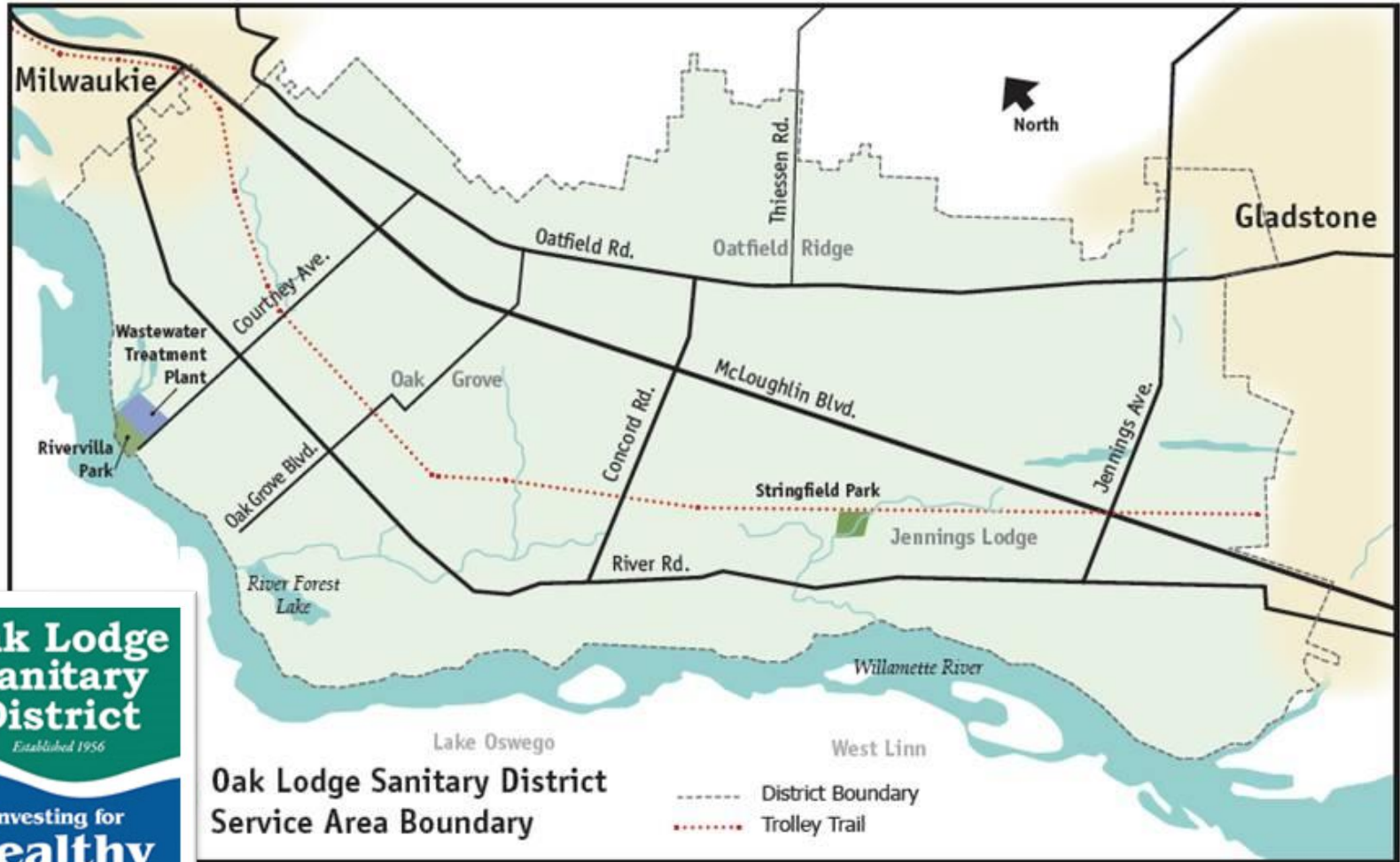


# Leveraging Lucidity: Performance Metrics and Program Development

Rich Ludlow  
Oak Lodge Sanitary District

# Oak Lodge Sanitary District



**Oak Lodge Sanitary District**  
Established 1956

Re-Investing for  
**Healthy Rivers**

**Oak Lodge Sanitary District  
Service Area Boundary**

- District Boundary
- ..... Trolley Trail

# Areas of Responsibility

- Sewer System
  - Approximately 8,600 sewer connections
  - 100 miles of sewer pipe
  - 2273 sewer manholes
  - 5 wastewater pump stations
- Water Reclamation Facility, 10 MGD, Cannibal Plant
- Surface Water Management:
  - 2,500 catch basins
  - 53 miles of storm lines
  - 100 sedimentation manholes
  - 50 private detention systems.



# Asset Maintenance Manager

- Me
- Responsible for:
  - Field Operations and Maintenance (4 staffs)
  - Treatment Plant Maintenance (2 staffs)
  - Lucity implementation continuation/development
  - SCADA maintenance/upkeep
  - Safety programs
  - Fleet maintenance



# District Advantage

- Technology tools and information in place
  - SCADA – WonderWare
  - GIS – Esri ArcGIS
  - CMMS – Lucity
  - Electronic O&M Manual – eFIMS
  - Operations/Lab Database Software – Hach WIMS
- Relatively small number of Assets (records in Lucity)
  - 1103 Equipment Assets
  - 17 Fleet Assets
  - 4011 Storm Assets
  - 12059 Sewer Assets
- Treatment plant recently reconstructed (2012)





# District Disadvantages

- Staffed Leanly
- Many hats to wear
- Challenges focusing on shifting priorities
- Firefighting maintenance culture
- Working through plant start-up issues
- Neighboring political influences
  - Clackamas County, Gladstone, Milwaukie, Portland
  - Wealthy riverfront community neighbors with high expectations
  - Stuck in the middle again...



# Managing Organizational Shifts

- The District was in a major construction phase that threw everything out of rhythm.
- Staff came to work not knowing what they would be doing each day.
- Field Operations had set a 5 year goal to clean and TV the entire system in 2009, just over 50% in 2014
- How do we get things back on track?



# The Plan

- Field crews had been tracking footage for line cleaning and TV inspections in Lucity since 2009, we needed to reset the target.





# The Focus

- In January 2014, I implemented a production target for Field Operations.
  - Trevor Lierman calculated an achievable goal that would put us back on the 5-year track.
  - Focused on bite sized pieces, Trevor did the math
    - Known system footage divided by the 5 year goal, equates to inspecting 9,000 feet of line per month or 2,250 ft. per week.
  - The goal is intentionally attainable to ensure achievability and still provide for project work and other responsibilities.

# Tracking Work

- A Crystal Report was developed to track to the goal

## Hydrocleaning

WO NUMBER	NT USMAN	NT DSMAN	Work Completed Date	Footage Completed
14-001614	A2-767	A2-741	2/11/15	25.03
14-001614	A2-741	A2-543	2/11/15	198.76
14-001614	A2-095	A-2552	2/11/15	95.77
14-001614	A2-319	A2-095	2/11/15	224.53
14-001614	A-12929	A-12819	2/26/15	110.00
14-001614	A5-1612	A5-1448	2/12/15	162.45
14-001614	A-12310	A-11830	2/26/15	480.00
14-001614	A-12819	A-12709	2/26/15	110.00
14-001614	A-13138	A-12929	2/26/15	209.00
14-001614	A-13165	A-13138	2/26/15	27.00
14-001614	A07-1219	A07-805	2/12/15	423.88
14-001614	A04-503	A04-205	2/10/15	297.86
14-001614	A07-805	A07-608	2/24/15	197.00
14-001614	A07-499	A07-302	2/25/15	197.93
14-001614	A07-608	A07-499	2/25/15	110.02
14-001614	A-12510	A-12310	2/26/15	200.00
14-001614	A-12709	A-12510	2/26/15	199.00
14-001614	A4-494	A4-370	2/24/15	122.01
14-001614	A4-717	A4-494	2/24/15	223.33
14-001614	A02-266	A02-184	2/10/15	82.00
14-001614	A07-302	A07-261	2/25/15	41.57
14-001614	A-11830	A-11491	2/26/15	339.00
14-001614	A5-825	A5-643	2/24/15	182.12
14-001614	A02-475	A02-349	2/10/15	128.57
14-001614	A42-340	A42-155	2/11/15	184.00
14-001614	A5-1918	A5-1612	2/12/15	318.59

## TV Inspections

WO NUMBER	NT USMAN	NT DSMAN	Work Completed Date	Footage Completed
14-001615	A22-213	A2-1209	2/17/15	212.93
14-001615	A22A-359	A22-667	2/17/15	359.57
14-001615	A24-454	A24-423	2/4/15	31.49
14-001615	A24-423	A24-299	2/4/15	124.00
14-001615	A05-444	A05-300	2/19/15	144.00
14-001615	A51-498	A51-407	2/13/15	91.65
14-001615	A5-1448	A5-1175	2/13/15	272.62
14-001615	A5-1175	A5-825	2/13/15	350.65
14-001615	A51-407	A51-060	2/13/15	346.80
14-001615	A22A-860	A22A-703	2/17/15	156.32
14-001615	A21-821	A21-499	2/3/15	322.36
14-001615	A11-798	A11-568	2/2/15	232.95
14-001615	A1-605	A1-530	2/2/15	71.74
14-001615	A11-568	A11-336	2/2/15	232.95
14-001615	A11-336	A11-246	2/2/15	90.58
14-001615	A21-200	A2-543	2/3/15	199.97
14-001615	A2-972	A2-767	2/17/15	204.85
14-001615	A2-1209	A2-972	2/17/15	237.26
14-001615	A2-767	A2-741	2/17/15	25.03
14-001615	A2-741	A2-543	2/17/15	198.76

14-001614	A2-543	A2-319	2/11/15	226.96
14-001614	A07-261	A07-067	2/25/15	226.80
14-001614	A07-067	A-10069	2/25/15	67.75

14-001615	A22B-206	A22-213	2/17/15	206.50
14-001615	A5-2580	A5-2248	2/13/15	332.00
14-001615	A10-270	A-6859	2/26/15	270.50

Total Footage

14,006.70

Total Footage

10,882.96

# Time Bandits

- The first few months the goals were not met
  - What is distracting crews from the core work?
- Excellent! More questions.
  - Let's look at the data...



# Another Query

- Another Crystal Report tracked the labor time charged to Work Orders by the Field Operations Technicians

## Grease Lines

<u>WR_STRT_DT</u>	<u>WO_NUMBER</u>	<u>WR_RSRC_TY</u>	<u>WR_UNITS_GT</u>
2/5/15	15-000132	Merritt, Abe	1.50
2/5/15	15-000132	Woods, Doug	1.50
2/6/15	15-000130	Woods, Doug	2.25
2/6/15	15-000132	Woods, Doug	3.75
2/6/15	15-000130	Merritt, Abe	2.25
2/6/15	15-000132	Merritt, Abe	3.75
2/9/15	15-000130	Woods, Doug	1.75
2/9/15	15-000132	Woods, Doug	1.50
2/9/15	15-000130	Merritt, Abe	1.75
2/9/15	15-000132	Merritt, Abe	1.50
<b>SS0090</b>			<b>21.50</b>

## Hydrocleaning

<u>WR_STRT_DT</u>	<u>WO_NUMBER</u>	<u>WR_RSRC_TY</u>	<u>WR_UNITS_GT</u>
2/9/15	14-001614	Merritt, Abe	0.50
2/9/15	14-001614	Woods, Doug	0.50
2/10/15	14-001614	Woods, Doug	5.25
2/10/15	14-001614	Merritt, Abe	5.25
2/11/15	14-001614	Merritt, Abe	6.75
2/11/15	14-001614	Woods, Doug	6.75
2/12/15	14-001614	Woods, Doug	3.25
2/12/15	14-001614	Woods, Doug	0.50
2/12/15	14-001614	Merritt, Abe	3.25
2/23/15	14-001614	Woods, Doug	0.75
2/24/15	14-001614	Merritt, Abe	4.50
2/24/15	14-001614	Woods, Doug	4.50
2/25/15	14-001614	Woods, Doug	2.25
2/25/15	14-001614	Merritt, Abe	2.25
2/26/15	14-001614	Merritt, Abe	4.50
2/26/15	14-001614	Woods, Doug	4.50
<b>SS0100</b>			<b>55.25</b>

## TV Inspections

<u>WR_STRT_DT</u>	<u>WO_NUMBER</u>	<u>WR_RSRC_TY</u>	<u>WR_UNITS_GT</u>
2/2/15	14-001615	Lierman, Trevor	6.00
2/2/15	14-001615	Strong, Larry	6.00

## Fleet Repairs

<u>WR_STRT_DT</u>	<u>WO_NUMBER</u>	<u>WR_RSRC_TY</u>	<u>WR_UNITS_GT</u>
2/5/15	15-000165	Woods, Doug	0.25
2/5/15	15-000165	Merritt, Abe	1.00
2/6/15	15-000165	Merritt, Abe	1.00
2/6/15	15-000165	Woods, Doug	1.00
2/6/15	15-000165	Woods, Doug	0.25
2/24/15	15-000217	Woods, Doug	2.00
<b>FL0210</b>			<b>5.50</b>
<u>WR_STRT_DT</u>	<u>WO_NUMBER</u>	<u>WR_RSRC_TY</u>	<u>WR_UNITS_GT</u>
2/9/15	15-000173	Woods, Doug	0.50
2/25/15	15-000173	Woods, Doug	1.75
<b>FL0225</b>			<b>2.25</b>

## Locates

<u>WR_STRT_DT</u>	<u>WO_NUMBER</u>	<u>WR_RSRC_TY</u>	<u>WR_UNITS_GT</u>
2/2/15	15-000138	Woods, Doug	1.25
2/2/15	15-000138	Woods, Doug	0.50
2/3/15	15-000138	Merritt, Abe	3.00
2/4/15	15-000138	Merritt, Abe	2.00
2/5/15	15-000138	Woods, Doug	1.50
2/5/15	15-000138	Merritt, Abe	1.50
2/6/15	15-000138	Strong, Larry	2.00
2/23/15	15-000138	Woods, Doug	4.75
2/24/15	15-000138	Strong, Larry	5.50
2/25/15	15-000138	Strong, Larry	2.00
2/25/15	15-000138	Woods, Doug	0.25
2/26/15	15-000138	Woods, Doug	1.50
2/27/15	15-000138	Woods, Doug	1.00
<b>SS0030</b>			<b>84.75</b>

# Knowledge is Key

- It's impossible to manage what we don't understand
  - Immediate realization of the impact of our utility locate program
  - A more clear picture of how District resource use was forming
  - Acknowledged the need to continue working with staff to capture time to Work Orders



# Non-Work Order Time

- Reliability maintenance professionals consider staff utilization at 50-60% as world class in the Physical Asset Management Handbook

<http://www.reliabilityweb.com/excerpts/excerpts/PAM-ch6.pdf>

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- “In world class facilities, maintenance craft efficiency tends to be above 50%.”  
**‘Big M’ and the Performance Culture**  
**Managing Maintenance for Production Reliability**

*by James Davis, PE, CMRP*

[http://reliabilityweb.com/index.php/print/big\\_m\\_and\\_the\\_performance\\_culture](http://reliabilityweb.com/index.php/print/big_m_and_the_performance_culture)

# Capturing Work Order Time



- Lucity Timesheets automatically capture Work Order time

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[Timesheet Overview](#) X [Lierman, Trevor - Wc](#) X



### Lierman, Trevor - Work Timesheet 2

FY15/16 < 2/16/2015 15 >



#### Summary

Description	Task	Time Code	Project Number	Account Number	Class	Mon Feb 16	Tue Feb 17	Wed Feb 18	Thu Feb 19	Fri Feb 20	Sat Feb 21	Sun Feb 22	Mon Feb 23	Tue Feb 24	Wed Feb 25	Thu Feb 26	Fri Feb 27	Sat Feb 28	Total Hours
Daily Totals							7	4	4		2					2			19

#### Additional Time

Description	Task	Time Code	Project Number	Account Number	Class	Mon Feb 16	Tue Feb 17	Wed Feb 18	Thu Feb 19	Fri Feb 20	Sat Feb 21	Sun Feb 22	Mon Feb 23	Tue Feb 24	Wed Feb 25	Thu Feb 26	Fri Feb 27	Sat Feb 28	Total Hours

#### Linked Work

Description	Task	Time Code	Project Number	Account Number	Class	Mon Feb 16	Tue Feb 17	Wed Feb 18	Thu Feb 19	Fri Feb 20	Sat Feb 21	Sun Feb 22	Mon Feb 23	Tue Feb 24	Wed Feb 25	Thu Feb 26	Fri Feb 27	Sat Feb 28	Total Hours
Locate					11-14						2								2
Sewer Pipe - TV					11-14		7												7
Sewer Pipe - TV					11-14			4											4
Sewer Pipe - TV					11-14				4										4
Sewer Pipe - TV					11-14											2			2

# Capturing Non-WO Time

- The rest of the story

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Timesheet Overview X Lierman, Trevor - Wc X

**Lierman, Trevor - Work Timesheet 2** FY15/18 < 3/16/2015 15 >

**Summary**

Description	Task	Time Code	Project Number	Account Number	Class	Mon Mar 16	Tue Mar 17	Wed Mar 18	Thu Mar 19	Fri Mar 20	Sat Mar 21	Sun Mar 22	Mon Mar 23	Tue Mar 24	Wed Mar 25	Thu Mar 26	Fri Mar 27	Sat Mar 28	Sun Mar 29
Daily Totals						7.25	8	6.75	5.5	4			6	6.5	6.5	7	8		

**Additional Time**

Description	Task	Time Code	Project Number	Account Number	Class	Mon Mar 16	Tue Mar 17	Wed Mar 18	Thu Mar 19	Fri Mar 20	Sat Mar 21	Sun Mar 22	Mon Mar 23	Tue Mar 24	Wed Mar 25	Thu Mar 26	Fri Mar 27	Sat Mar 28	Sun Mar 29
Childrens Festival		Regular Time					8												
Festival Video	Program Developpr	Regular Time				2													
Field/Ops MTG	Staff Meeting	Regular Time				0.75		0.75											
Forklift Training	Training	Regular Time						4											
Granite Inspection Review	Program Developpr	Regular Time							1										
Lucity/GIS data gathering	Work Planning	Regular Time													2	3			
Lucity/GIS work	Program Developpr	Regular Time				1		2											
Presentation meeting	Staff Meeting	Regular Time							1.5										
Presentation Prep.	Program Developpr	Regular Time											2						

**Linked Work**

Description	Task	Time Code	Project Number	Account Number	Class	Mon Mar 16	Tue Mar 17	Wed Mar 18	Thu Mar 19	Fri Mar 20	Sat Mar 21	Sun Mar 22	Mon Mar 23	Tue Mar 24	Wed Mar 25	Thu Mar 26	Fri Mar 27	Sat Mar 28	Sun Mar 29
Customer Service Call		Regular Time			11-14										0.5				
Customer Service Call		Regular Time			11-14										0.5				
Fleet- Service Fleet Equipment		Regular Time			11-14														
Investigate		Regular Time			11-14										1				
Investigate		Regular Time			11-14											1.5			
Locate		Regular Time			11-14			3											
Locate		Regular Time			11-14							2							
Locate		Regular Time			11-14								2.5						
Locate		Regular Time			11-14									2.5					

# Telling the Story

- Where do the resources go?
- Now we know
- Let's pass it on!

knowl·edge

/ˈnələj/

*noun*

1. facts, information, and skills acquired by a person through experience or education; the theoretical or practical understanding of a subject.  
"a thirst for knowledge"  
*synonyms:* understanding, comprehension, grasp, command, mastery; **More**
2. awareness or familiarity gained by experience of a fact or situation.  
"the program had been developed without his knowledge"  
*synonyms:* awareness, consciousness, realization, cognition, apprehension, perception, appreciation; *formal cognizance*  
"he slipped away without my knowledge"



Translations, word origin, and more definitions

# Reporting

Field Operations Monthly Report for February, 2015

Staff Availability:

Working Hours in Month	Actual Attendance/Available Hours (working hours minus leave)
608	506.25

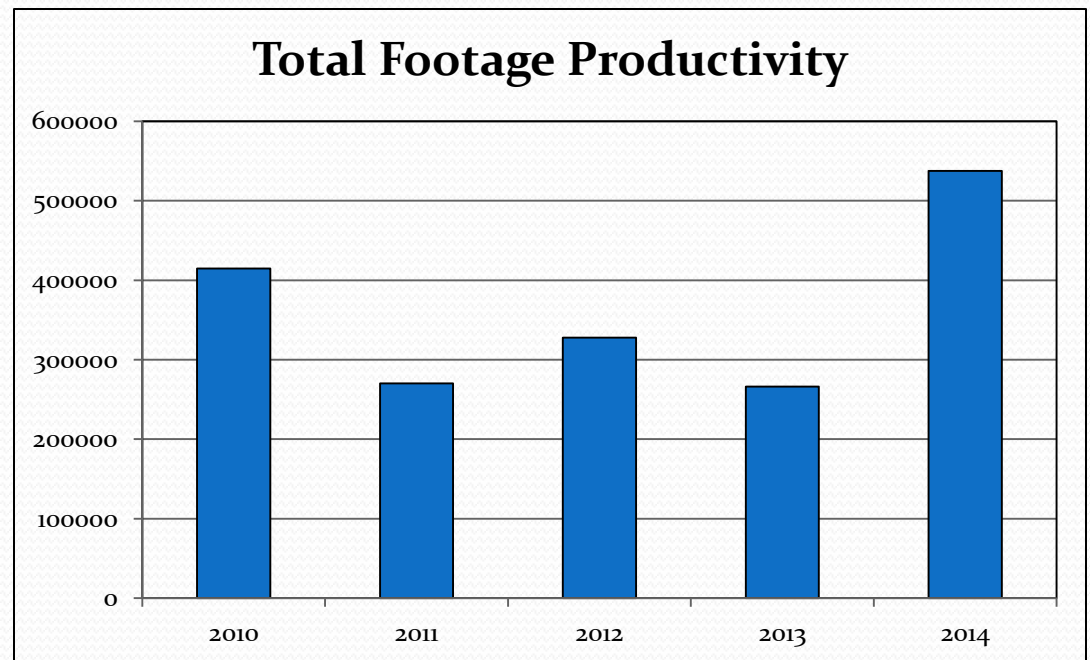
Accomplishments:

	Goal	Actual	% Goal Met	Staff Hours
Sewer Cleaning (linear feet)	9450	14006.7	148%	55.25
TV Inspections (linear feet)	9450	10883	115%	78.75
Grease Line Cleaning		5972.4	100%	22.5
Sewer Line Repairs				-
Utility Locates		152	100%	84.75
Bio-solids Hauling by Line Maintenance Techs				-
SWM Work by Line Maintenance Techs				2.5
Fleet Support Work				32.25
Plant/PS Equipment Work Orders				52.75
Customer Service/Investigate Work Orders				3
			Total Work Order Hours	331.75
			Staff Time Utilized on Work Orders	66%



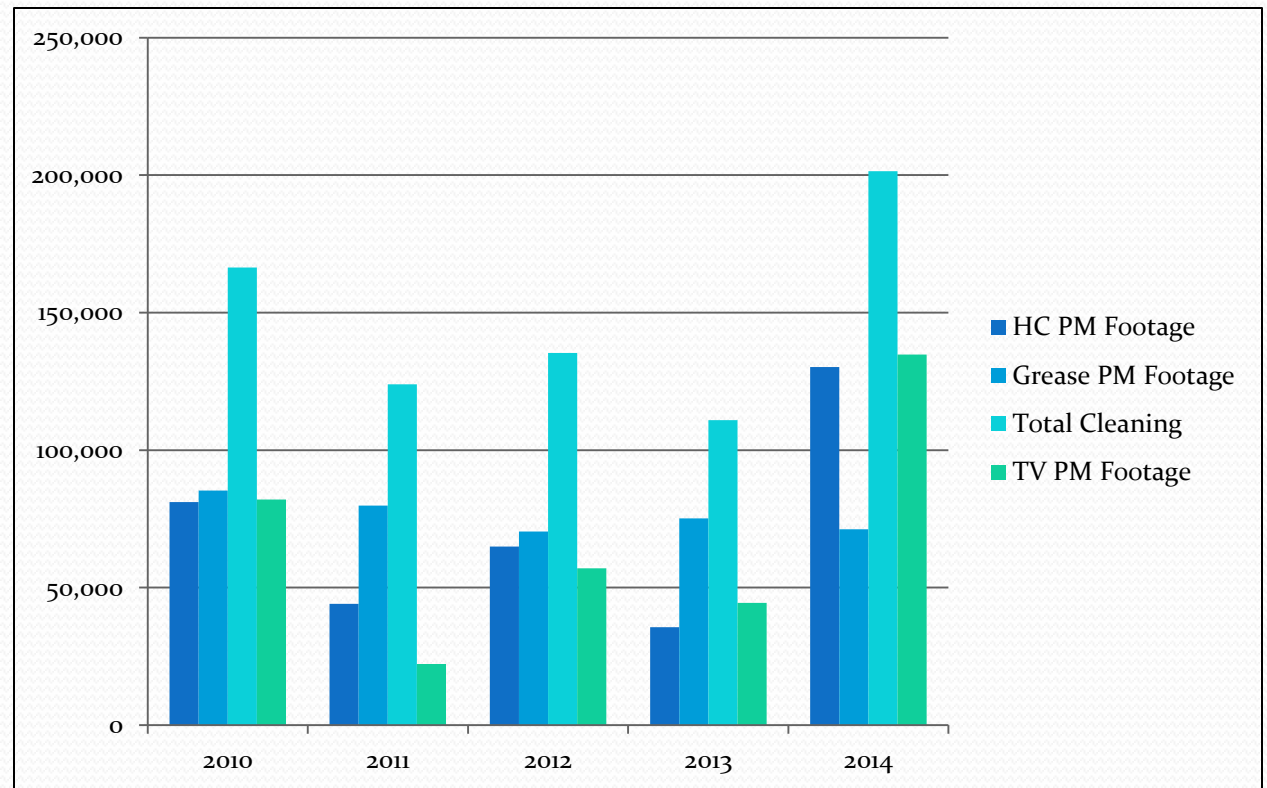
# 2014 Summary

- By focusing on meeting or exceeding the weekly goal in most months of the year, measurable production in 2014 is the best its been in five years.



# Comparisons of work type

- Overall grease line cleanings have decreased
- Hydro-cleaning and TV Inspections have equalized



# Unmeasurable Success

- The general mood in the Field Operations group has significantly improved
- Management confidence in staff performance is up
- Interpersonal relationships have improved toward comradery
- A team is forming

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I like this!

Questions?

