

EMS SERVICES OPTIONS REPORT

Flushing, Michigan

Final Report



CPSM[®]

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ICMA

Exclusive Provider of Public Safety Technical Services for
International City/County Management Association

THE ASSOCIATION & THE COMPANY

The International City/County Management Association (ICMA) is a 108-year-old, nonprofit professional association of local government administrators and managers, with approximately 9,000 members spanning thirty-two countries.

Since its inception in 1914, ICMA has been dedicated to assisting local governments in providing services to their citizens in an efficient and effective manner. Our work spans all the activities of local government — parks, libraries, recreation, public works, economic development, code enforcement, Brownfields, public safety, etc.

ICMA advances the knowledge of local government best practices across a wide range of platforms including publications, research, training, and technical assistance. Its work includes both domestic and international activities in partnership with local, state, and federal governments as well as private foundations. For example, it is involved in a major library research project funded by the Bill and Melinda Gates Foundation and is providing community policing training in Panama working with the U.S. State Department. It has personnel in Afghanistan assisting with building wastewater treatment plants and has had teams in Central America providing training in disaster relief working with SOUTHCOM.

The **ICMA Center for Public Safety Management (ICMA/CPSM)** was one of four Centers within the Information and Assistance Division of ICMA providing support to local governments in the areas of police, fire, EMS, emergency management, and homeland security. In addition to providing technical assistance in these areas we also represent local governments at the federal level and are involved in numerous projects with the Department of Justice and the Department of Homeland Security. In each of these Centers, ICMA has selected to partner with nationally recognized individuals or companies to provide services that ICMA has previously provided directly. Doing so will provide a higher level of services, greater flexibility, and reduced costs in meeting members' needs as ICMA will be expanding the services that it can offer to local governments. For example, The Center for Productivity Management (CPM) is now working exclusively with SAS, one of the world's leaders in data management and analysis. And the Center for Strategic Management (CSM) is now partnering with nationally recognized experts and academics in local government management and finance.

Center for Public Safety Management, LLC (CPSM) is now the exclusive provider of public safety technical assistance for ICMA. CPSM provides training and research for the Association's members and represents ICMA in its dealings with the federal government and other public safety professional associations such as CALEA. The Center for Public Safety Management, LLC maintains the same team of individuals performing the same level of service that it has for the past seven years for ICMA.

CPSM's local government technical assistance experience includes workload and deployment analysis using our unique methodology and subject matter experts to examine department organizational structure and culture, identify workload and staffing needs, and identify and disseminate industry best practices. We have conducted more than 269 such studies in 37 states and 204 communities ranging in size from 8,000 population (Boone, Iowa) to 800,000 population (Indianapolis, Ind.).

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EXECUTIVE SUMMARY

The Center for Public Safety Management LLC (CPSM) was retained by the City of Flushing, Michigan to conduct an analysis various options to enhance EMS delivery within the city. The city desires to evaluate enhancement options due to recent service delivery challenges from ambulance agencies provided through a complex system in Genesee County, Michigan.

In our review, CPSM analyzed five potential options for EMS delivery in Flushing:

- Option 1:** 1-Person Medical First Response Unit Staffed at the EMT Level (TANGO Unit)
- Option 2:** 2-Person Medical First Response Unit Staffed at the EMT Level (TANGO Unit)
- Option 3:** 1-Person Medical First Response Unit Staffed at the Paramedic Level (ECHO Unit)
- Option 4:** 2-Person Medical First Response Unit Staffed at the Paramedic Level (ECHO Unit)
- Option 5:** ALS Ambulance

Response data used to conduct this analysis was provided by the City of Flushing, and included comprehensive data related to EMS response volume or Calendar Year 2022 (CY 2022). No personally identifiable incident information was provided to CPSM.

In addition to the response data from Flushing, CPSM used revenue data from a recent report for another city in Michigan to derive potential revenue that could be generated from ambulance service delivery by the City of Flushing.

THE CURRENT STATE

CPSM conducted an independent analysis of EMS response data provided by the City of Flushing for responses in their jurisdiction for CY 2022. In this data set, presumed high-acuity medical responses were classified as a “Tier 1” response, and presumed low-acuity EMS responses were classified as a “Tier 2” response.

Using this data, we completed the following analysis regarding EMS service delivery in the City of Flushing for CY 2022.

Table 1: Response Volume

	2022	2023
Responses	953	1,001
On-Scene Responses	892	937
On-Scene %	93.6%	93.6%

Notes:

1. 2023 response volume is projected to increase 5% from CY 2022.
2. Responses include calls that were canceled prior to an EMS unit arriving on scene.

Response Times

In this part of the analysis, we present response time statistics for different call types, agencies, and areas. We separate response time into its identifiable components. **Processing time** is the difference between the time a call is received and the earliest dispatch time of an ambulance service or a transport-capable medical unit (i.e., ambulance). Processing time includes the time required to determine the nature of the emergency and the type of resources to dispatch. We did not include Processing Time for the purposes of this analysis. **Activation time** is the difference between the earliest dispatch time and the earliest enroute time. **Travel time** is the difference between the earliest enroute time and the earliest on-scene time. **Response time** is typically the total time elapsed between receiving a call to arriving on scene, however for this analysis, it includes only Activation and Travel time.

CPSM uses two response time measures to evaluate EMS response times, average and fractile. The average time represents the response time interval at which half of the responses are LESS than that interval, and half are LONGER than that interval. It is a level of performance, but not necessarily a level of reliability. The 90th percentile measure is a measure of reliability. A 90th percentile analysis determines the response interval in which 90 percent of the EMS response times fall under that interval. In other words, the response time interval in which only 10 percent of the EMS response time was **longer** than that 90th percent interval.

Table 2: Response Times

	Activation		Travel		Total Response Time	
	Average	90% Fractile	Average	90% Fractile	Average	90% Fractile
Tier 1	0:01:22	0:03:00	0:09:28	0:15:00	0:10:50	0:18:00
Tier 2	0:01:06	0:05:00	0:12:24	0:20:00	0:13:30	0:25:00
Overall	0:01:14	0:04:00	0:10:56	0:17:30	0:12:10	0:21:30

SYSTEM ENHANCEMENT OPTIONS

Flushing city leaders asked CPSM to evaluate several options under consideration for EMS delivery enhancements, including a Basic Life Support (BLS) Medical First Response (MFR) unit, or TANGO unit; an Advanced Life Support (ALS), or ECHO MFR unit; or perhaps even the providing of ALS ambulance service by the city.

CPSM estimates the expenses related to each of these options in the following tables.

Table 3: Personnel Expense – Single Person TANGO or ECHO Unit

Staffed Unit Hours	8,760	
Personnel Expense	EMT	Paramedic
Average EMT Wage	\$21.00	\$26.25
Fringe at 5%	\$1.05	\$2.63
Total Wage	\$22.05	\$28.88
Annual Personnel Expense	\$193,158	\$252,945

Table 4: Operational Expenses – Non-Transport Vehicle

Operational Expenses	
Fuel	\$35,000
Maintenance	\$4,100
Medical Supplies	\$35,000
Operational Expenses	\$74,100

Table 5: Capital Expenditures

Capital Expense	Cost	Useful Life	Annual Depreciation Expense
Utility Vehicle	\$60,000	5	\$12,000
Cardiac Monitor	\$45,000	5	\$9,000
Lucas Device	\$17,500	5	\$3,500
Patient Care Reporting Tablet	\$1,500	3	\$500
MCT	\$1,500	3	\$500
Radios	\$4,000	3	\$1,333
Capital Costs	\$129,500		\$26,833

Table 6: Total Expenditure Comparisons

	TANGO Unit		ECHO Unit	
	1-Person	2-Person	1-Person	2-Person
Personnel	\$193,158	\$386,316	\$252,945	\$505,890
Operations	\$74,100	\$74,100	\$74,100	\$74,100
Capital	\$26,833	\$26,833	\$26,833	\$26,833
Training	\$2,363	\$4,725	\$3,248	\$6,497
Total	\$296,454	\$491,974	\$357,127	\$613,320

Table 7: Full ALS Ambulance Expenses

Ambulance Analysis			
EMT Wages (Incl. Uniforms and Training)	\$195,521		
Paramedic Wages	\$256,193		
Total Wages	\$451,714		
Capital Expense	Cost	Useful Life	Annual Depreciation
Vehicle - Ambulance	\$300,000	5	\$60,000
Cardiac Monitor	\$45,000	5	\$9,000
Mechanical Compression Device	\$17,500	5	\$3,500
Patient Care Reporting Tablet	\$1,500	3	\$500
Mobile Computer Terminal	\$1,500	3	\$500
Radios	\$4,000	3	\$1,333
Capital Costs	\$369,500		\$74,833
Operational Expenses			
Fuel	\$100,000		
Maintenance	\$7,100		
Medical Supplies	\$35,000		
Operational Expenses	\$142,100		
Total Annual Expenses	\$668,647		

Table 8: Ambulance Revenue & Operational Margin Estimates

Revenue Analysis	
Average \$ Per Transport	\$365.00
Transports	625
<i>Net Revenue</i>	\$228,125
Billing Expense	(\$10,266)
Net Cash from Operations	\$217,859
Operating Margin	(\$450,788)

Table 9: Options Roll-up Estimates

Net Total Expenses By Option	Single Person TANGO Unit	Dual Person TANGO Unit	Single Person ECHO Unit	Dual Person ECHO Unit	ALS Ambulance
Cost Per Unit Hour	\$33.57	\$55.62	\$40.40	\$69.27	\$50.29
Cost Per Response	\$293.90	\$486.93	\$353.65	\$606.43	\$440.24
Cost Per Transport	\$448.14	\$742.48	\$539.24	\$924.68	\$671.27

Discussion

Based on our analysis, the cost-of-service delivery for a 2-Person TANGO is \$491,974. The current Fire Department budget estimates \$426,000 seems reasonable. Our estimate includes the costs of capital equipment depreciation expenses, which appear to be different than the original budget.

Considering the acuity mix of EMS responses in Flushing, we would recommend staffing the first response unit at the **ALS level**. The marginal personnel cost difference may be worth the ability of the personnel on the unit to be able to initiate ALS care, in the event of a delayed response from either the ALS ambulance, or the ECHO unit from the Genesee County Sheriff's Office.

We believe that staffing the unit with 2-Persons may not be necessary for the majority of responses the unit would be responding to. The average, and at the 90th percent response time analysis does not seem to warrant the need for a 2-person unit. Most medical can be easily administered by a single provider. We occasionally hear that a 2-person unit is considered 'safer' than a single person unit. However, most medical calls do not pose a scene safety issue, especially given the socio-demographics of Flushing. However, if a potential scene safety issue may be evident based on the nature of the response, or other concerns on the part of the 911 call taker, or responding EMS unit, a police back-up for scene safety could be requested. If there are concerns about having 2 providers on scene to act as a 'witness' to on-scene interactions, this could be more effectively, and economically managed with body worn cameras.

We recommend that the TANGO or ECHO unit be equipped with a mechanical chest compression device, that would provide mechanical CPR as opposed to needing EMS personnel for that intervention. We also feel that if a TANGO or ECHO unit is staffed by a single person, in the event of a cardiac arrest (20 such responses in 2022), an additional response from the Flushing Police Department could be initiated as a back-up resource.

The typical staffing for an ALS ambulance is 2-persons, typically one EMT and one paramedic. This staffing configuration is not unlike the 2-person TANGO or ECHO unit.

Note in Table 9, that the net cost to the city for a full ambulance is less than a 2-person TANGO unit. This is due to the revenue that would be generated by the city if they were to operation a transport capable ambulance, which is reimbursable by most insurance, whereas there is no insurance reimbursement typically for a non-transport first response unit.

We believe that the most logical two options for the city of Flushing to consider would be to either staff a single ALS provider ECHO unit or do full ALS ambulance service provision.

P/T vs. F/T Staffing Model

It is our understanding that the city plans to utilize part-time personnel to staff the MFR unit. We believe this is sound reasoning, not only due to the reduced costs for benefits and related expense, but also to maintain skill proficiency. The Flushing MFR, or ambulance unit would have very low utilization, which could lead to medical skill degradation from lack of utilization.

Consideration of Outsourced Services

As described, the reasoning for implementing a MFR unit in Flushing to enhance services makes is sound. We would be remiss if we did not suggest that the city also seek a few proposals from local ambulance providers to provide these services as well. The city may be able to derive a more economical solution than providing the services in-house.

Workload and Value-Added Services

One method for measuring workload is Unit Hour Utilization (UHU). UHU is a measure of activity, essentially measuring the amount of on-duty time that an EMS unit assigned to a response.

A Unit Hour is defined as one unit, fully staffed, equipped and available for a response. For example, one unit on-duty, 24 hours per pay, 365 days per year equates to **8,760-unit hours** (1 x 24 x 365). The UHU is then derived by dividing the number of *responses* by the total number of *unit hours*.

Dividing the number of runs into the number of Unit Hours, we derive a response UHU of 0.114. This essentially means that a County ALS ambulance is on an EMS response 11.4% of the time they are on-duty.

A challenge with the incident based UHU calculation is that it presumes each response consumes one hour of time. However, the medical first response unit recommended for Flushing would only have an average time on task of 19 minutes, 19 seconds prior to an ambulance arriving at the scene. Factoring for time on a medical call, the actual UHU for the MFR is anticipated to be 0.078, meaning the MFR unit will be committed to an EMS response, 7.8% of the time it is on-duty.

Table 10: Time on Task

Average Time at Scene	0:19:19
90% Fractile Time at Scene	0:27:00

Table 11: Unit Hour Utilization

Staffed Unit Hours	8,760
Unit Hour Utilization - Response	0.114
Unit Hour Utilization - Transport	0.075
Unit Hour Utilization - Time on Task	0.078

This leaves a substantial amount of capacity within the MFR unit.

We would recommend this unit also be assigned non-time-sensitive duties such as:

- Community Education
- Community Paramedicine
- Fire Inspections
- Fire Investigations
- Fire Pre-Planning

Summary

We commend the City of Flushing for investing in EMS delivery enhancements for its residents and visitors. Any option for enhancement will require substantial investment on the part of the city, and we are impressed with their commitment to do so.

CPSM is privileged to have been asked to assist with the evaluation of the options available to the city. We are also prepared to assist the city with implementation of any of these options.