



Executive Summary

The City of Gresham Fire and Emergency Services (GFES) completed a Standards of Cover in 2022. The Standards of Cover (SOC) is defined by the Commission on Fire Accreditation International (CFAI) as the “adopted written policies and procedures that determine the distribution, concentration, and reliability of fixed and mobile response forces for fire, emergency medical services (EMS), hazardous materials, and other technical types of responses.”

A comprehensive assessment of risks and demand were

completed so that the city and department leadership can adopt policies with the utmost confidence to meet expectations and a high degree of transparency with the public.

This executive summary highlights the most substantive recommendations and alternatives for the Department. Overall, there are five main themes that were utilized to frame opportunities for improvement and a pathway forward that best aligned resource allocation to risks.

Once fully implemented, the citizens and visitors of the greater Gresham area would receive improved EMS response capability, reduced reliance on large fire apparatus for EMS incidents, and maintain or improve response time performance.

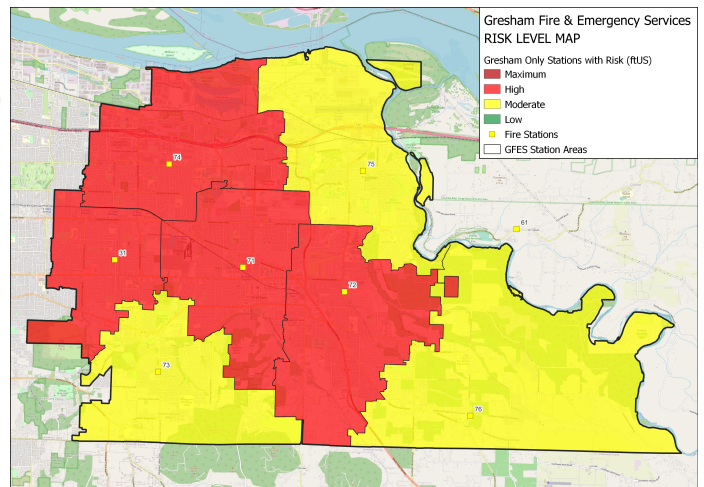
Substantive changes would include adding one additional Rescue unit for Station 72, optimizing staffing, reducing overtime, implementing a Mobile Integrate Health (MIH) model, creating an EMS overlay, and adopting a system of measures.

Top Six Priorities

1. Improving Dispatch and Turnout Times
2. Adding a Rescue unit at Station 72
3. Optimizing Staffing and Deployment and reducing overtime costs
4. Introducing Outcome Measures to Performance Management Strategies
5. Adopting a System of Measures for Future Action Planning and Decision Making
6. Adopting a Mobile Integrated Health (MIH) Model

Risk Assessment Process

The risk assessment process utilized both retrospective and prospective lenses to measure community risks. Ultimately, risks were classified as low, moderate, high, and maximum. Socioeconomic and demographic variables were utilized to compliment retrospective measures of historical demand such as the number of calls and the rate of call concurrency or simultaneity. Stations 71, 72, 74, and 31 were classified as high-risk and Stations 73, 75, and 76 were moderate risk.





Improving Dispatch and Turnout Times

The Department understands the relative opportunity to improve the citizens' experience by maximizing the efficiency of the dispatch interval and turnout time. Dispatch Time is defined as the time from when the 911 center receives a request for service until the fire department is notified to respond. Turnout Time is defined as the time between the fire department being notified of a call (dispatched) and when they are actually driving to the incident.

The National Fire Protection Association (NFPA) 1710 and 1225, recommend a 64-, and 60-second dispatch time, respectively. The current performance is 174-seconds.

Similarly, the NFPA and the Commission on Fire Accreditation International (CFAI), recommend a turnout time of 60-seconds for EMS incidents and between 80-, and 90-seconds for non-EMS incidents, respectively. The Department's current performance is at 150 seconds for EMS and 156 seconds for fire related incidents, both approximately twice the recommended best practice performance.

Recommendations

1. Work with the 911 provider to find incremental improvements in dispatch times, where applicable
2. Better align turnout time performance with best practices

2021 90th Percentile Response Time Performance

| Program | Dispatch Time | Turnout Time | Travel Time | Response Time | Sample Size ¹ |
|--------------|---------------|--------------|-------------|---------------|--------------------------|
| | (Minutes) | (Minutes) | (Minutes) | (Minutes) | |
| EMS | 2.9 | 2.5 | 6.8 | 10.6 | 10,271 |
| Fire | 2.6 | 2.6 | 9.0 | 12.2 | 755 |
| Hazmat | 3.9 | 2.6 | 7.5 | 12.4 | 62 |
| Rescue | 2.9 | 4.1 | 11.5 | 17.7 | 22 |
| Total | 2.9 | 2.6 | 7.0 | 10.7 | 11,110 |

Commensurate Risk and Maintaining Response Time

Analyses of the seven stations areas revealed that each of the station areas have a mix of both urban and rural call densities. In other words, each of the station areas have a relatively uniform blend of demand related risks as defined by concentration.

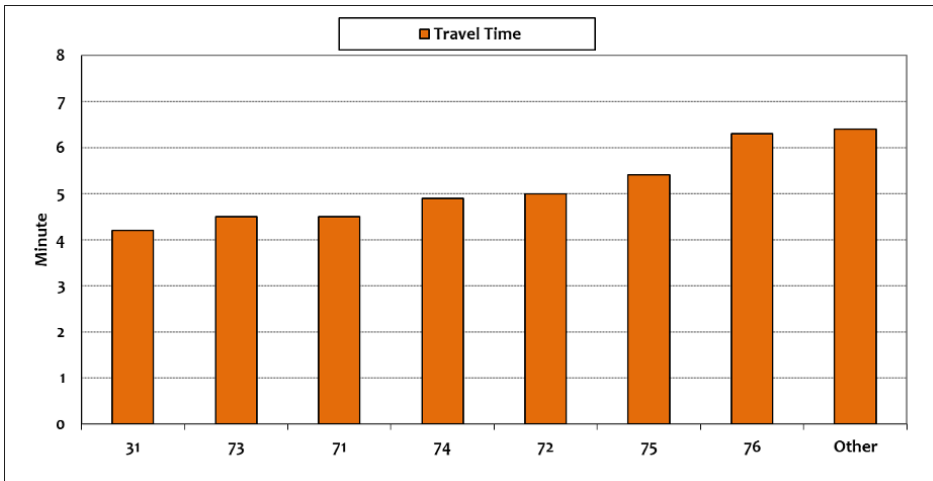
Therefore, continuing to staff and deploy at least 11 units from all seven stations would provide a commensurate risk model across all areas of the jurisdiction and maintaining current response time performance. This strategy is well aligned, and more responsive, as a commensurate risk model than the current census definition of urban and rural.

Recommendations

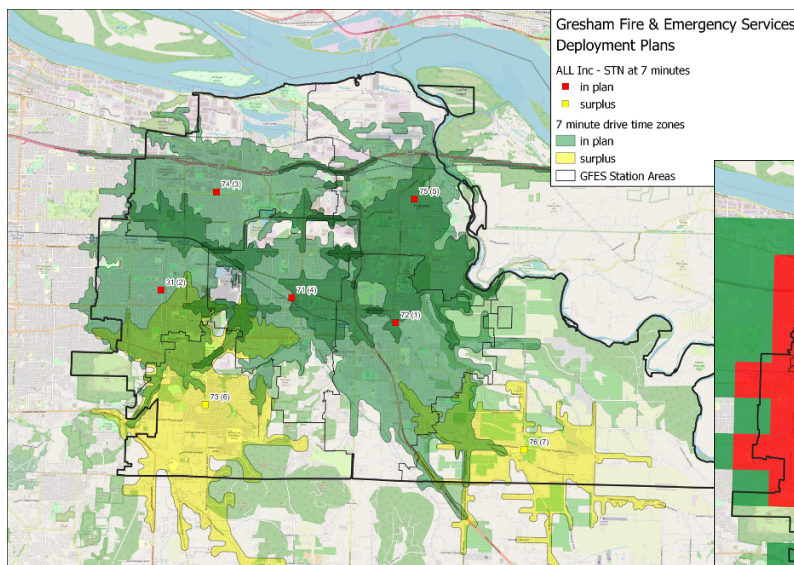
1. Continue to staff all seven stations
2. Deploy a total of 11 apparatus (units) each day

Observations

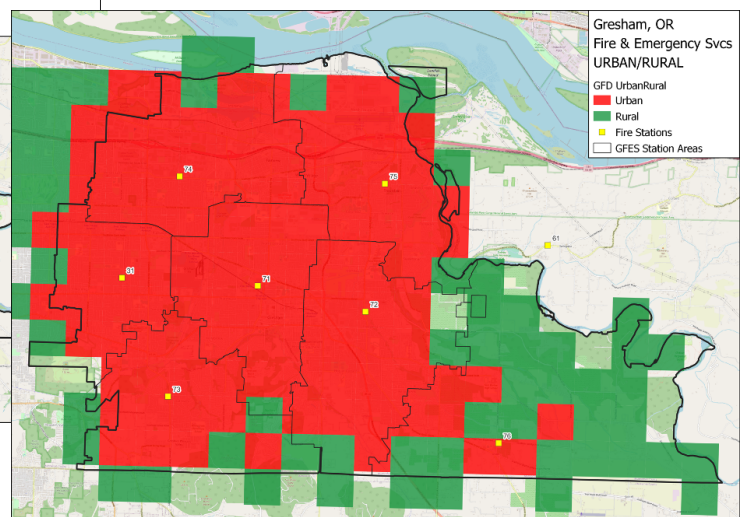
1. Station 76's placement is well-aligned with where calls are concentrated
2. There is limited variation in travel time across the seven station areas



The figure below demonstrates a blend of urban (red) and rural (green) in each of the response areas.



The figure to the left demonstrates that all 7-stations are required.





Optimized Relief Staffing Multiplier

A Continuous Staffing strategy is utilized when the department hires additional personnel to cover the average leave experienced on shift work. In this manner, the additional personnel are available as “relief” personnel who are utilized to cover vacancies at the straight time rate more frequently and thus reducing the overtime liability.

An optimized staffing analysis was conducted utilizing mathematical formulae to determine the most efficient allocation of personnel to maintain the desired staffing. Data provided by the department included an accounting of all personnel time spent away from regularly scheduled shift work. Analyses found that GFES is optimally staffing personnel with respect to the current minimum staffing.

Optimal staffing is defined as sufficient staffing to cover all scheduled work hours, shift schedules, and the average employee leave experience. Maintaining the minimum daily staffing of (25/31/25), it would require a staffing multiplier of 4.04 to optimally staff the department. In other words, it would take 4.04 Full Time Equivalents (FTEs) for each of the minimum staffed positions for a total of 109 personnel assigned to shift. The current allocation is 98 personnel. This equates to a need for an additional 11 personnel department-wide .

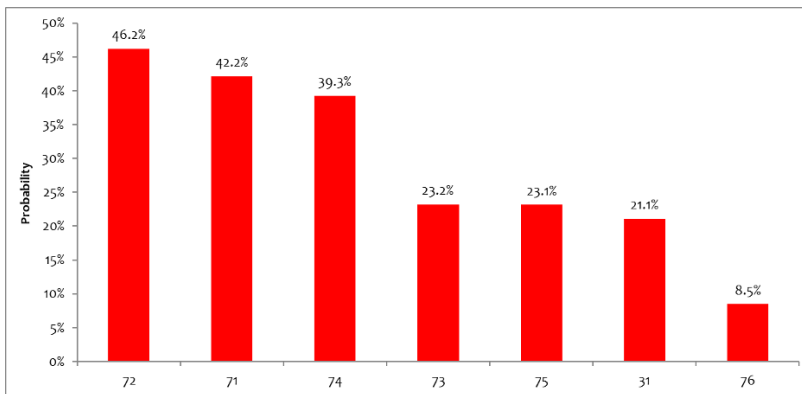
Recommendations

1. Optimized staffing would require an additional 11 FTEs to cover the average employee leave
2. Optimizing staffing will reduce the overtime costs
3. The department should hire 4.04 personnel for each position within the daily minimum staffing

| Current Staffing and Unit Count | Excluding Station 31 All Shifts | | Only Station 31 (B-Shift only) | | Total |
|--|---------------------------------|-----------------|--------------------------------|-----------------|------------------------------------|
| 24hr Seats | 25 | | 6 | | 25 A and C Shifts 31 on B Shift |
| Minimum Per Shift | 25 | 4.04 Multiplier | 6 | 1.35 Multiplier | 25 A and C Shifts 31 on B Shift |
| Total FTE Required by Multiplier | 101 | | 8 | | 109 |
| Shift Assigned FTE Strength | 92 | | 6 | | 98 |
| Additional Department Personnel Needed | 9 | | 2 | | 11 |

System Resiliency and Deployment

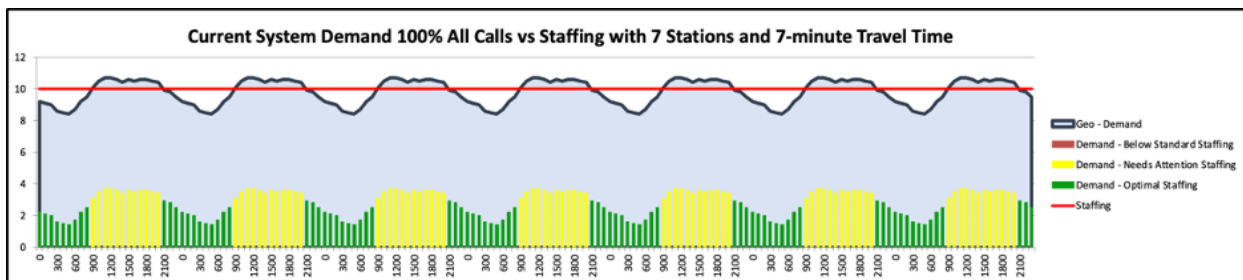
Station 72 has the most demand, and the duration of calls lasted 53 minutes, thus it has the highest probability of having overlapped calls at 46.2%. This means that during the period of an active station 72 call, there is a 46.2% chance that another incident in station 72 will occur. Calls in 71 and 74 had the second and third highest probability of overlapped calls occurring since they had the 2nd and 3rd most call volume.



Recommendations

1. Station 72 is identified as a high risk station area along with Stations 71 and 74. However, Station 72 does not have multiple units assigned similar to Stations 71 and 74
2. At 46%, Station 72 has the highest rate of call concurrency in the department and requires a second unit
3. It is recommended that the department add one additional unit and deploy 11 resources per day. Adding a Rescue to Station 72 is recommended

The current deployment included a total of 10, 24-hour resources. The following figures illustrate the resource constraint of the current system. When reviewing the figures, the green/yellow/red columns are the hourly demand for services, adjusted for time on task, from Sunday through Saturday. The blue shaded area represents the unit demands to cover the geographic area with a 7-minute travel time. The dark blue line that outlines the shaded area is the required unit deployment required without consideration for workload. Finally, the red line is the actual unit deployment. Whenever the redline is at or below the blue line, the system is resource constrained even before considering the impact of the workload on the personnel.



When the system is resource constrained, the units aren't available to immediately respond, which means that there may be longer response times from farther away units and/or mutual and automatic-aid requests. Within the current system, the combination of the geographic demand to meet a 7-minute response time and the average hourly rate of calls requires a total of 11 deployed units each day. The current system has 10, therefore, the optimal resource allocation for the current risks, desired performance, and system design would require 1 additional resource. Therefore, adding a Rescue to Station 72 is recommended.



Introducing Outcome Measures

In addition to setting goals or benchmarks related to impact or outcome measures, systems typically set goals or benchmarks related to outputs or process measures due to the presumed or evidence-based relationship between the two measures. For example, research indicates that transport of Step 1 and Step 2 trauma patients to a designated trauma center (process measure) can reduce mortality (outcome measure).^[3] As such, the Washington State Department of Health has set a process-related goal that $\geq 90\%$ of Step 1 and Step 2 trauma patients be transported by EMS to a designated trauma center.

Outputs or process measures are typically more easily evaluated, as the system exerts direct influence over their outputs and processes, and can oversee related data collection and management. Impact or outcome measures become more difficult to evaluate when data collection and management are outside the purview of the system, and interpretation of data must account for other intervening factors.

| Fire Suppression | | |
|--|-----------------------|---------------------|
| Measure | Benchmark Performance | Current Performance |
| Fire Spread - Degree of Confinement - All Building Fires with Fire Spread | | |
| Fire Confined to Building of Origin | 95% | % |
| Fire Confined to Floor of Origin | 75% | % |
| Fire Confined to Room of Origin | 50% | % |
| Time to Fire Confined (from FD arrival) | 10:00 | mm:ss |
| Fire Spread - Degree of Confinement - Residential Structures with Fire Spread | | |
| Fire Confined to Room of Origin | | |
| Fires Controlled by Fire Suppression Systems | | |
| Percentage of Fires Extinguished by Fire Suppression Systems in Protected Buildings | 90% | % |
| Preventable Fire Incidents | | |
| Percentage of Fires Unpreventable | % | % |
| Building Fires in Commercial Occupancies | | |
| Confined to Room of Origin | % | % |
| Fire Loss as a Percentage of Total Protected Property Value <u>with</u> Fire Protection System | % | % |
| Fire Loss as a Percentage of Total Protected Property Value <u>without</u> Fire Protection System | % | % |
| Property Saved in Buildings with Fires | | |
| Value of Property Saved in Dollars | \$ | \$ |
| Fire Loss as a Percentage of Total Protected Property Value | 0.05% | % |
| Emergency Medical Services | | |
| 7. Cardiac Arrest Patient Management | | |
| 7.3 Percent of patients (in cardiac arrest before EMS arrival) with a witnessed collapse and found in an initially "shockable" rhythm, with survival to discharge from the acute care hospital | $\geq 50\%$ | % |
| 7.4 Percent of overall cardiac arrest patients with survival to discharge from hospital | $\geq 10\%$ | % |

Nevertheless, systems are encouraged to move beyond goal setting or benchmarking and evaluation related to outputs or process measures, and consider ways that impact or outcome measures can be evaluated.

[1] Washington State Department of Health. (2017, January 18). EMS System Key Performance Indicators / Clinical Measures. State of Washington: Author, KPI 4.1. (Available: <http://ncecc.net/wp-content/uploads/2012/03/WA-State-EMS-KPI-Spreadsheet-Update-20170126.pdf>).

[2] *Ibid*, KPI 5.6.

[3] *Ibid*, KPI 1.2.



Adopting a System of Measures

However, it is still important to measure and manage the efficiencies of a well-run operation using a system of measures as presented in the table below. In this manner, the daily management continues in place, but the strict adherence to system design performance is secondary to the outcome measures. For example, if response time increases and there is no change in outcomes then it would be purely a policy choice to act. Conversely, if the outcomes change, then the Department leadership will turn to the system of measures and attempt to discern which of the variables or combination of variables may be contributing to the change in outcomes.

The summary of measures provided below include all aspects of time, apparatus staffing by type, relative risk ratings, and system resiliency measures such as reliability, call concurrency, workload, and unit hour utilization. For example, reliability should be at least 70% for each station and only if the reliability drops below the 70% threshold before considering a mitigation reaction. Similarly, call concurrency is credible until the call concurrency reaches 70%. In other words, only 30% of the calls are overlapping. Call concurrency is suggested as a per unit threshold unless the majority of calls are multi-unit responses. For example, if there are two units assigned to a station, the station level call concurrency can perform well at 60% or less for single unit responses. Finally, the cross-staffing strategy speaks to an upper threshold of call volume of no more than 1,500 calls per year (4 calls per day) and a call concurrency of 15% or less, units can generally be confidently cross-staffed.

| Type of Measure | Performance Metric | Recommended Performance Urban | Priority | Review Period |
|-------------------------------|------------------------------|--|---------------|---------------|
| Station/Unit Performance | Turnout Time – EMS | ≤1.0 Min at 90% | Emergent | Quarterly |
| | Turnout Time – All Other | ≤1.5 Min at 90% | Emergent | Quarterly |
| | Travel Time | ≤7 Min at 90% | Emergent | Quarterly |
| | Minimum Engine Staffing | ≥3 Firefighters | All Responses | Daily |
| | Minimum Rescue Staffing | ≥1 FF/PM ≥1 FF/EMT | All Responses | Daily |
| System Design and Performance | Dispatch | ≤2 Min at 90% | Emergent | Monthly |
| | Station Risk Rating | Increases in Risk | | Annually |
| | Reliability | ≥70% | | Quarterly |
| | Call Concurrency | ≤30% Per Unit | | Quarterly |
| | Call Volume | 3,000 – Initial 1,000 – Ongoing | | Annually |
| | Unit Hour Utilization | ≤0.25 on 24-hour units ≤0.50 on 12-hour units | | Quarterly |
| | Cross-Staffing at Unit Level | <1,500 annual calls and <15% Call Concurrency | | Annually |

The system of measures provided are not intended to be overly prescriptive for the Department. The Department should adopt the system performance objectives internally and update as needed.

Creating a Mobile Integrating Health Program

Mobile Integrated Health (MIH) programs, also known as community paramedic programs, can be highly effective in diverting patients from the 911 system and better aligning care and treatment rather than the singular approach of transporting all patients to hospital emergency rooms.

Understanding that 911 and hospital emergency rooms may be challenged to solve societal issues, MIH coordinators work to identify and coordinate the myriad of community resources such as social services, mental health resources, and geriatric care for community members that need assistance. Not only do community members get a more targeted and sustainable solution, diverting patients from the 911 system is a good cost avoidance strategy and improves availability for higher acuity emergency events.

In concert with the common activities undertaken to address MIH, is the inclusion of other health and prevention programs available within the community. The City of Portland, which dispatches Gresham resources, utilizes a patient diversion program to better address low-acuity incidents. This is titled the “Community Health Assess & Treat”, or CHAT^[1], program. The program accomplishes the following three elements:

1. Provide individuals who call 911 for non-emergent health issues the care they need in the moment and connect them to the right resources to get them on the path to health improvement.
2. Provide education to community members regarding how to access appropriate healthcare in the future, so they use 911 as a last resort, instead of their first options.
3. Help reduce the number of individuals going to the emergency department for non-emergent issues.

^[1] Community Health Assess and Treat (CHAT) Program.
<https://www.portland.gov/fire/community-health/chat>.

Recommendations

1. It is recommended that the department consider the implementation of a MIH program for the citizens and visitors within the jurisdiction.
2. It is recommended that the department consider fully-integrating the MIH program in concert with the CHAT resources to reduce 911-related responses and provide better-aligned health care options

Typical MIH-Related Activities Undertaken

- Conduct home visits with patients Monday through Friday.
- Provide follow-up care to program enrollees recently discharged from the hospital.
- Specifically, vitals/wellness checks and wound evaluation, if applicable.
- Provide support via education for enrollees with diabetes, asthma, CHF, and other chronic medical conditions that lead to EC visits.
- Educate and teach enrollees on the proper use of 911 services and the emergency center as well as how to determine emergent needs versus urgent needs.
- Educate and teach enrollees on the proper use of glucometers, home blood pressure monitors, and oxygen saturation monitors.
- Support Health Promotion and Prevention Programs by identifying the need and referring enrollees to the various community resources available.
- Participate in disease management, prevention, and wellness teaching as it relates to emergency medical services.