

February 2022

Executive Summary EMS Study



Jefferson County
Jefferson County, West Virginia

Prepared by:



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CONSULTANT REPORT

Executive Summary
EMS Study
Jefferson County, West Virginia

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EXECUTIVE SUMMARY

Jefferson County, West Virginia contacted Fitch & Associates (*FITCH*) to perform an EMS assessment and seek ways to improve services to citizens, while managing cost more effectively. The primary task for the *FITCH* team was to remotely evaluate the current performance and cost of the current EMS system and evaluate alternative models. The *FITCH* team conducted a series of meetings with the County's leadership team. Through the course of multiple remote meetings, structured and non-structured interviews, and comprehensive data analyses, every effort was made to understand the Agency's unique local conditions, to provide work products for review, and to solicit feedback and direction.

This comprehensive summary report includes an executive summary, a PowerPoint presentation, a quantitative data report, and estimated financials for each model presented. Overall, *FITCH*'s strategy is to provide the county's administration and the elected policy group with sufficient objective data to establish a clear policy and direction for the future of EMS in Jefferson County, WV. Therefore, all alternatives and recommendations are grounded in the data analysis and best practices, insulating the process from potential biases.

Methodology

The *FITCH* team collected more than five years of Computer-Aided Dispatch (CAD) data spanning from January 1, 2016, to September 30, 2021. We removed duplicate entries and inspected the data file for any anomalies to reconcile with the department prior to data analyses. All reporting periods were based on the calendar year, from January 1 to December 31. As such, we presented all year's volume and response time performance within the associated DATA report. Analyses herein primarily focused on the most recent reporting period of January 1, 2020, to September 2021.

Additional data was gathered relating to the Agency's current staffing levels, resource deployment, EMS assets, fiscal performance, and future Jefferson County, WV proposed planning documents. These elements were analyzed in association with the CAD data to identify alternative service delivery models for EMS services.

Community Demands for Service

In 2020, there were 6,601 unique requests for service within Jefferson County, WV. This totaled 23,336 distinctive vehicle responses, which averaged 3.5 responding units per unique EMS incident. From dispatch to clear, all units spent a total of 15,873 hours, averaging 43.4 hours per day. Like most communities, requests for emergency medical services (EMS) represent most of the community's demand for services. EMS incidents account for 79.08% of the total demand while fire related incidents account for 17.95%. Mutual Aid request for services to other counties accounted for the remaining 2.97% of the Agency's entire demand load. A two-year and nine-month evaluation period from 2019 to the first nine months of 2021 noted an annual 6.6% volume increase.

Monthly service level demands are consistent except for July where when volumes increase by approximately 1.8 responses per day. Demand was lower during the week from Tuesday to Thursday and Wednesday had the lowest demand. Hourly demands increase from 08:00 to 20:00 when EMS volumes average 1.97 responses per hour and during the hours of 21:00 to 07:00 volumes average 0.5 responses per hour. Of the total EMS responses, 52.1% equated to a transport producing 3,496 total transports during 2020, and for 2021 the annualized estimated transports were projected at 3,801. In 2021, the average dispatch time was 2.1 minutes, the average turnout and travel time was 8.2 minutes, the average response time was 10.4 minutes, and the 90th percentile response time was 16.2 minutes. Response time was significantly longer from 00:00 to 06:00 driven by longer turnout and travel times.

In review of the data sets received, we did have missing data fields where times were not documented. A total of 37% of records missed dispatch time, 24% missed enroute time, and 31% missed arrival on scene time. We looked at the response time performance of first arriving units in our response time analysis.

Current EMS Deployment Model

Jefferson County, WV EMS response system currently has seven (7) county Volunteer Fire Departments (VFD) that own their own ambulances and the county government has its own EMS agency called the Jefferson County Emergency Services Agency (ESA). The ESA service is both a response organization and a fire board, which the County believes is the only one of this type in West Virginia, which was established by special legislation. Currently, the ESA does not own ambulances but, provides the staff that mostly operate the ambulances owned by the VFD. ESA personnel are dual trained in both EMS and Fire emergencies.

When an emergency response occurs, there are a multitude of ways an ambulance becomes fully staffed. Two of the most common ways this occurs is: 1) If an ESA member is staffing the response SUV and a member from either the ESA or volunteer agency is with them, they will respond in the ambulance or 2) ESA personnel will meet on-scene and a member from either the ESA or volunteer agency will bring an ambulance to transport. Upon initiation of the 911 system, the 911 dispatch center will triage the call and then dispatch EMS units. The 911 dispatch center will alert the ESA and any volunteer first-due agency. If the first due agency is unavailable, dispatch will then notify other volunteer agencies to deploy and create a fully staffed ambulance.

As mentioned, the ESA is providing the staff to create a full ambulance and the VFD owns the ambulances. Since the ambulances are owned by the VFD, they are billing for every transport and keeping all the proceeds. In review of the seven (7) VFD IRS 990's that were provided to *FITCH* from the County, in 2020 the proceeds collected for transport services equated to \$1,226,668. Furthermore, in 2021, the County provided funds to the seven (7) VFD's a total of \$3,698,796 and in the 2022 County budget, the VFD's are slated to receive \$4,137,498. Adding both the 2020 IRS 990's

and the funds provided by the County to the VFD's, this totals \$5,364,166 in total funds being collected by the seven (7) VFD's. No funds go back to the County currently, even though they incur staffing and operating costs. Currently, there are no defined performance standards for either the ESA, VFD, or the dispatch center.

Historical Performance

Total Response Time consists of three primary components: Dispatch Time (911 call received to agency notified), Turnout Time (agency notified to unit responding), and Travel Time (unit responding to arrival on scene). When considering system design, Travel Time is the primary response time consideration. Measuring at the 90th percentile, the Total EMS Response Time (Turnout & Travel Time) performance for EMS calls is 16.2 minutes. The current Travel Time performance for incidents is 15.8-minutes at the 90th percentile. In other words, nine out of ten times, the EMS system will provide this level of service or better.

In reviewing the last 365-days, *FITCH* reviewed the number of times there were concurrent ambulance responses happening in the EMS System. During this period there was a maximum of 5 ambulances deployed at one time. In the Table below *FITCH* outlines the volume and percent of times when there was one (1) to five (5) ambulances operating on an emergency response.

Table 1: Concurrent Response in the Past 365-days

Concurrent Responses	Count for 52 Weeks	Percent of Concurrency	Cummulative Percent of Concurrency
5 Responses	14	0.3%	100%
4 Responses	76	1.8%	99.70%
3 Responses	318	7.4%	97.90%
2 Responses	1082	25.3%	90.5%
1 Responses	2789	65.2%	65.2%
Total	4279	100%	100%
Max Units Used in 365 Days	5		

Establishing Desired Performance

Currently, there are no performance standards set forth by Jefferson County, WV. To create response times that will better service Jefferson County, *FITCH* created a community baseline response plan that they should measure overall EMS performance to. These response times are based on the standards from the Commission on Fire Accreditation International (CFAI) and a review of historical risk.

The CFAI is used to guide emergency service agencies on performance measurements and establish a baseline or benchmark for the purpose of evaluating response times. The CFAI provides a range of performance standards providing both a baseline and benchmark performance standards. The standards are determined in two parts: 1) determining the population density and 2) determining the right level of response times for the community.

The components of response that are typically measured are as follows:

- Dispatch time — the time interval from initial call from the requestor until the first dispatch notification for a unit to respond.
- Turnout time — the time interval from when response personnel receive the dispatch notification until there is a staffed ambulance responding.
- Travel Time — the time interval from the staffed ambulance initiates response until it arrives at the scene of the incident.
- Dispatch to First Unit Arrival – is a cumulative time for the time components of Turnout and Travel times. This is the time controlled only by the responding resources and not the Communications Center.
- Hello-to-Hello time — the cumulative time for the components above that represents a call received in the Communication Center until response personnel arrive on scene with the patient. From the caller/patient’s perspective, this is the most important time interval.
- Time-on-Task – the time interval from initial dispatch of a response to the time the unit becomes available for another response. A unit may become available following a transport to the hospital, treat and release on on-scene, canceled, etc.

The EMS System response time begins when they receive a response from the 911 Dispatch Center. Then the “clock begins” for measuring the EMS System response to an Emergency. The clock stops when the unit arrives on scene of an incident or in staging awaiting another public safety official due to an unsafe scene. Figure 1 explains the response time expectations.

Figure 1. CFAI Response Times Baseline

<u>Creating Community Baselines</u>	
For the purposes of definition and the need to establish a common benchmark for purposes of evaluating response time accreditation criteria, the following times should be made available and used in defining base line norms for a candidate agency:	
Aggregate (Total) Response time -	
A. Alarm handling:	60-second/90% benchmark 90-second/90% baseline
B. Turnout time:	80-second/90% benchmark (Fire & Special Operations response) 60 Seconds/90% benchmark (EMS response) 90-second/90% baseline
C. Travel time:	Based on criteria for the different risk categories and within guidelines provided for service area and/or population density. See chart to follow.
Total response time:	A+B+C

The EMS System should measure the Turnout times and Travel times. Turnout times are based on the baseline performance of 90 seconds, 90% of the time. For travel time, Figure 2 methodology is used.

Figure 2. Response Times Baseline (continued)

Metropolitan – an incorporated or unincorporated area with a population of over 200,000 people and/or a population density over 3,000 people per square mile.

Metropolitan	1st Unit	2nd Unit	Effective Response Force
Benchmark	4 minutes	8 minutes	8 minutes
Baseline	5:12 minutes	10:24 minutes	10:24 minutes

Urban – an incorporated or unincorporated area with a population of over 30,000 people and/or a population density over 2,000 people per square mile.

Urban	1st Unit	2nd Unit	Effective Response Force
Benchmark	4 minutes	8 minutes	8 minutes
Baseline	5:12 minutes	10:24 minutes	10:24 minutes

Suburban – an incorporated or unincorporated area with a population of 10,000 to 29,999 and/or any area with a population density of 1,000 to 2,000 people per square mile.

Suburban	1st Unit	2nd Unit	Effective Response Force
Benchmark	4 minutes	8 minutes	10 minutes
Baseline	5:12 minutes	10:24 minutes	13 minutes

Rural – an incorporated or unincorporated area with total population less than 10,000 people, or with a population density of less than 1,000 people per square mile.

Rural	1st Unit	2nd Unit	Effective Response Force
Benchmark	10 minutes	14 minutes	14 minutes
Baseline	13 minutes	18:12 minutes	18:12 minutes

Wilderness – any rural area not readily accessible by public or private maintained road. Due to the large disparity between communities that protect wilderness areas, recommended travel times are not provided for this level of service.

FITCH reviewed the County’s population density per square mile to determine the expected response time performance based on the CFAI. In reviewing, the County would meet the Rural Zone standards. provides the breakdown.

Table 2. Populations/Square mileage of the County

Values	Jefferson County West Virginia
Population	57,146 (2019)
Square Miles	212
Population/Sq. Miles	269.6

The CFAI standards allowed *FITCH* to work with the County to determine response time expectations. With the County’s population per square mile at 269.6 meeting the Rural designation, the following are the CFAI recommended response times for the ambulance.

- Benchmark: Turnout Time=60 second/90% plus Travel Time 14 minutes/90%
- Baseline: Turnout Time=90 second/90% plus Travel Time 18:12 minutes/90%

Consideration #1 - Establishing Desired Performance

In the new Ambulance Service Agreement, the County should develop response times based off the Commission on Fire Accreditation International's (CFAI) guide for Fire and EMS.

This study examined four (4) performance models to provide the agency context and perspective for future planning efforts. The modeling examined 10-minute, 15-minute, 20-minute, and 30-minute deployment plans. The current station configuration can only achieve a travel time of 10-minutes to 94.19% of the historical incidents from six stations staffed 24/7. To meet the CFAI recommended Rural response time of 15 minutes, four (4) stations would need to be strategically staffed 24/7 to achieve 92.08% within 15-minutes.

Therefore, it is recommended the County elect to adopt a Total Response Time (Turnout plus Travel time) performance of 15-minutes at the 90% as the¹ performance standard for the EMS System.

Consideration #2 – Establishing Desired Performance

The Agency should consider formally establishing a 15-minute at the 90% Total Response Time as their performance standard for the EMS system.

Deployment Modeling and Options

Design components

Two primary factors influence the design of emergency response systems, the desired travel time performance, and the level of demand for services. Travel time performance is accomplished through the appropriate “distribution” of resources throughout the community. As stated, this study considered distribution models at 10-minute, 15-minute, 20-minute, and 30-minute travel times. Once distribution has been determined, the level of demand is addressed with the appropriate concentration of resources at each point of distribution. Demand is considered both geographically and temporally. Thus, the following system designs were established through a quantitative distribution and concentration of response resources.

A marginal utility analysis was also performed to determine the Agency's ability to cover the historical demand from their current fixed locations within each specified travel time performance. This helped to identify the number of locations needed to meet the desired level of performance.

Analyses were performed to strategically match staffing with demand. The primary objective is to ensure that the geographical deployment is not negatively impacted by the demand. Demand-vs-staffing charts were produced for each model to ensure that efficient and sustainable schedules with capital and human resource allocations were adequately provided for each presented alternative.

¹ Baseline performance objective is defined as the minimum service delivery to be delivered.

Personnel staffing levels were evaluated by mathematical formula to determine the essential number of FTE's needed to fill each required seat in the deployment plan. This ensures that enough staffing exists to cover all deployed unit hours for the year. To estimate the average annual leave *FITCH* used 20% per employee of the scheduled time annually. Therefore, a 20% "Relief Multiplier" was included in all modeling assumptions to show the minimum required personnel needed to deploy each model, while reducing the over reliance on overtime for expected absences. All expenses were estimated based on *FITCH*'s experience in managing EMS Systems and working with Jefferson County, WV to determine vehicle and facilities costing.

Revenue performance analysis and predictions were based on limited information. The predictive information is an estimation based on a 12-month annualization of the information *FITCH* received. The data analysis and revenue conservative estimates were considered by estimating the average miles per transport, payor level mix, service level mix, and payor mix using the 2022 Medicare and Medicaid Rates. Volumes were determined from the data report. *FITCH* created a Revenue calculator estimating all points above and independently valuing the annual revenues for transport to be \$1,537,009 or a per transport rate of \$404.48. Using the IRS 990's annual revenues of \$1,226,668 against the estimated volumes of 3,801, gave a current revenue per transport rate of \$322.72. It is *FITCH*'s understanding that all the VFD's use the same billing company.

Consideration was given to the workload that would be imposed on providers with the various models. Unit Hour Utilization (UHU) is the measurement commonly used to measure a unit's workload. Simply stated, UHU is the amount of time during a unit's deployed shift that it spends on mission, or on calls. The International Association of Fire Fighters (IAFF) has published a 30 percent, or 0.30 Unit Hour Utilization (UHU) threshold for 24-hour units, which aligns with best practice. In other words, the unit would only be committed on calls for approximately 7.2 hours of their 24hr shift. Industry best practice allows for 12-hour units to be worked up to a 0.50 UHU.

Consideration #3 – Design Components

Workload thresholds should be established for EMS units in alignment with best practice to ensure system performance, sustainability, and future needs.

Consideration #4 – Design Components

Jefferson County should consider managing EMS personnel shift exposure at no more than 24hrs with a workload below 30% Unit Hour Utilization (UHU).

EMS Deployment Options

Three EMS deployment models were developed for the County's consideration (Table 3) in having all EMS resources and personnel operating for the Jefferson County Emergency Services Agency. These alternatives are developed through a comprehensive review of the risk, demand, and performance of the department as well as future growth projections. Furthermore, each alternative was designed in accordance with the following objectives:

- Maintain or improve the current level of ALS performance within the community.

- All employees continue operating in the EMS and Fire capacity
- Develop alternatives that align with the CFAI.
- Stabilize the EMS Transport model with a sustainable approach.
- Provide fiscal sustainability and efficiency.

Table 3: Summary of All Models

Response Type	Ambulance Travel Time at 90%	Est. Workload (UHU)	Additional FTEs From Current	Year 1 Est Rev. Per Transport	Year 1	Year 2	Year 3	Year 4	Year 5
NET Taxpayer Change Per Model - With Buying New Assets & Current Revenue Collections									
8 Total Units-6-Geographic Units	10 Min	14%	32	\$ 322.72	(\$1,202,284)	(\$1,284,517)	(\$1,301,247)	(\$1,389,153)	(\$1,480,016)
6 Total Units-4-Geographic Units	15 Min	19%	16	\$ 322.72	\$193,141	\$142,224	\$157,592	\$102,587	\$45,448
4 Total Units-2-Geographic Units	15 Min	28%	0	\$ 322.72	\$1,573,866	\$1,553,965	\$1,601,124	\$1,578,705	\$1,554,966
NET Taxpayer Change Per Model - With Buying Agencies Assets & Improved Revenue Collections									
8 Total Units-6-Geographic Units	10 Min	14%	32	\$ 404.48	(\$607,738)	(\$689,971)	(\$706,702)	(\$794,608)	(\$885,470)
6 Total Units-4-Geographic Units	15 Min	19%	16	\$ 404.48	\$716,287	\$665,370	\$680,738	\$625,733	\$568,594
4 Total Units-2-Geographic Units	15 Min	28%	0	\$ 404.48	\$2,097,012	\$2,077,110	\$2,124,270	\$2,101,850	\$2,078,112

Of the three alternatives produced, two were able to meet the prescribed operational objectives. The 8-total unit model would create the least workload of crews only working 14% of the time at work but would require an additional 32 Full-time equivalents ((FTE) aka Full-time employees) and the initial year one addition cost to the County would range from \$607,738 to \$1,202,284. Due to the additional costs, we considered this model to not meet the prescribed objectives. However, both the 4- and 6- total unit models would meet all the prescribed objectives. The 6-total unit model workload of crews would be 19% of the time at work, but would require 16 more FTE's, and in year one there would be a savings to the County ranging from \$193,141 to \$716,287. The 4-total unit model workload of crews would be 28% of the time at work, would require no additional FTE's, and in year one there would be a savings to the County ranging from \$1,573,866 to \$2,097,012. The 4-total unit model would need monitored and if workload increases above 30%, then the County would need to consider investing into a 12-hour peak-of-day unit. All models are presented in detail within the accompanying PowerPoint.

Financial Analysis

The financial impact of each model was determined with assumptions made from various data points and collaboration with Jefferson County, WV government personnel. Annual increases were estimated for demand at 1%, collection rates at 1%, and CPI at 2.5%. An average revenue value per transport was established at \$322.72 for year 1 as this was the most conservative approach. All required equipment was normalized per item required by its cost per call and multiplied by the system's volume.

Ambulance vehicle, stretchers, stair chairs, and information technology costs we considered as new for the most conservative approach. All ambulances are assumed as ALS transport units and would also facilitate firefighting capabilities for their personnel. Additionally, a spare ambulance with equipment was provided at a ratio of 1.5 peak-of-day units. All transport units were equipped with Performance-Lift stretchers. For other capital such as cardiac monitors, etc. that are currently in use,

these would transition to the new ambulances at no additional cost. Depreciation was added in accordance with a 5-year replacement schedule that is included and documented within overhead. The subsidy dollars are accounted for within the total revenues allow each model to show estimated overall NET impact to the County's budget. Fixed facility capital needs were also considered and discussed with Jefferson County government personnel.

Comparisons of the EMS models were constructed separately, showing the 5-year annual average fiscal impact to the County. Revenues were based on the average trip rate provided and would separately include revenues from subsidy. Operating expenses were summarized into direct labor, direct materials, and overhead costs categories. Each specific model financial analysis is provided in Appendix C.

To determine the best-case scenario for cost savings, *FITCH* reviewed both the initial purchasing of vehicles and the revenue per transport. *FITCH* assumed the County would purchase all of the fully loaded ambulances from the VFD's and the cost of these units would be half of purchasing new units. *FITCH* would recommend an independent review to ensure they are purchasing assets at fair market value. Lastly, *FITCH* adjusted the revenue per transport to \$404.48, which would increase year one annual revenues by \$310,746.

Table 4: Cost Summary of All Models

Response Type	Year 1 Est Rev. Per Transport	Year 1	Year 2	Year 3	Year 4	Year 5
NET Taxpayer Change Per Model - With Buying New Assets & Current Revenue Collections						
8 Total Units-6-Geographic Units	\$ 322.72	(\$1,202,284)	(\$1,284,517)	(\$1,301,247)	(\$1,389,153)	(\$1,480,016)
6 Total Units-4-Geographic Units	\$ 322.72	\$193,141	\$142,224	\$157,592	\$102,587	\$45,448
4 Total Units-2-Geographic Units	\$ 322.72	\$1,573,866	\$1,553,965	\$1,601,124	\$1,578,705	\$1,554,966
NET Taxpayer Change Per Model - With Buying Agencies Assets & Improved Revenue Collections						
8 Total Units-6-Geographic Units	\$ 404.48	(\$607,738)	(\$689,971)	(\$706,702)	(\$794,608)	(\$885,470)
6 Total Units-4-Geographic Units	\$ 404.48	\$716,287	\$665,370	\$680,738	\$625,733	\$568,594
4 Total Units-2-Geographic Units	\$ 404.48	\$2,097,012	\$2,077,110	\$2,124,270	\$2,101,850	\$2,078,112

Consideration #5 – Jefferson County Government with the ESA operating the EMS System

The County should consider operating the entire EMS system under Jefferson County Government through the ESA.

Consideration #6 – Capital Purchasing

The County should consider purchasing fully loaded ambulances for the VFD's at fair market value.

Consideration

Volunteer Fire Department and Future Funding

It could be assumed that funds from the EMS program were going to support the overall fire mission. Jefferson County should consider evaluating how any EMS model changes would affect the overall fire service and the impacts it will have to support fire services in the future. Once understood, Jefferson County could consider ways to support the Volunteer Fire Departments.

Consideration #7 – Volunteer Fire Department Funding with Potential Changes
Jefferson County should consider evaluating how any EMS model changes would affect the overall fire service and the impacts it will have to support fire services in the future.

APPENDIX A – DATA REPORT

December 2021

**Jefferson County, WV
Data Analysis**

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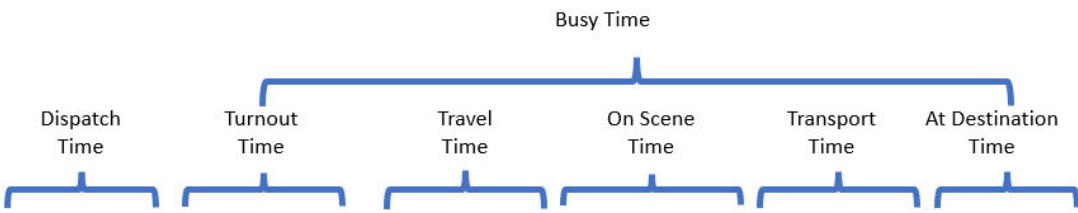
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METHODOLOGY

This report includes data from 2016 through September 30, 2021. Dispatch time in this report was calculated from the call time through the time a unit was dispatched. Turnout time was calculated from the time a unit was dispatched through the time a unit went enroute. Travel time was calculated from unit enroute time through unit arriving on scene time. Response time citizen experienced includes dispatch, turnout, and travel times. On-scene time is the duration from the unit arriving on scene through the unit begin to transport. Transport time was calculated from the time a unit began to transport through the time a unit arrived at hospital. Lastly, at destination time was calculated as the duration from the unit arrived at hospital time through unit in service time. So, the deployed or busy time of a unit can be broken down into five components: turnout time, travel time, on-scene time, transport time and at destination time. Below is a visual example of how each task component is calculated.



The diagram illustrates the components of 'Busy Time'. A horizontal line represents the total busy time, which is divided into six segments by vertical brackets. The segments are labeled from left to right: Dispatch Time, Turnout Time, Travel Time, On Scene Time, Transport Time, and At Destination Time. The 'Turnout Time' segment is further subdivided into 'Dispatch Time' and 'Travel Time'.

CAD Call Number	Nature	Unit	Date/Time Occurred	Dispatch	Enroute	Arrived	To Hospital	At Hospital	In Service
C20-00121	DiabeticEmerg-C	A52	1/1/2020 15:49:30	1/1/2020 15:52:21	1/1/2020 15:56:52	1/1/2020 16:04:14	1/1/2020 16:28:28	1/1/2020 16:43:34	1/1/2020 17:16:37
C20-00104	SickPerson-A	A2	1/1/2020 13:35:13		1/1/2020 13:40:33	1/1/2020 13:46:53	1/1/2020 13:53:31	1/1/2020 14:00:52	1/1/2020 14:17:19
C20-00064	Fall-B	A41	1/1/2020 10:15:17	1/1/2020 10:19:04	1/1/2020 10:20:44	1/1/2020 10:27:17	1/1/2020 10:51:00	1/1/2020 11:01:47	1/1/2020 11:22:41

EXECUTIVE SUMMARY

In the first nine months of the year, overall demand in 2021 measured by number of calls exceeded the 2019 level by 6.6%.

In 2020, a total of 6,601 calls were responded to by study agencies, averaging 18.0 calls per day. Of those, 52% were completed transports. On average, each call had 3.5 responding units. From dispatch to clear, all units spent a total of 23,336 hours, averaging 43 hours per day. Demand was lower during the week from Tuesday to Thursday and Wednesday had the lowest demand. Demand from midnight through 0600 averaged 0.4 per day, which is slightly less than half of the demand for the rest of the day (0.8 per day on average). EMS calls accounted for 79% of the total calls and averaged 14.3 per day. Fire calls averaged 3.2 per day. City code CTU had the most demand, followed by HFU and CT. Together, the top three cities generated 53% of total requests.

The issue of missing data is significant. A total of 37% records missed dispatch time, and 24% missed enroute time, and 31% missed arriving on scene time. We looked at the response time performance of first arriving units in our response time analysis. In 2021, the average dispatch time was 2.1 minutes, the average turnout and travel time was 8.2 minutes, the average response time was 10.4 minutes, and the 90th percentile response time was 16.2 minutes. Response time was significant longer from midnight to 0600 driven by longer turnout and travel times.

Table 1: Overall Stats from 2016 through 2021 September

Year	Number of Calls	Number of Unit Responses	Total Busy Hours	Average Busy Minutes per Response	Average Responding Units per Call
2016	6,388	25,967	16,752	38.8	4.1
2017	6,280	23,247	15,566	40.2	3.7
2018	6,507	23,259	15,175	39.2	3.6
2019	6,678	23,867	15,722	39.5	3.6
2020	6,601	23,336	15,873	40.8	3.5
2021	5,334	18,516	12,475	40.4	3.5

Figure 1: Jan to Oct: Number of Calls by Year

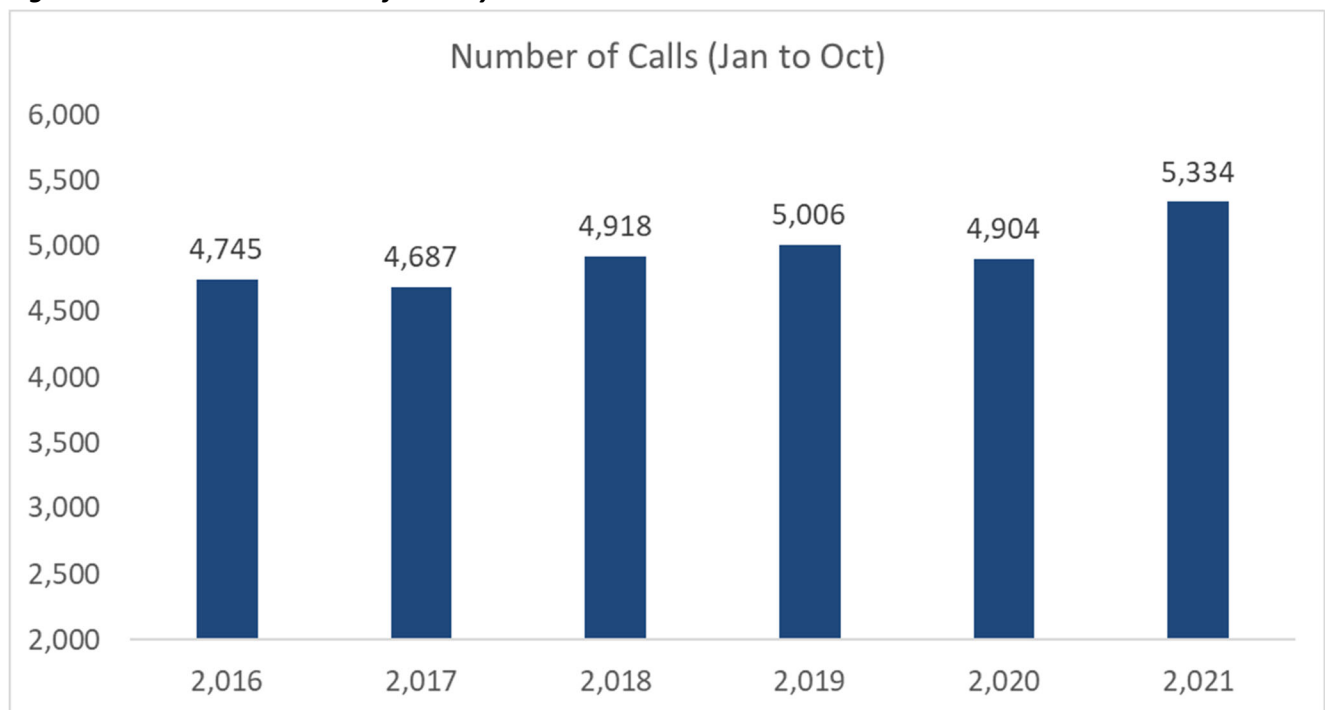


Table 2: Daily Stats from 2016 through 2021 September

Year	Number of Calls	Number of Responses	Total Busy Hours	Average Busy Minutes per Response
2016	17.5	70.9	45.8	38.8
2017	17.2	63.7	42.6	40.2
2018	17.8	63.7	41.6	39.2
2019	18.3	65.4	43.1	39.5
2020	18.0	63.8	43.4	40.8
2021	19.5	67.8	45.7	40.4

Table 3: Transports Only: Overall Stats from 2016 through 2021 September

Year	Number of Calls	Number of Responses	Total Busy Hours	Average Busy Minutes per Response	Average Responding Units per Call
2016	3,740	15,321	11,373	44.6	4.1
2017	3,556	13,208	10,434	47.4	3.7
2018	3,358	11,642	9,312	48.0	3.5
2019	3,504	12,297	10,056	49.1	3.5
2020	3,436	11,926	10,211	51.4	3.5
2021	2,770	9,317	7,979	51.4	3.4

Table 4: Transports Only: Daily Stats from 2016 through 2021 September

Year	Number of Calls	Number of Responses	Total Busy Hours
2016	10.2	41.9	31.1
2017	9.7	36.2	28.6
2018	9.2	31.9	25.5
2019	9.6	33.7	27.6
2020	9.4	32.6	27.9
2021	10.1	34.1	29.2

Table 5: Average and 90th Percentile Response Time Performance by Year

Year	Average			Sample Size
	Dispatch Time	Turnout & Travel Time	Response Time	
2016	3.1	8.2	11.1	3,733
2017	3.0	7.8	10.7	3,795
2018	3.0	7.7	10.7	4,097
2019	3.1	8.0	11.0	4,283
2020	2.1	8.3	10.4	4,652
2021	1.8	8.4	10.1	3,758

Priority	90th Percentile			Sample Size
	Dispatch Time	Turnout & Travel Time	Response Time	
2016	4.4	14.7	17.9	3,733
2017	4.4	13.5	16.7	3,795
2018	4.3	13.4	16.5	4,097
2019	4.4	13.6	16.8	4,283
2020	3.4	14.0	16.2	4,652
2021	2.9	14.0	15.8	3,758

Table 6: 2020: Total Responses by Call Type

Call Type	Number of Calls	Number of Responses	Total Busy Hours	Average Busy Minutes per Response	Number of Calls per Day	Avg. Unit Responses per Day	Busy Hours per Day
Cardiac and stroke	630	2,480	2,136	51.7	1.7	6.8	5.9
Seizure and unconsciousness	543	1,975	1,416	43.0	1.5	5.4	3.9
Breathing difficulty	555	1800	1468	48.9	1.5	4.9	4.0
Overdose and psychiatric	405	1,294	791	36.7	1.1	3.5	2.2
Fall and injury	1095	3417	2052	36.1	3.0	9.4	5.6
Illness and other	1427	4242	2883	40.8	3.9	11.6	7.9
Patient transfer	238	741	622	50.5	0.7	2.0	1.7
MVA	327	1815	1077	35.6	0.9	5.0	3.0
EMS Total	5,220	17,764	12,446	42.0	14.3	48.7	34.1
Structure fire	88	1,388	1,325	57.3	0.2	3.8	3.6
Outside fire	101	388	214	33.1	0.3	1.1	0.6
Vehicle fire	38	234	84	21.6	0.1	0.6	0.2
Alarm	399	1,047	231	13.2	1.1	2.9	0.6
Public service	113	303	302	59.8	0.3	0.8	0.8
Fire other	388	1,279	604	28.3	1.1	3.5	1.7
Rescue	29	236	170	43.1	0.1	0.6	0.5
Hazmat	29	193	132	41.0	0.1	0.5	0.4
Fire Total	1,185	5,068	3,061	36.2	3.2	13.9	8.4
Mutual aid	196	504	366	43.5	0.5	1.4	1.0
Total	6,601	23,336	15,873	40.8	18.1	63.9	43.5

Table 7: 2020: Total Calls and Unit Responses by City Code

City Code	Number of Calls	Number of Responses	Total Busy Hours	Average Busy Minutes per Response	Avg Unit Responses per Day	Busy Hours per Day
CTU	1,454	5,154	3,579	41.7	14.1	9.8
HFU	1,061	4,207	3,375	48.1	11.5	9.2
CT	969	3,302	2,023	36.8	9.0	5.5
KVU	697	2,742	1,829	40.0	7.5	5.0
STU	556	1,719	1,256	43.8	4.7	3.4
RN	673	2,210	1,216	33.0	6.1	3.3
SJU	223	768	527	41.2	2.1	1.4
RNU	236	773	491	38.1	2.1	1.3
HFB	156	589	330	33.6	1.6	0.9
SPU	115	454	329	43.5	1.2	0.9
ST	138	434	280	38.7	1.2	0.8
OOC	153	367	265	43.3	1.0	0.7
HF	66	260	153	35.2	0.7	0.4
CTR	49	191	85	26.8	0.5	0.2
KVR	12	67	68	60.9	0.2	0.2
MVU	3	17	9	33.3	0.0	0.0
PVV	1	4	3	51.1	0.0	0.0
MTB	3	6	1	11.7	0.0	0.0
BVV	1	3	0	5.5	0.0	0.0
NA	35	69	52	45.3	0.2	0.1
Total	6,601	23,336	15,873	40.8	63.9	43.5

Table 8: 2020: Average Response Time by City Code

City Code	Average			Sample Size
	Dispatch Time	Turnout & Travel Time	Response Time	
CTU	2.1	8.2	10.3	1,136
CT	2.0	5.7	7.7	736
HFU	2.2	10.6	12.7	717
KVU	2.1	10.9	13.0	474
RN	2.1	6.2	8.2	463
STU	2.1	7.3	9.4	396
RNU	2.2	7.7	9.8	184
SJU	1.9	11.1	13.0	146
HFB	2.7	5.9	8.2	100
ST	2.0	5.7	7.7	97
SPU	2.1	12.4	14.6	75
All Other	1.9	11.5	13.4	128
Total	2.1	8.31	10.4	4,652

Table 9: 2020: Total Responses by Agency Station

Agency Station	Number of Calls	Number of Responses	Total Busy Hours	Average Busy Minutes per Response	Number of Calls per Day	Avg Unit Responses per Day	Busy Minutes per Day
1	680	1,066	691	39	1.9	2.9	114
2	1,952	2,752	1,648	36	5.3	7.5	271
3	1,358	2,267	1,505	40	3.7	6.2	247
4	3,113	4,726	2,621	33	8.5	12.9	431
5	1,044	1,814	1,421	47	2.9	5.0	234
6	610	1,050	743	43	1.7	2.9	122
7	426	628	471	45	1.2	1.7	77
11	5,832	8,408	6,265	45	16.0	23.0	1,030
BC01	1	1	0	12	0.0	0.0	0
BC16	6	6	9	87	0.0	0.0	1
BC20	37	56	42	45	0.1	0.2	7
BC40	2	2	0	11	0.0	0.0	0
BC60	68	111	62	34	0.2	0.3	10
BC80	43	50	20	24	0.1	0.1	3
BC90	4	4	2	35	0.0	0.0	0
CC01	34	46	27	36	0.1	0.1	4
CC04	5	5	3	35	0.0	0.0	0
CC08	5	6	8	78	0.0	0.0	1
CC21	4	4	0	7	0.0	0.0	0
FC05	14	17	31	109	0.0	0.0	5
FC19	9	9	7	49	0.0	0.0	1
LC02	9	10	23	136	0.0	0.0	4
LC04	9	14	21	88	0.0	0.0	3
LC26	31	48	56	71	0.1	0.1	9
MEDC	44	45	48	65	0.1	0.1	8

Agency Station	Number of Calls	Number of Responses	Total Busy Hours	Average Busy Minutes per Response	Number of Calls per Day	Avg Unit Responses per Day	Busy Minutes per Day
VA13	8	8	3	21	0.0	0.0	0
WC01	26	40	35	52	0.1	0.1	6
WC06	4	4	1	11	0.0	0.0	0
WC08	20	25	47	112	0.1	0.1	8
WC11	13	14	10	44	0.0	0.0	2
WC19	74	90	41	28	0.2	0.2	7
WC20	9	10	11	66	0.0	0.0	2
Total	6,601	23,336	15,873	40.8	42.4	63.9	2,609

Note: multiple agencies could respond to the same call, thus you can't add up calls by agency to match total call counts.

Table 10: 2020: Total Responses by Unit Type

Unit Type	Number of Responses	Total Busy Hours	Average Busy Minutes per Response	Avg Unit Responses per Day	Busy Hours per Day
Ambulance	8,560	5,865	41	23.5	16.1
Emergency Services Agency	6,744	4,976	44	18.5	13.6
Miscellaneous Unit	2,760	2,100	46	7.6	5.8
Engine	1,536	687	27	4.2	1.9
Rescue Engine	1,070	551	31	2.9	1.5
Engine Tanker	621	320	31	1.7	0.9
Command Unit	608	445	44	1.7	1.2
Truck	409	162	24	1.1	0.4
Tanker	311	262	51	0.9	0.7
Brush	164	109	40	0.4	0.3
Rescue	159	87	33	0.4	0.2
Boat	113	98	52	0.3	0.3
Engine or Brush	89	28	19	0.2	0.1
ALS Provider	85	75	53	0.2	0.2
Air Ambulance	45	48	65	0.1	0.1
Tower	34	11	19	0.1	0.0
Hazmat	10	5	27	0.0	0.0
Battalion Chief	9	23	151	0.0	0.1
All-Terrain Vehicle	6	14	142	0.0	0.0
Air Unit	3	7	146	0.0	0.0
Total	23,336	15,873	41	63.9	43.5

Table 11: 2020: Number of Calls and Daily Average by Month

Month	Number of Calls	Calls per Day	% of Total
January	564	18.2	8.5%
February	505	17.4	7.7%
March	504	16.3	7.6%
April	487	16.2	7.4%
May	535	17.3	8.1%
June	550	18.3	8.3%
July	646	20.8	9.8%
August	544	17.5	8.2%
September	569	19.0	8.6%
October	596	19.2	9.0%
November	549	18.3	8.3%
December	552	17.8	8.4%
Total	6,601	18.0	100%

Figure 2: 2020: Average Number of Calls per Day by Month

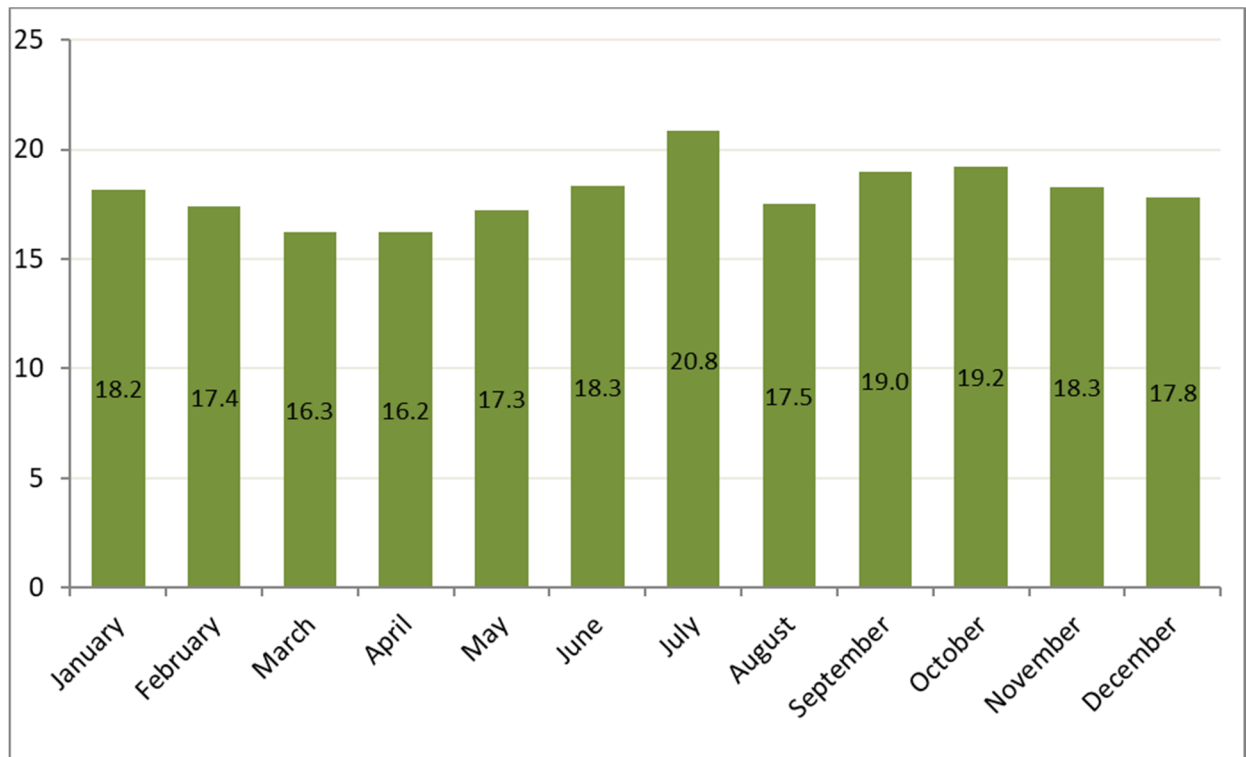


Table 12: 2020: Number of Calls and Daily Average by Weekday

Weekday	Number of Calls	Calls per Day	% of Total
Sunday	937	18.0	14.2%
Monday	991	19.1	15.0%
Tuesday	927	17.8	14.0%
Wednesday	893	16.8	13.5%
Thursday	943	17.8	14.3%
Friday	957	18.4	14.5%
Saturday	953	18.3	14.4%
Total	6,601	18.0	100%

Figure 3: 2020: Average Number of Calls per Day by Weekday

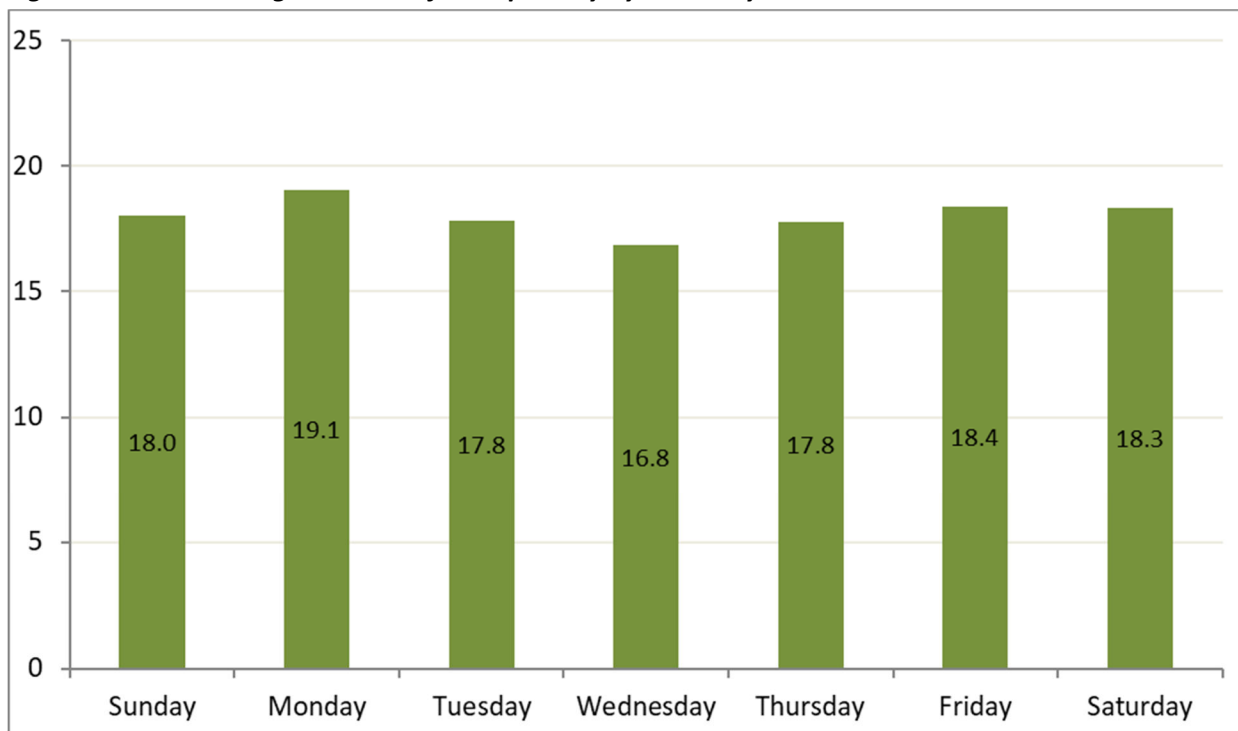


Table 13: 2020: Number of Calls and Daily Average by Hour of Day

Hour	Number of Calls	Calls per Day	% of Total
0	173	0.5	2.6%
1	147	0.4	2.2%
2	136	0.4	2.1%
3	150	0.4	2.3%
4	141	0.4	2.1%
5	127	0.3	1.9%
6	177	0.5	2.7%
7	214	0.6	3.2%
8	280	0.8	4.2%
9	321	0.9	4.9%
10	334	0.9	5.1%
11	378	1.0	5.7%
12	387	1.1	5.9%
13	372	1.0	5.6%
14	367	1.0	5.6%
15	359	1.0	5.4%
16	383	1.0	5.8%
17	379	1.0	5.7%
18	430	1.2	6.5%
19	323	0.9	4.9%
20	298	0.8	4.5%
21	274	0.7	4.2%
22	241	0.7	3.7%
23	210	0.6	3.2%
Total	6,601	18.0	100%

Figure 4: 2020: Average Number of Calls per Day by Hour of Day

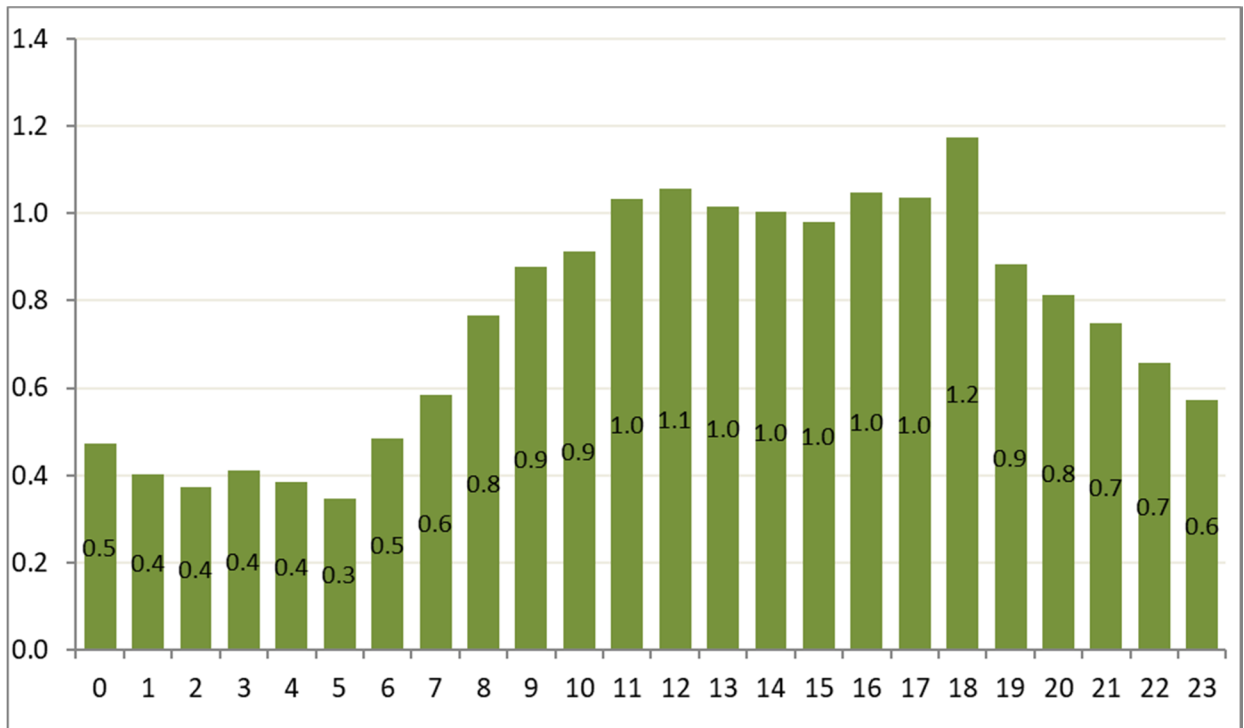


Table 14: 2020: Average and 90th Percentile Response Time by Hour of Day

Hour of Day	Avg. Dispatch Time	Avg. Turnout & Travel Time	Avg. Response Time	90th Percentile Response time	Sample Size
0	2.0	9.4	11.5	18.3	138
1	1.9	9.8	11.7	16.6	115
2	1.8	9.9	11.6	17.7	109
3	1.9	10.1	12.0	18.8	117
4	2.0	10.9	12.9	17.8	111
5	1.8	10.0	11.8	18.2	89
6	2.1	10.3	12.4	18.2	140
7	2.1	9.1	11.2	17.0	145
8	2.0	7.5	9.5	14.5	220
9	2.1	7.7	9.7	14.3	223
10	2.1	7.4	9.5	15.0	234
11	2.1	7.3	9.3	14.4	246
12	2.2	7.3	9.5	14.5	261
13	2.1	7.2	9.3	14.7	247
14	2.5	8.4	10.9	16.4	258
15	2.6	7.5	9.5	14.3	253
16	2.3	8.5	10.6	16.2	249
17	2.1	8.5	10.6	16.6	249
18	2.5	8.0	10.0	15.8	270
19	2.1	7.6	9.8	15.3	221
20	2.0	8.4	10.4	16.5	203
21	1.9	8.3	10.2	16.6	208
22	1.9	8.5	10.4	16.3	182
23	2.0	8.6	10.6	15.3	164
Total	2.1	8.3	10.4	16.2	4,652

Table 15: 2020 Transports: Number of Calls and Daily Average by Month

Month	Number of Transports	Transports per Day	% of Total
January	323	10.4	9.4%
February	262	9.0	7.6%
March	265	8.5	7.7%
April	219	7.3	6.4%
May	255	8.2	7.4%
June	304	10.1	8.8%
July	307	9.9	8.9%
August	296	9.5	8.6%
September	302	10.1	8.8%
October	316	10.2	9.2%
November	284	9.5	8.3%
December	303	9.8	8.8%
Total	3,436	9.4	100%

Figure 5: 2020 Transports: Average Number of Calls per Day by Month

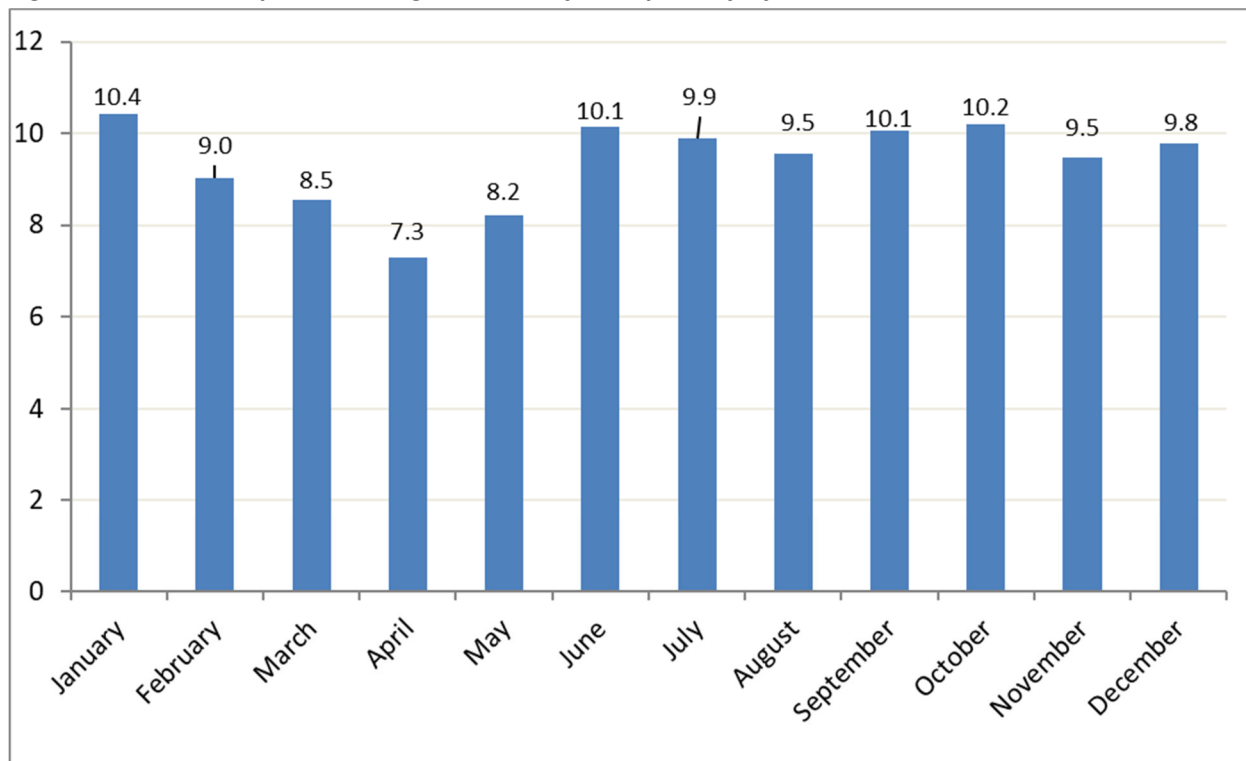


Table 16: 2020 Transports: Number of Calls and Daily Average by Weekday

Weekday	Number of Transports	Transports per Day	% of Total
Sunday	490	9.4	14.3%
Monday	533	10.3	15.5%
Tuesday	484	9.3	14.1%
Wednesday	442	8.3	12.9%
Thursday	491	9.3	14.3%
Friday	484	9.3	14.1%
Saturday	512	9.8	14.9%
Total	3,436	9.4	100%

Figure 6: 2020 Transports: Average Number of Calls per Day by Weekday

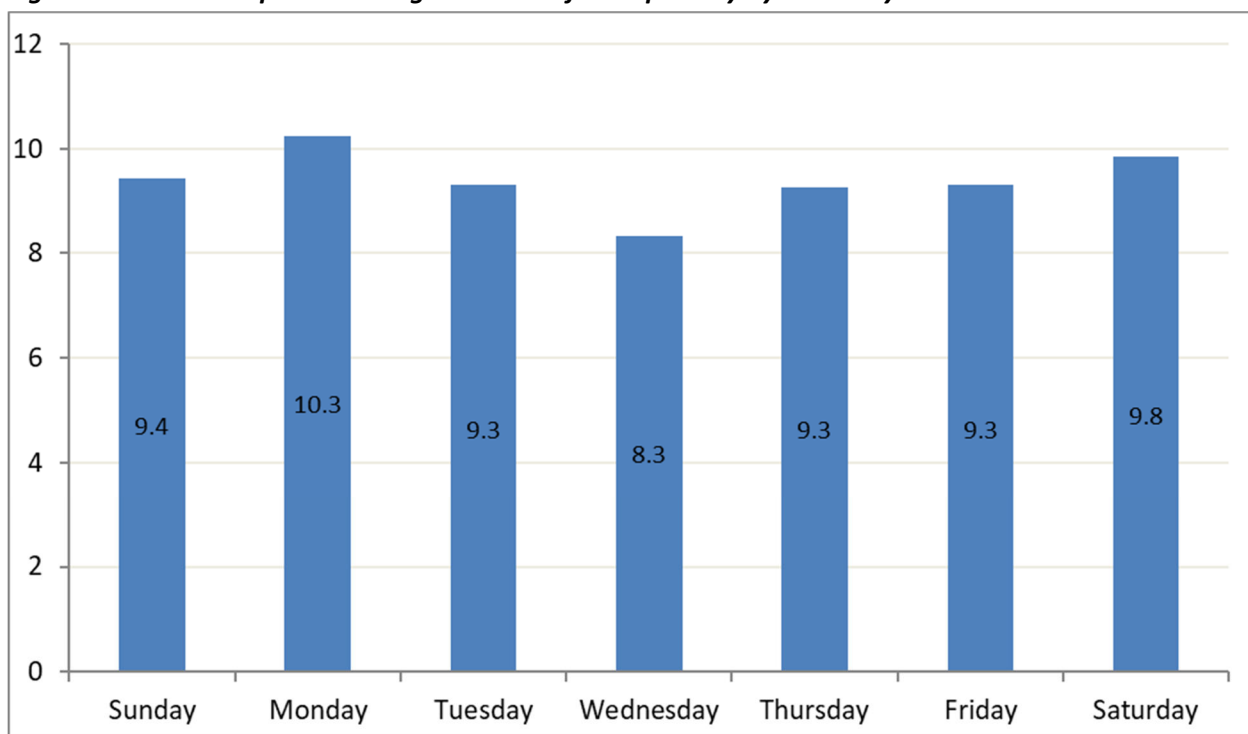
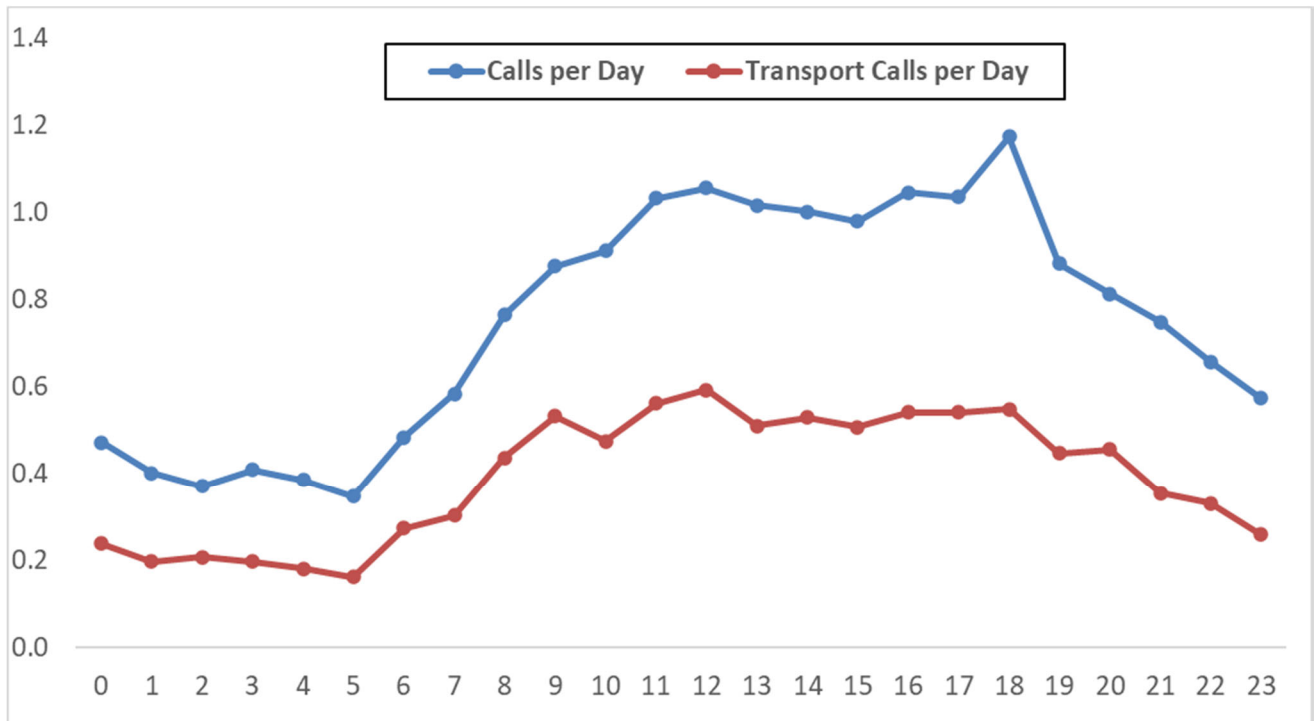


Table 17: 2020 Transports: Number of Calls and Daily Average by Hour of Day

Hour	Number of Calls	Number of Transport Calls	Calls per Day	Transport Calls per Day	Transport Rate
0	173	87	0.5	0.2	50.3%
1	147	72	0.4	0.2	49.0%
2	136	76	0.4	0.2	55.9%
3	150	72	0.4	0.2	48.0%
4	141	66	0.4	0.2	46.8%
5	127	59	0.3	0.2	46.5%
6	177	100	0.5	0.3	56.5%
7	214	111	0.6	0.3	51.9%
8	280	160	0.8	0.4	57.1%
9	321	195	0.9	0.5	60.7%
10	334	174	0.9	0.5	52.1%
11	378	206	1.0	0.6	54.5%
12	387	217	1.1	0.6	56.1%
13	372	187	1.0	0.5	50.3%
14	367	194	1.0	0.5	52.9%
15	359	186	1.0	0.5	51.8%
16	383	198	1.0	0.5	51.7%
17	379	198	1.0	0.5	52.2%
18	430	201	1.2	0.5	46.7%
19	323	164	0.9	0.4	50.8%
20	298	167	0.8	0.5	56.0%
21	274	130	0.7	0.4	47.4%
22	241	121	0.7	0.3	50.2%
23	210	95	0.6	0.3	45.2%
Total	6,601	3,436	18.0	9.4	52.1%

Figure 7: 2020 Transports: Average Number of Transports per Day by Hour of Day





APPENDIX B – FINAL POWER POINT



Options for EMS Services

FITCH Methodology

- ❖ Initiated on June 30th, 2021
- ❖ Fitch sent a 170-point data request
- ❖ All data received from Jefferson Co. WVa by November 1, 2021
- ❖ Fitch completed:
 - ❖ Operational deployment review: 11/18/21
 - ❖ Data report: 12/27/21
 - ❖ Financial review and projections: 1/2/21
 - ❖ Draft report to County Officials: 1/6/21

Community Response History

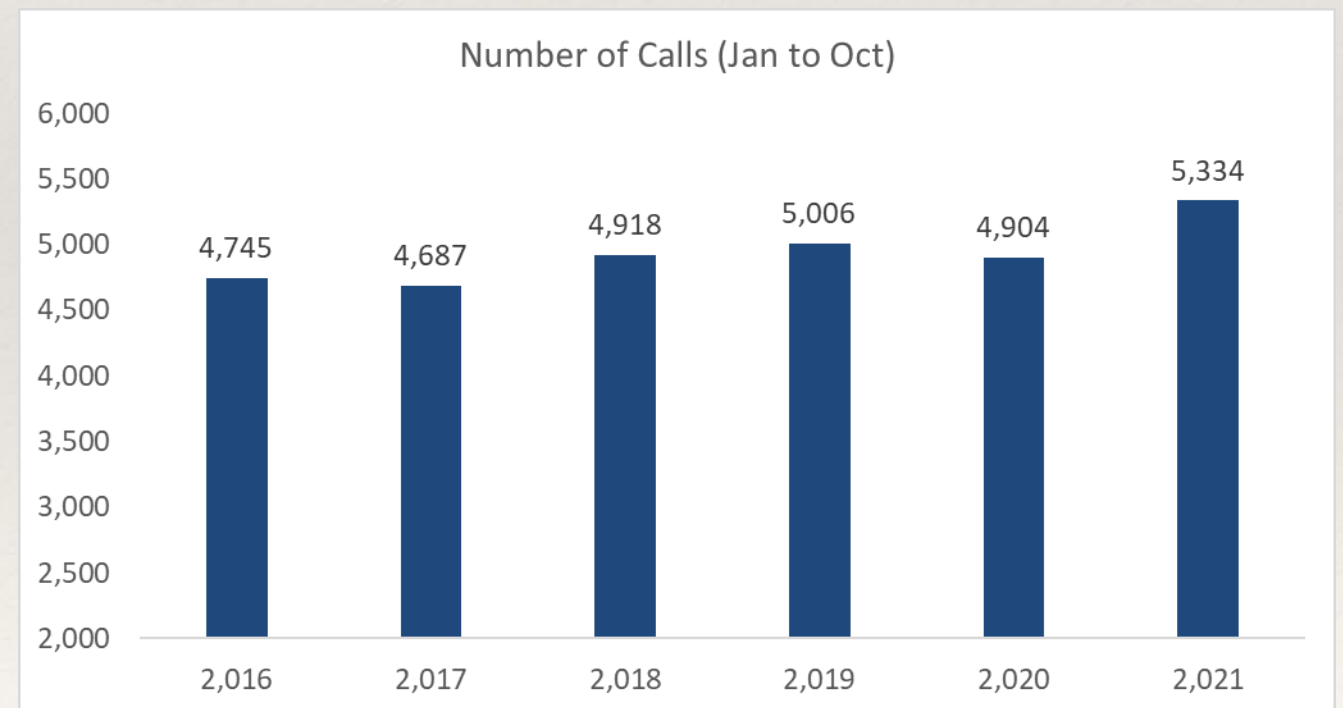
Community Demand

- ❖ Total of 6,601 unique incidents in 2020
- ❖ 18 Responses & 9.4 Transports per day
- ❖ Demand increased by 3.3% from 2016-2020, 8% from 2020-2021

Table 1: Overall Stats from 2016 Through 2021 September

Year	Number of Calls	Number of Unit Responses	Total Busy Hours	Average Busy Minutes per Response	Average Responding Units per Call
2016	6,388	25,967	16,752	38.8	4.1
2017	6,280	23,247	15,566	40.2	3.7
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2020	6,601	23,336	15,873	40.8	3.5
2021	5,334	18,516	12,475	40.4	3.5

Figure 1: Jan to Oct: Number of Calls by Year



EMS Response and Transport

Call Type	Number of Calls	Number of Responses	Total Busy Hours	Average Busy Minutes per Response	Number of Calls per Day	Avg. Unit Responses per Day	Busy Hours per Day
Cardiac and stroke	630	2,480	2,136	51.7	1.7	6.8	5.9
Seizure and unconsciousness	543	1,975	1,416	43.0	1.5	5.4	3.9
Breathing difficulty	555	1800	1468	48.9	1.5	4.9	4.0
Overdose and psychiatric	405	1,294	791	36.7	1.1	3.5	2.2
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Illness and other	1427	4242	2883	40.8	3.9	11.6	7.9
Patient transfer	238	741	622	50.5	0.7	2.0	1.7
MVA	327	1815	1077	35.6	0.9	5.0	3.0
EMS Total	5,220	17,764	12,446	42.0	14.3	48.7	34.1
Structure fire	88	1,388	1,325	57.3	0.2	3.8	3.6
Outside fire	101	388	214	33.1	0.3	1.1	0.6
Vehicle fire	38	234	84	21.6	0.1	0.6	0.2
Alarm	399	1,047	231	13.2	1.1	2.9	0.6
Public service	113	303	302	59.8	0.3	0.8	0.8
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Rescue	29	236	170	43.1	0.1	0.6	0.5
Hazmat	29	193	132	41.0	0.1	0.5	0.4
Fire Total	1,185	5,068	3,061	36.2	3.2	13.9	8.4
Mutual aid	196	504	366	43.5	0.5	1.4	1.0
Total	6,601	23,336	15,873	40.8	18.1	63.9	43.5

- ❖ 79.1% of all calls are EMS related, 18% of all calls are Fire Related, and 3% mutual aid.
- ❖ A response averages a Time-on-task of 40.8 minutes

Historical Performance

- ❖ Considering “Travel Time” of first arriving EMS unit at the 90th percentile
- ❖ Total system performance is 15.8 minutes at the 90th percentile
- ❖ EMS performance Travel times is 14:00 minutes at the 90th percentile
 - ❖ This does not mean a fully capable transport unit is on location

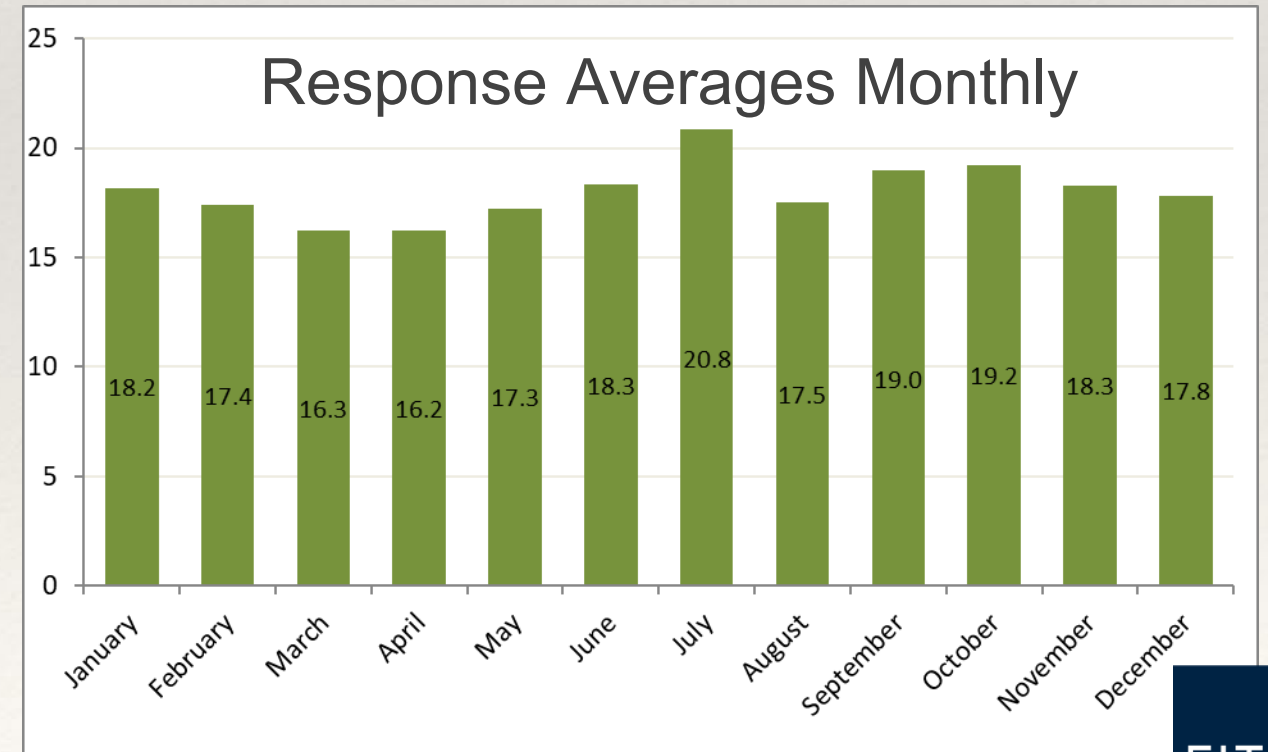
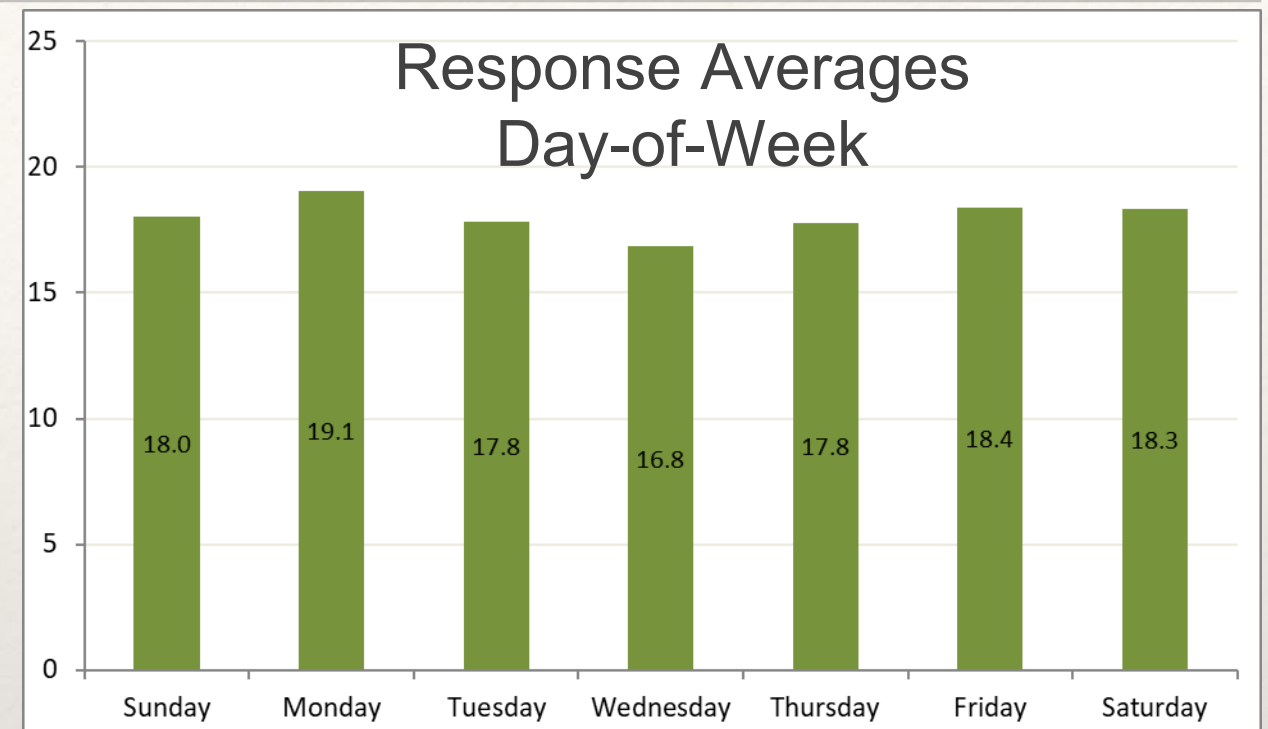
Table 5: Average and 90th Percentile Response Time Performance by Year

Year	Dispatch Time	Average		Sample Size
		Turnout & Travel Time	Response Time	
2016	3.1	8.2	11.1	3,733
2017	3.0	7.8	10.7	3,795
2018	3.0	7.7	10.7	4,097
2019	3.1	8.0	11.0	4,283
2020	2.1	8.3	10.4	4,652
2021	1.8	8.4	10.1	3,758

Year	Dispatch Time	90th Percentile		Sample Size
		Turnout & Travel Time	Response Time	
2016	4.4	14.7	17.9	3,733
2017	4.4	13.5	16.7	3,795
2018	4.3	13.4	16.5	4,097
2019	4.4	13.6	16.8	4,283
2020	3.4	14.0	16.2	4,652
2021	2.9	14.0	15.8	3,758

Response Averages

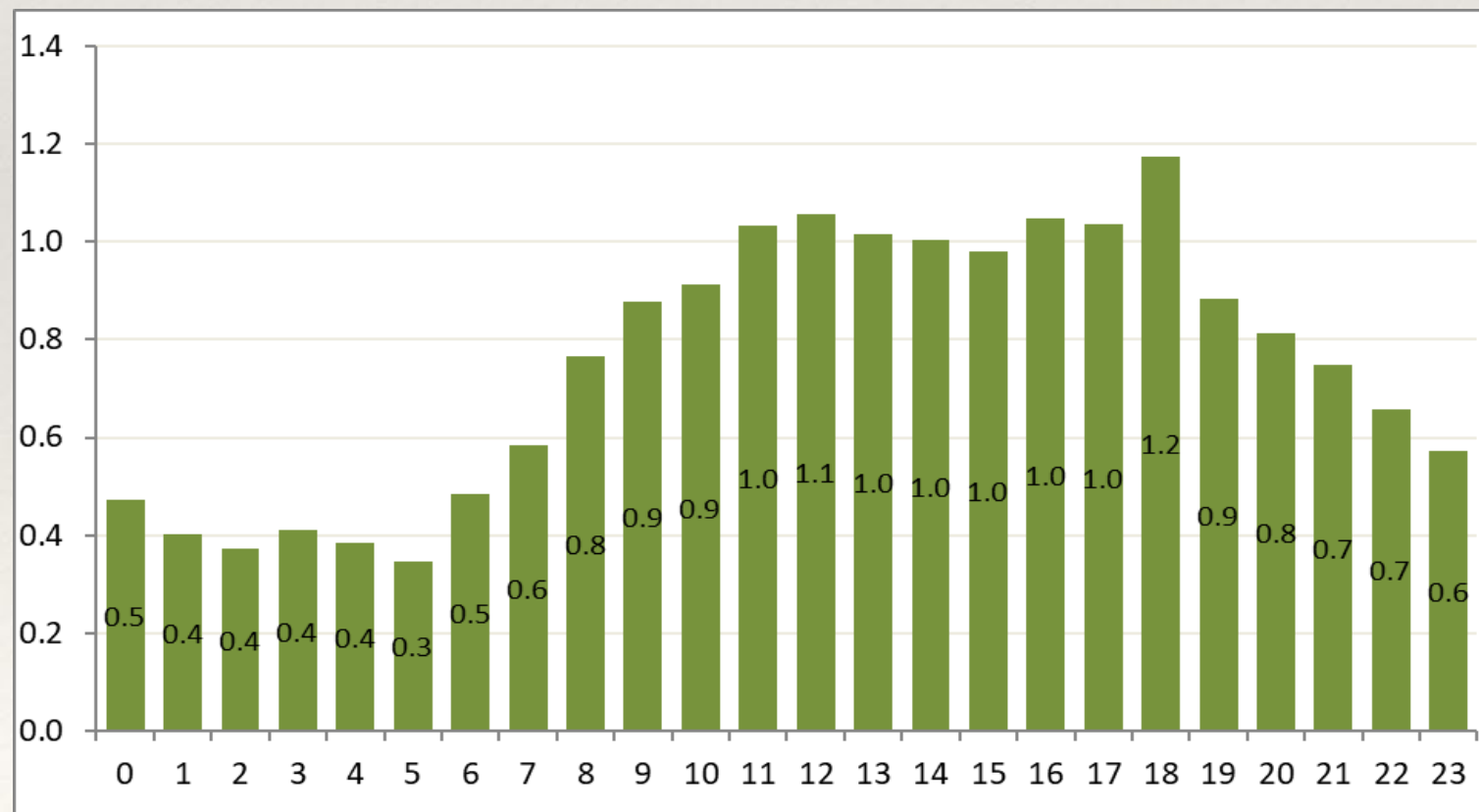
- ❖ The annual demand experience remains largely consistent
- ❖ Volume per day of the week is consistent at ~18 calls per day. Monday is the highest at 19.1 calls per day
- ❖ July increased ~2 calls per day above the the normal average to 20.8
- ❖ March and April are the lowest months at 16.2 & 16.3 responses per day respectively



Temporal Demand

- ❖ Workload - EMS demand is primary driver, 1.2 calls/hr. at peak.
- ❖ Overall system demand is highest between 11:00 and 18:00 hrs at 1 calls/hr.
- ❖ Most hours only require one unit to cover just a call per hour for demand
- ❖ Current 24/72 shifts are desirable for staff and acceptable for this type of coverage due to lower than .3 workload

Figure 4: 2020: Average Number of Calls per Day by Hour of Day



Concurrent Number of Units

Concurrent Responses per Hour	Count for 52 Weeks	Percent of Concurrency	CummulativePercent of Concurrency
5 Responses	14	0.3%	100%
4 Responses	76	1.8%	99.70%
3 Responses	318	7.4%	97.90%
2 Responses	1082	25.3%	90.5%
1 Responses	2789	65.2%	65.2%
<i>Total</i>	<i>4279</i>	<i>100%</i>	<i>100%</i>
Max Units Used in 365 Days	5		

Current Deployment

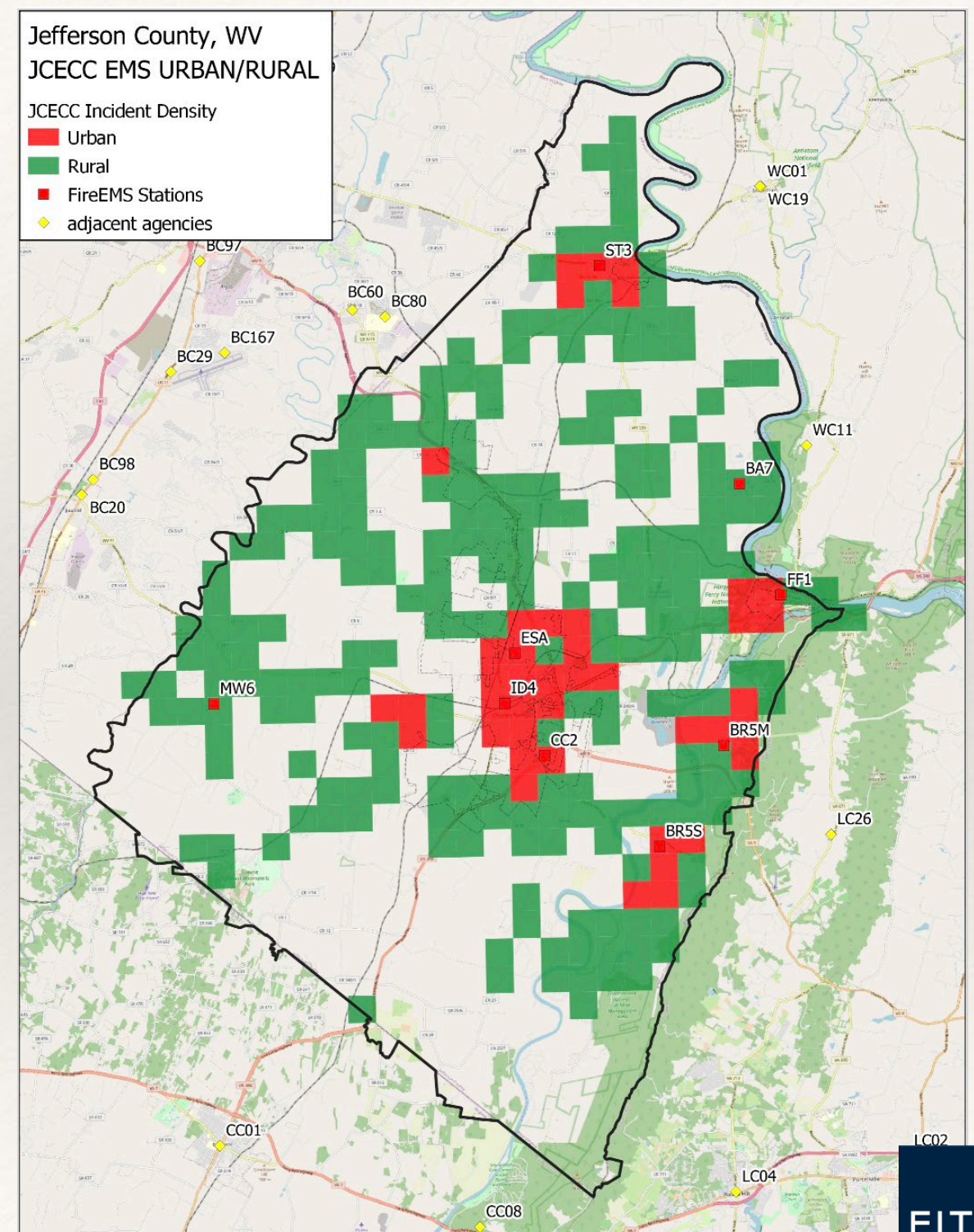
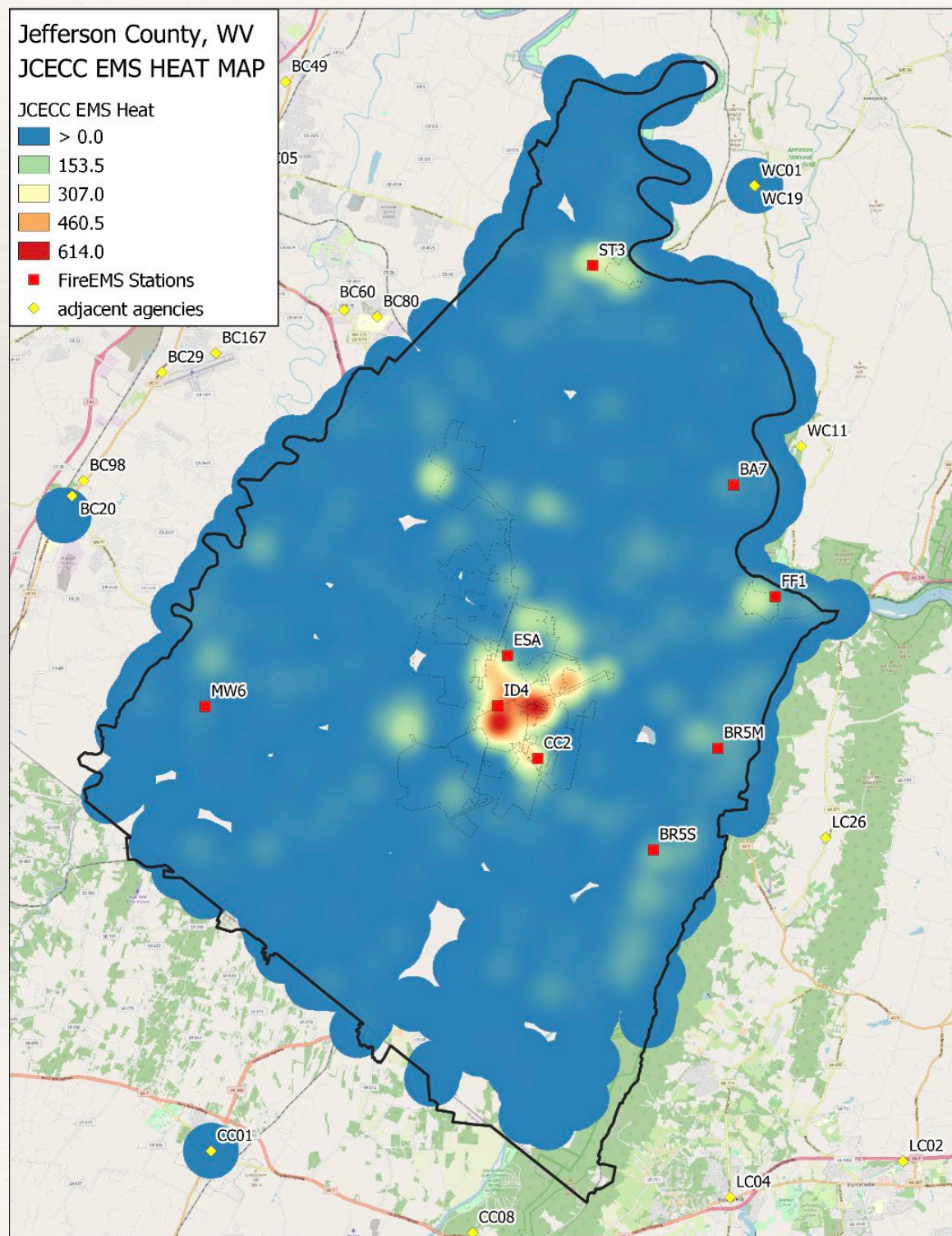
- ❖ JCEMSA responds to the bulk of all EMS calls with an EMS official only and not a full crew
- ❖ Must meet with a driver to complete a crew to transport the patient
- ❖ The EMS agencies bill for service without revenues being shared with the County
- ❖ County subsidizes all EMS agencies for service and in 2022 subsidized at \$4,137,498, which equals a subsidy per call of \$579.11

Desired Performance and Station Locations

Validation of Modeling

- ❖ Historical performance demonstrated a 14-minute overall turnout & travel time performance at the 90th percentile.
- ❖ GIS planning assessments estimated approximately 92.08% of the incidents could be responded to within 15-minutes travel time from two of the current stations.
- ❖ High degree of agreement between the quantitative analyses and the GIS planning analyses.
 - ❖ Considerable confidence can be maintained across the various GIS modeling.
 - ❖ Used two years of data to ensure sample size was significant enough to model

EMS Related-Distribution of Risk



Current Performance and Station Locations

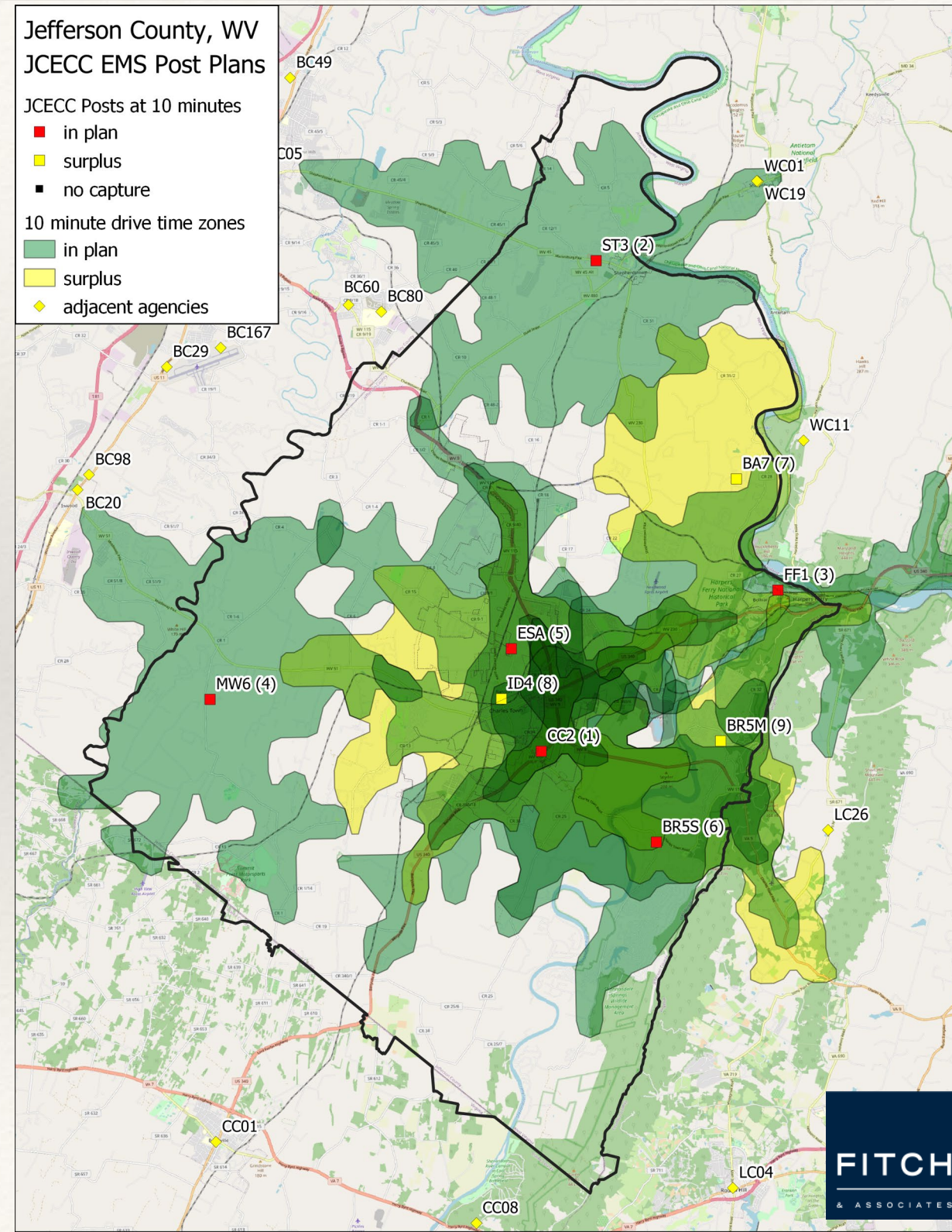
10-Minute Travel Time

Current Stations

Marginal Station Contribution

Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	CC2	10	39.27574	-77.8452	6891	6891	56.88%
2	ST3	10	39.43414	-77.8185	1320	8211	67.77%
3	FF1	10	39.32641	-77.7453	978	9189	75.84%
4	MW6	10	39.29441	-77.9827	789	9978	82.35%
5	ESA	10	39.3091	-77.8569	592	10570	87.24%
6	BR5S	10	39.24564	-77.798	474	11044	91.15%
7	BA7	10	39.36266	-77.7617	210	11254	92.89%
8	ID4	10	39.29293	-77.8614	153	11407	94.15%
9	BR5M	10	39.27798	-77.7704	5	11412	94.19%

- ❖ Current station configuration could capture approximately 91.15% of the incidents within 10 minutes with the utilization of all 6 stations



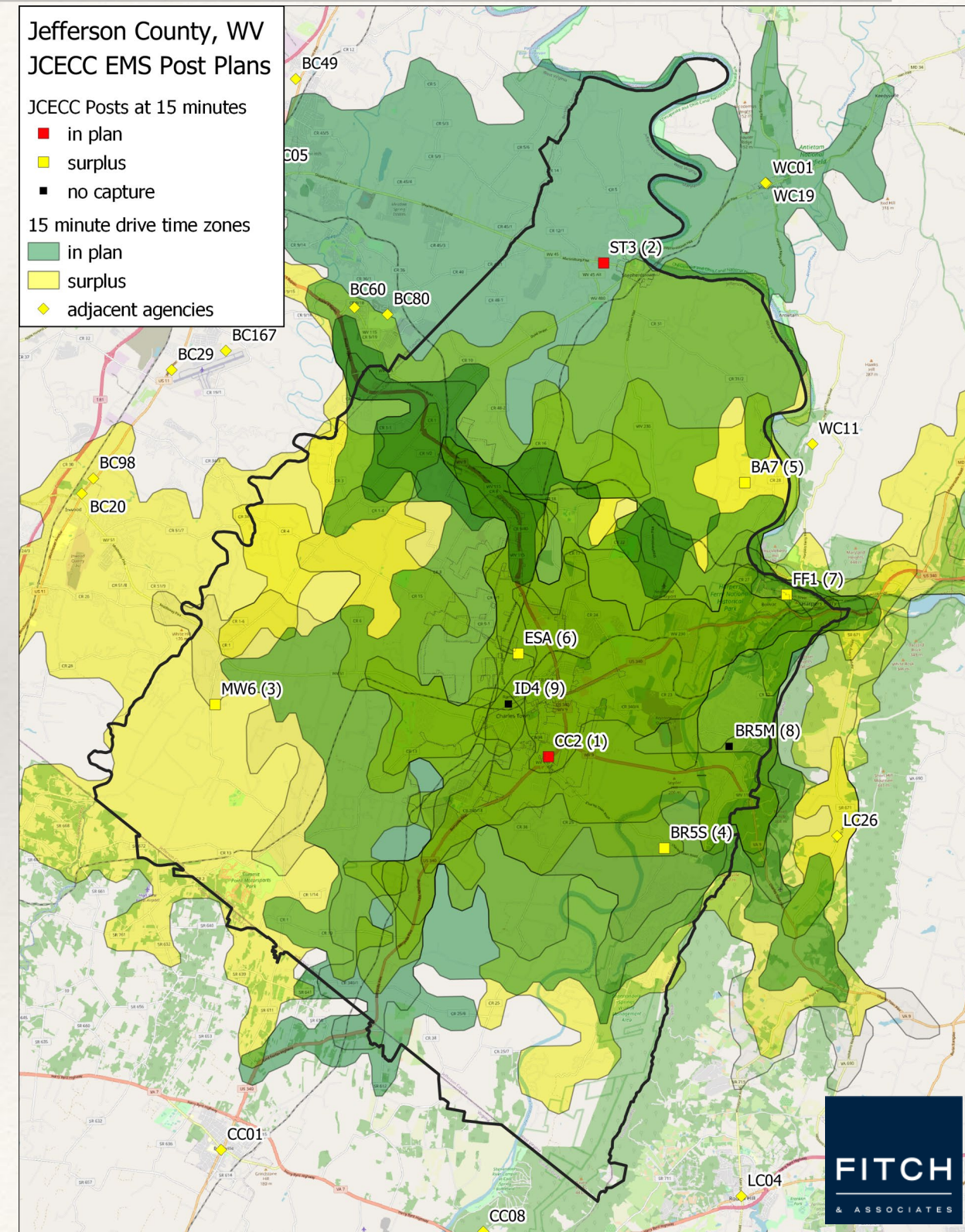
15-Minute Travel Time

Current Stations

Marginal Station Contribution

Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	CC2	15	39.27574	-77.8452	9612	9612	79.33%
2	ST3	15	39.43414	-77.8185	1544	11156	92.08%
3	MW6	15	39.29441	-77.9827	734	11890	98.13%
4	BR5S	15	39.24564	-77.798	97	11987	98.94%
5	BA7	15	39.36266	-77.7617	96	12083	99.73%
6	ESA	15	39.3091	-77.8569	5	12088	99.77%

- ❖ Current station configuration could capture approximately 92.08% of the incidents within 15 minutes with the utilization of all 2 stations



20-Minute Travel Time

Current Stations

Marginal Station Contribution

Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	ESA	20	39.3091	-77.8569	11052	11052	91.22%
2	ID4	20	39.29293	-77.8614	580	11632	96.01%
3	ST3	20	39.43414	-77.8185	375	12007	99.10%
4	BR5S	20	39.24564	-77.798	87	12094	99.82%
5	MW6	20	39.29441	-77.9827	12	12106	99.92%
6	CC2	20	39.27574	-77.8452	8	12114	99.98%

- ❖ Current station configuration could capture approximately 91.22% of the incidents within 20 minutes with the utilization of a station.

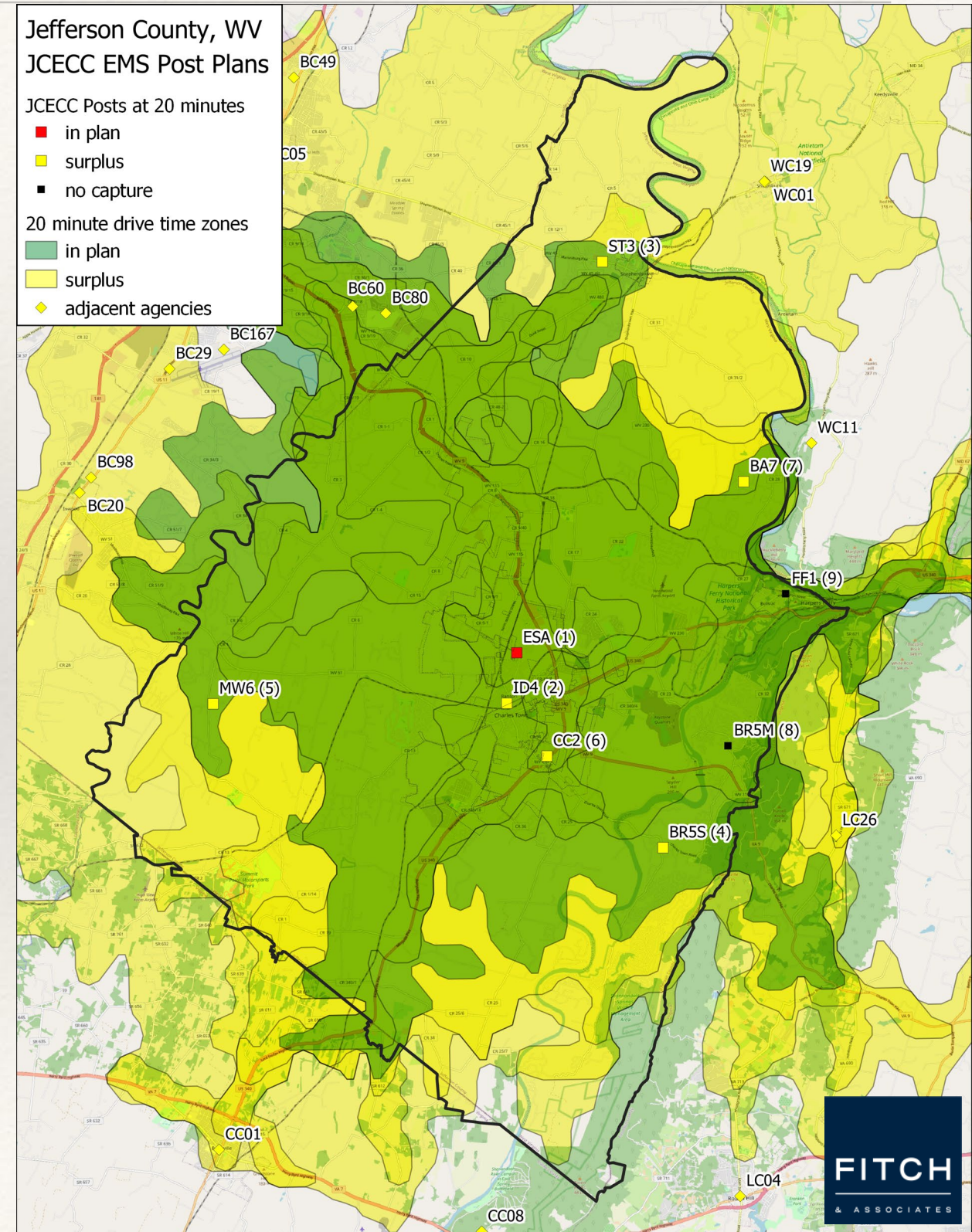
Jefferson County, WV JCECC EMS Post Plans

JCECC Posts at 20 minutes

- in plan
- surplus
- no capture

20 minute drive time zones

- in plan
- surplus
- ◆ adjacent agencies



Fitch Optimized Performance and Station Locations

10-Minute Travel Time

Optimized Bases

Marginal Station Contribution

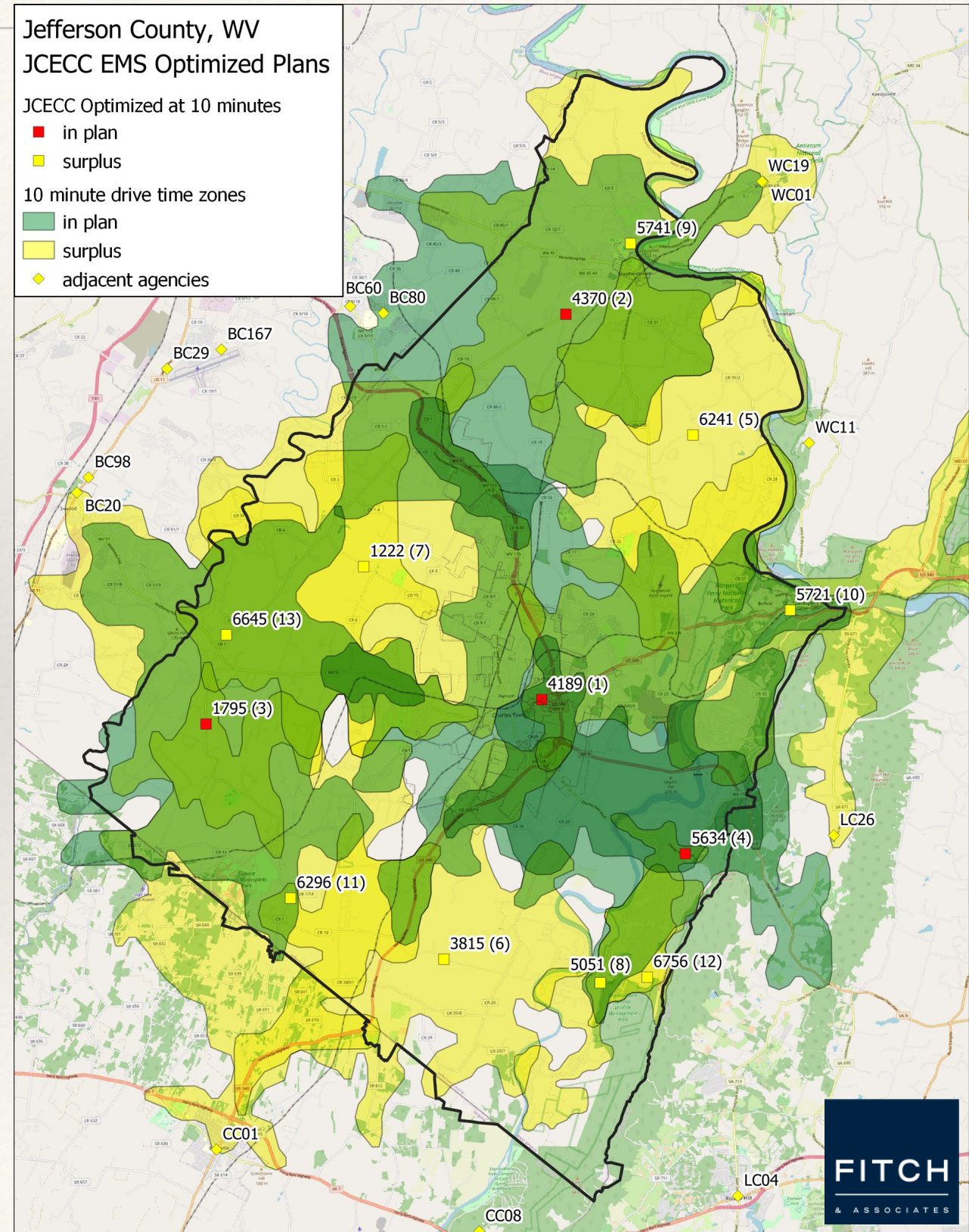
Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	4189	10	39.29386	-77.8459	8061	8061	66.53%
2	4370	10	39.41747	-77.833	1459	9520	78.57%
3	1795	10	39.28791	-77.9848	852	10372	85.61%
4	5634	10	39.2435	-77.7879	796	11168	92.18%
5	6241	10	39.37792	-77.7814	346	11514	95.03%
6	3815	10	39.21105	-77.8883	228	11742	96.91%

- ❖ Current station configuration could capture approximately 92.18% of the incidents within 10 minutes with the utilization of all 4 stations

Jefferson County, WV
JCECC EMS Optimized Plans

JCECC Optimized at 10 minutes

- in plan
- surplus
- 10 minute drive time zones
- in plan
- surplus
- ◆ adjacent agencies



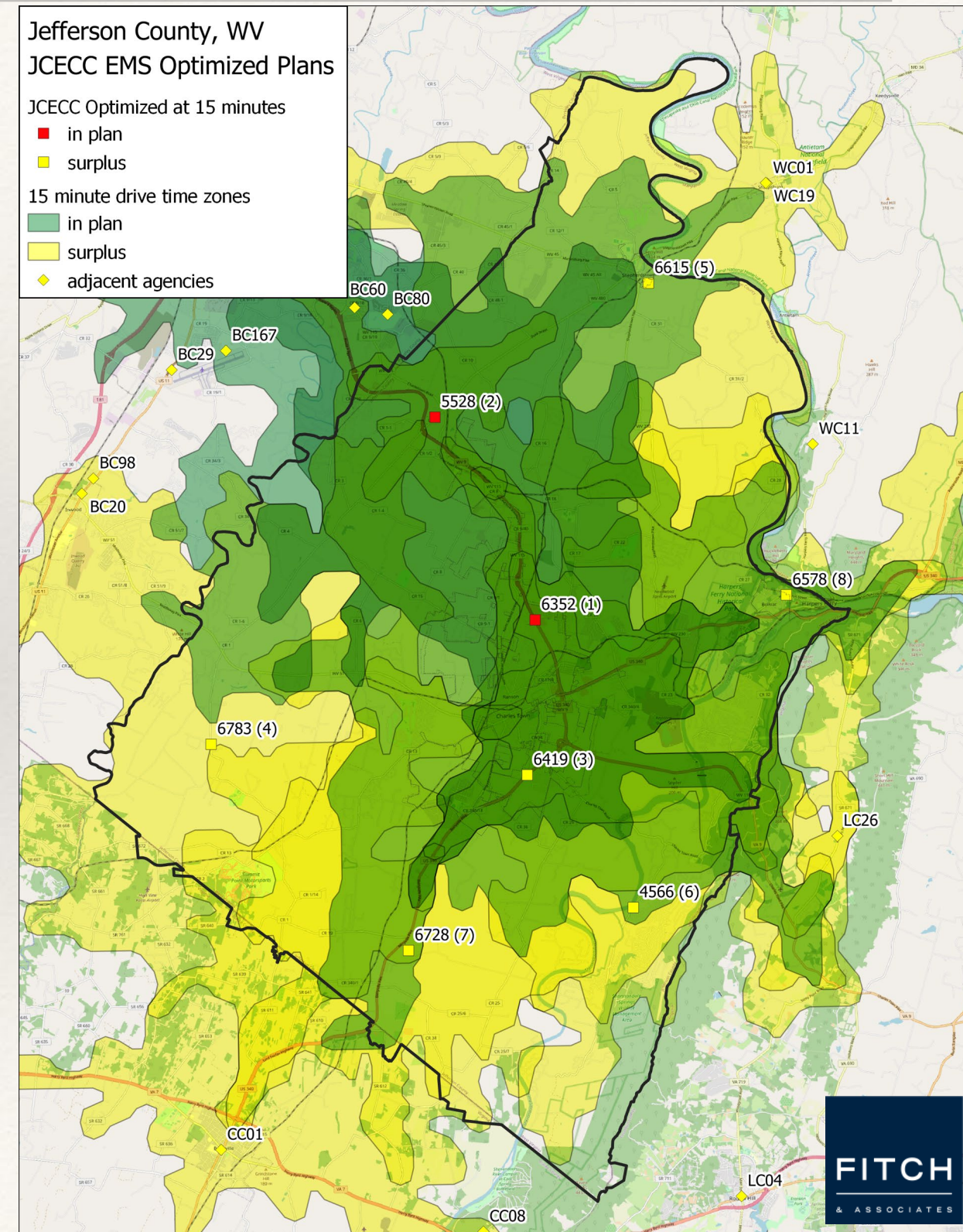
15-Minute Travel Time

Optimized Bases

Marginal Station Contribution

Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	6352	15	39.3198	-77.8497	10297	10297	84.99%
2	5528	15	39.38558	-77.8897	838	11135	91.90%
3	6419	15	39.27001	-77.8542	520	11655	96.20%
4	6783	15	39.28166	-77.9847	188	11843	97.75%
5	6615	15	39.42741	-77.8002	171	12014	99.16%
6	4566	15	39.22675	-77.8113	91	12105	99.91%

- ❖ Current station configuration could capture approximately 91.90% of the incidents within 15 minutes with the utilization of 2 stations



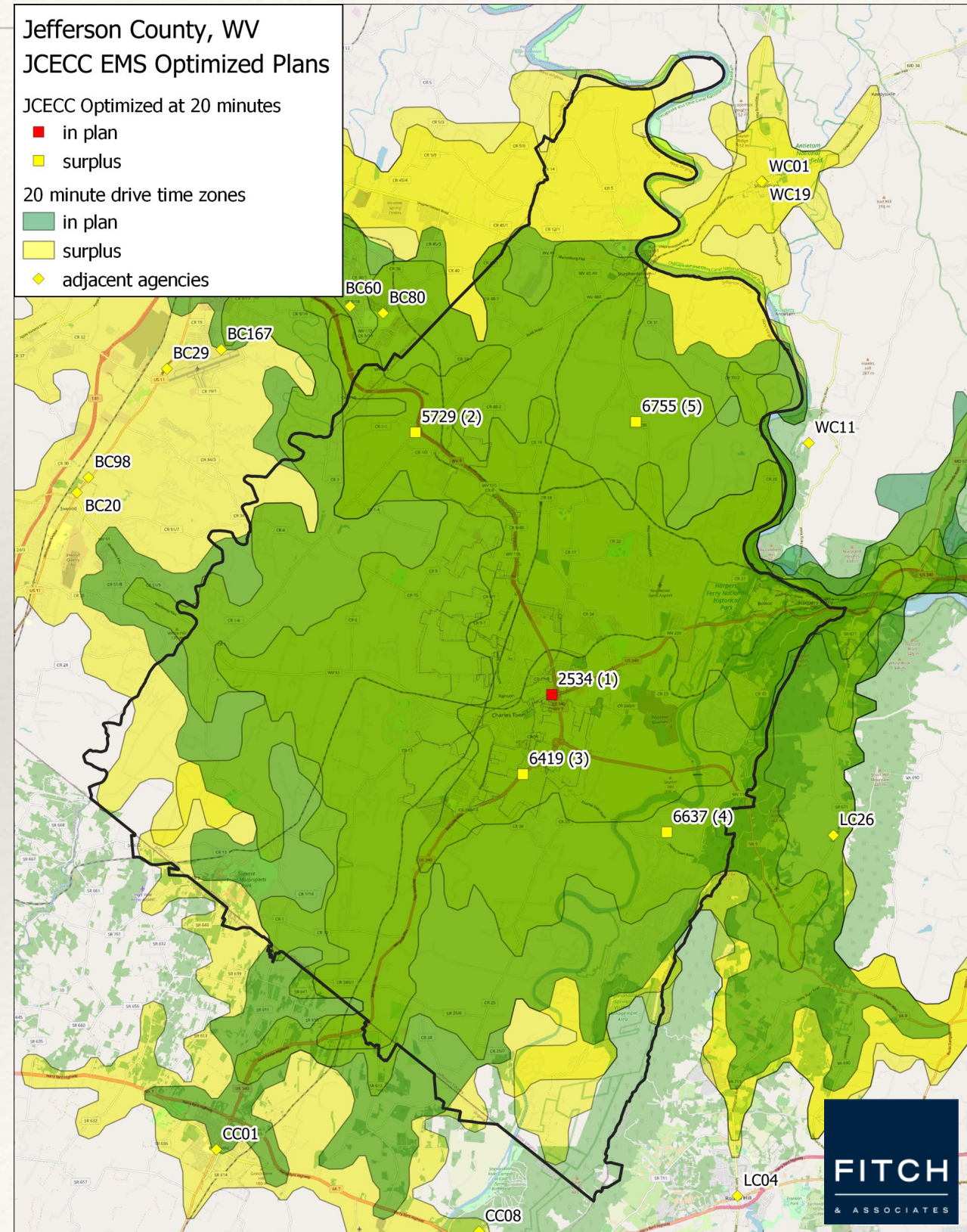
20-Minute Travel Time

Optimized Bases

Marginal Station Contribution

Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	2534	20	39.29538	-77.8416	11781	11781	97.24%
2	5729	20	39.38044	-77.8961	255	12036	99.34%
3	6419	20	39.27001	-77.8542	66	12102	99.88%
4	6637	20	39.25053	-77.7952	9	12111	99.96%
5	6755	20	39.38252	-77.8048	5	12116	100.00%

- ❖ Current station configuration could capture approximately 97.24% of the incidents within 20 minutes with the utilization of 1 stations



Staffing Considerations

Modeling Assumptions

❖ Capital

- ❖ Ambulances would need to be purchased with all equipment
- ❖ 1.5 spare ratio of ambulance is purchased for peak-of-day units
- ❖ Spare bio-medical and equipment included
- ❖ Current depreciation for vehicles and facilities maintained
- ❖ New ambulance cost and depreciation added
- ❖ Other facilities would be rented from local Fire departments

- ❖ Overhead Personnel Cost of \$525,000 annually

❖ Subsidies

- ❖ Used 2022 budgeted of \$4,137,498 as the baseline

❖ Volumes

- ❖ 1% annual increase in demand
- ❖ 1% annual increase in collections
- ❖ 2.5% CPI annually
- ❖ Revenue per trip is determined in two methods. All calculations were completed by using the current revenue/transport to be conservative.
 - ❖ Current: \$322.72
 - ❖ Fitch Est. \$404.48

❖ Equipment

- ❖ Normalized to item cost per call and multiplied by the overall volume

Modeling Assumptions

Capital Outlay

Fully loaded vehicle Depreciation schedule	Cost Per Item	Quatity	Total 8 unit model	Quatity	Total 6 unit model	Quatity	Total 4 unit model
Ambulance	200,000	12	\$ 2,400,000	9	\$ 1,800,000	6	\$ 1,200,000
Stretcher	19,500	12	\$ 234,000	10	\$ 195,000	7	\$ 136,500
Stairchair	3,000	12	\$ 36,000	1	\$ 3,000	1	\$ 3,000
Performance Load	6,000	12	\$ 72,000	9	\$ 54,000	6	\$ 36,000
MDT	4,500	12	\$ 54,000	9	\$ 40,500	6	\$ 27,000
Inmotion	3,500	12	\$ 42,000	9	\$ 31,500	6	\$ 21,000
Total cost			\$ 2,838,000		\$ 2,124,000		\$ 1,423,500
5 Year depreciations			\$ 567,600		\$ 424,800		\$ 284,700

- ❖ Each model is costed to determine number of assets required
- ❖ Ambulance numbers were determined at 1.5 ratio at Peak-of-day
- ❖ Other than the physical ambulance, stretchers, stair chairs, and IT equipment, all other equipment would be moved from current SUV to the new ambulances
- ❖ Fitch would recommend buying assets from the local fire departments first.
- ❖ Above is worst case and most conservative approach
- ❖ Fitch was not provided an opportunity to evaluate the current ambulances in Jefferson Co. and at this time we are unable to provide an approximate value for purchase

Modeling Assumptions

Overhead Labor

<u>Overhead Personnel</u>			
	<u>Costing</u>	<u>Quantity</u>	<u>Cost</u>
<i>Medical Director</i>	20,000	1	20000
<i>EMS Chief</i>	120,000	1	120000
<i>Shift Chiefs</i>	90,000	3	270000
<i>Logisitics Lt.</i>	70,000	1	70000
<i>Admin</i>	45,000	1	45000

- ❖ Each model was given the same overhead structure
- ❖ Our models do not have reduction of current staff or overhead

Optimized Personnel Staffing

❖ Staffing

- ❖ Staffing optimization was determined by mathematical formula based upon the required number of seats, the hours to be covered, and the annualized use of scheduled and unscheduled leave.
- ❖ The resulting “Relief Multiplier” indicates the minimum personnel needed to staff each seat in the deployment model.
- ❖ Without Relief Multiplier: 24/72 schedule (24/7) on an average 42hr work week requires 4 FTEs per seat.
- ❖ With Relief Multiplier: 24/72 schedule (24/7) on an average 42hr work week requires 4.6 FTEs per seat.

CFAI Accreditation Benchmarking

Creating Community Baselines

For the purposes of definition and the need to establish a common benchmark for purposes of evaluating response time accreditation criteria, the following times should be made available and used in defining base line norms for a candidate agency:

Aggregate (Total) Response time -

- A. Alarm handling: 60-second/90% benchmark
90-second/90% baseline
- B. Turnout time: 80-second/90% benchmark (Fire & Special Operations response)
60 Seconds/90% benchmark (EMS response)
90-second/90% baseline
- C. Travel time: Based on criteria for the different risk categories and within guidelines provided for service area and/or population density. See chart to follow.

Total response time: A+B+C

- ❖ Population: 57,146 (2019)
- ❖ Square mileage: 212
- ❖ Population per square mile: 269.6
- ❖ *Rural – an incorporated or unincorporated area with a population of over 10,000 people or with a population density less than 1,000 people per square mile.*
- ❖ *Response Times: **Benchmark:** 14Min + 60 seconds = 15:00 minutes, **Baseline:** 18:12Min + 90 seconds = 19:42 minutes*

Metropolitan – an incorporated or unincorporated area with a population of over 200,000 people and/or a population density over 3,000 people per square mile.

Metropolitan	1st Unit	2nd Unit	Effective Response Force
Benchmark	4 minutes	8 minutes	8 minutes
Baseline	5:12 minutes	10:24 minutes	10:24 minutes

Urban – an incorporated or unincorporated area with a population of over 30,000 people and/or a population density over 2,000 people per square mile.

Urban	1st Unit	2nd Unit	Effective Response Force
Benchmark	4 minutes	8 minutes	8 minutes
Baseline	5:12 minutes	10:24 minutes	10:24 minutes

Suburban – an incorporated or unincorporated area with a population of 10,000 to 29,999 and/or any area with a population density of 1,000 to 2,000 people per square mile.

Suburban	1st Unit	2nd Unit	Effective Response Force
Benchmark	4 minutes	8 minutes	10 minutes
Baseline	5:12 minutes	10:24 minutes	13 minutes

Rural – an incorporated or unincorporated area with total population less than 10,000 people, or with a population density of less than 1,000 people per square mile.

Rural	1st Unit	2nd Unit	Effective Response Force
Benchmark	10 minutes	14 minutes	14 minutes
Baseline	13 minutes	18:12 minutes	18:12 minutes

Wilderness – any rural area not readily accessible by public or private maintained road. Due to the large disparity between communities that protect wilderness areas, recommended travel times are not provided for this level of service.

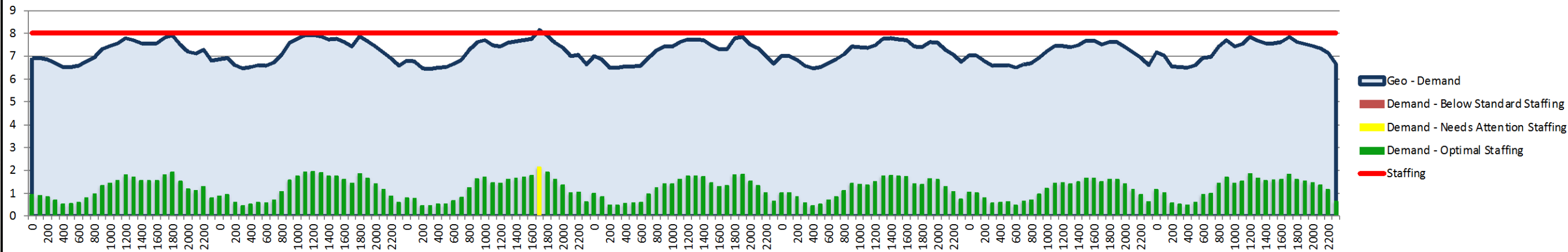
EMS Deployment Options

10-Minute Travel Ambulance Service

10-Minute: ALS Ambulance

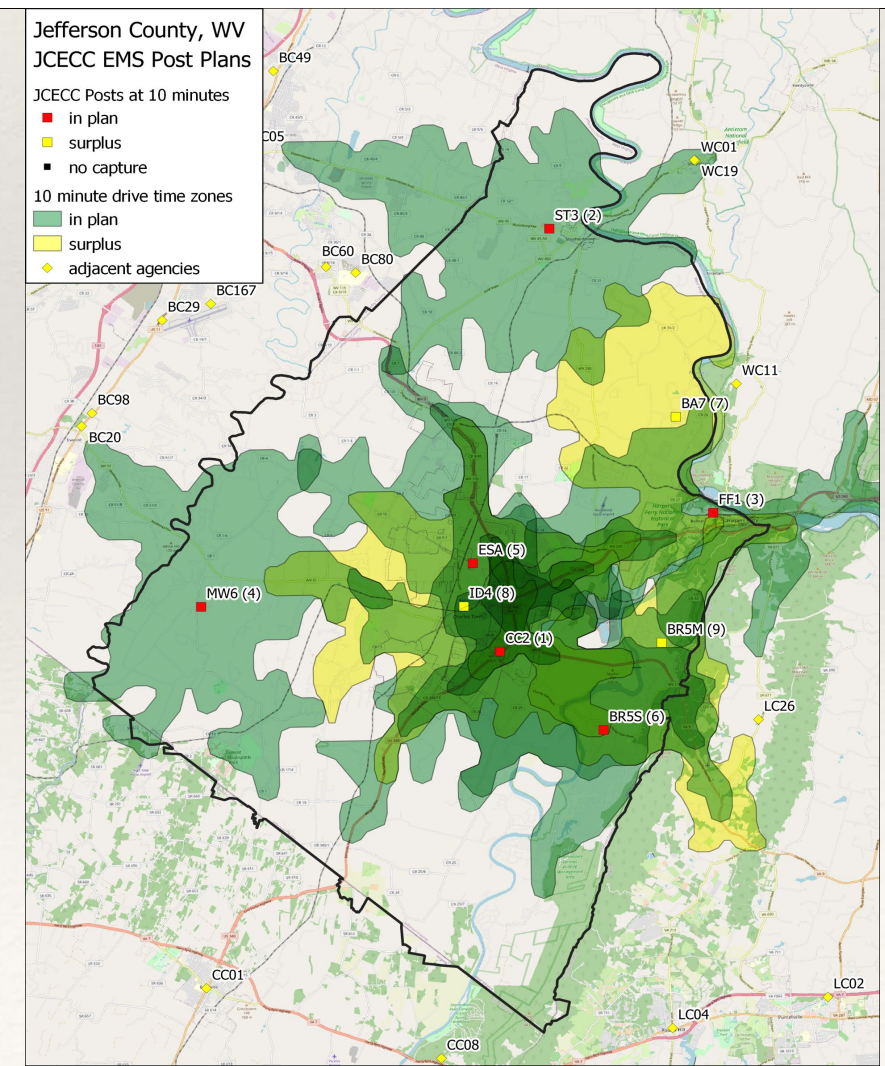
6 Geographic Units & 8 Total Units - 24/7

10 Minute Drive Time (6 unit Geographic Coverage) - Demand vs Staffing



- ❖ 6 geographical units
- ❖ 2 demand units
- ❖ Drawdown to CC2 & ST3 with only two units available.

Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	CC2	10	39.27574	-77.8452	6891	6891	56.88%
2	ST3	10	39.43414	-77.8185	1320	8211	67.77%
3	FF1	10	39.32641	-77.7453	978	9189	75.84%
4	MW6	10	39.29441	-77.9827	789	9978	82.35%
5	ESA	10	39.3091	-77.8569	592	10570	87.24%
6	BR5S	10	39.24564	-77.798	474	11044	91.15%



10-Minute: ALS Ambulance

6 Geographic Units & 8 Total Units - 24/7

		<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<u>Assumptions</u>						
	Revenue Increase		1%	1%	1%	1%
	Volume Increase		1%	1%	1%	1%
	CPI		2.5%	2.5%	2.5%	2.5%
<u>Revenue</u>						
Est. annual collections		\$ 1,226,668	\$ 1,251,324	\$ 1,276,476	\$ 1,302,133	\$ 1,328,306
	Percent collections	32%	32%	32%	32%	32%
	Est. revenue per transport	\$ 322.72	\$ 325.95	\$ 329.21	\$ 332.50	\$ 335.83
Est. volume		3801	3839	3877	3916	3955
Est. Subsidies		\$ 4,137,498	\$ 4,178,873	\$ 4,220,662	\$ 4,262,868	\$ 4,305,497
	<u>Total Revenue</u>	\$ 5,364,166	\$ 5,430,197	\$ 5,497,137	\$ 5,565,001	\$ 5,633,803
<u>Operating Expense</u>						
	Labor Cost	\$ 5,487,501	\$ 5,624,688	\$ 5,765,305	\$ 5,909,438	\$ 6,057,174
	Direct Materials & Overhead Cost	\$ 443,050	\$ 454,126	\$ 465,479	\$ 477,116	\$ 489,044
	<u>Capital/Depreciation</u>					
	Overhead Cost	\$ 635,900	\$ 635,900	\$ 567,600	\$ 567,600	\$ 567,600
	<u>Total Operating Expense</u>	\$ 6,566,450	\$ 6,714,714	\$ 6,798,385	\$ 6,954,154	\$ 7,113,818
	<u>NET Profit/(Loss)</u>	\$ (1,202,284)	\$ (1,284,517)	\$ (1,301,247)	\$ (1,389,153)	\$ (1,480,016)
	Unit Hours	70080	70080	70080	70080	70080
	Unit Hour Cost-Fully Loaded	\$ 93.70	\$ 95.81	\$ 97.01	\$ 99.23	\$ 101.51
	Unit Hour Cost-Marginal Cost	\$ 77.13	\$ 79.06	\$ 81.04	\$ 83.06	\$ 85.14
	Total busy hours		9882.6	9882.6	9882.6	9882.6
	Est. Productivity (AKA: Unit Hour Utilization)		0.141	0.141	0.141	0.141

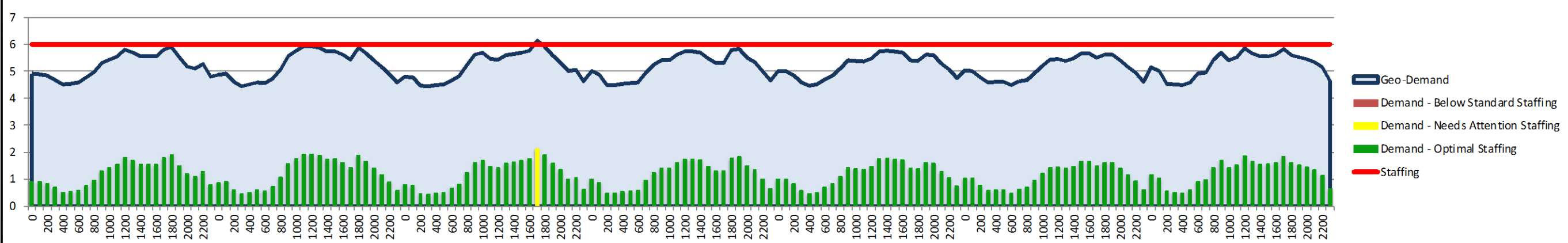
Considerations

- ❖ Performance
 - ❖ Will improve community ALS performance from 14-minute travel to 10-minute travel at the 90th percentile.
 - ❖ Credible level of performance for CPSE accreditation
 - ❖ Productivity:
 - ❖ Normalized workload: .141 UHU
 - ❖ New Cost
 - ❖ Vehicles and Equipment: \$2,838,000
 - ❖ Facilities: Rent from Current Fire Departments
 - ❖ Payback Period: None
- ❖ Challenges
 - ❖ Most costly model
 - ❖ Plans to have three more resource everyday above the five max units used at once in 2020 & 2021

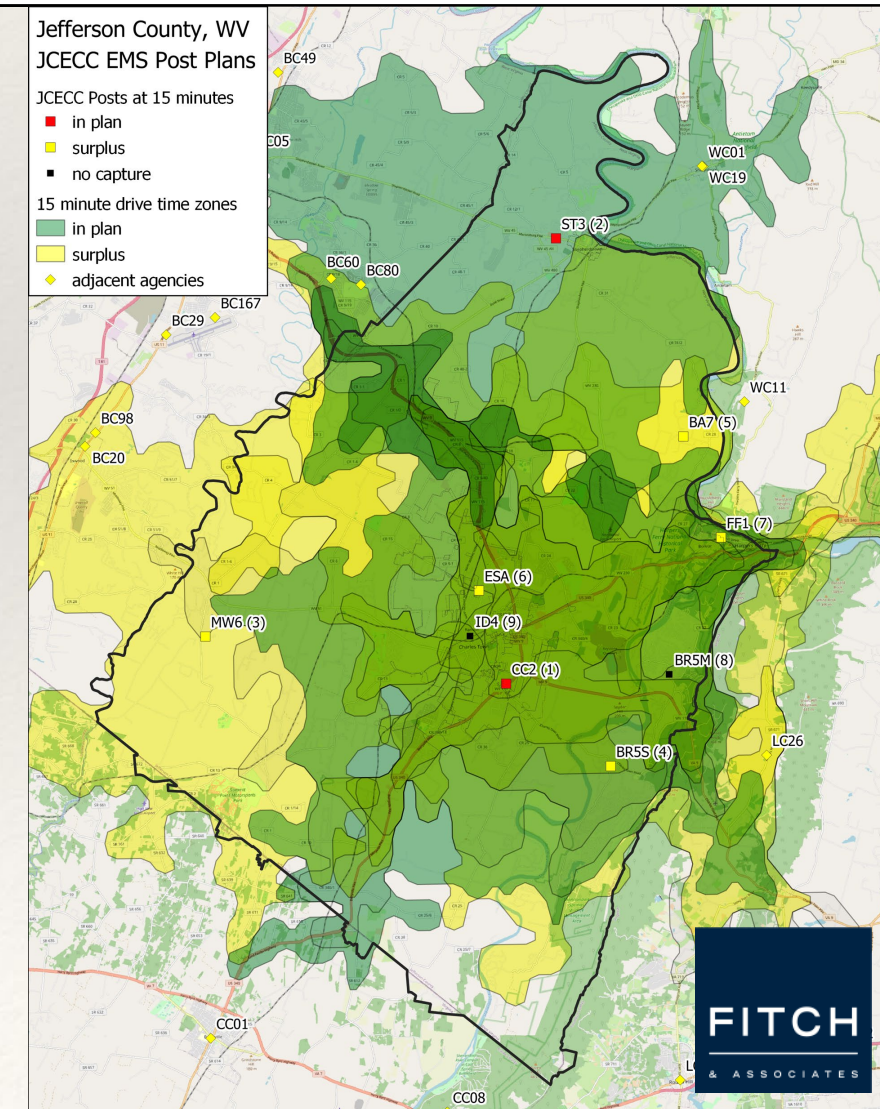
15-Minute: ALS Ambulance

4 Geographic Units & 6 Total Units - 24/7

15 Minute Drive Time (2 Unit to Capture 90% Vol. & 4 unit for Land Coverage Totaling Geographic Coverage) - Demand vs Staffing



- ❖ 4 geographical units
- ❖ 2 demand units
- ❖ Drawdown to CC2 & ST3 with only two units available.



Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	CC2	15	39.27574	-77.8452	9612	9612	79.33%
2	ST3	15	39.43414	-77.8185	1544	11156	92.08%
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4	BR5S	15	39.24564	-77.798	97	11987	98.94%
5	BA7	15	39.36266	-77.7617	96	12083	99.73%
6	ESA	15	39.3091	-77.8569	5	12088	99.77%

15-Minute: ALS Ambulance

4 G

24/7

		15 Minute (4 Geo Units)				
		Year 1	Year 2	Year 3	Year 4	Year 5
Assumptions						
	Revenue Increase		1%	1%	1%	1%
	Volume Increase		1%	1%	1%	1%
	CPI		2.5%	2.5%	2.5%	2.5%
Revenue						
Est. annual collections		\$ 1,226,668	\$ 1,251,324	\$ 1,276,476	\$ 1,302,133	\$ 1,328,306
	Percent collections	32%	32%	32%	32%	32%
Est. revenue per transport		\$ 322.72	\$ 325.95	\$ 329.21	\$ 332.50	\$ 335.83
Est. volume		3801	3839	3877	3916	3955
Est. Subsidies		\$ 4,137,498	\$ 4,178,873	\$ 4,220,662	\$ 4,262,868	\$ 4,305,497
	Total Revenue	\$ 5,364,166	\$ 5,430,197	\$ 5,497,137	\$ 5,565,001	\$ 5,633,803
Operating Expense						
	Labor Cost	\$ 4,246,876	\$ 4,353,047	\$ 4,461,874	\$ 4,573,420	\$ 4,687,756
	Direct Materials & Overhead Cost	\$ 431,050	\$ 441,826	\$ 452,872	\$ 464,194	\$ 475,798
	<u>Capital/Depreciation</u>					
	Overhead Cost	\$ 493,100	\$ 493,100	\$ 424,800	\$ 424,800	\$ 424,800
	Total Operating Expense	\$ 5,171,025	\$ 5,287,973	\$ 5,339,545	\$ 5,462,414	\$ 5,588,354
	NET Profit/(Loss)	\$ 193,141	\$ 142,224	\$ 157,592	\$ 102,587	\$ 45,448
	Unit Hours	52560	52560	52560	52560	52560
	Unit Hour Cost-Fully Loaded	\$ 98.38	\$ 100.61	\$ 101.59	\$ 103.93	\$ 106.32
	Unit Hour Cost-Marginal Cost	\$ 79.01	\$ 80.99	\$ 83.01	\$ 85.09	\$ 87.22
	Total busy hours		9882.6	9882.6	9882.6	9882.6
	Est. Productivity (AKA: Unit Hour Utilization)		0.188	0.188	0.188	0.188

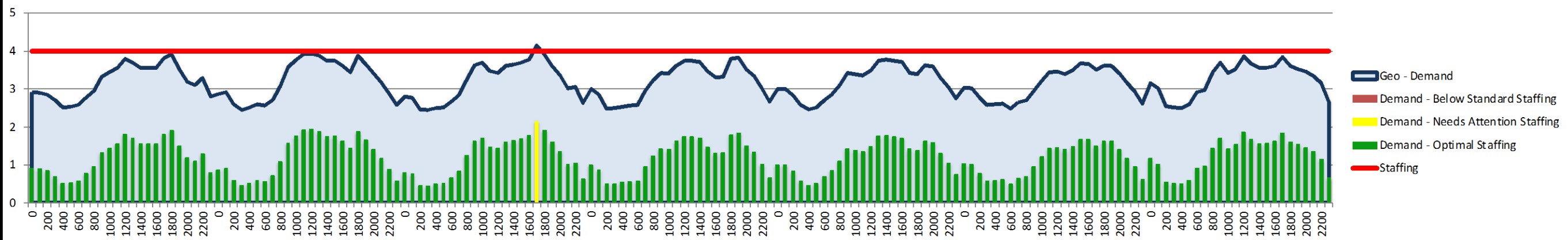
Considerations

- ❖ Performance
 - ❖ Will closely maintain community ALS performance at 15-minute travel at the 90th percentile.
 - ❖ Credible level of performance for CPSE accreditation
 - ❖ Productivity:
 - ❖ Normalized workload: .188 UHU
 - ❖ New Cost
 - ❖ Vehicles and Equipment: \$2,124,000
 - ❖ Facilities: Rent from Current Fire Departments
 - ❖ Payback Period:
 - ❖ 16.57 Years Purchasing all New Assets
 - ❖ 1.63 Years Purchasing Assets From Current Providers & Increased NET Income
- ❖ Challenges
 - ❖ Middle of the road costing model
 - ❖ Plans to have one more resource everyday above the five max units used at once in 2020 & 2021

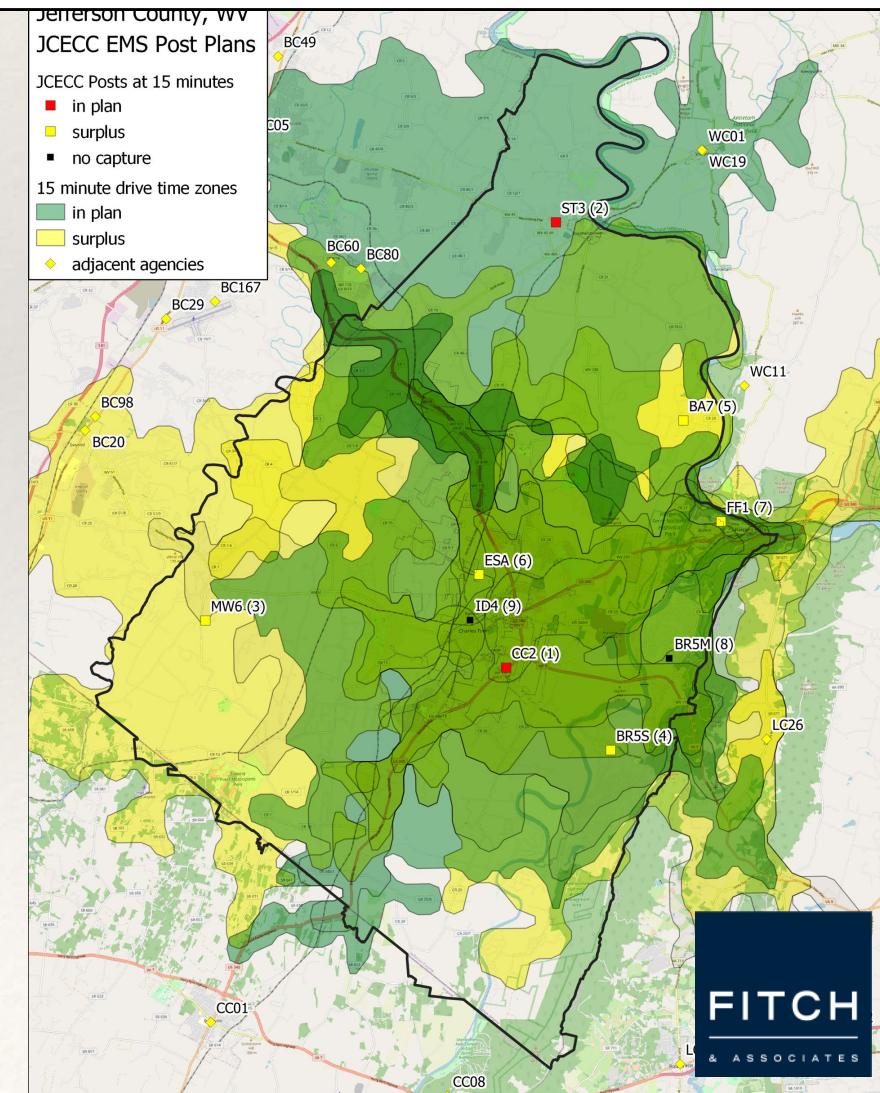
15-Minute: ALS Ambulance

2 Geographic Units & 4 Total Units - 24/7

15 Minute Drive Time (2 Unit to Capture 90% Vol. & 2 unit for Land Coverage Totaling Geographic Coverage) - Demand vs Staffing



- ❖ 2 geographical units
- ❖ 2 demand units
- ❖ Drawdown to CC2 & ST3 with only two units available.



Rank	Post Number	DriveTime	Latitude	Longitude	Post Capture	Total Capture	Percent Capture
1	CC2	15	39.27574	-77.8452	9612	9612	79.33%
2	ST3	15	39.43414	-77.8185	1544	11156	92.08%
3	MW6	15	39.29441	-77.9827	734	11890	98.13%
4	BR5S	15	39.24564	-77.798	97	11987	98.94%
5	BA7	15	39.36266	-77.7617	96	12083	99.73%
6	ESA	15	39.3091	-77.8569	5	12088	99.77%

15-Minute: ALS Ambulance

2 G

24/7

		15 Minute (2 Geo Units)				
		Year 1	Year 2	Year 3	Year 4	Year 5
<u>Assumptions</u>						
	Revenue Increase		1%	1%	1%	1%
	Volume Increase		1%	1%	1%	1%
	CPI		2.5%	2.5%	2.5%	2.5%
<u>Revenue</u>						
Est. annual collections		\$ 1,226,668	\$ 1,251,324	\$ 1,276,476	\$ 1,302,133	\$ 1,328,306
	Percent collections	32%	32%	32%	32%	32%
Est. revenue per transport		\$ 322.72	\$ 325.95	\$ 329.21	\$ 332.50	\$ 335.83
Est. volume		3801	3839	3877	3916	3955
Est. Subsidies		\$ 4,137,498	\$ 4,178,873	\$ 4,220,662	\$ 4,262,868	\$ 4,305,497
	<u>Total Revenue</u>	\$ 5,364,166	\$ 5,430,197	\$ 5,497,137	\$ 5,565,001	\$ 5,633,803
<u>Operating Expense</u>						
	Labor Cost	\$ 3,006,250	\$ 3,081,407	\$ 3,158,442	\$ 3,237,403	\$ 3,318,338
	Direct Materials & Overhead Cost	\$ 431,050	\$ 441,826	\$ 452,872	\$ 464,194	\$ 475,798
	<u>Capital/Depreciation</u>					
	Overhead Cost	\$ 353,000	\$ 353,000	\$ 284,700	\$ 284,700	\$ 284,700
	<u>Total Operating Expense</u>	\$ 3,790,300	\$ 3,876,232	\$ 3,896,014	\$ 3,986,296	\$ 4,078,836
	<u>NET Profit/(Loss)</u>	\$ 1,573,866	\$ 1,553,965	\$ 1,601,124	\$ 1,578,705	\$ 1,554,966
	Unit Hours	35040	35040	35040	35040	35040
	Unit Hour Cost-Fully Loaded	\$ 108.17	\$ 110.62	\$ 111.19	\$ 113.76	\$ 116.41
	Unit Hour Cost-Marginal Cost	\$ 83.11	\$ 85.19	\$ 87.32	\$ 89.50	\$ 91.74
	Total busy hours		9882.6	9882.6	9882.6	9882.6
	Est. Productivity (AKA: Unit Hour Utilization)		0.282	0.282	0.282	0.282

Considerations

- ❖ Performance
 - ❖ Will improve community ALS performance from 14-minute travel to 10-minute travel at the 90th percentile.
 - ❖ Credible level of performance for CPSE accreditation
 - ❖ Productivity:
 - ❖ Normalized workload: .282 UHU
 - ❖ New Cost
 - ❖ Vehicles and Equipment: \$1,423,500
 - ❖ Facilities: Rent from Current Fire Departments
 - ❖ Payback Period:
 - ❖ .91 Years Purchasing all New Assets
 - ❖ .34 Years Purchasing Assets From Current Providers & Increased NET Income
- ❖ Least costly and can handle with the current number of FTE's
- ❖ Challenges
 - ❖ Plans to have one less resource everyday below the five max units used at once in 2020 & 2021
 - ❖ Which only accounted for 14 times in a 52-week period
 - ❖ Where mutual aid is utilized.

Current JCEMS Staff

Staffing Type	Current FT Staffing	8 Unit Deployments	6 Unit Deployments	4 Unit Deployments
EMTs	19	32	24	16
Paramedics	13	32	24	16
Total	32	64	48	32

- ❖ Could adopt the 4-unit plan with current personnel
 - ❖ Would need to hire three more Paramedic FTE's
- ❖ Could adopt the 6-unit plan with hiring personnel
 - ❖ Would need to hire 11 more Paramedic & 5 more EMT FTE's

Summary of Three Models

Most Conservative Methodology

System Performance Options	Year 1	Year 2	Year 3	Year 4	Year 5
10 Minute Performance Model with 6-Geographic Units)	(\$1,202,284)	(\$1,284,517)	(\$1,301,247)	(\$1,389,153)	(\$1,480,016)
15 Minute Performance Model with 4-Geographic Units)	\$193,141	\$142,224	\$157,592	\$102,587	\$45,448
15 Minute Performance Model with 2-Geographic Units)	\$1,573,866	\$1,553,965	\$1,601,124	\$1,578,705	\$1,554,966

- Buying all new Ambulances, Stretchers, Stair Chairs, & IT Equipment

With Buying Agencies Assets & Improved Revenue Collections

System Performance Options	Year 1	Year 2	Year 3	Year 4	Year 5
10 Minute Performance Model with 6-Geographic Units)	(\$607,738)	(\$689,971)	(\$706,702)	(\$794,608)	(\$885,470)
15 Minute Performance Model with 4-Geographic Units)	\$716,287	\$665,370	\$680,738	\$625,733	\$568,594
15 Minute Performance Model with 2-Geographic Units)	\$2,097,012	\$2,077,110	\$2,124,270	\$2,101,850	\$2,078,112

- Buying fully loaded ambulances from current agencies
- Modeling considers these assets bought at half a new assets cost
- Average Revenue per call increase from \$322.72 to \$404.48

Payback Period

Initial Investment - All New Equipment

System Performance Options	Initial Investment	5-Year Avg NET Income/Yr	Payback Timeframe
10 Minute Performance Model with 6-Geographic Units)	\$ 2,838,000	(\$1,331,443)	No Return
15 Minute Performance Model with 4-Geographic Units)	\$ 2,124,000	\$128,198	16.57
15 Minute Performance Model with 2-Geographic Units)	\$ 1,423,500	\$1,572,525	0.91

Initial Investment - Buy Current Agencies Assets & Improved Revenue Collections

System Performance Options	Initial Investment	5-Year Avg NET Income/Yr	Payback Timeframe
10 Minute Performance Model with 6-Geographic Units)	\$ 1,419,000	(\$736,898)	No Return
15 Minute Performance Model with 4-Geographic Units)	\$ 1,062,000	\$651,344	1.63
15 Minute Performance Model with 2-Geographic Units)	\$ 711,750	\$2,095,671	0.34

Summary of Options

Response Type	Ambulance Travel Time at 90%	Est. Workload (UHU)	Additional FTEs From Current	Year 1 Est Rev. Per Transport	Year 1	Year 2	Year 3	Year 4	Year 5
NET Taxpayer Change Per Model - With Buying New Assets & Current Revenue Collections									
8 Total Units-6-Geographic Units	10 Min	14%	32	\$ 322.72	(\$1,202,284)	(\$1,284,517)	(\$1,301,247)	(\$1,389,153)	(\$1,480,016)
6 Total Units-4-Geographic Units	15 Min	19%	16	\$ 322.72	\$193,141	\$142,224	\$157,592	\$102,587	\$45,448
4 Total Units-2-Geographic Units	15 Min	28%	0	\$ 322.72	\$1,573,866	\$1,553,965	\$1,601,124	\$1,578,705	\$1,554,966
NET Taxpayer Change Per Model - With Buying Agencies Assets & Improved Revenue Collections									
8 Total Units-6-Geographic Units	10 Min	14%	32	\$ 404.48	(\$607,738)	(\$689,971)	(\$706,702)	(\$794,608)	(\$885,470)
6 Total Units-4-Geographic Units	15 Min	19%	16	\$ 404.48	\$716,287	\$665,370	\$680,738	\$625,733	\$568,594
4 Total Units-2-Geographic Units	15 Min	28%	0	\$ 404.48	\$2,097,012	\$2,077,110	\$2,124,270	\$2,101,850	\$2,078,112

Concurrent Responses per Hour	Count for 52 Weeks	Percent of Concurrency	CummulativePercent of Concurrency
5 Responses	14	0.3%	100%
4 Responses	76	1.8%	99.70%
3 Responses	318	7.4%	97.90%
2 Responses	1082	25.3%	90.5%
1 Responses	2789	65.2%	65.2%
Total	4279	100%	100%
Max Units Used in 365 Days	5		

Questions?

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Senior Consultant/Data Analyst



APPENDIX C – FINANCIAL MODELS

Table 1: 10-Minute: 8 ALS Transport Units

		<u>Year 1</u>	<u>Year 2</u>	<u>10 Minute</u> <u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<u>Assumptions</u>						
	Revenue Increase		1%	1%	1%	1%
	Volume Increase		1%	1%	1%	1%
	CPI		2.5%	2.5%	2.5%	2.5%
<u>Revenue</u>						
Est. annual collections	\$	1,226,668	\$ 1,251,324	\$ 1,276,476	\$ 1,302,133	\$ 1,328,306
	Percent collections	32%	32%	32%	32%	32%
Est. revenue per transport	\$	322.72	\$ 325.95	\$ 329.21	\$ 332.50	\$ 335.83
Est. volume		3801	3839	3877	3916	3955
Est. Subsidies	\$	4,137,498	\$ 4,178,873	\$ 4,220,662	\$ 4,262,868	\$ 4,305,497
	<u>Total Revenue</u>	\$ 5,364,166	\$ 5,430,197	\$ 5,497,137	\$ 5,565,001	\$ 5,633,803
<u>Operating Expense</u>						
	Labor Cost	\$ 5,487,501	\$ 5,624,688	\$ 5,765,305	\$ 5,909,438	\$ 6,057,174
	Direct Materials & Overhead Cost	\$ 443,050	\$ 454,126	\$ 465,479	\$ 477,116	\$ 489,044
	<u>Capital/Depreciation</u>					
	Overhead Cost	\$ 635,900	\$ 635,900	\$ 567,600	\$ 567,600	\$ 567,600
	<u>Total Operating Expense</u>	\$ 6,566,450	\$ 6,714,714	\$ 6,798,385	\$ 6,954,154	\$ 7,113,818
	<u>NET Profit/(Loss)</u>	\$ (1,202,284)	\$ (1,284,517)	\$ (1,301,247)	\$ (1,389,153)	\$ (1,480,016)
	Unit Hours	70080	70080	70080	70080	70080
	Unit Hour Cost-Fully Loaded	\$ 93.70	\$ 95.81	\$ 97.01	\$ 99.23	\$ 101.51
	Unit Hour Cost-Marginal Cost	\$ 77.13	\$ 79.06	\$ 81.04	\$ 83.06	\$ 85.14
	Total busy hours		9882.6	9882.6	9882.6	9882.6
	Est. Productivity (AKA: Unit Hour Utilization)		0.141	0.141	0.141	0.141

Table 2: 15-Minute: 6 ALS Transport Units

		15 Minute (4 Geo Units)				
		<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
<u>Assumptions</u>						
	Revenue Increase		1%	1%	1%	1%
	Volume Increase		1%	1%	1%	1%
	CPI		2.5%	2.5%	2.5%	2.5%
<u>Revenue</u>						
Est. annual collections	\$	1,226,668	\$ 1,251,324	\$ 1,276,476	\$ 1,302,133	\$ 1,328,306
	Percent collections	32%	32%	32%	32%	32%
Est. revenue per transport	\$	322.72	\$ 325.95	\$ 329.21	\$ 332.50	\$ 335.83
Est. volume		3801	3839	3877	3916	3955
Est. Subsidies	\$	4,137,498	\$ 4,178,873	\$ 4,220,662	\$ 4,262,868	\$ 4,305,497
	<u>Total Revenue</u>	\$ 5,364,166	\$ 5,430,197	\$ 5,497,137	\$ 5,565,001	\$ 5,633,803
<u>Operating Expense</u>						
Labor Cost	\$	4,246,876	\$ 4,353,047	\$ 4,461,874	\$ 4,573,420	\$ 4,687,756
Direct Materials & Overhead Cost	\$	431,050	\$ 441,826	\$ 452,872	\$ 464,194	\$ 475,798
	<u>Capital/Depreciation</u>					
Overhead Cost	\$	493,100	\$ 493,100	\$ 424,800	\$ 424,800	\$ 424,800
	<u>Total Operating Expense</u>	\$ 5,171,025	\$ 5,287,973	\$ 5,339,545	\$ 5,462,414	\$ 5,588,354
<u>NET Profit/(Loss)</u>	\$	193,141	\$ 142,224	\$ 157,592	\$ 102,587	\$ 45,448
	Unit Hours	52560	52560	52560	52560	52560
Unit Hour Cost-Fully Loaded	\$	98.38	\$ 100.61	\$ 101.59	\$ 103.93	\$ 106.32
Unit Hour Cost-Marginal Cost	\$	79.01	\$ 80.99	\$ 83.01	\$ 85.09	\$ 87.22
Total busy hours			9882.6	9882.6	9882.6	9882.6
Est. Productivity (AKA: Unit Hour Utilization)			0.188	0.188	0.188	0.188

Table 3: 15-Minute: 4 ALS Transport Units

		15 Minute (2 Geo Units)					
		Year 1	Year 2	Year 3	Year 4	Year 5	
<u>Assumptions</u>							
	Revenue Increase		1%	1%	1%	1%	
	Volume Increase		1%	1%	1%	1%	
	CPI		2.5%	2.5%	2.5%	2.5%	
<u>Revenue</u>							
Est. annual collections	\$	1,226,668	\$ 1,251,324	\$ 1,276,476	\$ 1,302,133	\$ 1,328,306	
	Percent collections	32%	32%	32%	32%	32%	
	Est. revenue per transport	\$ 322.72	\$ 325.95	\$ 329.21	\$ 332.50	\$ 335.83	
Est. volume		3801	3839	3877	3916	3955	
Est. Subsidies	\$	4,137,498	\$ 4,178,873	\$ 4,220,662	\$ 4,262,868	\$ 4,305,497	
	<u>Total Revenue</u>	\$ 5,364,166	\$ 5,430,197	\$ 5,497,137	\$ 5,565,001	\$ 5,633,803	
<u>Operating Expense</u>							
	Labor Cost	\$ 3,006,250	\$ 3,081,407	\$ 3,158,442	\$ 3,237,403	\$ 3,318,338	
	Direct Materials & Overhead Cost	\$ 431,050	\$ 441,826	\$ 452,872	\$ 464,194	\$ 475,798	
	<u>Capital/Depreciation</u>						
	Overhead Cost	\$ 353,000	\$ 353,000	\$ 284,700	\$ 284,700	\$ 284,700	
	<u>Total Operating Expense</u>	\$ 3,790,300	\$ 3,876,232	\$ 3,896,014	\$ 3,986,296	\$ 4,078,836	
<u>NET Profit/(Loss)</u>	\$	1,573,866	\$ 1,553,965	\$ 1,601,124	\$ 1,578,705	\$ 1,554,966	
	Unit Hours	35040	35040	35040	35040	35040	
	Unit Hour Cost-Fully Loaded	\$ 108.17	\$ 110.62	\$ 111.19	\$ 113.76	\$ 116.41	
	Unit Hour Cost-Marginal Cost	\$ 83.11	\$ 85.19	\$ 87.32	\$ 89.50	\$ 91.74	
	Total busy hours		9882.6	9882.6	9882.6	9882.6	
	Est. Productivity (AKA: Unit Hour Utilization)		0.282	0.282	0.282	0.282	

Table 4: Estimated Service Level Mix

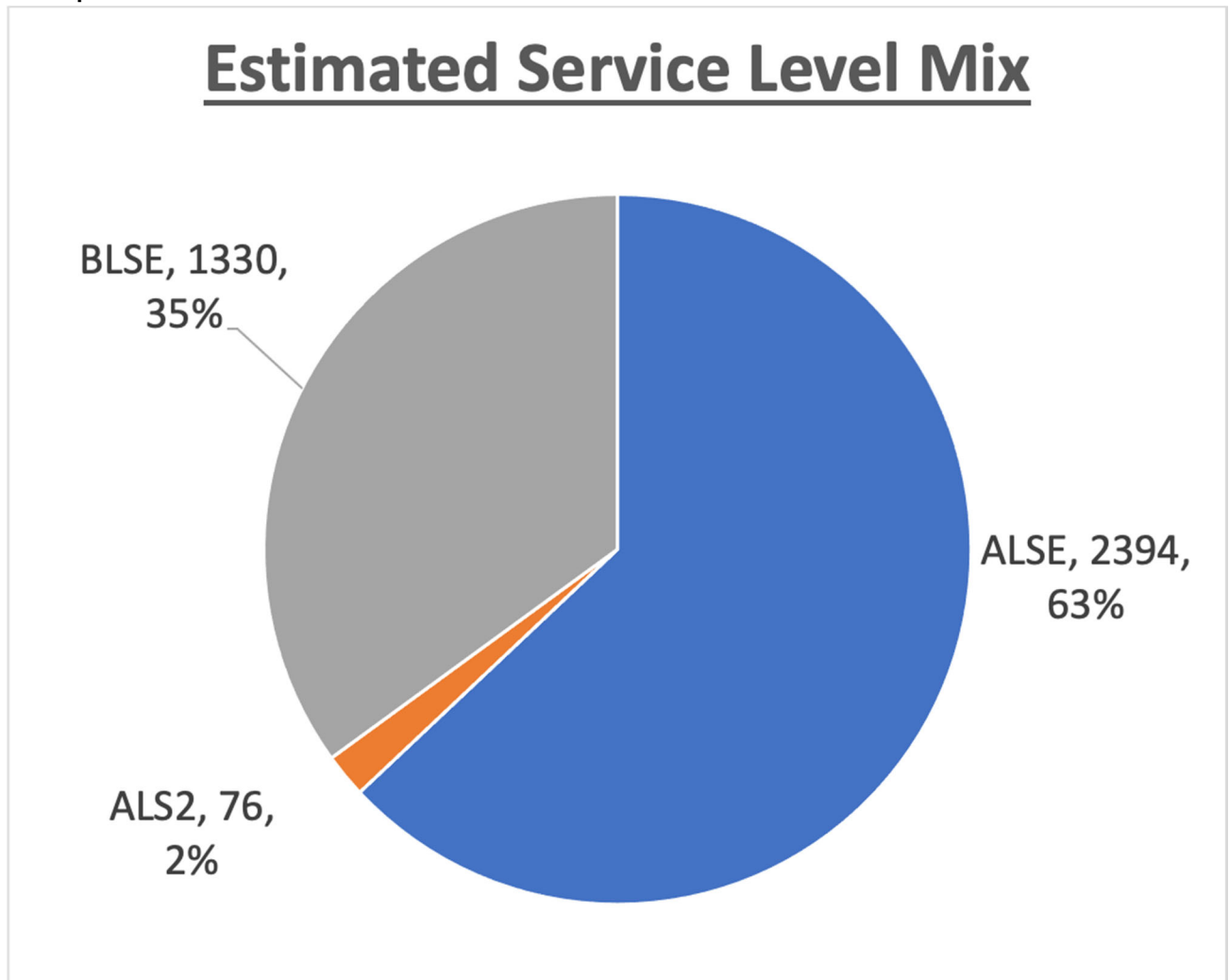


Table 5: Payor Level Mix

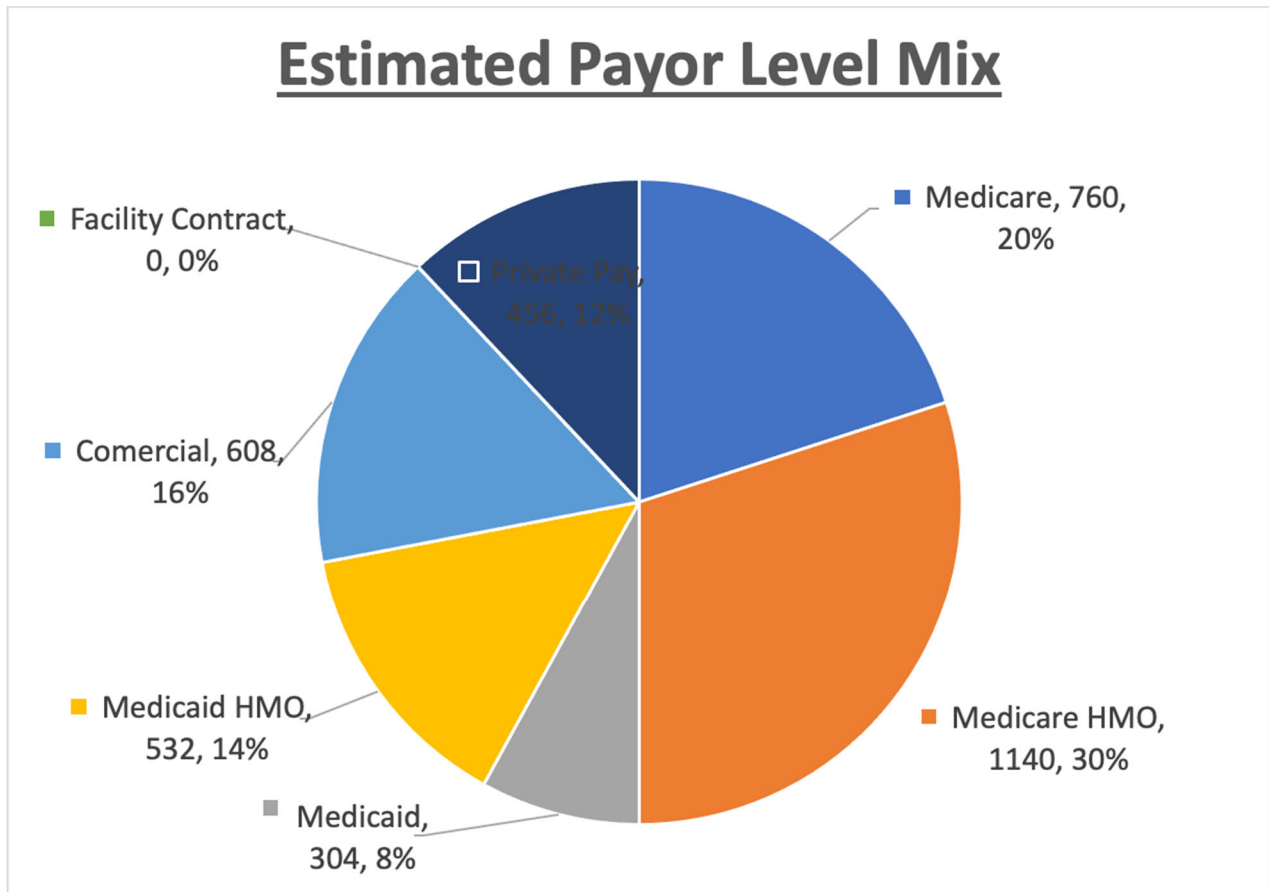


Table 6: Overhead Personnel

<u>Overhead Personnel</u>	<u>Costing</u>	<u>Quantity</u>	<u>Cost</u>
<i>Medical Director</i>	20,000	1	20000
<i>EMS Chief</i>	120,000	1	120000
<i>Shift Chiefs</i>	90,000	3	270000
<i>Logisitics Lt.</i>	70,000	1	70000
<i>Admin</i>	45,000	1	45000

Table 7: Capital Assets for Ambulances

<u>Fully loaded vehicle</u>	<u>Cost Per Item</u>	<u>Quatity</u>	<u>Total 8 unit</u>	<u>Quatity</u>	<u>Total 6 unit</u>	<u>Quatity</u>	<u>Total 4 unit</u>
<u>Depreciation schedule</u>			<u>model</u>		<u>model</u>		<u>model</u>
Ambulance	200,000	12	\$ 2,400,000	9	\$ 1,800,000	6	\$ 1,200,000
Stretcher	19,500	12	\$ 234,000	10	\$ 195,000	7	\$ 136,500
Stairchair	3,000	12	\$ 36,000	1	\$ 3,000	1	\$ 3,000
Performance Load	6,000	12	\$ 72,000	9	\$ 54,000	6	\$ 36,000
MDT	4,500	12	\$ 54,000	9	\$ 40,500	6	\$ 27,000
Inmotion	3,500	12	\$ 42,000	9	\$ 31,500	6	\$ 21,000
Total cost			\$ 2,838,000		\$ 2,124,000		\$ 1,423,500
5 Year depreciations			\$ 567,600		\$ 424,800		\$ 284,700



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