



LEAN Ohio
BOOT CAMP

Course Overview
Day 1 Module 1

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Why are we here?

- Changing world / increased demands
- Simpler, faster, better, and less costly
- Success in state government
- Provide opportunities for local government to learn and apply these best practices



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Course Learning Objectives

- Participants will be able to:
 - Distinguish lean and six sigma
 - Identify an improvement project
 - Identify customers and their needs
 - Map a process
 - Identify and remove waste from a process
 - Apply at least two tools at home or work
 - Prepare an action register
 - Be ready to be on an improvement team!

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Course Overview

- 5 day course
- Focus primarily on Lean
- Principles, practices, and tools
- Highly interactive with exercises and a simulation

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Course overview

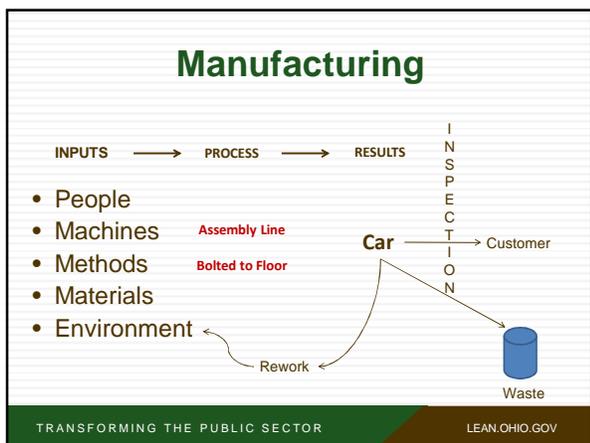
Day 1	Day 2	Day 3	Day 4	Day 5
Introduction, Overview and Basic Principles <ul style="list-style-type: none"> • Lean Six Sigma Overview • Listening to the Voices • DOP Simulation • SIPOC – Introduction to Scoping 	Making the Invisible visible <ul style="list-style-type: none"> • Project Charter • Metrics and Data Collection • Operational Definitions • Process Mapping • Identify Waste and Value-Add • Interpret the Process Map 	Analyze and Improve <ul style="list-style-type: none"> • 5 S+ safety • Batching, Flow, Push – Pull, Standard work • Poka Yoke, Pareto diagram • Brainstorming, Affinity diagram, Impact-Control matrix 	Achieving transformation: Process Redesign <ul style="list-style-type: none"> • Clean sheet redesign • Create future state • Making the future state happen • Implementation plans and tools 	Leveraging Results <ul style="list-style-type: none"> • Measures of success • Team management • Change management • Taking Lean back to your workplace

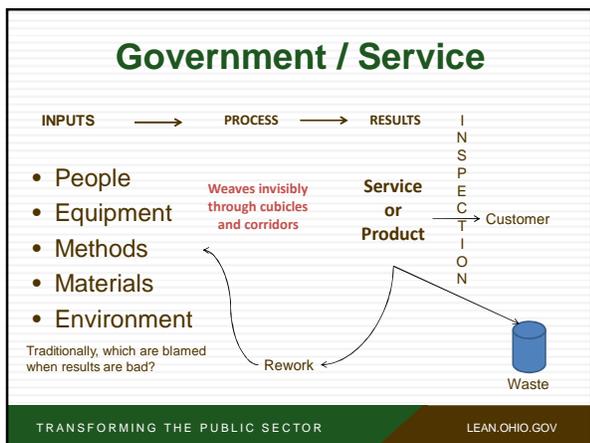
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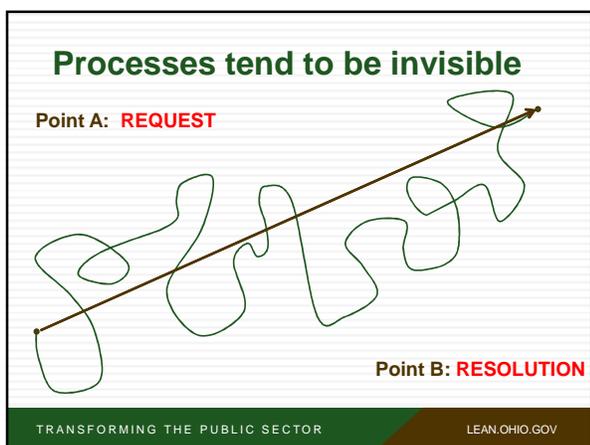
What is LeanOhio?

- An approach to making government services simpler, faster, better, and less costly
- Based on business best practices of Lean and Six Sigma
- State government
- Local government

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The Key Differences

- The main challenges of 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 does not routinely apply Lean to the back office service processes

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In manufacturing or government, Whatever your results...

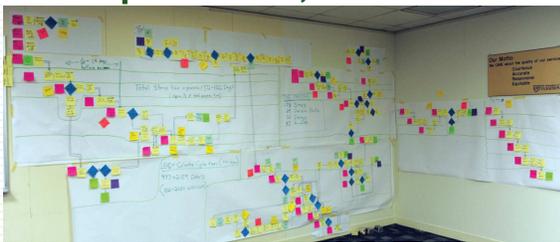
- Lead time
- Cycle time
- Errors
- Costs
- Rework
- Customer satisfaction or frustration

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

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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

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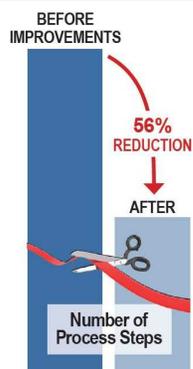
Ohio's Approach to Lean

- Ohio state government utilizes an approach called "Kaizen events"
- Kaizen means *to break for the better*
- A Kaizen event is 5 days where a team of people who do the work examine a process and determine how to improve it
- Initial implementation of the improvement occurs starting the following Monday

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SIMPLER



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FASTER



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BETTER



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LESS COSTLY

RETURN ON INVESTMENT:
In **FY2013**, for every **\$1**  invested in LeanOhio activities, the state gained more than **\$40** in projected savings.

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More Demonstrated Success

- Returned injured workers to work 4 days sooner
- Eliminated a 16,000 volume backlog of tax appeals
- Licensed car dealerships an average of 186 days faster, saving those businesses between \$200,000 and \$300,000 each
- Reduced time to process DNA samples from 126 to 21 days, ensuring the right person is convicted

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LGIP / LGEP

- Local Government Innovation Program (LGIP)
- Local Government Efficiency Program (LGEP)
 - Scholarships
 - Grants
 - Support

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Facilitator Introduction

- Name, Credentials/Experience
- Contact Information
- Why I am excited about this session

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Introductions

- Name, Organization, Position
- Quality Improvement Experience
- Expectations
- First or Most Interesting Job

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Ground Rules

- Everyone participates
- Open and honest dialogue
- Respect Opinions
- Consensus
- Blameless Environment
- Leave Rank at the Door
- Other?

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Housekeeping

- Silence your cell phones
- Keep interruptions to a minimum
- Be on time
- Stand up and stretch when you need to
- It's always snack time
- Dress code
- Restroom Location
- Schedule/Breaks/Lunch

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Class Logistics: Dates and Times

- Dates:
- Lunches:
- Class Times:

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Icebreaker



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Lean is all about Change

- Improvement means change!
- Change is not always easy
- Changing how you do your job, AND
- Changing how you think about your work



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Circles of Learning

- Comfort Zone
- Learning Zone
- Panic Zone



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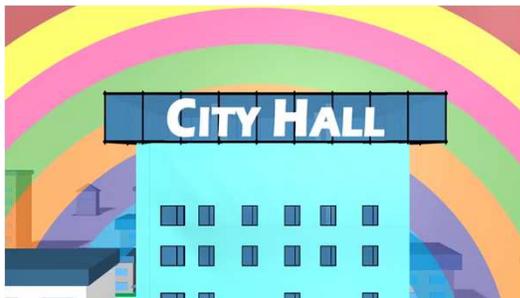
Lean Boot Camp Expectations

- Identify problem/opportunity in your organization
- Utilize and apply Lean Tools
- Become a member of the LeanOhio Network

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The Fable of Complexity



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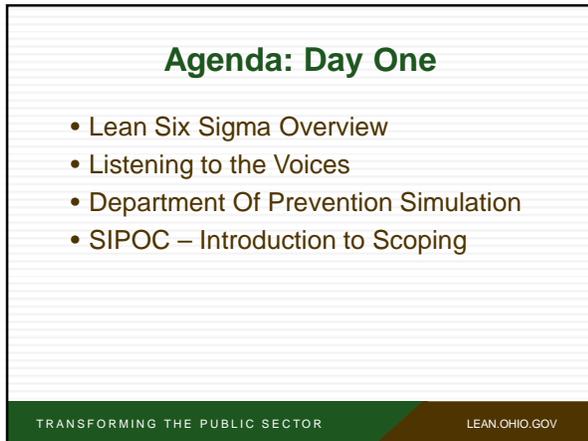
Questions / Comments



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Seven Key Principles of Lean

1. Define value in the eyes of the customer
2. Identify the process for a service or product
3. Create continuous flow without interruptions
4. Reduce defects in services or products
5. Let customer pull what they want
6. Pursue perfection (Six Sigma)
7. Eliminate or reduce variation

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ASQ Foundations of Lean

Lean shines a spotlight on the eight wastes and seeks to eliminate or reduce these wastes by the use of, but not limited to:

- Teamwork with well-informed, cross-trained employees who participate in the decisions that impact their function
- Clean, organized, and well-marked work spaces
- Flow systems instead of batch and queue
- Pull systems instead of push systems
- Reduced lead times through more efficient processing, set-ups and scheduling

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Foundations of Lean

- Two pillars of Lean
 - Pursuit of continuous improvement
 - Philosophy of respect for people
- The true value of continuous improvement is creating an atmosphere of continuous learning and an environment that embraces change



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ASQ: Steps of Lean

- **Define:** Defining Value – Value must be determined by the customer
- **Identify the Value Stream:** The sequence of activities contributing value; identify non-value added activities to determine if they are necessary
- **Enhance Value Flow:** Flow is the moving of the product uninterrupted through the system to the customer.
- **Maximize Customer Flow:** Create the product upon customer requests
- **Optimize the Process:** efforts to remove waste and improve flow never cease.

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What is Six Sigma?

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What is Six Sigma?

- Six Sigma is a **business management strategy** originally developed by Motorola, USA in 1986
- Six Sigma seeks to improve the quality of process outputs by **identifying and removing the causes of defects (errors) and minimizing variation** in business processes
- A six sigma process is one in which 99.99966% of the outputs produced are statistically expected to be free of defects (**3.4 defects per million**)

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The pursuit of perfection

Not 99% good...

But 99.99966% good

What's the difference?

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No electricity for seven hours each month

One hour without electricity every 34 years



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200,000 wrong prescriptions given to patients each year

68 wrong prescriptions given to patients each year



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Two bad landings
at most airports
every day

One bad landing at
most airports every
5 years



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Six Sigma

- Six Sigma is the Best of the Best
- Six Sigma:
 - Minimizing variation
 - Identifying and removing the causes of defects



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Try This!

- Team1 – write your name on one and pass
- Team2 – write your name on three and pass
- Team3 – write your name on all and pass



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Three Levels of Six Sigma

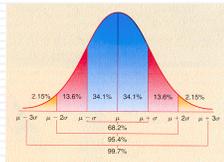
- Metric
- Methodology
- Management system

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Six Sigma as a Metric

- A Six Sigma process is one in which 99.99966% of the products are statistically expected to be free of defects – which equates to 3.4 defects per one million opportunities



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Six Sigma Methodology

- Focused on Customer
- Data Analysis
- Minimize Variation
- Continuous Improvement
- DMAIC

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DMAIC

DMAIC	
Define	Define the problem, clearly and related to customer
Measure	Measure what you care about, know your measure is good
Analyze	Look for root causes; generate a prioritized list of Xs
Improve	Installing the optimal solution and transitioning to process owner
Control	Ensure the problem doesn't come back – Sustain the Gain

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Six Sigma Management System

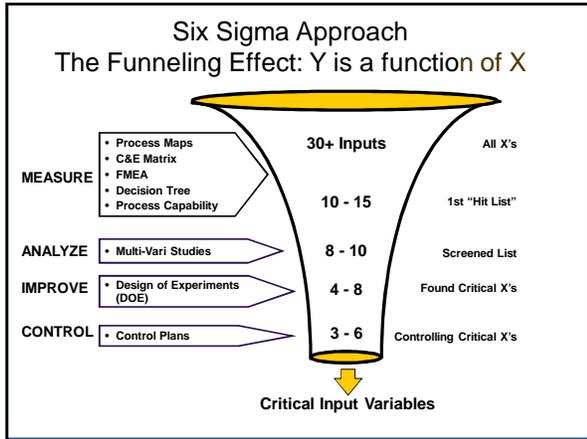
- Culture of the organization
- Improvement tools
- Support system for the tools

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Variation is Evil

- Variation = lack of standardization
- Common causes of variation:
 - Missing information
 - Unsure of the answer
 - Lack of training
 - Non-standard lists, signs, manuals

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Lean Six Sigma

Process improvement requires aspects of both Lean and Six Sigma approaches. Both are:

- Customer focused
- Quality focused
- Require strong management support
- Data driven decisions
- Proven continuous improvement methods

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Lean and Six Sigma

Lean	Six Sigma
Two Pillars: Continuous Improvement & Respect	DMAIC Methodology
Reduce Time and Waste	Reduce Defects and Variation
Reduce cycle time and bottlenecks with an emphasis on flow and pull	Six Sigma Goal: 3.4 Defects per million opportunities
Process Mapping, 5S and 7 Wastes – and more	Data and Root Cause Analysis Tools – and more
Achieves goals by use of less technical tools such as kaizen, workplace organizational and visual controls. (ASQ)	Achieves goals by use of statistical data analysis, design of experiments and hypothesis testing. (ASQ)

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Start with Lean

- According to ASQ: "The most successful users of implementations have begun with the lean approach, making the workplace as efficient as possible, reducing the eight wastes and using value stream maps to improve understanding and throughput. When process problems remain, the more technical Six Sigma statistical tools may be applied.
- LeanOhio experience supports this statement

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Lean Boot Camp: Transforming the Public Sector

History of Continuous Improvement

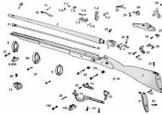
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History of Continuous Improvement

1793



Lean thinking may be traced to Eli Whitney who is credited for spreading the concept of interchangeable parts



1800s



Six Sigma has its roots all the way back to the 1800s with Carl Frederick Gauss' concept of the normal curve



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History of Continuous Improvement

1901 Henry Ford went to great lengths to reduce cycle time and lower costs



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History of Continuous Improvement

1940s U.S. Military becomes primary proponent of quality to help support the war effort



Japan enters the quality revolution following Joseph M. Juran and W. Edwards Deming: total quality control (TQC)

Quality

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History of Continuous Improvement

1950s Toyota Production System (TPS) developed between 1948-1975 packaged most of the tools now known as lean manufacturing



1970s Japan's high quality outsells U.S. industries. U.S. responds by emphasizing statistics and embracing (TQM)

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History of Continuous Improvement

1986



MOTOROLA

Six Sigma officially begins as a statistics based method to reduce defects at Motorola Inc.

1991

Motorola certifies its first Six Sigma "Black Belt". Allied Signal and GE follow.



2000s

Quality moves beyond manufacturing into service, healthcare, government and education

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Lean Boot Camp: Transforming the Public Sector

Quality Pioneers

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Quality Pioneers

- W. Edwards Deming (1900-1993)
- Walter A. Shewhart (1891-1967)
- Joseph M. Juran (1904-2008)
- Philip Crosby (1926-2001)
- Kaoru Ishikawa (1915-1989)

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W. Edwards Deming

Credited with starting the modern quality improvement movement

- Introduced statistical methods to American industry during World War II
- Quality is what the customer needs and wants
- Process-oriented approach
- Acknowledge and involve of workers' expertise
- Understand variation using statistical analysis

"95% of quality problems are due to system, while only 5% are due to employees"

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Walter A. Shewhart

Father of statistical quality control

- Developed control chart techniques – common cause and special cause variation
- Methodology: PDCA Cycle (known as the Shewhart Cycle or Deming Cycle)



Plan, Do, Check, Act

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Joseph M. Juran

Co-founder of the 20th century quality movement

- Worked with Japanese to introduce quality concepts
- Quality control as a management tool rather than specialist's technique
- Cost of Quality

Cost of Quality: The further from the source, the greater the cost

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Phillip Crosby

Business Person of Quality



- Basis of quality is based on DIRFT
“Do it right the first time”
- Made quality meaningful and accessible to American executives
- Promoted addressing quality problems through existing management structures rather than from statistical basis

DIRFT: “Do It Right The First Time”

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Kaoru Ishikawa

Father of Japanese Quality Control Efforts



- Made quality movement a nationwide phenomenon
- Company-wide quality control (CWQC) to distinguish the Japanese approach from Total Quality Control
- Use of 7M Tools

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Questions on Lean / Six Sigma Overview?

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The Four Voices
Day 1: Module 3

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Movie Theatre Thoughts

- You own a local movie theatre
- You are going on vacation for 10 days
- You have asked your theatre manager to email you 5 data items every other day

What would you want to know?



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VOICES

Listening to the immediate environment

4 Voices

- Voice of the Customer - VOC
- Voice of the Business - VOB
- Voice of the Process - VOP
- Voice of the Employees - VOE



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Customer Focus

Value Stream vs. Traditional View

"Whenever there is a product or service for a customer, there is a value stream."

"The challenge lies in seeing it."

*-Learning to See
Jim Womack*

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VOC – Voice of the Customer

- Who are our customers?
- What do they want?
- What are we doing that they don't want?
- What do they think of our services?
- What would they like in addition?
- Are we fast enough?
- What are their reactions to staff?

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Recording the VOC

- Written Survey
- Email Survey
- Phone Calls
- Complaints
- Interviews - Focus Groups
- Data (Number & type of calls we get, etc.)
- Plus Delta - Scorecards

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Email Survey

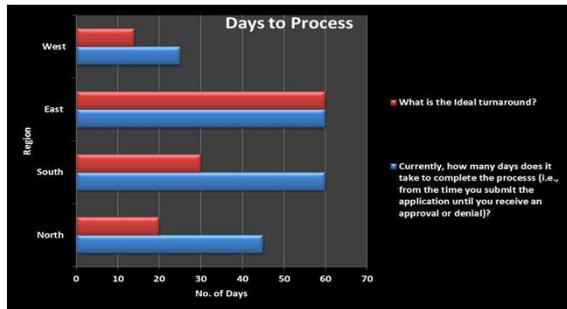
Background: Processing time has increased significantly creating a backlog of applications to be processed. The department does not have an established goal for processing.

What survey questions would you ask?

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Email Survey



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Email Survey - Comments

- “Pre-logging is cumbersome due to the amount of pages or screens you have to go through to enter the info. It seems repetitive and unnecessary. Perhaps a format similar to this survey would be much easier.....just check boxes and less screen updating.”

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Email Survey - Comments

- “The department treats me/us so well. They have always been accommodating to us - even when we screw up and need something done yesterday. The only complaint is getting the application processed quick enough for our customers who are always clamoring for results. The East Office probably could use a few more employees.”

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Voice of the Customer

How satisfied were you with the services received?

Department	Score
DAS	3.84
HRD	3.90
GSD	3.57

How do you rate the value of the services?

Department	Score
DAS	3.84
HRD	3.90
GSD	3.57

Did you receive the services you expected?

Department	Percentage
DAS	88.0%
HRD	91.8%
GSD	92.8%
OIT	81.4%
EOD	78.7%
OCB	97.8%
Central Service	88.6%
LeanOhio	85.0%

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VOC - Customer Trends

- Immediate feedback – close to the service
- Utilize social media
- Web utilization
- Raised expectations
- Want it faster
- Want it on-line
- Want it INSTANTLY

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Do Customers Fail?

When they do...
have we failed?

I followed correct procedure but the customer wasn't very happy....

The customer clearly didn't follow correct procedure.



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VOB - Voice of the Business

- The “voice of the business” is the term used to describe the stated and unstated needs or requirements of the organization
 - Mission Statement
 - Goals
 - Burning Platforms
 - What are other examples of VOB?

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Google's mission is to organize the world's information and make it universally accessible and useful

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Board of Health Mission

To prevent disease and injury, promote positive health outcomes, and to provide critical services to improve the health status of the community

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VOB - Goals

DAS Strategic Planning Process
DAS Mission: To provide Service, Support and Solutions that improve state government in Ohio by:

- Service
- Support
- Solutions

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VOB Burning Platforms

Congressional Inaction on Road Funding Hits the States

Concerned that Congress won't find enough money for planned projects by summer, Arkansas and Tennessee have scaled back transportation work. Other states are pondering similar moves.

by [Daniel C. Vock](#) | April 14, 2014

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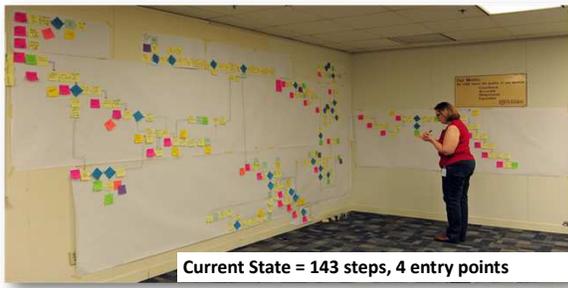
Voice of the Process

- Process Time
- Errors in Process
- Rework
- Safety data
- Backlog
- Cost

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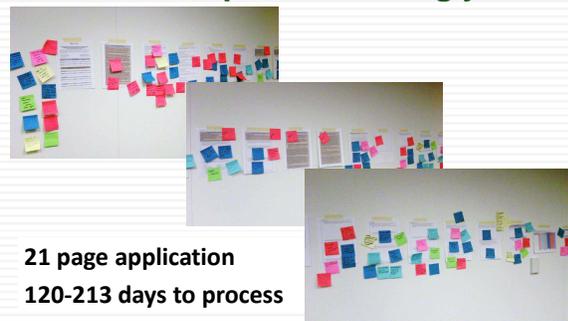
What is this process telling you?



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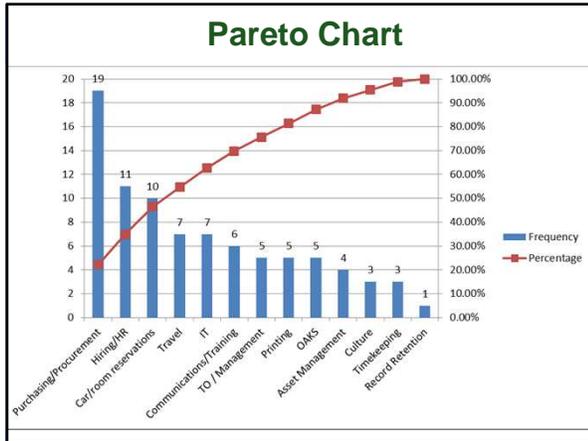
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What is this process telling you?



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VOE - Voice of the Employees

- Is there anyone who know the inputs, process and outcomes better?
- Is there anyone better situated in your organization that, when positively engaged, can move your process improvements forward?

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VOE - Voice of the Employees

- Employees are closest to the work
- Feelings count
- Ideas come from employees
- A better place to work
- “Set them up for Success”
- Change can be very difficult
- Buy-in is critical
- Be aware of the “mood” and morale

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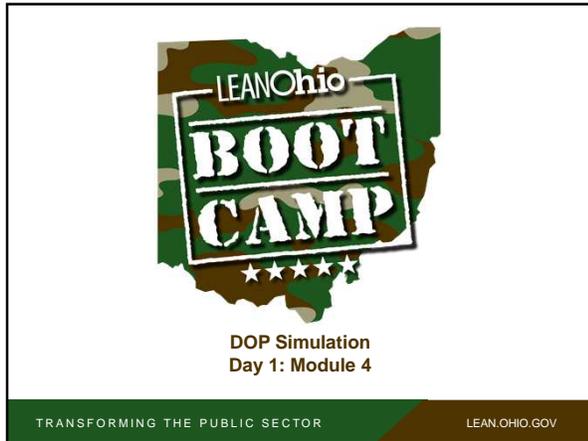
Questions on the 4 VOICES?

- Four Voices
- Recording the Voices
- Customer Focus



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DOP Application Simulation

- Department of Prevention (DOP)
- DOP is a Government Organization
- DOP reviews applications from other Government Organizations

DOP Motto: Keeping bad things from happening.

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Application Processing Section

- You will be working in the Application Processing Section
- This Section receives applications from government organizations requesting permission to conduct process improvement activities
- DOP processes two types of applications: **Renewal and Initial**

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Application Processing Section: Goals

- The section goals are to process applications as quickly and efficiently as possible without losing quality
- The section must process 16 applications every day in order to meet customer demand and avoid a backlog
- A day lasts 6 minutes

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DOP Simulation Rules

- DOP needs to process 16 apps every day (6 min)
- Each DOP employee is required to work until the end of the day
- Every position has written instructions that must be followed
- Each DOP employee is responsible for getting their own materials
- Materials cannot be shared and must be transported in the authorized folders only
- Each folder can hold only two applications

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DOP Simulation Rules

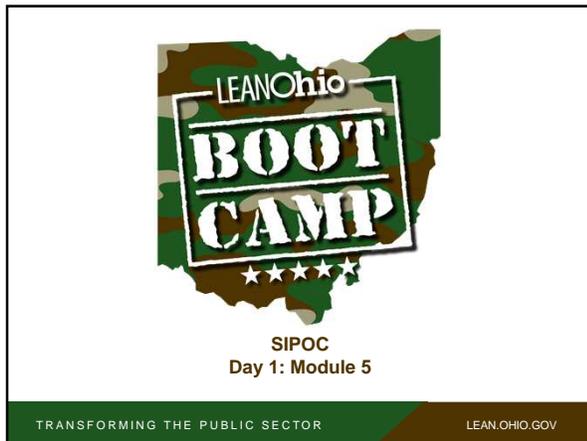
- Extra materials can be found in the Supply Area
- Running is not permitted
- All DOP employees are responsible for moving their completed work to the next worker
- Folders cannot be moved across the table. All work must travel around the outside of the table
- Forms will be processed in batches of two
- You are required to follow the written instructions

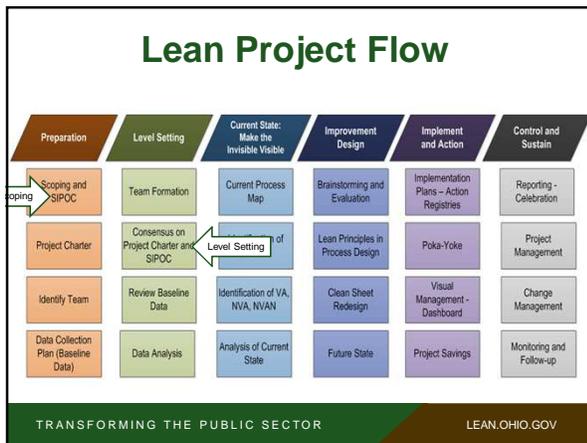
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DOP: Job Assignments

Job Assignments
Mail Carrier
Mail Opener
Renewal Processor
Initial Processor
Legal
Approval
Addressor
Auditor
Quality Assurance

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SIPOC

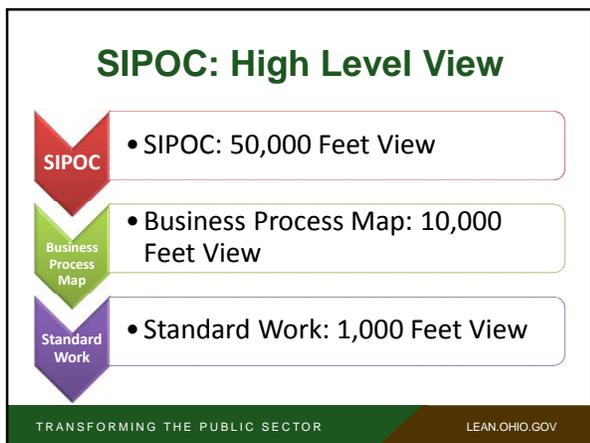
- SIPOC diagram is a type of process map used to identify the primary elements of a process
- It provides a macro view that brings together Suppliers, Inputs, Process, Outputs, and Customers
- Defines the scope of the process/project

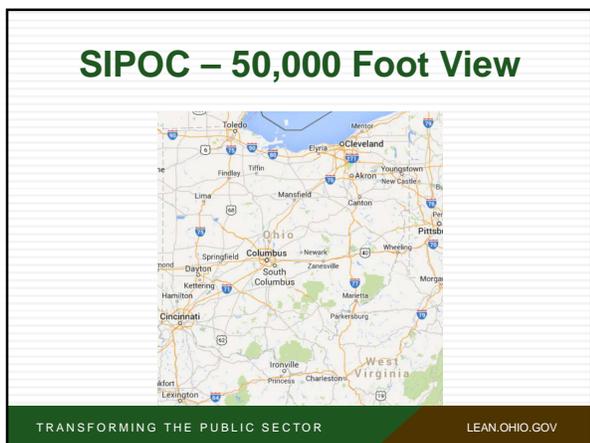
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SIPOC

Suppliers	Inputs	Process	Outputs	Customers
Individuals or organizations that provide inputs to the process.	Material, information and/or services that are required by the process to produce the outputs (People, methods, machines, materials & environment)	The step by step method that produces the output, defined at a very high level- only 5-7 steps	Products, information, services and/or decisions that are produced by the process	Those who receive the process output, pay for it or are directly impacted by the process output

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Process Mapping: 10,000 Foot View



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Standard Work – 1,000 Foot View



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SIPOC Purpose

- Define and document
- Identify scope
- Level set
- Operational definitions
- Key terms
- Ensure it is a process

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Where to Start

- S: Supplier
- I: Inputs
- **P: Process**
- O: Outputs
- C: Customer

Always start with the Process!

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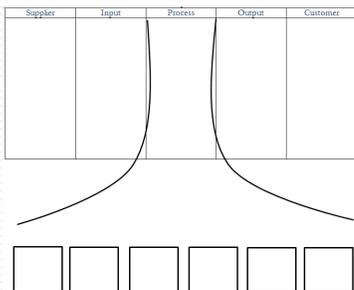
SIPOC - Process

- High Level: 5-7 process steps
- Reach Consensus
- Use post it notes to document each step
- Beware of those that want to get into the details of process
- Great tool to share with senior leadership

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SIPOC Template



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Outputs

- Identify and document the outputs
- Products, materials, services or information provided to customers (internal or external), from a process
- Not all outputs are desirable

What the process produces for the customer(s)

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Customer

- Identify and document the customers
- Recipient of each output of your process

Customer is the recipient (person or department) of the process output (product, service or information)

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Inputs

- Identify and document the inputs
- Review each step of the process map to determine what is necessary to complete the step
- Inputs: The products, services and material obtained from suppliers to produce the outputs delivered to customers

Input: (Typically) People, Machines, Methods, Materials, and Environment

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Suppliers

- Identify and document all of the suppliers who provide your inputs
- Customers are often also suppliers

Suppliers: A source of materials, service or information provided to a process

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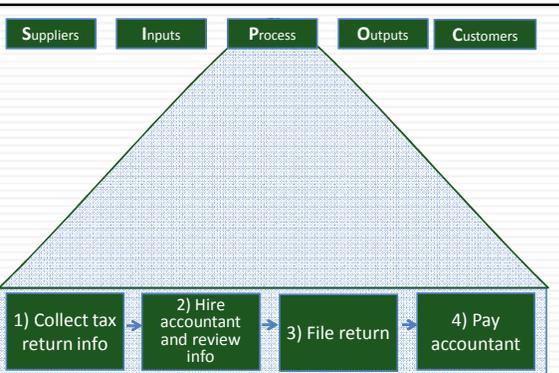
SIPOC Example

The process of filing your tax return



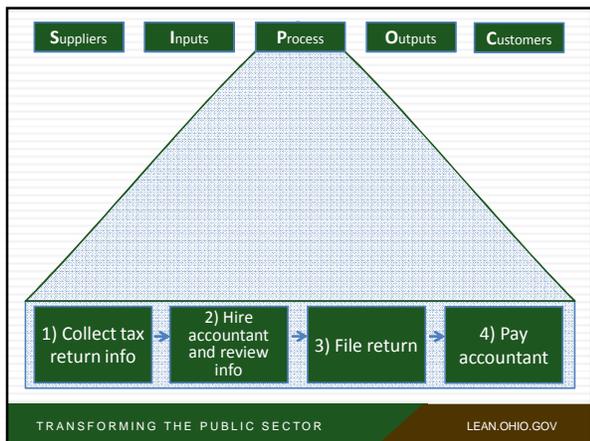
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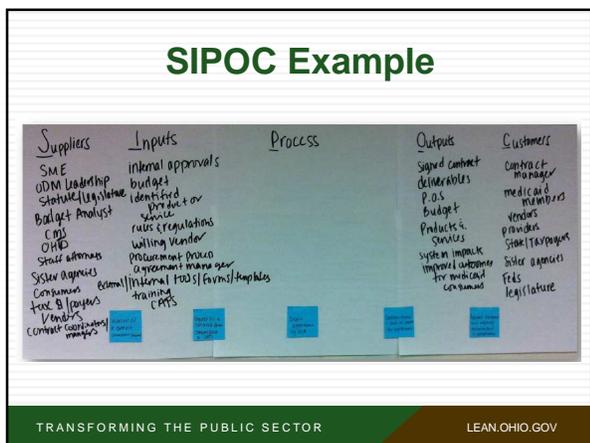


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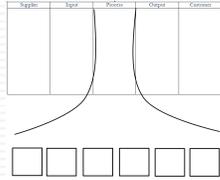






Questions on SIPOC?

- S: Supplier
- I: Inputs
- P: Process
- O: Outputs
- C: Customer



SIPOC Exercise

- In your groups – create a SIPOC for the DOP Application Processing Section
- Start with the Process



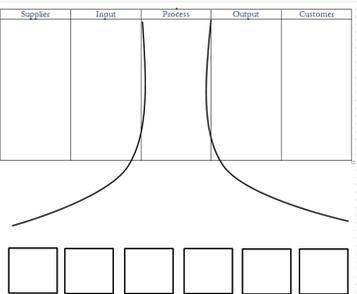
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Scoping / Charter
Day 2: Module 1

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Review Day One

Supplier	Input	Process	Output	Customer

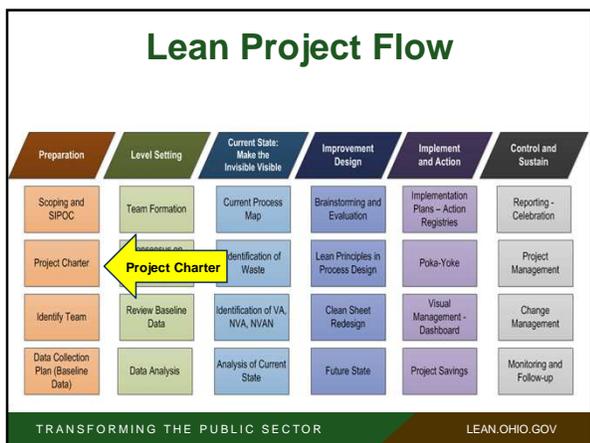


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Day 2 Objectives

- Complete a Project Charter
- Identify Metrics and collect data
- Develop operational definitions
- Map a simple process
- Identify Waste and Value Add Activities
- Interpret the Process Map

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Project Charter

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- ## Why Charter?
- Document and approve projects
 - Scope of authority
 - Creates common understanding
 - Monitoring
 - “Living” document
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Project Contact Information

LEANOhio Project Charter

Project Event Title	
Project Facilitator	
Agency Organization	
Project Mentor	
Charter Last Updated Date	

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Project Background	<h2 style="margin: 0;">Project Background and Opportunity</h2>
Problem/Opportunity Statement	
SCOPE (DEFINE BOUNDARIES)	First step in the process:
Project Goals	Last step in the process:
Project Boundaries	

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Project Background

- Project Background
 - Short description of the process to be improved
 - What has been happening and the context of the project

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Problem/Opportunity Statement

- Problem/Opportunity Statement
 - Detail the issue
 - Historical data
 - How long problem has existed
 - Other Symptoms

Do not include a solution or state course of action in Problem/Opportunity Statement

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Problem/Opportunity Statement Questions

- What is the reason we are working on this project?
- When does the problem occur?
- How often?
- What is the current (or potential) impact

Always related to why customer expectations are not being met.

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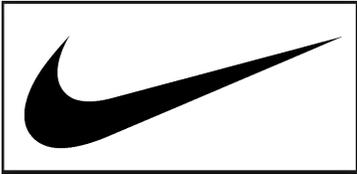
Effective Problem/Opportunity Statements

- Concise and Specific
- Jargon-Free
- Written for management
- Quantify the magnitude of the problem
- Identify the process and current performance
- Include how customer is affected, data, and time frame (if available)

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Problem/Opportunity Statements

Be like Nike



If you already know the solution,
then Just Do It!

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Problem Opportunity Statement Example

Statement:
Eliminate data quality errors in the
“application review through grant award”
timeframe

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Example

Improved Statement:
Processing time for application review through
grant award disbursement has increased by 40%
within the past 3 grant cycles. 75% of our
customers/providers have complained about
delays ranging from 18 – 60 days for award
disbursement which prevents the department from
complying to the current policy that states
disbursements must be provided within 10
business days after award approval.

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Example

Improved Statement:

Processing time for application review through grant award disbursement has increased by 40% within the past 3 grant cycles. 75% of our customers/providers have complained about delays ranging from 18 – 60 days for award disbursement which prevents the department from complying to the current policy states that disbursements must be provided within 10 business days after award approval.

(Note: Callouts in the original image identify 'Problem' at 'increased by 40%', 'Quantified' at '75%', 'Impact' at 'prevents the department from complying', 'Customer Focus' at 'customers/providers', and 'Critical Output' at 'business days'.)

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Project Background	
Problem/Opportunity Statement	
SCOPE (DEFINE BOUNDARIES)	First step in the process: Last step in the process:
Project Goals	
Project Boundaries	

Process Scope, Project Goals and Boundaries

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Process Scope

- Scope is the Boundaries of the process:
 - First Step in the Process
 - Last Step in the Process
 - From your SIPOC

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Project Scope-Creep

Scope creep:
uncontrolled changes or continuous growth in a project's scope

- Be specific
- Touchstone



Don't Boil the Ocean:
large problems may require several projects

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Avoid Sub-Optimization

Sub-Optimization is improving one process at the expense of another

- Improvement projects are interrelated with other processes
- Only sub-optimize if agreed upon
- Communication

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Goals

- Intended outcomes of the project
- Related to Problem and Defect Definition
- What will be Achieved
- Sets targets - deliverables
- Criteria to know if project was successful

A carefully developed goal statement is critical to project success.

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Project Boundaries

- Limits on scope of process change allowable as defined by the team sponsor, legal restrictions, budget, etc.
- What the team has authority to do

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Event Out of Scope

- No one loses their job because of the Lean event, but duties may be modified
- No additional staff
- No additional money
- No legislative changes or changes to collective bargaining agreements
- No IT solution until it is determined that an IT solution is needed
- Other?

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Project Metrics, Benefits, Team Members, Sign-off

Performance Metrics: What measures will tell you if you are successful	Performance Metrics			
	Current	Goal	Final	% Change
Projected Benefits				
Project Team				
Team Lead: _____				
Team Champion Sponsor: _____				
Process Owner: _____				
Team Members: _____				
Subject Matter Experts: _____				
Project Champion Sponsor and Process Owner Sign-Off: I am committed to supporting this project and implementing the teams improvements.				
Sponsor Signature: _____				
Process Owner: _____				

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Performance Metrics

What measures will tell you that your project is successful?

- Establish the process's baseline
- Allow a comparison to the target or goal
- Drive project decisions

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Projected Benefits

- Financial Benefits
- Intangible Benefits



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Project Team

- Team Champion/Sponsor
- Team Lead
- Process Owner
- Team Members
- Subject Matter Experts (SMES)
- Fresh perspective
- Customer

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Sign-off/Approval

- Project Champion/Sponsor Sign-off
- Process Owner Sign-Off

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Group Exercise

- In groups complete a project charter for DOP
- Feel free to ask your sponsor any questions (including project boundaries)
- Once of your team has completed your project charter – review the charter with your sponsor and receive their sign off

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Data Collection Plans
Day 2 Module 2

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Lean Project Roadmap

Preparation	Level Setting	Current State: Make the Invisible Visible	Improvement Design	Implement and Action	Control and Sustain
Scoping and SIPOC	Team Formation	Current Process Map	Brainstorming and Evaluation	Implementation Plans - Action Registries	Reporting - Celebration
Project Charter	Consensus on Project Charter and SIPOC	Identification of Waste	Lean Principles in Process Design	Poka-Yoke	Project Management
Identify Team	Review Baseline Data	Identification of VA, NVA, NVAN	Clean Sheet Redesign	Visual Management - Dashboard	Change Management
Data Collection Plan (Baseline Data)	Data Collection	Analysis of Current State	Future State	Project Savings	Monitoring and Follow-up

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Data Collection Method

Measurement management starts with a data collection methodology



```
graph TD; A([Identify Measures]) --> B[Step 1: Develop operational definitions for measure]; B --> C[Step 2: Develop measurement plan]; C --> D[Step 3: Collect data]; D --> E[Step 4: Display and evaluate data];
```

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Identify Measures



- First question: What data do you need to help you understand the problem or to establish a baseline?
- Second question: What measures will tell you if your improvement is successful?
- Third question: How can you clearly define the measurement of that data?

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Balancing Measures

Primary Measure: What you are trying to improve
 Secondary Measure: To avoid sub-optimization

- Quality vs. Cost
- Errors vs. Time
- Speed vs. Cost
- Speed vs. Quality
- Customer Service vs. Time

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Step 1: Operational Definitions

- An operational definition, when applied to data collection, is a **clear**, concise detailed definition of a measure
- Operational definitions **help ensure that the team does it right the first time** when it comes to data collection

Operational Definitions should be made before collecting data.

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Operational Definitions

- Should be written anytime data is being collected
- Without them data will usually be inconsistent or wrong
 - It is easy to assume everyone understands
- Should be documented, standardized, accessible and tested routinely

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Operational Definition = Measurement Defined

- Overtime = paid time over 40hrs in a week
- Dark = street lights come on
- Weight = numbers that appear on scale in nurses office
- Backlog = total # of unprocessed requests at 5pm
- Late = 1 minute after the start of shift

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Operational Definition

- Good:
 - Response Time = minutes elapsed from application fax date/time to decision fax date/time
- Better:
 - The response time in minutes will be determined by the date and time of the fax received (as shown on the faxed application), to the time the approval or rejection letter is faxed to the applicant (as shown on the fax log)

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Operational Definitions Exercise

Write an Operational Definition for a “sweet” in groups

Are the following items a sweet based on the operational definition your group created?

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Operational Definition Exercise

- What would you do differently next time you write an operational definition?
- What experiences have you had at your organization with operational definitions or the absence of operational definitions?

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Operational Definitions: Quick Sheet

	Who	What	How	Where	When
Overtime Hrs/Dept.	Bill	# of OT hrs/dept.	Run Report	Payroll System	Every Monday - 6 months
Overtime Requests	Steve	# of requested hours /supervisor	Run Report	Payroll System	Previous calendar year
Data (3)					
Data (4)					

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Step 2: Develop a Measurement Plan

Determining current process performance usually requires the collection of data. When developing a **measurement plan** ensure that:

- The data collected is meaningful
- The data collected is valid
- All relevant data is collected concurrently

The Measurement Plan is simply an extension of the Operational Definitions

Questions to Answer

- How often do you want the data?
 - Monthly, weekly, daily (monthly but daily increments)
- What will the data be used for?
 - Performance measurement or causes of process deficiencies
- Do we analyze all relevant data or a sample?
- What tools are necessary?
 - Scale, ruler, yard stick, stopwatch, phone systems
- What logistical issues are relevant?
 - Who will collect the data, shift, region
- What format should the data be displayed in?
 - Excel, collection form, report, logs

Example Measurement Plan

Performance measure	Operational definition	Data source and location	Sample size	Who will collect the data	When will data be Collected	How will data be collected	Other data that should be collected at same time
Time to process an application	Fax date, time Decision fax date, time	applications 5 fax center	289	Tim Smith David Mann	During the first 2 weeks of the month, 3 rd to 17 th	Randomly selected from January	Type of loan Amount of loan Dealer Time of day Day of week

How will the data be used? How will the data be displayed?

Examples:

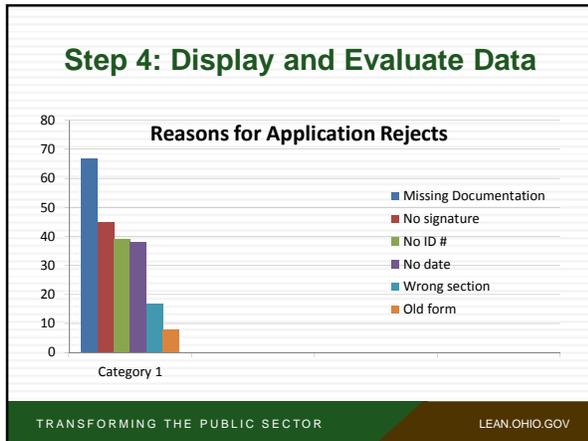
- ◆ Identification of Largest Contributors
- ◆ Identifying if Data is Normally Distributed
- ◆ Identifying Sigma Level and Variation
- ◆ Root Cause Analysis
- ◆ Correlation Analysis

- ◆ Pareto Chart
- ◆ Histogram
- ◆ Control Chart
- ◆ Scatter Diagrams

Step 3: Collect Data Check Sheet

Application rejects						
Reason	Day 1	Day 2	Day 3	Day 4	Day 5	Total
No date	### ###	### ### III	###	### I	IIII	38
No signature	### ### ###	### ### I	###	IIII	### IIII	45
Missing documentation	### ### ### III	### ### ### IIII	### II	### ### I	### ### II	67
No ID #	###	###	###	### ### III	### ### I	39
Wrong section completed	III	###	IIII	II	III	17
Old application form	II	III	I	I	I	8
					Total	175

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- ### Activity
1. Get in your DOP groups and review the DOP Slow Forms
 2. Identify Measures
 3. Collect data from the DOP forms
 4. Create a visual representation (bar chart, pareto, pie chart etc.)
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Process Mapping
Day 2: Module 3

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Lean Project Roadmap

Lean Project Flow

Preparation	Level Setting	Current State: Make the Invisible Visible	Improvement Design	Implement and Action	Control and Sustain
Scoping and SIPOC	Consensus of Project Charter and SIPOC	Current Process Map	Brainstorming and Evaluation	Implementation Plans - Action Registries	Reporting - Celebration
Project Charter		Identification of Waste	Lean Principles in Process Design	Poka-Yoke	Project Management
Identify Team	Review Baseline Data	Identification of VA, NVA, NVAN	Clean Sheet Redesign	Visual Management - Dashboard	Change Management
Data Collection Plan (Baseline Data)	Data Analysis	Analysis of Current State	Future State	Project Savings	Monitoring and Follow-up

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What is Process Mapping?

- A process map is a picture of a process
- Illustrates functional areas, tasks, decisions, and delay in a process
- Shows the process flow

Lean Mantra: Make the Invisible Visible

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Why Should You Process Map?

- Clear and detailed visual of what is occurring in the process
- Create common understanding
- Detail all stakeholders involved in the process
- Identify process handoffs and loop backs
- Identify waste and value add activities

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Process Mapping Fundamentals

- Use your agreed upon scope or SIPOC
- Always map with the employees who conduct the tasks that need to be detailed in the process
- Develop and maintain the appropriate level while mapping

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Process Map Key



Different functions of the process



Beginning and end points of the process



Any task / activity where work is performed



Places where information is checked against established criteria (standards) & decision made on what to do next



Any time information is waiting before the next process or decision (i.e. in-baskets, out-baskets, waiting to be batched)

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Process Map Arrows

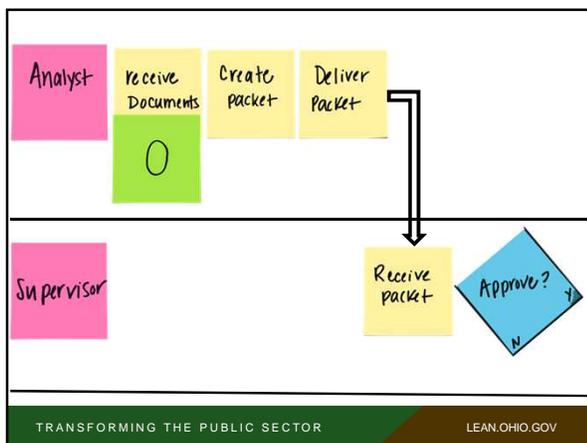
-  Used between tasks performed by the same person or area, but no physical movement has occurred
-  Indicates physical movement of information/product from one function to another
-  Demonstrates electronic movement of information from one person/function to another

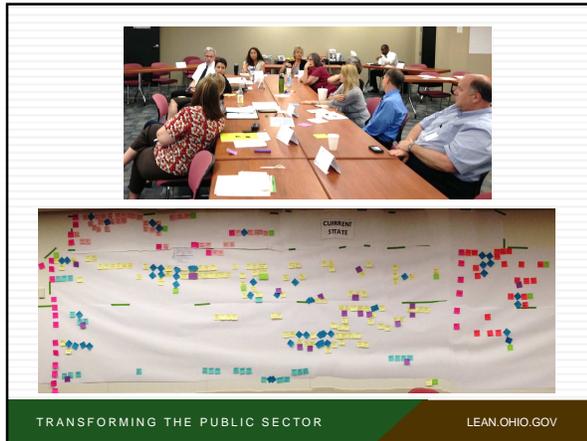
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Process Mapping Materials

- Flip chart paper or butcher block paper
- Masking tape
- Washable markers
- Fine point Sharpie markers
- Pink, Yellow, Blue, Green, and Purple 4"x5" Post-it notes

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Process Mapping Set Up

- Title and date your map
- Hang flip chart paper near the map for Parking Lot issues or Ah-Ha Moments
- Create group ground rules before mapping
- Review mapping key before mapping
- Assign roles to the team-involve them!

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Process Mapping Steps

- Start by identifying the functional area that starts the process
- Detail the tasks, decisions, and delay in each functional area
- Follow a swim lane model
- Connect your steps with appropriate arrows
- Draw in your swim lane lines

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Process Mapping How-To

- Use your SIPOC or scope as the guide to the beginning and ending steps on the map
- Refer to the SIPOC or scope often to keep on track
- Avoid getting into the weeds
- Document Operational Definitions
- Take the happy path first

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Process Mapping Decisions



Decisions are:

- Whenever there are two distinct paths in the process map
- Or, if it changes the end result for the customer (internal or external)

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Process Mapping How-To

- One person acts as facilitator
- Only map what is currently happening
- Repeat tasks back to the group
- Focus on the individual(s) doing the work
- Do not jump to solutions while mapping

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Process Mapping Tips

- Use the 80/20 Rule
- Use letters, numbers, or stickers to connect loopbacks
- Use different color Post-it notes when mapping multiple groups or use a different space on the map
- Draw lines in with a pencil first before using the marker

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Process Mapping Tips

- One Voice
- Write tasks in Noun-Verb or Verb-Noun format
- Stay at the average 10,000 foot level (zoom in when needed)

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Process Mapping Guidance

- Take breaks!
- Be patient and stay engaged
- Read the group-watch for body language
- Never judge the group

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Process Mapping Questions

- Who starts this process?
- How does the process start?
- And then what...?
- What happens next...?
- Are we in the weeds?
- If I am the customer I do...?

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Process Mapping Activity

- In your DOP groups **assign a facilitator** to begin mapping the current state
- Rotate the role of facilitator during the activity
- Be prepared to report out your group's progress

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Identify Waste
Day 2: Module 4

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Lean Project Roadmap

Preparation	Level Setting	Current State: Make the Invisible Visible	Improvement Design	Implement and Action	Control and Sustain
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Identify Team	Identify Waste	Identification of VA, NVA, NVAN	Clean Sheet Redesign	Visual Management - Dashboard	Change Management
Data Collection Plan (Baseline Data)	Data Analysis	Analysis of Current State	Future State	Project Savings	Monitoring and Follow-up

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Value Added (VA)

- Value Added Activities (VA)-Transforms information into services and products the customer is willing to accept
- VA Activities Must Meet Three Requirements:
 - Done right the first time
 - Transformational
 - Customer is willing to *pay* for

Typically 1% of a process is Value Added

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Non Value Added (NVA)

Non-Value Added Activities (NVA)

- Consumes resources
- Does not directly contribute to service
- Customer does not care

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Non Value Added but Necessary (NVAN)

Non-Value Added but Necessary (NVAN)

- Customer does not care
- Required to perform the step by current statute or law

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Meet TIM U WOOD



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Transportation

- Transport from office to office
- Transport from floor to floor
- Transport from building to building
- Trucking



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Inventory-Information

- Finished product
- Storage
- Printed in advance
- Work in process
- Excess information on a form, email or report



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Motion

- Going to the copier/scanner
- Going to the FAX
- Going to the storeroom
- Reaching
- Bending
- Clicking



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Underutilization

- Employees
- Office Space
- Technology
- Equipment



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Waiting

- Non productive time
- Waiting for:
 - Approvals
 - Copier/Scanner
 - Delivery
 - Catch up
 - The person upstream
 - Mail/UPS
 - Computer



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Over Production

- Making too many
- Making in advance of requests
- Throwing excess away
- Things get outdated
- "We have to be ready"
- Not cautious, but wasteful



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Over Processing

- Adding things that nobody wants
- Report that nobody reads
- “Gold Plating”
- The best
- Better than good enough
- Beyond meeting customer expectations



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Defects

- Mistakes
- Broken
- Inaccurate
- Can't read
- Can't understand
- Wasted materials
- Returned



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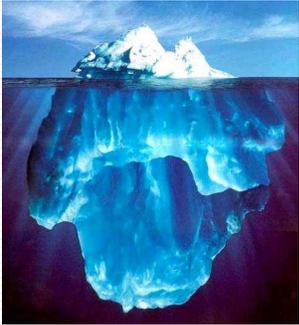
Causes of Waste

- Functional Organization
- Technology Gaps
- Excessive Controls
- Dated Process Design
- No Back-up/Cross Training
- Unbalanced Workload
- Batching of Forms
- Data Entry Batching
- Extreme Risk Adversity
- Changing Government Practices and Policies
- No Decision Rules
- Poor Visual Control
- Disorganized Workplace
- Lack of Training
- Obsolete Forms or Form Design
- Poor Layout
- Government Regulations

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Customer complaints
Customer calls
Calls to legislators
Waiting
Defects



Transportation
Inventory
Motion
Over production
Over processing
Misplaced skills
Bad materials
Slow machines
Re-work
Waste
Storage
Paperwork
Approvals

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TIM U WOOD & VA Activity

- Identify TIM U WOOD in the DOP process
 - Use the designated stickers
 - Identify steps in your current state that represent (TIM U WOOD)
- Identify VA in the DOP process
 - Use the designated stickers
 - Identify steps in your current state that are value added (must meet the three requirements)
 - Done right the first time
 - Transformational
 - Customer is willing to pay for

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Interpreting Your Process Map
Day 2: Module 5

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Lean Project Flow

Preparation	Level Setting	Current State: Make the Invisible Visible	Improvement Design	Implement and Action	Control and Sustain
Scoping and SIPOC	Team Formation	Current Process Map	Brainstorming and Evaluation	Implementation Plans - Action Registries	Reporting - Celebration
Project Charter	Consensus on Project Charter and SIPOC	Identification of Waste	Lean Principles in Process Design	Poka-Yoke	Project Management
Identify Team	Review Baseline Data	Identification of VA, NVA, NVAN	Clean Sheet Redesign	Visual Management - Dashboard	Change Management
Data Collection Plan (Baseline Data)	Interpreting	Analysis of Current State	Future State	Project Savings	Monitoring and Follow-up

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Root Cause Analysis

- Root cause analysis is a method that separates the symptoms from the true cause of the issue or problem



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Root Cause Analysis

- We want to make sure we are not treating the symptoms but curing the disease.

Example: Takes too long to get permit.....everybody work faster!

- Several Lean Six Sigma Root Cause Analysis Tools:
 - 5 Whys
 - Fishbone Diagram
 - Pareto Chart
 - FMEA

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why?
why?
why?
why?

why?

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Classic Five Why Example

The Lincoln Memorial was disintegrating

Why?



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Interpreting Your Process Map



What does this tell me?

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Interpreting Your Process Map

- All process maps have common red flags
- Mapping standardization allows for easy interpreting
- The more you map, the more you see common process issues

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Red Flags



- Multiple Entry Points
- Several Decisions in a Row
- Multiple Databases
- High Level Staff Performing Administrative Work
- Everything going to a certain section (i.e. Legal, Director, IT)
- Multiple Reviews, Inspections, Approvals
- Loop Backs Between Sections, Employees, Functional Areas
- Different "ways" of doing some thing

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DOP Example

Process mapping shows that DOP has multiple databases:

- Why?
 - Each section created their own database for tracking purposes
- Why?
 - Because our policy said so
- Why?
 - Because Meghan lost an application in 2006 (it made the news)
- Why?
 - No standard process for dealing with that issue
- Why?

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Interpreting your Process Map Exercise

- In your groups – Review your current state DOP map and identify Red Flags.
- Record Red Flags on Flip Chart



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