Less Time,
Lower Cost, and
Greater Quality:

Making Government Work Better with
Lean Process Improvement

Lean
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Introduction

Public managers are often asked to "trim the fat" in times of revenue scarcity. Unfortunately, there is no line item in the budget called "fat," so managers will need to look elsewhere. Very often, organizations build slack into their business processes in the form of non-value-added activities (Exhibit 1 lists the basic types of non-value-added activities). A formal business process improvement methodology can find and remove these sources of waste. One process improvement method that holds particular promise for local governments is "Lean." Lean refers to a collection of principles and methods that focuses on identifying and eliminating non-value-added activity (waste) involved in producing a product or delivering a service to customers.[1] Lean may hold particular promise for government because it is:

- **Gradual, continuous improvement**. Unlike the business process re-engineering of the 1990s, which took a "rip out and replace" approach to business process improvement, Lean takes existing processes and makes steady improvements to them over time. While some situations may call for a radical change to business processes, many governments will do better with a gradual change model.[2]

- **Implementation-oriented**. Lean methods focus on applying these gradual improvements in rapid succession, rather than relying on lengthy planning, analysis, and implementation cycles.

- **Customer-focused**. Under Lean, what is considered to be the value a process produces is defined by the customer – who is, in many cases, the citizen. This focus on value delivered to the customer/citizen can lead to greater support from elected and appointed officials for process improvement.

The purpose of this paper is to describe the Lean process improvement method, how to move forward with Lean, and the experiences of local governments that have used Lean. The first section of this paper describes local governments' experiences with Lean. The second section is about planning a Lean initiative. The third section addresses executing a Lean event. In the next section, the follow-up from the event needed to secure positive results will be explored. The final section covers the place of Lean in the local government beyond the first Lean event (a focused, intense, short-term project to improve a process).

Public managers are often asked to "trim the fat" in times of revenue scarcity. Unfortunately, there is no line item in the budget called "fat."

Local Government Experiences with Lean

Lean originated in manufacturing, but its principles have been successfully applied to public and private service organizations. Here are some examples of benefits local governments have obtained from Lean:[3]

- **The County of Peoria, Illinois**, reported that staff productivity for building permit processing improved between 50 percent and 100 percent. Similar results were reported after Lean was applied to the hiring process and the county board agenda process.

- **The City of Conroe, Texas**, had a goal of imbedding a Lean culture into the organization. Selected staff members were trained in Lean concepts, and several Lean events were held. The staff members who were trained first then trained other staff. These efforts have

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Exhibit 1: Sources of Non-Value-Added Activity (Wastes)

- **Defects**. Anything that has to be redone or corrected. Employees probably know what work often has to be redone.

- **Overproduction**. When too much of something is produced (e.g., information) or when something is produced too soon, while the downstream customer (internal or external) waits for something else.

- **Waiting**. Waiting for anything – people, paper, signatures, etc. This waste is the easiest to find.

- **Not using employees**. Failing to take advantage of employees' skills. For example, does management seek out their ideas for improvement? If so, do they act on them?

- **Transportation**. The time that a piece of work spends in transit until the next step. One critical kind of transport waste is hand-offs. Each time work is handed off from one person to the next in a process, there is an opportunity for the process to break as work gets lost, misunderstood, etc. Minimizing the number of hand offs in a process is essential to making a process lean.

- **Inventory/backlog**. Not just an abundance of supply, but also a backlog of work that leads to even greater waste as workers must spend time and effort managing and working around the backlog.

- **Motion**. Excess motion on the part of the worker. For example, a poorly laid out office might require a worker to spend too much time walking between different points where work equipment is located.

- **Excess processing**. Extra processing that does not add value, from the customer's perspective (e.g., obtaining too many signatures or double- or triple-checking of work).

resulted in $2 million in combined real-dollar savings in the community's $42 million general fund budget and $14.7 million enterprise fund budget.

- **The County of McHenry, Illinois**, used Lean for its development regulation processing. Lean reduced internal processing time by 73 percent without requiring an investment in new technology. Continued improvements are expected as the county makes technology investments.

- **The City of Palm Bay, Florida**, realized benefits from Lean for its utility billing process, including: reducing meter reading times (estimated labor cost avoidance of $12,000 annually); reducing meter reading rework for billing by 70 percent; allowing payments to be collected in the field (estimated recovery of 60 labor hours in a six-month period); and eliminating printing and mailing of late notices (hard cost savings of $33,000 annually).

- **The City of Montgomery, Ohio**, was facing a severe regional rock salt shortage and a price spike of 172 percent. The city applied Lean processing to its snow plowing process, reducing the amount of salt it used by 300 tons, saving $40,000 (about 30 percent of the budget) and reducing overtime costs by 15 percent. The process improvement also addressed communications with the public, better informing Montgomery residents about how the city would deal with the shortage. Follow-up surveys indicated that residents were satisfied with the city's snow removal efforts.

- **The City of Cincinnati, Ohio**, estimated a 50 percent reduction in sewer easement processing time and a 35 percent reduction in the time required for police recruiting.[4]

- **Metropolitan Sewer District of Greater Cincinnati, Ohio**, believed a cumbersome process for collecting the costs of pretreatment program activities was responsible for slow receipts and unacceptable numbers of delinquent accounts. A Lean event revealed opportunities for streamlining and consolidating the processes for preparing and issuing invoices, billing for new and renewal permits, and collecting permit and monitoring fees. The process improvements collectively reduced processing time by more than 50 percent, resulting in significant cost reduction and staff efficiencies.

- **Pitkin County, Colorado**, applied Lean to its budget process. Pitkin County found that focusing on the customers of the budget process identified important opportunities for improving communication. Department heads now have a better understanding of what is required of them and why, leading to higher quality and more timely submissions. All county staff now better understand the county's financial strategies because the budget process is more transparent. Elected officials have also benefited from new forward-looking quarterly reports, rather than the backward-looking reports that are typical of financial reporting. Lean also streamlined the budget process. Many of the budget reviews the county manager conducted were determined to duplicate reviews conducted by the county's leadership

team (executive management plus independent elected officials). As a result, all responsibility for the budget reviews was placed with the leadership team, leading to a 25 percent reduction in the number of budget development meetings. At the same time, budget discussions have been woven into other existing meetings, thereby improving the quality of planning and the evaluation of results.

The next sections describe how to plan and execute a Lean initiative in order to achieve similar benefits in other governments.

Planning a Lean Initiative

Lean requires a brief but intense event to analyze the business process and identify the available improvement opportunities. Careful planning ensures that this Lean event delivers. Planning entails first making the case for Lean, then selecting a process to be improved with Lean, and, finally, defining the team that will carry out the Lean event.

Making the Case for Lean

One of Lean's distinguishing characteristics is that the employees who perform the day-to-day work of the process being analyzed drive the initiative through their direct participation. Of course, Lean also requires the support of the managers who oversee the process. The active involvement of these people is essential to both generating the best ideas for improving the process and creating sufficient support for the new and improved process (preventing backsliding to old ways of working). Therefore, these people will need to be willing, if not enthusiastic, participants in Lean. A manager who is advocating Lean can achieve this by guiding staff through the following stages:

- **Make them aware of what Lean is**. What is Lean? How is it different from other process improvement methods? Has it worked elsewhere?

- **Build their desire to participate in Lean**. How will Lean benefit me, personally? How will it benefit our government? Our citizens? What larger, strategic objective will Lean contribute to? What tangible benefits has it produced for other governments? As an employee, will my ideas for process improvement be listened to? What are the goals of using Lean for our government? Will it be used to cut jobs?

- **Give them knowledge about how to participate**. What happens in a Lean event? How can the process I work with apply Lean concepts? How can I get skilled in Lean concepts?

- **Give them the ability to participate**. How can participation in the Lean event be reconciled with my regular job duties? Will the results of the Lean event be supported by upper management?

- **Reinforce the change**. How will Lean concepts be integrated into the ongoing business of the local government? How will we make sure the changes that came out of the Lean event are sustained, and how can we prevent backsliding? Will management be consistent in its advocacy and use of Lean? How will success be recognized and celebrated?

This paper will help managers provide answers to these questions.

Select a Process and Apply Lean to It

When starting out with Lean, it is advisable to begin with a pilot project by selecting a single business process and applying Lean thinking to it. Consider the following criteria when deciding which process to begin with:

- **Importance to organization's mission or priorities**. The process should be important enough to capture the attention of the organization.

- **Support of process managers and participants**. The managers of the process must be willing to support a Lean event. If managers are unwilling to change the process, then Lean will not work. Similarly, if staff members who carry out the day-to-day work of the process are hostile to the idea of Lean, it will be difficult to produce benefits from the Lean event.

- **A burning business problem**. If a process is experiencing acute problems with cost, customer complaints, productivity, work backlogs, or delays, this could motivate staff to participate in Lean more enthusiastically. Also, reducing or eliminating these problems will likely result in noticeable benefits – benefits that can be measured and touted to promote future Lean events.

- **No reduction in headcount.** If the initial Lean event is used to reduce headcount, it may poison any potential future Lean events. Rather, choose a process where the soft-dollar savings (e.g., person-hours saved) can be redirected to other sources that will create value and/or where there are other potential sources of hard-dollar savings besides headcount reduction, like wasted materials or excessive use of overtime or contractors.

- **Low variation among transactions**. Generally speaking, Lean will produce the greatest benefit for a process that has a high number of transactions and low variation among those transactions (e.g., procurement requests). Lean can also benefit low frequency, low variation processes (e.g., annual budgeting), but the benefits will likely accrue as increased quality and transparency, rather than savings in person-hours. Lean is less useful for high variation processes (e.g., complex construction projects, strategic planning).

See Exhibit 2 for processes that are good candidates for an initial Lean event.

Exhibit 2: Typical Processes with Lean Potential

- **Hiring**
- **Procurement**
- **Building Permits**
- **Municipal Court**
- **Information Technology Project Prioritization**
- **Accounts Payable and Accounts Receivable**

To illustrate, the City of Conroe, Texas, choose to apply Lean to swimming lesson registration because of the impact on both the city's staff and its customers. During the summer months, the city offered "Learn to Swim Classes" every three weeks. The classes were filled on a first-come, first-served basis. To register their children for the best class times, parents and guardians were starting to stand in line earlier and earlier – customers were standing in line at 4:00 a.m., even though registration did not begin until 7:00 a.m. There were also different registration stations set up for each class level and time, so customers who were registering multiple children often had to go from one station to another. Customers included both city residents and non-residents, as the program was known for its exceptional quality. The process required approximately 14 staff members, and the superintendent of the aquatic center would still have to take registration information home and manually assign pool locations and teachers. Hence, the recreation staff was very open to changing this process.

In another example, the City of Palm Bay, Florida, chose to apply Lean to utility billing. The city reads meters and bills for approximately 30,000 customers each month. Although the process was performing adequately, there was a sense that growth in the city's customer base was having negative affects on cost, quality, and customer service – especially since multiple departments and divisions were involved in the process.

In a final example, participants in the Pitkin County, Colorado, budget process were dissatisfied with the level of communication. It was not clear to them when various tasks needed to be completed, and for what reason. They also wanted to be more closely involved in the final budget decisions. Further, the Great Recession was putting pressure on county finances, further emphasizing the need for a better budgeting process. The county saw Lean as an opportunity to make the budget process more transparent, cut down on unnecessary work, and develop new, value-added means of communication and decision making.

Define Lean Initiative Roles

A Lean initiative requires four primary roles: facilitator, sponsor, team leader, and team members. This section describes each role and important considerations for filling it.

Lean facilitator. The facilitator runs the meetings for each part of the Lean event. The facilitator needs to have training and experience in Lean facilitation. As well as giving staff confidence in Lean, a skilled facilitator can adapt the process to unexpected twists and turns, and can help the Lean team work past common challenges in analyzing the process and generating improvement ideas. A good facilitator also helps participants think broadly about process improvement ideas and not be limited by "the way it has always been done." The facilitator makes sure that the process isn't dominated by one or a few team members – which can be a challenge because line employees who are on the team can become overly-deferential to managers.

Because the facilitator's role is so important, most governments that are considering Lean should consider procuring the services of an outside facilitator (you can learn more about Lean facilitation services at

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Exhibit 3: Lean Team Member Development at the City of Conroe
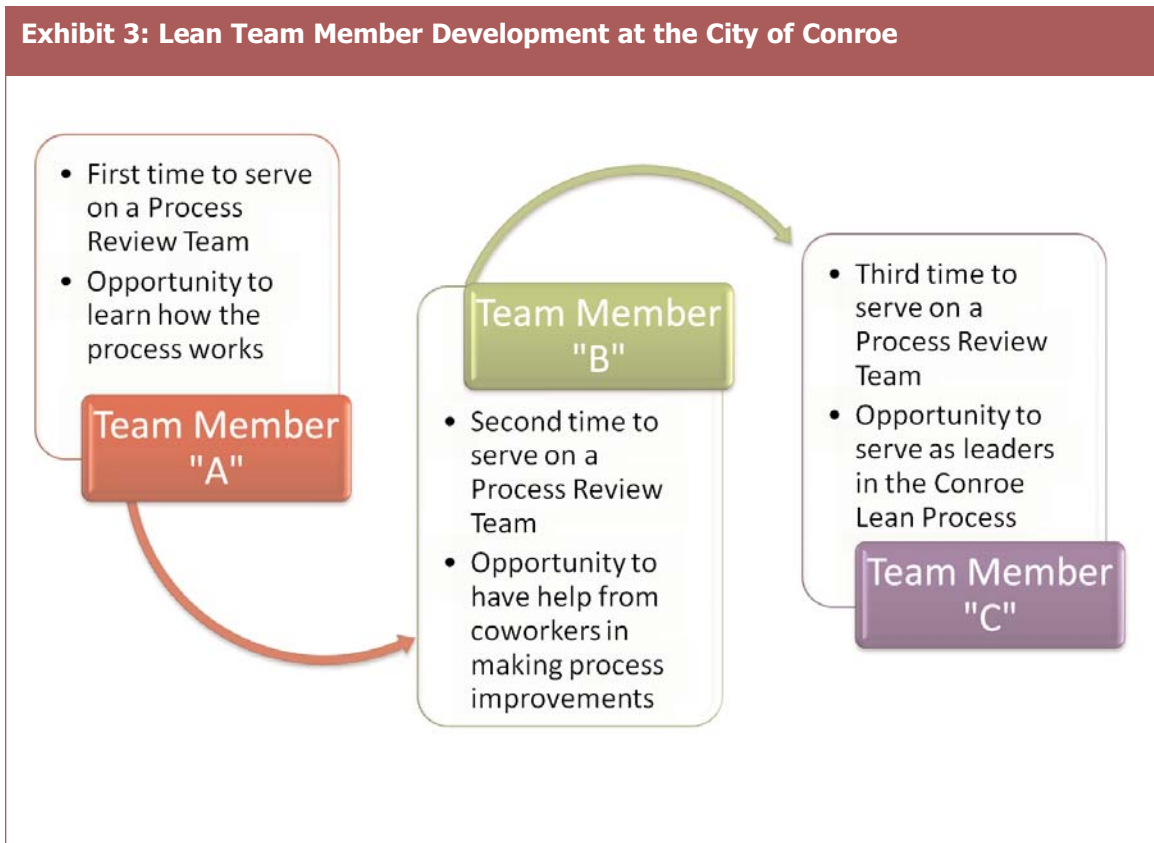
Team Member "A"
- First time to serve on a Process Review Team
- Opportunity to learn how the process works

Team Member "B"
- Second time to serve on a Process Review Team
- Opportunity to have help from coworkers in making process improvements

Team Member "C"
- Third time to serve on a Process Review Team
- Opportunity to serve as leaders in the Conroe Lean Process

www.gfoaconsulting.org). Once staff members gain experience with Lean, they can take over the facilitation duties. Exhibit 3 shows a diagram from the City of Conroe that describes how its staff development for Lean works. Conroe used a consultant to initiate the cycle and then carried it forward with existing city staff.

Sponsor. The sponsor provides resources to the Lean event and has the authority to remove obstacles to making the improvements that come out of the Lean event. The sponsor also establishes that process improvement is taken seriously – not least by being physically present for the actual Lean event. Accordingly, the sponsor makes it clear that the process improvement ideas that come out of the Lean event will constitute the new process, not just a recommendation. The sponsor also publicly recognizes the accomplishments of the Lean team and tracks the implementation efforts following the event to make sure the process changes occur. Our research participants commonly designate as the sponsor the department head who oversees the process being improved. If multiple departments have responsibility for the process, then an assistant city manager or someone in a similar position might be the sponsor.

Team leader. The team leader helps plan the Lean event and logistics, and assists the facilitator. The leader should have a significant decision-making role in the process, though the leader doesn't have to be an executive manager (and often isn't). The leader could also come from outside the process being examined, but in that case, communications between the leader and the team will need more attention.

The team leader should also keep in mind that the projects need to produce demonstrable benefits that can later be used to make other parts of the organization want to undertake Lean events. In fact, this is such an important duty (especially for the initial Lean event) that the City of Palm Bay advocates putting a different team member in charge of the "marketing" duties. This allows the leader to concentrate on the event itself, while the marketer concentrates on the story the event tells.

Team members. A Lean team typically consists of 10 to 20 people who are chosen based on their capacity for innovation and their potential to make a positive contribution to the Lean event. A third of the Lean team participants should come from each of three groups: 1) those who work directly in the process being analyzed; 2) those who manage or supervise the process; and 3) those who are not directly involved in the process.[5]

From the first group – workers involved directly in the process – choose participants from across different steps in the business process. This is important for two reasons. First, Terry Schurter, a noted process management expert, makes the keen observation that process improvement is like the story of the blind monks examining the elephant: One monk feels

> **The sponsor provides resources to the Lean event and establishes that process improvement is taken seriously.**

the trunk and believes it is a snake, one feels the leg and thinks it is a tree, one feels a tusk and thinks it is a spear, and so on. Applied to process improvement, this means that everyone has a different perspective on what a process looks like and does, based on his or her limited viewpoint.[6] A Lean event helps bring the "elephant" into full view. Therefore, it is important that the team include process stakeholders who, together, can correctly describe the elephant. These participants also need to be included on the team because it will give them a greater understanding of downstream affects their work has, and what they require from those upstream in the business process. This better, shared understanding of mutual upstream and down-stream affects helps all employees better see how hand-offs of work affect others. For example, Pitkin County found that staff made far fewer errors when filling out purchase orders after they understood the importance of the information to their fellow employees downstream in the process. The reduction in errors enabled the county's purchasing agent to process more orders (and increased her job satisfaction, as well).

The members of the second group – managers – should be willing to make changes to the business process and also be willing to listen to employees. If a manager dominates the discussion with his or her own view-points, it will have a chilling affect on the bottom-up generation of process improvement ideas that characterizes a successful Lean event.

Finally, put staff from outside the process on the team. This third group brings a "neutral" perspective to the analysis. Taking part in the Lean event will help these individuals participate in future Lean events for busi-ness processes in which they are direct participants. For example (as Exhibit 3 showed), in the City of Conroe, the first time staff members are on a team, it is to help acquaint them with the process review system. The second time they are on a team, it is to review a process of which they are an integral part. The third time they are on a team, it is to help motivate and lead the other team members.

Information technology (IT) staff are a natural fit for this third group. IT staff can be valuable members because they are often good global thinkers who understand the technology tools the organization has available and might be able to help identify where existing technology is being underuti-lized. However, W. Edwards Deming, the originator of the quality movement from which Lean springs, taught that most business processes contain up to 95 percent waste. Therefore, if technology is applied too broadly to a busi-ness process, there is a serious risk of automating non-value added work.[7] Hence, IT staff can be important participants, but the team should be care-ful to remember that IT is not a panacea, and that technology solutions should be used only where they truly add value for the customer.

Execute the Lean Event

A Lean event typically lasts between three and five days. However, preparation is required to secure the benefits of Lean. This section describes the pre-event meeting, event preparation, and the Lean event itself.

Pre-Event Meeting

A pre-event meeting should take place a few weeks before the actual Lean event. The pre-meeting should involve the facilitator, sponsor, team lead, and key decision makers for the process being analyzed. The pre-event meeting accomplishes the following activities:[8]

Refine event goals. Precisely define what is desired from the Lean event. Is it a drop in processing time? Reducing errors and re-work? Improving the customer experience? Is there a particular source of waste that Lean should target? For instance, because Conroe is a growing community, many of its Lean events tend to focus on accomplishing more work with the same amount of staff.

Many governments may be interested in Lean to generate hard-dollar savings. Taking into account the multiple Lean events that Conroe has held, the city has seen a total of almost $1.8 million in hard-dollar savings on its general fund budget of $42 million and its enterprise fund budget of $14.6 million. And there were further savings, when soft dollars are factored in. Key to producing hard-dollar savings is to select high-volume, resource-intensive processes for Lean. Then, the opportunities for savings must be meticulously documented, and there must be follow-up on the opportunities, including identifying who is responsible for realizing those savings and the date by which they will accomplish the tasks that will lead to savings. Of course, the management and staff involved in the process must be willing to make the changes that will save money.

Soft-dollar savings are often easier to realize with Lean (or any process improvement methodology) than hard-dollar savings. This is simply because personnel are the largest input into most governments' business processes, and it can be difficult to translate time savings directly into reduced budgets. However, soft-dollar savings can still help the bottom line if the organization identifies an appropriate use for the time saved. For example, the City of Palm Bay realized that streamlining its utility billing process would free up technicians' time for other projects – particularly, installing automated meter reading devices, which would then allow the city to reduce the amount spent on contracted, manual meter reading. The City of Montgomery saved the equivalent of one person-year in time by streamlining its set-up and takedown of holiday lights in the downtown area. These savings were redirected to preventative vehicle maintenance.

Precisely define what is desired from the Lean event.

In any case, always be careful about how the quest for savings is presented to Lean participants. Employees could perceive it as a threat to job security and withhold participation. Since Lean is predicated on high-quality employee participation, this would be a serious problem.

Define the customer. Government business processes have many potential customers. Customers might include direct recipients of a service, the community at large, regulators, lawmakers, and/or businesses. Further, in the case of regulatory services, the customers may not be entirely willing customers! After determining who the customers of a business process are, consider what the customers want from a process. This could include, but is not limited to: more readily available access to the service; shorter wait times from service request to completion; a higher quality product (fewer errors); and/or lower cost. However, when considering customer needs, remember what Henry Ford cautioned: "Customers that say they want faster horses really don't care at all about horses; they simply want a way to get from point A to point B in the fastest and safest way possible."[9] In other words, be sure to distinguish the ends or result the customer really wants from the particular means, tools, or techniques they may reference when articulating their want.

Identify performance measures. Measures lend more specificity to the goals of the Lean event and provide a means for measuring progress. Measures can address any of the following:

- **Time**. How long does it take to complete a transaction? What percentage of time spent on the process adds value to the customer?

- **Cost**. How much does the process cost to operate? What savings are possible?

- **Quality**. How much re-work and/or corrections are required? What do customers think of the quality of the output?

- **Output**. How many units are completed or processed in a given time frame? What is the backlog?

Choose to focus on a few key metrics and select metrics that provide useful information to both the sponsors of the Lean event and the participants in the process.

Set boundaries for the event. The beginning and end point of a process is not always entirely clear. The scope of the process to be examined should be defined upfront. Also define boundaries with respect to solutions that will be considered. For instance, perhaps there is a very limited budget for new technology investments. Also, make it clear that the purpose of Lean is to improve the beginning-to-end business process, not to re-engineer or scrutinize individuals' jobs or performance.

> **Measures lend more specificity to the goals of the Lean event and provide a means for measuring progress.**

One boundary particular to local government is laws and regulations to which the business process is subject, both in terms of mandates from higher levels of government and ordinances or other local regulations that describe how the process should operate or what it should produce.[10] Identifying relevant regulations allows the government to:

- **Determine which regulations are open to change**. For example, using the valuable time of a Lean event to debate the merits of a state requirement will probably not lead to many opportunities for process improvement, but discussing how a local ordinance could be changed might.

- **Understand what the regulations really require.** Extraneous activities often get built into a process in a well-meaning but misguided effort to comply with a regulation. Eliminating these activities may lead to efficiencies, while still complying with the regulation.

- **Identify compliance costs**. Highlighting activities that are designed purely for compliance purposes allows the Lean team to consider the marginal costs and benefits of compliance and think about whether there are better ways to achieve the required outcome.

Set ground rules for the event. Ground rules help the participants work together. For example, in Conroe, team members are asked to be courteous and respectful to the others on the team. They are expected to not interrupt anyone who is speaking and to listen to whoever has the floor. To promote clarity for the group, team members may ask questions during the process of identifying steps. Teams are asked to refrain from making improvement suggestions until the time designated, so brainstorming ideas can take into account the entire process concept (and to help move the process along). Team members are also asked to be innovative and customer-oriented in their thinking and come up with "out-of-the-box" ideas.

The Lean team members the GFOA interviewed repeatedly emphasized this ground rule of innovative and open thinking. An open mind is essential to coming up with new ideas and finding the courage to try out the new ideas after the Lean event is finished. Management can support this by not rebuking radical ideas and, in fact, rewarding good participation.

Identify pre-work. The tasks that need to be completed before the Lean event takes place, so participants will get the most out of the event, are called pre-work. Pre-work involves collecting documentation that explains how the current process works. In Conroe, the participants are asked to come prepared by knowing each person and every step involved in the process. They are to have knowledge of how long each step takes, on average. The team must also know how often a step occurs in the process, generally, and how often that step occurs each year.

Pre-work might also entail gathering data to compile the baseline score for performance metrics or talking to customers of the process to get

their viewpoints (especially if customers are not on the team). Customer viewpoints can be gathered through surveys or interviews. It can be particularly effective to videotape interviews, especially if customer dissatisfaction is a problem. The video will communicate customers' feelings much more effectively than a written interview summary.[11]

Event Preparation and Logistics

Because a Lean event is a brief but intense use of the team members' time, attention must be given to preparation and logistics to make sure the time is spent productively. This includes: [12]

- **An event agenda**. The agenda ensures that the activities of the event match the goals for the event and the time available for the event.

- **Scheduling the event**. An event typically takes between three and five consecutive days. Hence, scheduling will need to take vacations and other conflicts into account.

- **Meeting space**. Space will be required for meeting as a complete group, as well as in break-out groups. The room should provide the proper space and materials to conduct the Value Stream Mapping that is described later in this paper. Given the intensity of the work in the Lean event, the space should also be comfortable, and refreshments should be provided.

- **Brief other senior management**. Make sure that senior management who have not been involved in the previous planning are aware of the Lean event, its objectives, and any potential impact on their operations. For example, if any of their staff is participating on the team, those staff members will need to be freed from their other responsibilities for the duration of the Lean event.

- **Inform staff about the Lean event**. Let staff know about the Lean event. This might generate feedback about problems that Lean could address. Also, address key questions that staff may have about Lean. The GFOA's Lean research participants found that the following questions are common:

  - **Will Lean lead to job cuts?** Employees who aren't on the team may be apprehensive about what will come out of the Lean event, while those on the team may be worried that they are being asked to make cut-back decisions.

  - **Will the Lean project have support of upper management?** This might be especially important if those managers have been in place a long time and are not perceived as pro-change. Employees will be hesitant to get behind Lean if they don't believe the improvements they generate will be implemented or supported.

  - **How much time will be required of me (and/or my employees) to participate in the Lean event?** The time Lean requires com-

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Because a Lean event is a brief but intense use of the team members' time, attention must be given to preparation and logistics to make sure the time is spent productively.
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petes with existing job duties. Employees will want to know how this will be accommodated within their work schedules.

- **How will Lean improve our work?** Employees may be particularly interested in how Lean will benefit them personally. They may also want to know how Lean will take into account other groups on whom the employees depend to get their work done.

- **How is Lean different from other "flavor-of-the-month" management techniques that have been tried before?** If the organization has tried (and abandoned) other process improvement techniques or has a history of stalled business improvement initiatives, then employees may want to know what makes Lean different.

The Lean Event

All of the foregoing preparation leads to the main event: the Lean event. The Lean event typically starts with a training session of about one day. At this "just-in-time training," participants learn about Lean, including how the Lean event will work and about the tools and techniques for Value-Stream Mapping (VSM). They also review the eight sources of waste that were described in Exhibit 1. Finally, they learn about common pitfalls in Lean and how to avoid them. For example, the staff in Montgomery learned that many people tend to understate the time a process step takes because they do not want to look bad in front of their peers. Staff is taught to recognize this and other pitfalls, and how to get past them.

Once the training is complete, the participants are ready to begin the Lean process review, using VSM. VSM is a high-level visual representation or flow-chart, from start to finish, of the process involved in delivering a desired outcome, service, or product (a "value stream") to customers.[13] The VSM process review has seven components:

Role of a Consultant

Our research subjects agreed that the role of a consultant is to teach the customer how to do Lean on their own. The City of Montgomery worked with its consultant to take on progressively more responsibility for running the Lean event. In the first event, the consultant led the process, and the city participated. In the second, the city led the process, and the consultant actively coached city staff. In the third, the consultant observed and provided support as needed. Visit gfoaconsulting.org to learn more about what Lean consultants do.

1. Determine customers
2. Determine scope
3. Document the current state VSM map
4. Identify "touch" and "lead" times for the steps in the process
5. Identify value-added and non-value-added steps in the process
6. Document the future-state VSM map
7. Create the implementation plan

Steps one and two involve reviewing and refining, with all the participants in the Lean event, the conclusions about customers and scope that came out of the pre-event meeting. The remaining steps concentrate on developing the VSM maps and figuring out how to improve the work process in question.

The VSM current-state and, later, future-state map is produced in the form of a "swim lane" diagram (see Exhibit 4). In the exhibit, the letters along the left-hand side represent participants in the process. Each step in the process is charted out, sequentially, from left to right – Exhibit 4 shows 15 steps. The swim lanes denote transfers of information or hand-offs between the participants. Besides being a useful analytical tool, a swim lane diagram helps engage employees in the Lean event by providing a tangible product and a visualization of the work at hand. The GFOA's research participants emphasized the ability of the map to engage participants and stimulate thinking about process improvement.

After identifying and refining definitions of the customers and scope of the process, the next major task of the Lean event is to develop the current-state VSM swim lane diagram for the business process that is the subject of

Exhibit 4: The "Swim Lane" Diagram
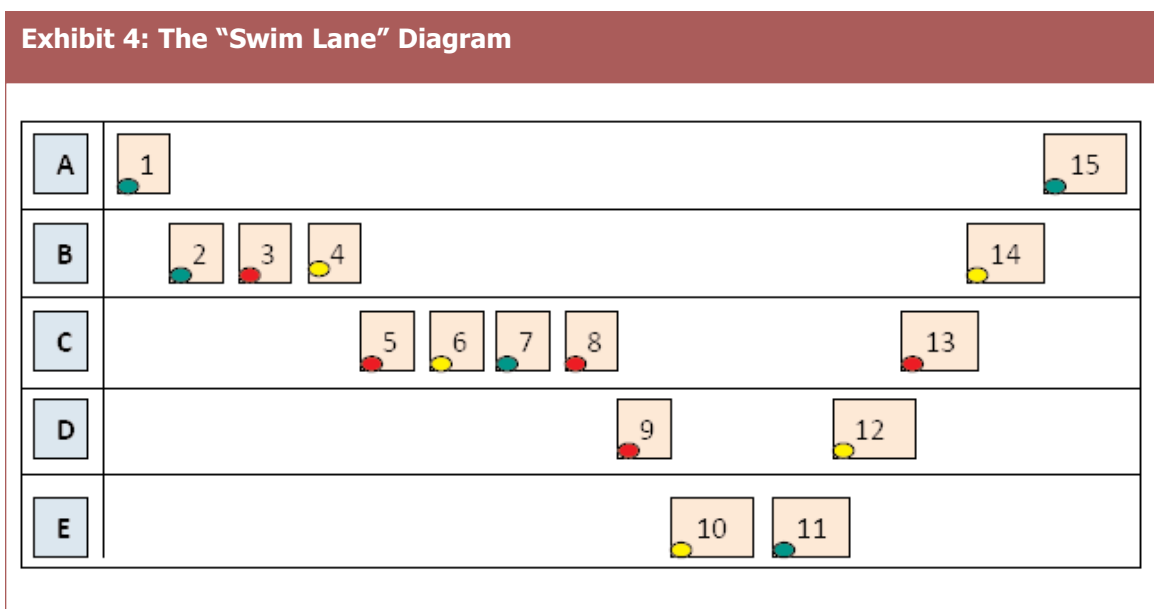
the Lean event. The Lean team constructs the map using block paper and adhesive notes on a wall (see Exhibit 5). It is important to include all of the steps in the process, no matter how insignificant they may seem. A more detailed map will make it easier to find areas for improvement.

Putting together the current-state map is the most difficult part of the Lean event, and it is the most likely to create conflict and friction among the participants. However, it is important not to spend too much time discussing any particular process task. The main objective of VSM is to gain an understanding of the tasks and time associated with each task, as will be described in more detail later. It is counterproductive to spend too much time discussing a particular aspect of one process task at the expense of reviewing all the tasks at a higher level.

Once the basic current-state process is set out, the team reviews the diagram and defines the "touch time" and "lead time" for each step. The touch time is the amount of uninterrupted time required to perform a step.

The City of Montgomery's experience with their fire hydrant repair process provides an example of touch time. In the past, all reports of hydrants needing repair were sent to a designated firefighter. However, he worked 24 hours on duty and 48 hours off. If he was on a vacation, it could

Exhibit 5: Swim Lane Construction in Conroe

Why Map the Current Process?

Some schools of process improvement thought advocate skipping the current-state mapping and going right to the future-state mapping. This is a risky approach because the current state often holds lessons that are needed to develop the future state.* There can be a number of critical steps in the current state that must also occur in the future state, and if they don't map the current state, process designers might miss these steps. Also, "you can't get to where you are going without knowing where you've been" – mapping the current process informs the transitions the organization will have to make in order to change to the new process.

* Subramanian Muthu, Larry Whitman, and S. Hossein Cheraghi, "Business Process Reengineering: A Consolidated Methodology," Proceedings of the 4th Annual International Conference on Industrial Engineering Theory, Applications and Practice, November 17-20, 1999, San Antonio, Texas.

take more than a week before someone was notified. In response to this excess touch time, the lieutenant on duty is now notified immediately, which helps expedite repairs. Lead time is the amount of time from when the preceding step is complete until the step in question is complete. An example of lead time is when a requisition is written and then sits in someone's inbox waiting for processing.

Lead and touch times do not have to be precisely defined; a good estimate will do for the role that these times play in Lean:

- They provide direction on where to look for opportunities for improvement (e.g., excess time).

- They are used to determine if progress is being made on making the process more efficient (i.e., times are reduced).

- The times are used to calculate the total time that is spent on "value-added" activities versus "non-value-added activities. (The concept of "value-added" is addressed below.)

It is important to be honest about lead and touch times. At the Lean event, the facilitator should emphasize that the process is not being reviewed to find fault with any individual – the goal is to eliminate waste and to make everyone more productive.

Next is to determine if each process step adds value for the customer. The customer is defined during the pre-event meeting, and the participants in the Lean event should understand who the customer is early in the Lean event. With the customer in mind, the team puts each step into one of the three categories below. Exhibit 4 shows which category a step falls into using a colored dot in the lower left corner of the step.

- **Value-added (green dot).** Any activity that improves the form or functioning of the product or service. These are things a knowledgeable customer is willing to pay for.

- **Non-value-added (red dot).** Any activity that does not improve form or functioning and is not necessary. These activities should be eliminated.

- **Non-value-added but necessary (yellow dot).** Any activity that does not improve form or functioning but is necessary to the current process. These activities should be eliminated, simplified, or reduced.

The color codes help focus the team's attention on areas of the process that need improvement – a cluster of yellow and red requires their attention.

However, putting a step into one of these three categories is not always as easy as it might seem, in theory. For example, a step may be valuable to one customer group, but not another. The team should be prepared for some disagreement over categorization and remain flexible about assigning categories (for instance, Montgomery's teams sometimes placed a step into more than one category to recognize the interests of different customer groups).

The last task associated with the current-state mapping and analysis is to generate improvement ideas. All of the participants in the Lean event write down all the ideas they can come up with on 3x5" Post-It notes. They then stick them to the current state map, near the process step most closely related to the idea. At this point, the facilitator and sponsor should encourage participants to be creative. Even if a participant thinks his own idea will most likely not work, he should still put it forward, because another participant might have a variation on that idea that will drastically improve the process. Once all of the ideas are up, the group goes through each of them and discusses them at length. If someone says an idea will not work, the facilitator should challenge that person to provide concrete reasons.

Purchasing Improvement Idea

Montgomery changed its purchasing process to require a purchase order only for purchases of $500 or more. Purchases of $499 or less need only a direct payment request form. The city was able to greatly simplify the process while still accounting for the money being spent – just with fewer signatures and less paperwork and lead time.

Coming up with improvement ideas can be challenging for the team. This is where a good facilitator is particularly important. The facilitator can challenge the team to question the current process and can bring in experiences from other Lean events. Some useful triggers facilitators can use to help the team come up with improvement ideas are:[14]

- **The Five Whys.** The Five Whys is a question-asking method used to explore the cause and effect relationships underlying a particular problem. Ultimately, the goal of applying the Five Whys method is to determine a root cause of a defect or problem.[15] The facilitator first asks why a defect exists, and then asks why the reason given for the defect exists. The facilitator continues to ask why for each successive reason, digging deeper into the problem. The technique is called the Five Whys because it is thought that it generally takes five iterations of asking why to get from defect to root cause. Once participants have an understanding of the root causes, solutions become more evident.

- **Self-service**. Customers of the process may be able to perform certain steps better and faster than staff. Of course, self-service is also potentially much cheaper. For example, in Conroe, Lean revealed the opportunity for recreation registration self-service, which reduced error rates, wait times, and costs.

- **Eliminate paper**. Lost or delayed paper is a key source of waste. Transforming paper into an electronic document can automate hand-offs. Also, while a physical piece of paper can be handled by only one person at a time, an electronic document can be accessed by many. This might allow tasks that were previously sequential to now take place in parallel. The Pinellas County Clerk of the Circuit Court used electronic document management and routing technology to achieve immediate access to court records, dramatically reduce storage and supply costs, and improve customer service – requested case files and records can now be provided to attorneys, judges, and the public almost instantly, where previously, it could take a week.

- **Empower employees**. Identify decision points that are now handled by supervisors but could be handled directly by employees. This could dramatically reduce wait times.

- **Quality control.** Build quality control into the process, rather than having it occur as a separate activity at the end.

- **Information transfer.** Use technology to quickly transfer information between parties. For example, email, mobile phone, or text messages might be used to transfer information between field and administrative staff much more quickly.

- **Separate out exceptions**. Complex processes often evolve to handle exceptions to the standard processing. Consider a way to route exceptions out of the primary process so the primary process can remain simple (and fast).

It takes about one day to complete the current-state map and conduct the analysis of the current state.

After the current-state analysis is complete, the next step is to develop the future-state swim lane diagram – or how the process will work in the future. The team starts with a blank swim lane chart and incorporates the ideas from the current-state analysis in order to arrive at the future state. Exhibit 6 shows how a current-state map is translated to the future state. The team should aim to reduce or eliminate all non-value-added steps as it creates the future state and should estimate future lead and touch times. It

Exhibit 6: From Current State to Future State
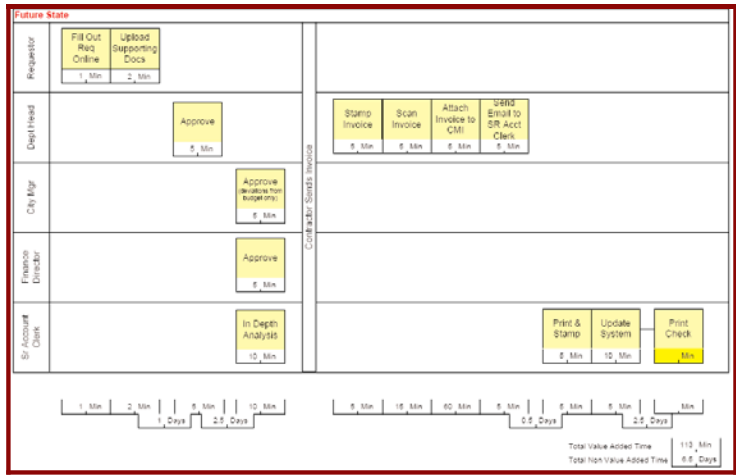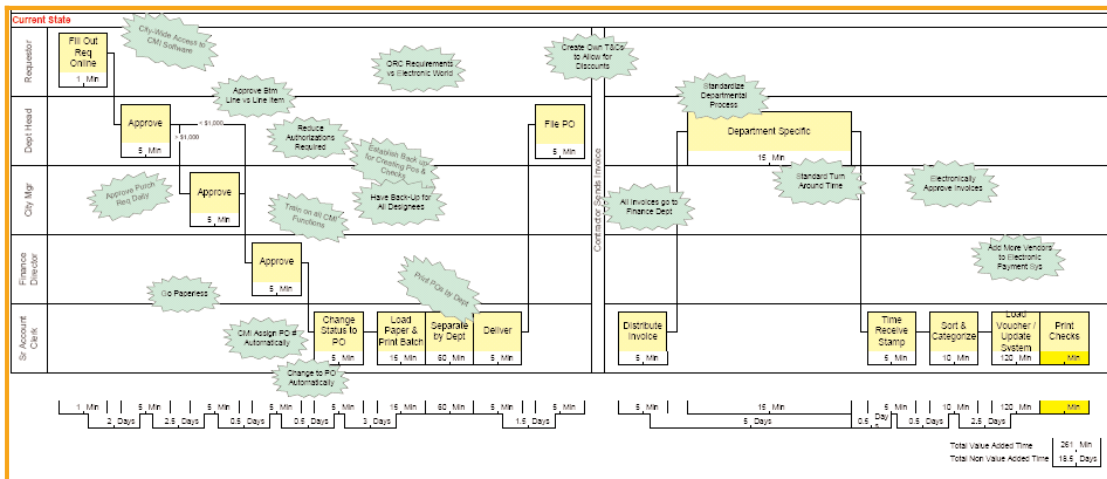
is also possible to develop two future-state maps – one that accounts for major investments in a new process (e.g., a significant new technology), and one that makes less expensive and perhaps more modest changes. It takes about one day to map the future state.

The implementation plan is the tool that bridges the gap between the current state and the future state (see Exhibit 7 for an example). The actions included in the plan will come directly from the idea Post-It notes created during the current-state analysis. Each improvement in the action plan should have the following associated with it:

Exhibit 7: Summary Implementation Plan from Palm Bay Florida

Utility Billing Lean Event – Implementation Plan

Activity	Who	Dec. 08	Jan, 09	Feb. 09	Mar. 09	Apr. 09
Change threshold levels and report parameters	Lori & Donna	▓				
Contact vendor to see if meter number and MIU number can be listed on invoice or shipping list.	Lori	▓				
Solution to notifying customer from field	Teresa	▓				
Coordinate meter reading and billing (schedule)	Donna & Lisa	▓				
Eliminate more than 200 courtesy calls	Lisa W	▓				
Coordinate application, permitting, and inspection activity with building department	Jon	▓	▓			
CSRs accept payments (credit card, cash, check)	Heidi	▓	▓			
Acquire hardware and service for field communication	Lisa & Lori	▓	▓			
Coordinate meter reading and billing (QAQC reports)	Donna & Lisa	▓				
Look into Palm Bay Direct to send e-mail for leak detection	Katie	▓				
Coordinate with police chief regarding water theft	Robin	▓				
Look into budget billing in Palm Bay direct	Katie	▓				
Review code red calls for shut offs	Dawn	▓				
Look into field services collecting shut-off fees	Heidi	▓				
Attach meter number to meter in warehouse	Lori & Donna		▓			
Coordinate training for field services for WO codes	Dawn & Lori			▓		
Implement fee for meter recheck	Lori	▓				
Add sequence numbers to GIS	Katie	▓				
Coordinate training of building department for performing cross connects	Katie		▓			
Coordinate training of CSRs for issuance of building permit	Alisha		▓			
Train field service and distribution personnel	Lisa W & Luis		▓			
Add late penalty and shut off notice on bill	Dawn	▓				
Present reading and billing cycle recommendations to council	Jon	▓				
Software vendor changes associated with reading and billing cycle changes	Lisa	▓			▓	▓
Public Information campaign for reading and billing cycle changes	Robin			▓	▓	▓

- **Impact**. The potential gain from the improvement. The impact drives the relative priority of the improvement opportunity.
- **Timing**. When the improvement should be made. Timing should be aggressive, yet realistic.
- **Resources**. The person who is accountable for making the improvement happen.

It takes about one day to develop the implementation plan. The implementation plan serves as the capstone for the event because it shows the way from the ideas the team generated to putting them into action. At this point, the Lean event formally concludes, and the participants are thanked and recognized for their work. Often, at the end of the event, participants are energized by seeing the potential they've created for saving money, working more productively, and creating more satisfied customers.

Lean Follow-Up

To capitalize on the improvement ideas generated, there must be follow-up on the Lean event. Foremost is making sure the sponsor and team leader remain engaged in executing the implementation plan. They must hold the other members of the organization accountable for completing their obligations, schedule and hold follow-up meetings, periodically evaluate progress and apply corrective actions, and communicate about the Lean project to executive management, staff, and elected officials.

A "tracking center" is a useful tool for follow-up. A tracking center is simply a board that contains the current-state map, future-state map, implementation plan, and performance measures. Performance measures are particularly important for seeing if the Lean event is reaching its objectives. The tracking center should be displayed in a prominent area, where many employees will walk by it each day. Exhibit 8 provides an example of a tracking center.
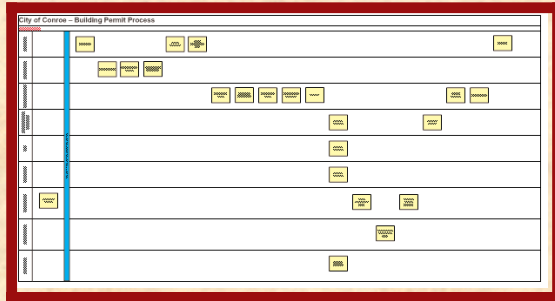
A tracking center can be supported with new, documented standard operating procedures to help employees carry out the new process. Standard operating procedures clarify what is expected of employees and help prevent backsliding when new employees come into the process.

Top management should conspicuously express and demonstrate their support for the new process. In doing so, management may have to address continuing concerns employees have about job security, loss of control, etc. Management should also hold monthly meetings to review progress against the implementation plan and performance measures. Lastly, management should encourage the beneficiaries of the Lean event to share their success story with others in the organization. For example, Conroe,
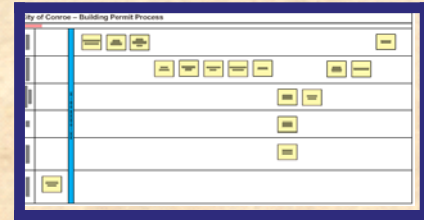
> **The sponsor and team leader need to remain engaged in executing the implementation plan.**

Building Permit Process

Current State

Future State

Implementation Plan

Performance Measures

Montgomery, Pitkin County, and Palm Bay have all found that early Lean successes in one department have inspired other departments to hold their own Lean events.

Ideally, "top management" will also include the governing board. Most elected officials will very much appreciate that staff are seeking ways to save money and better serve citizens through Lean. Discussing the results of Lean events at public board meetings helps reinforce Lean's importance with employees and appointed managers.

Beyond the First Lean Event

Ideally, Lean is more than just a one-and-done event – it becomes part of the fabric of the organization and a fundamental consideration in how work is accomplished. This section addresses how Lean applies to the business process over the long term, diffusing Lean thinking to the rest of the organization, and linking Lean to organization strategy.

Keeping a Process Lean over the Long Run

First, consider how Lean continues to affect the individual process. As Exhibit 9 shows, the initial Lean event leads to some immediate improvement, but this is greatly outdone by the impact of consistently monitoring and acting on process performance data and faithfully pursing the improvement ideas that came out of the Lean event. Eventually – every one to five years – another Lean event can be held for that same process. A follow-up Lean event can generate new ideas that were scarcely imaginable during the previous Lean event, as employees gain experience with Lean thinking. This contrasts with a more conventional model of process improvement where the occasional one-off project makes a noticeable improvement in the process, but the process backslides as the organization shifts its focus to other concerns.

Diffusing Lean Thinking

Ideally, Lean thinking will spread from the first Lean event to other business processes in the organization. There are six practices for diffusing Lean throughout the organization:[16]

- **Share results from early Lean experiences.** Tout the successes of early Lean events. Ideally, the managers who work in those processes will serve as advocates by sharing their experiences with others. Don't just rely on informal word of mouth. Plan specific opportunities for the beneficiaries of Lean to share their stories. For example, Montgomery, Ohio, established a permanent Efficiency and

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Exhibit 9: Lean Continuous Improvement Model
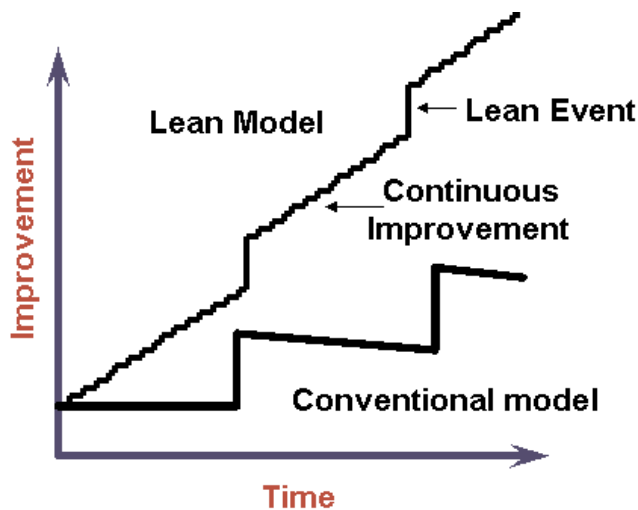
Ideally, Lean thinking will spread from the first Lean event to other business processes in the organization.

Effectiveness Team, a cross-departmental team of employees focused on city-wide performance measures and process improvement. The team provides an opportunity for departments to share experiences on what has worked and what hasn't. After the fire department heard about the success of the public works department's Lean event and after a member of their staff participated in another department's Lean event, the firefighters wanted to try applying Lean to their process for fire hydrant maintenance.

- **Get consistent support from organizational leadership.** Executive managers should be consistent and conspicuous in their support for Lean. They should continue to make the case for Lean, much as was described in the first pages of this paper. This includes addressing employee questions and concerns about Lean, identifying and supporting Lean champions in the organization, empowering them to make changes, and demonstrating the importance of measuring process performance by insisting that the organization track and act on measurement results.

- **Establish a Lean coordinator.** A Lean coordinator helps direct resources to those who want to conduct Lean events, makes sure concurrent Lean events are coordinated, and helps the organization maintain follow-up on Lean events. However, a coordinator is not a substitute for consistent and conspicuous support from the organization's leadership, or for the engagement of the Lean event sponsor or Lean team leader in both the Lean event and follow-up activities.

- **Build staff capacity for Lean.** As Exhibit 3 showed, participating in successive Lean events makes employees increasingly able to lead future Lean events. Formally track the Lean experience of staff and identify those who have the greatest capabilities.

- **Develop consistent tools for Lean.** Lean templates and tools provide a consistent approach between events and can save time and effort.

- **Keep momentum.** Continue to hold Lean events. Three or four Lean events per year is a good number to shoot for. Be sure not to overdo Lean, lest staff burn out.

Link Lean to Organizational Strategy

While Lean is powerful for making significant improvements in business process performance, it is a tactical tool. If it is not linked to broader organizational strategy, Lean can lose relevance to the organization members and be discontinued. Fortunately, Lean has many potential applications for organizational strategy. Here are just a few ideas with respect to budgeting and financial planning strategy.

Priority-driven budgeting. The GFOA recommends that governments use the organization's strategic priorities to drive resource allocation decisions.[17] Under this model, resources are allocated to programs based on how well that program produces results that contribute to the priorities con-

stituents have for their government. The implication is that lower-priority programs will be eliminated or cut back significantly. Lean can be used to help the business processes contained within high-priority programs perform at their peak – maximizing the results and/or reducing the cost so the government can continue to fund other programs, as well.

Managed competition. Under managed competition, in-house service units are required to compete with external providers to perform public services. However, internal service providers must first be prepared to compete. Lean can help internal service providers streamline their own processes so the competition will be better.
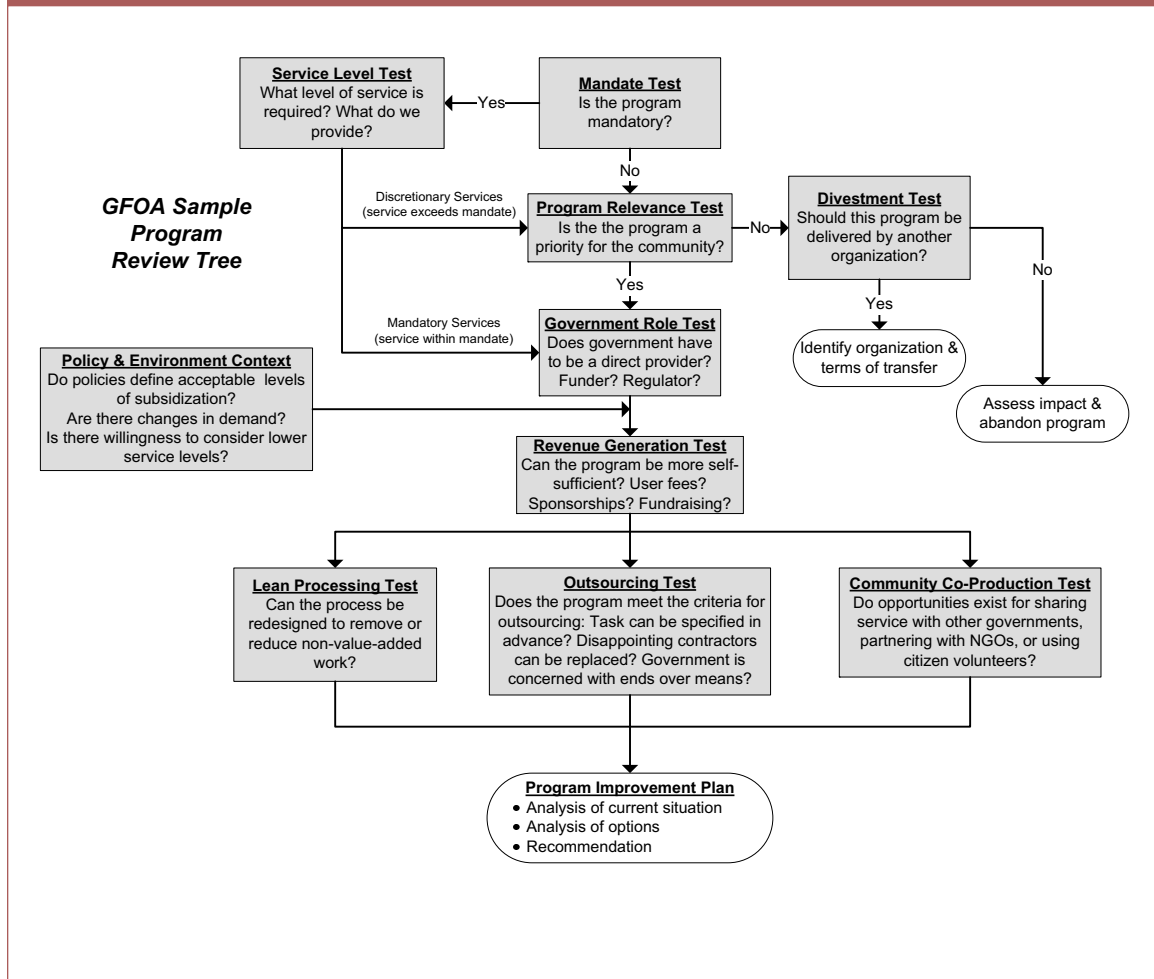
Program review. A program review is a formal and thorough examination of a service area to determine where efficiency improvement opportunities might lie. A team follows an analytical process to gather data, assesses the program against a number of predefined tests, and develops options for improving efficiency. A program review can cover a wide range of ground, including examining mandates from other levels of government to see if they are being properly translated into actual service provision, looking for potential partnerships with other governments for service provision, or streamlining business processes through Lean. Exhibit 10 provides a decision tree that illustrates how a program review could work with Lean.

Conclusion

Lean is a potentially powerful tool for improving efficiency, citizen satisfaction, and employee productivity. Lean can produce both hard-dollar and soft-dollar savings. High-volume processes with low variability among transactions have the most potential for savings. However, the decision makers and participants in a process must be willing to try Lean thinking and make changes to their business process for savings to be realized. Therefore, be sensitive to concerns participants in the Lean event may have regarding job loss, management commitment to Lean, and impact on work life.

Lean works best when it is treated as a discipline that is instilled into the fundamental way in which the organization thinks about service provision, rather than being treated as a one-off project. As such, public managers should carefully study Lean and consider how it might contribute to wider organization strategic objectives. If Lean seems a good match, a case can be made for a Lean pilot project, which can blossom into a wider dispersion of Lean thinking to government operations.

> Lean is a tactical tool. If it is not linked to broader organizational strategy, Lean can lose relevance.

Exhibit 10: Sample Program Review Decision Tree

GFOA Sample Program Review Tree

Service Level Test
What level of service is required? What do we provide?

Mandate Test
Is the program mandatory?

Yes

No

Program Relevance Test
Is the the program a priority for the community?

Discretionary Services (service exceeds mandate)

No

Divestment Test
Should this program be delivered by another organization?

No

Yes

Identify organization & terms of transfer

Assess impact & abandon program

Yes

Mandatory Services (service within mandate)

Government Role Test
Does government have to be a direct provider? Funder? Regulator?

Policy & Environment Context
Do policies define acceptable levels of subsidization?
Are there changes in demand?
Is there willingness to consider lower service levels?

Revenue Generation Test
Can the program be more self-sufficient? User fees? Sponsorships? Fundraising?

Lean Processing Test
Can the process be redesigned to remove or reduce non-value-added work?

Outsourcing Test
Does the program meet the criteria for outsourcing: Task can be specified in advance? Disappointing contractors can be replaced? Government is concerned with ends over means?

Community Co-Production Test
Do opportunities exist for sharing service with other governments, partnering with NGOs, or using citizen volunteers?

Program Improvement Plan
- Analysis of current situation
- Analysis of options
- Recommendation

Notes

1 James Womack, Daniel Jones, and Daniel Roos coined the term "lean" in their book, *The Machine that Changed the World: The Story of Lean Production* (New York: Rawson Associates, 1990), to describe the manufacturing paradigm (often referred to as the Toyota Production System) the Toyota Motor Company developed, based on principles pioneered by Henry Ford.

2 As the NASCIO explains in a 2007 paper, "Transforming Government through Change Management," government change efforts rely more heavily on stakeholder support than such efforts in the private sector. Important stakeholders include professional staff and elected executive and legislative officials. While many of these groups can be expected to support the goals of an improvement effort, in principle, there will likely be significant con-

> **Lean works best when it is treated as a discipline that is instilled into the fundamental way in which the organization thinks about service provision, rather than being treated as a one-off project.**

cerns about possible interruption of services, disruption to the organization, and lengthy initiatives that don't promise results within the short tenure of some officials. A discontinuous or large change initiative therefore presents significant risks related to completion of the initiative within the short time frames relevant to policymakers, and the potential disruptions to operations that span administrations. These concerns and perceptions drive change efforts in government toward an incremental approach. This approach provides the capability to properly manage risk, expectations, and relationships, thereby improving the chances for long-term success.

3 The examples governments were assisted with Lean by TechSolve. Results are based upon self-reporting by the government and investigation by TechSolve

4 Dave Krings, Dave Levine, and Trent Wall. "The Use of 'Lean' in Local Government," *Public Management Magazine*, September 2006.

5 U.S. Environmental Protection Agency, *Lean in Government Starter Kit: How to Implement Lean Initiatives at Environmental Agencies*, Version 2.0.

6 Terry Schurter with Peter Fingar, *The Insider's Guide to BPM: 7 Steps to Process Mastery* (Tampa, Florida: Meghan-Kiffer Press, 2009).

7 Bill Bott, "There is No 'I' in Lean," *Public CIO*, December 2009/January 2010.

8 Adapted from *Lean in Government Starter Kit*.

9 Krings, Levine, and Wall.

10 Krings, Levine, and Wall.

11 John Kotter, *A Sense of Urgency* (Cambridge, Massachusetts: Harvard Business Press, 2008).

12 Adapted from *Lean in Government Starter Kit*.

13 Description of VSM from *Lean in Government Starter Kit*.

14 A number of triggers are adapted from John Jeston and Johan Nelis, *Business Process Management: Practical Guidelines to Successful Implementations*, 2nd edition (Burlington, Massachusetts: Butterworth-Heinemann, 2009).

15 Definition taken from Wikipedia.

16 Adapted from *Lean in Government Starter Kit.*

17 GFOA Best Practice, *Budgeting for Results and Outcomes*, 2007. Available at www.gfoa.org.