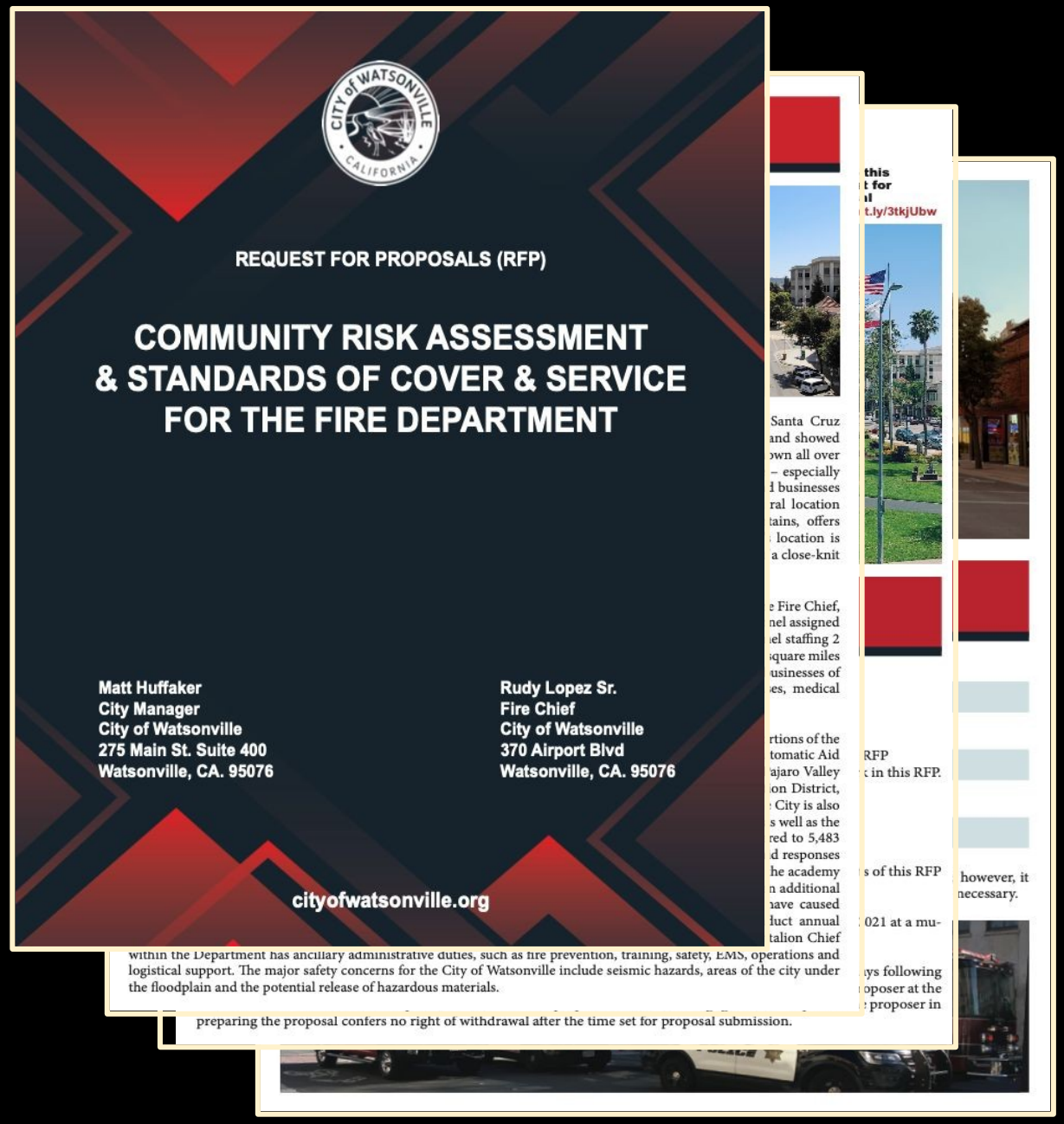
COMMUNITY RISK ASSESSMENT AND STANDARDS OF COVER

04.12.22



Why it's needed.

- **A Gap Analysis was conducted 2006.**
- **In 2019, The Public Safety Sales Tax Measure (Measure Y) was adopted.**
  - Established that the City must commission an independent third-party fire facility and operational needs assessment every 10 years.
- **A Community Risk assessment is used to update the Fire Department's short and long term facility and operational needs.**

Request for Proposals

- **A Request for Proposals was released on April 14, 2021, requesting the following services;**
  - 1 - General Summary of the Community Served
  - 2 - Analysis and Summary of the Services Provided by the WFD
  - 3 - Examine the Effectiveness of Inter-Jurisdictional Response
  - 4 - Analysis and Summary of the Community Risk
  - 5 - Review of Historical System Performance
  - 6 - Performance Objectives and Measures
  - 7 - Overview of Compliance Methodology
  - 8 - Evaluation, Conclusions and Recommendations to Policy Makers

- The City contracted with Fitch & Associates on July 14, 2021
- Study was completed April 2022

Fitch & **Associates**

Dr. Steven Knight, EFO - Project Manager

COMMUNITY RISK ASSESSMENT AND STANDARDS OF COVER

City Council Presentation

4-12-2022

STRUCTURE AND FORMAT

Follows the rigor of the CFAI/CPSE International Accreditation process

Format that includes the building blocks from the accreditation documents to assist readers in identifying required elements

Executive Summary

Sections A - I

Additional reports include

- Comprehensive Quantitative Data Report
- Comprehensive GIS Report
- Risk Assessment

STANDARDS OF COVER PROCESS

A fire Department's Standards of Cover (SOC) document 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, hazardous materials and other technical types of responses." For the elected body and city administrators to have confidence that their Fire Department is meeting the needs of the community, a complete assessment of the risks must be honestly undertaken. Only after the application of a proven and consistent risk assessment model is made can a fire department develop an SOC performance contract.

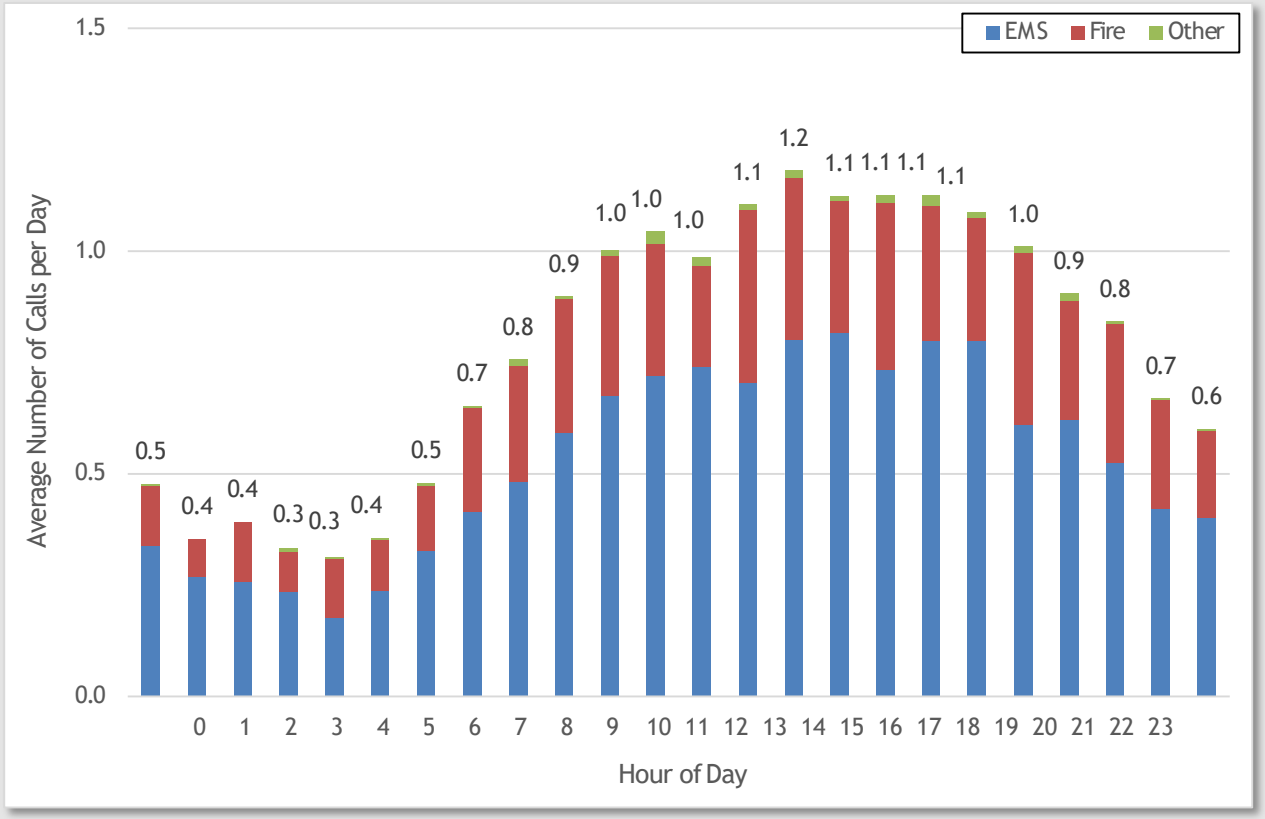
It is the responsibility of department's decision makers to provide an educated calculation of the expected risk, what resources are available to respond to that risk, and what outcomes can be expected. All of these factors play a role in providing the community's emergency services. It is best practice that communities set response standards based on the identified risks within their jurisdictions. Fire departments that do not apply a valid risk assessment model to their community are not able to adequately educate their community leaders of their true needs. The application of a tested risk assessment model allows the fire department and elected officials to make educated decisions about the level of emergency service they desire.

HIGH LEVEL DATA OVERVIEW

Community Demand 2018-2021

- Call volume has increased between 2018 and 2021
- Average year over year growth through 2021 is 4.9%
- National experience is between 3% and 7% in EMS growth
- Average call duration has remained relatively consistent, but increased by a few minutes
- Average calls per day has varied between 11.6 calls per day and 12.7 calls per day

Reporting Period[1]	Number of Calls[2]	Number of Responses[3]	Average Responses per Call	Total Busy Hours	Responses with Time Data[4]	Average Busy Minutes per Response	Average Calls per Day[5]	Average Responses per Day[5]
2018-19	4,270	5,583	1.3	3,112.1	5,530	33.8	11.7	15.3
2019-20	4,242	5,299	1.2	3,123.7	5,271	35.6	11.6	14.5
2020-21	4,636	6,012	1.3	3,625.6	5,976	36.4	12.7	16.5



Temporal Distribution

- The community demand is at its peak between 9 am and 9 pm
- Generally, there is an average of 1.2 calls per hour throughout the peak periods
- EMS accounts for most unique calls per hour
  - As high as 0.84 of the 1.2

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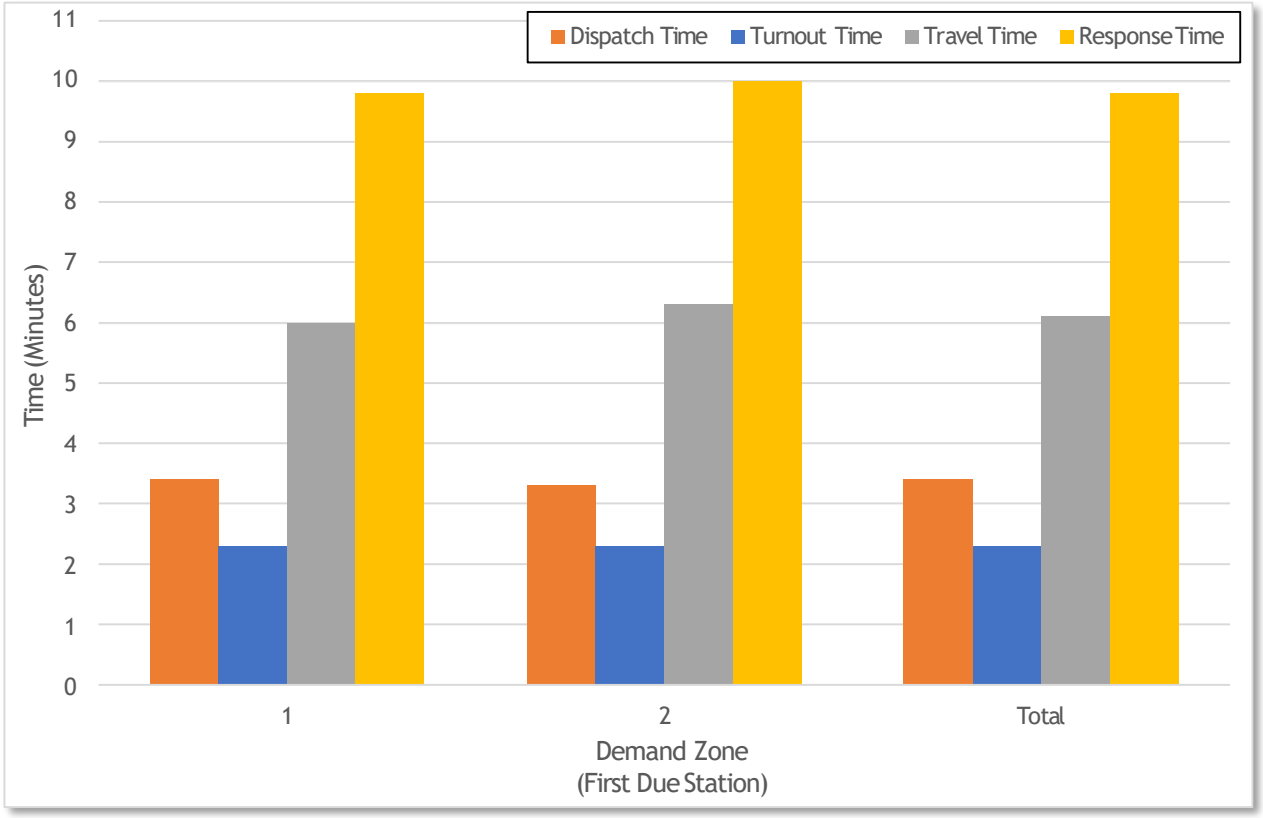
First Arriving Response Time by WFD Units by Station Area

- Commensurate service across the two station areas
- Travel times varies by only 18 seconds between station areas
- Citywide performance is 6.1 minutes
- While turnout time is approximately 1.0 minute longer than optimal, the performance is relatively consistent across the stations

Demand Zone (First Due Station)	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)
1	3.4	2.3	6.0	9.8
2	3.3	2.3	6.3	10.0
Total	3.4	2.3	6.1	9.8



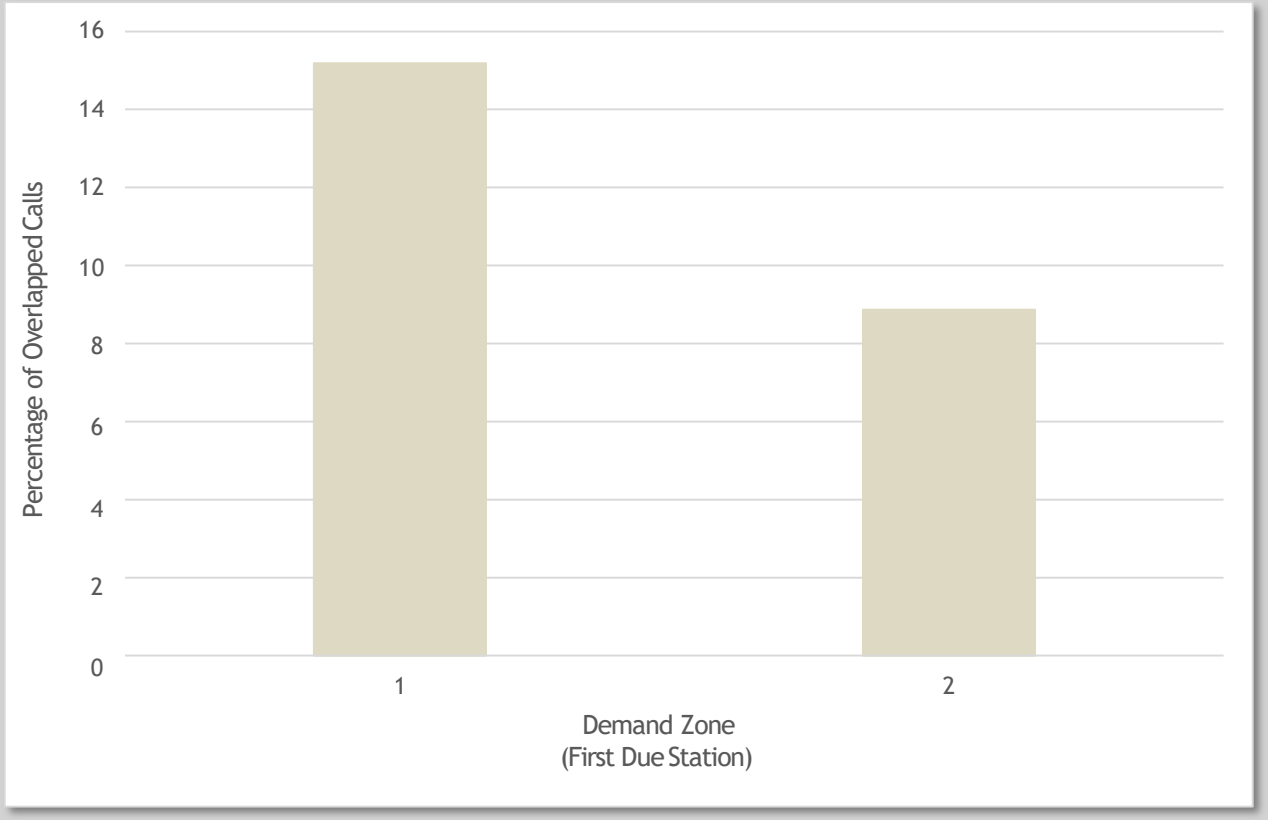
Station Reliability – First Due Engines

- Reliability is a misleading measure for Watsonville since there are EMS incidents that occur that WFD does not respond to by design. It artificially lowers the measured reliability
- However, this analysis utilized the program area and showed that the percentage of reliability by program area was approximately 88%
- Antiquated measure due to automatic vehicle location (AVL) dispatching that assigns the closest unit regardless of the prescribed geographic legacy boundary
- AVL dispatching is considered a best practice

Program	No Valid WFD Unit Dispatch	Valid WFD Unit Dispatch	Total Calls	Percent Valid Unit Dispatch
EMS	553	4,080	4,633	88.1
Fire	266	1,880	2,146	87.6
Hazmat	1	66	67	98.5
Rescue	1	20	21	95.2
Total	821	6,046	6,867	88.0

Simultaneous Events

- First Due Station Areas
- Station 1 has the highest rate of simultaneous events at 15.2%
- Station 2 has a simultaneous rate of 8.9%
- Overall, the rate of call concurrency is less than 15% and is reasonable to consider cross-staffing strategies



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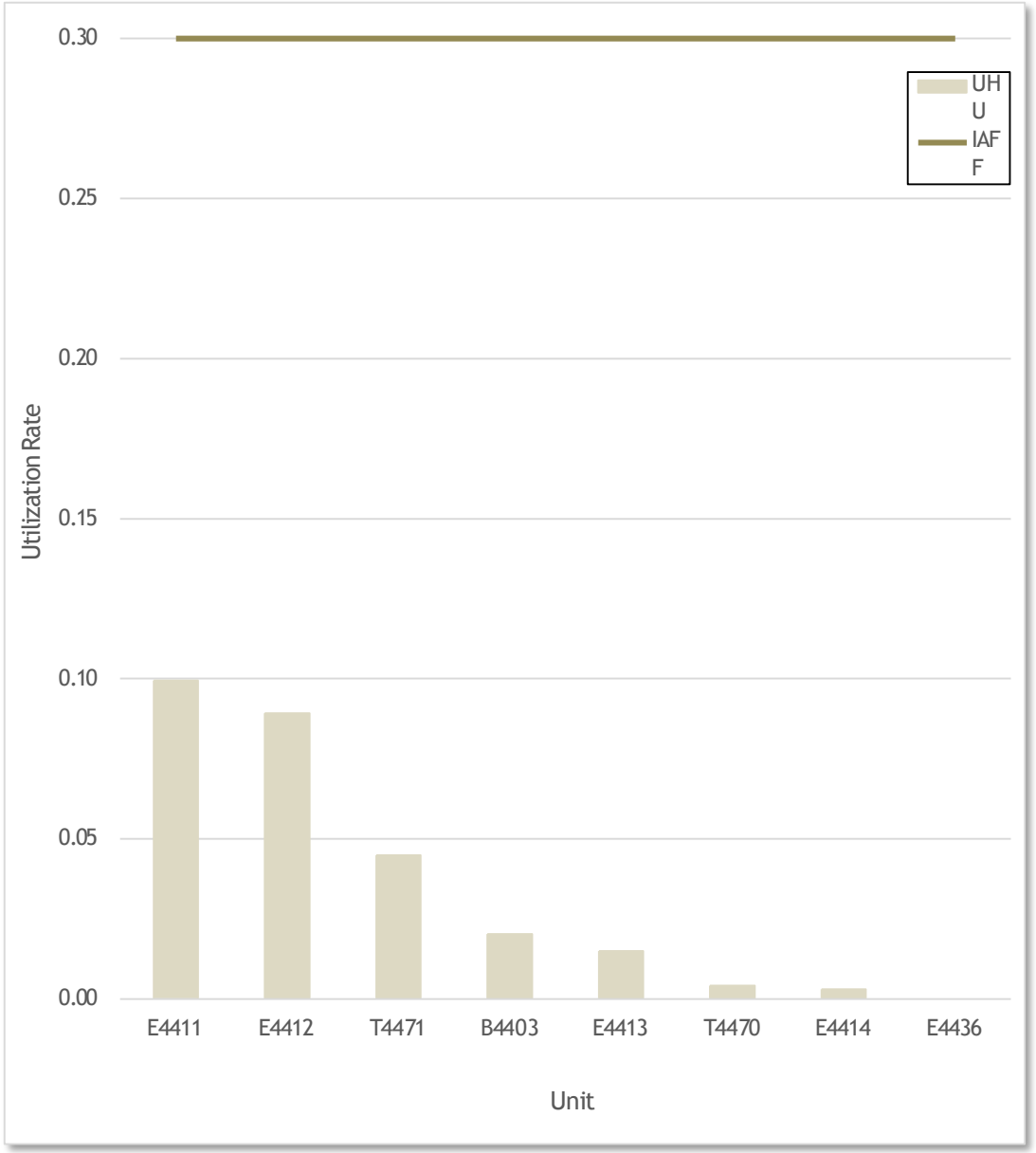
Unit Hour Utilization

- Considering how much work is to much work
- Best practice is not to exceed 0.25 to 0.30-unit hour utilization within a 24-hour shift
- The two primary engine resources function at or below 0.10 (10%)
- This equates to approximately 2.4 hours per day on emergency responses



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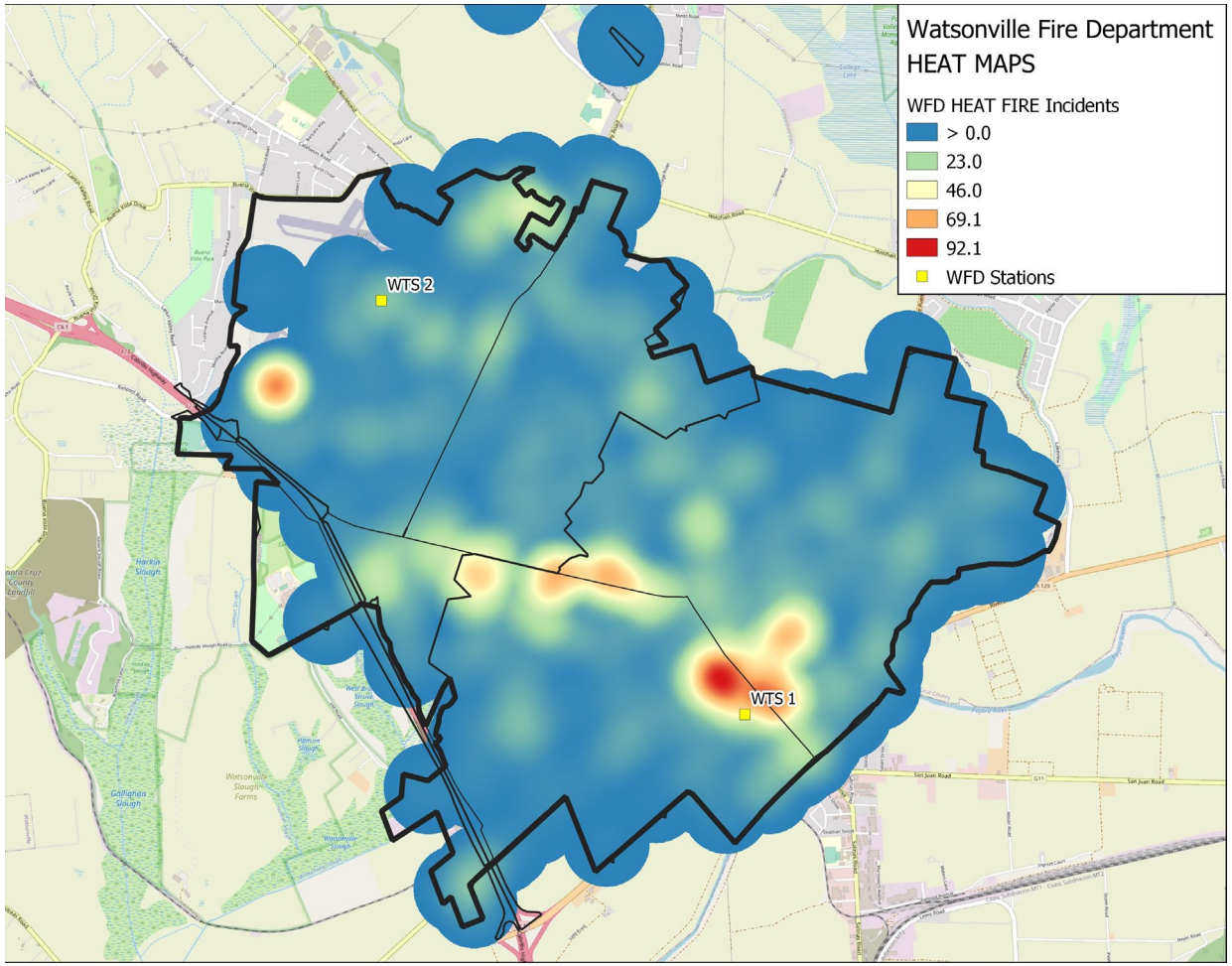
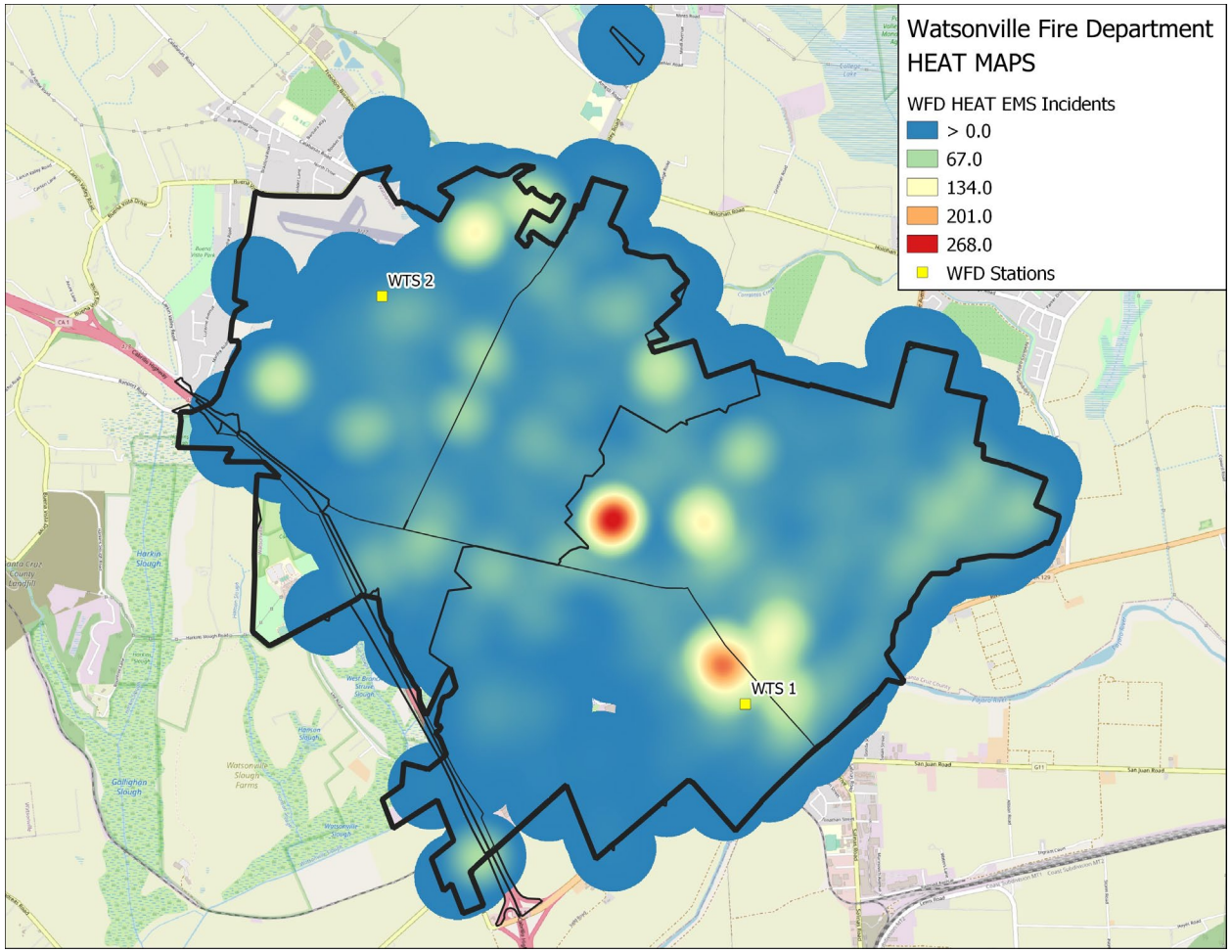
RISK ASSESSMENT

Comprehensive Detailed Process

Fire Incidents

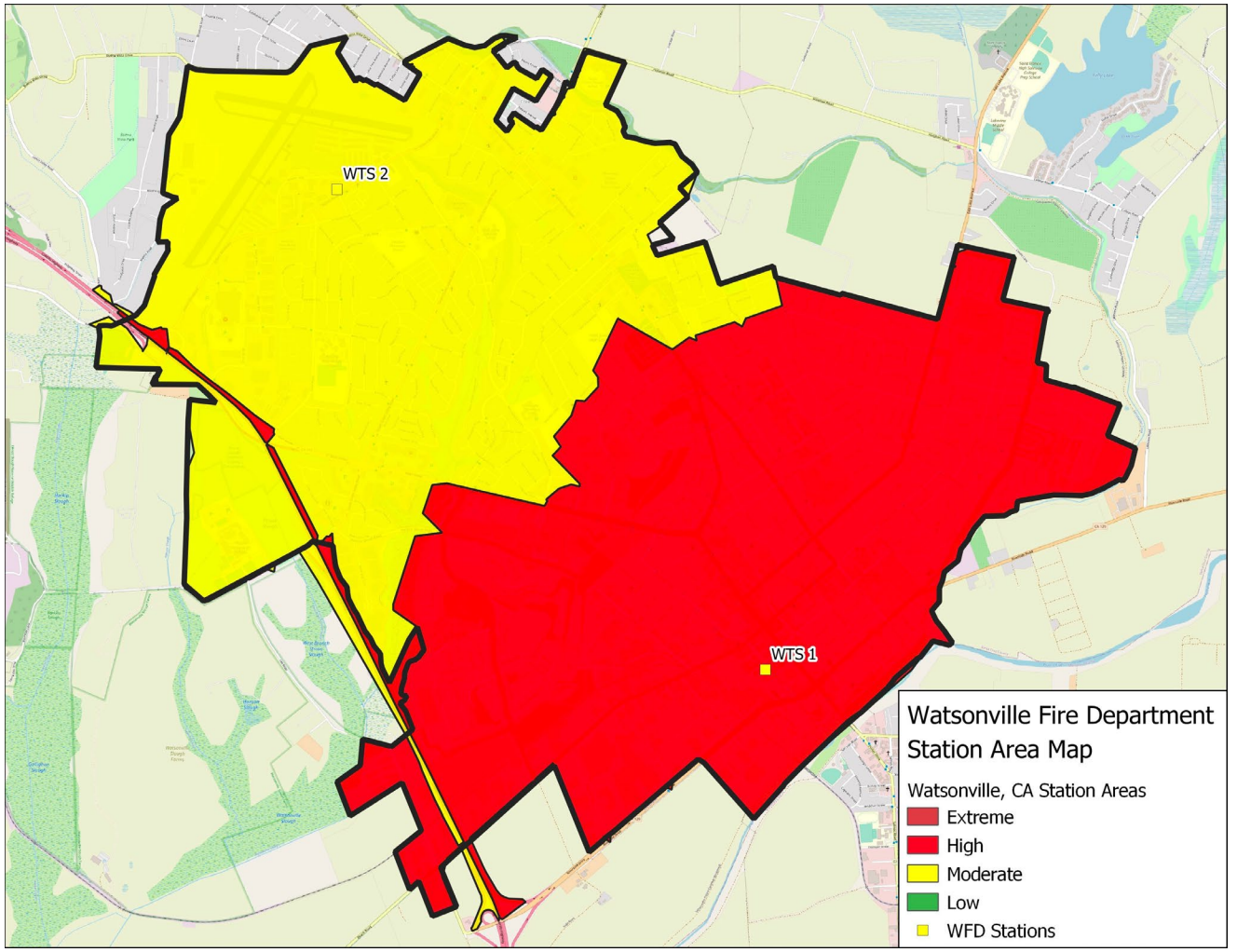


EMS Incidents



GEOGRAPHIC

- Geographic planning zones (GPZ's) were adopted at the existing station response areas.
- Once all first due stations were assigned scores for all three variables—average census variables score or "Homogenized Risk (R)" score, "Community Demand (D)" score, and "Call Concurrency (C)" score, the values were placed into a formula to yield a final risk score



Risk Level	Community Demand (D)		Call Concurrency (C)		Homogenized Risk (R)		Total Risk Score
	Value	Scale (Average Calls per Period)	Value	Scale (%)	Value	Scale (Average Score)	$\sqrt{\frac{[(CD)^2+(CR)^2+(DR)^2]}{2}}$
Maximum	10	> 4,049	10	> 26.99	10	10	≥ 99.5
High	7 to 9	> 2,699 to 4,049	7 to 9	> 17.99 to 26.99	7 to 9	7 to < 10	44.5 to < 99.5
Moderate	4 to 6	> 1,349 to 2,699	4 to 6	> 8.99 to 17.99	4 to 6	4 to < 7	12 to < 44.5
Low	1 to 3	≤ 1,349	1 to 3	≤ 8.99	1 to 3	< 4	< 12

	Component Risk Scores for Census Variables							2018-19 to 2020-21 Call Data				Final Scoring	
First Due Station	Population Density	Square Miles	Median Age of Residents	Median Household Income	Unemployment Rate	Percentage of Homes > 50 Years Old	Census Average Score	Total Number of Calls	Average Number of Calls per Period	Demand Risk Score	Call Concurrency Rate	Concurrency Risk Score	Final Risk Score	Final Risk Level
1	10	5	4	5	5	10	6.50	10,827	3,609.0	9	14.2	5	57.02	High
2	10	5	4	4	6	10	6.50	6,335	2,111.7	5	8.6	3	28.82	Moderate

STATION LEVEL RISK ASSESSMENT

- Population density
- Median household income
- Unemployment rate
- Square miles
- Median age
- Percentage of homes greater than 50 years old
- Call concurrency rate
- Community demand (workload)

Desired Performance and Station Locations

- All Calls

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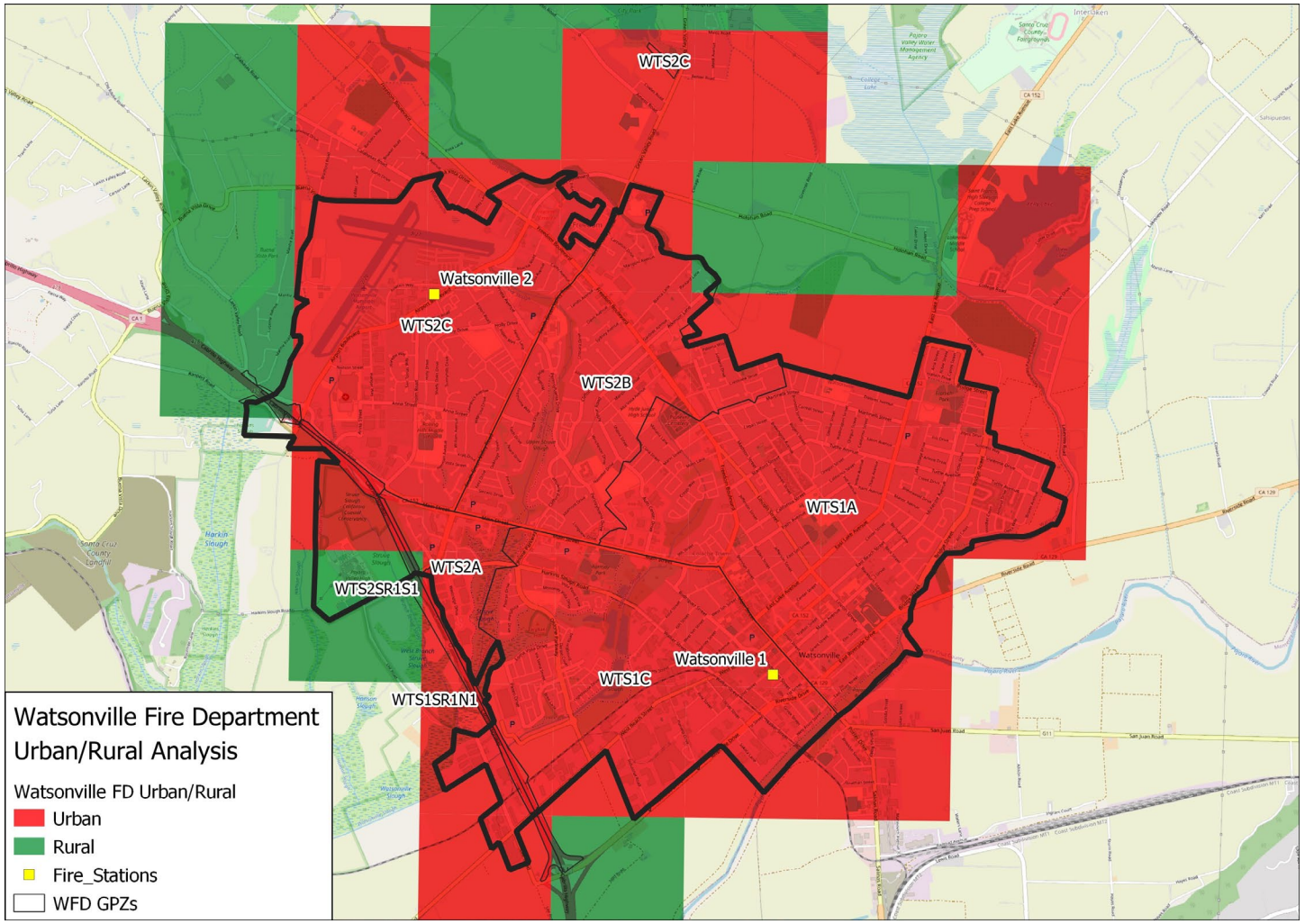
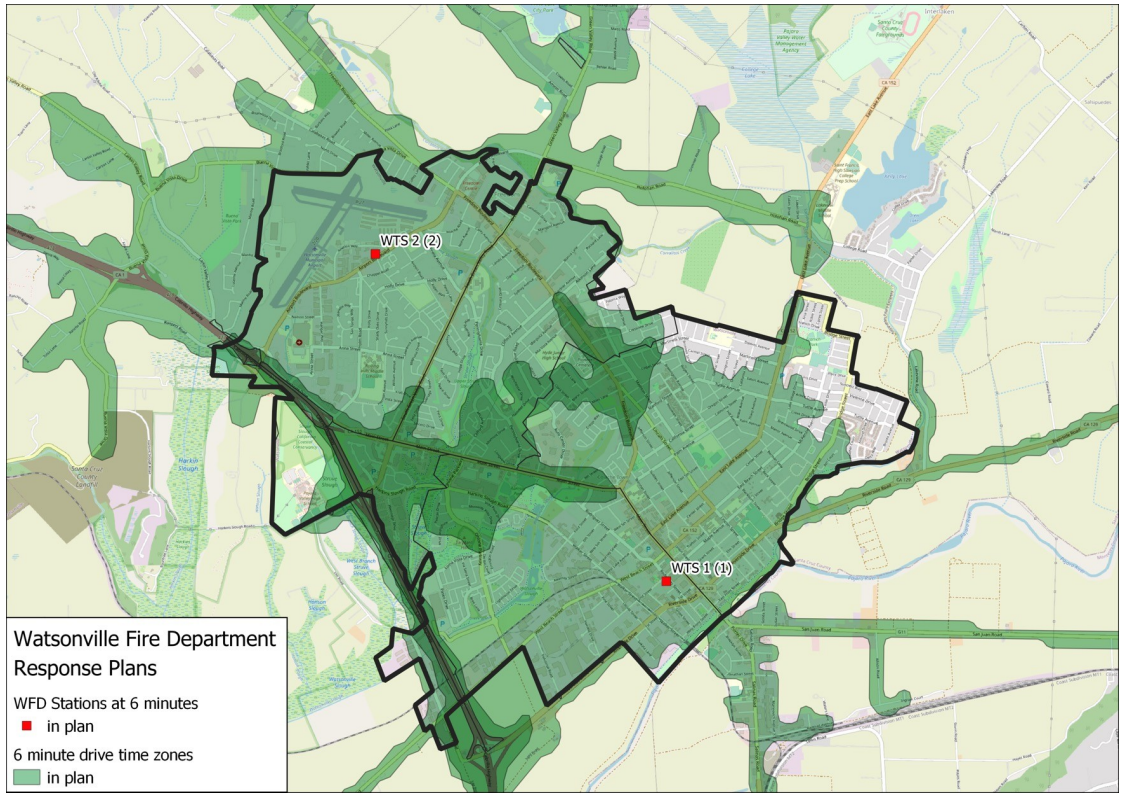
Call Density Validates Station Locations

Overall, the station placement is well aligned with the demand for services



6-Minute Travel Time

- Two stations are required to continue to meet greater than 90% of the incidents within 6-minutes travel time or less
- Strategic move-up strategy can preserve performance as system drawdown occurs



Rank	Station	Station Capture	Total Capture	Percent Capture
1	WTS 1	11,687	11,687	60.32%
2	WTS 2	6,610	18,297	94.44%

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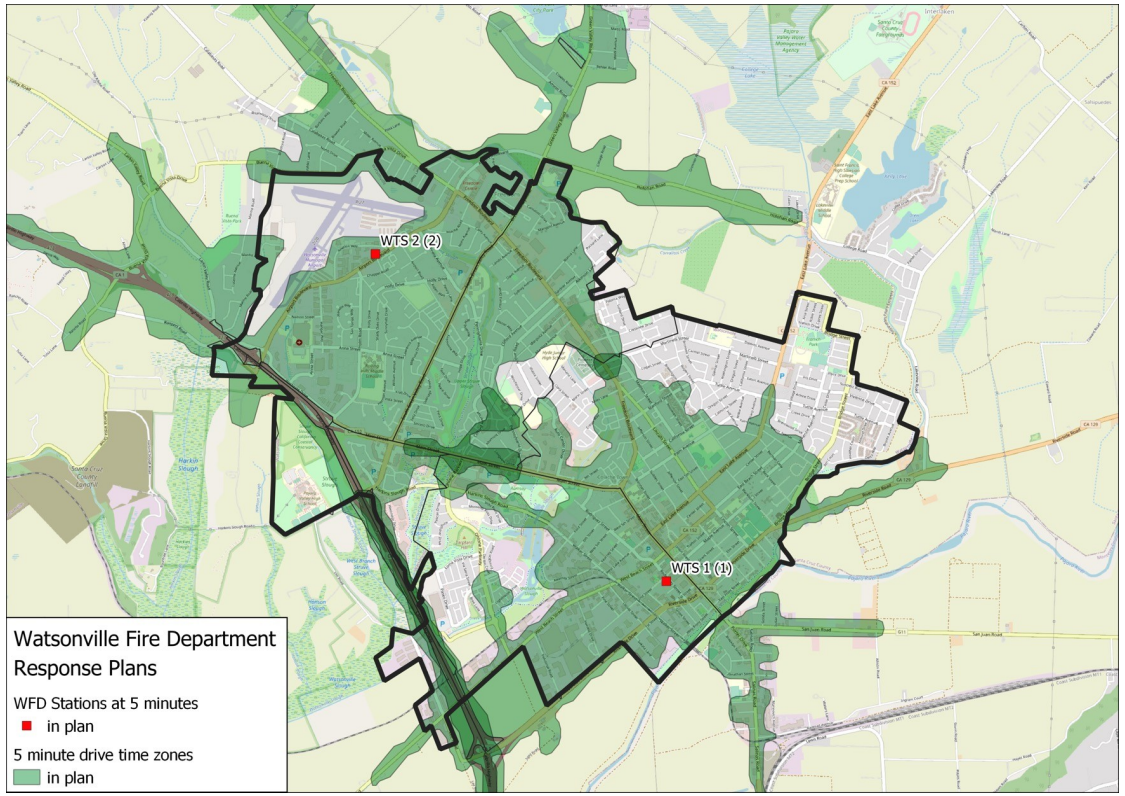
5-Minute Travel Time

- Two stations can meet approximately 83% of the incidents within 5-minutes travel time or less



Rank	Station	Station Capture	Total Capture	Percent Capture
1	WTS 1	8,836	8,836	45.61%
2	WTS 2	7,159	15,995	82.56%

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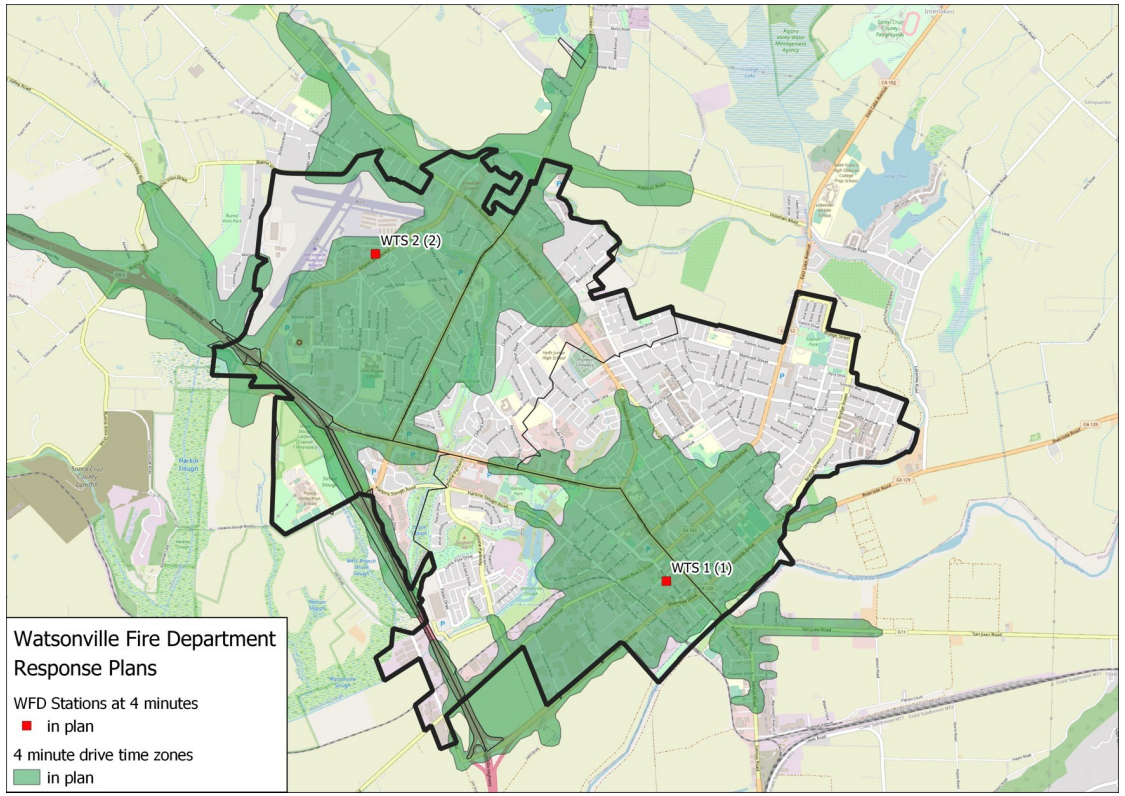
4-Minute Travel Time

- Two stations can meet approximately 65% of the incidents within 4-minutes travel time or less
  - NFPA 1710



Rank	Station	Station Capture	Total Capture	Percent Capture
1	WTS 1	6,718	6,718	34.68%
2	WTS 2	5,888	12,606	65.07%

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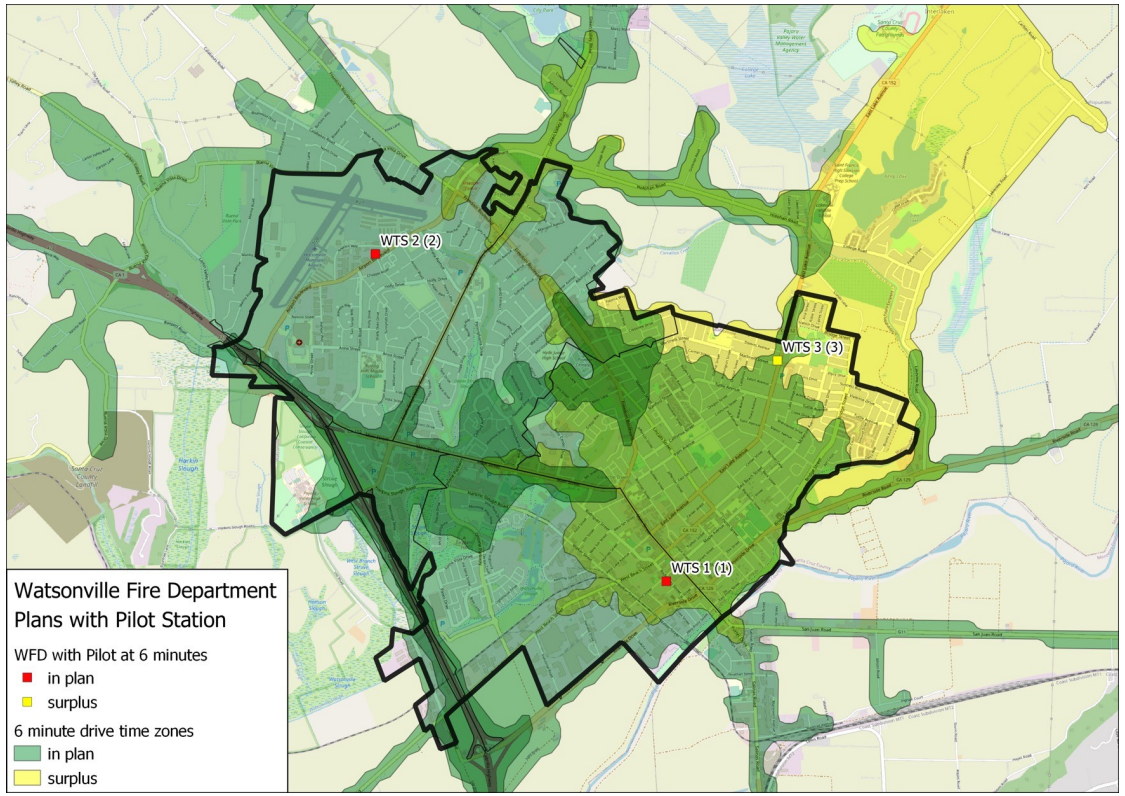
Feasibility for 3rd Station – Pilot Location

6-Minute Travel Time

- Current configuration can meet approximately 94% of the incidents within 6-minutes travel time or less
- A third station would increase coverage by approximately 5%
- Much less return on investment than the current two stations
- If the goal is maintaining a 6-minute travel time (current performance) then a third station is not required



Rank	Station	Station Capture	Total Capture	Percent Capture
1	WTS 1	11,687	11,687	60.32%
2	WTS 2	6,610	18,297	94.44%
3	WTS 3	988	19,285	99.54%

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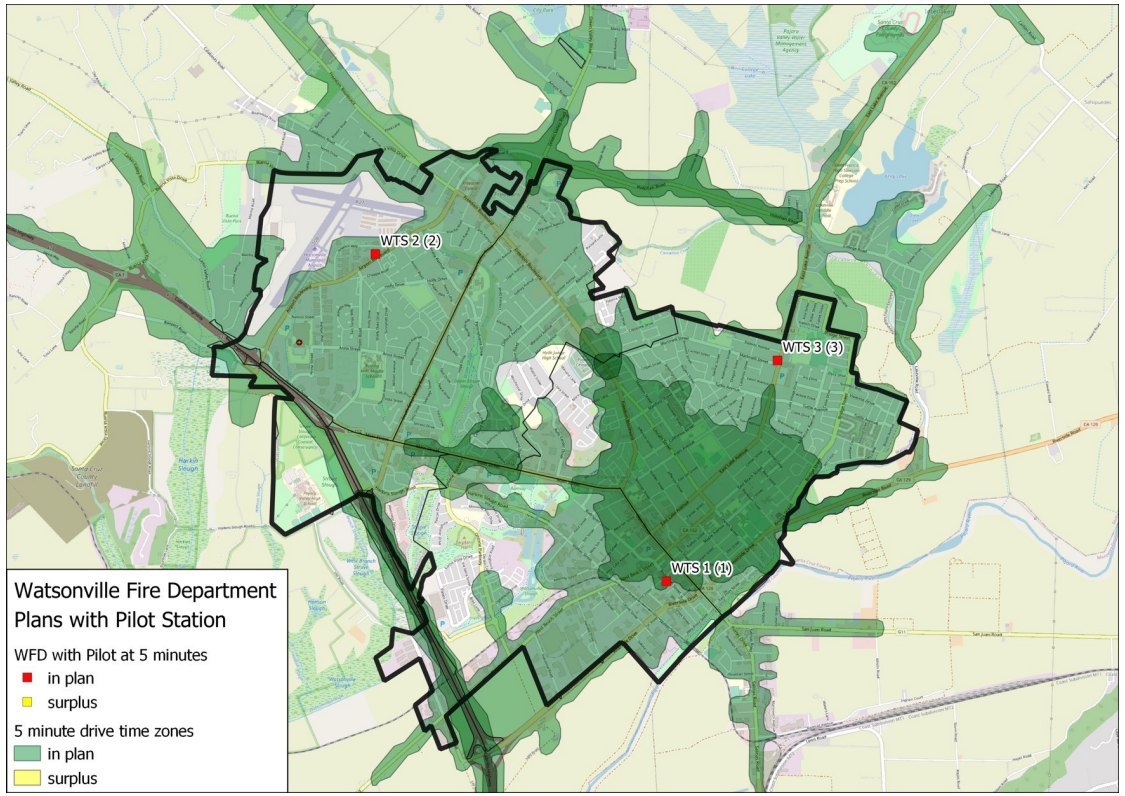
5-Minute Travel Time

- If the desired performance is a 5-minute travel time, then a three-station configuration would be required to cover at least 90% of the incidents within the desired timeframe
- The third station would increase coverage by approximately 10%



Rank	Station	Station Capture	Total Capture	Percent Capture
1	WTS 1	8,836	8,836	45.61%
2	WTS 2	7,159	15,995	82.56%
3	WTS 3	1,974	17,969	92.75%

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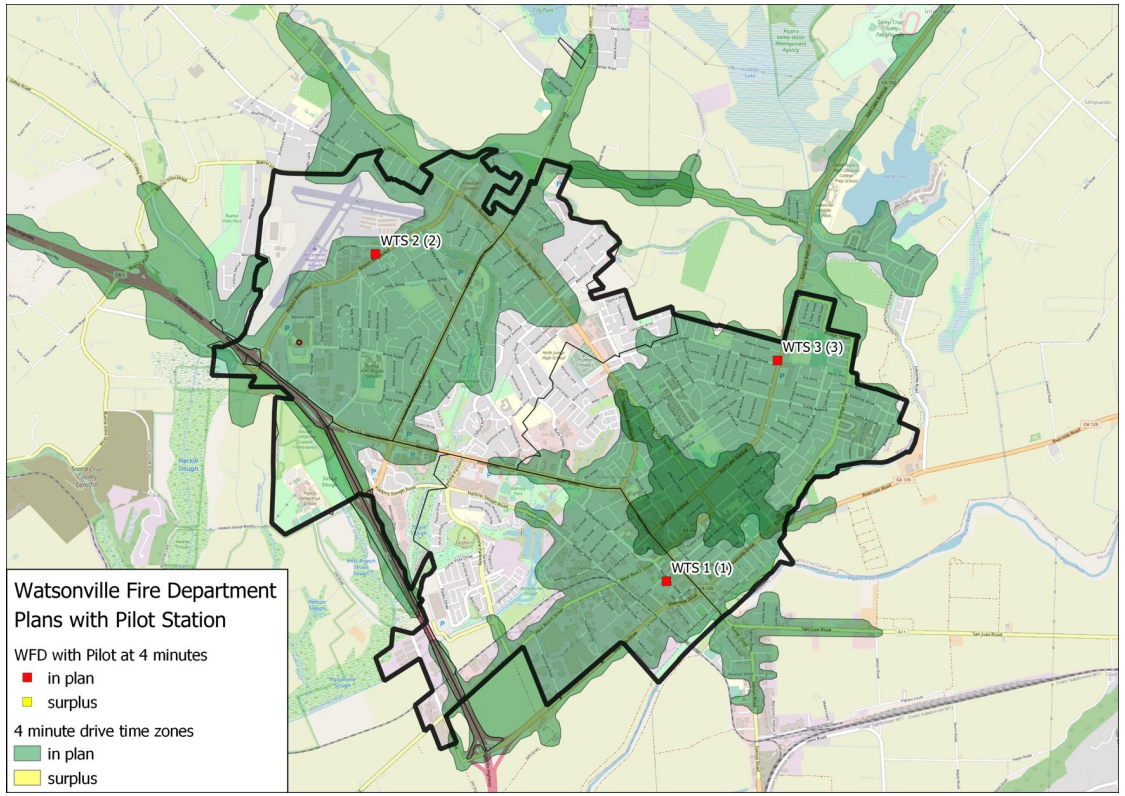
4-Minute Travel Time

- If the desired performance is a 4-minute travel time, then a three-station configuration would still not be able to cover at least 90% of the incidents within the desired timeframe
- The third station would increase coverage by approximately 12%
- Total coverage is approximately 77%



Rank	Station	Station Capture	Total Capture	Percent Capture
1	WTS 1	6,718	6,718	34.68%
2	WTS 2	5,888	12,606	65.07%
3	WTS 3	2,382	14,988	77.36%

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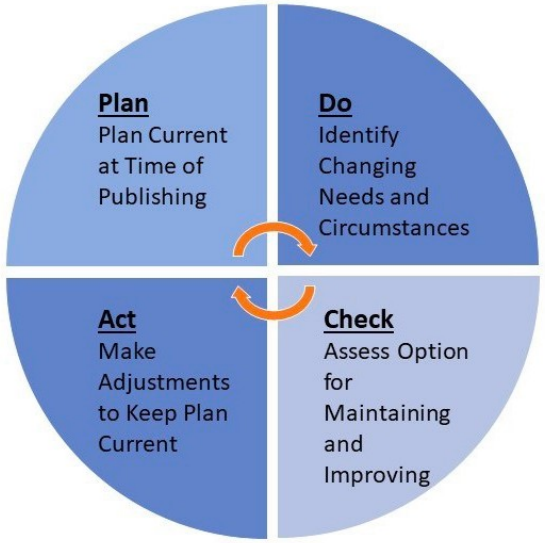
CONTINUOUS IMPROVEMENT



Type of Measure	Performance Metric	Recommended Performance Urban	Priority	Review Period
Station/Unit Performance	Turnout Time – EMS	≤1.0 Min at 90%	Emergency	Quarterly
	Turnout Time – All Other	≤1.5 Min at 90%	Emergency	Quarterly
	Travel Time - EMS	≤6 Min at 90%	Emergency	Quarterly
	Travel Time - Fire	≤6 Min at 90%	Emergency	Quarterly
	Travel Time	≤15 Min at 90%	Non-emergency	Quarterly
System Design and Performance	Dispatch	≤2 Min at 90%	Priority	Monthly
	Station Risk Rating	Increases in Risk		Annually
	Reliability	≥70%		Quarterly
	Call Concurrency – Per Unit	≤30%		Quarterly
	Call Volume	3,000 – Initial 1,000 – Ongoing		Annually
	Unit Hour Utilization	≤0.30 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

CONTINUOUS IMPROVEMENT

High-Level Summary

Observations and Recommendations

Consideration of a Cross-staffed QRV

- Truck at Station 1 has a UHU of 0.05, or 5% which equates to approximately 1.2 hours per day out of the 24-hour period
- The call concurrency at Station 1 was approximately 15%
- In 2020/2021 the Truck was first on-scene a total of 534 times
- Therefore, at the current workload, utilization, and exposure for simultaneous events, it would be reasonable for the City and Department to consider cross-staffing the Truck with a Quick Response Vehicle (QRV) for EMS related incidents
- Minimal decrease in operating costs, but increased response time from utilizing the large fire apparatus

Consideration for a Third Fire Station

- All analyses demonstrate that the two-station configuration is required to meet currentperformance
  - 6-Minute Travel Time
- In other words, there are no duplicative efforts with two stations
- A three-station configuration does not provide the return on investment of a third station as overall performance would only improve by approximately 5% while greater than 94% of the calls are already covered by the existing two fire stations
- A three-station configuration would only be required to achieve a 5-minute travel time
- It would require a four-station model to achieve a 4-minute travel time following NFPA1710

Long-term Sustainability and Cost Avoidance

- Current deployment is well-aligned with the risk and community demands
- Measures of system resiliency such as response time by available vehicles, reliability, call concurrency, and unit hour utilization demonstrate that there is no specific need to reinvest in the operational deployment for the foreseeable future
- Resources have capacity to absorb new work for years prior to reinvestment
- Provides the city with a sustainable and predictable future expenditures and cost avoidance
- If reinvestment is desired due to future workload, it is recommended that peak load-unit coverage is considered

RECOMMENDATIONS AND OBSERVATIONS

The City could improve the total response time in most instances with an incremental improvement in crew turnout time that is more closely aligned with best practices. It is understood that connectivity issues may be contributing to reported turnout times.

The City is encouraged to work with the County 911 to explore opportunities to improve call processing time.

A three-station solution is not required unless there is a desire to improve response time to 5-minutes or less. Therefore, a 3rd station is more of a policy choice rather than an operational need and may not provide the desired return on investment.

The fire stations are strategically located and well-aligned with the measured risks and community demands for service.

The City could consider a cross-staffed quick response vehicle for Station 1 for EMS calls, although it would provide little fiscal or operational benefit.

When it is time to reinvest in the department's deployment, the City is encouraged to explore the utilization of peak-load units to garner the greatest return on investment.

The Department and City are encouraged to utilize the proposed system or measures, or triggers, for ongoing performance management.

The Department is encouraged to develop a 3 to 5-year strategic plan that is well aligned with the City's goals and objectives and department initiatives.

Questions?

Steven Knight, PhD