FIRE DATA LAB

DATA ANALYTICS SUMMIT REPORT

INTRO

This report covers outcomes from the first Fire Data Analytics Summit held May 31 – June 1, 2018 in San Diego, CA. Attendees represented fire departments that are participating in the Fire Data Lab. This group of fire departments is pioneering the use of comparative data in public safety. This year they have transitioned from talking about possibilities into executing a concrete set of steps that has moved the group forward (see Appendix A for summit agenda).

Sue Swenson, Chairwoman of FirstNet, keynoted the summit. She highlighted how the attendees' important work in the new field of inter-departmental data analytics will help the FirstNet Authority deliver on public safety goals.

THE ROAD TO THE SUMMIT

In year 1, the Fire Data Lab (FDL) created an efficient and anonymized derivative data warehouse. Twenty fire departments connected their AVL, CAD, and RMS systems to the data warehouse and logged over 1,000,000 incidents. Through a series of workshops, the FDL identified the most urgent data challenges departments are experiencing and also identified new analytics departments would like to see (see Appendix B).

SUMMIT ACTION ITEMS

Data Quality

There is a difference in data quality between departments (see Appendix C for an example of data quality issues in response flow data). Data quality can be fixed after the incident through quality control, but it is time consuming. In an effort to reduce that time, the Fire Data Lab will create a data quality dashboard with basic metrics that will alert departments when something in the data needs to be reviewed.

Unit Hour Utilization (UHU)

Departments are interested in a universal approach to tracking resource utilization so they can compare apples-to-apples when they discuss policies. The first metric attendees want the Fire Data Lab to produce is Unit Hour Utilization (see Appendix D for specific UHU calculations). Departments would like the ability to compare their UHU to similar departments to better set realistic benchmarks for resource utilization.

Community Solutions

Departments would like their analytics programs to identify opportunities to improve their performance. Heavy resource usage by non-emergent calls related to homelessness, drug abuse, and mental health is an area of growing concern. Individual departments have developed pilot programs around these concerns, but technical questions of how to measure the effectiveness of these programs need to be explored. The Fire Data Lab has a large amount of response data that can be used to identify prevention activities that might improve performance in these areas.

NEXT STEPS

"RIGHT NOW THE FOCUS IS ON HOW WE ARE COLLECTING DATA, WHAT DATA WE ARE COLLECTING, ETC., WHICH MAKES SENSE FOR THIS STAGE. I WOULD HOPE THAT AS THINGS MOVE FORWARD WE GET MORE OF AN OPPORTUNITY TO DISCUSS WHAT THE DATA MEANS, AND HOW TO USE DATA TO DETERMINE RISK AND DEPLOYMENT."

-ATTENDEE

In 2019, the Fire Data Lab will grow reporting capabilities in areas most impactful to the participating agencies, such as data quality metrics, UHU/Unit Performance statistics and hold a Community Solutions Summit that will focus on using data to address growing fire department concerns. The FDL will award an additional 13 departments to grow the dataset. The FDL will continue to publish results at firedatalab.com as the participating departments work to apply inter-departmental analytics to meet their operational needs.

APPENDIX A

FDL Data Analytics Summit Agenda

Thursday, May 31

9:00 AM Welcome and Introductions Jeff Johnson

9:15 AM FirstNet Presentation Sue Swenson

10:00 AM WFCA & Data Analytics Jeff Johnson

10:15 AM Creating a Fire Data Lab Community

- Observations from Year 1
- Discussion: What can we learn/share about data-driven decision making? What is the relationship between Ops/IT? Can we improve vendor and data interactions?

10:45 AM Break

11:00 AM Department Profiles and Demographics

- The current state of department-to-department metrics
- Discussion: How do we relate from department-to-department? Does department or population demographics impact our perception of performance?

12:00 PM Lunch

1:00 PM Year 1 Data: Let's Take a Look

- Year 1 Performance Data
- Discussion: Year 1 focused on collecting performance data, what ways do we recommend that we present the data?
- Year 1 Data: What's in, what's out, and where does the Fire Data Lab get its data?
- Discussion: What data are we collecting now? What's not being collected?

2:30 PM Break

3:00 PM Data Quality – Here's What We're Seeing

- Garbage in/Garbage out
- Discussion: Not all data is good data, what happens the first time a department looks at its data? What is the value of good data vs bad data? How important is data accuracy?

3:45 PM Future Topics

- Data analytics success stories
- Discussion: How did your department use data analytics last year? What interesting stories have you heard this past year? What should WFCA focus on for Year 2?

4:30 PM Adjourn

Friday, June 1

8:30 AM The Role of Data Analytics in the Fire Service

- How important is data analytics to the fire service?
- Discussion: Who does analysis in the fire service? Who is the audience? Does this mean anything to the line? Does the public need analysis?

10:00 AM Summary of Workshops

11:00 AM Mentor Program Overview

12:00 PM Adjourn

Data Analytics: Opportunities & Challenges

Opportunities For Enhanced Analytics Identified at Workshops

Understanding critical failure points of future growth
U.H.U. – time on task / capturing total time
Budget impacts on service
How response time changes at a similar location over time
Staffing models (equipment wear, training/inspection, standards of cover in future development)
Value of property saved
Overtime of strike teams
Time to effective force on-scene
Disaster modeling
Effects of occupancy changes on service delivery
Quality of Life calls
Historical traffic vs. provided route
Factors to fall victims
Defining/finding comparable data sets around building projects
Arson analytics
Effectiveness of vegetation management programs
Automatic mutual aid / number of incidents and number of units
Rest period (ideal vs. actual)
Cardiac outcomes / survival rates
Dynamic model for time of day
Inspector performance
Cancer presumption
C.R.R. effectiveness
Presenting data to gain firefighter buy-in
Reporting to city council on similar departments

Data Challenges Identified at Workshops

Limited access to CAD data
Lack of access to intervention and outcome data (hospital/care provider - actions on scene)
Inconsistent data quality
Delayed/inaccurate structure info from parcel/tax valuations
Lack of clarity on benefit of data based projects
Inability to integrate data
Lack of support from I.T.
Network coverage – back-up plan
Inefficiency of reporting (time to compile reports / high volume of requests)
Lack of resources
Data loss
Too much time required to input data
Gaps in data entry (garbage in / garbage out)
Hardware faults – time lags

Response Flow (Time Processing from Alarm to Close)

Agency	Incident Count	Not Cancelled	No Duration	No Alarm Processing	No 1st Unit	No 1st Unit Turn Out	No 1st Travel	No 1st Response
A	39437	37242	1	1006	2395	2415	2415	2395
B	7881	6912	7					
C	327	282				4	4	
D	112	86	36	8	40	49	44	47
E	1128	1070	209	23	85	286	274	103
F	38004	36349	4		1	192	192	1
G	64999	59914	8861	1213	3980	6683	6263	4490
H	118975	106868	3309	2619	3584	3593	3593	3584
I	1537	1437	222	22	112	420	394	149

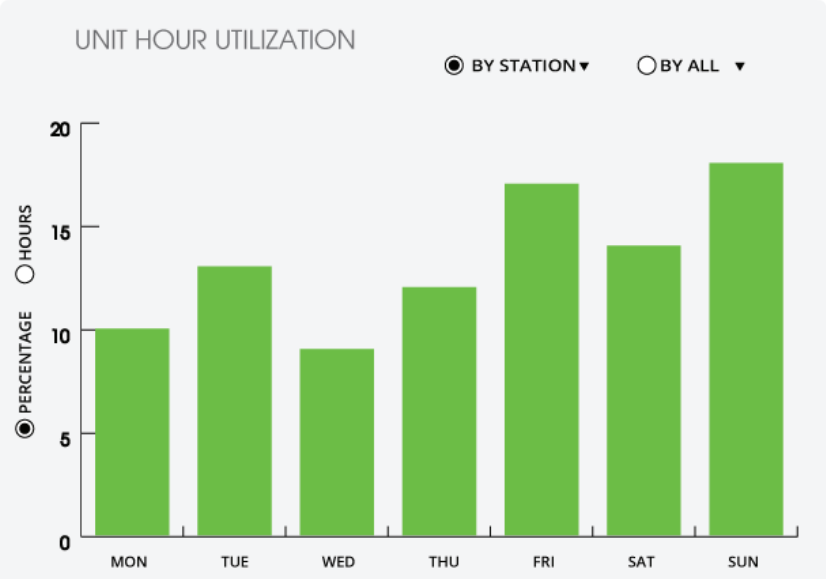
Unit Hour Utilization (UHU) Calculations

Specific calculation for UHU is hours out of service divided by unit availability window.

Hours out of service is calculated as total time from dispatch alarm to clear.

Unit availability window is stored per unit in the unit lookup tables.

The resulting graph should resemble the graph below.



A UHU chart on a monthly agency dashboard should resemble the graph below.