

Data Mining and how it can Improve your LDAR Program



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Background

I've 24 years in the LDAR industry. A large portion of that career was spent under the mentorship of a man who drove home safety, value, learning in every thing we did. This was the true beginning of understanding what data mining meant to me.

My current position with Bureau Veritas allows me to continue to excel and push the data driven part of our industry and push for greater results

What is Data Mining?

The practice of examining large amounts of data in order to generate new information.

In OUR industry of LDAR, data mining is an important step of building stronger compliance and productivity.

Data Mining is also key in retention of employees for your LDAR program.

Lets focus on 3 questions regarding Data Mining

What Data should be mined?

How should the Data be mined?

**More Importantly, What should we do with
data after it is mined?**

What Data should be mined?

Monitoring Data

- **Monitoring Speed (Dwell Time)**
- **Time Between Components**
- **Proper Response Time after Deflection**
- **Leaks Detected**

Productivity Data

- **First Component of the Day**
- **Last Component of the Day**
- **Lunch Break Duration**
- **Excessive Breaks**
- **Number Monitored per Day**
- **Total Time on Tools**

How should we Mine the Data?

**What Tool can be used to
perform Data Mining?**

Tools for Data Mining

LDAR Database Reports

Positives: Some canned reports are available. Can be performed by Site Supervisor or anyone with Database access. No transfer of data.

Negatives: Greater detail of data mining can be very time consuming and strenuous work

Tools for Data Mining

MS Excel / Spreadsheets

Positives: Greater filtering and sorting is available. Options for Macros can be used to allow for more data analysis.

Negatives: Greater knowledge may be required for spreadsheet development. Multi-step process of adding data into spreadsheet. Formatting issues

Tools for Data Mining

External Database

Example: MS Access or Sequel Server

Positives: Even greater filtering and sorting than MS Excel. Queries and reports can be utilized help mine data. Importing of data from LDAR database to external database is more streamline.

Negatives: Even greater knowledge is required. Development costs.

Tools for Data Mining

Off the Shelf Software

Example: LdarTools LStar

Positives: Seamless, customizable tools tailored around LDAR business. Technician scoring and built in reporting by email functions

Negatives: Additional costs.

The most IMPORTANT question!!

**What should we do with the results
of the data that is being mined?**

First we should Understand the Results

Next we should Discuss the Results

Next we should Share the Results

Next we should Care About the Results

HOPEFULLY!!!!

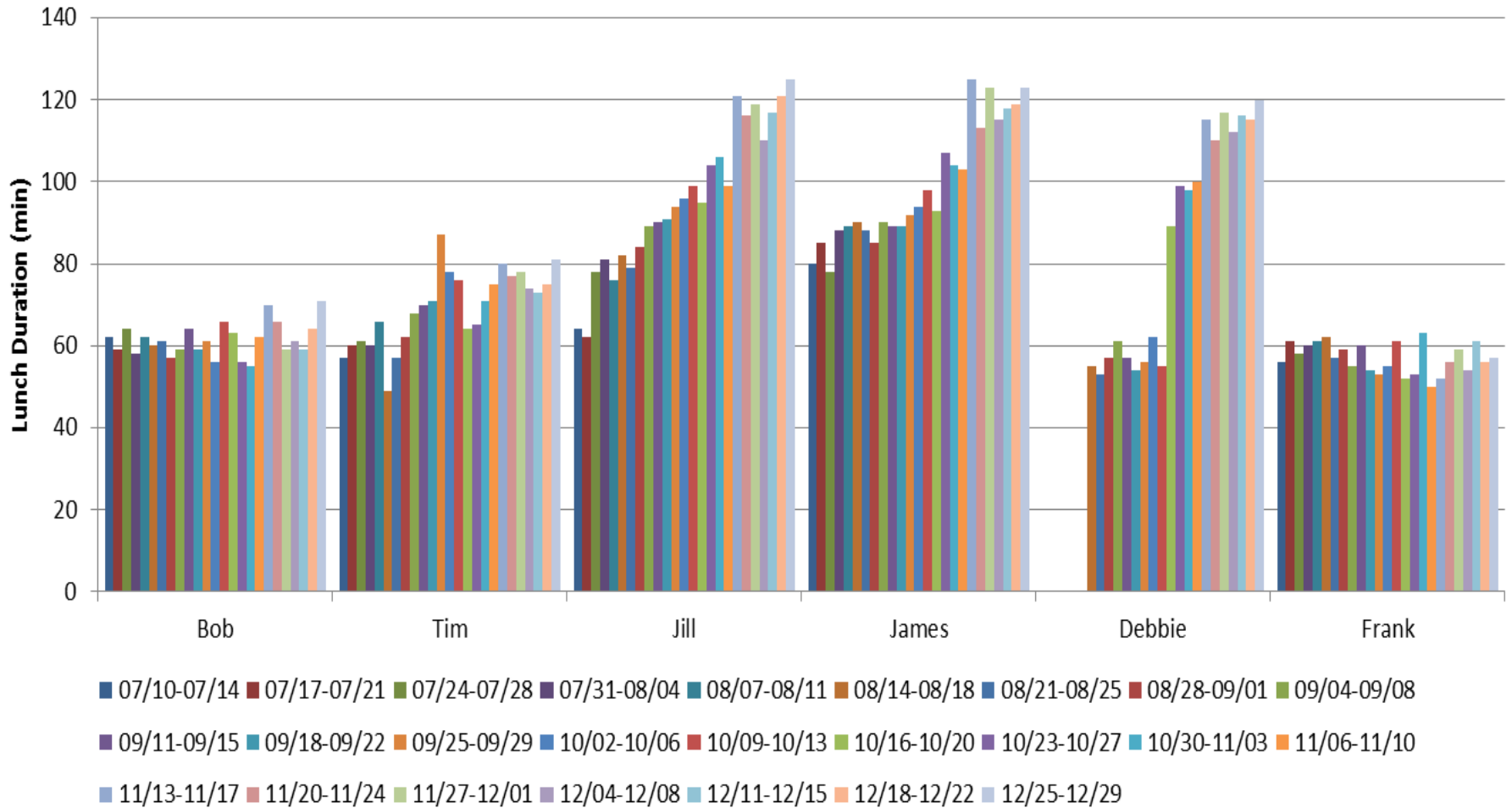
We LEARN from the Results

Example of Real LDAR Data

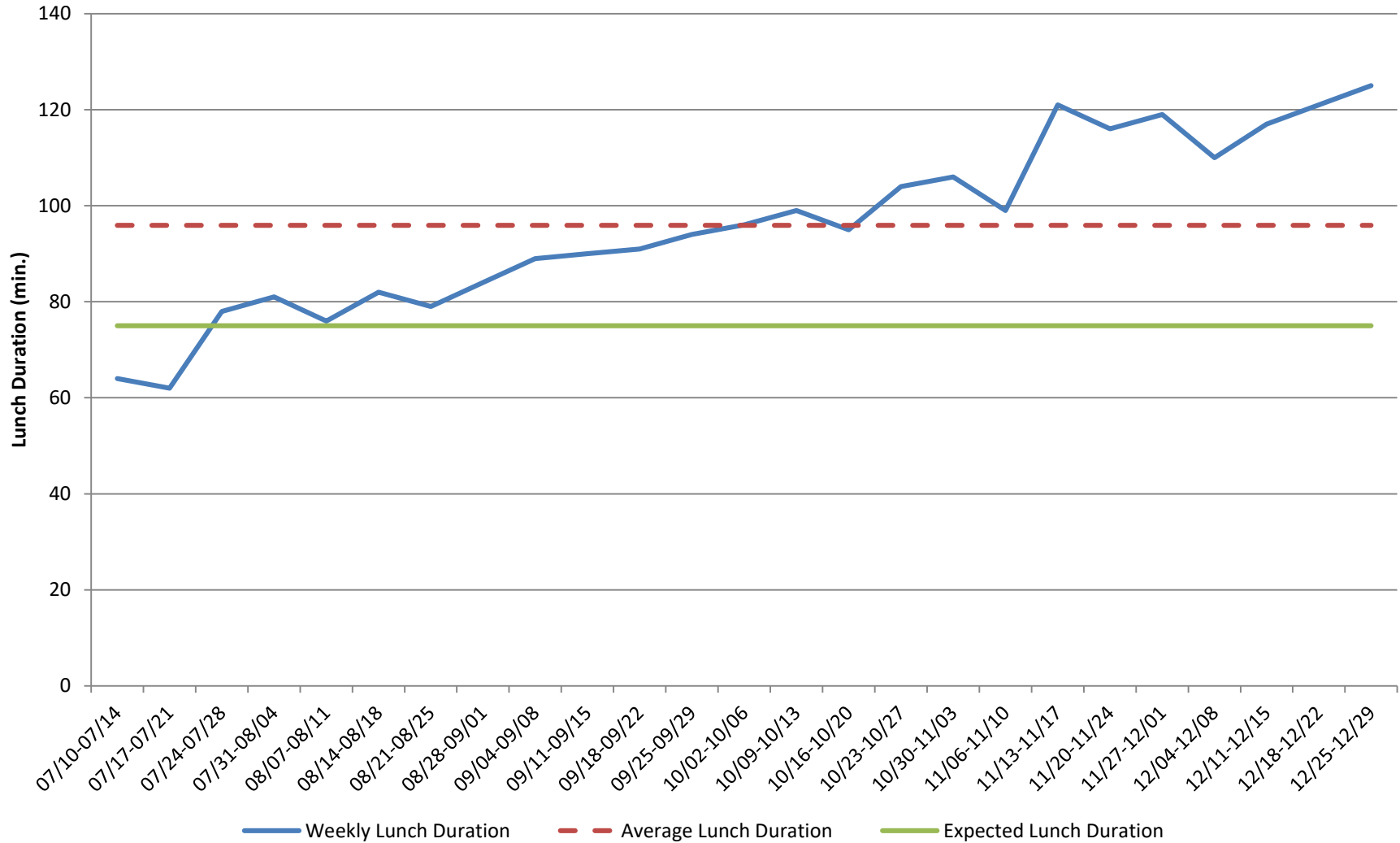
Site “A” has 6 monitoring technicians onsite. After review of the productivity data it is found that lunch time durations have continued to increase and productivity has decreased.

Lets look at some data on the lunch time durations!

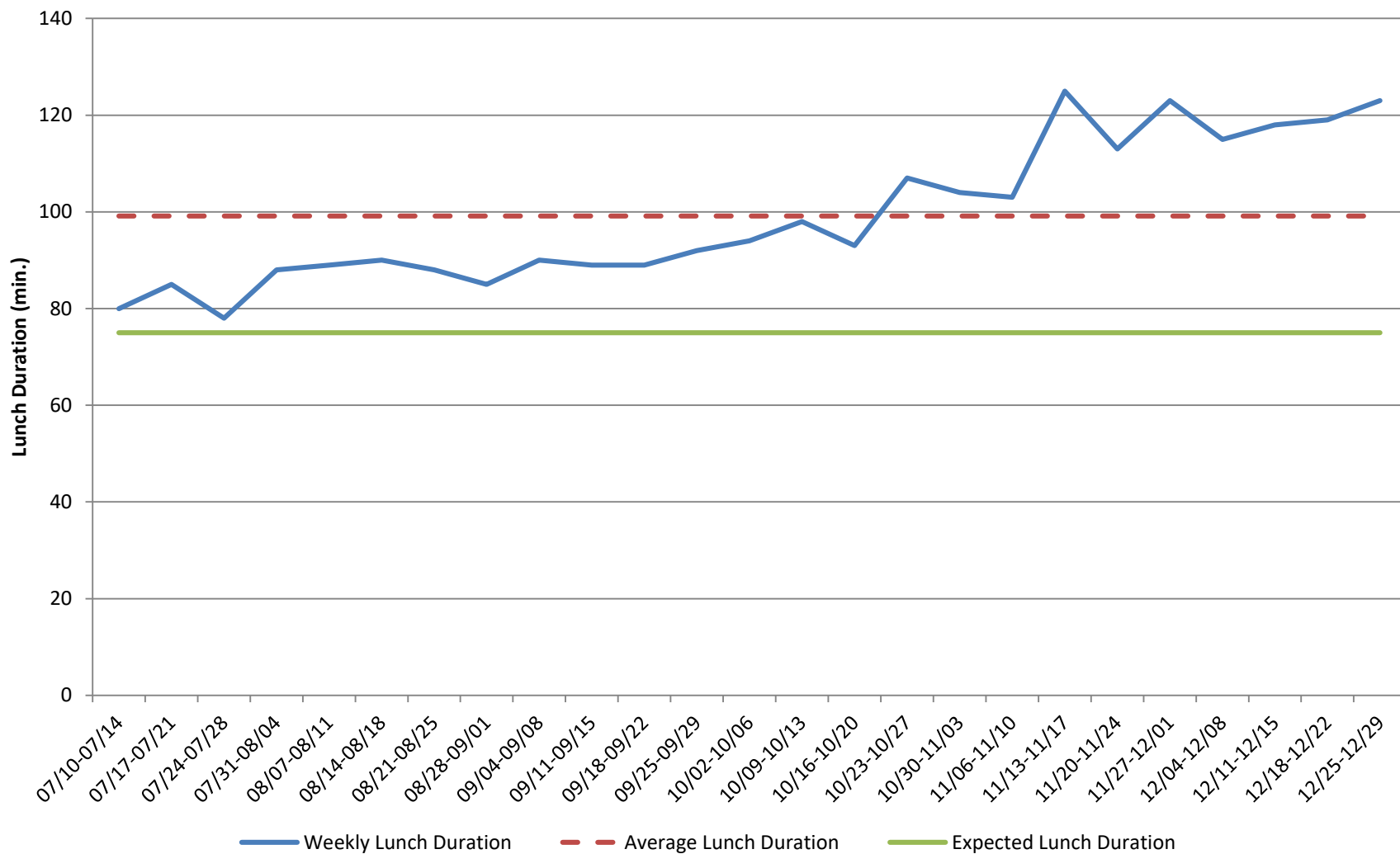
Weekly Avg. Lunch Duration July - December 2017



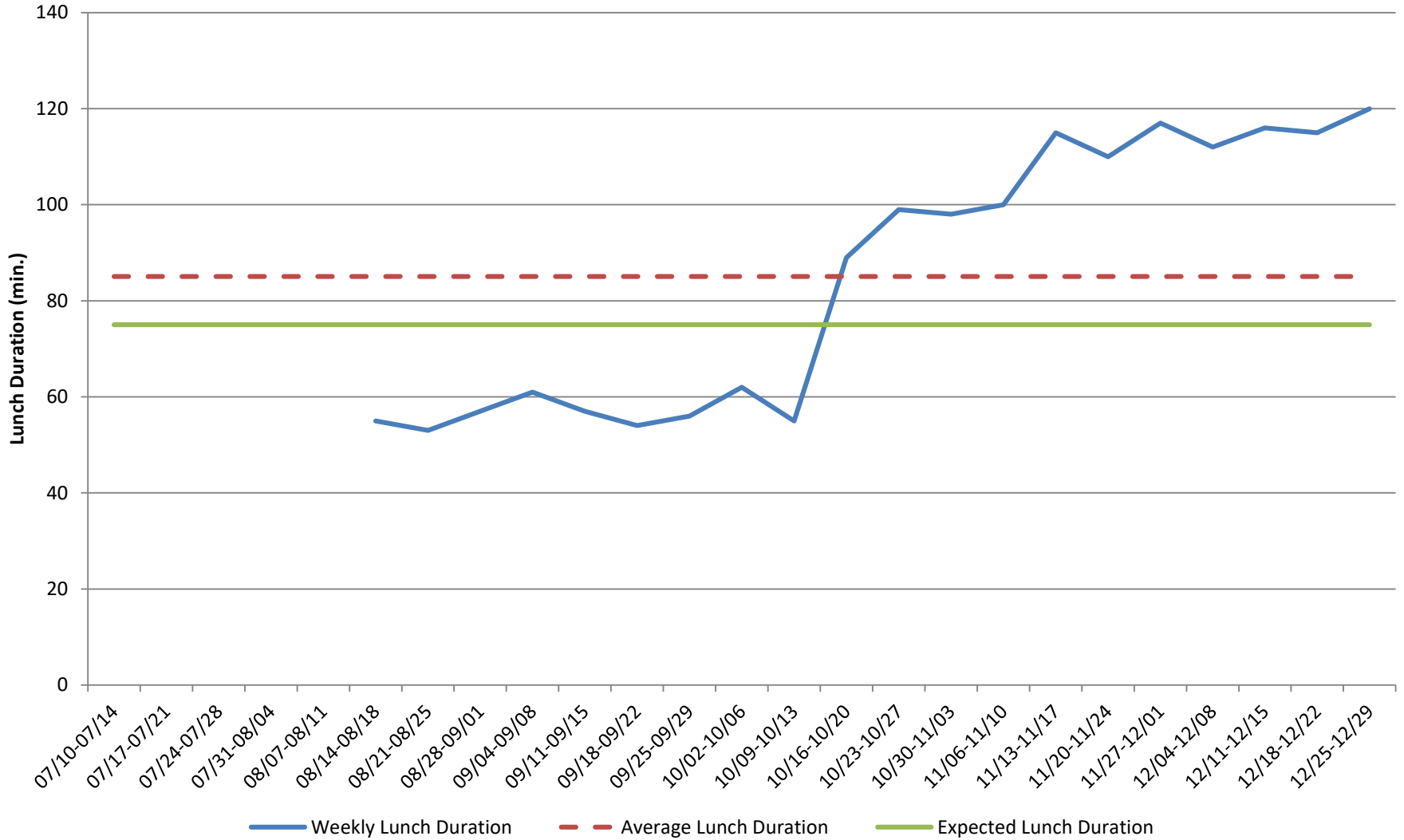
Avg. Lunch Duration - Jill July - December 2017



Avg. Lunch Duration - James July - December 2017



Avg. Lunch Duration - Debbie July - December 2017



What did we learn from this data?

Jill and James were taking advantage of lunch breaks and received no feedback. They were both well over site expected duration.

Debbie (a new technician) started off doing well and received no feedback. She likely started her extended lunch breaks after Jill and James told her it was ok to take longer lunches because supervision was not paying attention.

Frank and Bob were doing a great job on lunch breaks. I wonder if they know it?

How can Data Mining effect your LDAR Program

What are some of the POSITIVE effects Data Mining can have on your LDAR Program?

Stronger Compliance – Increase monitoring quality

Higher Productivity – Higher time on tools, achieving productivity goals

Employee Retention – Feedback to employees both negative or positive will increase retention.

What are the **NEGATIVE** effects Data Mining can have on your LDAR Program?

Sometimes with the **GOOD** comes the **BAD!**

Falsification
Theft of Time
Excessive Down Time
Invalid Data

These are all issues that can be found if strong data mining is performed. Of course would we rather find these items quickly and develop processes to keep them from happening again.

Data Mining Results Sharing and Feedback

Positives of providing quick feedback of results

- Eliminate long periods of non compliance, quick resolution if data anomalies are detected.
- Proper training on technicians when data show negative trends.
- Higher retention of good technicians through positive feedback and recognition of quality work.
- Higher Moral / Lower Turnover.
- Higher Productivity.
- Happier Customers.

Results of NOT providing quick feedback of data mining results

- Technicians who are doing it wrong, think they are doing it right and continue to do it wrong.
- Non-Compliant inspections for extended periods of time.
- Technicians who are doing it right think you don't care because your not telling them they are doing it right.

A real world scenario of how data mining proves to provide results

January 2017 an “un-named” person made a life choice by deciding to re-focus on life, fitness and health. This person decided to start jogging as their choice of exercise. Thousands of miles and countless hours were recorded to achieve the final results.

So how does this story relate to data mining

After months of jogging and hundreds of miles results started to come fast. Our dedicated person started tracking data by using a GPS watch and app. He started watching his per mile time become faster, his miles per day increase, and his weight and pants size fall.

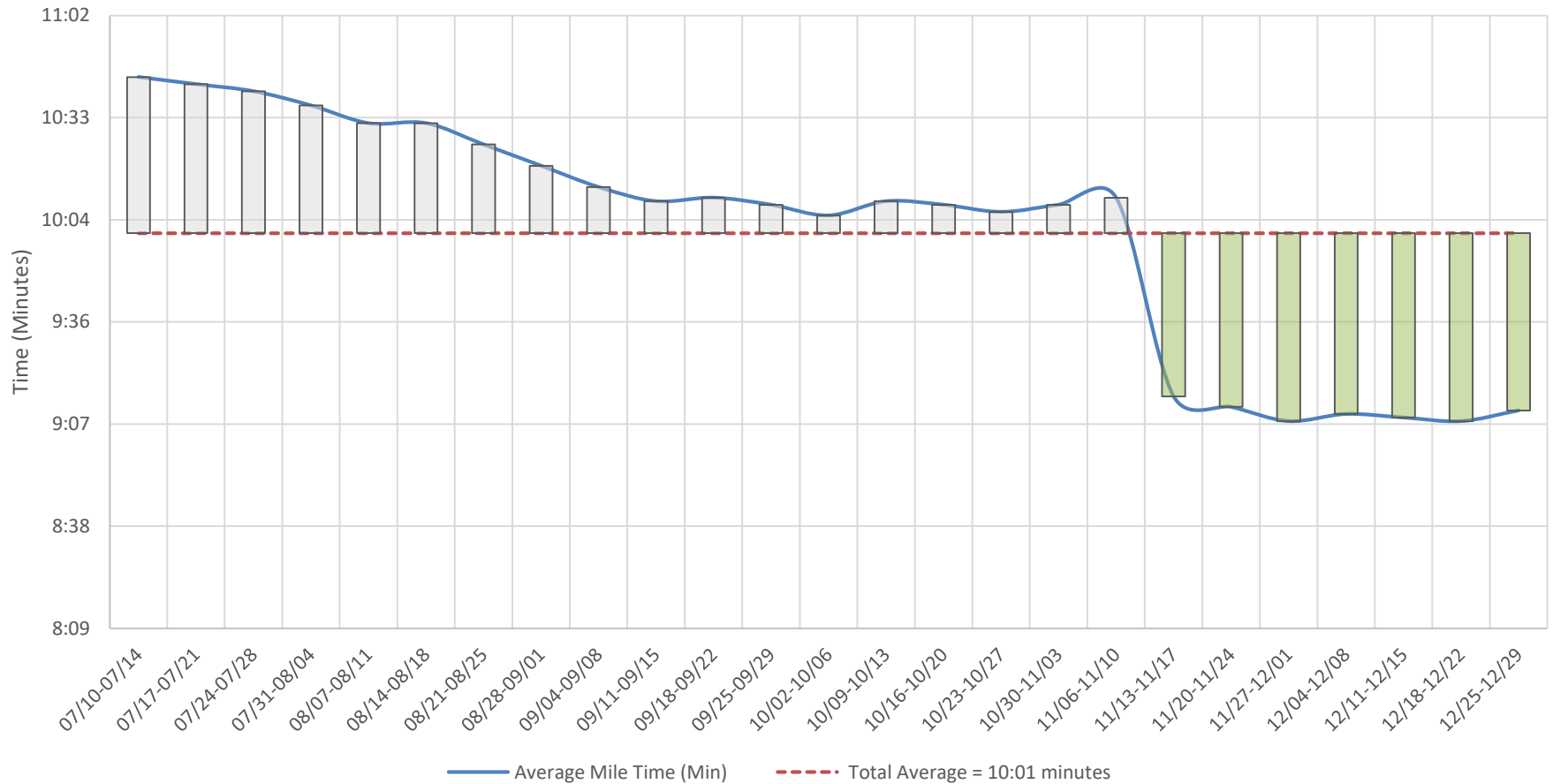
Constantly watching data trends provided by the GOS tracking watch on his wrist was key to success. Data Mining every day and every workout allowed to track results and track success.

**The day came when the trends stopped
and that dreaded plateau hit!**

**Coming from a background in LDAR
and being mentored by a person who
pioneered the art of data mining LDAR
data, he knew the only way to continue
to achieve more results was to start
looking at more data!**

Actual data recorded from GPS tracking watch

Avg. Mile Times
July - December 2017



Conclusion

- The MORE data we mine the MORE information we can have.
- If we mine data MORE often, we will see MORE data trends.
- The quicker we provide feedback from the results, the MORE likely we are to have positive results.

Conclusion

LDAR Gold Rush

**Nobody s getting rich off the big nuggets.....
It's the fine gold dust that is embedded in
the thousands of cubic yards of dirt, mined
from deep down in the earth and feed into
the wash plants to be exposed.**

Conclusion

LDAR Gold Rush

In our LDAR programs we produce millions of data points every year. What are doing with this data? Are we sharing it? Are we learning from it? Are we getting better because of it?

Questions / Comments



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