



Date: July 11, 2017
To: Steve Edin, MSD
From: Chris Alexander, Fire Chief
Re: 2016 and 2017 Mukilteo Fire Department Annual Response Analysis

“Every city and town shall evaluate its level of service and deployment delivery and response time objectives on an annual basis. The evaluations shall be based on data related to level of service, deployment, and the achievement of each response time objective in each geographic area within the jurisdiction of the city or town. (2) Beginning in 2007, every city and town shall issue an annual written report which shall be based on the annual evaluations required by subsection (1) of this section. (2a) The annual report shall define the geographic areas and circumstances in which the requirements of this standard are not being met. (2b) The annual report shall explain the predictable consequences of any deficiencies and address the steps that are necessary to achieve compliance.” RCW 35.103.040

The Mukilteo Fire Department mission is to plan for, prevent, and respond to fire, medical and disaster events. To achieve that mission, objectives have been set for turnout times and response (travel) times to emergency incidents. These are measured at the 90th percentile, meaning that 90% of the responses had a time less than the time specified. The City has not defined objectives for certain types of responses, including special operations, aircraft rescue and firefighting, marine rescue and firefighting, and wildland firefighting. These responses require a response from a specialized regional resource or team not operated by the Mukilteo Fire Department. Their turnout and travel times are outside the control of the department.

In October 2015, the regional 9-1-1 communications center, SNOCOM, changed computer-aided dispatch (CAD) systems. This required changes to how individual departments accessed their data for analysis. Problems were identified in the initial methods for data extraction which generated incomplete or inaccurate data sets. In 2018 these issues were resolved by a team of fire professionals, communications center technical experts and the CAD vendor. A data set was generated to include both 2016 and 2017 data. This resulted in this combined annual response analysis report.

Incident Volume

The basic measurement of how busy the department has been is the incident volume, or the number of times units responded to calls for help. The department divides emergency responses into two categories. The incident volume in Mukilteo, which require measurement against the City objectives, accounts for 81% of the department's calls. Automatic aid incidents to neighboring jurisdictions, which are outside the City objectives, account for 19% of the department's calls. The calls in Mukilteo can be further divided by geographic area. Station 24's area includes the 1.95 square miles in the City limits north of 84th Street. This area accounts for

26% of the department's calls. Station 25's area includes the 4.67 square miles in the City limits south of 84th Street. This area accounts for 74% of the calls. Across the board, call volumes increased from 2016 to 2017.

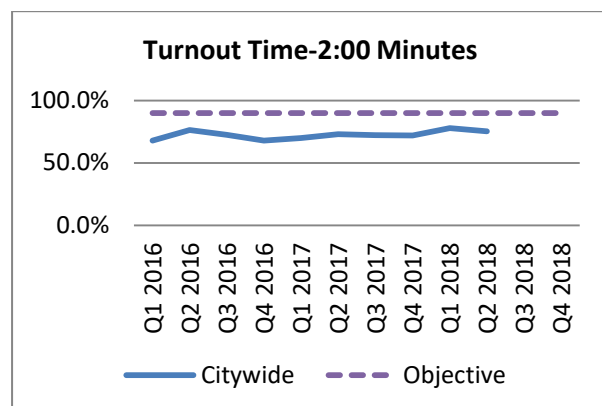
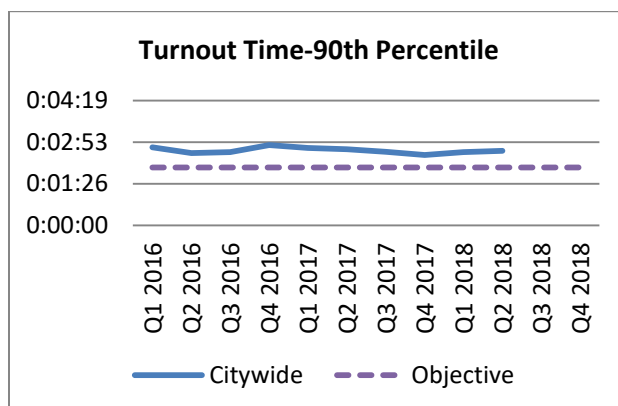
Measure	Change from 2016 to 2017
Total Mukilteo Fire Calls	12 % increase (307 incidents)
Fire Department calls in Mukilteo	14% increase (278 incidents)
Fire Department calls outside of Mukilteo	6% increase (29 incidents)
Calls in Station 24 Area (north of 84 th Street)	10% increase (55 incidents)
Calls in Station 25 Area (south of 84 th Street)	16% increase (223 incidents)

It is expected that overall incident volumes will increase as the population ages, the prevalence of chronic medical conditions continues to rise, and traffic volume on the roadways increase. Tempering that increase are factors such as installation and maintenance of commercial and residential fire protection systems, improvements in fire and building codes, and improvements in vehicle safety.

Turnout Time

Turnout time is the time from when personnel are alerted to an incident by the communications center until the apparatus starts responding ("wheels rolling"). The City objective is for turnout time is 2:00 minutes from the time of dispatch with 90% compliance. Through the two years examined, the turnout time is trending down and percentage of compliance is trending up, but neither meets their objective. Further root cause analysis is needed to identify potentially correctable causes.

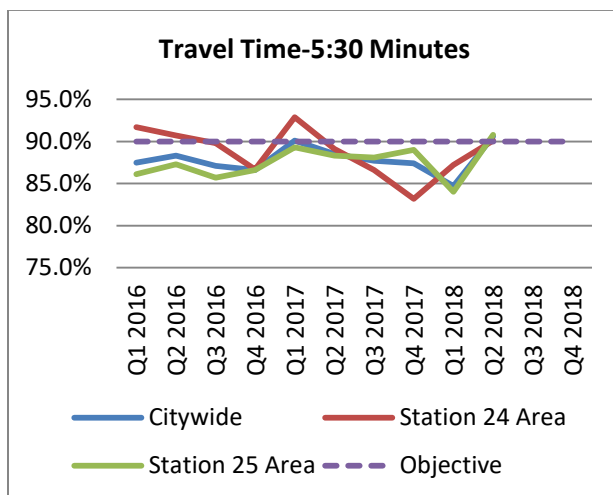
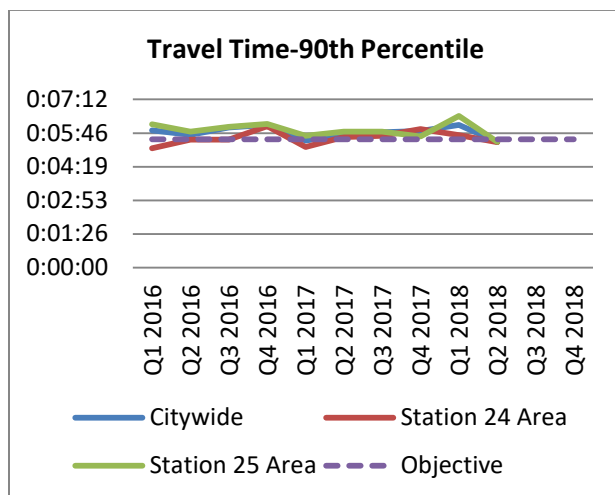
Turnout	2016	2017
Count	1681	1852
Mean (Average)	0:01:39	0:01:38
Min	0:00:06	0:00:03
Max	0:04:45	0:04:42
Range	0:04:40	0:04:39
Standard Deviation	0:00:43	0:00:43
90th Percentile	0:02:37	0:02:36
2:00 Objective	71.0%	72.0%



Travel Time

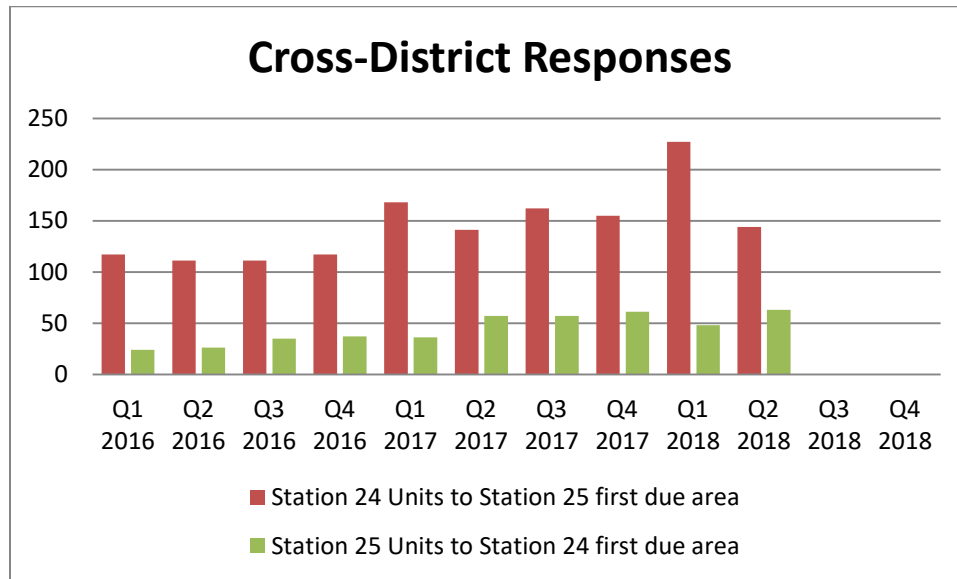
Travel time is the time from when the apparatus starts responding to the incident (“wheels rolling”) until they arrive on the scene (“wheels stopped”). The City objective for travel time is 5:30 minutes with 90% compliance. Through the two years in this report, the travel time is trending down and the percentage of compliance is trending up, but neither meets the objective. Of note, the travel time for Station 24 is up to a minute faster in some quarters than the travel time for Station 25. Further root cause analysis is needed to identify potentially correctable causes.

Travel		
	2016	2017
Count	1573	1738
Mean (Average)	0:03:32	0:03:32
Min	0:00:00	0:00:01
Max	0:13:21	0:13:31
Range	0:13:20	0:13:30
Standard Deviation	0:02:04	0:01:58
90th Percentile	0:06:07	0:05:48
5:30 Objective	86.6%	87.9%



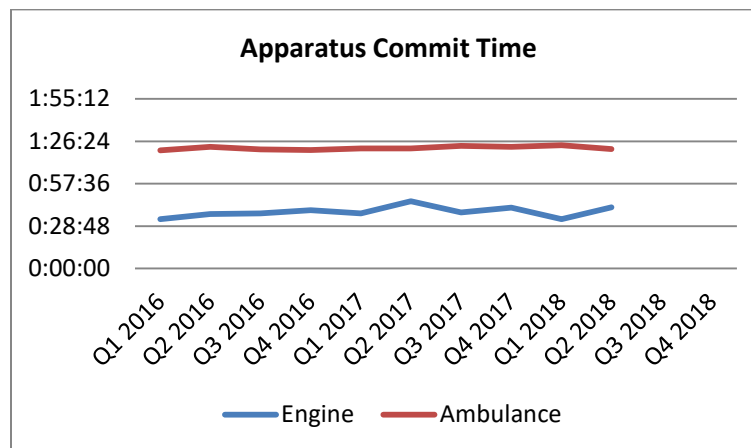
Cross-District Responses

One contributing factor to longer travel times is the number of times a unit is responding to the other station's area. The cross-district responses of concern are ones that occur as a result of a second incident in that area while the primary unit is out. The chart below shows all cross district responses. The data set does not have enough detail to effectively identify situations where the primary unit was unavailable. Further analysis will be necessary prior to using this tool for deployment decisions.



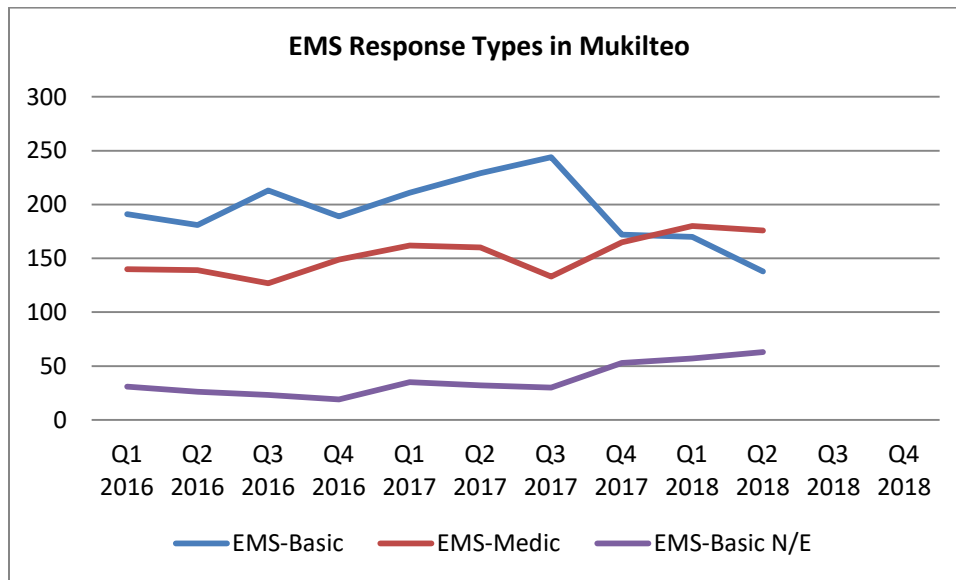
Commitment Time

Measurement of the number of times an apparatus responds is useful to gauge the department's workload. Measurement of the amount of time the apparatus is committed to an incident is also necessary as this indicates the department's readiness to respond to the next incident. Engines spend less time committed to calls unless there are a growing number of fire calls. Ambulances have significantly greater commitment time due to the time required to transport a patient to the hospital and return to the City. Both are fairly constant over the two years in this report. Increasing time in the future will be an indication to examine the number and type of units deployed.



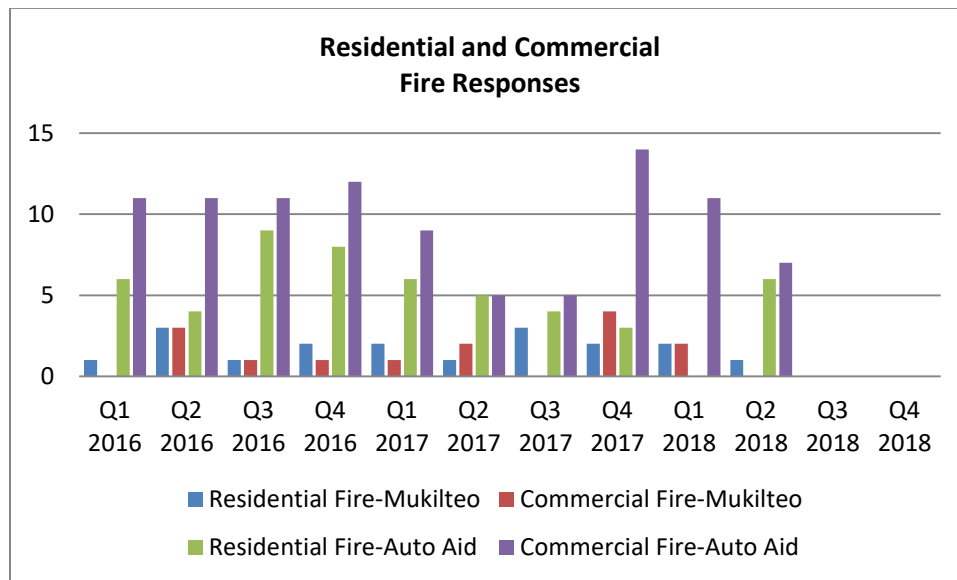
EMS Response Types

Emergency Medical Service (EMS) responses account for a significant portion of the fire department's incidents. These calls are divided into three primary categories, basic life support emergency incidents (EMS-Basic), advanced life support emergency incidents (EMS-Medic), and basic life support non-emergency incidents (EMS-Basic N/E). Units responding to emergency incidents utilize lights and sirens during the response. Units responding to non-emergency incidents do not use the warning equipment. Every instance of emergency response comes with a greater chance of being involved in or causing a motor vehicle collision. The communications center utilizes a protocol when taking calls to identify the appropriate call type category. This determines the units and their response urgency. In November 2017, the communications center changed protocol systems. This resulted in a drop in the number of EMS-Basic incidents and an increase in the number of EMS-Medic and EMS-Basic N/E incidents. Over time, it is expected that the protocol system will result in more non-emergency responses.



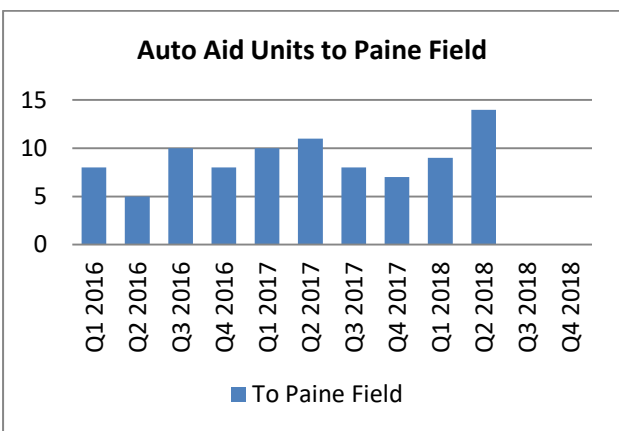
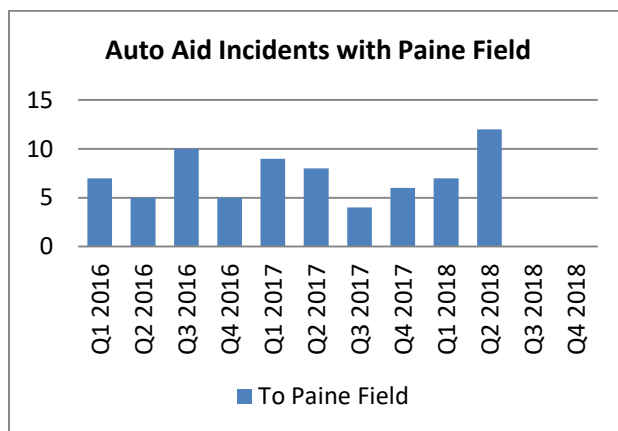
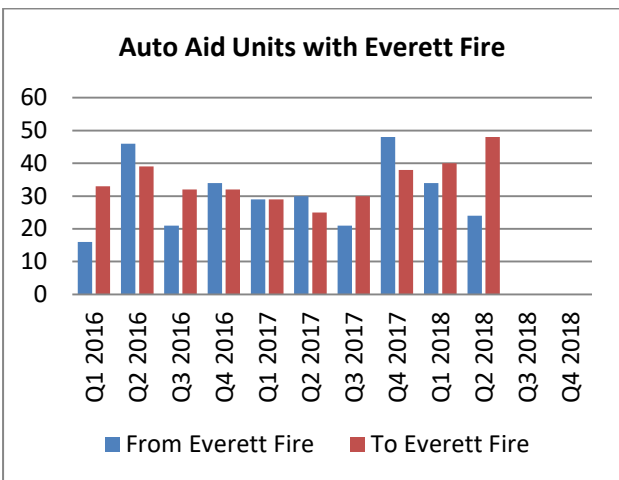
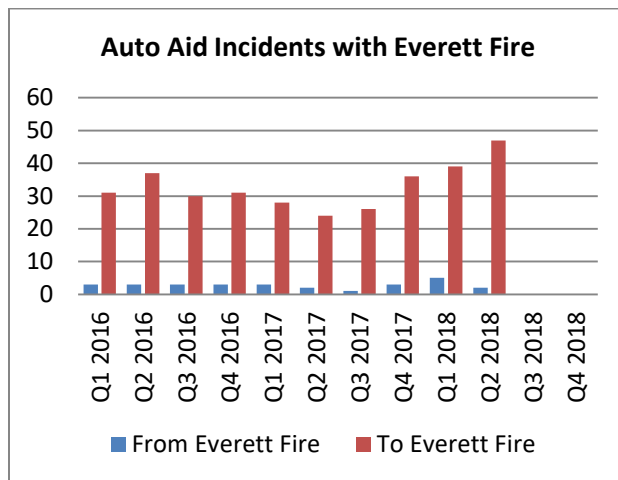
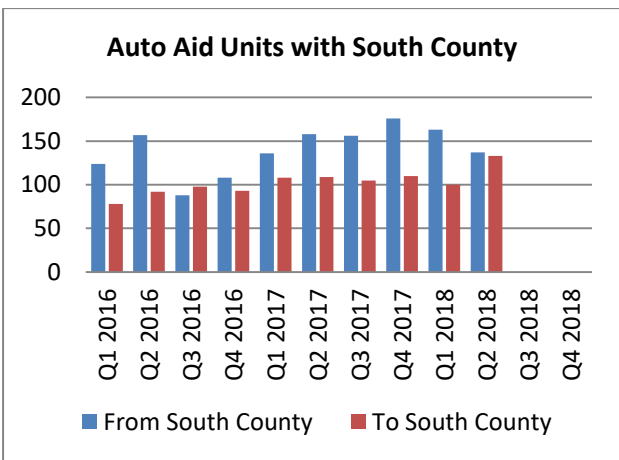
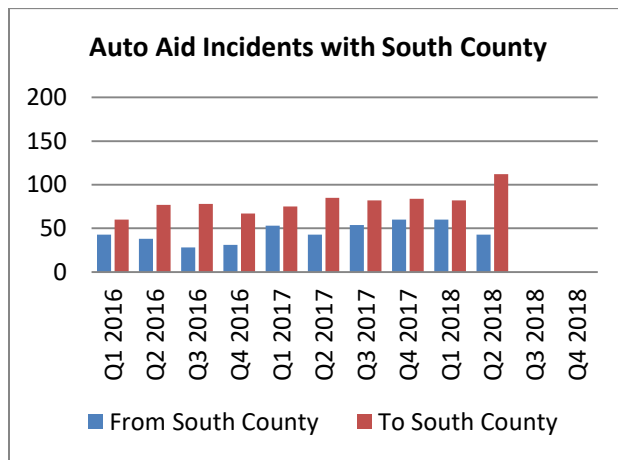
Residential and Commercial Fire Responses

Fire responses are divided into two categories, residential and commercial. Responses are separated this way because the higher complexity of commercial fires requires more resources. While fire responses in Mukilteo are small, Mukilteo Fire units respond to a significant number of fires with our automatic aid partners. This is beneficial in two ways. First, the responses allow Mukilteo crews to keep up their firefighting skills through actual responses. Second, by working closely with our automatic aid partners, operational safety is improved as the crews have experience working together. Due to the number of resources required, any residential or commercial fire in Mukilteo will always require a response from our automatic aid partners.



Automatic Aid

Snohomish County Fire Chiefs have adopted a policy of closest unit dispatch, meaning the closest appropriate resource is sent to the incident, regardless of department. This policy of automatic aid provides the best service to the caller as help arrives as soon as possible. Mukilteo's primary automatic aid partners are South Snohomish County Fire and Rescue ("South County"), Everett Fire Department, and Paine Field Fire Department. South County and Everett both provide resources to and receive resources from Mukilteo Fire Department. Paine Field receives resources only, although their specialized apparatus would be available in the event of a downed aircraft in Mukilteo. The fire department monitors both the number of automatic aid incidents and the number of units sent to each incident. Based on closest unit dispatch, South County often provides multiple units for a single incident. Mukilteo Fire, in contrast, normally only sends one unit to a South County incident.



Summary

Mukilteo Fire Department staff will continue to monitor all response performance measures on a quarterly basis. Staff will do further investigation on the turnout and travel times to identify potentially correctable causes. As needed, policy recommendations will be brought to the City Council for consideration.