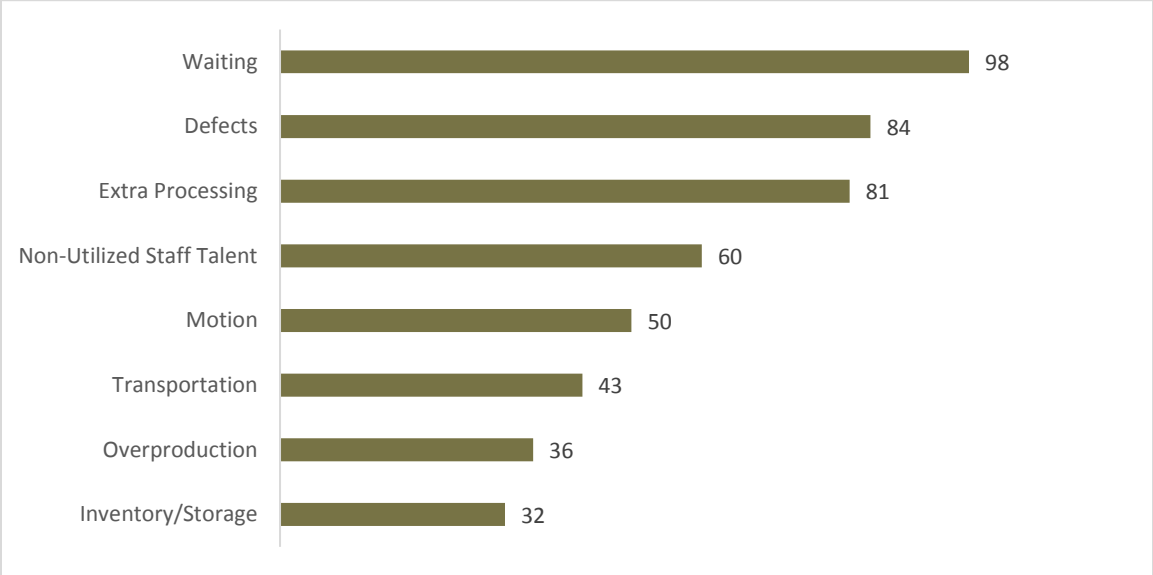
The survey asked respondents to characterize the waste discovered in their process review, using the standard waste categories and definitions adopted by the ASQ Government Division (Table 1).

*Table 1. ASQ Government Division: Sources of Process Waste*

| Defects | Overproduction | Waiting | Non-Utilized Staff Talent |
|---|---|---|---|
| Right things done wrong, Time spent on fixing errors and mistakes, incomplete work and defective first efforts. Re-processing work to add missing or incomplete information | Wrong things done right. Performing work that is not necessary or useful. Batching. Inspection. Sign-off and review that serves no purpose. Business necessary non-value add. Lost time in communication or meetings that were not needed. | Idle time. All process wait time. Time in queues. Backlog. Waiting for records and customer information. Waiting for feedback, opinions and decisions. Waiting for copies, supplies, vehicles and other materials. | Personnel working below grade level, or in activities or tasks that could be contracted out, or provided by automated systems. Using high paid staff to perform menial tasks. |
| **Transportation** | **Inventory/Storage** | **Motion** | **Extra Processing** |
| Moving products, equipment, or materials from one place to the next. Routing of documents for processing or approvals. Delivering and retrieving files | Unnecessary storage of information and materials or more information and materials than is needed. Duplicate records storage and unnecessary or obsolete databases and files. Storage of records that should be destroyed. | Unnecessary movement required of workers. Includes finding people or travel to meet with people where other means of getting information were possible. 'Costs' include time, energy, and health and safety issues | Processes steps that are non-value add. Double entry of data fields. Data entry, reports and memos that exceed requirements, or satisfy outdated requirements. |

Respondents categorized improvement opportunities by one or more waste categories. *Waiting* (68%), *Defects* (58%), and *Extra Processing* (56%) were selected as the most predominant sources of waste for more than half of the improvement opportunities provided (Figure 5). Less than 25% of improvement opportunities were cited as having *Overproduction* or *Inventory/Storage* issues.

*Figure 5. Waste Categories by Number of Improvement Opportunities (n=145)*



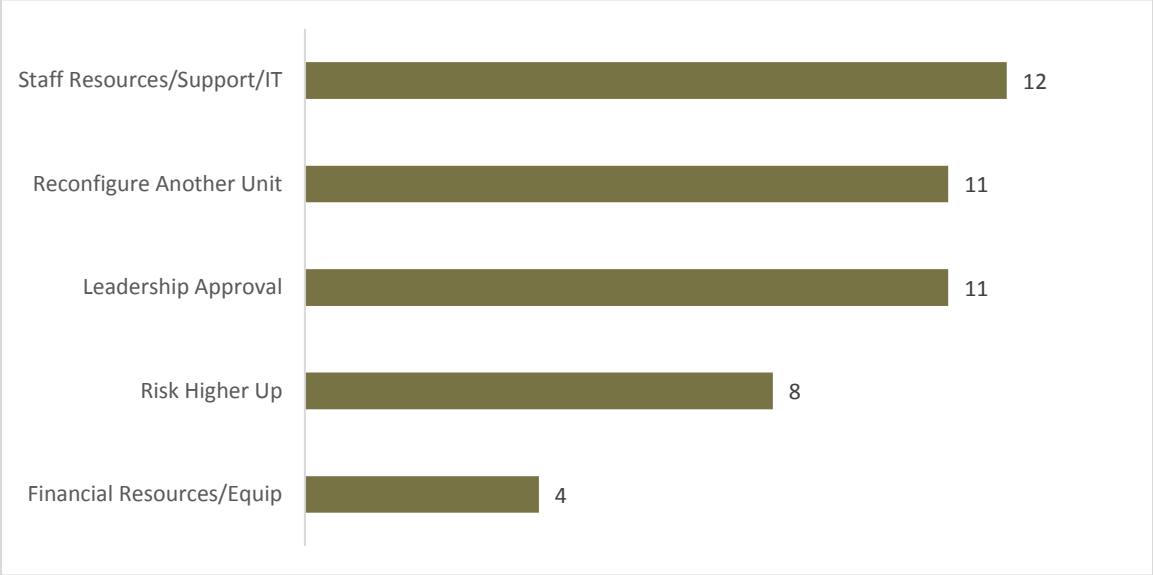

## Barriers to Elimination of Waste

The survey asked about barriers to the elimination of waste by having each respondent provide additional information regarding those improvement opportunities developed by their team for which the actual implementation was ranked "low," "very low," or "not at all." There were 33 improvement opportunities that met this criteria. Respondents were asked to select one or more of the following factors:

- Required financial resources/new equipment
- Required staff resources and support from another unit (including an IT solution)
- Increased risk to someone higher up or outside the process team
- Required another unit to reconfigure their staffing or work to support a new process
- Required leadership approval to change process or requirements

Not all improvement opportunities were rated, although most respondents provided descriptive feedback; 12 respondents rated the applicable improvement opportunities they had provided, 22 recommendations in all (see Figure 6). More than 50% of these improvement opportunities had barriers such as *required staff resources/support from another unit*, *required another unit to reconfigure*, and *leadership approval*.

*Figure 6. Barriers for Improvement Opportunities with Low/No Implementation (n=12)*




Additional factors offered by respondents included:

- Physical space constraints
- Technical/IT constraints
- Additional staff resources during implementation
- Increased work/paperwork
- Regulatory clearance
- Complete buy-in from all staff
- Lack of a change facilitator/transition team

Many respondents provided clarification regarding the factors they selected, especially regarding the impact of executive sponsorship:

- The leadership, strategy, and cultural change elements of the change model are missing; the lack of a senior level Lean steering committee makes sustainability of this pilot uncertain at this time.
- The factor that most impacted the actual implementation of the improvement opportunity was the need for leadership approval to change processes.
- Project sponsor said that a different software was not an option. We were able to make some modifications to the current software that enabled us to achieve some of identified goals.

The comments provided underline the often repeated observation that successful team efforts must have executive sponsorship to succeed. Executive sponsorship benefits improvement efforts in several ways: ensuring the use of new process steps or work methods, working out interdepartmental issues, providing resources or permissions, and providing change management.

## Additional Constraints for Business Process Reinvention in Government

During informal professional discussions of Lean Process Improvement efforts in government[10], it is noted that process team members are hesitant to be completely candid, or that team members have reluctance about advancing some suggestions for improvement because of concern they could either cause reductions in unit staffing or in unit budget allocations. While the reasons for these beliefs could be the subject of considerable discussion, the survey attempted to find objective evidence of their existence as a means of evaluating the extent of their possible impact on Lean Process Improvement teams overall.

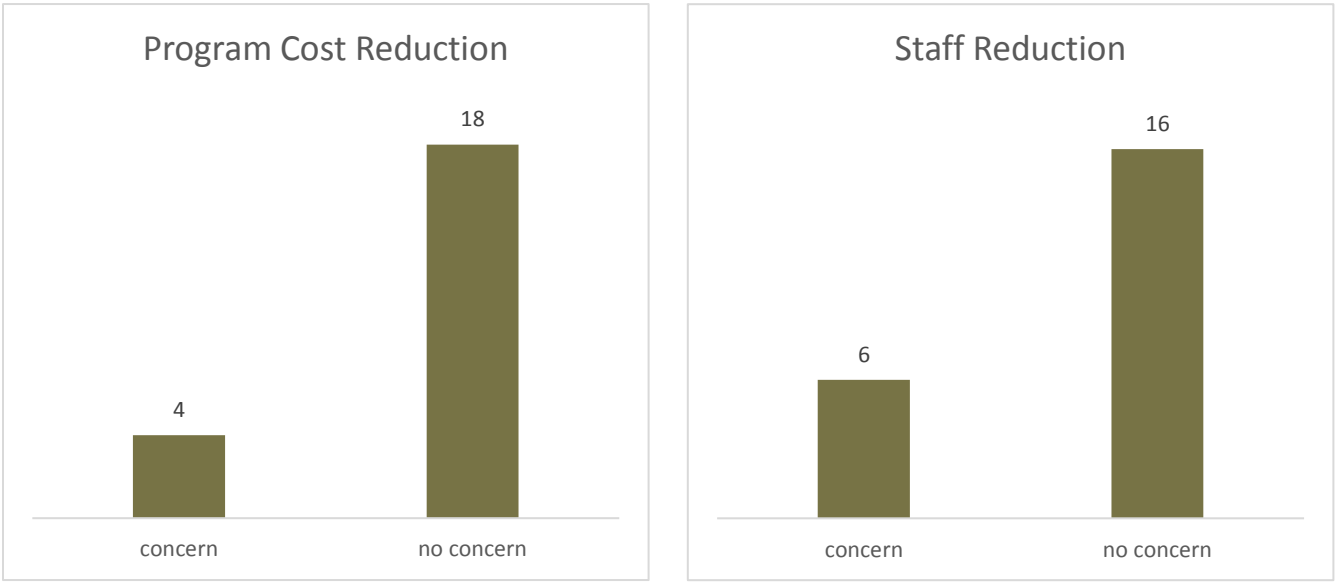
Respondents were provided context for questions regarding reporting sensitivity:

A) Some improvement teams have identified a potential for *significant reduction of program costs* as a result of proposed improvement activities, which can cause concern among management and team members that immediate reduction of program budgets will result, even though the work unit may be hard pressed to cover costs in other areas. This may cause concern about reporting potential savings of improvement activities.

B) Some improvement teams have identified a potential for *reduction of staffing (labor savings)* as a result of proposed improvement activities, which can cause concern among team members who are in those jobs and friends who may be affected.

About one out of five respondents were concerned when it came to reporting cost reductions (18%), but those concerned rose to 27% when it came to staff reductions (see Figure 7). Those who were not concerned about cost reduction indicated that funds would be reallocated within the department or that the focus was on time and not cost.

*Figure 7. Concerns about Reporting Reduction Impacts (n=22)*




[10] Direct reference to discussions during teleconference meetings of the Sustainability in Lean Process Improvement Task Force, commissioned by the ASQ Government Division in 2015 and 2016.

Typical comments regarding cost included:

- This improvement was taken on to be able to achieve the mission not for cost savings.
- Projected costs savings by the proposed changes actually would have been enough to pay the salaries of two full-time employees in the section. Reprogramming benefitted the section and sped up the process, totally eliminating the backlogs that were present before the process improvement changes were implemented. We looked at reallocating those resources to other areas.

Those concerned about staff reductions indicated issues and perceptual contradictions best illustrated by one comment:

- There was concern to the very end. Most staff did not trust that jobs would not be eliminated. Agencies did lose staff, but they also gave up the work. They could tangibly feel the loss of staff, but did not feel they lost the work. They felt that the work had been pushed out to the field and struggled to feel the decrease in effort in the short term. They have enjoyed faster processing, although a new computer system was deployed at the same time as the [redacted] improvements, so the impact was not as readily felt. The team could see that attrition was taking care of the reduction in staff naturally through centralizing. They were concerned, but seemed to adjust during the project as they began to focus on the work product and timing and not the number of people needed.

Those who were *not* concerned about staff reductions indicated an upfront understanding that no one would lose their job or job status due to potential changes. Respondents indicated (many times without prompting) that many programs were understaffed or that staff had been involved in the improvement initiative and had complete understanding and buy-in of the changes.

- The biggest concern was what happens if the new process requires less people, and up front the team was made aware that no one would lose their job as a result of the Kaizen event.

It is significant that even this instance citing 'no fear' of job losses refers to discussion of the issue as a foundational event of the team effort.

### Summary of Results of Process Team Activity

Respondents were asked to provide data on a list of standardized Lean Process metrics developed by ASQ Government Division, both initial values and those after process implementation. Not all metrics were applicable across all programs[11]. Although data was limited, the following aspects of process performance indicated measurable improvement:

**Process Step Reduction (PSR)**. The initial average of 61 steps was reduced to 24 steps, a reduction of 61% (n=12). The lowest reduction reported was 20%, whereas the highest reduction was 89%.

**Total Process Time/Elapsed Time (TPT)**. Initial values for TPT averaged 102 days with average post-implementation values of 42 days, a 60% reduction in time (n=12). The process with the most significant difference in TPT values reported an initial value of 547 days that was reduced to 74 days.

[11] Other metrics requested included: *Activity Time/Actual Time*, *Value Added Time*, *Non-Value Added Time*, and *Non-Value Added Time – Business Necessary*. Insufficient data were collected on these metrics.

**Throughput Yield**. This is the percent of process-input occurrences that pass through the entire process without error. Reporting on this metric was limited to six respondents who averaged a reduction of 19% in rework.

### MAGNITUDE OF PROCESS IMPROVEMENTS

Respondents provided additional information on the magnitude of improvements, with a focus on increased financial and staff resource availability, decreased time to desired outcome, and greater effectiveness in carrying out the department or agency's mission. The following representative comments demonstrate typical responses:[12]

- This 5S event did free up the space required for the additional production. It helped everyone understand what parts of their process add value to the products and what does not. It helped them to identify wasted motion and over-processing steps of working ahead and eliminate those steps to create a better 1 piece flow system. Prior to the event we did not measure value added or non-value added times. There was very little data for any production improvements. Now they meet daily and measure daily metrics around safety, quality, delivery, cost and people engagement goals that they developed.
- …The dates on the Future State map didn't change that much. What changed was re-work loops and wait times throughout the process. Review time was dramatically cut down because the right people were involved earlier in the process. Communication about the process was increased and happened earlier in the process so majority of Agency leaders were less mystified and frustrated by the process.
- We found significant amounts of time (or "days used") that were unaccounted for, and thereby wasteful. Our revised process improves how operational information is handled so there is better operational tracking. So now, instead of applications sitting on a hiring manager's desk, waiting to be addressed, managers are audited during the process to ensure they stay on task.
- Ambulance offload time decreased by 20%. Considering that on average (the agency) transports 1,569 patients per month to (the local) Hospital this improvement translates to 344 hours of increased ambulance availability per month or 4,132 hours per year. This generated annual cost savings of $3.5 million from not having to hire additional EMS staff plus out-fitting additional vehicles.
- Process improvements reduced and/or eliminated the amount of calls coming to the help desk or switchboard. This was the result of providing training to all end users to allow employees to complete self-service tickets and troubleshoot problems prior to making a service request….
- Productivity in the contract review department increased 5x. The success in meeting the state's performance target of 21 days increased 3x from 25.78% success to 76.31%.
- Issuing of some clothing and gear occurred the day prior to deployment in current state. Some items were shipped to deployed individuals with a high defect rate. New process completes the sizing, purchase, & issuance 90 days prior to deployment.

In at least one case, a team encountered unintended consequences of process improvement for their organization:

- The [application] origination process had a lead time of 146 to 547 days per application (average 270 days), and 57 independent process steps. The initial kaizen workshop resulted in lead times being reduced to 65 days. Unfortunately, the success of the Lean process effort drew in more applications

[12] Minor edits were made to clarify comments and maintain the confidentiality of the respondent.

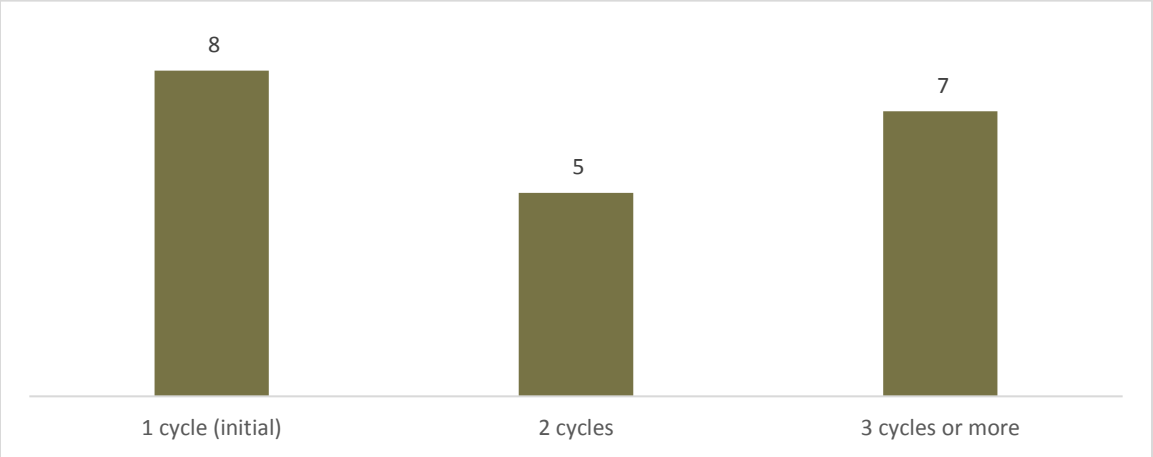
than the allotted resources could manage. As the volume of requests increased, the lead time grew back to 130 days.

### Perspective on Sustainability of Improvement Efforts

Respondents were asked a final series of questions to evaluate their perspective on the likelihood that developed improvements will be maintained over time and that their process team will continue on with continuous improvement efforts. These questions were structured to obtain feedback relative to the often expressed professional expectation that once teams have been trained and have participated in a successful improvement effort that their positive results will result in a continuing growth and expansion of the agency's commitment to quality.

Respondents indicated that 40% of teams had undertaken only the initial cycle of improvement, while 35% had undertaken three or more cycles (Figure 8). When asked if they had already begun another improvement cycle, 45% indicated "Yes." Those who said "No" were asked if an improvement cycle was likely next year; 6 out of 10 respondents felt there was a greater than 75% chance of an improvement cycle being conducted. Based on this limited result, it seems that process teams are more likely than not to begin a second cycle of improvement, but that there is no certainty that such efforts will continue indefinitely or become routine in future process management[13]. As such, it is reasonable to conclude that Lean Process teams are looked at primarily as targeted and temporary problem solving efforts, rather than as on-going means of process management.

*Figure 8. Work Teams' Cycles of Improvement (n=20)*




Respondents indicated that since completion of the initial effort, 82% of improvements to operations are still in place and actively used (n=19). Only two respondents specified use of improvements at less than 60%, indicating a relatively high level of acceptance. Respondents were 81% confident that the team would be able to maintain the improved operations achieved at the end of the improvement cycle over the next three years. Comments that represent the attitude of most respondents include:

[13] This is further supported by the data presented in the next section on the extent of the use of Lean and Quality Improvement Practices in host agencies.

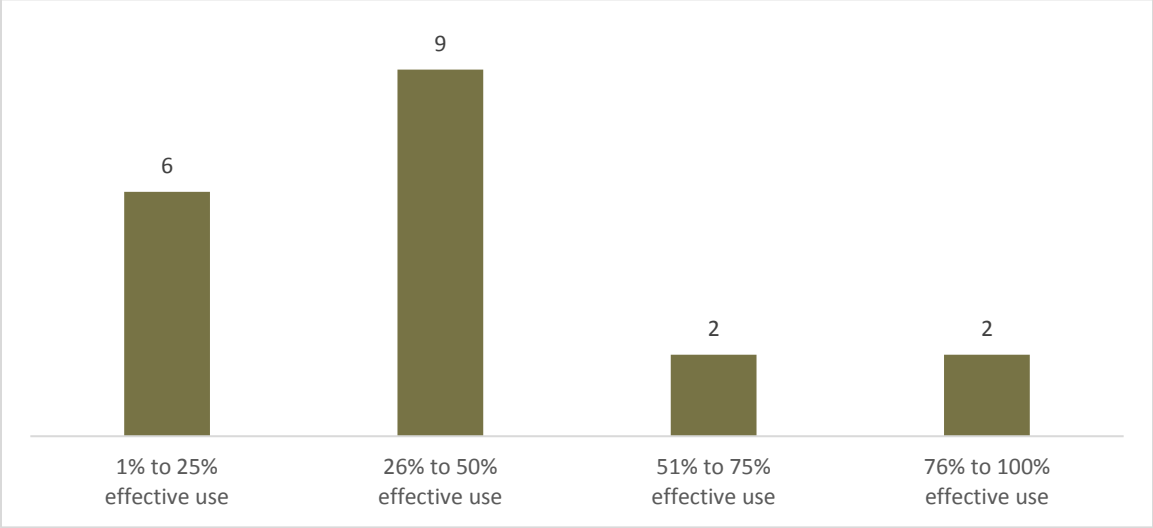
- We have provided the area with the tools and knowledge to reevaluate themselves. We will make ourselves readily available if needed to provide another improvement cycle in six months.
- The people who worked on the original project are all very motivated to make this process work. Many of them have been on other continuous improvement projects so they know how to sustain improvements.
- … I'm totally confident that we'll continue to see improvements for two reasons: 1) We will find more areas of improvement with the proposed process we have in place for the pilot, and 2) we fully anticipate that there will be changes in regulations and technology which the proposed pilot process will embrace.
- …The success of the work for the [agency] has given weight to continuing the formal pursuit of process improvement work and other initiatives have been started/completed within the [agency] since this project.

### Percentage of Overall Agency Operations Using Lean Process Improvement

As noted at the beginning of this report, survey invitations were provided to all known state offices of Lean and Continuous Quality Improvement, to the Federal Government Improvement Team, and to the professional contacts and networks known to members of the Government Division Leadership Council. Surveys were directed to Lean Process Improvement Team Leaders and Facilitators who were believed to have completed a significant team-based improvement effort over the past three years. As such, it might be assumed that such agencies would be generally supportive of Lean Quality Improvement, and that as a result, would either have higher than average rates of participation in Lean Quality Improvement, or uniformly high rates of use of these practices.

In order to test this theory, respondents were asked to estimate the percentage of their overall agency operations "that are effectively using the principles of process/quality improvement." Four out of five respondents (82%) estimated their overall agency use of these principals was 50% effective or less (Figure 9). Overall, respondents estimated that just 38% of their "overall operations" were effectively using Lean Quality Improvement techniques.

*Figure 9. Organization-wide Effective Use of Principles (n=19)*



In comparison, the initial study conducted by CPS HR and ASQ Government Division last year estimated that just 20% of all state government offices and agencies were users of Lean Quality improvement techniques. With the limited number of responses available in this year's study, one must be careful not to infer broad conclusions without additional supportive research. Further study is needed, but the preliminary results show us that agencies who are supportive of Lean Process Improvement (as defined by the response group) are almost twice as likely (38% compared to 20%) to have wider-scale implementation of these principles throughout all of their operations.

However, we would also have to conclude that such agencies have not been successful at making Lean Process Improvement an integral part of their overall operational management. As such, there is no evidence that Lean Process Improvement spreads throughout an agency based on practiced success in some of its programs and offices.

### Process Maturity

Respondents were asked to rate their agreement with statements relating to structure and management support for the Lean and Quality teams in their agencies, and those are generally listed in order of agreement. A high rate of agreement (70%) was expressed for the statement that the teams were commissioned to address "process improvement opportunities" (Table 2). This again supports the idea that Lean and Quality approaches are commissioned primarily as problem solving tools, rather than as an ongoing means of process management.

There was also a high rate of agreement (75%) for the structuring of improvement efforts as "team based." This would be in opposition to the idea of conducting Lean and Quality improvement of processes as an external or expert-imposed structure.

*Table 2. Process Maturity (n=20)*

| | Agree or Strongly Agree | Neither agree nor disagree | Disagree or Strongly Disagree |
|---|---|---|---|
| **Efforts are based on process improvement opportunities.** | 70% | 20% | 10% |
| **Efforts are team-based.** | 75% | 10% | 15% |
| **Results from efforts are published and publicized.** | 60% | 15% | 25% |
| **Those involved in successful efforts have received appropriate recognition.** | 45% | 25% | 30% |
| **Those involved in successful efforts have found it helpful to their career advancement.** | 50% | 40% | 10% |
| **Fact-based decision making is a well-established principle in our organizational culture.** | 40% | 30% | 30% |
| **Our Organization supports the right of all employees to ask "why do we do this without fear of reprisal.** | 35% | 40% | 25% |
| **Higher management is committed to the success of this effort.** | 55% | 30% | 15% |

Just 50% of all respondents thought their participation in a successful team would be helpful to their career advancement; although 60% of respondents indicated that the results of their efforts were publicized, only 45% felt those involved in the effort received "appropriate recognition."

The last three questions inquired about the overall management culture, and whether it was in alignment with the tenets of Lean and Quality Improvement[14]. Just 40% agreed with the statement that "fact-based decision making" is a part of the organizational culture, while 30% disagreed. Only 35% agreed that their organization "supports the right of all employees to ask 'why we do this' without fear of reprisal." Surprisingly, 25% disagreed and 40% were not sure. Only 55% agreed that management "is committed to the success of this effort," while 30% were unsure and 15% disagreed.

These results would appear to further support the idea that highly successful Lean and Quality Improvement can be and often is launched in organizations that do not have cultural alignment with these efforts. This lack of alignment with the tenets of Lean and Quality Improvement may indeed be primary factors in the lack of sustainability and growth of these efforts.

[14] Reference is made to the Core Values and Concepts of the *Baldrige Excellence Framework*, published by the Department of Commerce, National Institute of Standards and Technology, 2017-2018, pages 40-44. Principal topics include Visionary Leadership, Valuing People, Organizational Learning and Agility, Managing for Innovation, and Managing by Fact.

# Conclusions and Recommendations

### Conclusions on Sustainability of Improvement Efforts

The primary conclusion of this study is that, despite the impressive and significant process improvements achieved by these Lean and Quality Improvement teams, their efforts were most often focused on acknowledged problem areas ("based on process improvement opportunities"), possibly as a "last resort" problem solving effort[15]. It also is not a foregone conclusion that such efforts will be sustained, and no evidence is presented that such efforts naturally expand and grow within their hosted organizations. These efforts also often exist as "pockets" of excellence within a larger management structure that does not support them. This is perhaps best seen in response to the questions regarding support for "fact-based decision making," and the right of employees "to ask why we do this, without fear of reprisal."

The study confirmed much of what is already known from prior studies and revealed the following:

- Lean Process Improvement is capable of producing substantial positive improvement in the efficiency and effectiveness of government. This is supported by an observed 61% reduction in process steps and 60% reduction in process time, combined with a 19% improvement in error free work. It is acknowledged that the process improvements reported in this study were in part nominated due to known and observed initial problems in their timeliness and effectiveness. As a result, it could therefore be argued that they had greater possible improvement potential than more typical government processes. However, this study supports the conclusion that Lean Quality Improvement has the potential to produce substantially improved results wherever problems are addressed.
- A number of significant barriers to the success of Lean Process Improvement teams exist and limit both the development and adoption of improvement opportunities. Most significantly, employees of units considering Lean Process Improvement are sensitive to the fact that their efforts could reduce the numbers of positions required or result in budget reductions in their agency, and specifically in the office in which they work. Those who manage these agencies must ensure that those who create process improvement opportunities know they will not lose their own job as a direct result or the root causes of inefficiency will never be revealed.
- Either the lack of resources to implement recommended improvements or a lack of support for recommended changes by leadership or other organizational units can prevent the realization of hoped-for improvements. The lack of a holistic organizational improvement focus is itself a barrier.
- There is no evidence that Lean Process Improvement spreads throughout an agency based on practiced success in some of its programs and offices. This is based on the finding that even the agencies which have sponsored these highly successful Lean Process Improvement teams have not been successful at making Lean Process Improvement an integral part of their overall operational management – or even in a majority of its other program areas.

[15] Data provided by this survey is supplemented by the professional observations of the ASQ Government Division Leadership Council in reaching this conclusion.

## RECOMMENDATIONS

Study findings continue to support the assertion of the Government Division that the growth and sustainability of Lean and Quality practices in government depends on continuing leadership interest and attention or that growth and sustainability will be lost. Even at that, every change of leadership can undermine and possibly extinguish interest in its practice. Its growth is not self-sustaining without an empirical and uniform measure of the maturity of quality practice in each supervisory and management area of every government organization. For success, consider the following:

A) Government leaders everywhere should embrace Lean Process Improvement as an ongoing management strategy for all managers and supervisors, and as a *required management practice*. This is possible through the use of the Government Division's Process Management Standards and System Management Standard[16] that provide empirical and uniform measures of the practiced quality of any manager and supervisor.

B) High level support for process teams is required in several ways:

   a. Executive leadership must create a safe and beneficial career transition for employees that undertake recommendations or process improvements that lead to the elimination of existing jobs in government. This practice recognizes that employees take a personal career risk in recommending or working toward savings in their own program area, and that there is a strong public interest in ensuring that such employees are rewarded with equal or greater positions rather than job loss.[17]

   b. Executives and elected leadership must allow agencies the freedom to repurpose savings from achieved efficiencies and economies rather than attempting to annually reduce budgets. This includes the freedom to repurpose saved staff time for other agency needs. A longer-term approach to realize savings must be adopted so that each improvement cycle does not create a natural fear of future cycles.

C) A strategic and project-based focus to Lean Process Improvement teams is necessary to support a holistic organizational improvement focus. Creation of chartered teams with an executive sponsor are often the best way to ensure necessary change management and resource allocation to achieve the full benefit of process teams. Executive sponsorship benefits improvement efforts in several ways: ensuring the use of new process steps or work methods, working out interdepartmental issues, providing resources or permissions, and providing change management.

D) The use of empirical and uniform measures of the practiced quality within government organizations provides the most promising means of expanding and sustaining efficiency and effectiveness in government. Specifically, Government Division believes that a consistent and continuing focus on process quality can be achieved through the development and use of an organization-wide scorecard based on these quality maturity standards.

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16 Both are available at no cost in the Government Division online library: http://asq.org/gov/quality-information/library/. A further explanation of the need and structure of Quality Standards is available in the book: *Quality Standards for Highly Effective Government*, by Richard Mallory.

17 Advice on doing so is provided by Government Division's *Professional Practices for Lean Quality Improvement in Government*, available at no cost at: http://asq.org/gov/quality-information/library/