LEAN PROGRESS

Ideas for helping your company transition to lean effective and rapidly.

LEAN LEARNING CENTER

ISSUE 9
JANUARY 2007

No Stone Unturned

Dramatic improvements in material storage and handling were made at a commercial vehicle supplier applying the lean rules through the kaizen process.

-by Ron Holcomb

Activities are deemed value add only if they meet three criteria:

- Final customers are willing (and happy) to pay for them
- They physically change the product or service being sold
- They are completed correctly the first time

This is a narrow definition and, as such, much of what we do in our organization falls outside of it. In fact, even world-class processes include less than 10% value add activities. We intentionally keep the criteria narrow so we maximize the number of activities that are fair-game for elimination.

Most organizations focus continuous improvement efforts on the value add activities even though they are a very small portion of all the activities in the process. For instance, most organizations have "process engineers" and "industrial engineers" whose job descriptions focus on reducing cycle times. Rarely do we find a "transportation waste elimination engineer" whose assigned job is to reduce travel distances and unnecessary material movement. This phenomenon is particularly troubling when we observe the following:

- Processes that provide non-value add activities are frequently plant wide or site wide. (E.g. inefficient storage and transportation systems) Therefore, they frequently diminish the effectiveness of many production and/or service departments in the site.

Non-value add activities tend to be more basic and lower tech. Improvements are frequently easy to find, and cheap and quick to implement. Value add process improvements have often been analyzed to death and may entail new technologies and capital investment.

With all this said, the mission becomes targeting at least some of the continuous improvement resources toward non-value add activities. This mission aligns very well with the use of kaizen. Kaizen is a well defined focused effort to actually execute improvements in a selected area or process. The trick then is to select non-value add processes for improvement and get on with it.

Such was the result of a recent kaizen event staged at a client that manufactures commercial vehicles. The plant in focus assembles axles for light and heavy truck applications serving 100+ customers mainly in the U.S. and Canada. The most striking statistic which emerged during the charter development was the staggering number of fork lift trucks and associated drivers. In full, 156 drivers worked 3 shifts seven days a week operating 84 fork lift trucks in the plant. The scene was like that of a bumper-car ride at a carnival with grid-lock developing repeatedly throughout the plant.

The need for fork lift trucks was initially driven by the nature of the axle assembly business….that

INSIDE THIS ISSUE:

Lean Learning Center

WWW.LEANLEARNINGCENTER.COM

RON HOLCOMB, LEAN LEARNING CENTER PARTNER, WORKED WITH THE TEAM ON THESE SIGNIFICANT CHANGES

is a few individual heavy parts and lot of smaller parts packaged in large quantities. Hence, the need for powerful vehicles transporting the material through tight aisle-ways snaking their way through 7 distinct assembly lines. The traffic volume was further exacerbated by an average of 11 handoffs between material handling vehicles once the material arrived in the plant (sometimes after multiple moves into, through, and out of a remote leased warehouse.)

The original charter of the kaizen event was removal of "near-line" storage of parts in high-bay racks across the aisle from a low-complexity axle assembly line. This was the result of an inquiry from the newly appointed Division General Manager during his first visit to the plant "What is all that material doing there?" The material he was referring to was floor to ceiling storage racks full of partial pallets and bins containing small to medium sized components used in the assembly of axles. It was located across the aisle (made narrow by the storage racks) from the assembly line. Its stated purpose was to permit relatively speedy replenishment of line side storage at assembly stations by dedicated line stocking personnel using forklift trucks (due to the large size and weight of the containers of parts.) He was clearly not satisfied with the resulting rationalization of the need for 3 separate storage locations (in the adjacent warehouse, across the aisle and at line side). He requested the entire near line storage system be removed before his next visit. Within days a team consisting of the Operations Manager, Supervisors, material handlers, warehouse personnel and line stockers drafted the charter with the assistance of the Lean facilitator onsite.

The lean drivers were the elimination of wastes of inventory, transportation and motion associated with the constant movement of material into and out of the near-line storage racks. Other key objectives included:

- Creation of an organized assembly workplace (through 5S's)
- Improved Visual Factory by elimination of the ceiling-high line-wide near line storage racks. (The assembly area was almost cave-like)
- More efficient and effective line side part storage stations with scheduled and signaled replenishment
- Increased floor space permitting wider aisle-ways.
- Safety improvements through the addition of pedestrian walkways and substantially reduced forklift traffic in and around personnel
- Simple and Specific Flow of material and information

It was quickly determined that elimination of the near line storage without corresponding improvements in delivery efficiency would result in even more and longer "moves" involving lift trucks. The team brainstormed the possibilities and concluded that the solution lay in reducing the number of material deliveries by increasing the capacity and efficiency of the delivery process. Initial suggestions to use tug and train delivery instead of fork lift delivery were met with skepticism. It seems the plant had tried and rejected this method in 1970 when lines were not aligned and parallel in the plant and near-line storage resulted in extremely tight aisles. Upon further reflection, the team speculated that the elimination of near-line storage would double the width of aisles thereby enabling the use of trains. Further, a one-way circular traffic pattern through the assembly area would relieve traffic jams and improve safety.

Invoking the lean rule of "Improve through experimentation", it was agreed that tugs/trains would be tested. Ironically six wagons had been relegated to the plant bone yard after the earlier trial that was declared a failure. Three of these wagons were attached to an existing tug and successfully pulled through the plant much to the surprise of observers. Also worthy of note here was the courage of the team to actually start the removal of the near line storage on the first day of the event even before the solution was designed and validated. The team basically proceeded with conviction and confidence showing a great deal of courage. (Execution of 80% of the proposed improvements during a kaizen is strong guideline that sometimes takes that kind of courage.) In short, they perceived that elimination of the near line storage was more than an offhand suggestion by the General Manager….it was something that needed doing.

This successful test proved

that one train load could eliminate the need for 20+ individual fork truck moves while enabling a JIT replenishment system for line-side material storage locations designed to hold 4-hours worth of each part. It also suggested elimination of dedicated in-warehouse storage locations by exploiting the trailers as "rolling" storage for high usage parts.

The cost effect of implementing this storage/delivery process on one line was negligible. It amounted to some productivity improvements and floor space. These savings were offset by the need (and cost) to set up a trial tug/train process. And yet, taken across the plant it was estimated that 50% of the fork lift fleet could be decommissioned at a savings of $600 per truck per month. (a total savings of $300,000 annually) Even more important, the services of 80+ fork truck drivers will be redirected from non-value-added transportation to more value-added activities. This kaizen also spawned a subsequent Demonstration Project. (A demonstration project is a larger, broader and lengthier process focused on changing a process that may span many departments and/or plants). In this case it was observed that the large parts of the axle were being delivered from the warehouse to the line in small "batches". They needed to arrive in assembly sequence. The resulting project involved two supplying plants. The project successfully developed, tested and implemented new rolling racks of sequenced components that are loaded at the supplying plants, trucked according to a carefully planned schedule in sequence to the axle plant. They are then unloaded at the dock and tugged directly to the assembly line one sequenced batch at a time. This project will be in full effect in the first quarter of 2007.

RESULTS:

- **50% of Fork Fleet decommissioned**
- **$300,000 Annual Savings**
- **80+ Material Handlers reassigned to higher value work**

In effect, the kaizen was more important as a learning opportunity than an improvement action. It was a paradigm buster. This small experiment validated a significant process improvement by driving a small team of engaged and motivated people to "question all the answers". In this case, the plant had already done much of what they could in a tight capital situation to improve the productivity of the seven assembly lines. This new perspective focused on improving a supporting non-value add process that will produce profound results that may indeed "make the difference" in this plant.

So, in closing, remember to "Directly observe (non-value add) work as activities connections and flows" to find opportunities to systematically eliminate waste. After all, there's gold in them thar hills.

Lean Learning Center

KAIZEN WORKSHOPS ARE INTENDED TO BRING CROSS-FUNCTIONAL TEAMS TOGETHER TO MAKE RAPID IMPROVEMENTS APPLYING THE LEAN RULES AND PRINCIPLES. IT IS A GREAT TOOL FOR YOUR TOOLKIT.

Lean Learning Center Instructional Design Studio

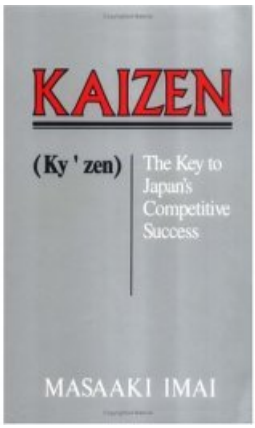
Are you looking for lean or six-sigma training customized for your company and its particular culture? The Lean Learning Center Instructional Design Studio has been established to provide these services to our clients.

Headed by Melissa Curtis-Hendley, M.A., P.H.R, the Design Studio is prepared to meet any request you may have. From train-the-trainer programs to expert led training, the Design Studio has delivered training solutions to a multitude of clients in many different industries. All programs will of course be grounded in the Center's philosophy of learn while doing.

For inquiries, contact Melissa by e-mail at melissac@leanlearningcenter.com or call the Lean Learning Center, (248) 478-1480.

INSTRUCTIONAL DESIGN STUDIO
Lean Learning Center

Lean Book Reviews



Kaizen-The Key to Japan's Competitive Success

By Masaaki Imai

Book description: what's the key message?:

Kaizen means improvement. In the workplace, it means continuous improvement involving everyone – managers and workers alike. The book focuses much more on the attitudes and culture of kaizen than it does the tools. The most extended tools discussion is probably found in the appendices, covering some basics with little detail for 3M (Muda, Muri and Mura), 5-S, five Ws and one H, 4-M (Man, Machine, Material, Method) Checklist and the Seven Statistical Tools and Seven New Tools.

One significant theme throughout the book is the responsibility of individuals for kaizen. Imai distinguishes between three types of work: innovation, kaizen and maintenance. The point is made that most resources inside an organization from top to bottom are focused on maintenance activities, which is keeping things in order and humming along with the status quo. At the top of the company, a significant portion of time is also spent on innovation. Imai believes that on the front lines of an organization, the dominant activity is still maintenance. But at each subsequent level, kaizen becomes a more and more significant activity until at the top levels, there is only innovation and kaizen, leaving maintaining the status quo to the rest of the organization.

Chapter 1, Kaizen, The Concept, focuses on the process versus results mindset. This is the essence of lean, going all the way back to the teachings of Dr. Deming. In order to get true continuous improvement, you can not put all your emphasis on the results. The process generates the results, and therefore in order to get different results, you must change the process. Chapter 1 also introduces kaizen as, quite literally, an umbrella of continuous improvement. Under the kaizen umbrella falls many lean terms: QC circles, suggestion system, TPM, Just-in-Time, Zero Defects and so on.

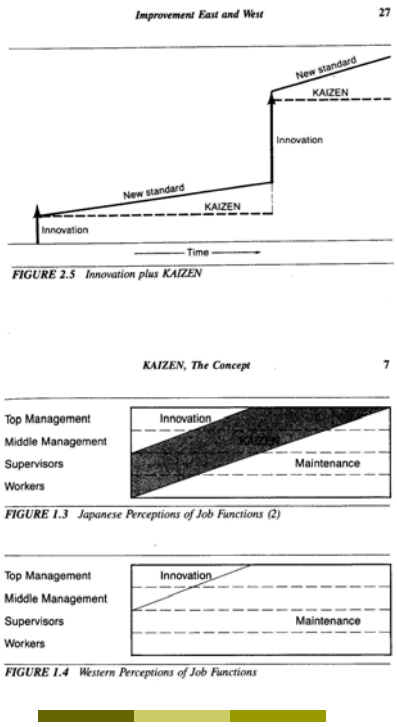
Chapter 2, Improvement East and West, contrasts Eastern cultures (mostly Japan) with Western cultures. He explains that Western cultures focus more on Innovation, while Eastern cultures focus more on Kaizen. He is very clear that Kaizen is not better than Innovation, but that it is about having both Innovation and Kaizen.

Chapter 3, Kaizen by Total Quality Control, lays out the thorough marriage between TQM/TQC and Kaizen. It discusses several concepts central to Kaizen and TQC. One key concept, and one that is often lost in lean discussions today, is the idea of market-in or customer focus versus product out or manufacturing focus. The customer defines reality for us, and all our processes must be aligned based on the voice of the customer. Also covered is the fundamental concept of PDCA, or Plan Do Check Act, and several examples are provided.

Chapter 4, Kaizen – The Practice, centers on three segments of Kaizen: Management-oriented Kaizen, Group-Oriented Kaizen and Individual-Oriented Kaizen. The chapter starts with an excellent table that spells out the three practices in terms of tools, who it involves, the target, the cycle or time period, achievements, the supporting system, implementation cost, results, what it boosts (such as morale) and in what direction you will head. Details of implementation and execution are fairly limited, however.

Chapter 5, Kaizen Management, explores Kaizen activities in management such as cross-functional management, including an extensive case study of cross-functional management at Toyota. Policy deployment, often referred to as hoshin kanri, is touched upon, and although it is a very important topic, it only gets 3 pages here. Other topics include Control Points and TPM.

Chapter 6, The Kaizen Approach to Problem Solving, starts by delving into



the topic of labor and management relations. While a little misplaced, the lead in is that problem solving in small groups is a way to bridge the gap between labor and management. Central to this chapter is an 18 page case study titled *Solving Problems Together: The Introduction of TQC at Kayaba* where even the process flow maps were included.

Chapter 7, Changing the Corporate Culture, challenges traditional views on management that must change to enable kaizen. An important statement in this chapter is "All the Kaizen programs implemented in Japan have had one key prerequisite in common: getting workers' acceptance and overcoming their resistance to change." This is the job of management.

How does it contribute to the lean knowledge base?:

Based on the date published, the impact of the author and the subject matter, this book was an influence on many of the teachers and writers of lean today. The book does not get nearly the attention that it did in its first five years, and is rarely listed at the top of lean book lists anymore. That being said, even though kaizen is only one dimension of lean, it is a more popular Google search term than lean manufacturing.

Kaizen, along with its sequel Gemba Kaizen, belongs without question on a "classics" list of lean or any list of books on continuous improvement. Other books are more helpful in terms of what lean is all about and how to do it, but the timing and impact of this book can be seen as a true contribution to what we know about lean and kaizen today.

What are the highlights? What works?:

The two strengths of this book are (1) its focus on thinking, behavior and culture and (2) its overall impact on our collective understanding of lean transformation. The book does not go through in painstaking details how this tool or that tool works. Other books are available for that. Kaizen focuses on the way people approach work, approach improving their work and how management and workers alike can change their mindset. Its use of case studies and models to highlight this change of thinking makes it very apparent that an organization can not transform itself through tools alone.

The book has impacted hundreds of other books. As you read other books, you may never know when someone was influenced by Imai's writings or teachings. However, you can be assured that just like any study of economics is in some way influenced by Adam Smith, any study of lean is likely influenced by Imai.

What are the weaknesses? What's missing?:

One major weakness, more so in delivery than fact, is the stark difference drawn between Japanese and Western companies. The reality is that only a handful of Japanese companies have mastered these techniques with many of the companies achieving low performance. Many companies in the U.S. and other Western cultures, even in 1987, had achieved excellent continuous improvement records. The delivery would be more effective and more palatable if drawing the distinction not across nationalistic lines but simply across management behaviors and practices.

The book also isolates Kaizen, making it a "thing" unto itself, which most effective lean implementations would not find consistent. It is part of this practice, along with the authors, companies and consultants that followed, that allows kaizen and lean to often be disconnected in practice.

How should I read this to get the most out of it?:

Do not read this book as a "how to" book. It only belongs as part of a portfolio of lean reading. However, for the manager who (a) does not understand their role in kaizen, lean, or all things continuous improvement and (b) thinks a little training in kaizen tools will do the trick, this book may be the perfect antidote. It will clearly articulate what must change in your mind and in management in order to enable kaizen. This is also a great tool for writers to reference when exploring lean concepts as several themes are articulated here that are not articulated elsewhere.

.

KAIZEN, ALONG WITH ITS SEQUEL GEMBA KAIZEN, BELONGS WITHOUT QUESTION ON A "CLASSICS" LIST OF LEAN OR ANY LIST OF BOOKS ON CONTINUOUS IMPROVEMENT.

Lean Tool Kit: Milk Runs

Lean Learning Center

Proper Uses of Tool

- To create more efficient flow paths for material and information through frequent, often timed pick-ups and deliveries
- To move closer to a one-piece flow environment by reducing batch deliveries

Improper Uses of Tool

- To institute milk runs without first establishing robust, capable and in-control processes. As with any attempts to cut inventories and move to one-piece flow, excessive downtimes from material shortages will be incurred without the proper foundation in place.
- To build your processes around milk runs over customer needs instead of designing processes around customer needs served by milk runs
- Milk runs do not make sense if the volume produced is so high that frequent runs of full truckloads can be made from a supplier or to a customer, as may be common in shipments to Wal-Mart, for example.

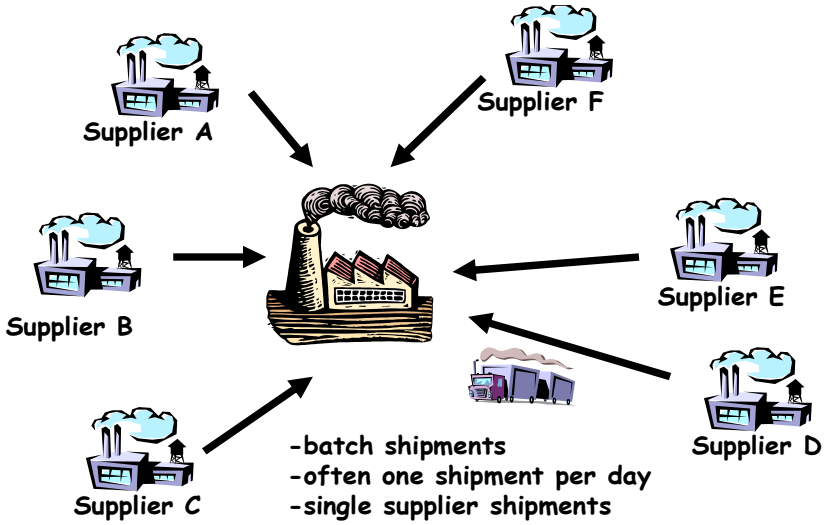
MILK RUNS CAN BE AN EFFECTIVE TOOL TO REDUCE TRANSPORTATION COSTS AND EXCESSIVE MATERIAL STORAGE AND HANDLING

Description of Tool – How-to

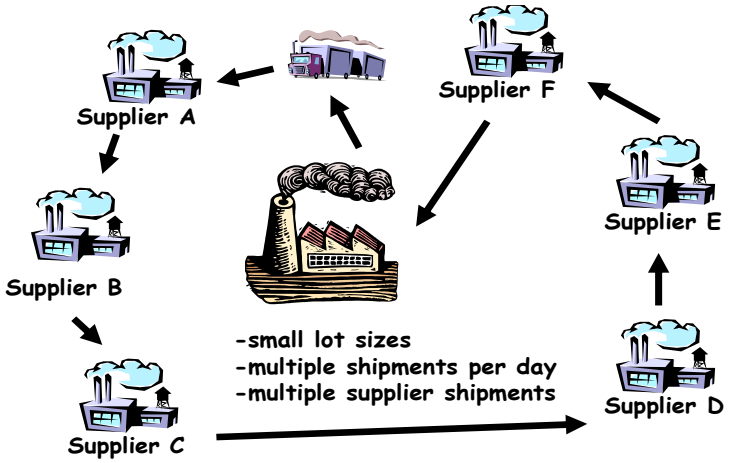
Milk runs, simply put, are an adaptation of the tool's namesake. Before electricity, and later, supermarkets became widespread, it was impossible to store milk for long periods of time in any one location. Thus, those in the milk production and delivery business learned to produce the right amount of product and deliver it on timed routes to multiple customers.

A milk run establishes a simple material flow system (though it can be used for more than just material flows) to enable reduced inventories and leveraged logistics costs. Traditional material logistics called for product to be moved in large batches directly from a stores area (e.g. warehouse, supplier) to the point of use. The advantage of doing so, it was believed, was to capitalize on the economies of scale in transportation costs. The more parts that were being transported translated to a reduction in transportation cost per part.

With the push to drive toward one-piece flow to reduce inventories and lead times, milk runs are an effective way to accomplish these imperatives and at the same time keep transportation costs from becoming excessive. Milk runs utilize frequent, regular and timed deliveries that stop at multiple locations to transport material. Instead of shipping direct from supplier to customer (usually in large lot sizes to keep shipping density high), multiple suppliers are connected on routes to ship multiple parts to a warehouse or factory. Thus the part density for any one shipment remains high saving transportation costs, and at the same time, multiple parts in smaller lot sizes are received significantly cutting inventories. The diagram below illustrates a traditional material logistics system:



Traditional Example



Milk Run Example

The illustration above shows how milk runs can be applied to a supplier network. In this case, multiple suppliers shipping to one common location will use a milk run, in this case likely owned and surely coordinated by the delivery point. The milk run truck will show up at the location with any returnable containers and sometimes even order information. Once new material is picked up, it will go on to the next supplier and only when full will it return to its destination site.

In addition to receiving material you can also ship material in this way. If you are shipping parts to multiple factories, distribution centers or retailers, you can use a milk run that will be timed to distribute that material. This is commonly done in the specialized logistics business, and some third-party logistics handlers will provide the benefits of milk runs for multiple customers.

Like many lean tools, the concept is rather straightforward; however, rushing into implementing a milk run procedure can create problems. First, someone experienced in logistics should be included to avoid adding unnecessary and excessive costs to material transportation and handling. Second, as with any initiative that enables operations to run with reduced inventories, processes that are not capable can create excessive downtime and excessive strain on the system. Make sure the foundational elements of production are in place before instituting milk runs. Third, packaging may need or benefit from altering the system. This may result in smaller delivery trucks instead of trailers or modular packaging systems that allow for easy mixed-load loading and unloading of a truck. For these reasons, a company should not just start milk runs without thinking through the barriers and options first.

Variations on the Tool

Smaller companies or those lacking logistics experience will often outsource this process instead of forgoing its benefits, resulting in the significant growth in third-party logistics providers. The downside to this is in order to coordinate multiple companies, the individual company may not benefit as significantly at least in terms of lead-time reduction to the end customer.

How Tool Relates to Rules and Principles

Implementing the Milk Run concept illustrates the application of **Rule #3: Simplify and specify every flow path**. Milk runs create standardized and synchronized flow paths for materials and information. By implementing milk runs, the flow path is also simplified as large batch sizes are reduced thereby eliminating the need for additional steps in storing and handling the material.

The principle of **Systematic Waste Elimination** is applied through milk runs. Milk runs enable smaller batch sizes reducing the **waste of inventory**. With smaller inventories, **waste of transportation** can also be reduced as the need for material handling equipment (e.g. racks, conveyors) and the need to add material handling steps (storage, transportation) is mitigated. In general, as with any lean tool that takes aim at reducing inventories, the reduction of every other type of waste is potentially realized.

Lean Learning Center

THE MILK RUN CONCEPT CAN ALSO BE APPLIED TO MATERIAL HANDLING INSIDE OF A PLANT OR OPERATION

Jamie Flinchbaugh Honored as 40 Under 40 Recipient

In recognition for his business achievements, Lean Learning Center co-founder and partner Jamie Flinchbaugh has been honored as a *40 Under 40, Class 2006* recipient by *Crain's Detroit Business,* the premiere Detroit-area business publication. The *40 Under 40* program identifies men and women in the business and non-profit communities who have achieved solid business success before the age of 40. Flinchbaugh was recognized for helping to train over 2,500 executives worldwide in lean principles thereby building the five-year-old Center into a leading provider of lean curriculum and consulting. Additionally, Flinchbaugh recently co-authored a book with Center co-founder Andy Carlino, *The Hitchhiker's Guide to Lean.*

Despite starting in a difficult economy in 2001, the Center has managed to thrive and teach its message of "lean" to diverse industries and high level companies such as Intel, DTE Energy, Northrop Grumman, DaimlerChrysler, Glanbia Foods, Harley Davidson and Land O'Lakes, to name a few.

Flinchbaugh commented, "I am pleased to be recognized by *Crain's* and in the company of such highly successful business people that make up the *40 under 40*. I am proud of the work we accomplish at the Center and believe that we are helping companies learn how to be competitive in today's global economy by teaching them how to build lean cultures and capabilities for transformation."

EPA Report on Lean

Few would say the government is lean and perhaps even fewer would look to the government for help on their lean program. But that is exactly what we've seen with the Environmental Protection Agency.

In a rare move in promoting change not through regulation or policies or incentives, the EPA set out to work with industry, lean experts and others to provide tools to support lean transformation. Why? Their essential premise was that truly lean companies, in the pursuit of waste elimination and the pursuit of excellence, would also pursue environmental excellence. Based on the evidence, this is a pretty sound premise.

The EPA believes that by helping companies with lean and more specifically, help them make the connection between lean and environmental waste, more companies can and will do the right thing by their standards.

The EPA worked with many lean individuals, including Jamie Flinchbaugh, to collect knowledge and ideas. It's first product was released under the title **The Lean and Environment Toolkit.** It can be downloaded for free at: **http://www.epa.gov/lean/toolkit/index.htm** and it includes other downloadable tools. The book covers topics such as Getting Started with Lean & Environment, Identifying Environmental Wastes, Value Stream Mapping, Kaizen Events, and 6S (5S+Safety).

As an example of some of the questions this booklet answers:

How do I measure the environmental impacts of a process? Measurement of key environmental wastes associated with a process can pinpoint those wastes that are most important to track over time. For example, chemical use and hazardous waste generation may be important to measure for one process, while water use may be most important to measure for another process. Chapter 3 discusses techniques for integrating environmental metrics into value stream maps. Appendix B includes information on environmental metrics that are often used by companies and facilities.

The strengths of this booklet is that it does a good effort at trying to integrate lean and the environment, rather than create any sort of hierarchy. Secondly, they promote environmental responsibility in terms of business success. Given this cost (free, except for your tax dollars which have already been spent) this is certainly worth checking out.

LEAN LEARNING CENTER

40028 Grand River Avenue
Suite 300
Novi, Michigan 48375

Phone: 248-478-1480
Fax: 248-478-1589
Email: info@leanlearningcenter.com

Lean Learning Center

For more visit www.leanlearningcenter.com

The Lean Learning Center was founded in 2001 by manufacturing and consulting industry veterans Andy Carlino, Jamie Flinchbaugh and Dennis Pawley to address the gaps and barriers that are holding back companies from successful lean transformation. In addition to the advanced curriculum, the Center has developed a learning environment designed specifically for adult learning, utilizing techniques that include discovery simulations, case studies, personal planning and journaling. Together, with affiliate Achievement Dynamics, founded by Andy Carlino in 1991, the companies offer a complete array of lean transformation services.

Lean Learning Center Announcements

LEAN EXPERIENCE (5-DAY PROGRAM):

January 20, 2007 -- *Sold Out*
March 05, 2007
April 16, 2007
July 30, 2007
September 17, 2007
November 05, 2007
December 10, 2007

LEAN EXPERIENCE-UK EDITION (5-DAY PROGRAM):

February 19, 2007 (Held in Solihull, England) -- *Sold Out*

LEAN KAIZEN WORKSHOP (5-DAY PROGRAM):

October 1, 2007

LEADING LEAN (3-DAY PROGRAM):

March 12, 2007

LEAN VALUE STREAM IMPROVEMENT (2-DAY PROGRAM):

October 29, 2007

For more information visit:
www.hitchhikersguidetolean.com