Long Beach, New York

FIRE/EMS

OPERATIONS

CENTER FOR PUBLIC SAFETY MANAGEMENT

Operations / Data Analysis
Fire and Emergency Medical Services

January 13, 2015

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About ICMA

The International City/County Management Association (ICMA) is a 100-year-old nonprofit professional association of local government administrators and managers, with approximately 9,000 members located in 28 countries. (graphic possibly of world).

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 of the activities of local government: parks, libraries, recreation, public works, economic development, code enforcement, brownfields, public safety, and a host of other critical areas.

ICMA Center for Public Safety Management

The ICMA *Center for Public Safety Management* (ICMA/CPSM), one of four centers within ICMA's U.S. Programs Division, provides support to local governments in the areas of police, fire, emergency medical services (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 U.S. Department of Justice and the U.S. Department of Homeland Security.

ICMA TEAM

Thomas J. Wieczorek, *Director*

- Expert in fire and emergency medical services
- Served as police officer, fire chief, director of public safety and city manager
- Recently worked with National League of Cities and Department of Homeland Security on an emergency management program for local officials
- Former Executive Director of Center for Public Safety Excellence (Fire Accreditation Agency)

Leonard A. Matarese, *Director, Research and Project Development*

- Masters Degree in Public Administration
- 44 years' experience as a law enforcement officer, police chief, public safety director, city manager and major city Human Resources Commissioner Managed several hundred studies of emergency services agencies.

Joseph Pozzo, *Senior Manager*

- Masters Degree in Public Administration,
- Former Deputy Director, Volusia County Department of Public Protection; former Director and Fire Chief, Volusia County, Florida, former Fire Chief, Loudon County, Virginia, former Fire Chief Portsmouth, Virginia
- Chief Fire Officer Designation from the Center for Public Safety Excellence

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ICMA TEAM

Peter Finley, *Associate, BS in Fire Science*

- Bachelor of Science degree in Fire Science/ Administration from the University of Maryland
- 36 year career in fire and emergency services, former president of the New Jersey Fire Chiefs Association

Gang Wang, Ph.D., *Senior Quantitative Analyst*

- Ph.D. in Industrial Engineering with five years experience in enterprise information system and eight years experience in data analysis and applied mathematical modeling
- Rich experience in areas of automotive, travel and public safety with particular emphasis in fire/EMS analysis

Dov N. Chelst, *Ph.D., Director of Quantitative Analysis*

- Ph.D. in Mathematics
- Has managed over 140 data analysis projects for city and county agencies ranging in population size from 8,000 to 800,000

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Presentation Agenda

- Project Purpose / Project Methodology
- Major Issues Confronting the LBFD
- Key ICMA Observations
- Data and Workload Analysis Overview
- Operational Analysis
- Recommendations

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Project Purpose

1 **Long Beach Medical Center Closure**

Analyze emergency response service in light of the closure of Long Beach Medical Center. ICMA identified the LBFD as the department most impacted by the closure of the hospital.

2 **Comprehensive Analysis**

Complete a comprehensive analysis of the City's Fire/Rescue Department.

3 **Recommendations**

Provide recommendations for continued improvement.

Project Methodology

The ICMA Center for Public Safety Management team follows a standardized approach to conducting analysis of departments involved in providing services to the public.

Project Begins — *Final Recommendations*

IDENTIFICATION

- LBMC Closure
- Identification of impacted City Dept(s)

ON-SITE ANALYSIS

Fire Department

- Operational Analysis
- Response Data Information

- Data and Workload Analysis
- Response and Demand Mapping

COMMUNICATIONS

- Additional Communications with City Staff
- Follow-up Analysis
- Clarification of Operations

FINAL REPORT

- Summarize Recommendations
- Final Report Documents Project Work

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Major Issues Confronting the LBFD

Closure of Long Beach Medical Center (LBMC)	• There are unique challenges presented by the closure of LBMC such as, the turnaround time when transporting and the impact of traffic and congestion on EMS operations.
LBFD Inefficiencies and Organizational Issues	• The LBFD has organizational issues and inefficiencies that require improvement, regardless of whether the hospital reopens. **Note:** It is ICMA's position that while the LBFD is generally a capable organization, it is also fractured between the volunteer and paid staff.
Challenging Financial Landscape	• The City is recovering from a catastrophic fiscal crisis coupled with the challenges of Superstorm Sandy. • LBFD Safer Grant matured in December 2014, creating a demand of nearly $650,000 year in personnel costs.

The most substantive recommendations addressing the City's enhanced safety needs and operational & fiscal inefficiencies are associated with alternative staffing and deployment models that upgrade public safety at lower costs.

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Key ICMA Observations

CAPABLE ORGANIZATION

- The Long Beach Fire Department is a capable organization that provides quality fire and emergency medical services (EMS) to the citizens and visitors of Long Beach, N.Y.
- However, like most organizations, there are areas that require improvement.

OUTDATED ORG STRUCTURE

- It is the strong opinion of the ICMA study team that the current organizational structure of the LBFD is outdated.
- The current outdated org structure is having an negative impact on the department's operations and has become increasingly less common throughout municipalities.

The LBFD is not operating as efficiently and effectively as it should.

EMS SERVICES – 75% of all Calls

- Emergency Medical Service responses represent the largest number of calls for service at approximately 75%. Note: This is typical for fire departments across the country.
- Given the level of EMS responses, the instability in the current outdated organizational structure should be addressed by the City.
- Need is seasonal

FIRE SERVICES – 23% of all Calls

- Fire Services represent 23% of total Calls.
- 4% structural (approx. 8 per year) , 3% outside fires – together account for **only 4.7% of the departments total workload**.
- 46% of fire calls are false alarms
- Need is not seasonal

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Key ICMA Observations ~ Administrative

There are some key administrative components the department has not completed or can improve on:

STANDARD OPERATING GUIDELINES

- The LBFD does not have a current or published document of standard operating guidelines/procedures.
- The lack of direction for both the paid and the volunteer firefighters contributes to the overall lack of organization-level direction and coordination.

COMPREHENSIVE STRATEGIC PLAN

- The LBFD does not have a comprehensive strategic plan that focuses on the future, provides clear direction, and defines resources that support the strategy for fire protection and EMS service deliverables.

EMS QA/QI PROGRAM

- The EMS QA/QI program (patient care record reviews) is poorly developed.
- The level of scrutiny of the quality of care is not fully developed and depends on the officer of the day.
- There is no oversight on the report writing when the volunteer ambulance responds to a concurrent call.

TRAINING INITIATIVES

- Seamless oversight of training initiatives: All members, paid and volunteer, are maintaining their state-required minimum training and recertification hours. However, there is not an organization-level approach to training.
- According to the volunteer leadership, the paid unit resists participating in cross –training opportunities, which exacerbates the problem.

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Key ICMA Observations ~ Staffing

WORK AS A COHESIVE UNIT, TRAIN SEPERATELY

- The current configuration (Paid & Volunteer Fire Fighters) has generally worked well during the 8-10 structural fires in Long Beach each year. The volunteers lead and manage the response team, and comprise the majority of the effective response, to meet consensus standards on fire ground activities.
- Paid unit resists participating in cross –training opportunities.

VOLUNTEER UNIT

- Currently over 100 active volunteers
- For structural fire calls, volunteer personnel made up the effective response for 97% of the calls.
- First arriving volunteer unit is within one minute of the paid engine for structural fire calls and within thirty seconds for all other fire calls.

PAID / CAREER STAFF

- Career staff are available 24/7 at the headquarters fire station, and as such, respond to more than 90 percent of calls with or without the volunteer contingency.
- Out on fire calls approximately **1.5 hours per 24 hour tour, an average of less than 10 minutes per hour.**
- EMS calls average 5.5 hours per day leaving considerable downtown for additional training.

PAID / CAREER STAFF CON'T

- Average time away from work was 322 hours in 2013 (just under two months per employee), with an estimated cost of over $500,000.
- Increased response times occur during "sleeping" hours.
- If was a stand alone paid department, it would not be in compliance with NFPA response standards.

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Data and Workload Analysis Overview

Table 3: Call Types

Call Type	Number of Calls	Calls per Day	Call Percentage
Cardiac and stroke	235	0.6	5.6
Seizure and unconsciousness	328	0.9	7.8
Breathing difficulty	295	0.8	7.0
Overdose and psychiatric	199	0.5	4.7
MVA	173	0.5	4.1
Fall and injury	790	2.2	18.8
Illness and other	1,140	3.1	27.1
EMS Total	3,160	8.7	75.2
Structure fire	37	0.1	0.9
Outside fire	31	0.1	0.7
Hazard	239	0.7	5.7
False alarm	450	1.2	10.7
Good intent	62	0.2	1.5
Public service	160	0.4	3.8
Fire Total	979	2.7	23.3
Mutual aid[2]	24	0.1	0.6
Canceled	38	0.1	0.9
Total	4,201	11.5	100.0

Greatest % of Calls

Greatest % of Fire Calls

Notes:
[1]Data as of 2013
[2] Mutual Aid – Assistance to the LBFD during major incidents from neighboring volunteer fire departments

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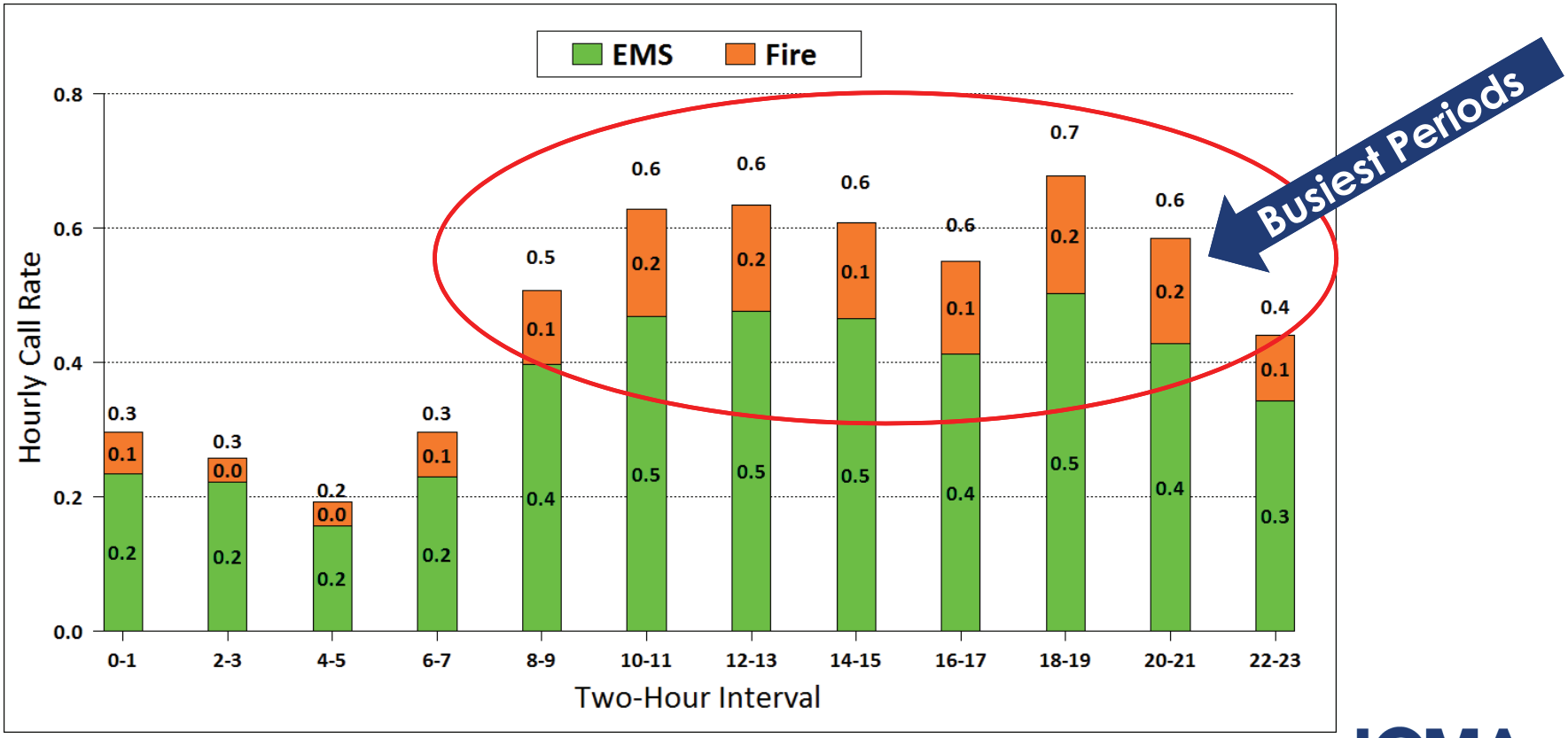
Data and Workload Analysis Overview

Figure 8: Calls by Hour of the Day



Data and Workload Analysis Overview

Table 6: Average Response Time

Call Type	Dispatch Time	Turnout Time	Travel Time	Response Time	Sample Size
Cardiac and stroke	0.8	1.8	2.5	5.0	231
Seizure and unconsciousness	0.8	1.7	2.3	4.8	315
Breathing difficulty	0.8	2.1	2.4	5.3	291
Overdose and psychiatric	0.8	2.0	2.5	5.3	196
MVA	0.8	1.9	2.1	4.7	167
Fall and injury	0.8	2.0	2.4	5.2	761
Illness and other	0.9	2.0	2.5	5.4	1,093
EMS Total	0.8	2.0	2.4	5.2	3,054
Structure fire	0.8	2.2	2.2	5.3	32
Outside fire	0.8	2.2	2.2	5.2	24
Hazard	1.0	2.7	3.1	6.7	229
False alarm	0.9	2.6	2.6	6.1	410
Good intent	1.0	2.5	2.5	6.0	58
Public service	1.1	2.5	2.9	6.5	144
Fire Total	0.9	2.6	2.7	6.3	897
Total	0.9	2.1	2.5	5.4	3,951

Note: Data as of 2013

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Data and Workload Analysis Overview

Response Time Observations

Overall, and at the average, LBFD response performance looks good.

The performance is fairly consistent across the call types. The EMS performance is very consistent, although major upgrades can made. The fire performance varies to some degree, but at an appropriate level for call severity.

At the 90th percentile-and if benchmarked against NFPA 1720, LBFD met or exceeded recommended performance. As a stand alone career department, the LBFD would not be in compliance with applicable NFPA standards. Response time is noticeably slower during the overnight hours.

The response and turnout of the volunteer component is meeting or exceeding the recommendations of NFPA 1720. As a 1720 agency—overall this is to be commended.

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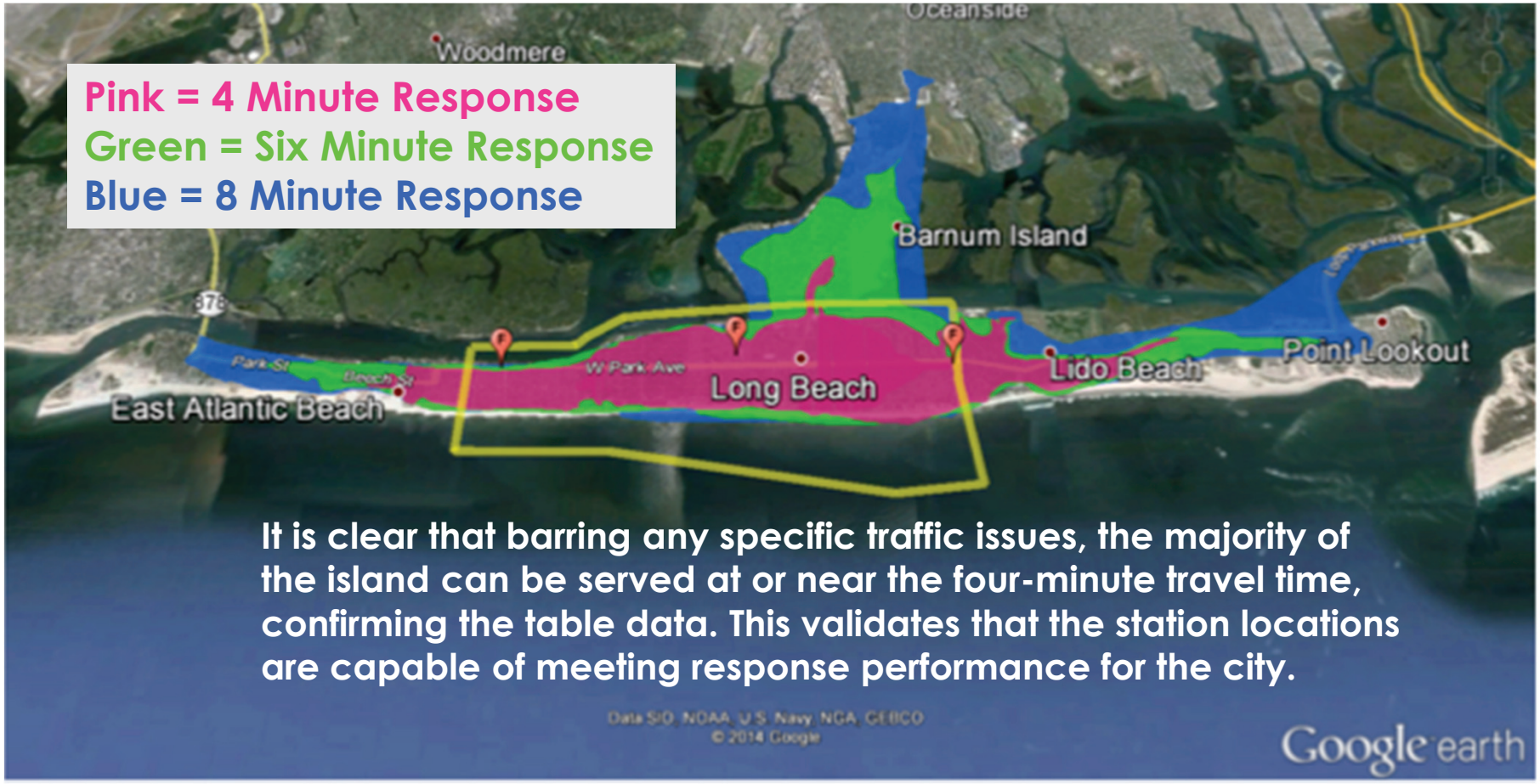
Response Travel Times ~LBFD Stations



It is clear that barring any specific traffic issues, the majority of the island can be served at or near the four-minute travel time, confirming the table data. This validates that the station locations are capable of meeting response performance for the city.

Data and Workload Analysis Overview

Number of Units Dispatched to Calls

Figure 9: EMS Calls by Responding Unit

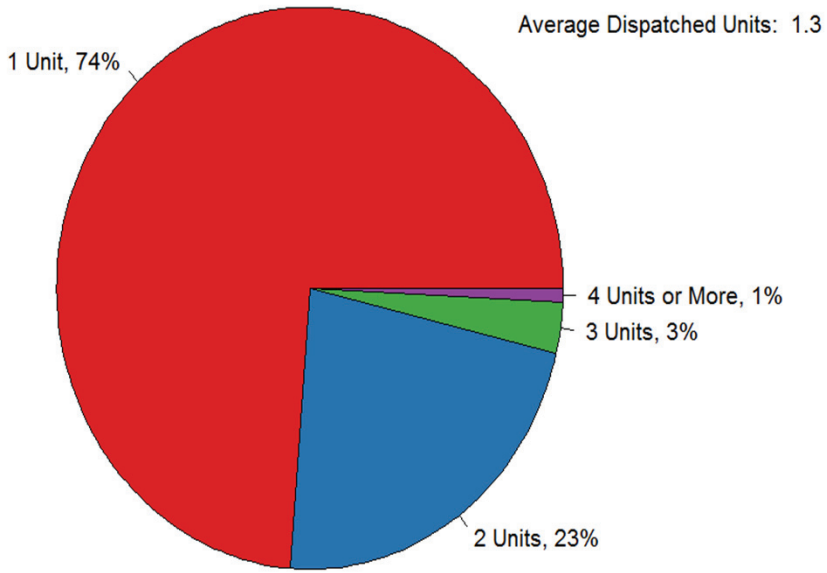
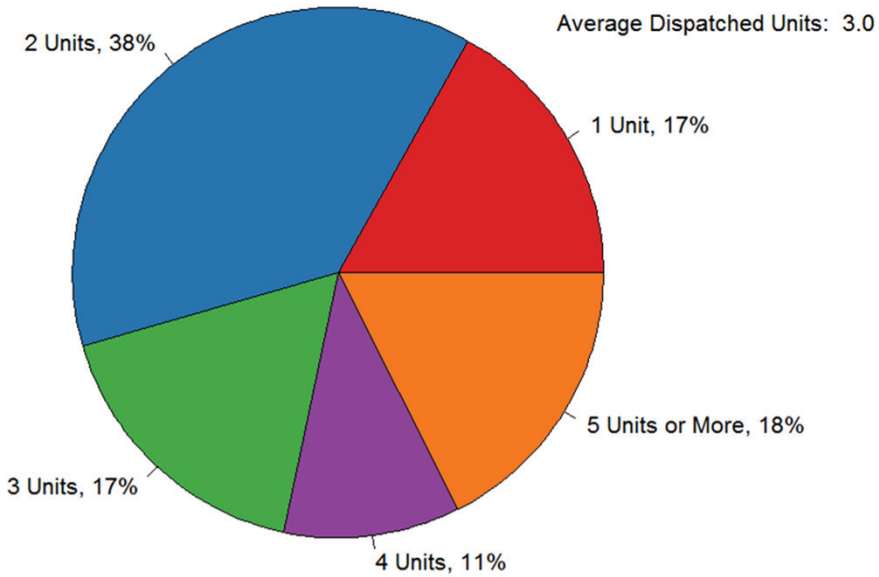


Figure 9: Fire Calls by Responding Unit



Data and Workload Analysis Overview

Number of Units Dispatched to Calls

- **Structure Fire Calls:** The volunteer personnel made up the effective response force for 97% of the structure fire calls. This excludes "mutual aid" provided by neighboring volunteer fire departments, which provide aid and assistance to the LBFD during major incidents.

- **Number of Units:** The first two units (paid contingency) responded to and handled 55 percent of the requests for service.

- **Volunteers:** 45 percent of the time, the volunteers were needed and responded on calls.

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Data and Workload Analysis Overview

Table 8: Average Response Time for Structure and Outside Fire Calls by First Arriving Unit

			Outside Fire		Structure Fire		Total	
Unit Type	Full-time or Volunteer	First Arriving Unit	Response Time	Number of Calls	Response Time	Number of Calls	Response Time	Number of Calls
Ambulance	Both	2322	NA	0	3.8	1	3.8	1
	Full-time	2319	4.7	10	4.0	11	4.3	21
	Volunteer	2321	5.0	1	NA	0	5.0	1
Engine	Full-time	2343	5.2	11	4.8	13	5.0	24
	Volunteer	2342	NA	0	10.8	2	10.8	2
	Volunteer	2344	NA	0	5.5	3	5.5	3
Ladder	Volunteer	2362	9.7	1	8.1	1	8.9	2
	Volunteer	2372	5.6	1	12.4	1	9.0	2
Total			5.2	24	5.3	32	5.2	56

Note: "NA" denotes missing data

- Response time performance speaks to the seamless service delivery from LBFD regardless of component.
- The data reveal that the first arriving volunteer engine company is within one minute of the paid fire engine to structure fire calls.
- When considering all fire-related calls, the first arriving volunteer fire engine is within 30 seconds of the full-time paid staff.

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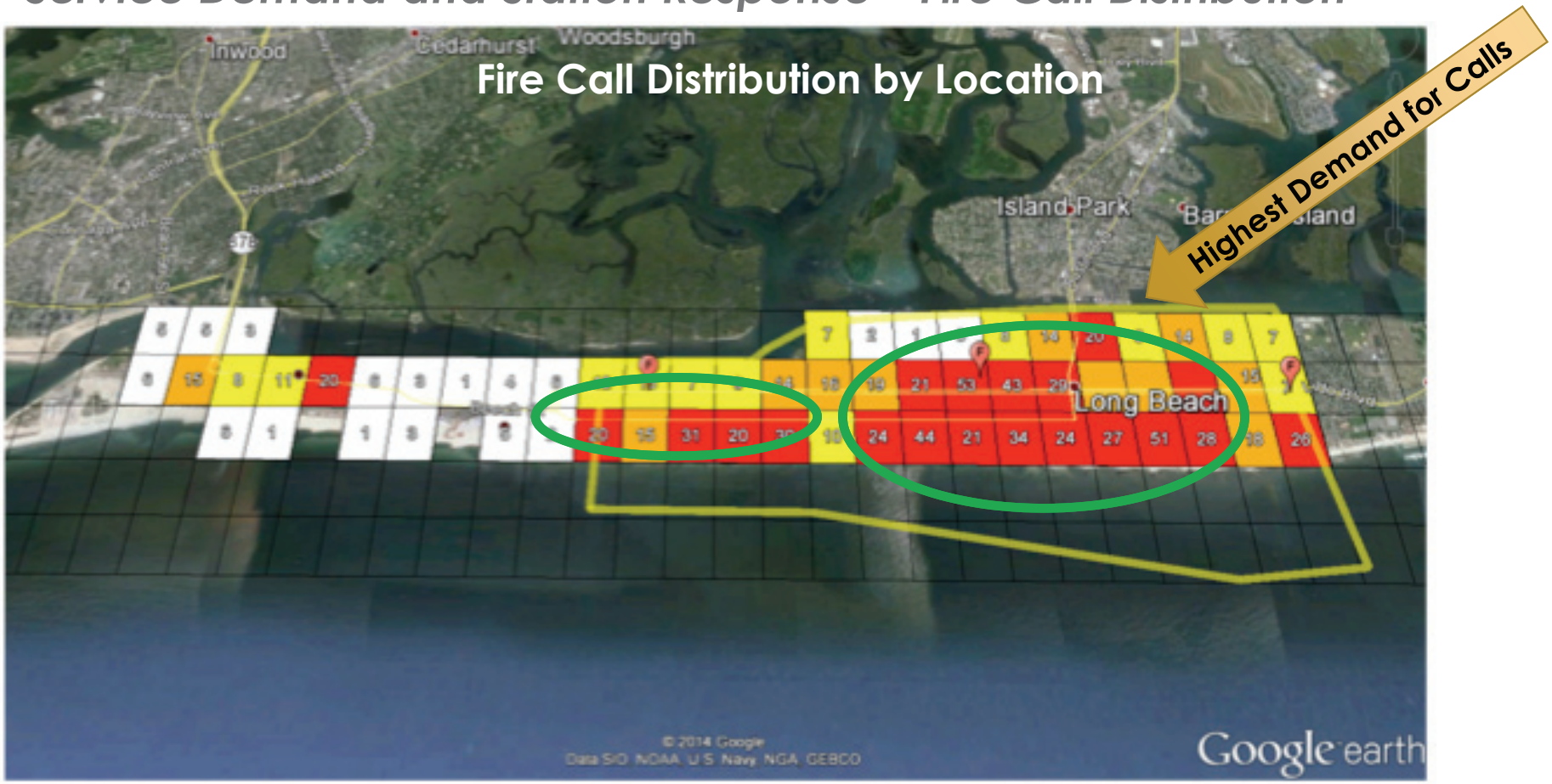
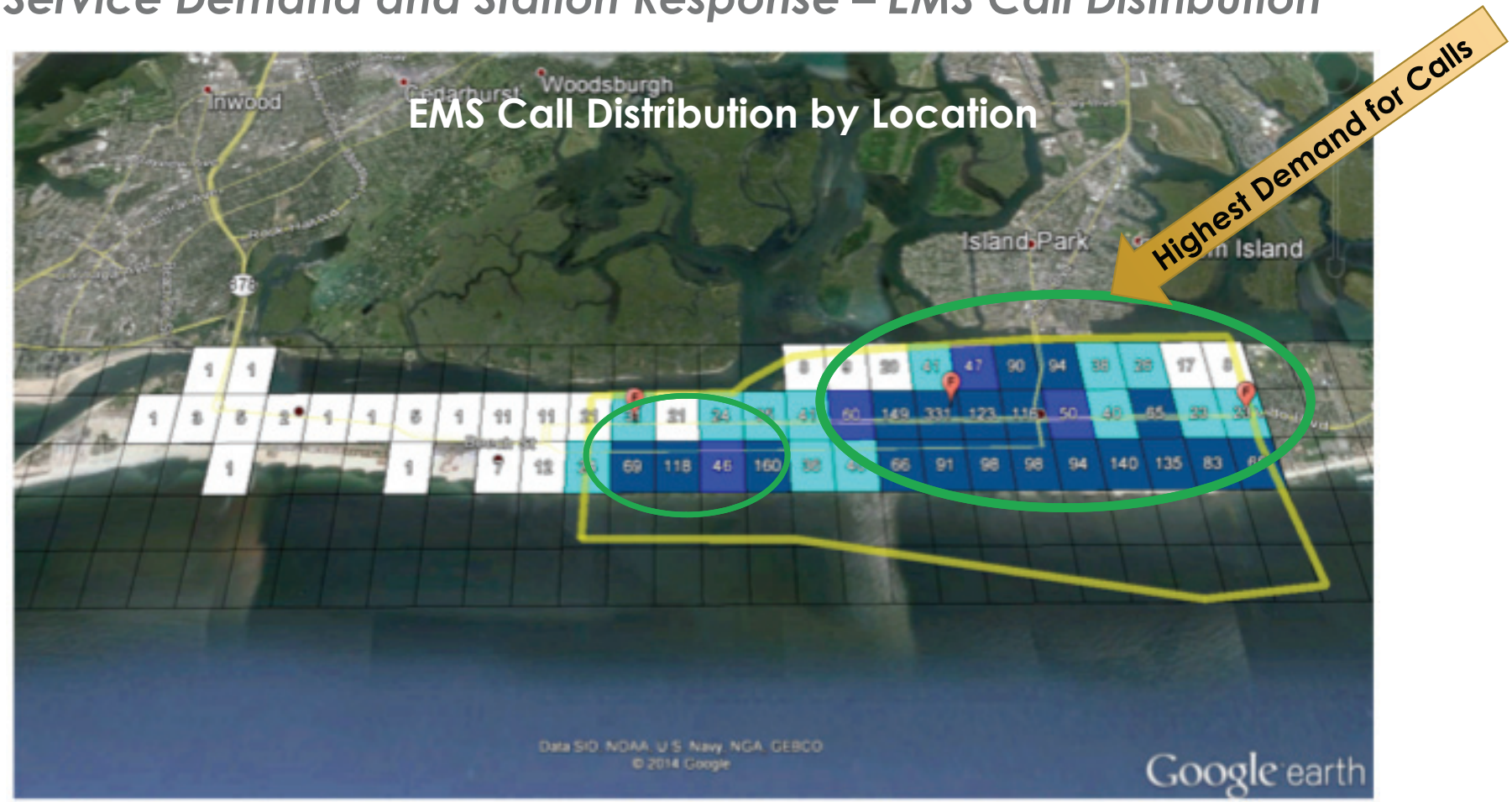
Operational Analysis ~ Call Distribution

Service Demand and Station Response – Fire Call Distribution



Operational Analysis ~ Call Distribution

Service Demand and Station Response – EMS Call Distribution



Operational Analysis ~ EMS Transport Calls

Table 9: EMS Transport Calls by EMS Call Type

Call Type	Number of Calls			Transport Rate
	Non-transport	Transport	Total	
Cardiac and stroke	34	201	235	85.5
Seizure and unconsciousness	114	214	328	65.2
Breathing difficulty	57	238	295	80.7
Overdose and psychiatric	52	147	199	73.9
MVA	107	66	173	38.2
Fall and injury	348	442	790	55.9
Illness and other	391	749	1,140	65.7
EMS Total	1,103	2,057	3,160	65.1
Daily Average	3.0	5.6	8.7	NA

- Overall, 65 percent of EMS calls to which LBFD responded involved transporting patients.
- On average, LBFD responded to an average of 8.7 EMS calls per day, among which 5.6 were EMS transport calls.
- Cardiac and stroke, and breathing difficulty calls had the highest transport rates, averaging 86 percent and 81 percent, respectively.

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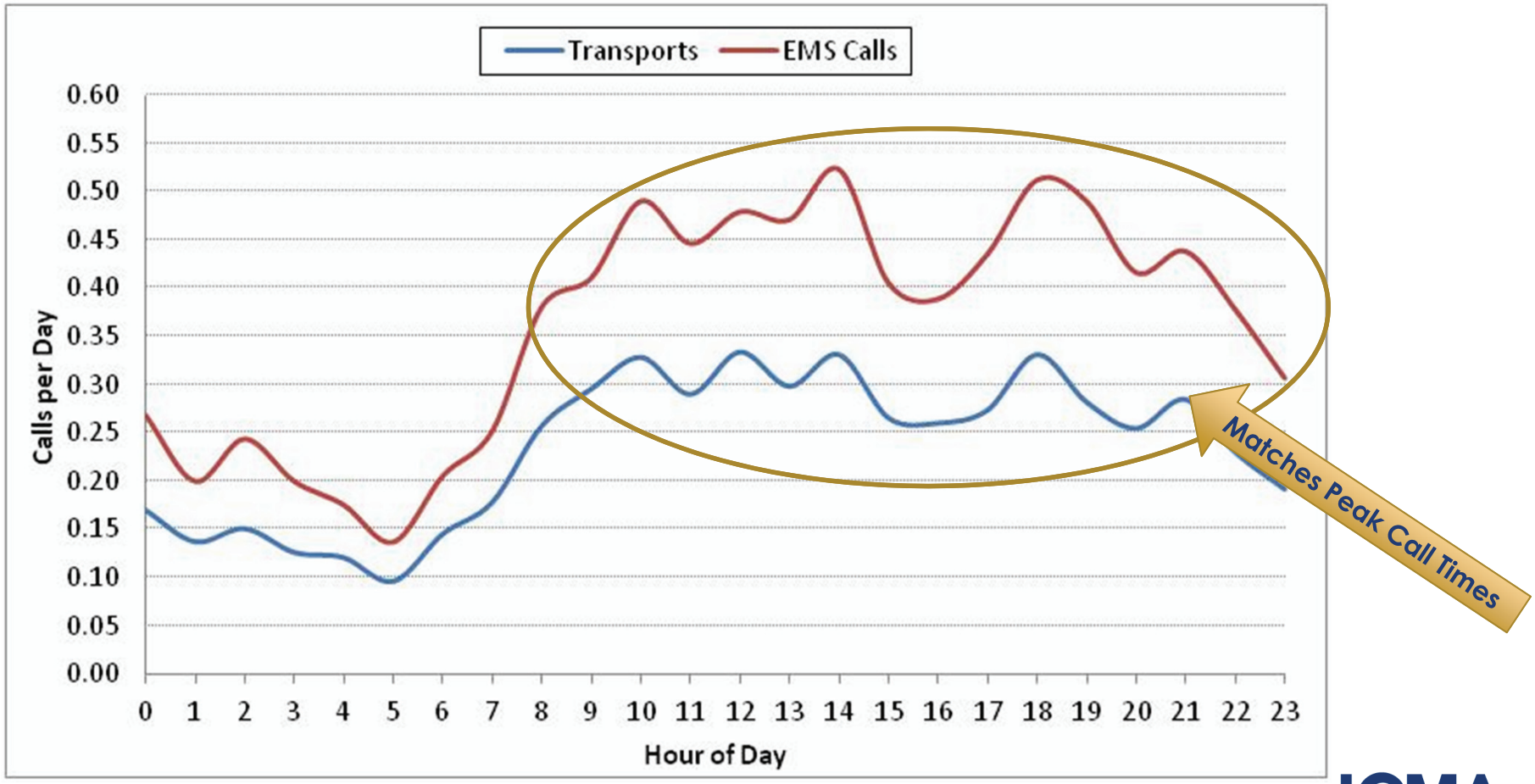
Operational Analysis ~ EMS Calls by Hour

Figure 19: EMS Number of Transport Calls, by Hour of Day



Operational Analysis ~ EMS Duration

Table 10: EMS Duration Comparison, by Call Type		
Call Type	Non-transport Calls	Transport Calls
Cardiac and stroke	22.2	62.1
Seizure and unconsciousness	22.1	57.8
Breathing difficulty	18.8	59.0
Overdose and psychiatric	23.2	55.3
MVA	17.9	54.6
Fall and injury	17.1	54.8
Illness and other	19.5	56.0
Total	19.1	56.8
Sample Size	1,103	2,057

- Impact of Long Beach Medical Center Closure: This analysis confirms the impact that the closure of Long Beach Medical Center has had on the turnaround time when transporting. It also confirms the impact of traffic and congestion on EMS operations, and the reason why the City should look for ways to reduce initial EMS response times. In other words, because it takes more time to reach South Nassau Communities Hospital (and other facilities), it highlights the need for the city's to improve in the one area it can control: initial ambulance response times. Ambulances need to reach patients as quickly as possible.
- The impact of the additional time on task will be noticed during peak times such as the summer months.

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Recommendations

EMS – Drives an Alternative Staffing Model

- The emergency medical service most heavily impacted by the closure was and is the Long Beach Fire Department.
- EMS calls for the study year totaled 3,160 (75 percent of all calls), averaging 8.7 per day--opportunities may exist to better align personnel by service area.
- The demand for services by hour of day suggests that the utilization of peak load, or demand-based staffing may be a successful strategy for the EMS mission.

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Recommendations

Alternate Staffing to Better Align Service Delivery

Staffing Models

- Two alternative staffing models and deployment models emerged during tis operational analysis.

Closing of LBMC

- The driving force behind these recommendations is the impact that the closing of the local hospital has had on operations.

Alternatives

- Finding alternatives that improve the response capabilities of the EMS mission, while not adversely affecting fire operations, is at the core of these recommendations.

Outdated Delivery Model

The other influencing factors are the outdated delivery model currently used in the LBFD, the need or desire to find new operating efficiencies that stand to assist the City's day-to-day operations, cost considerations related to financial constraints, and financial impact of Superstorm Sandy.

- Fire & EMS model as it stands is inefficient;
  - EMS not pre deployed;
  - Limited number of structural fires annually (approx. 8-10);
- Current salaries of the career firefighters are much higher than average EMS compensation.

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Recommendations

The Two Alternatives are:

1 Civilianize the EMS Program

2 Develop a Public-Private Partnership for EMS Functions

Each of these recommendations are made with the foundation that two ambulances would be put in service for at least the peak demand periods, so as to avoid compromising service or safety.

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Recommendations

Alternative 1: Civilianize the EMS Program

- Staff ambulances with highly trained civilian paramedics at a starting salary in the low 40's.
- Dependent on schedule this may be 11 or 12 employees.
- Maintain pre-deployed ambulances, one 24/7 and another during peak call times 12/7.
- Reduce the number of career firefighter positions to 12, **which maintains the current 3-person engine staffing.** Current career unit salaries range from $87,238 to $130,984, plus benefits.
- Reduce overall full time operational employees from 30 to 23 or 24 dependent on ambulance shift model.
- The total estimated savings after implementation would average $1,750,000 to $2,000,000 by 2016, with little change in the fire fighting mission but with improved service in EMS.

In other words, more ambulances in service, quicker response times, and higher certifications for EMS responders.

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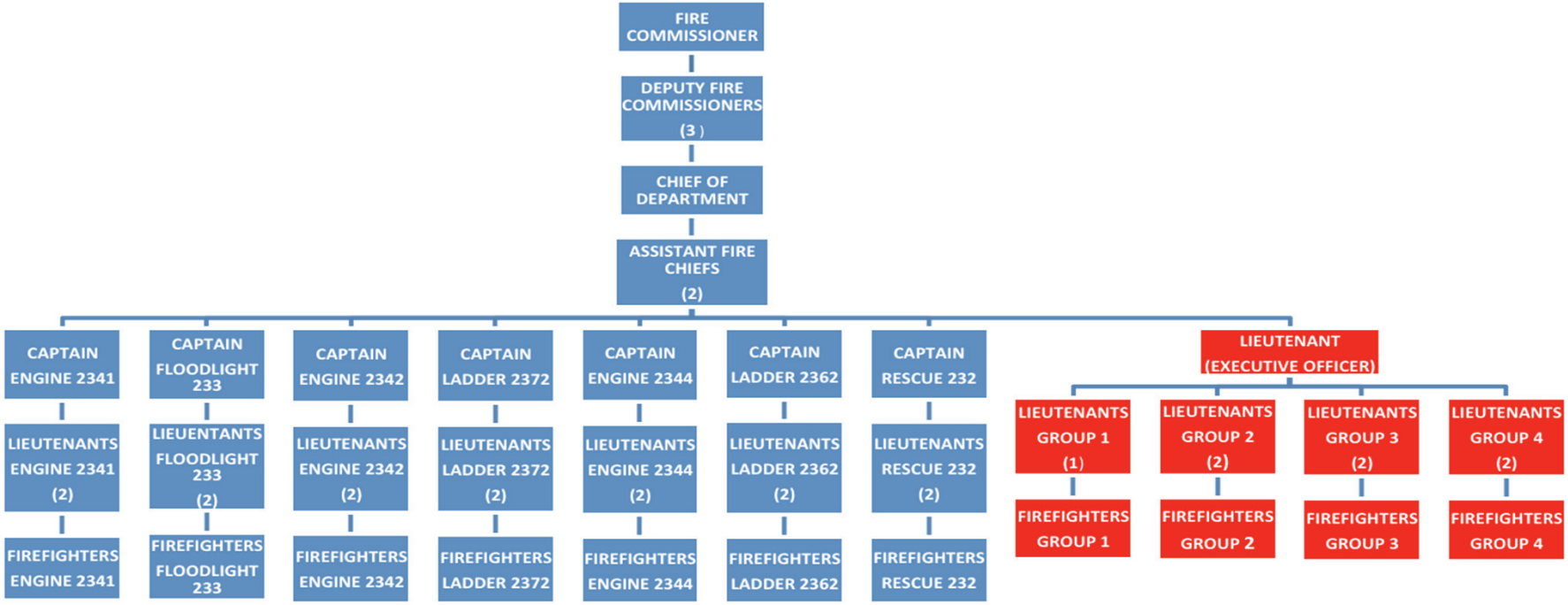
Key ICMA Observations ~ Org Structure

Figure 1: Current Long Beach Fire Department Organizational Chart



Red = Paid personnel
Blue = Volunteer personnel

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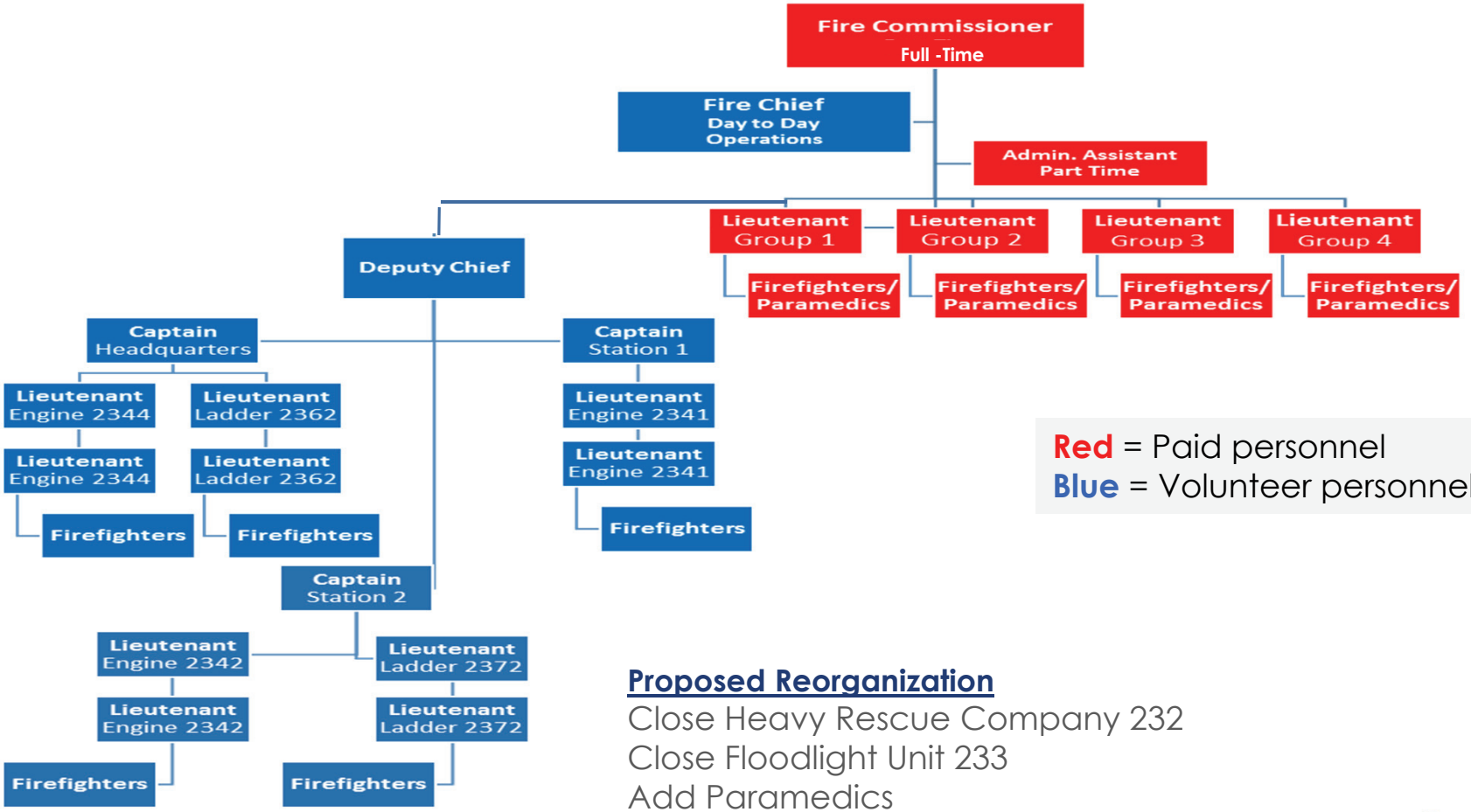
Key ICMA Observations ~ Org Structure

Figure 2: Proposed Long Beach Fire Department Organizational Chart



Red = Paid personnel
Blue = Volunteer personnel

Proposed Reorganization

Close Heavy Rescue Company 232
Close Floodlight Unit 233
Add Paramedics

Recommendations

Alternative 1: Civilianize the EMS Program (Cont.)

- The vast majority of the paid firefighters possess only EMT or EMT-CC certification. In Alternative 1, more highly-trained personnel would serve residents, as ICMA recommends that the majority of EMS employees be certified paramedics.
- Currently, the paid firefighters work in 24-hour shifts, and respond to EMS calls mainly from the firehouse. A civilianized paramedic response team would work in 12-hour shifts, and would be stationed in ambulances that are pre-deployed on city streets. This will help reduce response times, particularly during the late-night/early morning hours, when firefighters are awoken from sleep to respond to EMS calls (see Figure 14: *Average Dispatch, Turnout, Travel , and Response Time of First Arriving Unit, by Hour of Day*).
- Reduced response times are critical in the wake of the hospital's closure. However, even if the hospital reopens, reduced response times will still benefit patients.

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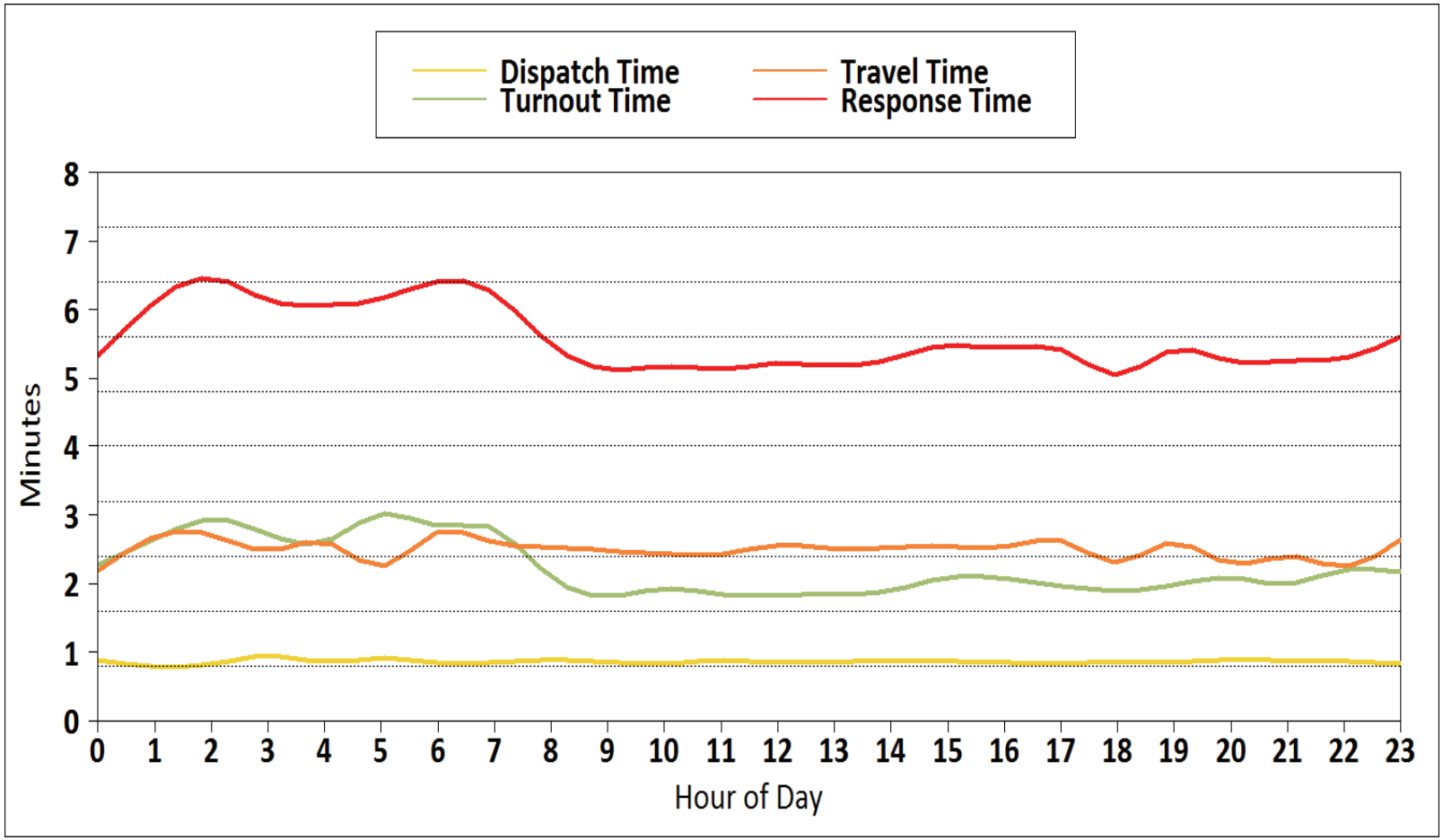
Recommendations

Figure 14: Average Dispatch, Turnout, Travel, and Response Time of First Arriving Unit, by Hour of Day



Recommendations

Alternative 2:
Develop a Public-Private Partnership for EMS Functions

- The City would enter into a performance-based contract with a high-quality EMS service provider that stipulates service performance and capabilities.
- The City could ensure high-quality services through a contractual relationship while avoiding the liabilities and many of the costs associated with an internally provided service.
- This alternative would also improve EMS delivery with Paramedics and additional ambulances.
- Another advantage to the city with this proposal is that the larger regional providers can backfill ambulances into the community in real time as the demand for services change. It is a more efficient method of providing services that is based on demand.

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Recommendations

Alternative 2:
Develop a Public-Private Partnership for EMS Functions (Cont.)

- ICMA would recommend that the City not enter into a cost-centered contract. In other words, the City should dictate the performance through a contractual relationship, but allow the provider to collect its own revenue from patient transportation services. In this way, the City does not incur any need to subsidize services if they are not cost neutral or profitable.
- ICMA recommends a minimum three-person fire engine staffing (two firefighters and one Lieutenant).
  - The total cost for this alternative is entirely associated with the firefighting force's compensation at approximately $2.19 million. The alternative would require 12 full-time firefighters. The estimated fire department savings to the city would be approximately $3.31 million by 2016. Overall savings may be less or neutral based on any subsidy the city may or may not be obligated to a future EMS private contract.
- The major, and only obstacle to implementation is the union contract which designates the paid unit as the "primary" EMS responders. It is unknown whether the union would be willing to relinquish this designation, or whether the city has the legal authority to implement this configuration unilaterally.

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Recommendations

Other Considerations

- Union Contracts: Due to the legal uncertainties created by the language of the union contract, the primary recommendation is for the city to adopt Alternative 1—civilianizing the EMS Program— as the first option. The ICMA study team believes that this method would result in improved service to residents, and would afford significant cost reductions.

- Alternative 2: If however, the city elects not to adopt Alternative 1; it is recommended that it attempt to implement Alternative 2—Development of a Public-Private Partnership for EMS. This alternative provides the greatest savings and distances the city from the financial liability associated with the delivery of EMS while assuring a high level of service.

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Full copies of the report will be available January 14, 2015 at www.longbeachny.gov

Comments will be accepted through January 20, 2015 at comment@longbeachny.gov.

All are welcome to speak and share comments during Good and Welfare at next Tuesday's Council Meeting on January 20, 2015.

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