

Unit Location Analysis Abbreviated Fire Station Location Study

Chris Armstrong, Project Manager, ESCI

Project Scope



Phase 1 – Project Initiation

Phase 2 – Evaluation of Current Conditions

Phase 3 – Future Demand Projections

Phase 4 – Unit Location and Staffing Recommendations

Phase V – Development, Review, and Delivery of Unit Location Analysis & Deployment Study

Station Location Study Background

The 2025 Station Location

Study offers a comprehensive analysis of the department's current fire and emergency medical services (EMS) response capabilities and compares it capabilities of a 2station system.

Station Location Study Methodology

The methodology involved a comprehensive analysis of the Broward Sheriff's Office Fire Rescue's data and statistics, comparing them against established benchmarks from the National Fire Protection Association (NFPA) and the Commission on Fire Accreditation International (CFAI).

Station Location Study Data Sources

The **2025 Station Location Study** for Cooper City, Florida, utilized a variety of data sources to ensure a comprehensive analysis.

•Broward Sheriff's Office Fire Rescue:

Incident data, response times, and resource distribution statistics.

- National Fire Protection Association (NFPA)
- •Commission on Fire Accreditation International (CFAI)
- •National Fire Incident Reporting System (NFIRS)

•American Community Survey (U.S. Census Bureau)

- •Geographic Information Systems (GIS)
- Insurance Services Office (ISO)

Current System Staffing, Incidents

Staffing:

- 1 Station
- 4 apparatus
- 13 firefighter/paramedics

Incidents:

- 2022 = 2,911
- 2023 = 3,008
- 2024 = 2,470

Station Designation	Unit Number	Resource Type	Minimum Daliy Staffing
Fire Station 28	Q-28	Aerial w/Pump	3
	E-28	Type 3 Engine	3
	R-28	ALS Transport - 3PM's	3
	R-228	ALS Transport - 3PM's	3
	District Chief	Staff Vehicle	1
		Total:	13

Current System Incidents Types

Cooper City Service Demand by NFIRS Series, 2020–2024

- Nearly 64% of incidents are Medical in Nature
- 11% Of incidents are cancelled or good intent
- 1% of incident are fires

Current System Service Demand

Cooper City Service Demand by Hour, 2019–2024

- Highest service demand falls between 7:00am and 8:00pm
- Lowest demand is between 10:00pm and 6:00am

Current System Incident Map

Incident Density (All Incidents), 2019-2024

Another data point documented for each incident response is the location of the incident, either by address and/or the latitude and longitude of the incident. The first view of incident density includes all responses within the service area, regardless of incident type

Current System EMS/Fire Incidents

Current System Commitment Factor

Factor	Indication	Description
16%-24%	Ideal Commitment Range	Personnel can maintain training requirements and physical fitness and can consistently achieve response time benchmarks. Units are available to the community more than 75% of the time.
25%	System Stress	Community availability and unit sustainability are not questioned. First-due units respond to their assigned community 75% of the time, and response benchmarks are rarely missed.
26%-29%	Evaluation Range	The community served will experience delayed incident responses. Just under 30% of the day, first-due ambulances are unavailable; thus, neighboring responders will likely exceed goals.
30%	"Line in the Sand"	Not Sustainable: Commitment Threshold—the community has less than a 70% chance of timely emergency service and immediate relief is vital. Personnel assigned to units at, or exceeding, 30% may show signs of fatigue and burnout and may be at an increased risk of errors. Required training and physical fitness sessions are not consistently completed.

Unit	2020	2021	2022	2023	2024	Change Over Study Period
E28	1.7%	2.0%	2.2%	2.0%	1.8%	0.1%
Q28	0.5%	0.0%	0.0%	2.2%	2.0%	1.5%
R228	6.4%	8.3%	8.6%	8.0%	6.6%	0.1%
R28	6.9%	7.6%	8.6%	8.5%	6.8%	-0.1%

Current System Response Analysis

The following time performance measures that are subsets of total response time:

- Alarm handling time
- Turnout time

Current System Response Analysis

The following time performance measures that are subsets of total response time:

- Travel time
- Total response time

Hazardous Condition

Canceled, Good Intent

Service Call/Other

00:00

03:00

06:00

10:22

09:00

10:31

11:39

12:00

Current System 4 & 8 Minute Coverage

Existing Fire Station Response Coverage (Baseline Scenario):

- 4-Minute Response Area: 1.97 square miles
- 4-Minute Coverage: 23.58% of the city
- 8-Minute Response Area: 8.05 square miles
- 8-Minute Coverage: 96.50% of the city

System Scenarios/Considerations

The following scenarios were conducted during the study

- Current system capabilities with existing resources
- Adding 1 additional station splitting current resources

System Scenarios ERF

Current Effective Response Force (ERF) Capabilities with 12 firefighters

2 Station Effective Response Force Capabilities with 6 firefighters each.

Effective Response Force Scenarios

Option 1: Add New Station with New Resources

Increases 4-minute coverage to 40.45% (+16.87%)

Maintains 8-minute ERF coverage at 96.50% Enhances service for time-sensitive incidents Costly: \$5.79M in Year 1, \$3.24M annually thereafter

Option 2: Relocate Existing Resources

•Also improves 4-minute coverage to 40.45%

Reduces 8-minute ERF coverage to 78.00%Creates potential service gaps in

previously well-served areas

•Conclusion

- Existing configuration provides stronger ERF coverage than splitting resources
- 12-firefighter ERF coverage reaches 97% with current station configuration

System Scenarios Findings

Findings:

- Splitting Resources saves money but reduces operational capacity.
- Fully Equipping a new station (with new personnel) offers slightly improved protection but costs \$5.79M in the first year and \$3.24M per year thereafter.
- Relocating existing resources improves rapid response in some areas but reduces coverage in others, potentially increasing risks for locations previously within the 8-minute response range.
- Deciding between these options requires evaluating the trade-offs between improving initial response times and maintaining broader coverage for larger incidents.

Recommendations and Strategic Considerations

Staffing Review:

- Fire suppression units fall short of NFPA 1710 (3 personnel vs. recommended 4–5)
- EMS staffing exceeds NFPA standards (3 PMs per ALS unit)
- Current deployment meets ERF standards—no immediate staffing increase required

Short-Term Improvements:

- Improve alarm handling time (current: 2:23 vs. NFPA goal of 1:04)
 - Invest in dispatcher staffing, CAD optimization, call-taker training
- Enhance turnout time performance through alerting systems, drills, and policy reinforcement

Recommendations and Strategic Considerations Cont.

Alternative Strategies Before Building a Station:

- Add peak-hour EMS units or roving deployment
- Improve dynamic staging of units
- Strengthen automatic/mutual aid agreements

Long-Term Considerations:

- Monitor growth and response trends—especially in underserved northwest
- Reassess station need if 4-minute response delays increase

Questions - Comments

