City of Rochester, NY
EMS System Evaluation

Executive Summary

The City of Rochester's Fire Department has completed an evaluation of the EMS system utilizing 5 years of historical data between 2017 and 2021. The evaluation included comprehensive quantitative data and Geographic Information System (GIS) analyses to determine the distribution, concentration, and reliability of fixed and mobile response forces for fire and emergency medical services (EMS).

A comprehensive assessment of the available revenues within the city's EMS system demand was completed so that the city and department leadership can consider policy options to meet expectations and introduce a high degree of transparency with the public.

This executive summary highlights the most substantive recommendations and alternatives developed for the Department.

Overall, there were six main themes that were utilized to evaluate potential EMS system configurations. These included various configurations of the Rochester Fire Department (RFD) providing or supplementing EMS services that are currently provided by a private contractor. Finally, options for preserving the status quo and improving the performance management of the private contractor to ensure highly transparent and accountable services.

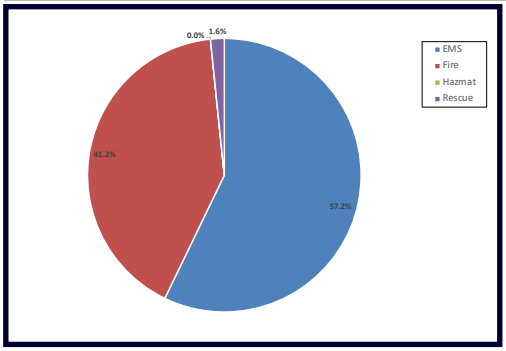
Once fully implemented, the citizens and visitors of the City of Rochester would receive improved EMS response capability, reduced reliance on large fire apparatus for EMS incidents, and maintain or improve response time performance for the most critical EMS incidents.

Substantive alternatives would include creating an EMS overlay provided by the RFD, providing patient transportation services by RFD, improving the performance management oversight for the contract with the private provider, and updating the contract language to support an objective and transparent contract oversight that is fair to the City and the provider.

Top Five Priorities

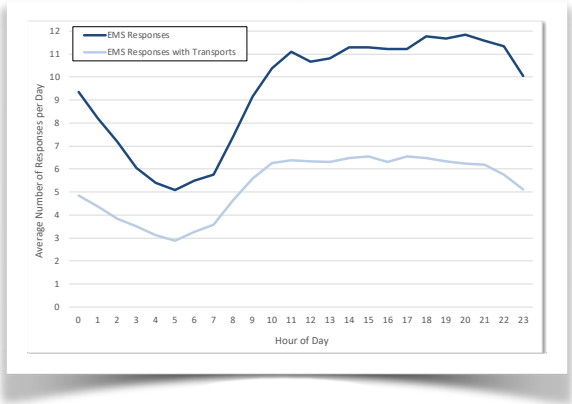
1. Stabilizing and improving EMS response times and capacity
2. Evaluating and selecting the desired system design presented
3. Optimizing staffing and deployment
4. Developing objective, transparent, and accountable performance criteria
5. Adopting a longer response time criteria for the private contractor if the desire is to remain an unsubsidized patient transport system

2021 Total Number of Incidents: 38,807



Evaluating the Current EMS System

The current system design includes having RFD respond to approximately 25% to 30% of the total community demand for EMS incidents. Nearly all EMS incidents are responded to by the current contracted provider, American Medical Response (AMR) as AMR provides 100% of the patient transport services unless mutual or automatic aid is required when resources are constrained. Historically, RFD did not provide any patient transportation services.



Recommendation

1. Better align turnout time performance with best practices

In 2021, a total of approximately 82,264 EMS responses occurred within the City of Rochester that resulted in 46,332 patient transports, or a transport rate of 56.3%.

The average total time on task for a patient transport provided by AMR was 77.6 minutes and 24 minutes for a non-transport. The average total time on task for RFD responses on all EMS incidents was 16.2 minutes.

2021 90th Percentile Response Time

RFD EMS Performance

Program	Dispatch Time (Minutes)	Turnout Time (Minutes)	Travel Time (Minutes)	Response Time (Minutes)	Sample Size[1]
EMS	**1.6**	**2.1**	**4.6**	**7.0**	**20,549**
Fire	1.6	2.1	4.8	7.3	12,718
Hazmat	--	--	--	--	3
Rescue	2.6	1.9	4.4	7.5	584
Total	**1.6**	**2.1**	**4.7**	**7.1**	**33,854**

AMR EMS Performance

Dispatch Time	Turnout Time	Travel Time	Response Time
10.5	**0.3**	**12.0**	**20.7**

RFD travel time to EMS incidents was 4.6 minutes at the 90th percentile.

RFD total response time to EMS incidents was 7.0 minutes.

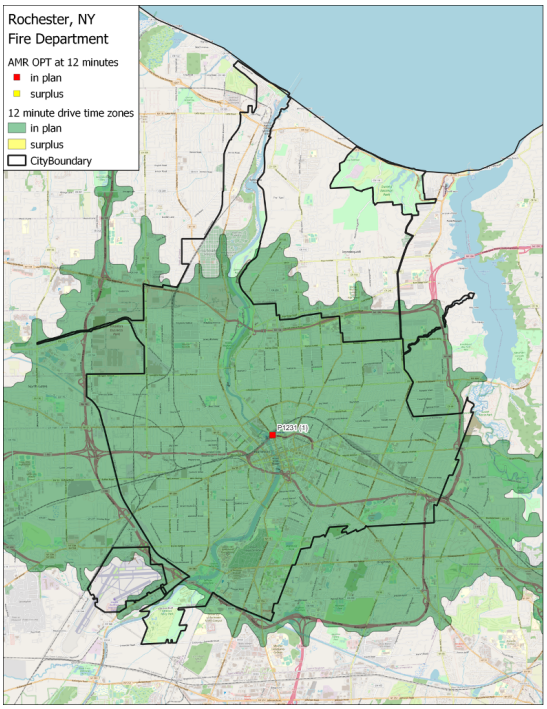
AMR response time was aggregated for all responses regardless of priority at a 12 minute travel time. This is a high level analysis and should not be scrutinized as the contractually required performance is provided separately.

Contractual Obligation for Ambulance Performance

The contract executed on October 31, 2020 includes performance objectives for the contractor based on the clinical severity of the incident as triaged through the 911 emergency communications center (ECD). It is understood that the medical director and the ECD migrated from priority types to event types in Appendix B of the current contract. However, for simplicity, the performance objectives are described below based on the historical priority values.

Priority 1	Priority 2	Priority 3	Priority 4
8:59	12:59	14:59	17:59

The current contractual compliance for response time could not be evaluated during this study. The timing of the changes between legacy priority definitions and the updated event types has introduced sufficient ambiguity that the contractor has to expend considerable manual effort to eliminate the myriad of exclusion criteria. Overall, this leaves the city with limited transparency for oversight and relies on the contractor to manage their own compliance. Therefore, it is recommended that the contractual language and processes are better aligned to allow the city to provide contractual oversight and compliance.



It is recommended that the City update the contract language to either utilize the Medical Priority Dispatch System (MPDS) determinants and/or the associated response time priorities for each of the determinants. The migration to event types provided a more consolidated approach, but an unintended consequence is that it lost granularity for the nuances of how calls are processed and categorized. In addition, if calls do not work through the priority dispatch process, then all non-categorized calls should be measured for compliance as a Priority 2, or 12:59 at the 90th percentile.

Recommendations

1. Utilize the MPDS determinants and priorities for contractor performance and contractual compliance
2. Priority 2, at 12:59, should be utilized for all uncategorized incidents
3. It is recommended that the contractor meet the contractual obligation by priority irrespective of whether the city fire or police department co-responds
4. City should provide oversight for contractual compliance
5. Update the contractual language accordingly

Observations

1. The process of utilizing event types appeared to have introduced more ambiguity into the ability to transparently measure contract performance
2. Utilizing co-response as a determining factor in contract compliance in not sufficiently distinct to be effective

Primer on Data Challenges with Contract Compliance

Fitch facilitated a data retreat with ECD, RFD, and AMR to discuss the ongoing challenges with contractual compliance and the accuracy of information. This was a productive meeting and shed light on some cross-user concerns from the differing perspectives. Overall, the following recommendations and observations are provided to improve the contractual relationship and specifically the City and RFDs ability to transparently manage the contractor and system.

First, is the challenge that has been introduced with the new CAD system. Within the changeover to the new CAD the collective bodies collapsed the MPDS determinants to a comparatively small handful of "event types" within CAD. While the process made the transition easier, it introduced ambiguity where event type descriptions could reside in more than one MPDS determinant with different response parameters. It is recommended that the ECD, RFD, and contractor (currently AMR) agree to use the MPDS determinants and priority system for compliance measurement and the event types for dispatching, if desired. This will require a table relationship in CAD to attach the MPDS determinant to the call.

Second, the frequency of police related and/or staging calls has introduced times that are conflated at best, and highly inaccurate at worst. For example, when a call comes through PD and then escalates to an EMS incident, the recommendation may be to stage for PD. The time appears to begin at the moment of the request, but the ambulance unit could be staging for long-durations where they may be more efficiently utilized within the system. Compounding the problem, is the contractual obligation of the response time for a co-response with a city resource. Therefore, it is recommended that the ambulance's compliance "clock" doesn't start until a PD unit notifies EMS that the scene is "all clear" or "clear to enter".

Third, it was observed that the bi-directional CAD interface allows an incident to be closed in the ECD CAD when AMR assigns, then unassigns a unit. It is recommended that ECD needs to prevent that from occurring. Therefore, it is recommended that the ECD creates "dummy AMR units" within CAD. Utilizing this processes, AMR can simply do unit swap commands to handle an assign/unassigned actions without closing the call.

Finally, the current compliance process is nearly universally a manual evaluation that is completed by the contractor. The process is highly labor intensive, cumbersome to complete, and largely opaque to the City and RFD. In other words, the contractor is monitoring the contractor's performance and the city receives the reported compliance.

Recommendations

1. Utilize the MPDS determinants and priorities for contractor performance and contractual compliance
2. The contractors' response time for staging calls should not begin until a PD unit notifies EMS that the scene is "all clear" or "clear to enter"
3. ECD should create "dummy AMR units" within CAD to allow AMR to assign and unassigns units as needed without closing the call
4. It is recommended that the City and RFD update the contractual language to reflect recommendations and ensure a transparent and more closely automated process to manage contractor compliance

System Valuation and Establishing Performance

The current system is built to handle the most restrictive performance for Priority 1 (and their equivalent event types) at 8 minutes and 59 seconds for 90% of the events. The contractual measure includes both turnout time, defined as once the units are notified of an incident until driving to the call, and travel time, defined as the time it takes to actually drive to the incident. Therefore, assuming an industry best practice of a 1-minute turnout time, an 8-minute travel time was tested to determine the relative sustainability of the system in a non-subsidized environment.

The analyses suggest that an 8-minute travel time (8:59) is not sustainable in an unsubsidized environment within the current staffing schema and available revenues. AMR reported that the actual 2021 911 related collections was $13,907,581. Similarly, *FITCH* estimated a system value of $14,493,276 for 911 related incidents prior to billing costs. Therefore, if the policy desire is to continue with an unsubsidized patient transport system, it is recommended that the city consider migrating performance to 10:59 or 12:59 at the 90th percentile. RFD can respond to the highest acuity incidents in under 5-minutes to begin either Basic Life Support (BLS) or Advanced Life Support (ALS) care.

	Unit Hour Cost	8-Minute		10-Minute		12-Minute	
System Design	Minimum Hours - No Control for UHU	Unit Hours	Cost	Unit Hours	Cost	Unit Hours	Cost
ALS	$160.44 (ALS)	100,037	$16,049,635	91,301	$14,648,063	82,565	$13,246,491
ALS/BLS Tier	$141.57 (ALS/BLS)	100,037	$14,161,915	91,301	$12,925,193	82,565	$11,688,470

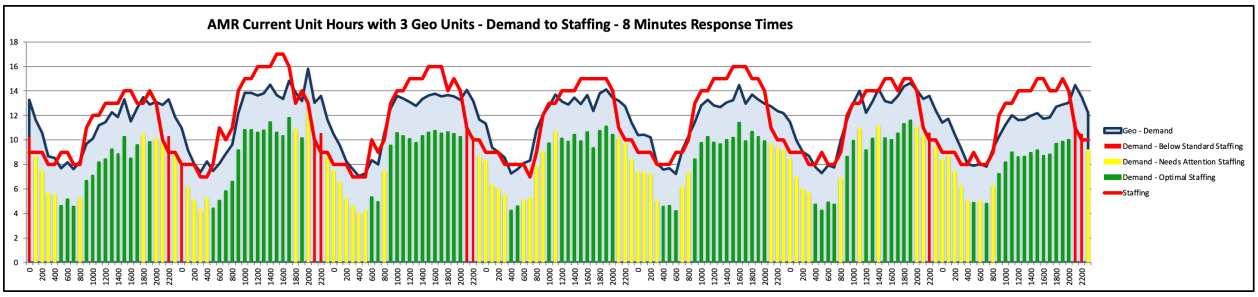
Observations

1. Establishing performance at 8:59 may threaten the sustainability of any contractor to provide services in an unsubsidized environment
2. The 12-minute aggregate performance in 2021 is well-aligned with these analyses
3. The system valuation is the minimum necessary deployment and was utilized to demonstrate the limited available revenue.
4. Actual operations may require additional deployed hours to control for workload that may introduce the need for a 12:59 minimum standard

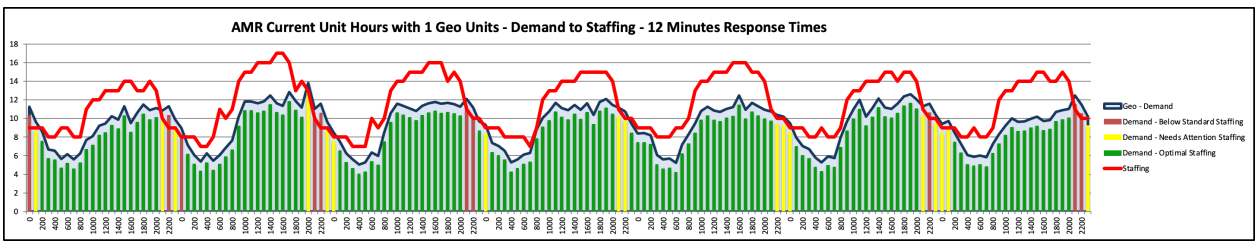
Recommendations

1. It is recommended that the City consider adjusting the desired performance to maintain a non-subsidized environment
2. Fiscally, a response time of 10:59 or 12:59 provides for more sustainability

The current staffing matrix would be challenged to cover 90% of all incidents within 8:59.



The current staffing matrix is better aligned to cover 90% of all incidents within 12:59.



Comparative Analyses with Similar Communities

The City of Rochester was compared with other like agencies to determine the per capita rate for fire protection services between 2016 and 2021. This was accomplished through the research of a benchmarking advocacy group. No information was available for 2022 at the time of the completion of this report. The information was consistently reported across the communities; therefore it is assumed that the methodology may have been more uniformly applied than typical peer surveys. While the information was not independently validated, the information is still beneficial for comparative purposes.

Overall, the benchmarking results found that the City of Rochester had an average per capita expense on fire protection of $240 over the 6-year period. The $240 is median per capita value across the comparators.

Year	Albany	Buffalo	Rochester	Syracuse	Yonkers
Population	99,224	278,349	211,328	148,620	211,569
2016	$218	$232	$233	$224	$329
2017	$208	$253	$235	$248	$348
2018	$247	$232	$238	$244	$364
2019	$236	$239	$243	$259	$369
2020	$248	$226	$244	$244	$354
2021	$250	$246	$247	$258	$345
6-year Average	$235	$238	$240	$246	$352

Observations

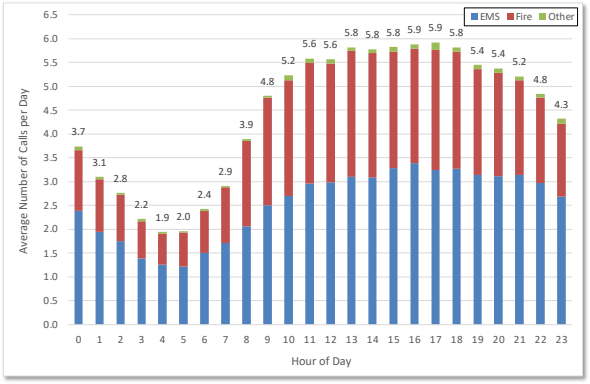
1. Rochester's per capita spending on fire protection, which includes first response for EMS, is well aligned with the comparator cities
2. Rochester exercised considerable cost avoidance for EMS services
3. Currently, reducing or eliminating RFD EMS responses would not reduce the current fire protection resource allocation or needs
4. However, there could be some cost avoidance for reinvestment due to growing EMS demands

Recommendation

1. The City and RFD need to select a desired service delivery model for the future

RFD EMS Related Expenditures

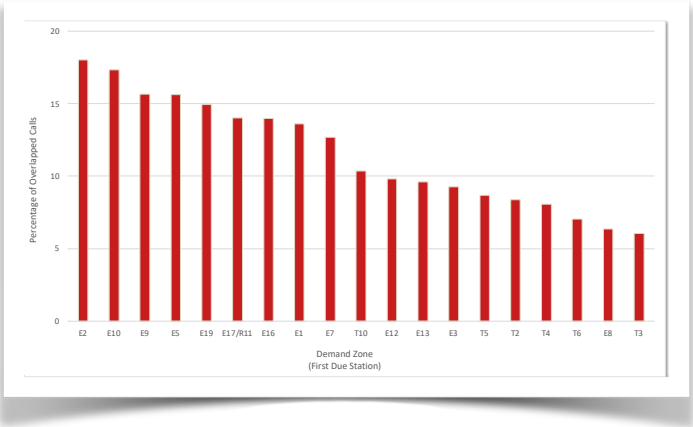
It is common in New York to provide EMS services through a public-private partnership similar to the current system in Rochester. Within these systems, the patient transport ambulance services are largely unsubsidized systems. In other words, the contracted providers for patient transport operate within their cost recovery efforts through patient billing. Therefore, Rochester has not historically invested heavily into the provision of EMS that wouldn't already be considered a sunk cost for fire protection readiness. RFD is responding to approximately 25% to 30% of the total 911-related EMS incidents and has done a good job of cost avoidance as it relates to EMS activity.



https://seethroughny.net/benchmarking/local-government-spending-and-revenue/#

RFD System Resiliency and Deployment

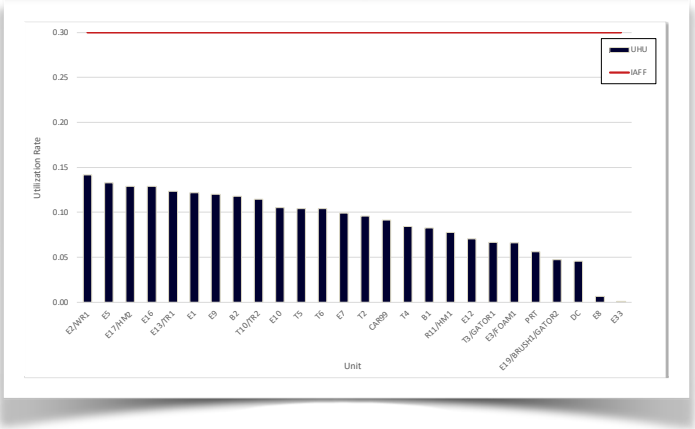
Station E2 has highest rate of call concurrency at 18%. In other words, approximately 82% of the time a call can occur within E2's first due area and it can be completed before a second or greater call occurs. E2, E10, E9, E5, and E19 all have a call concurrency rate of approximately 15% or more.

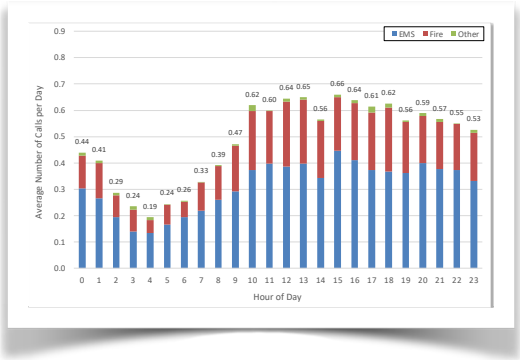


Recommendations

1. Under the current deployment strategy Stations E2 and E5 are in need of reinvestment of a second unit
2. Stations E17/R11 and E9 will require reinvestment in the near future as call volume increases
3. It is recommended that the additional resources are 2-person EMS units
   1. Squad, or;
   2. Ambulance

Unit Hour Utilization (UHU) is an objective measure of time on task for deployed resources. RFD is as busy as other large metro departments that provide first response EMS. Considering that RFD only responds to a fraction of the overall EMS workload that occurs within the city is of import. Fire departments that do not provide patient transportation services very rarely exceed 0.2, or 20% workload on 911 related activity. Understanding where the department is today, reinvestment is needed to maintain the status quo and significant investment would be required to provide a greater role in the delivery of EMS.



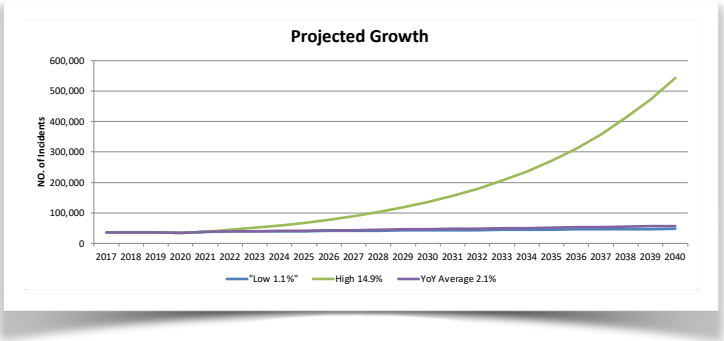


Stations E2 and E5 could use additional resources to overcome the average hourly call rate. It would be recommended that these units are either 2-person quick response vehicles (Squads) or Ambulances.

Stations E17/R11 and E9 would follow the same strategy as the call volume continues to increase. Stations E17/R11 and E9 are right at the threshold for reinvestment.

Maintaining the Status Quo

Previous analyses validate that the current deployment strategies from RFD are generally sufficient for the current percentage of EMS calls for which they are responding. However, as previously identified, Stations E2 and E5 should each receive an additional resource, followed by Stations E17/R11 and E9. When referring to the available data, the post Covid rebound was nearly 15% increase in call volume in one year. The year-over-year growth was 2.1%.



Recommendations

1. Adjust contractual compliance and performance objectives to maintain an unsubsidized environment
2. At a minimum, maintain current deployment
3. Reinvest in Stations E2 and E5 in the short-term
4. Reinvest in Stations E17/R11 and E9 as call volume dictates

Reinvestment in one station at a time is effective at reducing workload and reliability issues within that station's first due response area. However, the investment provides little citywide or system benefit as the reinvestment would be a single area at a time resulting in a more robust investment and deployment plan than creating a system benefit such as as an EMS overlay program. The squad concept discussed subsequently will provide a more cohesive systemwide strategy.

Units	Personnel	Personnel Costs	Capital Costs	Total Costs
2 BLS	20.8	$1,774,630	$242,500	$2,017,130
2 ALS	20.8	$1,954,578	$321,500	$2,276,078

Finally, preserving the status quo of a public-private partnership includes maintaining an unsubsidized environment for the City. This will require reasonable adjustments to the contractual compliance methodology and response time objectives for long-term sustainability.

Opportunities

1. Preserves the quality of services as they are provided today
2. Improves response capacity and system resiliency
3. Reduces workload in assigned areas
4. Requires limited RFD reinvestment
5. Stabilizes the performance and fiscal sustainability for the private contractor

Challenges

1. Investments may become incremental and lack a system wide benefit
2. Sensitivity to relaxed response time of the private contractors

RFD Provides ALS First Response

This alternative evaluated whether RFD could provide ALS first response through an ALS engine/truck program. Currently, the department has 8 paramedics, but does not have a specific classification for paramedic. So, the increased costs for FF/PMs is modeled at a 20.28% increase over FF/EMT based on other large metropolitan fire departments and applied to the 4th person on each apparatus. Depending on the policy choice, 1 unit at each station could upgrade to ALS (16 units) or the full total of 20 units.

Upgrading from BLS response to ALS response does not alter the total call volume or need for reinvestments. Therefore, as previously identified, Stations E2 and E5 should each receive an additional resource, followed by Stations E17/R11 and E9 as the increasing call volume dictates. All personnel estimates utilized a staffing multiplier of 5.21 for the shift deployed 10/14 personnel.

Recommendations

1. Transition at least 16 of the large fire apparatus to ALS
2. Consider a shift deployed EMS supervisor and one additional EMS administrative person
3. Reinvest in Stations E2 and E5 in the short-term
4. Reinvest in Stations E17/R11 and E9 as call volume dictates
5. Adjust contractual compliance and performance objectives to maintain an unsubsidized environment

Introducing ALS clinical care will require the department to provide a greater depth of oversight, logistics, pharmaceuticals and other supplies, and quality assurance and quality improvement. Therefore, expanding the administrative capacity may be required. It is recommended that there is one EMS supervisor per shift and a second EMS person on a M-F day shift for QA/QI and assistance in training. Additionally, the fact that the department would have ALS capacity may introduce some future policy discourse on the percentage of the totality of EMS calls that they choose to respond. Increasing call volume would ultimately require another strategy such as an EMS overlay or full patient transport services.

Units	Personnel	Personnel Costs	Capital Costs	Total Start-Up Costs
16 ALSFR	83.4 (upgrade)	$1,439,580	$780,000	$2,219,580
20 ALSFR	104.2 (upgrade)	$1,799,475	$975,000	$2,774,475
2 ALS	20.8	$1,954,578	$321,500	$2,276,078
ALL ALS Total	20.8 (New) 104.2 (Upgrade)	$3,754,053	$1,296,500	$5,050,553

Finally, the department providing ALS would have synergy with relaxing the contractor compliance to ensure sustainability.

Opportunities

1. Preserves first-due response time
2. Improves the response time for ALS care
3. Reduces workload in assigned areas
4. Requires limited reinvestment
5. Stabilizes the performance and fiscal sustainability for the private contractor

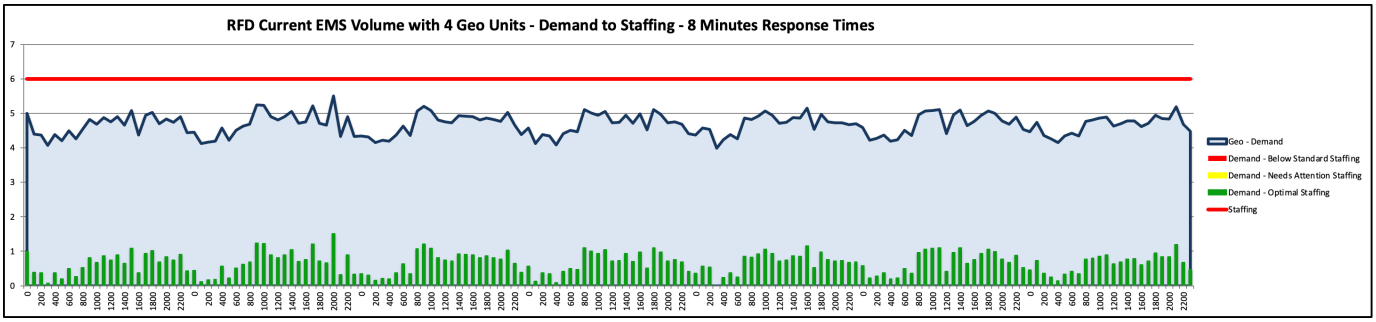
Challenges

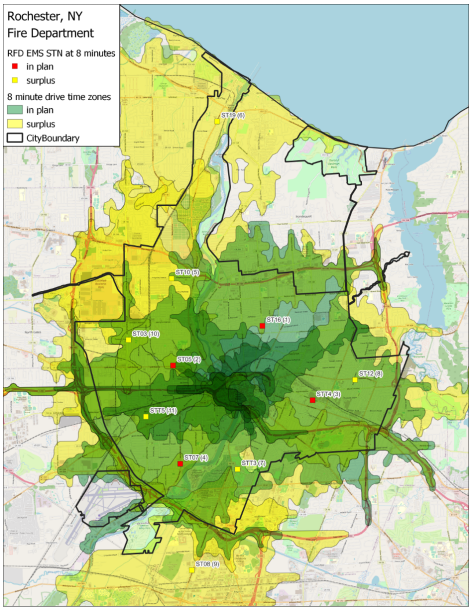
1. May require a long-term implementation as the 104 personnel are trained and deployed (96 with the current 8)
2. FF/PM classification will have to be negotiated
3. ALS capability may lead to a choice to respond to a greater proportion of EMS calls that is misaligned with this strategy as a singular solution
4. Sensitivity to relaxed response time of the private contractors

RFD Provides BLS/ALS First Response with Squads

This alternative evaluated whether RFD could provide BLS and/or ALS first response through an ALS quick response vehicle (QRV) or Squad concept. Currently, the department has 8 paramedics, but does not have a specific classification for paramedic. So, the increased costs for FF/PMs is modeled at a 20.28% increase over FF/EMT based on other large metropolitan fire departments. All squad staffing is one FF/EMT and one FF/PM.

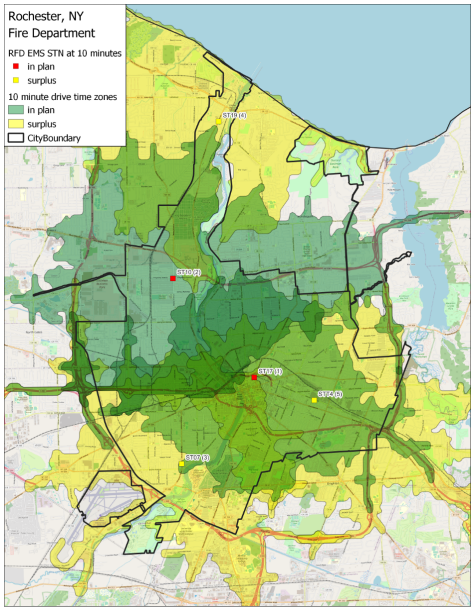
This alternative would require 6 Squads to cover the current EMS workload within an 8-minute travel time while keeping the UHU under the recommended threshold at 11.3%. Understanding that the crews work a split 10/14 schedule, these units could be deployed with 4 Squads and a 10-minute travel time with a UHU of 17%. Utilizing this strategy would provide a system wide benefit to the current EMS workload on the large fire apparatus. This deployment strategy would account for nearly 100% of the workload for EMS incidents that can be responded to within 8-minutes travel time. Working in concert with the medical director, RFD could decide which call types still would require and benefit from a 4.6-minute response from the closest engine or ladder truck.





The figure on the left is an 8 minute travel time with 6-Squads from a minimum of four locations.

The figure on the right is a 10 minute travel time with 4-Squads from a minimum of two locations.



RFD Provides BLS/ALS First Response with Squads

The projected costs for a BLS and/or an ALS first responder Squad concept is presented below. The personnel count would be synonymous whether BLS or ALS was provided, however, the personnel costs and capital needs are greater with the ALS service delivery model.

As previously presented the FF/PM value is suggested as 20.28% above FF/EMT based on our national experience with other large metropolitan size fire departments. BLS staffing would be 2 FF/EMTs and ALS staffing would be 1 FF/EMT and 1 FF/PM.

Finally, at the city's sole discretion, the fire department could deploy single-certification personnel that were only EMTs or PMs. In other words, there could be added EMS depth, but not sworn firefighters. The deployment plan would be the same, but the personnel costs would be less of a barrier to entry.

Recommendations

1. Create a 6-Squad deployment from at least four locations that delivers an 8-minute travel time
2. Consider a shift deployed EMS supervisor and one additional EMS administrative person
3. No need to reinvest in Stations E2, E5, E17/R11, and E9 as this deployment will solve the workload issue
4. Adjust contractual compliance and performance objectives to maintain an unsubsidized environment

When considering this model it is important to consider the necessary field supervision and the administrative position previous described. The model will have a positive impact on reducing the reliance on large fire apparatus to respond to EMS incidents and reintroduce availability for fire protection and other services.

Squads	Personnel	Personnel Costs	Capital Costs	Total Start-UP Costs	Net Operating Costs
BLS Sworn	62.5	$5,323,891	$727,500	$6,051,391	$5,427,819
ALS Sworn	62.5	$5,863,733	$964,500	$6,828,233	$6,001,519
BLS Single-Certification	62.5	$3,642,038	$727,500	$4,369,538	$3,745,966
ALS Single-Certification	62.5	$4,762,298	$964,500	$5,726,798	$4,900,083

This alternative essentially creates an EMS overlay on top of the base fire protection services provided by RFD. While the system will work very effectively and accomplish many of the desired elements, it is important to note that the level of investment is similar to migrating to a full transport model and introducing the cost recovery elements associated with patient billing.

Opportunities

1. Preserves first-due response time
2. Improves the response time for ALS care (if an ALS model is chosen)
3. Reduces workload on large apparatus
4. Provides cost avoidance strategies for the future
5. Stabilizes the performance and fiscal sustainability for the private contractor

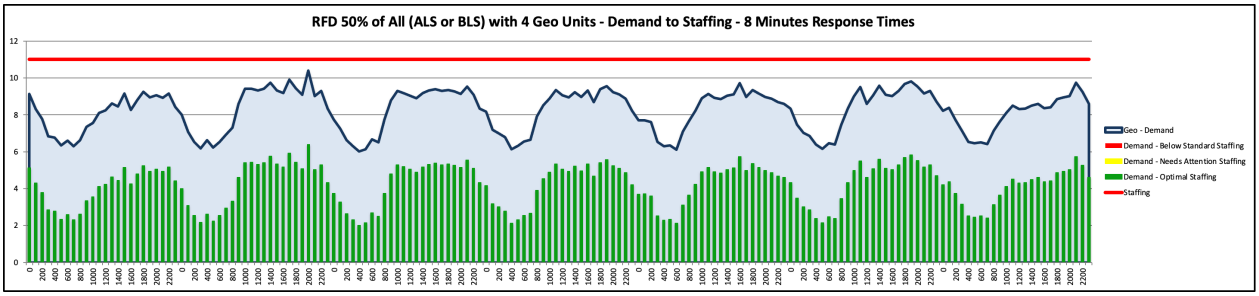
Challenges

1. May require a long-term implementation as the 63 personnel are either hired or trained and deployed
2. FF/PM classification will have to be negotiated
3. Costs are very similar to a full fire-based transport model but without access to cost recovery
4. Sensitivity to relaxed response time of the private contractors

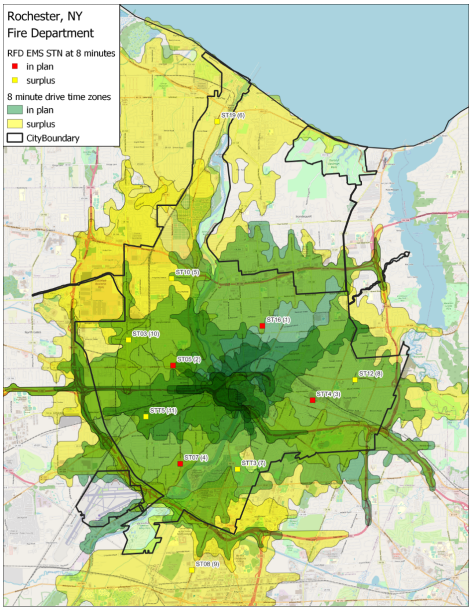
RFD Provides Only ALS or BLS Patient Transports

This alternative evaluated whether RFD could provide either ALS patient transport or BLS patient transport and continue with a public-private partnership for the residual work. In other words, this would allow both RFD and the contractor to co-exist within the EMS system. The model utilized a 50% split between ALS to BLS requests for service.

This alternative would require RFD to staff 11 ambulances to cover either the ALS or BLS workload within an 8-minute travel time while keeping the UHU under 50%. Understanding that the crews work a split 10/14 schedule, these units could be deployed with a system UHU of 38.4%. However, if crews routinely swap to, or create, a 24/48 schedule, then this would not be recommended. It would require 4 additional units, for a total of 15 units, to control for workload on a 24-hour schedule with a UHU of 28%.

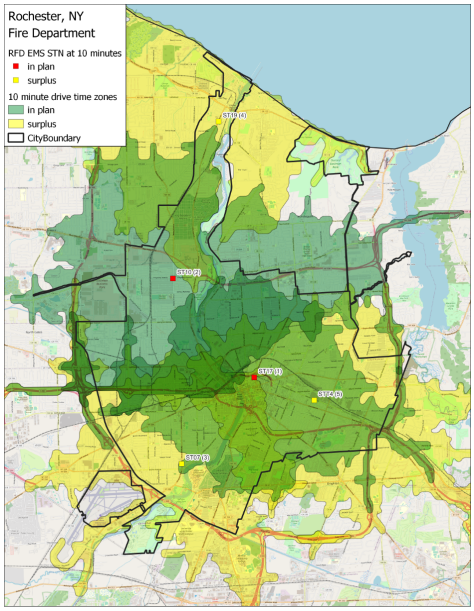


Utilizing this strategy would provide a system wide benefit to the current EMS workload on the large fire apparatus. This deployment strategy would account for nearly 100% of the workload for either ALS or BLS incidents that can be responded to within 8-minutes travel time. Working in concert with the medical director, RFD could decide which call types still would require and benefit from a 4.6-minute response from the closest engine or ladder truck.



The figure on the left is an 8-minute travel time with 11 ambulances from a minimum of four locations (move-up plan)

The figure on the right is a 10 minute travel time with 9 ambulances from a minimum of two locations (move-up plan)



RFD Provides Only ALS or BLS Patient Transports

An important consideration of this model is if the tiered approach of a public service responding to 50% of the EMS incidents and a private provider partnering for the other 50% of the EMS incidents within the city is efficient and fiscally sustainable for either agency.

Private Contractor	Unit Hour Cost	8-Minute		10-Minute		12-Minute	
System Design		Unit Hours	Cost	Unit Hours	Cost	Unit Hours	Cost
ALS	$160.44	50,019	$8,024,817	45,611	$7,324,031	41,283	$6,623,246
BLS	$122.70	50,019	$6,137,294	45,611	$5,601,341	41,283	$5,065,387

An analysis of the private market would indicate that 50% of the available revenues of $6,953,790 would likely be insufficient for a private contractor to provide ALS services without subsidy. BLS services are more sustainable.

Recommendations

1. Create an 11-ambulance deployment model if 10/14 schedule is adhered to with fidelity as a single-tier model (Primary)
2. Create a 15-ambulance deployment if utilizing 24-hour shifts
3. It would be recommended that RFD invest in ALS services
4. Consider 2 shift deployed EMS supervisors and two additional EMS administrative personnel
5. Ensure that the program manager has sufficient expertise and experience

When considering this model it is important to consider the necessary field supervision and the administrative positions necessary for oversight, training, QA/QI, and pre-billing review. Similarly, it will be important to ensure that the program manager has sufficient experience and expertise with a large EMS transport model.

Ambulances = 15 Assumption of 24/hr Schedules	Single Tier BLS Sworn	Single Tier ALS Sworn	Single-Tier BLS Single-Certification	Single Tier ALS Single-Certification
Revenue	$6,953,791	$6,953,791	$6,953,791	$6,953,791
Personnel	156.3	156.3	156.3	156.3
Personnel Costs (DL)	$13,309,727	$14,659,333	$9,105,094	$11,905,744
DM and OH	$4,057,810	$4,692,953	$3,829,600	$4,464,743
Total Operating Costs	$10,413,746	$12,398,495	$5,980,904	$9,416,697
Capital Start-up	$3,895,875	$8,341,875	$3,895,875	$8,341,875

The transportation models introduce a more robust financial assessment that includes Direct Materials (DM) and Overhead (OH) which includes asset depreciation over 7 years. Initial capital purchases are identified separately and includes a factor of 1.5 of peak deployment to provide for reserve capacity.

Opportunities

1. Provides the city more control and transparency over service delivery
2. Preserves first-due response time
3. Improves the response time for ALS care (if an ALS model is chosen)
4. Reduces workload on large apparatus
5. Affords the city some cost recovery

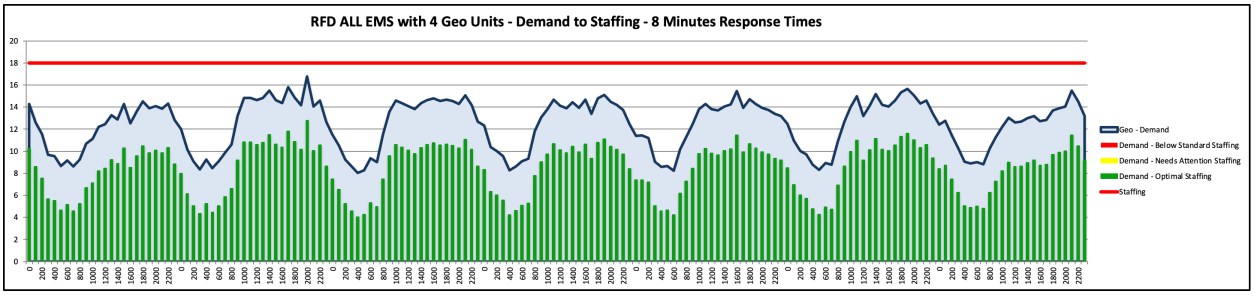
Challenges

1. May require a long-term implementation as the 156 personnel are either hired or trained and deployed
2. FF/PM classification will have to be negotiated
3. Costs may be a barrier to implementation
4. Sensitivities to unintended consequences for the existing workforce with the long-term contractor

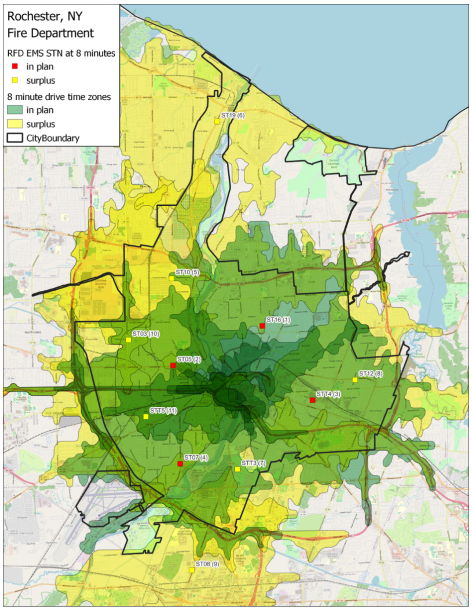
RFD Provides All Patient Transport Services

This alternative evaluated whether RFD could provide an all ALS single-tier or ALS/BLS tiered patient transport services. In other words, this alternative would largely reduce a private provider's 911-related EMS foot print to automatic and mutual aid for large events and additional surge capacity. Currently, the department has 8 paramedics, but does not have a specific classification for paramedic. So the increased costs for FF/PMs is modeled at a 20.28% increase over FF/EMT based on other large metropolitan fire departments.

This alternative would require 18 ambulances to cover the city's total EMS workload within an 8-minute travel time while keeping the UHU under 50%. Understanding that the crews work a split 10/14 schedule, these units could be deployed with a system UHU of 46.8%. However, if crews routinely swap to create a 24-hour schedule, then this would not be recommended. It would require 10 additional units, for a total of 28 units, to control for workload on a 24/48 schedule with a UHU of 30%.

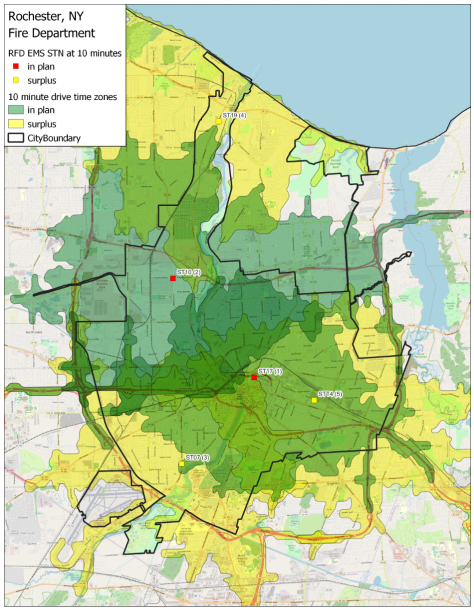


Utilizing this strategy would provide a system wide benefit to the current EMS workload on the large fire apparatus. This deployment strategy would account for nearly 100% of the workload for EMS incidents that can be responded to within 8-minutes travel time. Working in concert with the medical director, RFD could decide which call types still would require and benefit from a 4.6-minute response from the closest engine or ladder truck.



The figure on the left is an 8-minute travel time with 18 ambulances from a minimum of four locations (move-up plan)

The figure on the right is a 10-minute travel time with 16 ambulances from a minimum of two locations (move-up plan)



RFD Provides All Patient Transport Services

The projected costs for an all ALS or an ALS/BLS tiered fire-based patient transport service is presented below. As previously noted, the personnel costs and capital needs are greater with the ALS service delivery model.

It is important to recognize that workload was the limiting factor and a tiered ALS/BLS model could work as long as it was understood that ALS resources may respond to BLS calls, but BLS calls would be distributed to BLS resources first to maintain ALS availability. This model would best be utilized if members were working 24-hour schedule and additional resources were utilized to control for workload. Otherwise, it is recommended to deploy a single-tier all ALS system.

Recommendations

1. Create a single-tier ALS model on 12-hour shifts with civilian personnel.
   1. 33 12-hours shifts
   2. 42 hour workweek with scheduled OT included
2. Create a 28-ambulance deployment model if it is customary to allow employees to swap or trade shifts to work a 24-hour schedule
3. Consider 2 shift deployed EMS supervisors and two additional EMS administrative personnel
4. Ensure that the program manager has sufficient expertise and experience

When considering this model, it is important to consider the necessary field supervision and the administrative positions necessary for oversight, training, QA/QI, and pre-billing review. Similarly, it will be important to ensure that the program manager has sufficient experience and expertise with a large EMS transport model.

Ambulances	ALS/BLS Tier Sworn - 28 Ambulances - 24-hours / Day (24/72)	Single Tier ALS Sworn - 18 Ambulances - 24-hours/ Day (10/14s)	ALS/BLS Tier Single-Certification - 28 Ambulances - 24-hours / Day (24/72)	Single Tier ALS Single-Certification - 18 Ambulances - (10/14s)	Single Tier ALS Single-Certification - 33 12-hour Shifts / Day
Revenue	$13,907,581	$13,907,581	$13,907,581	$13,907,581	$13,907,581
Personnel	291.8	187.6	291.8	187.6	155.7
Personnel Costs (DL)	$26,464,350	$17,591,199	$20,356,956	$14,286,893	$12,065,337
DM and OH	$5,356,512	$4,943,796	$5,101,210	$4,709,334	$4,702,952
Total Operating Costs	$17,913,281	$8,627,414	$11,550,585	$5,088,647	$2,860,708
Capital Start-up	$12,607,500	$10,010,250	$12,607,500	$10,010,250	$10,010,250

The transportation models introduce a more robust financial assessment that includes Direct Materials (DM) and Overhead (OH) which includes asset depreciation over 7 years. Initial capital purchases are identified separately and includes a factor of 1.5 of peak deployment to provide for reserve capacity.

Opportunities

1. Provides the city more control and transparency over service delivery
2. Preserves first-due response time
3. Improves the response time for ALS care (if an ALS model is chosen)
4. Reduces workload on large apparatus
5. Affords the city some cost recovery
6. Operating costs are reasonable for the level of services provided
7. Allows additional government-based cost recovery

Challenges

1. May require a long-term implementation as the 156 to 292 personnel are either hired or trained and deployed
2. FF/PM classification will have to be negotiated
3. Costs may be a barrier to implementation
4. Sensitivities to unintended consequences for the existing workforce with the long-term contractor

Single Contract Provider - No RFD EMS Response

As previously discussed during the system valuation, the current system is built to handle the most restrictive performance for Priority 1 (and their equivalent event types) at 8 minutes and 59 seconds for 90% of the events. The contractual measure includes both turnout time, defined as once the units are notified of an incident until driving to the call, and travel time, defined as the time it takes to actually drive to the incident. Therefore, assuming an industry best practice of a 1-minute turnout time, an 8-minute travel time was tested to determine the relative sustainability of the system in a non-subsidized environment.

The analyses suggest that an 8-minute travel time (8:59) is not sustainable in an unsubsidized environment within the current staffing schema and available revenues. Therefore, if RFD elected to not respond to EMS calls any longer, it would be assumed that the policy option would want the contractor to respond in the most restrictive timeframe of 8:59 (8-minute travel time). *FITCH* estimates that a tiered ALS/BLS system would cost approximately $14.2 million dollars to operate. This is considered cost neutral, so it would be safe to assume that a subsidy of approximately $1.4 million would be required for the contractor to provide 8:59 service. Any subsequently faster response times would exponentially add subsidy obligations and it would be unrealistic to replicate RFDs first-due response time of 4.6 minutes.

	Unit Hour Cost	8-Minute		10-Minute		12-Minute	
System Design		Unit Hours	Cost	Unit Hours	Cost	Unit Hours	Cost
ALS	$160.44	100,037	$16,049,635	91,301	$14,648,063	82,565	$13,246,491
ALS/BLS Tier	$122.70	100,037	$14,161,915	91,301	$12,925,193	82,565	$11,688,470

Observations

1. Establishing performance at 8:59 would likely require an annual subsidy of at least $1.4 million
2. The need for subsidy would increase exponentially if the contractor was asked to replicate current RFD performance

Recommendations

1. It is recommended that the City carefully consider policy options that would eliminate responding to community requests for service

The fire department would not realize any immediate efficiency or reduced costs by discontinuing responses to the EMS calls at the current frequency. In other words, the sunk costs for the readiness of the fire protection model is providing sufficient capacity to respond to EMS incidents.

Opportunities

1. Reduces workload on large apparatus
2. Introduces some cost avoidance for a growing call volume

However, it is recognized that some cost avoidance would be available as reinvestment would be delayed.

The public policy calculation is the balance between the real or perceived reduction of services while increasing the specter of subsidizing the system.

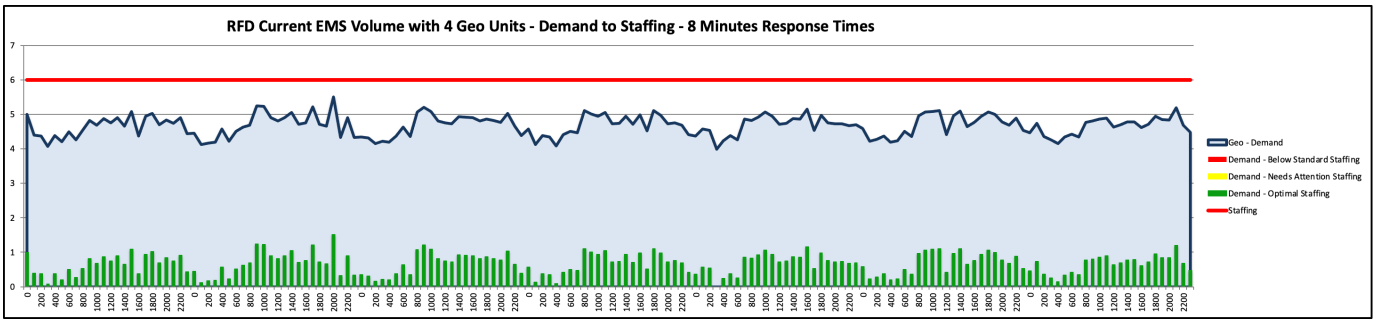
Challenges

1. May be perceived as a reduction in services
2. There will be limited fiscal benefit for decisions that may be highly scrutinized
3. The perception of increasing subsidies for a private contractor at the expense of public employees
4. There would be no reduction in current fire protection resource allocation

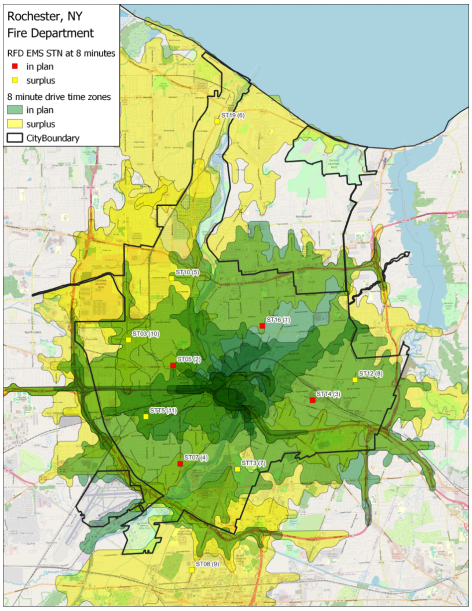
RFD Provides Supplemental Patient Transport

This alternative evaluated whether RFD could provide BLS and/or ALS first response and supplemental transport within the city. Therefore, the model will follow precisely the previous Squad alternative, but the capital costs would increase to provide for transport capable units.

This alternative would require 6 first response and transport capable units to cover the current EMS workload within an 8-minute travel time while keeping the UHU under the recommended threshold at 11.3%. Understanding that the crews work a split 10/14 schedule, these units could be deployed with 4 Squads and a 10-minute travel time with a UHU of 17%. Utilizing this strategy would provide a system wide benefit to the current EMS workload on the large fire apparatus. This deployment strategy would account for nearly 100% of the workload for EMS incidents that can be responded to within 8-minutes travel time. Working in concert with the medical director, RFD could decide which call types still would require and benefit from a 4.6-minute response from the closest engine or ladder truck.

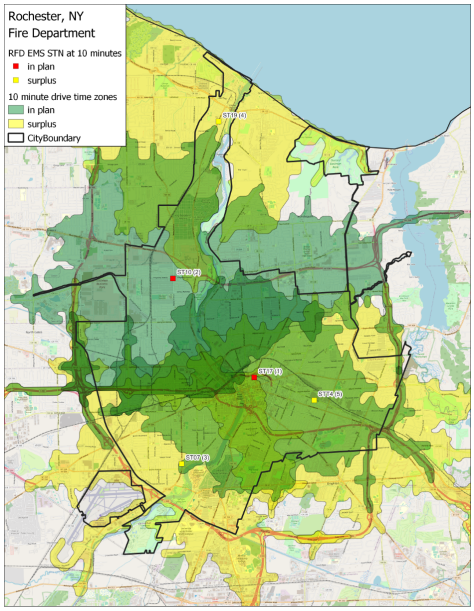


Essentially, this alternative is to provide for the first response component, similar to the squads, but maintain the capability to transport patients in times of high demand when the private contractor may not be available or when there is a clear clinical need to transport immediately. If the contract compliance is managed well, this should occur relatively infrequently.



The figure on the left is an 8-minute travel time with 6 ambulances from a minimum of four locations.

The figure on the right is a 10-minute travel time with 4 ambulances from a minimum of two locations.



RFD Provides Supplemental Patient Transport

The projected costs for a BLS and/or an ALS first responder supplemental ambulance concept is presented below. The personnel count would be synonymous whether BLS or ALS was provided, however, the personnel costs and capital needs are greater with the ALS service delivery model.

As previously presented the FF/PM value is suggested as 20.28% above FF/EMT based on our national experience with other large metropolitan size fire departments. BLS staffing would be 2 FF/EMTs and ALS staffing would be 1 FF/EMT and 1 FF/PM.

Finally, at the city's sole discretion, the fire department could deploy single-certification personnel that were only EMTs or PMs. In other words, there could be added EMS depth, but not sworn firefighters. The deployment plan would be the same, but the personnel costs would be less of a barrier to entry.

Recommendations

1. Create a 6-ambulance deployment from at least four locations that delivers an 8-minute travel time
2. Consider a shift deployed EMS supervisor and one additional EMS administrative person
3. No need to reinvest in Stations E2, E5, E17/R11, and E9 as this deployment will solve the workload issue
4. Adjust contractual compliance and performance objectives to maintain an unsubsidized environment
5. Develop clear contractual parameters for when RFD units could be utilized

When considering this model it is important to consider the necessary field supervision and the administrative position previously described. The model will have a positive impact on reducing the reliance on large fire apparatus to respond to EMS incidents and reintroduce availability for fire protection and other services.

Ambulances	Personnel	Personnel Costs	Capital Costs	Total Start-UP Costs
BLS Sworn	62.5	$5,323,891	$1,558,350	$6,882,241
ALS Sworn	62.5	$5,863,733	$3,336,750	$9,200,483
BLS Single-Certification	62.5	$3,642,038	$1,558,350	$5,200,388
ALS Single-Certification	62.5	$4,762,298	$3,336,750	$8,099,048

Opportunities

1. Preserves first-due response time and adds transport capable surge capacity
2. Improves the response time for ALS care (if an ALS model is chosen)
3. Reduces workload on large apparatus
4. Provides cost avoidance strategies for the future
5. Stabilizes the performance and fiscal sustainability for the private contractor

This alternative essentially creates an EMS overlay on top of the base fire protection services provided by RFD. While the system will work very effectively and accomplish many of the desired elements, it is important to note that the level of investment is similar to migrating to a full transport model and introducing the cost recovery elements associated with patient billing.

Challenges

1. May require a long-term implementation as the 63 personnel are either hired or trained and deployed.
2. FF/PM classification will have to be negotiated.
3. Costs exceed a full fire-based transport model
4. Sensitivity to relaxed response time of the private contractors
5. Potentially incentivize contractor to decrease resources and leverage RFD

Adopting a System of Measures

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

The summary of measures provided below include all aspects of time, apparatus staffing by type, relative risk ratings, and system resiliency measures such as reliability, call concurrency, workload, and unit hour utilization. The system of measures provided are not intended to be overly prescriptive. RFD should adopt the system performance objectives internally and update as needed.

Type of Measure	Performance Metric	Recommended Performance Urban	Priority	Review Period
Station/Unit Performance	Turnout Time – EMS	≤1.0 Min at 90%	Emergent	Monthly
	Turnout Time – All Other	≤1.5 Min at 90%	Emergent	Monthly
	Travel Time – First Due	≤5 Min at 90%	Emergent	Monthly
	Travel Time – ALS	≤8 Min at 90%	Emergent	Monthly
	Travel Time – BLS	≤10 Min at 90%		
	Minimum Eng./Truck Staffing	≥4 Firefighters	All Responses	Daily
	Minimum Ambulance of Squad Staffing	≥1 FF/PM ≥1 FF/EMT	All Responses	Daily
System Design and Performance	Dispatch	≤2 Min at 90%	Emergent	Monthly
	Station Risk Rating	Increases in Risk		Annually
	Reliability	≥70%		Quarterly
	Call Concurrency	≤30% Per Unit		Quarterly
	Call Volume	3,000 – Initial 1,000 – Ongoing		Annually
	Unit Hour Utilization	≤0.30 on 24-hour units ≤0.50 on 10-, and 14-hour units		Quarterly

Similarly, the following is recommended as a contract compliance adjustment.

Priority 1	Priority 2	Priority 3	Priority 4
10:59	12:59	14:59	17:59

Summary of Alternative System Designs

Multiple alternative EMS models were evaluated in this study. If the City's desire is to ensure a high quality and sustainable EMS system, then there are several pathways to achieve this goal.

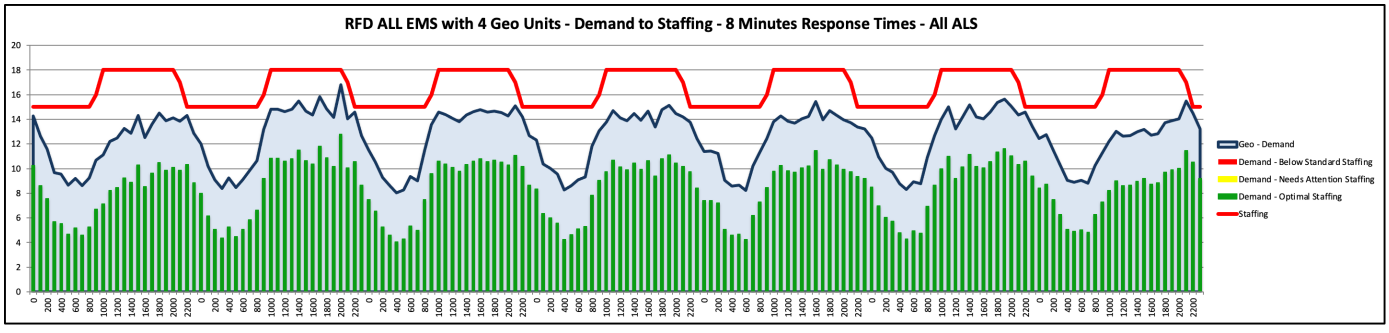
For example, the current ambiguity associated with compliance monitoring of the contractor can be fixed with the recommendations contained herein. Additionally, any actual difficulties in meeting compliance may be associated with the available revenues and the reasonableness of the desired response times. Recommendations to re-establish sustainable response time parameters of 10:59 and/or 12:59, in concert with a transparent compliance process, can ensure fiscal and operational sustainability in a non-subsidized environment. Therefore, options that improve first response capacity and simultaneously address the contract compliance, will introduce the least risk.

Finally, RFD patient transportation options will provide the City with the greatest control over the service provision as a direct provider. This can be accomplished with a moderate level of net investment after cost recovery of approximately $2.8 million. The deployment strategy is provided below.

In addition, through the Ground/Public Emergency Medical Transportation (GEMT/PEMT) program it is estimated that an approximate annual value of $738,831 would be available to the city as a government provider that is not currently available to private providers. The cost recovery varies by year based on participation. Therefore, it is not recommended to operationalize the revenue, but it may be very beneficial in purchasing capital and other one time costs as needed or to build up an EMS reserve fund balance.

Observations

1. The options with the greatest ease of implementation, and the least risk and disruption, are associated with reinvesting in first response capability and simultaneously ensuring that the contractor is fiscally sustainable and compliant
    1. Status Quo - ALS
    2. ALS FR with Status Quo - ALS
2. Options with the greatest direct control over the provision of services is a fire-based transport model
3. Variations of implementation strategies may be costly throughout the transition
4. The 12-hour civilian-based model would provide the most operationally and fiscally sustainable city provided option
    1. Annual cost of $2.8 million to operate
    2. Improves response times for all service as well as ALS services
5. Additional GEMT/PEMT cost recovery of approximately $738,831 would be available to the city if they were the provider of services



However, it would be a large organizational endeavor to both develop an ALS system and a transport system simultaneously. If that is the ultimate policy goal, a long-term strategy of different levels of public-private partnership may be a substantive consideration. For example, a public-private partnership could be utilized for the next five years, while implementing an all ALS first response department, and then reassess for the next contract period.

Primer on Financial Assumptions and Modeling

The financial models began with market research on the costs of civilian EMTs and Paramedics. The highest 3 (EMT) and 4 (PM) salaries were identified and utilized within the base assumptions. A total of 35% was added for the rollup on benefits as well as an increase of 5% over market for a reasonable competitiveness in a difficult labor market. Supervisory positions were estimated at 10% over the corresponding rank of paramedic.

Firefighter paramedics are not currently a classification within the Rochester collective bargaining agreement, therefore, market research of other large metro fire-based agencies established that the average increase was 20.28% over the classification of FF/EMT. It is understood that this would be a negotiated item for the interested parties, but this value was utilized as a reasonable industry estimate for the creation of a FF/PM classification for the financial modeling.

Capital costs were estimaed based in industry experiences working with other clients and managing current ambulance systems. However, it is understood that within the current environment inflation, green initiatives, and lingering supply chain delays have creates an understandable degree of instability within the market. Therefore, the capital estimates are provided with confident for today, but may change considerably year of year and should be reevaluated following policy direction. Understanding the limitations, BLS units require less specific equipment than the ALS service will provide. Similarly, civilian models may allow a less expensive apparatus type than a fire-based model that has to account for the firefighting personal protective equipment.

Direct materials and overhead (DL & OH) were estimated utilizing costs for fuel, uniforms, consumable medical supplies, and capital depreciation. All scenarios had a DM & OH cost between $3.4 million and $4.7 million. The most operationally and fiscally efficient plan had a DM & OH cost of $4,702,952.24. It is understood that there may be additional costs allocated to EMS in the future such as intergovernmental transfers.

Classification	Total Annual Compensation	Cost per Hour
FF/EMT	$85,155.00	$40.94
FF/PM	$102,424.43	$49.24
Civilian EMT 2080	$58,253.96	$28.01
Civilian PM - 2080	$94,090.82	$45.24
Civilian EMT 2184	$59,281.37	$28.50
Civilian PM - 2184	$95,750.27	$46.03
EMS Chief	$192,750.00	$92.67
Civilian EMS Supervisor	$103,499.90	$49.76
Sworn EMS Supervisor	$112,666.88	$54.17
QA/QI and Prebilling	$50,000.00	$24.04

Transport Units - Capital Estimates

Capital Item	BLS	ALS
Vehicle	$121,900	$280,000
Striping/Decal	$2,600	$2,600
Stretcher w/autoload	$30,000	$30,000
Cardiac Monitor		$38,000
Stair Chair	$4,000	$4,000
Backboard/Scoop	$1,500	$1,500
Bags and Supplies	$3,000	$4,500
Suction	$750	$750
ePCR	$2,000	$2,000
Electronics	$4,400	$4,400
Radios	$3,000	$3,000
Total Capital Costs	**$173,150**	**$370,750**

Estimated DM and OH	Description
Fuel Costs	$537,817.50
Uniform	Varies by Plan Per Employee $200 / year $400 / year for Sworn
Medical Supplies	$1,434,180.00
Capital Depreciation	7-year Depreciation Varies by Plan Recommended plan is $1,430,035.71