



# LEAN SIX SIGMA

## GREEN BELT TRAINING

**LEAN**Ohio

SIMPLER • FASTER • BETTER • LESS COSTLY

# Agenda



- Seven Steps to Implementing Lean “Manufacturing” in State Government
- Sample of Results
- Case Study
- What works
- Next Steps
- Lean Ohio Dashboard
- Q&A

# Step 1



Learn and test the effectiveness of “Lean Manufacturing” to improve state government systems

***Do not invest in fads***

A team of state employees work with business experts to learn and experiment with Lean Six Sigma tools and principles to determine their effectiveness improving government services

# Lean: Manufacturing vs. Government



## Manufacturing

Makes things to specifications for specific customers

Process bolted to shop room floors

Data for each step and part

Workers have pride and want to do a great job

## Government

Provides information and services to all

Processes invisibly winds through cubicles

D.R.I.P

Workers have pride and want to do a great job

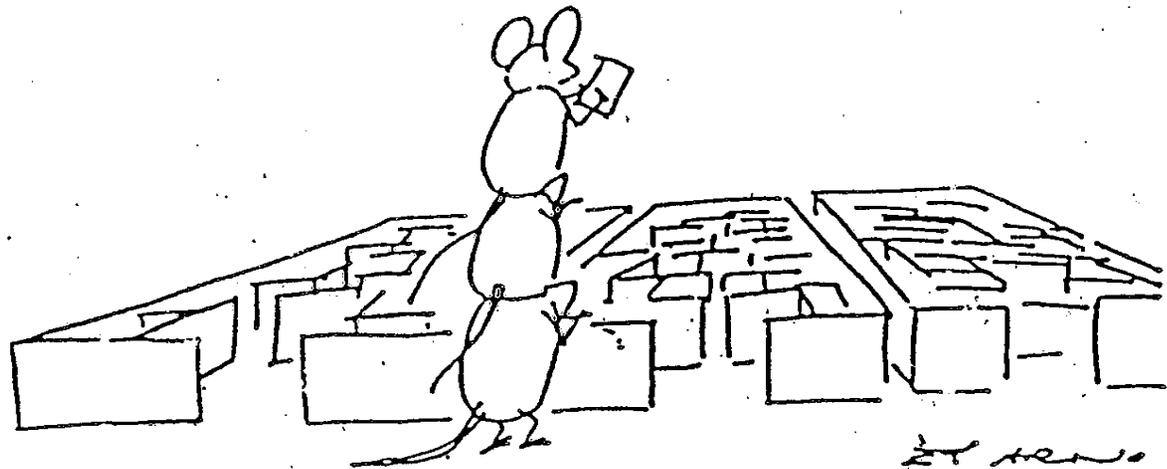
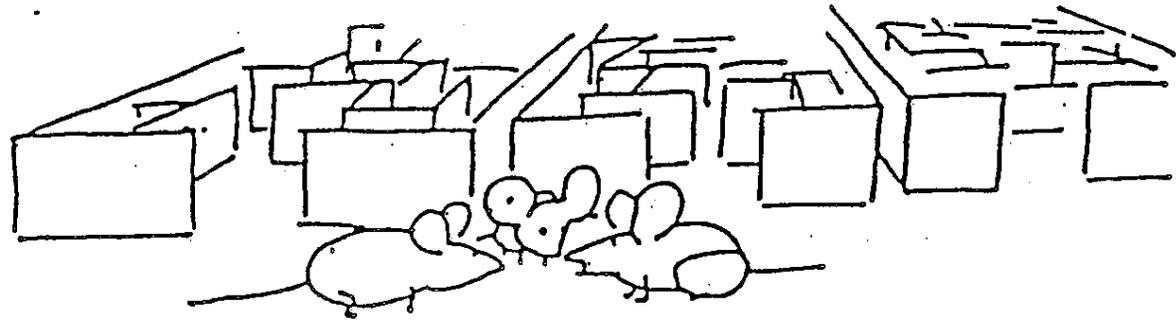
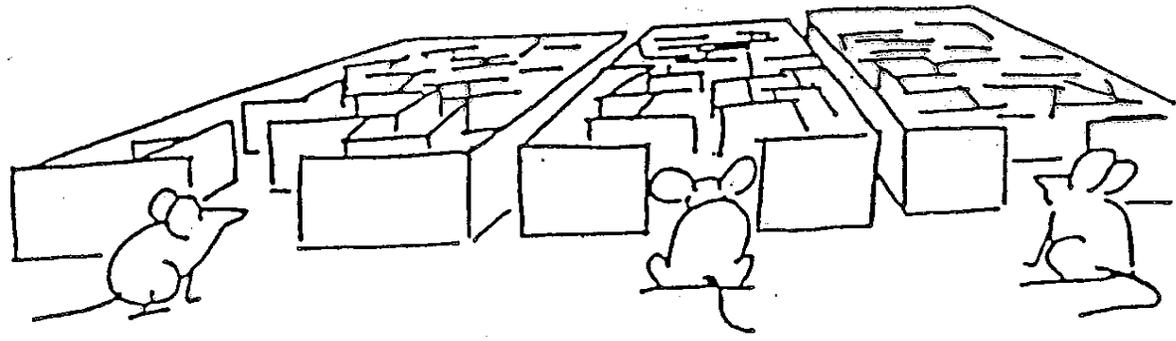
# The Key Differences



The main challenges for adapting “Lean Manufacturing” to Government are:

- Processes are not as visible in government
- Measurements, tolerances, specifications, and data are more routinely required in manufacturing

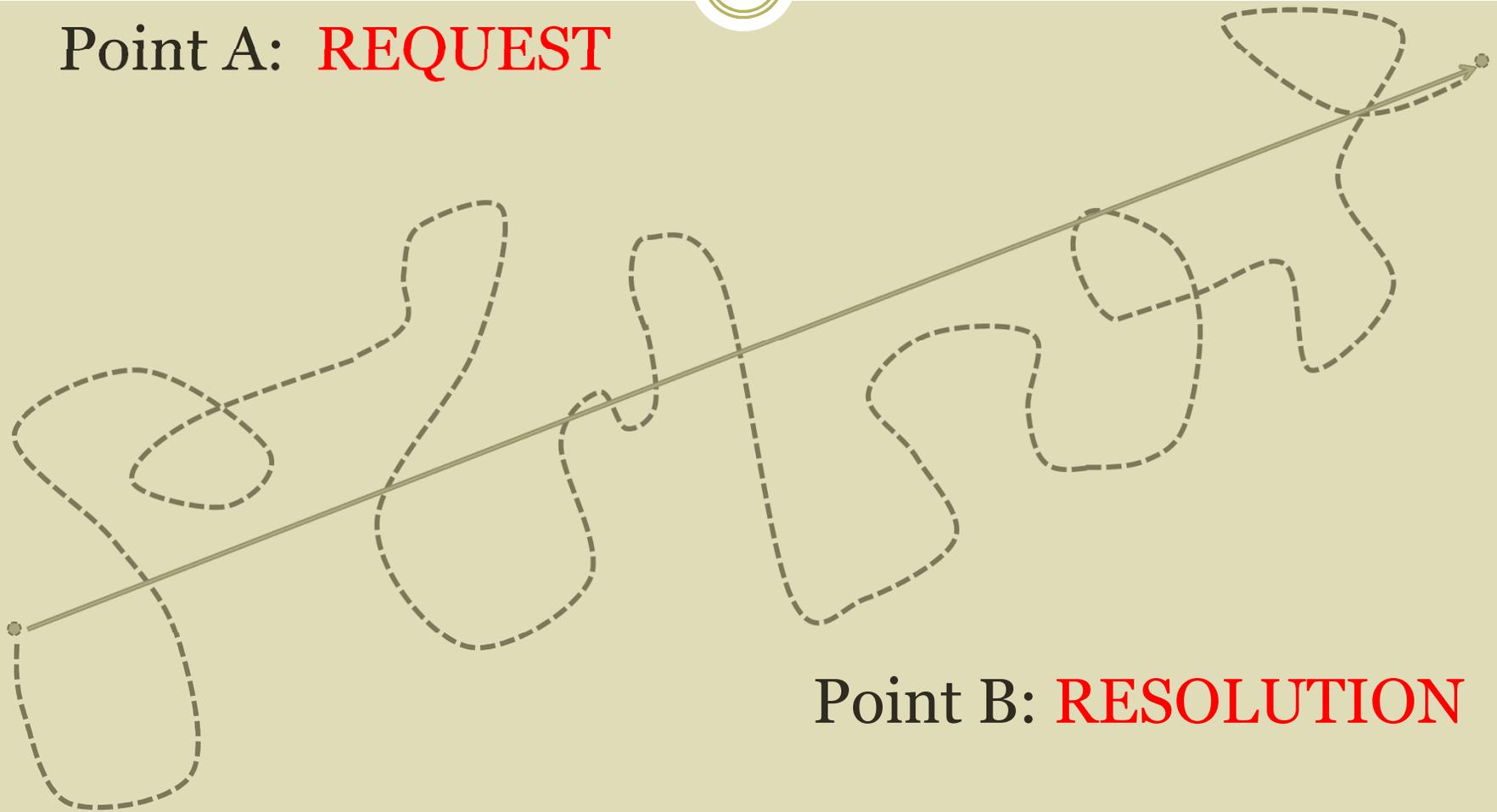
\*even the private sector is more likely to apply Lean to the manufacturing processes that occur on the shop room floor than to the hiring, invoice, or other service process that occurs upstairs in cubicles



# Processes tend to be invisible



Point A: **REQUEST**



Point B: **RESOLUTION**

# In Manufacturing or Government, Whatever your results ...



- Lead time
- Cycle time
- Errors
- Costs
- Customer satisfaction or frustration

...your process is **PERFECTLY** designed  
to achieve those results

# What result is this process perfectly designed to achieve?



# Step 2



Focus preliminary Lean efforts on major “Kaizen Events” to ensure significant rapid results.

***Selling results is easier than selling theory***

Select high-opportunity projects and champions that will do what it takes to succeed, and accumulate a variety of significant, transformative results throughout state government

# Kaizen Event



Kaizen Events are just one tool in the Lean tool box – but powerful.

- 1 week (Monday – Friday)
- Scope 3 weeks prior to event
- 12-20 people
- Folks who do work, supervise work, customers, fresh perspective
- Action oriented - Some things change Monday
- 30, 60, 90, 6 month, 1 year follow ups

# Fix processes, not blame

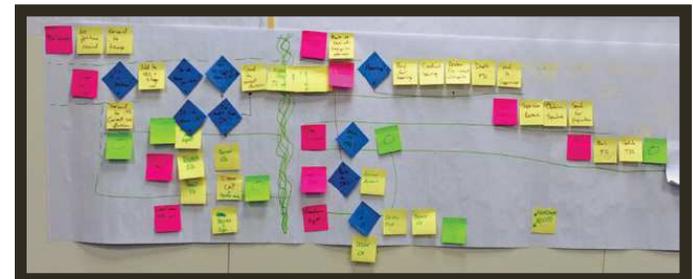


Current State = 143 steps, 4 entry points

Future State = 96 steps, 1 entry point

Lead time reduced from 32 months to as few as 7 - 20 days

**LEANOhio**  
SIMPLER • FASTER • BETTER • LESS COSTLY



# Taxation/Tax Appeals

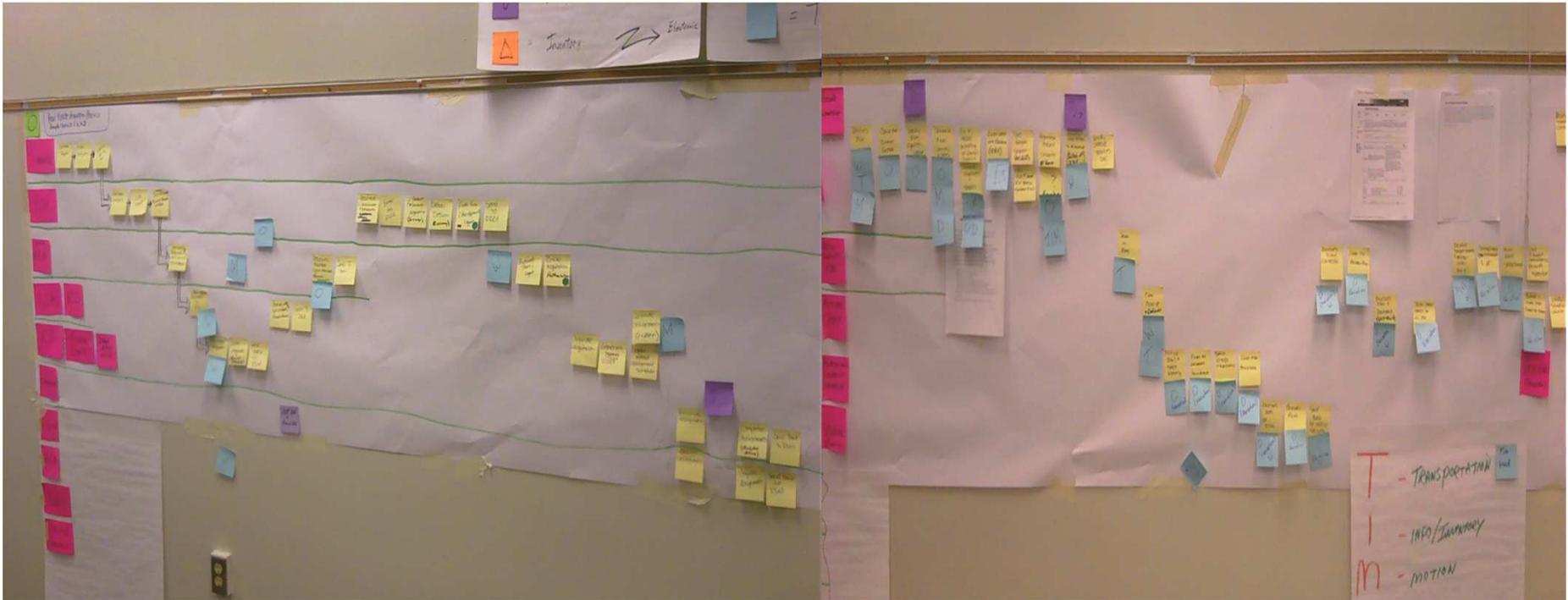


- Four entry points reduced to 1
- 18,000 backlog reduced to less than 3000
- Lead time from as much as two years to just a few days for common appeals
- \$529,200 reduced in cost avoidance
- Cost to process simple returns reduced from \$105 to \$7

# Ohio Department of Transportation



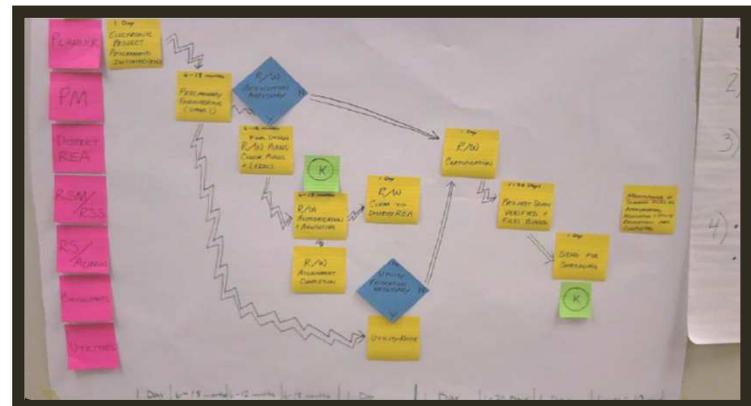
## REAL ESTATE RECORDS RETENTION PROCESS



Current State = 61 steps, 22 handoffs

Future State = 11 steps, 8 handoffs

Cost to process each records box fell from \$705 to \$1 by processing electronically



# More Out of the Box Results



- 82% fewer steps in process
- Lead time reduced as much as 40%
- 353 boxes backlog eliminated
- 700,000 sheets of paper touches eliminated



# Ohio Department of Public Safety

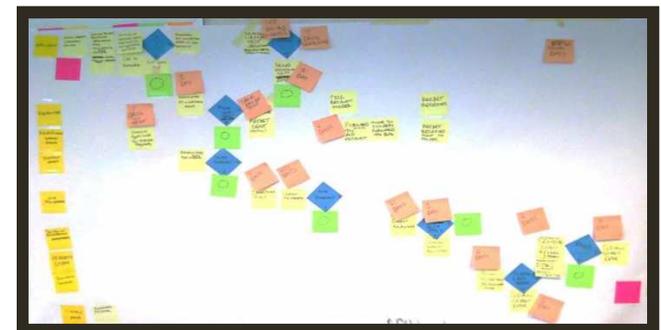
**HIGHWAY PATROL  
TROOPER RECRUITMENT PROCESS**



Current State = 235 steps, 28 decisions,  
76 handoffs, 50 delays

**Future State = 34 steps, 8 decisions,  
11 handoffs, 15 delays**

**Lead time reduced from a range of  
191 days to more than a year, down  
to 61 days**



# Kaizen Events Top 10 List



Top 10 reasons why a Kaizen Events is the “sledge hammer” of the Lean tool kit and works best to achieve the biggest results as quickly as possible

# Top 10 Reasons Kaizen Events Work



## Number 10:

No Kaizen event is held without first developing a meaningful yet appropriately sized scope to ensure success

# Top 10 Reasons Kaizen Events Work



## Number 9:

Each Kaizen event has a detailed charter that provides operational definitions and clearly defines the purpose and goals so everyone is on the same page.

# Top 10 Reasons Kaizen Events Work

## Number 8:

The people who do the work (and therefore know the work best) are involved in making the improvements

# Top 10 Reasons Kaizen Events Work

## Number 7:

Through team work,  
more creative  
solutions are tried  
and all have  
ownership of the  
new process

# Top 10 Reasons Kaizen Events Work



## Number 6:

Customers are part of the improvement team so their needs are more accurately identified

# Top 10 Reasons Kaizen Events Work

## Number 5:

The team is taught the science of flow, sequencing and pull systems so they can design their own processes to work more efficiently



# Top 10 Reasons Kaizen Events Work



## Number 4:

Decisions are  
made based on  
the data, so  
facts trump  
opinions

# Top 10 Reasons Kaizen Events Work



## Number 3:

The process creates a blameless environment to help overcome defensiveness and resistance to change.

# Top 10 Reasons Kaizen Events Work

## Number 2:

Implementation of the new process begins immediately so momentum is not lost.

# Top 10 Reasons Kaizen Events Work

## Number 1:

Management is totally committed to implementing the new process

“Men, I want you to fight vigorously and then run. And as I am a little bit lame, I’m going to start running now.”

- General George Stedman  
U.S. Army (Civil War)

# Step 3



Communicate and celebrate those first tangible results to increase interest and demand for Lean

*If you improve it, they will come*

Use web site, articles, and meetings to share results, and recognize and reward excellence

# Communicating Cost Savings



## BMV/Dealer Licensing Process

- Process reduced from 221 days to 37 days
- \$62,649 annual cost savings
- 5200 annual staff hours redirected
- New Dealerships save between \$200,000 and \$300,000 each
- Columbus based DMV “**concierge**” service for auto dealers

# Communicating in English



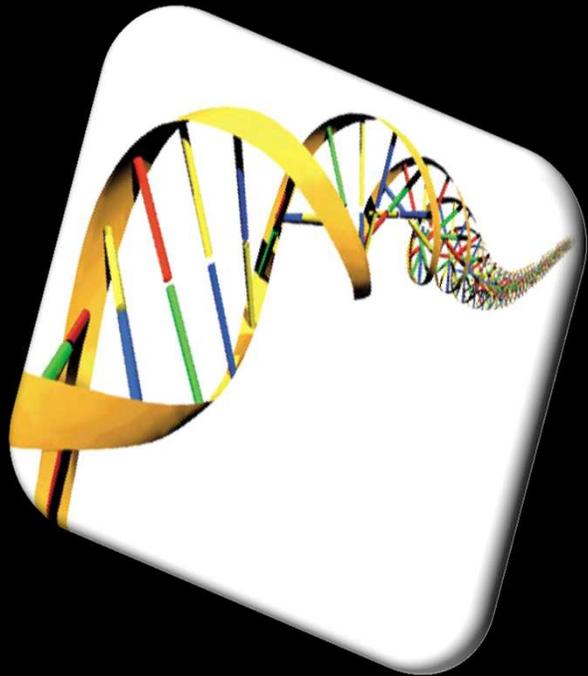
**Ohio Department of Insurance:** It used to take between 102 and 146 days for the state to respond to citizen's complaints about Ohio's insurance companies. It now takes less than 56 days, on average, to resolve those

**Ohio Bureau of Workers' Compensation:** Because of improvements made to streamline the modified claims process, injured workers will return to work an average of four days sooner. This leaner claims process will save the state approximately \$6 million annually.

**Ohio Development Services Agency:** A new improved process for determining eligibility in the Home Energy Assistance Program (HEAP) program will mean Ohio citizens in need will be able to get heat for their homes in the winter more than 60 percent faster.

**Ohio Rehabilitation Services Commission:** The time to determine eligibility for vocational rehabilitation services has been reduced by more than half so Ohioans with disabilities will be able to find jobs faster.

# Ohio Bureau of Criminal Investigation



- FB & DNA Process Study
- Kaizen Event Report Out
- April 11-15, 2011

# The TAQ Masters



# The Team

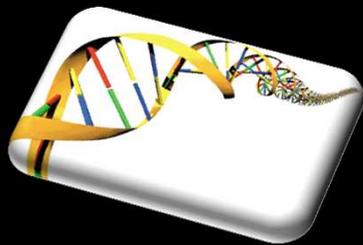
- **Mike Velten, Assistant Deputy Superintendent, DNA & FB**
- **Liz Benzinger, BCI DNA, Technical Leader/QA Manager**
- **Lewis Maddox, BCI-Richfield Lab Director**
- **Lynn Bolin, BCI-London DNA Lab Director**
- **Jen Duvall, BCI-Bowling Green, Acting Lab Director**
- **Amy Wanken, BCI-London, FB Lab Director**
- **Becki Hager, BCI-London, Office Assistant**
- **Bryan White, BCI-London, Special Agent, Crime Scene**
- **Casey Agosti, BCI-Bowling Green DNA Forensic Scientist**
- **Brenda Gerardi, BCI-Richfield DNA Forensic Scientist**
- **Kristen Slaper, BCI-London Forensic Scientist**
- **Russ Edelhelt, BCI-Richfield DNA Forensic Scientist**
- **Emily Draper, BCI-London DNA Forensic Scientist**
- **Julie Trackler, Executive Assistant to DAS Director**
- **Jonathan Blanton, Assistant Attorney General**

**Facilitators:** Bill Demidovich, Steve Wall, Gloria Calcara, Sue Kirby, Chris McGill, Cintas Corp., Amy Harris, Parker, Rich Martinski

# Background

The Ohio Bureau of Criminal Investigation processes more than 7,000 DNA cases each year. Most cases are received and/or processed beginning with Forensic Biology and then DNA at three primary laboratories, 1) London, 2) Richfield and 3) Bowling Green.

The process is utilized by most law enforcement agencies throughout the state and the results of BCI testing impact the viability of related case prosecution.

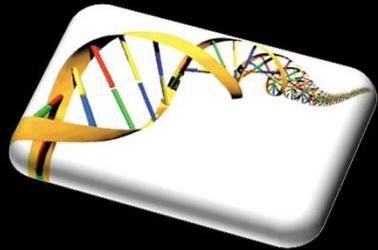


## Stakeholders

Victims/Victims Family  
Law enforcement agencies  
Courts  
Attorneys  
Accused offenders  
Ohio Attorney General

# Reasons for improving this process

- **Improve overall customer relationships.**
- **Improve service to enforcement agencies and victims/victim family members.**
- **Improve public/media understanding of the service levels provided by our units.**
- **Provide better education to submitters entering evidence into our process for increased accuracy and completeness.**



# Scope of Event

The process begins when agencies bring evidence to BCI and ends when the final report is issued or the forensic scientist testifies.

## **Overarching Themes:**

The purpose of this event is to reduce processing time and improve customer satisfaction while maintaining high quality.

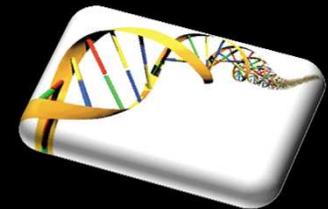
# Out of Scope

Areas that will not change as a result of the Kaizen event are:

- **No one loses their job because of the Kaizen event, but duties may be modified.**
- **Need for additional staff is not dependent on improvement process**
- **Need for additional monies is not dependent on improvement of process**
- **No legislative changes or changes related to collective bargaining.**
- **No IT solutions until it is determined that an IT solution is needed.**

# Goals & Objectives

- Have ALL cases come in ready to work
- Start work on all submissions within 5 days
- Achieve an average report time of 35 days from submission
- Reduce the number of reports returned for changes after technical and administrative review
- Improve customer and employee satisfaction



# Baseline Data

DNA Lab Statistics				
	Days Until Assigned	% Assigned	Total Days at BCI	% Assigned
One Day	122	39%	1	0%
2-7 Days	10	3%	1	0%
8-14 Days	8	3%	1	0%
15-30 Days	19	6%	8	3%
31-60 Days	65	21%	46	14%
>60 Days	92	29%	262	82%

The average processing time for DNA cases was 126 days. 50% were not assigned to a scientist for 30 days or longer

# Current-State Process Map



**187 steps**

**52 handoffs**

**43 decisions**

# The original processes had:

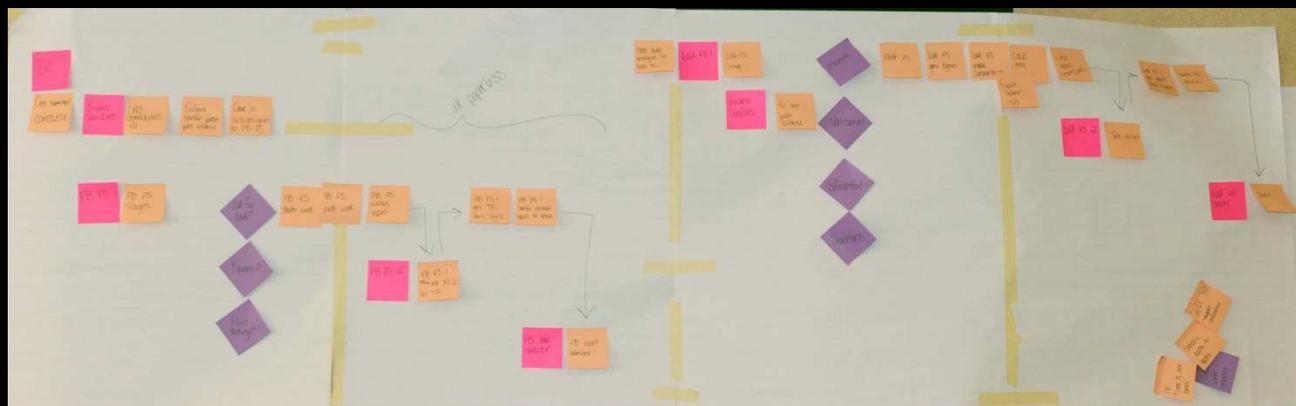
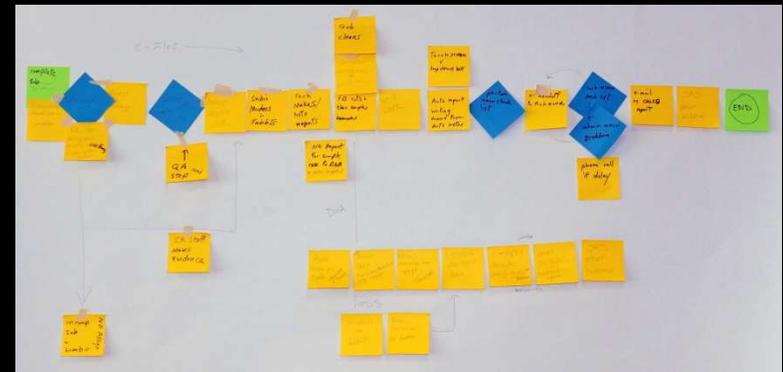
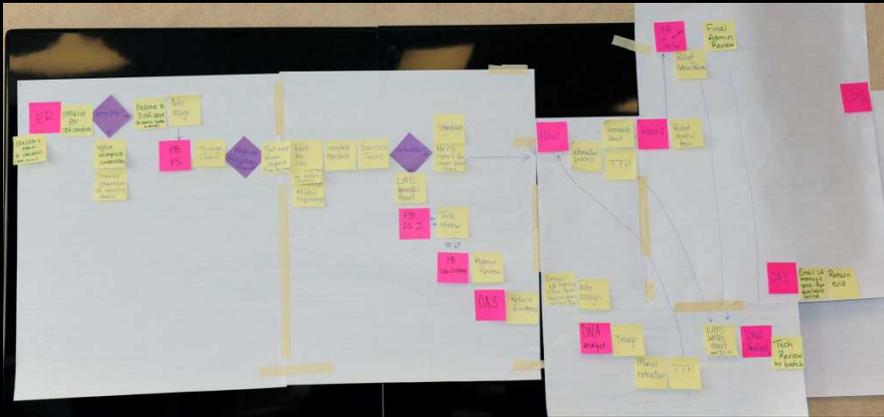
- Too many steps
- Too many handoffs
- Caused too much process lead time
- Too many duties for the forensic scientist that could be done by others
- Lot of delays
- Lot of redundancies

# The team brainstormed more than 70 improvement ideas

Garbage in=Garbage out  
Only take complete cases  
No non-sex cases at less than F3 level  
Edit sub. Policy (limit rushes)  
Establish better criteria for submission of evidence to reduce non-essential work  
Require synopsis & standards on submission  
Incomplete is unacceptable  
Tighten up compliance with evidence protocol – must have svcs std & synopsis  
Cases ready to be worked on submission  
Require checklist to be completed prior to case acceptance  
Incentives for status communication for Detectives & Court  
Stop cases at the door if they don't have everything they need  
Train LEA better  
Tell L.E. & Pros. What is required  
OHLEG Training & use  
Give Detectives /Inv. OHLEG access to reports  
No memos.. OHLEG  
Give BCI staff "read" access to OHLEG  
Electronic access to court dockets & OHLEG  
Mideo access on other computers  
Stop attaching CV to each report - stop mailing reports  
Automated note taking  
Purchase & install barcode system for sample tracking  
Dictation software for staff  
LIMS generate report from report input info  
LIMS that works  
LIMS creates reports FB/DNA little FS interaction wizards

Better LIMS – report writing – tracking sample types  
IT support to include program for robots  
Faster computers  
Make more of process electronic  
Paperless process  
Go paperless  
Better data mining tools to track trends and sample types  
Take better advantage of OA3s  
Have someone else order  
Evidence transfer to a minimum  
More support with admin functions (Purchasing ordering)  
Reassign non-technical tasks to OA3s  
Liz have dedicated OA3  
OA3 to order supplies (2)  
Delegate some responsibilities to OA3  
Decrease amount of case transfer  
Don't transfer cases/evidence  
Less shipping around of case files  
Minimize transfer between labs  
Eliminate or reduce Fed Exing  
Less movement of case pockets- only absolutely necessary transfers  
Organize DNA vault for incoming evidence  
Property room person to move evidence  
Place in DNA vault (no transporting from vault to vault)  
Good scanners for case files  
Better define interpretation guidelines (i.e.: inconclusive)  
Bar code readers for DNA sample tubes  
Use colored folders to identify case typed priority  
Assign additional counties to L&R – from BG area

# Clean Sheet Redesign



# Common Ground

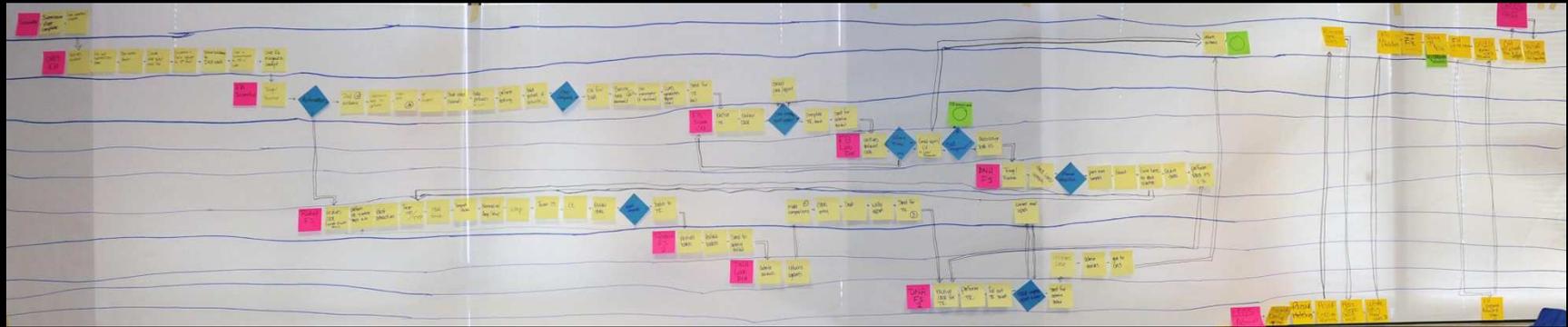


## Common Ground

- Auto-Assign
- Submission Policy Enforced
- No more mailing
- QC Tech Responsibilities
- OAS's move evidence
- Bar coded Tubes
- Tablets for Notes
- Triage in analysts Hands

- Automated Flow Path.
- Paperless
- IDX - use it.
- LIMS enhancement
- Simple cases bypass FB reporting
- Visual Prioritization
- CODIS - Forensic check by analyst - rest Adm-ORS.  
(initials)
-

# The New, Improved Process



84 steps

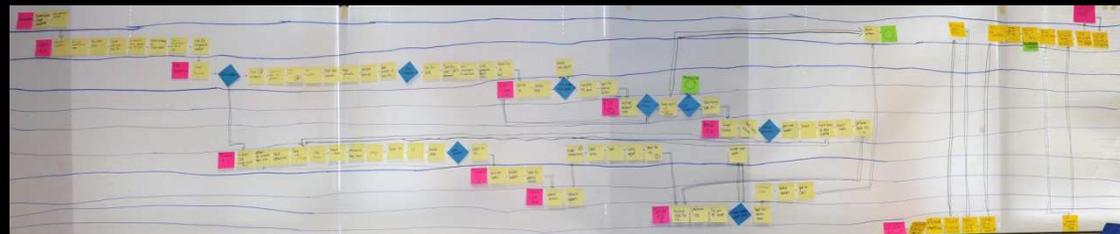
26 handoffs

8 decisions

# Old Process



# New Process



# The Results

Measure	Before	Projected After	Difference
Number of Processes	3	1	66% reduction
Steps	187	84	103 less steps -55%
Decisions	43	8	81% fewer
Handoffs	52	26	50% fewer
Forensic Biology Processing Time	50 days	14 days	36 fewer days 72% reduction
DNA Processing Time	126 days	21 days	105 fewer days 83% reduction
Overall Processing Time	117 days	35 days	82 fewer days 70% reduction

# More Results

- Reduced information-gathering steps
- Created a process that can be explained to the customers
- Reduced job frustration; revitalized job satisfaction
- Buy-in from all levels of staff

# Projected Cost Savings

Laboratory-wide savings :

**Paperless Reports:**

**Paper Savings: \$28,000 annually**

**Postage Savings: \$12,000**

**OA3 time spent mailing: \$17,000**

**Projected Annual Savings of \$57,000**

# Staffing Plan

**2012 Budget includes money to hire 8 DNA Forensic Scientists (\$500,000/year)**

**Post Kaizen staffing plan:**

**4 DNA Forensic Scientists**

**3 Laboratory QC/QA Analysts**

**3 FT & 2 PT dedicated OA3s to the DNA Biology Unit**

**BUDGET NEUTRAL**

Key Issues	Major Improvements
Each lab had a separate process	Standardized processes
Forensic samples came in incomplete	Created a new checklist and educational process to ensure more complete submissions.
Scientists doing too many other duties	Moving duties to more appropriate staff . Hiring and using office assistants.
	Future hiring of technicians to free up scientists to do more DNA work
Lead time too long	Reduced steps, implementing paperless process,
Purchasing procedures were burdensome & caused delays	Credit card, blanket POs, pre-approved standard lab supplies vendor
Employees took too long to get help	Dedicated IT staff at BCI

# Implementation Plan

- Submission Expectation action items
- Training plan
- Communication plan
- IT action items
- HR action items
- Fiscal action items
- Data collection



# Action Plans

## Fiscal Action Plan

What	Who	When
P-cards x2	Jennifer B. (memo to COO)	4-22
List of most common vendors for - Blanket POs - "Preapproved" Std Lab Supply Vendors	Levi	4-22
Timing for Maintenance Contracts	Mike Jennifer B.	
Performance audit of local PCs - Help Ticket with PCs	Lynn and Levi (Liz)	4-22
Ensure IT is aware of all DNA IT projects needed	Mike, Levi, Liz, Lynn	4-22

## HR Action Plan

What	<sup>HR</sup> Who	When
Potential intern Candidates fr. OSU	Erica	Mon, Apr 18
Create specs/P.D. for tech position	Erica + BCI mgrs. est	June 18 (8 wks)
<sup>tech</sup> Study tasks that can be reassigned to OA3	Erica	Mon, May 2 (2 wks)
OA3 - Designated per Lab. - Mike Study IT support staff for BCI - Mike		

# Submission Form

HEADER

(susp. vic case #  
dates agency  
offense)

BARCODE

★

Charged  yes  no

Trial Date  yes  no

Grand Jury  yes  no

In Custody  yes  no

Other comments:

Agency Item	description	where?	Purpose/ why?
1	comforter	victim's bed	suspects semen
2	pants	victim's pants	suspect's semen
3	underwear	suspect's underwear	victim DNA
4	knife	found @ scene	susp-handle vic-blade
5	swabs/ - standard	victim	for comparison (auto populate)
6	standard	suspect	for comparison (auto populate)

(Submitted by)

(Investigator)  
Brief Synopsis: ★

# Come Monday...



- Purchasing
- DNA can be stored upstairs (London)
- Help desk
- Eliminate simple biology blood reports

# Benefits

- Less paper products
- Reduced postage costs
- Less waiting time
- Less frustration for employees
- Streamlined process
- Process is a product of the employees
- Reduces the opportunity for human error
- Fewer incomplete submissions
- More standardized workflow between labs
- Better use of scientists' time



# Step 4



Develop a network of additional practitioners to meet the increased demand for Lean efforts

## *Matching supply and demand*

As more people and agencies wish to use Lean, increase capacity by developing a variety of opportunities for training, mentoring and gaining experience – both within the Lean Ohio Office and interested agencies. Ensure new Lean champions in all agencies have support from experienced practitioners

# Creating a Kaizen Academy



- Trying valiantly to replace Cintas and Parker  
Training MUST be standardized  
Government examples < manufacturing examples  
Outside offerings are very expensive, significant variation, focused on manufacturing
- The state would save significant dollars and provide better training if we do it internally rather than having each agency contract with outside consultants or colleges to provide.
- Adding 300K to budget to develop Black Belt, Green Belt, Yellow Belt, and Lean Practitioner Certification courses focused on government
- Saves over \$200k the first year over consultants
- Lean for Managers
- Variety of other courses such as 5S, 3P, Poka-Yoke, courses



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“The LeanOhio Network is achieving results throughout state government.”



Learn how the Network is organized

The Network has five groupings based on members' different levels of Lean-related involvement and know-how. [Click for details.](#)

See who's who in the Network

The Network Directory provides info about Network members. The Network is big, but the directory is easy to navigate. [Click here.](#)

Get the latest news and views

This series of posts by LeanOhio staff will keep you up to date and informed about all things Lean in Ohio state government. [Click here.](#)

The LeanOhio Mission: Making state government in Ohio simpler, faster, better, and less costly.

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# Step 5

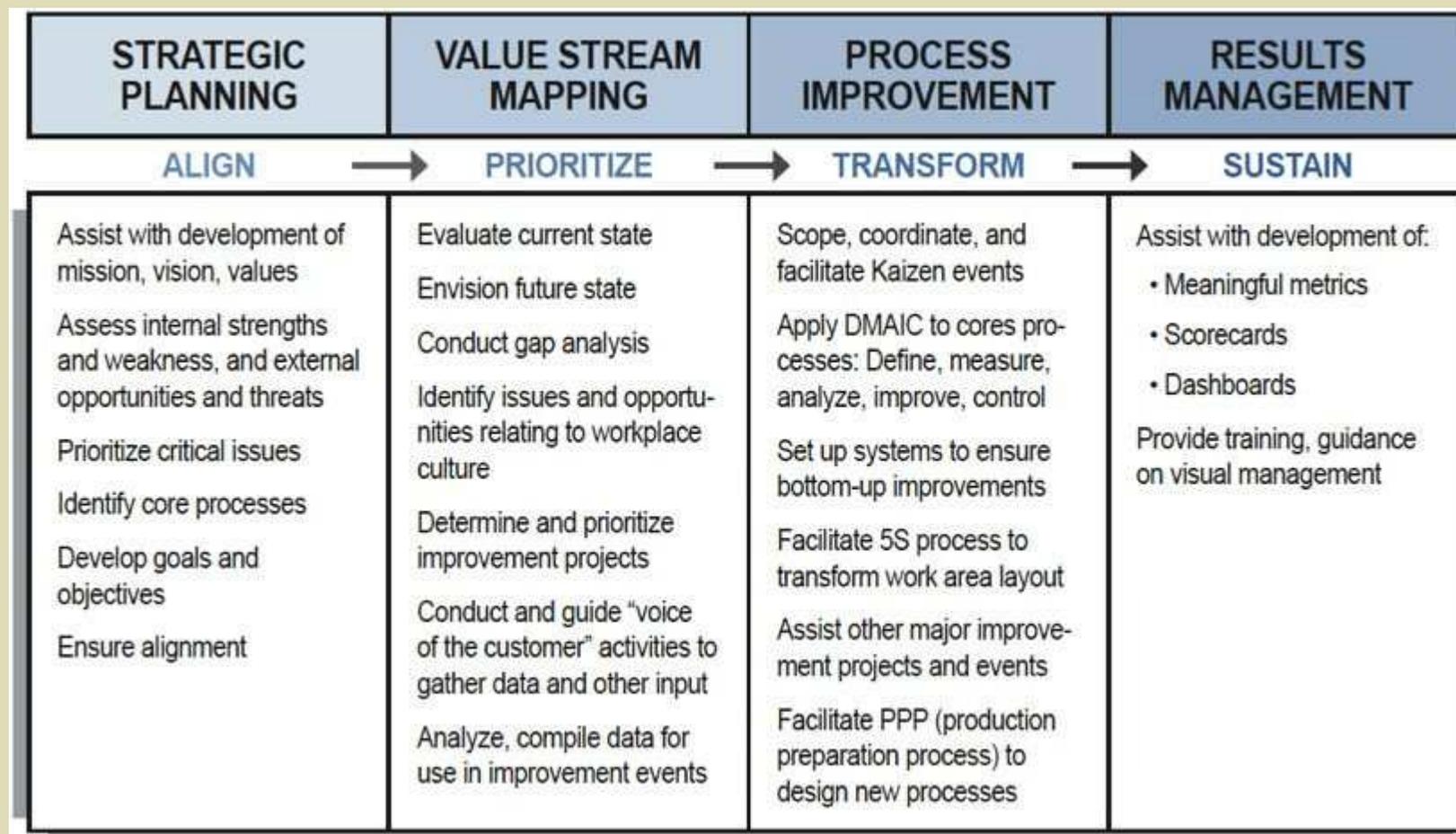


Ensure major improvement efforts are prioritized, aligned with agency goals, and managed with appropriate visual metrics

***From random projects to aligned system improvements***

Widen focus to include strategic planning, understanding and improving systems through value stream mapping, creating efficient processes the first time and visual management systems to better ensure complete success

# Lean Ohio Focus



# Step 6



Support opportunities for greater use of Lean tools  
by everyone

## *Push Lean down and out*

Promote bottom-up improvement efforts so everyone is improving all  
the time – not just if on Kaizen events.

# Lean Routine



- Make improvements all in one day, over 5 separate weekly meetings, or a combination. Steps:
  - 1) Scope the issue to ensure it is the right size (remember guidelines on previous page)
  - 2) Make that part of the process visible, and gather data such as lead time, cycle times, error rates, costs, etc. for those steps identified
  - 3) Analyze Data, ID Waste, and non-value added activities
  - 4) Lean it Up
  - 5) Do it!

# Step 7



Lean thinking becomes the normal routine rather than something done just during an event

## *Lean embedded in state government's D.N.A*

How else would you do ***any*** state business except by using the best practices for improvement and efficiency? Lean is naturally part of all meetings, projects, day-to-day work activities, and new employee orientation

# Not there yet, but...



- **Since January 2011**
  - More than 100 Lean improvement efforts including 40 week-long Kaizen events.
  - In Fiscal Year 2012 the ROI was 42:1
  - Kaizen event teams on average eliminated 54% of the process steps they identified, meaning thousands of handoffs, loopbacks, decisions, and unnecessary red tape was eliminated.
  - More than 120 Lean Six Sigma Black and Green Belts graduated.
  - \$145 million in cost savings / cost avoidance
  - Transformative: Teams average a 52% reduction in process lead time
  - Millions of hours citizens and businesses must wait on government has been eliminated.



Additional information can be found at [LEAN.Ohio.gov](http://LEAN.Ohio.gov)