Introduction

State environmental agencies have adopted a variety of business process improvement methodologies to help them cope with tight budgets and protect our states’ natural environment in a more efficient manner. The Environmental Council of the States (ECOS) has developed reports, tools, and other materials to showcase the Lean successes of our member agencies, demonstrate the benefits of Lean in the environmental regulatory field, and provide guidance and information to states seeking to expand their Lean activities.

Advocates of Lean principles and Lean projects must understand the cultural opportunities and obstacles to dealing effectively with colleagues, customers, and other stakeholders. Aspiring states do not only need technical information on how to implement Lean, but also information on these cultural and interpersonal challenges and how to manage and respond to them effectively. In this latest item in our Lean series ECOS is featuring a selected group of narratives, each describing a certain project or aspect of a given state’s Lean experience. These writings focus on the personal and cultural elements of implementing Lean and similar Business Process Improvement (BPI) methodologies, offering partner states new perspectives, advice, and a sense of how it feels to make the transition to a Lean culture and organization.
1. Cross-Sector Lean Partnerships at the Delaware Department of Natural Resources and Environmental Control

Beginning in 2016, the Delaware Department of Natural Resources and Environmental Control (DNREC) entered into a collaborative multi-year agreement with the University of Delaware to provide training and support services in the area of process improvements and Lean implementation to the agency’s Division of Air Quality and DNREC at large. The agreement was that the University would provide the Air Quality Division with Process Improvement learning solutions to assist its strategic process improvement efforts.

The agreement included 6 solutions:

1- Corporate Associate MBA interns (6) to assist with three discreet projects related to financial forecasting, human resources and process improvement;
2- Change leadership coaching sessions on change leadership for the Air Director (16);
3- Data analytics and visualization R workshop for the Division of Air staff (1 Session);
4- Process improvement champions seminar (2) for mid- to senior-level DNREC managers so that they can effectively lead process improvement efforts;
5- Lean Six Sigma Green Belt Certificate (2) for select DNREC mid-level managers so they can become proficient in managing process improvement teams at the Green Belt-level;
6- Technology & Business Improvement Consulting Teams (4) comprised of College Management Information Systems and Operations Management students (seniors) to assist the Division with discreet process improvement projects.

The Department hoped to lay the groundwork for a culture of continuous improvement and a community of practitioners by providing education through the Process Improvement Champions Seminars and the Lean Six Sigma Green Belt Certificate classes. The effort failed in delivering that foundation for two main reasons. First, the education did not reach far enough and may not have been the right starting place. The education was given to approximately 64 employees. DNREC employs anywhere from 750 to 1000 full and part time employees annually. Although the intent was to educate a group of managers and early adopters to help spread the news, most of the employees who participated in the education events (especially those who attended the Green Belt course) felt the information was good but had difficulty seeing how they could implement any improvements or educate others.
Additionally, the expectations were unrealistic. The education effort didn’t yield the expected results because it lacked clarity on what was expected from the participants after they finished the course and there was no action plan that identified next steps after the courses. Many attendees felt the courses put the cart before the horse and that they should have first experienced training and execution of some Process Improvement basics. Some said if they had known they were expected to engage with other staff as a Green Belt leading teams throughout the agency they would not have agreed to participate. They felt that simply attending the course did not make them experienced enough to lead teams and events on their own, and with their current workloads they also didn’t have the time to do so.

We learned a few valuable lessons, to ensure there’s clear communication and direction and an action plan. Those two things may have somewhat changed the outcome but would have still left us with majority of the staff population not having the basic tools to continuously improve. As a result of lessons learned and feedback received, we decided to take a step back and start at the grass roots by educating all employees on continuous improvement and problem solving so we implemented a curriculum. We feel this approach will assimilate the knowledge and help develop the culture of continuous improvement we are striving to achieve. Now we have a 2-yr Continuous Improvement Plan with a goal to utilize continuous improvement and lean principles and practices to engage and empower employees, improve organizational efficiency and effectiveness, and promote innovation to better achieve our vision. The CI Plan has two primary focuses; to increase employee general awareness level and knowledge of problem solving, continuous improvement and lean through education and communication; and to identify, initiate and implement process improvement projects throughout DNREC.

2. Two Takeaways from Iowa’s Department of Natural Resources

Be Prepared for what is Valuable to the Customer

The Iowa Department of Natural Resources (DNR) approached farmers and their consultants with the idea to move a paper, hard copy application to an electronic submission. The manual process required farmers to deliver a hard copy of their application to each of 99 counties they do business in, and receive a receipt to submit with the application to the DNR. We thought farmers would benefit by saving gas and time driving to each county, reducing time to obtain all their documents, and eliminate mailing or driving costs to provide copies to a local DNR office. But they were fine with driving to their county seat mainly to chit chat face to face with their county representatives, have some coffee, and catch up on the local news.

Next the Department thought paying online would help the farmer be more accurate in the price to pay with their application and more timely as to not incur late charges. Again, we were surprised when they were comfortable with manually calculating their total and if wrong, having to write another check. They enjoyed stopping in the office to have a conversation with the DNR team. They often enjoyed bringing a box of treats to share with the DNR team.

It was surprising to find out the amount of paper collectively among all farmers was what caught their interest. When about 8,000 farmers submit an annual application ranging from 1-200
pages long, the pile of applications would be almost 30 stories tall -- higher than many skyscrapers. Just one person’s paper submission didn’t seem like much but when added together, they stack up!

After a year of offering online submission and payment and a lot of marketing of the option (those who wish can still perform the manual submission process), about 73% of the 8,000 farmers utilize the online submission process, with many opting to pay online, too.

Sometimes we have to find just the right concept to spark someone’s interest!

**Making Room for the Team**

The Iowa Department of Natural Resources utilized the concepts of 5S (Sort, Set in Order, Shine, Standardize, and Sustain) and Kanban boards for a surprise office move. A leased office with about 70 team members received a three-month notice the lease would not be renewed. Instead of finding a new leased location, the team chose to move into DNR’s headquarters. But it was no small task!

The main office had to shuffle cubicles to make room for the newcomers. About 200 team members sorted and cleared out items no longer of use for their offices, common spaces, shared spaces, and storage areas. After pairing down items, those 200 team members packed up and moved spaces similar in size to a full sports game or movie theatre. Some moved twice--to temporary locations while their new space was configured. As headquarters consolidated unused spaces, they freed up an entire section of the building for the new offices.

Kanban boards were everywhere for teams to know their tasks and where in the process teams were at with achieving the tasks. Some were electronic and some were hung in hallways or on doors based on who needed the information.

With some grumblings and a few bumps in the road, the team pulled together to achieve the challenge to make room and fit the entire team under one roof.

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3. **An Overview of Minnesota Pollution Control Agency’s Lean Culture**

Since 2003, Minnesota Pollution Control Agency (MPCA) has focused on reviewing, improving, and designing more efficient and effective processes. The MPCA has had numerous process improvement successes over the years and has remained committed to continuously evaluating the effectiveness of our processes though several changes in State Government Administrations. Continuous Improvement (CI) is also included in every person’s position description and Division Directors regularly report to the Deputy Director on their CI projects. Our engagement survey also includes questions on level of support of CI in the organization. The Commissioner’s office, along with the Organizational Improvement leadership establishes a calendar year direction for supporting continuous improvement activities through a “Roadmap” that is used for development of a CI Deployment Plan for leadership and the CI Management Team’s (CIMT) approved fiscal year work-plan. The CI Roadmap lays out the timing for the Quarterly CI project check-ins with Senior Leadership: CI training for Leadership and staff; Monthly CI
newsletters; Gordie Award acknowledging individual process improvement contributions; CIMT review of Strategic Plan results for potential CI projects; and CIMT report out at Agency Managers meeting.

The use of a wide variety of continuous improvement (CI) tools provides for a structured method to assess our processes, gather customer input, collect and utilize data, analyze current problems and root causes, and improve ways to accomplish our work. At a high level, the MPCA uses PDCA (Plan, Do, Check and Adapt) to routinely monitor the effectiveness of our processes. When the need calls for a deeper look at how a process is performing the MPCA uses the DMAIC (Define, Measure, Analyze, Improve and Control) methodology. Kaizen events are used when appropriate. Results Based Accountability fosters better measures and reporting of results. CI project selection and management is accomplished at two levels within the Agency. All divisions identify opportunities and needs for improvement of processes both at the division and/or Agency level, at least annually. Division management will then develop a priority on how to manage the work with respect to the opportunities and track management and results of those projects in the CI Project Tracker database. Division management may assign the project to participants in the CI for Leaders training class. The CIMT reviews the adaptations suggested in the Strategic and Operational Agency Performance Management Reviews and contacts the assigned Managers to discuss whether continuous improvement tools or an assigned team would improve progress on that measure. Senior Managers also identify agency-level processes to be improved or designed, based on based on results/comments from the Employee Engagement Survey or areas where they believe there is a need for improvement based on their experience. If the improvement project requires multiple divisions or other state agencies to be involved, then the potential project is also discussed and approved by Senior Managers. The Organizational Improvement Unit has four CI coaches assigned to design, coach and facilitate CI projects. The CI coaches also provide data analysis assistance and conduct DMAIC, Lean, Results Based Accountability training for Leadership and staff. The CI coaches also work with CIMT to provide a monthly newsletter that highlights recent CI projects, along with CI tips for successful project execution. The state has also established a Minnesota Office of Continuous Improvement, which helps support government agencies as they build CI into their organizational culture and day to day business practices. They offer training, tools and templates and highlight results in a quarterly newsletter available to state employees. The Governor’s Office hosts an annual Governor’s CI Award, to recognize individual and organizational CI efforts.

Mapping hundreds of business processes has been especially helpful with the transfer of work knowledge from retirements and improving clarity and communication about roles and responsibilities. Improvement projects have been focused on standardizing, streamlining, making major improvements and redesigning work. As a result, our employees experience increased job satisfaction (or decreased frustrations) with their work, understand the goals and objectives of our processes, and are more productive. As staff experience the benefit of improving their work, they are passing on a more accepting attitude toward process improvement. This has created a positive culture for CI and supports our “learning organization” value. Definitive improvements in key work processes such as Permitting and Compliance and Enforcement has improved relationships with external customers, including the
legislature. Our tracking of results and improvements has also helped us respond to audit questions from the legislature and EPA.

4. Pennsylvania DEP’s Continuous Process Improvement Initiative

The Department of Environmental Protection (DEP) within the Commonwealth of Pennsylvania has started a Continuous Process Improvement (CPI) initiative. To accomplish this task, DEP is using the DMAIC approach. The following describes this approach, the Lean tools that will be used in each step of the process, and the final report used to inform management of the resulting improvement(s).

DEFINE

The define step is where we will determine key elements of the process to be improved.

Tool(s):

1. SIPOC (Supplier, Inputs, Process, Outputs & Customer).
2. Value Stream Map – high level map of the process & metrics to be measured.
4. Process Map – detailed map of the process steps.

MEASURE

The measure step is important because this will inform us of our current performance of the process, the baseline, and will feed metric information into the analyze step.

Tool(s):

1. Spreadsheet – contains process steps with metrics for at least 5 customer’s work going through the process.

ANALYZE

During the analyze step the metrics are scrutinized to identify possible areas of improvement.
**Tool(s):**

1. Standard Work Spreadsheet – models cycle time and lead time.
2. Pareto Diagram – models cycle time and lead time.
3. Histogram - models cycle time and lead time.

**IMPROVE**

The Improvement step is used to attack opportunities for process improvement.

**Tool(s):**

1. A3 Problem Solving Spreadsheet containing the following:
   a. Problem Statement
   b. Background
   c. Current Condition
   d. Root Cause Analysis
   e. Target Condition
   f. Counter Measures
   g. Action Plan

**CONTROL**

The control step is used for sustainment.

**Tool(s):**

1. Standard Work Document containing the following:
   a. Process Map
   b. Table
      i. Detailed description of each step
      ii. Desirable/Undesirable for each step
      iii. Lessons Learned for each step
2. Kanban Board – used for visual management during process use.

At the conclusion of some CPI projects, the staff may be required to report to senior management the results of the improvement. The following report will be used as a standard reporting tool for this purpose.
This will be a storyboard, describing the process used to identify, implement and track the improvement to the process. Hard copies of this report will be made available to the senior management team on 11x17 paper.

6. Frontline Lean at Rhode Island DEM: Records Retention

Once upon a time, there were a group of public servants at the Rhode Island Department of Environmental Management (RIDEM) in the Office of Water Resources (OWR). Day in and day out, they worked hard to protect one of the Ocean State’s most valuable resources — Narragansett Bay, and the state’s other water bodies. These resources make Rhode Island a desirable vacation destination and are central to the state’s economic well-being. Despite the hard work and commitment of these public servants, their efforts might not be acknowledged by visitor if the entry area to their office was overflowing with records boxes, as it was in 2013:
The Rhode Island Department of Environmental Management (RIDEM) has been involved in implementing Lean since 2012 via a Lean Team, with some programs having Lean efforts prior to that time. This case study focuses on one aspect of Lean (developing a records retention schedule) in RIDEM’s largest office (OWR). Although the follow through to this project is still ongoing, OWR and the Lean Team has learned some valuable lessons from this project on how to implement Lean.

Because OWR did not have a records retention schedule, this meant that all records needed to be saved permanently. Our office undertook an effort to document what records we had and set retention times, put that information in a draft records schedule. The process took us 6 years, but we did get the schedule approved.

Here are some lessons we learned along the way, which may be relevant to other Lean improvement projects:

**Start with “why”**. In the early stages of developing the schedule, we found it important to remind staff involved why we were undertaking this project. We had boxes clogging up cubicles and overflowing into the front hall. The “why” had to do with explaining that creating a system to organize records and destroy records which were no longer needed would (1) make it easier for staff to locate records (2) enable our office to better present itself to guests. During the development of the schedule these points were repeated in training presentations to staff, and pictures were used to illustrate the urgency of the problem.

**Get the involvement and input from stakeholders ahead of time**. There are more than ten programs and subprograms in OWR. During the process of developing the schedule, program and subprogram heads were repeatedly consulted and it became clear that each program had its own needs with respect to the schedule. Rather than taking a one-size-fits-all approach, the needs of each program were listened to and incorporated into the draft schedule. This gave programs some degree of a sense of ownership of the process, and after the schedule was finalized, they know that they have been involved in its development. So program heads weren’t just stakeholders, they became co-project managers. Additionally, the involvement of other leaders and offices (such as DEM Upper Management, DEM Legal,
the RI Attorney General’s Office, RI Sec of State’s Office, and the RI Auditor General’s Office) were key to the decision-making and approval processes. So OWR took the time to develop those contacts, and keep in touch to gather input, receive guidance, and ask for help moving the process along. This help was vital to getting the schedule approved.

Follow through. Having a finalized schedule was a significant milestone, but by itself, it accomplished little. In order to realize the benefits of the schedule, the next step was to meet with each program, and train them on how to use the schedule. This involves developing and explaining how to use the Standard Work and 5S Lean tools to implement the schedule, destroy records that are no longer needed, and reorganize the workplace to facilitate locating records quickly.

Although the implementation of this project is still ongoing, the records retention effort drew attention to the importance of maintaining a neat and tidy office. This not only enables staff to locate documents more easily, it allows the office to present itself in a more professional way:

![Image](image.jpg)

7. Texas Commission on Environmental Quality and U.S. EPA Region 6’ Shared LEAN Process

In FY2017 the Office of Water at the Texas Commission on Environmental Quality (TCEQ) started to see a number of Texas Pollutant Discharge Elimination System (TPDES) water quality permits becoming backlogged due to the Environmental Protection Agency (EPA) objections. In some cases, EPA’s review extended beyond its 45-day review period. These delays frequently involved pending permit applications that were more environmentally protective than existing permits. This increasing number of permits were “stuck” and there seemed to be no path forward for moving the permits. Both agencies wanted the process to be more efficient and less cumbersome.
EPA Region 6 and TCEQ’s Office of Water agreed to try the LEAN approach. The agencies agreed to have a three-day workshop with leadership and staff of both groups at TCEQ headquarters in Austin. The leadership pledged their staff’s full commitment to finding solutions and common ground.

Both agencies agreed upon the following objectives:

- Reduce the amount of time to review TPDES permits submitted by TCEQ
- Reduce resolution time
- Reduce pending permit backlogs
- Reduce EPA objections to TCEQ
- Develop a mechanism to move forward with national/programmatic issues
- Reduce the number of permits reviewed by EPA

Staff worked tirelessly for those three days in small and larger groups with a facilitator walking staff through the LEAN process. The meeting in Austin between EPA Region 6 & TCEQ was immensely successful.

Permit packages are now posted on TCEQ’s FTP website instead of being mailed. EPA “no objection” letters are concurred at the Section Chief level and an approval e-mail is forwarded instead of a letter. EPA has added a screening process to determine if a full review is necessary or if review can be declined. Programmatic issues are now elevated quickly with intentions for quick resolution. One programmatic issue, which is now resolved, took longer to resolve than expected, so there are still lessons to be learned. However, overall EPA has reduced the number of objections to TPDES permits. All these numerous changes were implemented and have greatly reduced the review processing times. In fact, the previous TPDES permit review backlog has been largely eliminated and there is a better and more efficient review process moving forward. Thanks in large part to the LEAN Process and the dedicated staffs, we have found better ways to communicate and review permits.

At the end of the workshop, we ask for direct feedback from TCEQ and EPA Region 6 staff about their thoughts with the process.

- Mutual interest in issuing permits, resolving issues, and running a good program.
- Periodic reevaluation is a good
- Details were important
- Opportunities to go paperless
- Appreciated good will to problem solve
- Good dedicated people in both agencies
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Co-Chairs:

Misael Cabrera, Chair Director, Arizona Department of Environmental Quality

Patrick McDonnell, VICE CHAIR Director, Pennsylvania Department of Environmental Protection

Contributors:

Martina Johnson, Delaware DNREC; Jerah Sheets, Iowa DNR; Cathy Moeger, Minnesota PCA; Eric Allen, Pennsylvania DEP; Louis Maccarone, Rhode Island DEM; Kelly Keel Linden and L’Oreal Stepney, Texas CEQ;
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