We ran out of pencils and paper...here's what we did.
Mobile Workforce, Lean Style

Brandon Brown
Not An Engineer
Robert J. Taylor, P.E.
An Engineer
We ran out of pencils and paper...here’s what we did. Mobile Workforce, Lean Style

Brandon Brown
Data / GIS Manager

Robert J. Taylor, P.E.
Infrastructure Asset Management Engineer
Dublin's Continuous Improvement Strategy
(time for some business buzzword bingo)
Lean / Six Sigma

- One Master Black Belt on retainer
- 8 Certified Black Belts
- 40+ staff trained Green/Yellow Belts
WHAT IS LEAN?

Provide Value

Eliminate Waste

- **Defects**: Efforts caused by rework, scrap, and incorrect information.
- **Overproduction**: Production that is more than needed or before it is needed.
- **Waiting**: Wasted time waiting for the next step in a process.
- **Non-Utilized Talent**: Underutilizing people's talents, skills, & knowledge.
- **Transportation**: Unnecessary movements of products & materials.
- **Inventory**: Excess products and materials being processed.
- **Motion**: Unnecessary movements by people (e.g., walking).
- **Extra-Processing**: More work or higher quality than is required by the customer.
WHAT IS SIX SIGMA?

Eliminate Defects & Variability

• Data Driven
• Process Driven
• Adapting for service industries
• Old fashioned detective work – find the smoking gun
TOOLS OF THE TRADE

Change Management
Agile/Iterative/MVP
Growth vs Fixed Mindset
Lean Startup
Hypothesis Driven Development
Change Management

Bonus Buzzwords:

Kai = Change
Zen = Good

改善
CHIPPING MOBILIZATION
CHIPPING?
PROCESS MAPPING - OLD PROCESS

Highlights...errr...Lowlights?

- Locations are on a list
- Make hand lists
- Copy those lists
- Scan those lists
- Attach those lists to work orders
- Make bulk work orders
- Lists and lists and lists and paper
- Several excel sheets to keep track of it all
PROCESS MAPPING - OLD PROCESS

Highlights...errr...Lowlights?

- Loads, that’s a great way to count things, right?
- Scheduled vs Unscheduled stops – this is important, right?
Why did we change?

• Requested reports and inbox searches
  • Data didn’t jive
• Asked questions
  • Employees expressed how crazy it was
  • Simpler way?
• The good of it all, residents did get good service at the employees expense
  • Lots of Waste
It all boiled down to three scenarios:

1. We know about it and can pick it up
2. We know about it but can’t pick it up
3. We don’t know about it but pick it up
PROCESS MAPPING - IMPROVED PROCESS

Revised Chopper Process – Request Based Service

1. Request Chopper
2. Receive Request (Love or Call)
3. Confirm Service Request (Officer/Dispatcher)
4. Schedule Chopper
5. Chopper Chopper
6. Open Subdivision
7. Contact Officer/Dispatcher
8. Order to 111
9. Receive Order
10. Prepare Order
11. Delivery
12. Return Service Request (Officer/Dispatcher)
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Cityworks Mobile

- 1 – 3 crews at any given time
- Power is in the hands of those doing the work
- Visual
- Work in zones, but can “chip in”

iPad

- Cellular* iPad
- mobile

*cellular optional, but useful
PROCESS - RESIDENT CALLS IN

Resident Requests Service

Open SR (office)

Dispatch Crew

Address is Geocoded
**PROCESS - RESIDENT CALLS IN**

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<th>Map</th>
<th>Service Request</th>
<th>![easy button]</th>
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<td>Solid Waste No Service Reasons-Chip</td>
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**Service staff has a custom Inbox for Competed Chipping SR, then they Close**
PROCESS - IF AN ISSUE

Supervisor has a custom Inbox for Competed Chipping SR with Issues. They investigate and Close the SR.
Crews are also looking for chipping along the road while en route to next pick up, if they encounter...

- Create SR in the field
- Address is not Geocoded
- Complete SR
- Go to Next
Service staff have a custom Inbox showing any SR that is Complete and opened in the field (iOS). These are our unattached “ad hoc” SR.
WORK ORDERS & DUMPING

We need to enter our ELM and keep track of loads dumped...OK

1. Open Daily WO
2. Pick Up Stuff
3. Dump Load & Get Weight
4. Enter ELM
5. Close WO

Loads are Weight entered as Material.
What started all this...reports. Now at a glance, in real time!

Hover for numbers, run the report for the weights from ELM
BENEFITS & IMPROVEMENTS

- Efficiency – immediate 33% increase
  - Will have more accurate after spring season
- Less steps for office staff – 14 touch points to 4
- Visual – no more lists for field staff, just collect the dots...we call it Pac-Man
- Real data – they were collecting “loads”. One load was one load if it was full, ½ full, or less
- Get true weights at the dump and record in ELM
- Transparent to residents, no degradation in service. ZERO COMPLAINTS to date
OUR CUSTOMERS

EMPLOYEES

BEFORE

AFTER

RESIDENTS
MOVING FORWARD
LESSONS LEARNED

• KISS - Gather a lot of data, but only used a few things
• Get the people involved in the process involved in the improvement.
  • “Can’t we just…”
  • Lots of assumptions who needs what
• Continuous Improvement
  • No "old way" anymore
  • Health checkups
  • Use data to continually improve process
“JIG” FOR SUCCESS

Using Cityworks, Cityworks Mobile, iPads and Lean Six Sigma knowledge…

Have effectively used this template for:
• Chipping
• Sewer cleaning and CCTV
• Solid waste (recycling and trash)
• Asphalt spot repairs at actual location
  • Roads and bike paths

Currently in progress:
• Construction "recon"
• CRM / e311
• Whatever else we can find…
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