

**Strategic Analysis and Master Plan
for the Division of Fire**

CITY OF MIDDLETOWN, OHIO

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August 17, 2004

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1. INTRODUCTION AND EXECUTIVE SUMMARY

The Matrix Consulting Group was retained by the City of Middletown, Ohio to conduct a “Strategic Analysis and Master Plan” for the Division of Fire. This first chapter provides a general introduction and description of the processes by which this report was developed. This first chapter also includes an executive summary and implementation plan which highlights key findings, recommendations, fiscal impact and timelines for making key changes. Given that management analyses tend to focus on improvement opportunities, the project team from Matrix Consulting Group has also provided a summary of key strengths we found in the Division of Fire.

1. INTRODUCTION

The City’s RFP included a comprehensive scope of work focusing on the Division of Fire and its operations. The scope of services included both an assessment of current operations and services as well as the development of a longer range master planning process. This report has been developed with these two key objectives in mind. The Matrix Consulting Group took the following steps in this assignment:

- Conducted one-on-one and small group interviews with almost every employee in the Division of Fire.
- Distributed a confidential survey to all staff of the Division of Fire to augment their opportunities for providing feedback and comments to the project team.
- Met with the new bargaining unit President to discuss issues that concerned the union as they related to this study.
- Met individually with each member of the City Council to discuss issues and objectives relating to the Division of Fire and its services.

- Toured the City to evaluate risks and key service issues with the Division of Fire command staff. In addition, the members of the project team toured the facilities and operations within AK Steel – the City’s largest employer and a firm which takes up a large portion of the City’s land area.
- Collected data from a wide variety of sources including the Division of Fire’s records, training files, inspection files, dispatch data (from the Police Department’s dispatch center) and other sources.
- Met frequently with a project steering committee comprised of the City Manager, Assistant City Manager, City Solicitor, Fire Chief and Police Chief.
- Developed interim documents which were reviewed with the steering committee. This process allowed for frequent review of factual information, early discussion of issues and initiation of implementation of key ideas and recommendations even as the project was on-going.

The Matrix Consulting Group worked closely with City executive staff as well as the command staff of the Division of Fire throughout the course of this project. The following section provides an executive summary of the key findings, recommendations and conclusions found elsewhere in this report.

2. EXECUTIVE SUMMARY

This section provides a detailed executive summary of the findings, analysis and recommendations in the body of the report. More detailed information on each topic can be found in the text of the chapters which follow this one.

Issue	Findings and Recommendations	Annual Fiscal Impact
Station Locations	<ul style="list-style-type: none">• Current station locations allow the Division of Fire to reach the majority of the City as well as the majority of calls.• Make no changes to the current fire station locations.	\$0

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Issue	Findings and Recommendations	Annual Fiscal Impact
Ambulance Resources	<ul style="list-style-type: none"> • Current support for ambulance demand ranges between 1 and 2 units per hour of day. • Current ambulance deployment is for three ambulances around the clock. • Reduce dedicated ambulance deployment by one unit. This will enable the Division to stop filling two positions on an overtime basis. 	(\$450,000)
Standards of Performance	<ul style="list-style-type: none"> • There are national consensus standards for response times for medical and fire responses. • These standards are based both on cardiac survival studies and the behavior of fires. • The City should adopt a policy objective to deliver at least three responders within 4 minutes of travel time to 90% of calls. Deliver an initial full response to structure fires within 8 minutes of travel time to 90% of calls. 	\$0
On Duty Staffing – Alternative A	<ul style="list-style-type: none"> • Current staffing is not sufficient to provide for 22 personnel on-duty without expending significant overtime. • With 27 personnel the Division can support 20 personnel on-duty with minimal overtime. • Eliminating the third ambulance results in a need for 20 on duty. • Make no changes to staffing to support a 20-person minimum (savings shown above). 	\$0

Issue	Findings and Recommendations	Annual Fiscal Impact
On Duty Staffing – Alternative B	<ul style="list-style-type: none"> • A wide variety of deployment and unit-staffing models exist nationally. • The project team tested opportunities to assign personnel to units in different ways than are currently used. • Analysis of a number of alternatives show that the delivery of services drop below the recommended targets when 18 or fewer personnel are deployed from current locations. • Analysis also shows that the City can continue to meet the targeted objectives with 19 personnel distributed in several ways. • Adoption of this approach would allow the City to reduce staffing on each platoon by two firefighter positions (for a total of six positions). • Adoption of this deployment approach would require that the City find a back-up transport provider to handle any concurrent third medical call. • Adoption of this approach would also be enhanced by the deployment of additional medic apparatus in each fire station to be cross-staffed by each engine company (thereby reducing paramedic deployment in transport units). The City should purchase two such units. • The City should move to adopt these approaches – 19 personnel on duty (at minimum) and deployment of additional units. Two deployment options will enable the Division of Fire to meet the performance objectives. 	<p>(\$360,000)</p> <p>\$300,000 (one time expense)</p>
Scheduling	<ul style="list-style-type: none"> • Average workweeks have been reduced in the Division of Fire to the current 51 hours per week. • Analysis of the impact shows that it takes one additional person per shift to deliver the same level of minimum staffing when the 51 hour workweek is compared to the 53 hour workweek. • The City should resist additional reductions in the average workweek. 	<p>\$0</p>

Issue	Findings and Recommendations	Annual Fiscal Impact
Use of Technology	<ul style="list-style-type: none"> • Dispatch procedures should be changed to increase the information provided to the fire units. In addition, the fire units should be providing information back to the dispatch center (en-route, at-scene, cleared, at-station) to reduce workload in the center and to enhance data collection. 	\$0
Dispatch Staffing	<ul style="list-style-type: none"> • Effective dispatch centers target 50% utilization of communications staff. This is done to ensure that personnel are available to handle the next event coming into the center, to reduce “burnout” of workers and to enable staff flexibility for major events. • Our analysis shows that current staffing of the center is three below optimal total staffing to account for workload, use of leave and turnover of staff. This results in the use of some overtime to meet current minimum staffing objectives. • Minimum staffing targets should be changed to 4/4/3 per shift from the current 4/5/3 per shift. • Staffing in the center should be increased by three positions, allowing for a net reduction in costs (overtime is reduced at the same time total wages for the unit are increased). 	<p>\$0</p> <p>(\$27,000)</p>
Training	<ul style="list-style-type: none"> • The Division of Fire offers a wide variety of training opportunities to staff in both fire and EMS skills. • The two Captains assigned to training are effective at researching, designing, implementing, supporting and providing training in the Division. • Make no major changes to the current approach to training. 	\$0

Issue	Findings and Recommendations	Annual Fiscal Impact
Fire Prevention Programs	<ul style="list-style-type: none"> • The Division has developed a cross-trained approach to delivering these services. • Analysis of workloads show that both positions in the unit are highly utilized providing inspections, education and investigations. • Make no changes to the current approach to delivering prevention and educational services. 	\$0
Policies and Procedures	<ul style="list-style-type: none"> • A review of current policies and procedures found no major gaps or deficiencies. • Policies and procedures undergo a continual review process. Personnel at every level of the organization are involved in reviewing, re-writing and critiquing policies and procedures. • The Division should continue its approach of policy and procedure review and enhancement. 	\$0
Collective Bargaining Issues	<ul style="list-style-type: none"> • The collective bargaining agreement specifically reserves a broad authority for the City as “management rights.” • Several issues should be considered when possible. These include issues such as: making several slight modification to language in the contract defining overtime, resisting further reduction in the average workweek, eliminating the sub-classification of “squad man” in favor of compensating personnel for maintaining their paramedic status and changing some call back requirements. • The City should pursue changing the items listed above when feasible. 	\$0

Issue	Findings and Recommendations	Annual Fiscal Impact
Organizational Structure	<ul style="list-style-type: none"> • The current approach of 1 Chief and 4 Deputy Chiefs (all of whom are in the bargaining unit) means that the Chief has no other senior staff member to confer with or to delegate responsibilities to outside the bargaining unit. • Eliminate one Deputy Chief position and create a new Assistant Chief position. 	\$13,000

The chapters which follow contain the project team’s analysis of the issues and opportunities facing the City and the Division of Fire.

2. EVALUATION OF EMERGENCY SERVICES

The focus of this chapter is on the evaluation of the provision of emergency services in the City of Middletown. General areas addressed in this chapter include:

- Review of current workload demand for both fire and EMS services.
- Review of the unit demand resulting from that workload.
- Evaluation of current response times.
- Assessment of current response protocols relevant to best practice in similar communities facing similar risks.
- Evaluation of the current use of leave by personnel in the Division of Fire. This includes an assessment of current approaches to managing leave.
- Review of staffing needs in the Department given various approaches to service delivery.
- Analysis of the ability of the current service delivery system to meet certain national targets or “standards” for urbanized areas.

The chapter is organized into sections which address each of these issues. The first section, which follows, describes the current demand for services in the City of Middletown.

1. ANALYSIS OF CURRENT SERVICE DEMAND

The Matrix Consulting Group first examines the workload handled by the Division of Fire. This workload can be broken down into a number of different views, each of which describes a particular element of the workload handled by the Division. The first table, which follows, provides a summary of the calls by major call type:

Call Type	Number	% of Total
ALS - EMS	4,022	50.2%
BLS - EMS	2,124	26.5%
Transport Only	60	0.7%
Box Alarm (Fire)	210	2.6%
Still Alarm (Fire)	512	6.4%
Haz Mat	5	0.1%
Assist	297	3.7%
Investigation	644	8.0%
Carbon Monoxide	93	1.2%
Entrapment	2	0.0%
Mutual Aid Squad	28	0.3%
Mutual Aid Fire	10	0.1%
Mutual Aid Haz Mat	4	0.0%
Total	8,011	100.0%

This table shows that the Division of Fire handled 8,011 calls for service in 2003. These calls often involved more than one unit - the average was 1.81 units per call for service. It is also important to note that the delivery of emergency medical services (EMS) makes up more than 76% of the workload of the Division of Fire. These EMS calls are equivalent to 16.8 calls per day or roughly 5.6 calls per Medic unit per day.

In addition to the types of calls, it is important to understand the distribution of these calls for service by time of day. The tables on the following pages provide two distributions: the first shows the distribution of calls for service by type by time of day and the second shows the distribution of all 8,011 calls for service by time of day and day of week. A third table shows the distribution of calls by primary response units (this figure adds to 13,650 indicating the number of unit responses to the 8,011 calls).

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Hour	EMS - ALS	EMS - BLS	Transport	Fire (Box)	Fire (Still)	Assist	Investigation	Other	Total
0000	108	77		7	9	12	26	3	242
0100	111	77	2	4	14	11	10	5	234
0200	98	73	1	3	13	7	6	5	206
0300	88	66	1	4	3	6	8	2	178
0400	72	44	0	5	7	11	2	1	142
0500	80	45	0	1	14	8	4	0	152
0600	91	49	1	1	10	11	8	0	171
0700	121	54	3	8	11	8	17	5	227
0800	164	79	5	3	15	15	32	7	320
0900	185	84	3	6	17	24	30	8	357
1000	230	101	9	14	24	16	26	5	425
1100	231	120	9	16	18	16	29	7	446
1200	225	102	3	9	26	13	35	10	423
1300	213	106	4	7	25	11	35	8	409
1400	234	106	5	21	25	13	36	6	446
1500	205	111	1	14	36	12	22	9	410
1600	222	109	3	13	42	14	34	13	450
1700	220	119	3	13	33	12	46	11	457
1800	199	106	1	16	37	10	43	7	419
1900	214	108	4	13	27	12	44	5	427
2000	214	115		10	33	17	42	6	437
2100	198	99	2	8	31	13	38	10	399
2200	151	93		6	21	16	48	8	343
2300	148	81		8	21	9	23	1	291
Total	4,022	2,124	60	210	512	297	644	142	8,011
% of Total	50.2%	26.5%	0.7%	2.6%	6.4%	3.7%	8.0%	1.8%	

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Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Total	% of Total
0000	33	27	40	33	38	32	39	242	3.0%
0100	42	26	40	24	34	33	35	234	2.9%
0200	35	31	20	32	26	23	39	206	2.6%
0300	27	27	22	23	26	23	30	178	2.2%
0400	22	15	31	26	11	15	22	142	1.8%
0500	22	23	16	22	30	20	19	152	1.9%
0600	15	25	32	33	23	23	20	171	2.1%
0700	25	37	29	29	40	40	27	227	2.8%
0800	36	47	46	45	44	61	41	320	4.0%
0900	35	52	52	57	55	54	52	357	4.5%
1000	53	71	67	57	68	60	49	425	5.3%
1100	49	65	64	67	66	70	65	446	5.6%
1200	38	53	77	59	82	50	64	423	5.3%
1300	54	67	62	59	50	59	58	409	5.1%
1400	68	55	56	62	71	87	47	446	5.6%
1500	59	60	59	64	62	61	45	410	5.1%
1600	69	65	54	78	65	63	56	450	5.6%
1700	58	46	78	73	79	61	62	457	5.7%
1800	58	60	70	72	47	51	61	419	5.2%
1900	59	78	54	66	65	55	50	427	5.3%
2000	66	61	55	70	70	75	40	437	5.5%
2100	69	47	46	61	46	65	65	399	5.0%
2200	50	46	35	55	48	47	62	343	4.3%
2300	46	44	38	48	22	36	57	291	3.6%
Total	1,088	1,128	1,143	1,215	1,168	1,164	1,105	8,011	100.0%
% of Total	13.6%	14.1%	14.3%	15.2%	14.6%	14.5%	13.8%	100.0%	

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Unit / Type	CH3	Engine 1	Engine 2	Engine 3	Medic 1	Medic 2	Medic 3	Medic 5	Quint 3	Quint 4	Quint 5	Total
EMS - ALS	32	1014	593	1122	1547	1052	1489	30	1	632	775	8287
EMS - BLS	8	36	23	43	885	540	796	12	0	30	26	2399
Transport	0	0	0	0	27	20	18	2	0	0	2	69
Fire (Box)	200	131	68	177	93	44	96	1	13	144	126	1093
Fire (Still)	5	162	97	118	9	3	3	0	0	69	108	574
HazMat	5	2	1	2	3	0	0	0	0	1	3	17
Assist	1	63	44	89	11	8	10	0	1	48	66	341
Investigation	9	172	111	169	3	6	3	0	1	87	131	692
CO	1	24	6	34	1	0	1	0	0	19	27	113
Entrapment	2	1	1	0	1	1	0	0	0	0	1	7
MA Squad	1	6	1	0	13	10	8	1	0	1	0	41
MA Fire	0	0	3	3	0	0	0	0	0	4	1	11
MA Haz	0	1	0	1	2	0	1	0	0	1	0	6
Total	264	1,612	948	1,758	2,595	1,684	2,425	46	16	1,036	1,266	13,650
% of Total Runs	1.9%	11.8%	6.9%	12.9%	19.0%	12.3%	17.8%	0.3%	0.1%	7.6%	9.3%	100.0%
Runs / Day	0.72	4.42	2.60	4.82	7.11	4.61	6.64	0.13	0.04	2.84	3.47	37.40

The paragraphs, which follow, summarize the key points to be taken from these preceding tables:

- The major calls types all follow a similar pattern of peak levels of activity from early morning until late evening. No call type is evenly distributed across the day.
- Calls for service are evenly distributed across the days of the week with no single day showing a major peak of activity. The marginally busiest day is Thursday, with more than 15% of calls – however, no single day represents less than 13.6% of calls for service.
- Calls are clearly distributed across the day in a cyclical manner, with peaks and valleys in the level of activity. The busiest time of day ranges from roughly 0900 – 2100 (9AM – 9PM) with more than 4.5% of calls occurring, on average, in each hour of the day.
- Unit activity is distributed primarily to the three front-line Medic units which represent a combined total of more than 49% of the total runs in the Division.
- A review of runs by unit also shows that certain stations and areas account for the majority of activity with units from Stations 1 and 3 making up more than 30% of runs each (and more than 61% of runs between the two stations).
- Daily run volume does not appear to be excessive for any of the units. The busiest two units (Medics 1 and 3) are averaging 7.1 and 6.6 runs per day. The busiest non-medic units (Engines 1 and 3) average 4.4 and 4.8 runs per day respectively. It is common to use 10 runs per day as a planning device in static deployment (i.e., station based) EMS and fire / rescue systems as a threshold for unit utilization.
- Concurrent call demand has been calculated to show that approximately 40% of calls occur while another call is on-going. This was determined by examining the start and end times of each call for service in relation to those around it. In approximately 5% of cases, a third call occurs.

This analysis has shown that the Division of Fire faces a widely varied demand for services. This demand is primarily for EMS services but also includes less frequent Fire calls (which also demand more staff resources than do most medical calls).

2. THE FIRE DEPARTMENT DOES NOT OPERATE WITH SPECIFIC SERVICE LEVEL GUIDANCE FROM THE CITY. NATIONAL EFFORTS PROVIDE GUIDANCE TO POLICY MAKERS.

The project team's review of current policy with the Division of Fire shows that there is no formal policy statement to guide the Division, City management or policy makers as they attempt to assess performance, plan for future resources and other key management steps. This is not uncommon in the project team's experience. Performance and response standards should have several key elements and such approaches are often stated as follows: *The Division of Fire shall be able to place an initial responding unit to 90% of emergency calls for service in "x" minutes or less. In addition, the Division of Fire shall have a reflex time of less than one minute. The Dispatch center shall have an average call handling time of one minute or less.*

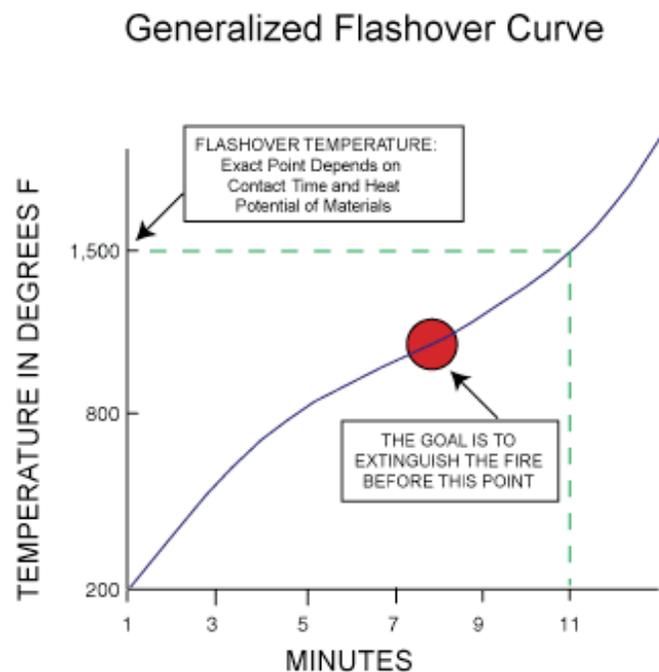
Such an approach enables Division management, City management and policy makers to assess operations as well as to plan for the future. A number of efforts have been made to develop a consensus or national standard. However, many of these efforts either fail to take into account the wide variance in service environments or fail to provide for a specific target. Regardless, the Division of Fire should have some formal guidance with which they can be assessed and with which major decisions (such as fire station locations) can be made.

A number of efforts have been made to develop a consensus national standard for response time, unit staffing and deployment of units. The standards promoted for fire rescue and EMS have their basis in research that has been conducted into two critical issues:

- What is the critical point in a fire's "life" for gaining control of the blaze?

- What is the impact of the passage of time on survivability for victims of cardiac arrest?

The exhibit, that follows, shows the typical “flashover” curve for interior structure fires. The point of “flashover” is critical because it defines when all of the contents of a room become involved in the fire. This is also the point at which a fire changes from “room and contents” to a structure fire – involving a wider area of the building.



Note that this graphic depicts a fire from the moment of inception – not from the moment that a fire is detected or reported. This demonstrates the criticality of early detection and fast reporting and dispatch of responding units. This also shows the critical need for a rapid (and sufficiently staffed) initial response – by quickly initiating the attack on a fire, “flashover” can be averted. The points, below, describe the major changes that occur at a fire when “flashover” occurs:

- It is the end of time for effective search and rescue in a room involved in the fire. It means that likely death of any person trapped in the room – either civilian or firefighter.

- After this point in a fire is reached, portable extinguishers can no longer have a successful impact on controlling the blaze. Only hand-lines will have enough water supply to affect a fire after this point.
- The fire has reached the end of the “growth” phase and has entered the fully developed phase. During this phase, every combustible object is subject to the full impact of the fire.
- This also signals the changeover from “contents” to “structure” fire. This is also the beginning of collapse danger for the structure. Structural collapse begins to become a major risk at this point and reaches the highest point during the decay stage of the fire (after the fire has been extinguished).

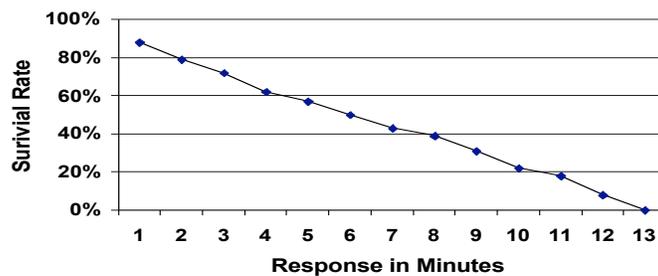
It should be noted that not every fire will reach flashover – and that not every fire will “wait” for the 8-minute mark to reach flashover. A quickly responding fire crew can do things to prevent or delay the occurrence of flashover. These options include:

- Application of portable extinguisher or other “fast attack” methodology.
- Venting the room to allow hot gases to escape before they can cause the ignition of other materials in the room.
- Not venting a room – under some circumstances this will actually stifle a fire and prevent flashover from occurring.

Each of these techniques requires the rapid response of an engine company that can safely initiate these actions. Under most circumstances, this requires at least three firefighters on-scene. However, many agencies wait to have at least two firefighters outside the structure to back up a two-person interior attack team.

The second issue to consider is the delivery of cardiac and other emergency medical first response. The exhibit, below, demonstrates the survivability of cardiac patients as a timeline:

% Survival Rate



This graph shows the results of extensive studies of the survivability of patients suffering from cardiac arrest. This is the most-often studied issue due to the ease of evaluating the outcome (a patient either survives or does not) from a cardiac arrest. This research results in the recommended standard of provision of basic life support within four minutes of notification and the provision of advanced life support within 8 minutes of notification. The goal is to provide BLS within six (6) minutes of the onset of the incident (including dispatch, reaction and travel time) and ALS within 10 minutes. Further descriptions of practical research into these issues are summarized in the section that follows.

Recommendation: The Matrix Consulting Group recommends that the City of Middletown and the Division of Fire adopt the following policy statement: *The City of Middletown will maintain a fire and EMS response system that is capable of responding to more than 90% of calls for service with an initial responding unit in five minutes or less from the time of dispatch. In addition, the Division of Fire will be able to respond with its full initial response in nine minutes or less, at least 90% of the time. The Division of Fire will have units en-route to calls for service in less than one minute, 90% of the time.* This allows for four and eight minutes of travel time and one minute of in-station reflex time.

3. ASSESSMENT OF CURRENT RESPONSE TIMES

The next phase of examining current deployment and delivery of services is to evaluate the response time capability of the current system. It should be noted that “response time” can be defined in several ways. These include:

- Time between the answering of the phone in dispatch to the time the unit is on-scene. This is often called total system response time. It involves three discreet elements:
 - Call handling and dispatching.
 - In-station response (or reflex) time.
 - Travel time from the station.
- Time elapsed between dispatch of the unit and the time the unit is on-scene. As discussed, above, this includes the reflex time and the travel time.
- Time elapsed between the time the unit(s) indicates it is en-route to the time it is on-scene at the incident. This includes only the travel time.

The project team determined that it would not be possible, given currently available data, to separate reflex (in-station) and travel time. This is because the dispatch center data has not regularly tracked the “en-route” time stamp in the majority of calls for service. This has two negative impacts on this analysis:

- It is not possible to evaluate the reflex time in the Division of Fire. Best management practices target a one-minute or less reflex time to emergency calls.
- It is not possible to measure the travel time from the station to the scene because we do not know when the units left the station.

The project team will focus, therefore, on the response time as measured by reflex plus travel time. We will also assume that the Division of Fire is averaging a one-minute reflex time to all calls for service (we have no basis for making any other assumption). The Division of Fire, during this project, implemented in-unit laptops. These allow the company officer to press a key which transmits an en-route time to the dispatch center. The Division should utilize these data, in the future, to closely monitor reflex times in aggregate and for each station by shift. It is important to control these

reflex times since these are one of the few areas in which the Division can truly control all elements leading to a reduction in response time.

In addition, the project team examined the response time of the first unit arriving on-scene only. The second, third, etc. units arriving on-scene do not, necessarily, travel under the same conditions. For example, they may be cancelled or slowed down upon the recommendation of the first responding unit.

Event Type	1st Unit Total Response	Reflex (Estimated)	1st Unit Travel
EMS (ALS and BLS Combined)	4.43	1	3.43
Fire (Any Type)	4.37	1	3.37
Hazardous Materials	10.05	2	8.05
Assistance (Any Type)	5.41	1	4.41
Mutual Aid	12.06	1	11.06
Grand Total	4.58	1	3.58

This analysis shows that the response times are very good for the initial arriving unit in all categories. National standards typically target the arrival of a first unit in four minutes or less of travel time. These standards include an additional minute for reflex time and a minute for dispatch time. Some new standards (NFPA 1710) also focus on the numbers of personnel that will arrive on-scene within these time frames. The City of Middletown has not adopted these staffing standards at this time.

These data point to a system which is functioning quite well. Furthermore, analysis of available data indicates that the Division is meeting these standards in more than 90% of all fire and medical calls for service. It should be noted that the project team cannot determine if this is travel time or reflex time given the limitations posed by the available data.

4. REVIEW OF CURRENT RESPONSE PROTOCOLS USED BY THE DIVISION OF FIRE

The Division of Fire has developed a set of pre-determined responses to a variety of call types. This approach is a key best management practice. The table, which follows, provides an annotated summary of the Division’s current approach:

Type of Call	Initial Response	Comments
EMS (Basic Life Support)	Medic	Best Practice – uses minimum resources likely necessary for the event.
EMS (Advanced Life Support)	Medic Engine	Best Practice – targets multiple responders to reduce response time of first unit, additional hands for life-saving medical techniques. Optional best practice is to staff medics with 3 and to eliminate engine response.
Assistance (No Injury) / Investigation	Engine	Best Practice – uses minimum resources likely necessary for the event.
Automatic Alarm (Single Activation)	Engine	Best Practice – uses minimum resources likely necessary for the event.
Structure Fire (Residential)	Engine Aerial (Truck or Quint) * Engine Medic Chief	Best Practice – uses minimum resources likely necessary for the event. Holds additional units in reserve for next event.
Structure Fire (Commercial)	Engine Aerial (Truck or Quint) * Engine Medic Chief	Best Practice – uses minimum resources likely necessary for the event. Holds additional units in reserve for next event.

Type of Call	Initial Response	Comments
Hospital (Even on Automatic Alarm)	Engine Aerial Engine Engine Medic Chief	Best Practice – uses minimum resources likely necessary for the event. Additional personnel over other fire responses necessitated by the size of the facility, evacuation coordination and other factors.
Confirmed Fire RIT / Rehab	Engine Medic	Best Practice – uses minimum resources likely necessary for the event. Holds additional units in reserve for next event. Brings total response to 17.
Fire (Car, Dumpster, etc.)	Engine	Best Practice – uses minimum resources likely necessary for the event.

* Given unit distribution, “engine” is picked first because a quint can satisfy either criteria. Therefore, a quint may be picked as an engine in its first due area but may be used to satisfy the need for an aerial in its second or third-due area.

The project team’s review of current response protocols indicates that the Division of Fire is using best practices in each major category. There are no opportunities to reduce responses to these primary categories of response.

5. CURRENT DEPLOYMENT AND SYSTEM DESIGN ACHIEVE TARGETED PERFORMANCE GOALS.

This section of the report examines the current emergency response network. The focus of this section is on a series of maps developed using a customized GIS approach. The purpose of this section is to evaluate, graphically, the capability of the current network of fire stations and to determine if there are any critical gaps or unnecessary overlaps which can be exploited to enhance service delivery in the City.

The project team’s approach is to evaluate the capability of the City to achieve two primary objectives:

- Place an initial responding unit on-scene in five minutes or less (we have already demonstrated that this can be done using CAD data) including one minute for in-station reflex time. This is shown on the maps as the ability to respond with a four minute travel time.
- Place an initial fire response on-scene in nine minutes or less (we have shown this to be the case as well) including one minute for in-station reflex time. This is shown on the maps as the ability to respond with an eight minute travel time.

The model utilizes a travel model to consider the ability of the system to place units at a range of locations. The assumptions that are made include the following:

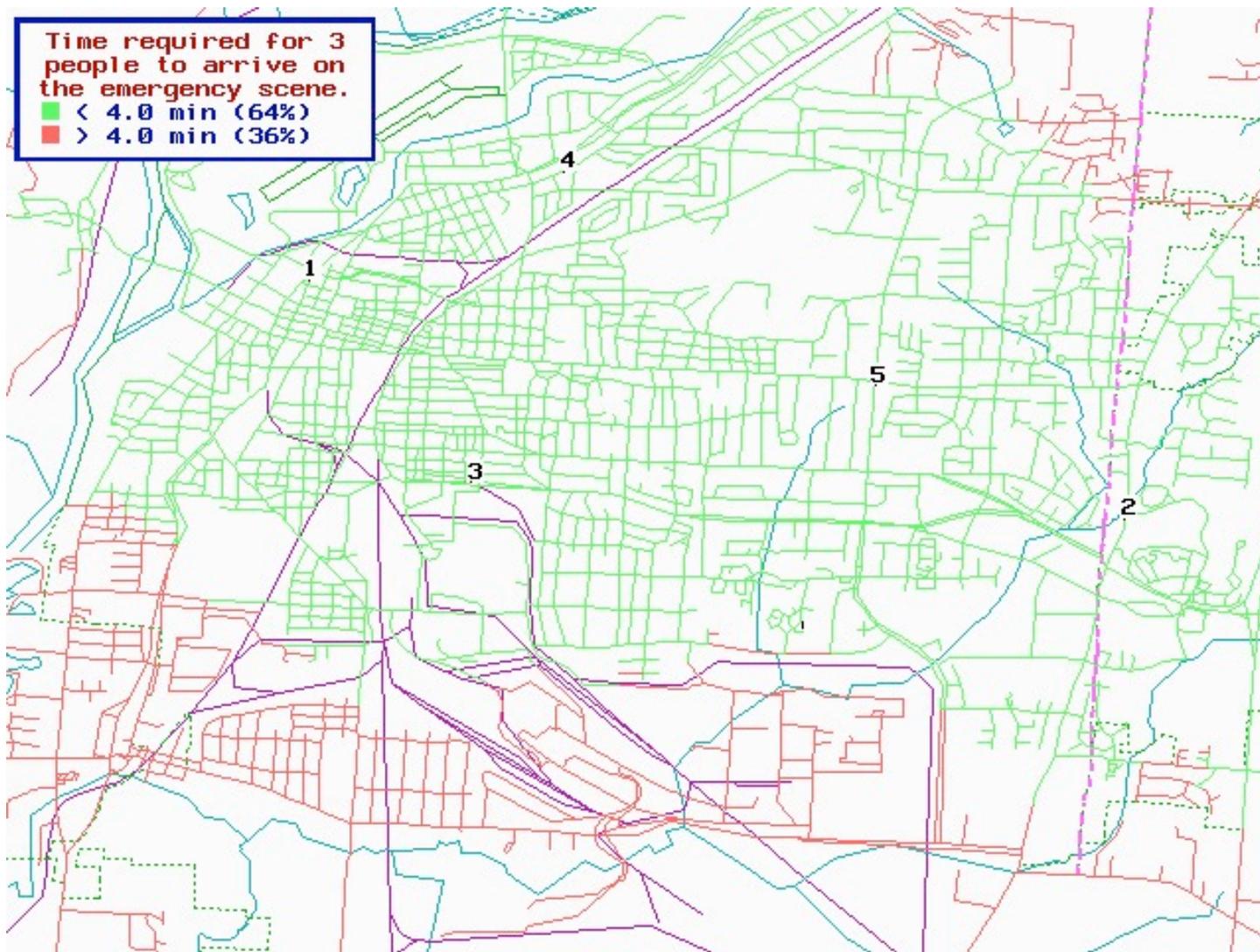
- The current street network in the City and its neighboring areas (since sometimes the fastest way to a location can be found by leaving the City).
- The travel speed of units on City streets.
- A short “pause” at all intersections as a proxy for slowing down and then speeding up again when crossing streets or making turns.
- Locations of each station and the resources assigned to each (apparatus and personnel).

The maps showing the assessment of the current system are provided on the following pages. The project team has developed two maps with which to evaluate the current (and alternative) deployments. These are as follows:

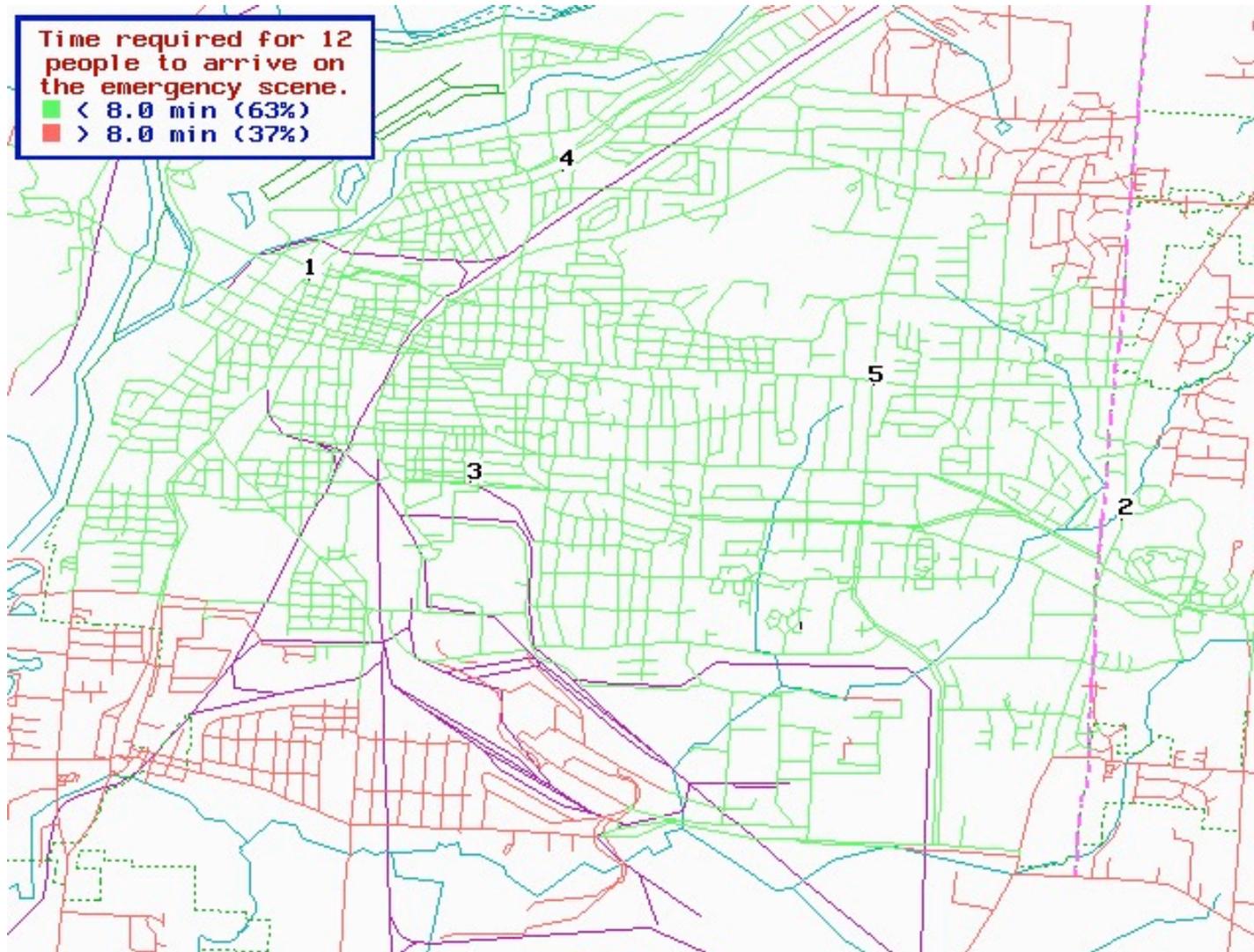
- **Initial Response:** The ability to place at least three people on-scene in four minutes or less of drive time.
- **Initial Fire Response:** The ability to place 12 people (from 2 engines, a medic, an aerial and a chief) on-scene in eight minutes or less.

The first map shows the ability to place the initial response on-scene and the second shows the ability to place the Fire Department’s current first response to fires on-scene. The resulting coverage is summarized, following the maps:

Current Ability to Place First Response On-Scene



Current Ability to Place Initial Structure Response On-Scene



- The first map shows that the Division of Fire can place an initial responding unit on-scene in less than 4 minutes to 64% of the road miles in the City or more than 92% of the calls in the City from the current stations.
- The second map also shows that the Department can reach 63% of the road miles and more than 90% of the calls for service with this initial response.

These analyses show that the current fire / EMS response system is effectively providing services to the City. It should be noted that the south-western corner of the City is not reached in either service standard at this time.

This analysis has indicated that the current response system is capable of providing the currently targeted level of response – i.e., at least three personnel in four minutes or less (travel time) and an initial structure fire response of 12 personnel in eight minutes or less (travel time). The project team will examine alternative deployments in a later section of this chapter.

6. AMBULANCE TRANSPORT CAPABILITIES EXCEED THE DEMAND FOR SERVICES BASED ON CURRENT DEPLOYMENT AND STAFFING.

The next critical analytical step is to determine what the community demand for services are. This is typically done by examining the demand for EMS units (as they are the busiest units) first. The table, which follows, provides a summary of the workload demand, per hour, for Medic units based on the workload in 2003. The analytical approach used to develop this table is described in the following points:

- The first step is to calculate unit demand per hour using average EMS calls for service which resulted in the use of a Medic unit.
- The project team derived the average EMS calls for service from the CAD data obtained from the Division of Police dispatch unit.
- By applying the average call duration (about 45 minutes from dispatch to clear), the analysis indicates how many units are required.

- The resulting figure shows the “average” number of Medic units required to meet the system demand in any given hour. This is shown in the third column entitled “Average Unit Demand.” The aggregate hourly unit demand is for 0.56 units per hour, or one unit per hour as applied practically.
- The major flaw with this first approach is that it does not take into account the variability of demand in any hour that is “hidden” by looking simply at the average number of calls per hour. An additional step has to be taken to enhance this analysis.
- The project team next calculates the standard deviation on the overall distribution of calls for service. The unit demand in each hour is increased by two standard deviations – allowing us to be confident that we are covering 95% of the potential maximum demand in each given hour.
- The result is a significant and important increase in the number of units required for each hour to 0.91 overall. This shows that the number of units required at this 95% confidence level exceed one unit during 12 hours of each day (10AM – 10PM).

Hour	EMS CFS	Hours	Average Unit Demand	2 Std Dev Unit Demand
0000	185	145.69	0.40	0.75
0100	190	142.50	0.41	0.76
0200	172	129.00	0.37	0.72
0300	155	116.25	0.33	0.68
0400	116	87.00	0.25	0.60
0500	125	93.75	0.27	0.62
0600	141	105.75	0.30	0.65
0700	178	133.50	0.38	0.73
0800	248	186.00	0.54	0.89
0900	272	204.00	0.59	0.94
1000	340	255.00	0.73	1.08
1100	360	270.00	0.78	1.13
1200	330	247.50	0.71	1.06
1300	323	242.25	0.70	1.05
1400	345	258.75	0.74	1.09
1500	317	237.75	0.68	1.03
1600	334	250.50	0.72	1.07
1700	342	256.50	0.74	1.09
1800	306	229.50	0.66	1.01
1900	326	244.50	0.70	1.05
2000	329	246.75	0.71	1.06
2100	299	224.25	0.65	1.00
2200	244	183.00	0.53	0.88
2300	229	171.75	0.49	0.84
Total	6,206	4,654.50	0.56	0.91

There are 12 hours in which unit demand is for up to two units and for 12 hours the unit demand is for one unit (rounding up in each case). The project team recognizes that there are several mitigating factors in the City of Middletown which need to be taken into account:

- The City does not have a major fire / rescue provider to cross-share utilization of EMS and other resources. This suggests that it is important to provide some additional capacity beyond system demand. There are three ways in which to accomplish this: 1) maintain the additional capacity in-house by operating more ambulances than are typically required (this is the current approach) and 2) contract with another provider to deliver additional ambulances when needed and 3) provide additional units and cross-staff them from other units in the system.
- Even at three standard deviations (covering 97% of the range of demand) unit demand does not approach two full units even during the peak hours.
- The hospital is currently located in a location which is extremely beneficial for the Division of Fire in terms of its EMS “refill rate” in which the Medic units are returned to the system quickly. Plans to move the hospital to the far eastern edge of the City (rather than in the middle of the City) will increase travel times to and from the hospital. The potential impact from this change (estimated at an additional 25 minutes per trip on average) is shown, below:

Hour	EMS CFS	Hours	Average Unit Demand	2 Std Dev Unit Demand
0000	185	226.63	0.62	0.83
0100	190	232.75	0.64	0.84
0200	172	210.70	0.58	0.80
0300	155	189.88	0.52	0.76
0400	116	142.10	0.39	0.67
0500	125	153.13	0.42	0.69
0600	141	172.73	0.47	0.73
0700	178	218.05	0.60	0.82
0800	248	303.80	0.83	0.98
0900	272	333.20	0.91	1.04
1000	340	416.50	1.14	1.20
1100	360	441.00	1.21	1.25
1200	330	404.25	1.11	1.18
1300	323	395.68	1.08	1.16
1400	345	422.63	1.16	1.22
1500	317	388.33	1.06	1.15
1600	334	409.15	1.12	1.19
1700	342	418.95	1.15	1.21
1800	306	374.85	1.03	1.12

Hour	EMS CFS	Hours	Average Unit Demand	2 Std Dev Unit Demand
1900	326	399.35	1.09	1.17
2000	329	403.03	1.10	1.18
2100	299	366.28	1.00	1.11
2200	244	298.90	0.82	0.97
2300	229	280.53	0.77	0.94
Total	6,206	7,602.35	0.87	1.01

The change in hospital location will have no impact on the number of units required in the system and on the hours that those units will be required.

The City and Division of Fire have several alternatives that arise from these findings:

- Reduce the number of units available during off-peak hours from three to two. The third medic could be cross-staffed from its co-located engine company on an as-needed basis. This would be complicated by the fact that the current contract implicitly prohibits 12-hour shifts for line personnel.
- Reduce the number of dedicated medic units to two around the clock. The third medic unit could be cross-staffed from a co-located fire unit.
- Maintain the current approach.
- Increase the number of medic apparatus and cross staff them from existing companies. This will serve to distribute the workload, reduce response times and enhance services.

Recommendation: The City should reduce the number of dedicated medic units from three to two. This should be done in conjunction with the Division of Fire being required to operate efficiently with current staffing. Over the long run the City should pursue deployment of additional ambulances, one per station, thereby enhancing the flexibility of deployment and service delivery. The cost for obtaining additional ambulances (two would be required) would be approximately \$300,000, plus on-going maintenance costs.

7. CURRENT STAFFING DOES NOT EFFICIENTLY SUPPORT TARGETED MINIMUM STAFFING. HOWEVER, MINIMUM STAFFING CAN BE REDUCED TO 20 ON-DUTY IN CONJUNCTION WITH THE REDUCTION IN MEDIC UNITS, THEREBY REDUCING OVERTIME EXPENDITURES.

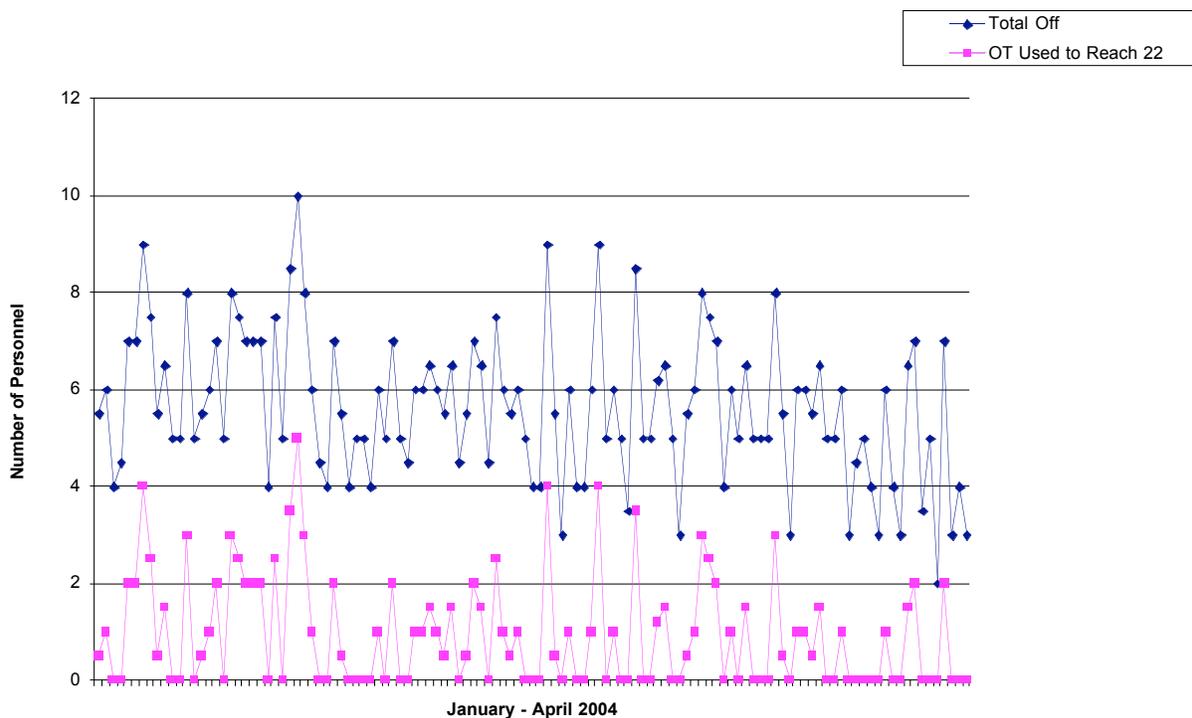
This section of the report focuses on the staffing required to meet the current objective of having 22 personnel on duty (minimum) per shift. Understanding this factor is crucial to understanding the options that are available to the City and Division, as well as to assess opportunities which may exist to enhance the efficiency of the current approach.

Current policies and procedures as well as the collective bargaining agreement contribute to allowing personnel time off for vacation, sick leave, union business, holidays, military leave, bereavement leave and so on. In addition, the City has agreed to a 51 hour average work week in the collective bargaining agreement which is designed to work by “paying back” additional time worked in the average work week through the granting of compensatory time, described in the agreement as “extra days off.” The result of these agreements and schedules is that it takes more people to staff the shift to ensure the minimum targeted staffing.

Management of several leave categories (EDO's, vacation, holiday) is a critical facet for controlling overtime. It is not possible to operate without overtime due to the unforeseeable nature of sick, bereavement and other similar leave categories. The Department's current approach to managing EDO's and vacation is as follows: no more than three people shall be allowed for either EDO and vacation (for a total possible six personnel off). The project team collected a sample of data showing the variance in time off for various categories. The exhibit, which follows, depicts the use of vacation, EDO's and the overtime on each day in the sample period. It should be noted that other

factors contribute to the use of overtime (including other leave categories). It should also be noted that currently these two major leave categories are managed as separate elements.

Use of Leave and Overtime to Reach 22 On Duty in the Division of Fire



The Division should take a different approach to managing leaves – it should, as is its current practice, determine what its total leave “liability” is for the year; once this decision is made, the Department should determine what the total number of days off should be. The key is to determine how many personnel should be allowed off on each day to meet this need. The table, which follows, shows part of that calculation:

Type of Leave	Vac / Hol	EDO's	Total Hours
Total	24,749.0	20,705.5	45,454.5
Hours / Day	67.8	56.7	124.5
# / Day to Cover	2.8	2.4	5.2

Note that the Division’s current approach of allowing no more than three off per day appears to be an effective way of managing days off. However, a second calculation shows that there is an opportunity to improve its efficiency:

Total Hours	45,454
Days / Year	365
Off	5
Total Covered	43,800
Remainder	1,654
Days / 6 Off	69

This analysis shows that the proper way to account for this is to allow six personnel off on a total of 69 days (given last year’s combination of staffing, longevity and the influence of the calendar on shift rotation). An element that can also be controlled for is to ensure that seniority is distributed roughly evenly across the three platoons, thereby ensuring a proportional distribution of time off and no “heavy” shift in terms of vacation and EDO liability.

The potential impact of this on savings could be significant. As the table below explores, the current staffing levels of the Department are insufficient to maintain 22 personnel cost-effectively (the liability of EDO and vacation places the Division in a hiring position for overtime coverage 69 days a year at minimum – before sick or other uncontrollable leaves). The approach to determining the “net availability” is a simple one, as shown, in the following table:

Factor	Value
Average Daily Positions Absent Per Shift (2003)	6.75
Number of Positions Per Platoon (Authorized)	27
Percent of Positions Vacant	25%
Net Availability	75%

The analysis shows that the net availability for personnel is 75%. This figure includes the extra days off, holidays, vacation days, sick days and other forms of leave.

Our analysis shows that this has two implications for the Division of Fire. The first is shown in the table, below:

Factor	Value
Minimum Staffing Target / Shift	22
Net Availability Factor	75%
Staffing Required / Shift to Meet Minimum (# / %)	29

Note that the Division of Fire would require 29 positions per platoon to minimize the overtime and to provide for a minimum staffing of 22 people per shift. This is two more than the current deployment. However, the 27 people assigned will efficiently provide for the 20 required to deploy current units less one medic unit. This is portrayed in the table, below:

Factor	Value
Staffing Currently Assigned Per Platoon	27
Net Availability Factor	75%
Minimum Staffing With Minimum Overtime	20

This analysis shows that the Division is currently exceeding the capacity of its personnel on each shift by a little more than two (2) positions. This is further borne out when we refer back to the analysis of leave utilization that shows that more than 2.4 personnel are working on an overtime basis on every shift, on average (the non-rounded staffing required to meet the 22 person minimum staffing is 29.3).

Factor	Value
Staffing Currently Assigned Per Platoon	27
Staffing Required With Minimum Overtime	29
Difference	2
Total Difference (3 Platoons)	6
Cost Per Positions (Salary and Benefits)	\$60,000
Total Cost	\$360,000
Overtime Cost of Covering 7.2 Positions (2.0 / Shift)	\$450,000
Annual Savings from Hiring	(\$90,000)

The project team has also shown that the Division of Fire is currently operating with excess dedicated medic capacity. Steps can be taken, including the purchase of additional transport capacity, to reduce the number of dedicated and staffed medic units

in the Division of Fire while retaining levels of service. This will also enable the Division to operate more efficiently with currently authorized staffing.

Recommendation: The Division of Fire should manage EDO’s and vacation / holiday time as a single bank of time. No more than five (5) should be allowed off during 296 shift days and no more than six (6) allowed off on the remaining 69 shift days. The Division should reduce minimum staffing to 20 if it continues to operate with current deployment decisions.

8. SEVERAL ALTERNATIVES TO DEPLOYMENT AND UNIT STAFFING EXIST WHICH WILL ALLOW THE DIVISION TO OPERATE WITH 19 ON-DUTY WITHOUT REDUCING PERFORMANCE VERSUS CURRENT GOALS.

This section provides an assessment of a number of alternatives to the current deployment approach. The current minimum staffing of 22 is deployed as shown in the table, which follows:

Station	Location	Emergency Units	Minimum Staffing
1	N. Clinton Ave. @ Columbia Ave.	Medic 1 (M1) Engine 1 (E1) Hazmat / Rescue	2 3 XS
2	S. Dixie Hwy @ Towne Blvd.	Medic 2 (M2) Engine 2 (E2)	2 3
3 (HQ)	Roosevelt Blvd. @ Wicoff St.	Medic 3 (M3) Engine 3 (E3) Quint 3 (Q3) Chief 3 (C3) Medic 5 (M5)	2 3 XS 1 XS
4	Tytus Ave. @ Jackson St.	Quint 4 (Q4)	3
5	Central Ave. @ South Briel Blvd.	Quint 5 (Q5)	3
Total			22

Note that the key characteristics of the current deployment approach are as follows:

- Medic units are staffed with two personnel.

- Fire units (engines and aerial / quints) are staffed with a minimum of three personnel (including one officer).

The project team’s analysis focuses on what other opportunities for deployment may exist and to determine what the impact of those deployments might be on service levels to the community. The project team examined a total of four alternatives, which are briefly summarized, below:

Alternative	Description	Staffing Required
Current	Engines / Ladders with 3 FF Dedicated Medics with 2 FF	22 @ minimum
Alternative 1	Engines / Medics with 2 FF Medic unit in every station	21 @ minimum
Alternative 2	Engine / Medic Stations 4 FF 3 Dedicated Medic Stations Non-medic Stations With 3 FF	19 @ minimum
Alternative 3	Engine / Medic Stations 4 FF 2 Dedicated Medic Stations Other Stations With 3 FF	18 @ Minimum
Alternative 4	All Stations with 3 FF	16 @ minimum

The points, which follow, describe the approach taken by the project team in developing each of the alternatives:

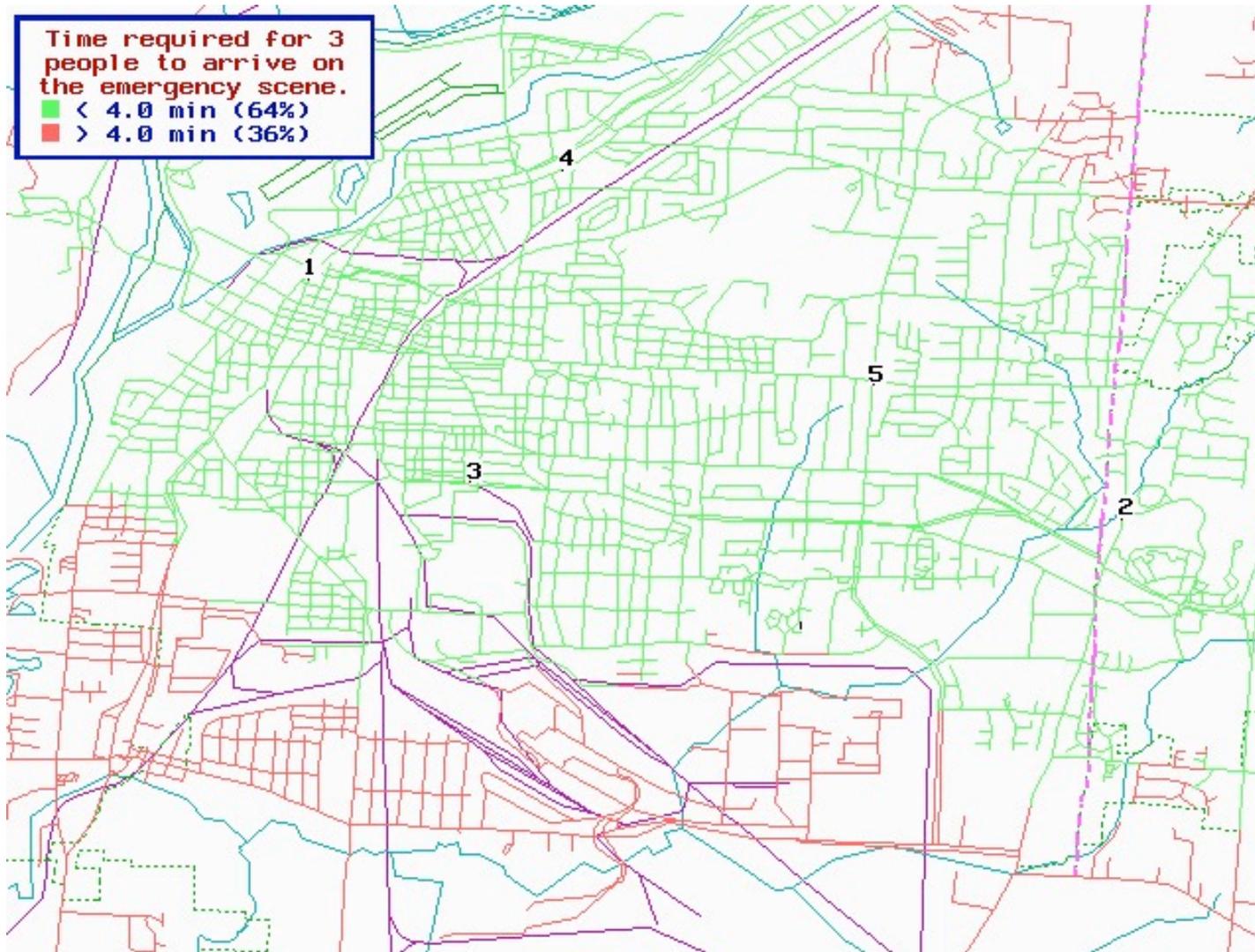
- **Alternative 1:** This option is focused on creating four-person companies citywide. The primary idea behind this approach is to offer the City enhanced flexibility with its units to respond to the majority of calls (EMS) while maintaining maximum flexibility to respond to future calls. A Deputy Chief would respond from Station 3 as is the current practice.
- **Alternative 2:** This second option focuses on maintaining flexibility in the medic stations while also maintaining current staffing in the remaining two stations. This approach maintains the ability to deploy an initial response to medical calls from the medic stations if the transport unit is already deployed. A Deputy Chief would respond from Station 3 as is the current practice. *Alternatively the Division could deploy 3 personnel in every station with 3 additional assigned to a dedicated ladder truck. All engine crews could eventually cross-staff medic units.*
- **Alternative 3:** This option assumes the reduction of one dedicated medic unit from the current three to two. All medic stations would be staffed with four personnel and the other stations with three personnel. A Deputy Chief would still be assigned to each shift.

- **Alternative 4:** Should be viewed as the “worst case” scenario which maintains the ability to at least initially respond to calls in all areas. This scenario would represent a major decline in service levels and service capabilities for the City and the Division of Fire. A Deputy Chief would respond from Station 3 as is the current practice.

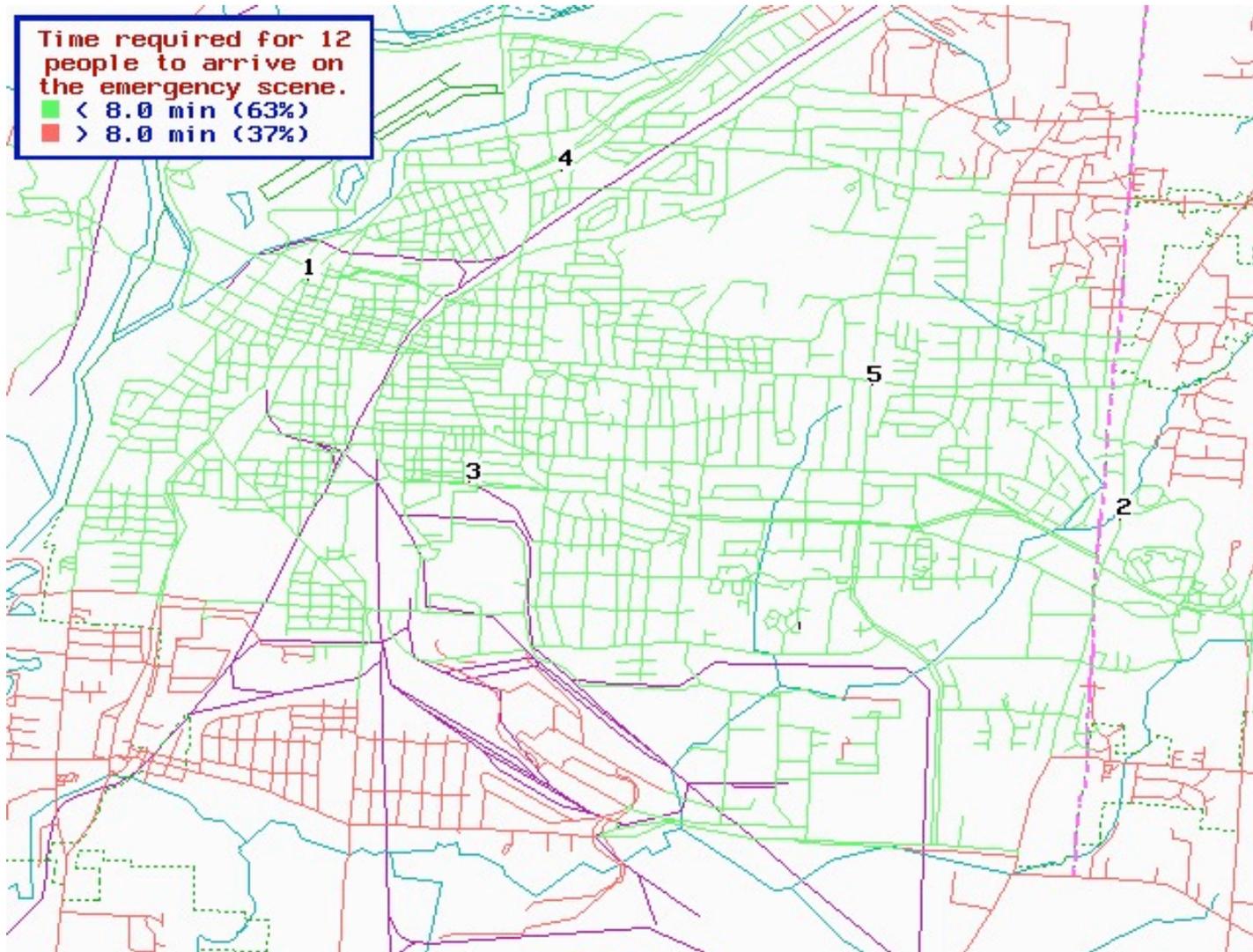
The project team examined the impact of each of these alternatives on the ability to achieve the stated goals: initial response in four minutes or less by at least three first responders and the ability to deliver at least 12 people in eight minutes or less (these are the current de facto goals of the City and Division). The maps, on the following pages, show the impact of these various options. Each analysis can be compared to the analysis presented previously focused on the current system.

The major findings from these analyses can be found summarized in a table which follows the maps. This table includes the results from the analysis of the current system for comparison.

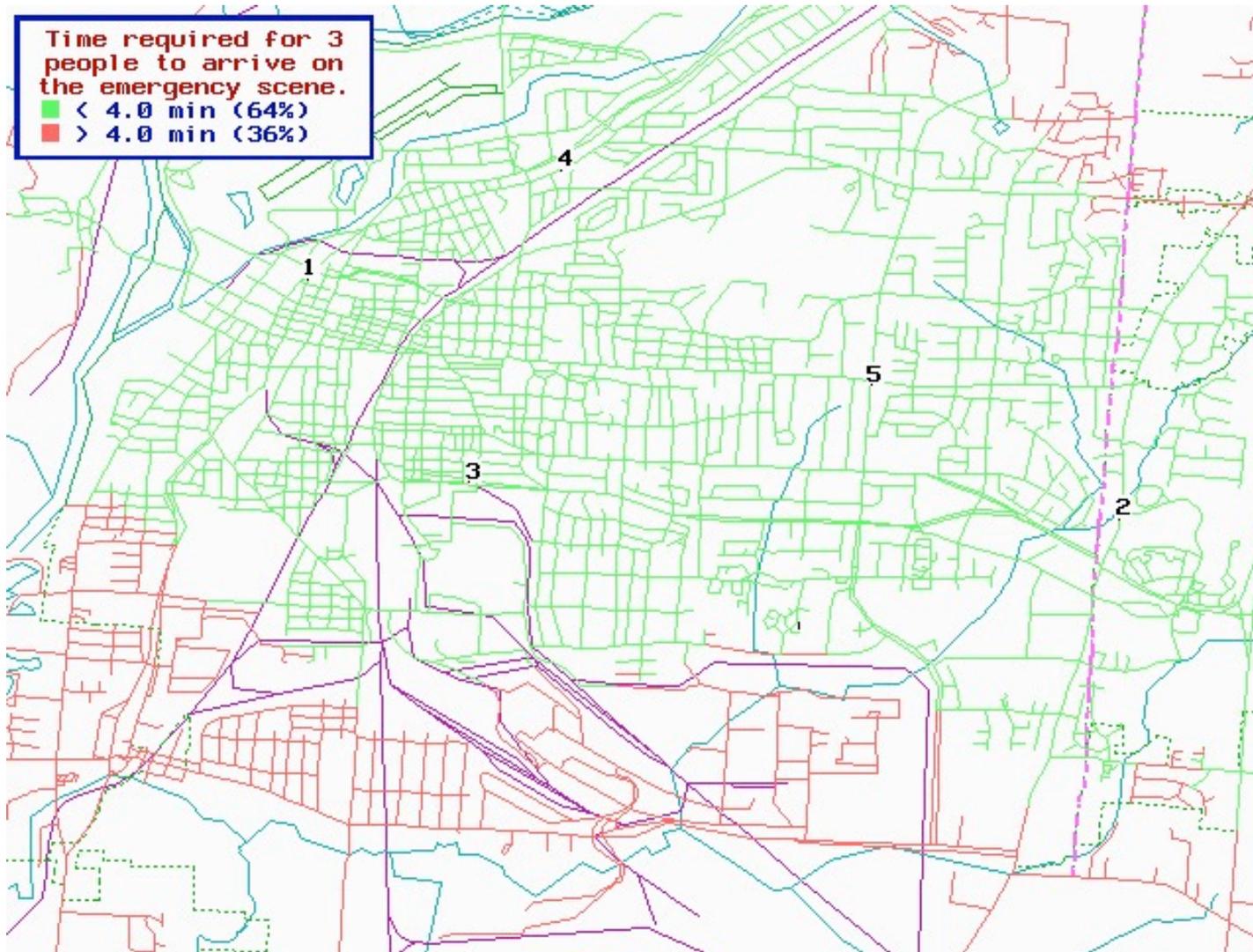
Alternative 1: Ability to Place First Response On-Scene



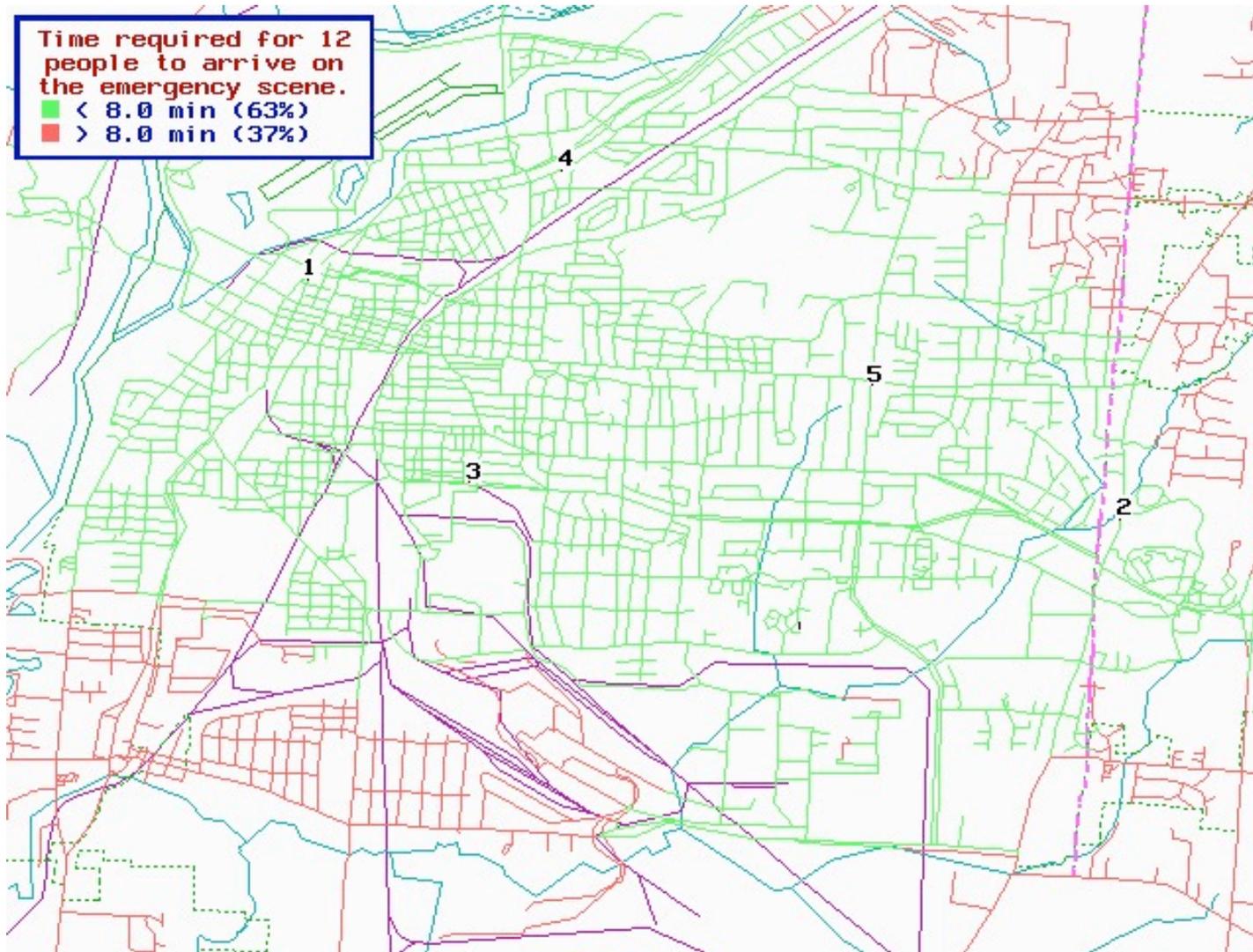
Alternative 1: Ability to Place Initial Structure Response On-Scene



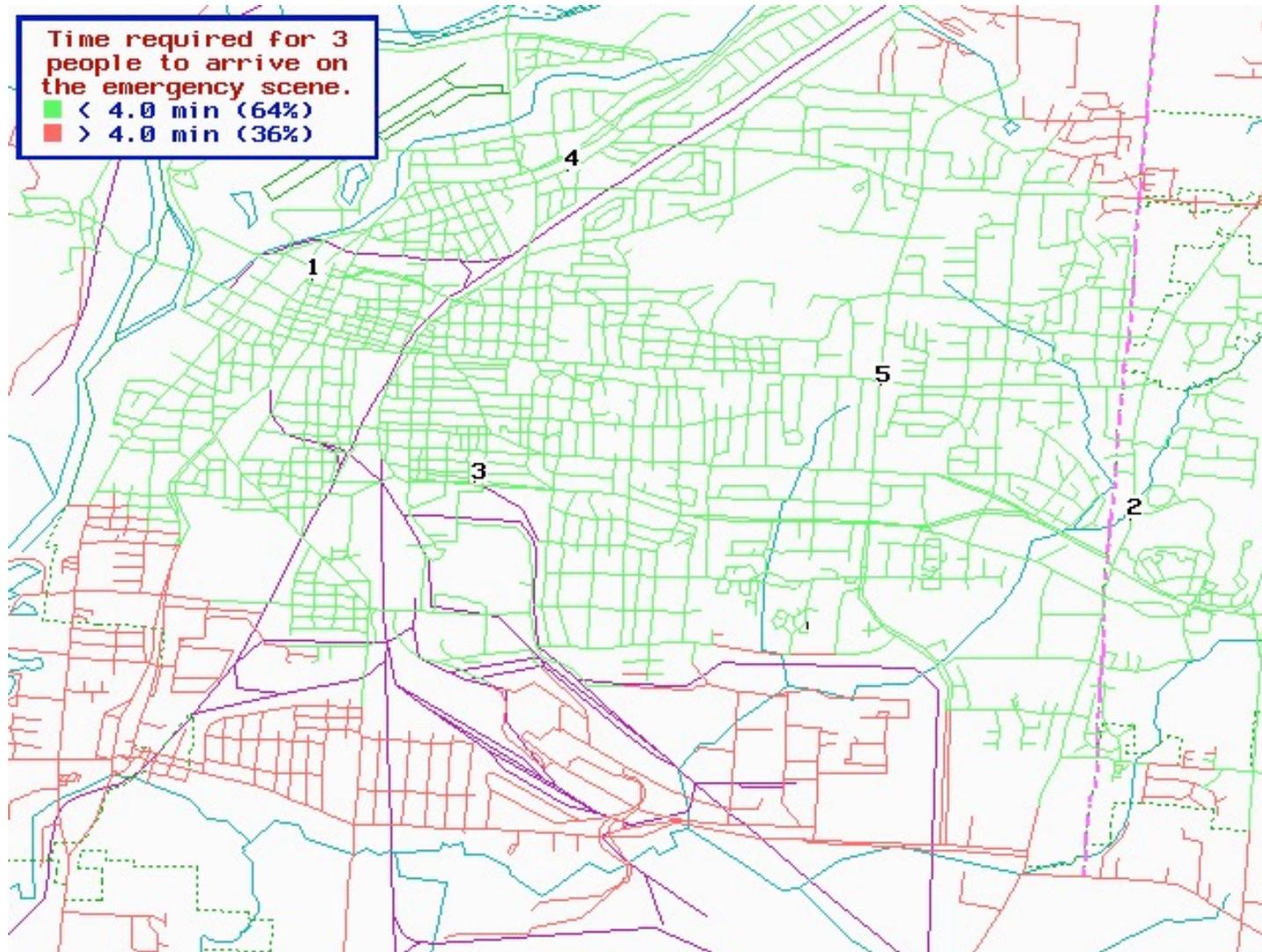
Alternative 2: Ability to Place First Response On-Scene



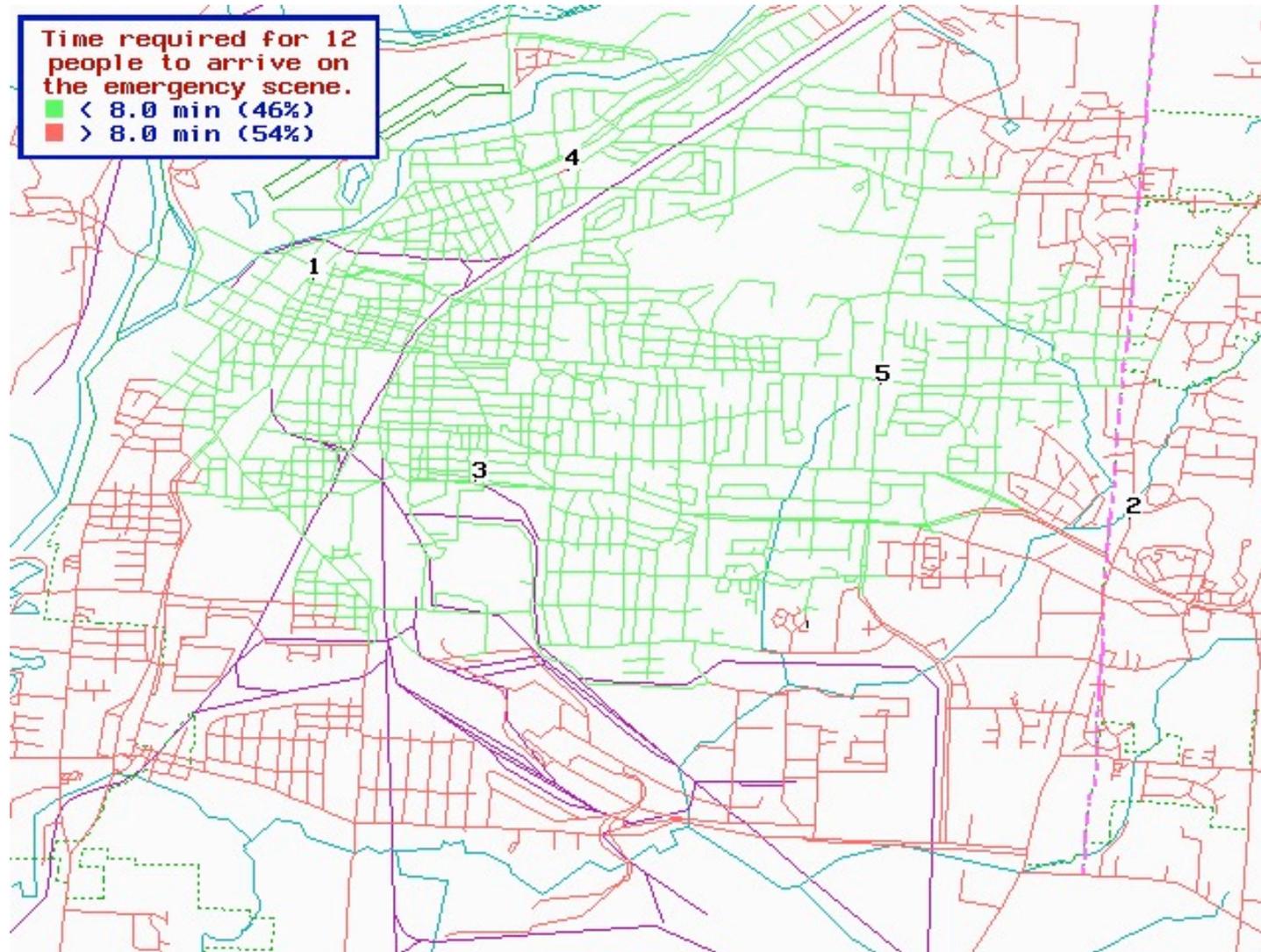
Alternative 2: Ability to Place Initial Structure Response On-Scene



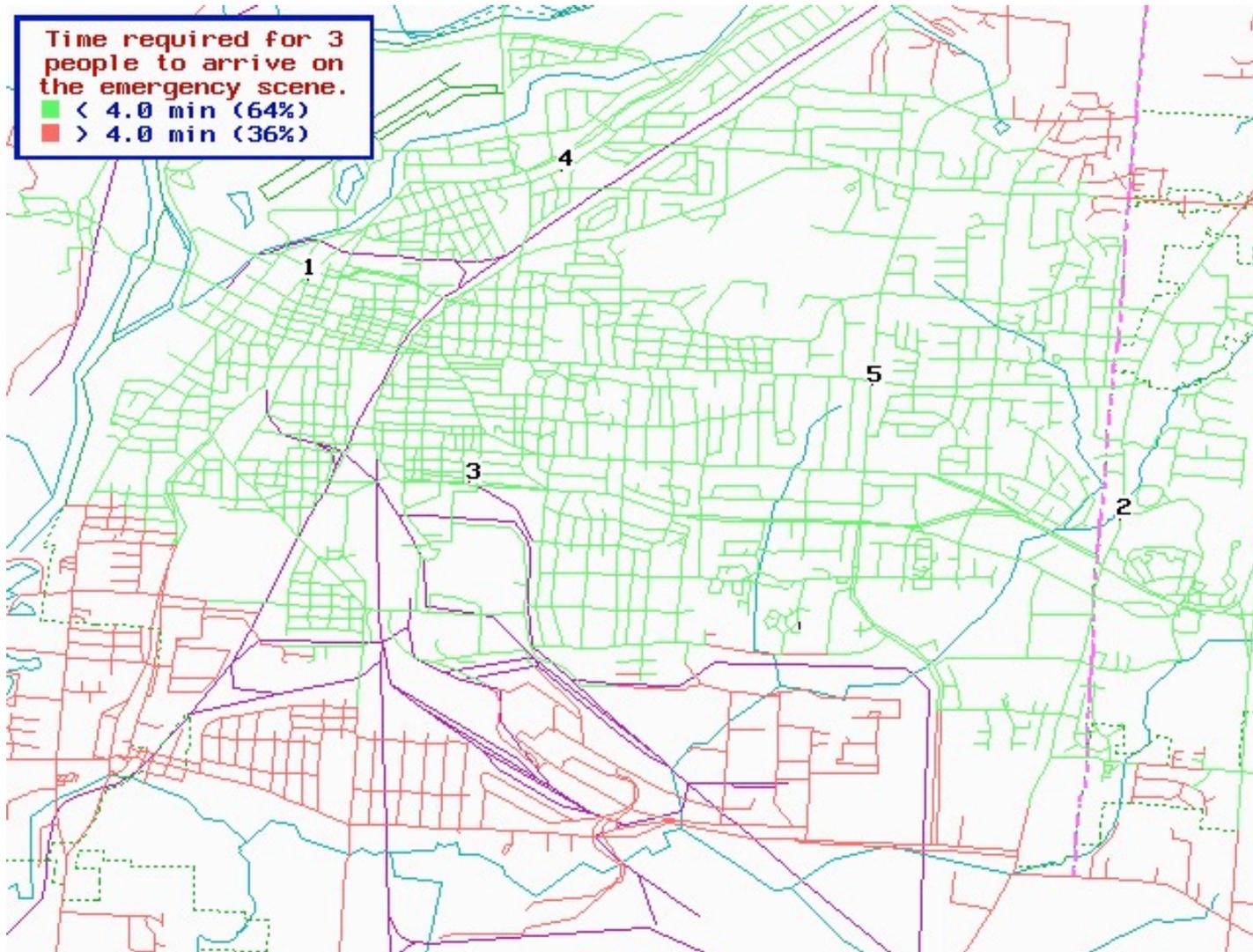
Alternative 3: Ability to Place First Response On-Scene



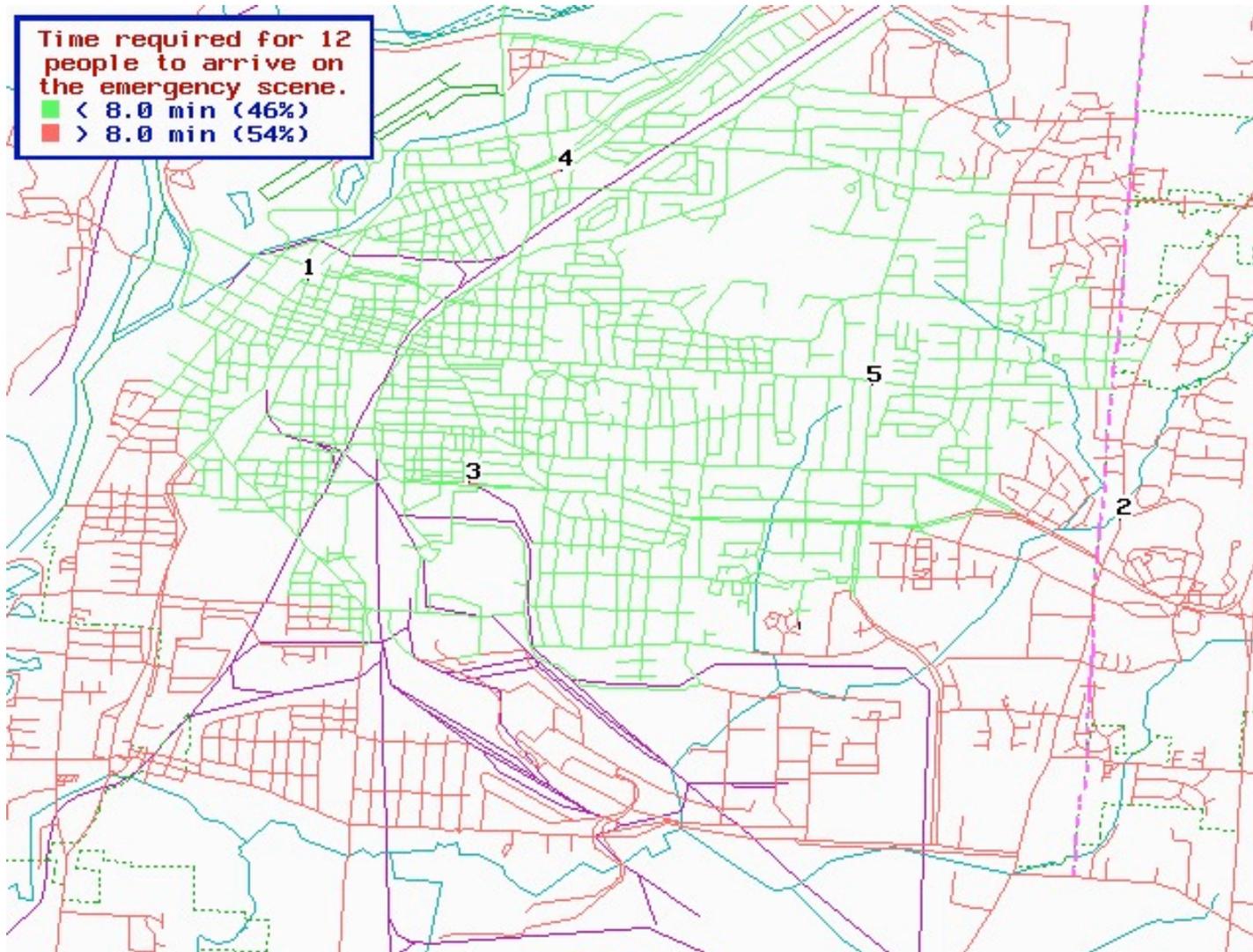
Alternative 3: Ability to Place Initial Structure Response On-Scene



Alternative 4: Ability to Place First Response On-Scene



Alternative 4: Ability to Place Initial Structure Response On-Scene



The maps on the preceding page show the resulting impact from making the various changes to the response network. The table, which follows, provides a summary of the system impacts. Note that the resulting impacts are compared to the current system which was presented previously in this report.

Alternative	First Response Road Miles	First Response Calls	Structure Response Road Miles	Structure Response Call
Current System	64%	92%	63%	90%
Squad (2+2)	64%	92%	63%	90%
Squad / 3's (3 Medics)	64%	92%	63%	90%
Squad / 3's (2 Medics)	64%	92%	46%	65%
3's in All Stations	64%	92%	46%	65%

It is interesting to note that the changes in deployment do not negatively impact the response capabilities of the Division of Fire, with the exception of the last two alternatives (which would reduce on-duty staffing to 18 and 16 people at minimum). It is also important to note that the overall staffing required for the Division of Fire will change. This can best be calculated by referencing the current utilization of leave and applying it to the minimum staffing required in each alternative.

To determine how many personnel are required to achieve various minimum staffing targets, divide the number of personnel targeted at minimum staffing by the net availability (as discussed previously in this report). A critical assumption is that the mix of seniority would be roughly the same regardless of the ultimate size of the minimum staffing targeted. This analysis is shown, below:

Alternative	Staffing Target	Staff Required
Current	22	29
Alt. 1: 2+2 @ Every Station	21	28
Alt. 2: 2+2 @ Medics / 3 @ Others	19	25
Alt. 3: 2 Medic Stations / 3 @ Others	18	24
Alt. 4: 3 @ All Stations	16	21

The paragraphs, which follow, provide a summary of the key findings from this analysis:

- Previous analysis has shown that the current level of staffing (27) is insufficient to efficiently staff the current minimum staffing target of 22 personnel per shift. This is borne out by the fact that each shift the Division is operating with at least two personnel on overtime each day.
- The analysis also shows that the current level of staffing would be insufficient to efficiently staff Alternative 1. The analysis shows that this level of staffing would require at least one person on overtime for each shift (on average).
- Alternative 2 can be staffed with 25 or more personnel efficiently. This could result in a reduction of required staffing assigned to each platoon. The staff reductions would be taken at the lowest classification since the number of units would not change.
- Alternative 3 would result in a requirement for 24 personnel to result in a minimum daily staffing of 18.
- The final alternative (Alternative 4) would result in a significant reduction in staffing in the Division of Fire. In this example, 21 personnel would be able to cover 16 minimum staffing positions.

It is important to note that there would be other impacts to the operations and flexibility of the Division of Fire under each alternative. These are summarized, below:

- Reducing the number of personnel on-duty will reduce the flexibility of the Division in terms of responding to multiple calls. An analysis of the call for service data for 2003 shows that approximately 39% of calls occur while another call is on-going. A third concurrent calls occurs about 5% of the time. One of these concurrent calls will be a fire about 2% of the time.
- Reducing the number of personnel on-duty will also reduce the flexibility of the Division when large-scale events occur requiring more than the initial 12 personnel to be dispatched to the scene. An analysis of call for service data show that this occurred 216 total times (136 with a fifth unit and 80 more where a sixth unit was called). This is equivalent to 2.7% of the Division's total responses in 2003 – or approximately once every two days. A review of concurrent call activity shows that a second call occurs when a very large call occurs approximately once every 4.2 days. In almost 100% of the cases, these second calls were medical emergencies requiring one or two units to respond under current response protocols.

While it is impossible to compute the “risk” associated with such analyses, it is possible to indicate that a reduction in staffing by the equivalent of one unit will increase the chances of there being no units available to respond from less than 1% to approximately 5% under Alternative 3 – with less significant increases for the other options. This risk can be partially offset by working with other ambulance providers to provide for transport once two units have been assigned (though this would also be accompanied by a loss in revenues).

Alternative	Overtime Reductions	Position Reductions	Total Savings
Current System	\$0	\$0	\$0
Alt. 1: Squad (2+2)	\$225,000	\$0	\$225,000
Alt. 2: Squad / 3's (3 Medics)	\$450,000	\$360,000	\$810,000
Alt. 3: Squad / 3's (2 Medics)	\$450,000	\$540,000	\$990,000
Alt. 4: 3's in All Stations	\$450,000	\$720,000	\$1,170,000

It should also be recalled that simply operating with the current number of personnel, while minimizing overtime by operating with 20 personnel at minimum staffing, will result in annual savings of \$450,000.

Recommendation: Current service levels achieve reasonable performance goals. However, the project team’s analyses have shown that the City can select a lower minimum on-duty staffing of 19 personnel for the Division of Fire without significantly reducing the first response capability of the Division though there could be impacts to the Division’s ability to respond to concurrent calls for service. Dropping below 19 personnel (at minimum staffing) would clearly result in reduced service levels to the community unless major steps were taken to redistribute workload (such as EMS transport) to other providers. Reducing minimum staffing to 19 will result in annual savings of approximately \$810,000.

9. ANALYSIS OF THE FISCAL IMPACT OF VARIOUS AVERAGE WORKWEEKS IN THE DIVISION OF FIRE.

The current collective bargaining agreement stipulates that employees who are assigned to the 24-hour shift will work an average workweek of 51 hours. This is currently arrived at by granting personnel a series of “extra days off” every 11th shift worked (though they are taken once every 11 shifts). The key question is whether this

approach is the most efficient way to schedule personnel. The project team examines this question with the following approach:

- What is the difference in the number of personnel required to achieve a targeted number of personnel?
- What are the costs or savings which result from any schedule changes?

A review has shown that prior contract changes in the number of hours did not result in a reduction in pay even though the personnel were working fewer hours. The reduction in hours can therefore be seen as an increase in wages. The table, below, shows the impact of these changes:

Base	New	% Change
56	53	5.7%
53	52	1.9%
52	51	2.0%
51	50	2.0%

Note that the largest “wage increase” occurs during the move from 56 to 53 hours. However, the other changes result in a smaller increase of approximately 2%. In each case, these changes were also accompanied by an additional increase in wages so that the hourly rate may have increased not only by the 2% (from 52 to 51 hours) but also by an increase of 2% or more per year.

In an effort to show the impact of these changes, the project team developed the following analysis. In order to make the analyses comparable, we have maintained the annual salary at the same level (except in the case of 56 hours where we show the impact of the built-in three hours of overtime each week). The “Annual Hours” in each case are defined as the number of positions at minimum staffing multiplied by 365 days and by 24 hours per day (i.e., $22 \times 365 \times 24 = 192,720$ Annual Hours). The table, which follows, shows that there is a difference of more than \$140,000 annually (keeping with

the 22 person minimum staffing example) between the 53 and 51 hour average workweeks. This shows the economic cost of the “hidden” wage increase resulting from the reduction in work hours for all employees.

Minimum	22	21	20	19	18	16
Annual Hours	192,720	183,960	175,200	166,440	157,680	140,160
51 = 2,255 Net	84	81	78	75	69	63
52 = 2,307 Net	84	81	75	72	69	60
53 = 2,359 Net	81	78	75	72	66	60
Salary / \$18.10	\$48,001	\$48,001	\$48,001	\$48,001	\$48,001	\$48,001
Salary / \$18.10	\$48,001	\$48,001	\$48,001	\$48,001	\$48,001	\$48,001
Salary / \$18.10	\$48,001	\$48,001	\$48,001	\$48,001	\$48,001	\$48,001
Cost @ 51	\$4,032,101	\$3,888,097	\$3,744,094	\$3,600,090	\$3,312,083	\$3,024,076
Cost @ 52	\$4,032,101	\$3,888,097	\$3,600,090	\$3,456,086	\$3,312,083	\$2,880,072
Cost @ 53	\$3,888,097	\$3,744,094	\$3,600,090	\$3,456,086	\$3,168,079	\$2,880,072

Note that the Net Hours in each example include a reduction for vacation, personal, holiday, sick and other non-EDO leaves. The EDO’s are already included in the average work week (i.e., the current 51 hour work week assumes the EDO’s).

The project team does not believe that the City is likely to succeed in moving the workweek in the opposite direction. Current trends in Ohio are towards shorter workweeks in the fire service. Recent arbitration decisions have favored proposals that result in shorter workweeks and the City will be bound by those trends and decisions. However, the project team urges the City to keep in mind that the reduction in hours does impact both the economics of the Division as well as the ability to staff operations. For example, the small drop to a 51 hour workweek resulted in a requirement that the Division increase staffing by several positions to continue this level of service, or to increase overtime expenditures.

Recommendation: Resist future efforts to lower the workweek without addressing issues of economic impact and the impact on staffing of operations.

3. EVALUATION OF SUPPORT SERVICES

This section provides the project team's analysis of the various support services functions in the Fire Department and dispatch (which is in the Police Department). The first section, which follows, provides a summary of our analysis of dispatch operations and staffing needs in the center.

1. EVALUATION OF EMERGENCY COMMUNICATIONS SUPPORT FOR THE DIVISION OF FIRE

The Communications Center handles police, fire, and EMS dispatching for the City and serves as the regional 911 center for northern Butler County, answering and transferring 911 calls for Trenton, Monroe, Madison Township and Ohio State Patrol.

The following points highlight the center's organization and operation.

- The Communications Center is part of the Services Division of the Middletown Police Department and has an authorized staff of 1 sergeant position, 1 communications supervisor, and a total of 16 dispatchers.
- Dispatch personnel work 8-hour shifts with a minimum staffing level of 3-4 personnel per hour.
- There are 4 console positions, each having the capability of answering calls, as well as dispatch.
- Typically, the center will be staffed with 1-2 designated call takers, 1 designated dispatcher for law enforcement, and 1 designated dispatcher for fire and EMS – each providing back-up when necessary.

For the calendar year 2003, the Communications Center dispatched for 44,286 community generated calls for law enforcement services and 8,011 fire and EMS calls, including ALS, BLS, fire alarms, mutual aid, etc. – for a total workload of 52,297 dispatches.

(1) Fire and EMS Response Policies

This section provides the dispatch policy information that is utilized by the Communications Center for the dispatching on fire and EMS incidents. The following table shows the codes used by the dispatchers for the various types of calls.

CODE	TYPE OF CALL
100	Advanced Life Support Medical Call (ALS). An incident at which paramedic skills are likely to be needed, for example: difficulty breathing, chest pains, cardiac or respiratory arrest, possible stroke, possible recent death, overdose, poisoning, possible or attempted suicide, drowning, semi- or unconscious, choking, amputation, electrocution, burns, imminent child birth, bleeding, shooting, stabbing, auto accident with injuries, etc.
101	Basic Life Support Medical Calls (BLS). An incident usually not requiring paramedic skill, for example: illness, pains, fractures, mental, nervous, intoxication, obstetrical, diabetic, seizures, etc. Dispatchers are advised that if in doubt, send the ALS units.
110	Medical Transport
200	Box Alarm. A response to an emergency when it is deemed necessary to have a full response (2 engines, 1 ladder truck, 1 medic unit, and a command vehicle). Examples include: A fire in a structure, a fire outside a structure that is threatening structure or the health and/or well being of humans, smoke in a structure, an aircraft incident, a confined space rescue, a trench rescue, etc.
201	Still Alarm. Generally a fire outside a structure that does not threaten a structure or humans. Examples include: vehicle fires, dumpster fire, grass fire, brush fire, rubbish fire, open burning of any sort not allowed by code, electric wires down, etc. Dispatchers are advised that if in doubt, send dispatch as a box alarm.
300	Haz Mat Call (Inside City)
400	Assist
401	Investigation
402	Carbon Monoxide
500	Entrapment
600	Mutual Aid Squad (Sent outside City)
601	Mutual Aid Fire (Sent outside City)
602	Mutual Aid Haz Mat (Sent outside City)

For these types of incidents, the personnel for the dispatching of units utilize the following procedures for non-medical and medical incidents.

(1.1) Non-Medical Dispatch

The following table shows the non-medical dispatch procedures for a box alarm, a still alarm, and non-emergency incidents.

<p>Emergency Box Alarm</p>	<ol style="list-style-type: none"> 1. Activate "All Units" page two times. 2. Dispatch following units. 2 engine companies 1 ladder truck 1 medic unit command unit 3. Receive acknowledgment from units. 4. Activate "All Units" page two times. 5. Dispatch units second time, including any additional pertinent information
<p>Emergency Still Alarm</p>	<ol style="list-style-type: none"> 1. Activate page for appropriate unit. 2. Dispatch 1 engine company. 3. Receive acknowledgment. 4. Activate page for unit. 5. Dispatch unit second time, including any additional pertinent information
<p>Non-Emergency</p>	<ol style="list-style-type: none"> 1. Activate page for appropriate unit. 2. Dispatch unit. 3. Receive acknowledgement 4. Activate page for unit. 5. Dispatch unit second time, including any additional pertinent information

These approaches to processing and dispatching calls for service appear to be appropriate for the current technological approach to dispatch. However, the introduction of laptops into the fire and EMS response units suggests that the second toning and additional dispatching could be considered for elimination. Additional dispatch information could be sent directly to the units via their laptops with no need for additional dispatcher information.

Recommendation: Change dispatch procedures to acknowledge the increased technological capabilities of the Division of Fire through the introduction of laptops into the engines, trucks and medic units. Explore the potential for "silent dispatch" of additional information, street addresses, map pages, etc. This should allow personnel to respond more quickly and will reduce workload for the dispatchers (though call takers will continue to update information in CAD).

(1.2) Medical Dispatch

The following table shows the medical dispatch procedures for ALS, BLS, and non-emergency incidents.

ALS	<ol style="list-style-type: none"> 1. Activate page for appropriate units. 2. Dispatch following units. 1 medic unit 1 engine company Engine 2 is to be sent in addition to other units for entrapment. 3. Receive acknowledgment from units. 4. Activate page for units. 5. Dispatch units second time, including any additional pertinent information
BLS	<ol style="list-style-type: none"> 1. Activate page for appropriate unit. 2. Dispatch 1 medic unit. 3. Receive acknowledgment from unit. 4. Activate page for unit. 5. Dispatch unit second time, including any additional pertinent information
Non-Emergency	<ol style="list-style-type: none"> 1. Activate page for appropriate unit. 2. Dispatch 1 medic unit. 3. Receive acknowledgement from unit. 4. Activate page for unit. 5. Dispatch unit second time, including any additional pertinent information

These approaches to processing and dispatching calls for service appear to appropriate for the current technological approach to dispatch. However, the introduction of laptops can also assist in this area of fire / EMS dispatch. The same recommendation described, above, is appropriate for these calls as well.

Recommendation: Change dispatch procedures to acknowledge the increased technological capabilities of the Division of Fire through the introduction of laptops into the engines, trucks and medic units.

(2) Staffing and Workload Analysis

This section explains the project team’s analytical approach to examining the staffing requirements of communication centers.

(2.1) Analytical Approach Based on Quantifiable Elements of Communications Workload.

There are several approaches which can be used to assess the staffing needs of a public safety communications center serving individual or regional areas. These approaches include the following:

- Methods which are based on comparisons with other agencies. These methods are inconsistent because the workload, technology and service level requirements vary tremendously among agencies.
- Approaches which are based on staffing a targeted number of “fixed posts” allocated on a functional basis (e.g. call taker, law enforcement radio, fire / rescue radio, etc.). These approaches are unsound because they do not tie staffing to actual workload.

The Matrix Consulting Group used a quantitative process for assessing communications staffing needs based on actual workloads in the existing communications centers. The paragraphs below summarize this approach, its assumptions and the time standards used.

- As an analytical starting point, there are relationships among communications center workloads that are relatively constant from one agency to another and in a single agency over time. These workload relationships include measuring calls by type such as:
 - The total number of telephone calls received in a communications center expressed on a "per incident" or "per call for service" basis.
 - The total number of radio transmissions handled in a communications center expressed on a "per incident" or "per call for service" basis.
 - The total number of other workloads handled and expressed on a "per incident" or "per call for service" basis.
- Since most agencies do not track individual work elements of a communications center, such as the number of transmissions, and since virtually no agency consistently measures the time taken for each task, standards are borrowed from other agencies and verified, where data exists, against workloads handled in the dispatch centers.
- These standards were developed by the project team and others using detailed time and motion studies of communications centers nationwide. These

communications centers incorporated state of art CAD technology and provided service to both law enforcement and fire / rescue agencies and emergency medical dispatch (EMD).

- Since police and fire calls for service are typically counted consistently and by most agencies, these communications "standards" are converted on the basis of total minutes of workload per call for service.
- More specifically, estimates of total communications center police and fire workloads (including not only calls for service related workloads, but also workloads associated with self-initiated and administrative activities) are expressed as a ratio of time per call for service. These time standards include the following:
 - For each law enforcement call for service, the equivalent of 8.9 minutes of call, self-initiated and administrative related communications workloads are allocated. This includes time estimates of radio, telephone, record check and administrative tasks. The 8.9 minutes is comprised of the following elements:
 - 130 seconds are allocated to process a service request (citizen generated call for service) and transfer to a radio dispatcher. This standard incorporates the fact that multiple calls can be generated by the same incident and that administrative / business calls are handled by staff in the communications center.
 - 327 seconds of total radio transmissions related activity expressed on a "per call for service" basis -- including call-related and officer / deputy initiated field workloads and administrative transmissions.
 - 13 seconds are allocated for record checks via the teletype -- expressed on a "per call for service" basis.
 - 64 seconds are allocated for other tasks associated with the dispatch center (administrative, record-keeping, other activities).
 - For each fire, emergency medical and service related incident, the equivalent of 8.2 minutes of call and administrative workloads are allocated. This includes time estimates of radio, telephone and administrative tasks. The 8.2 minutes is comprised of the following elements:
 - 120 seconds are allocated to process service requests and to transfer the call to a fire / rescue dispatcher. This standard incorporates the fact that multiple calls can be generated by the same incident and that administrative / business calls are handled

by staff in the communications center. This includes time accounting for Emergency Medical Dispatch (EMD).

- 372 seconds are allocated to radio transmissions -- this is also expressed on a “per call for service” basis.
- These time standards are then applied against known or estimated call for service workloads handled by the dispatch center. Call for service counts are distributed on a time of day basis and multiplied by the time standards described above (i.e., 8.2 minutes per call for fire / rescue and 8.9 minutes per call for law enforcement). This calculation yields total average communications workloads on a time of day and day of week basis.
- In addition, the project team has included a factor to account for the other communications workload handled by the agencies in the region. This factor is equivalent to 2% of total calls for service for all agencies.
- To address the issue that “average” calls for service per hour rarely occur, the project team calculates staffing to handle up to 95% of the statistically likely workload in any given hour (by calculating it at two standard deviations).
- Finally, to arrive at the number of dispatch center staff required to handle these workloads, a critical assumption needs to be made regarding the levels of productivity desired. An allowance needs to be made regarding the proportion of time which is desirable to have a dispatcher actually involved in call handling, radio transmission and related workloads. There are several reasons why direct task allocation should not be 100% of available time, including:
 - Dispatch centers which have relatively high utilization levels tend to "burn out" staff leading to high employee turnover and abuse of sick leave, disability, etc.
 - Communications centers which have relatively high utilization levels experience "queuing" problems in which responses to incoming calls are delayed because of the number of calls or field units handled.
 - Quality begins to suffer because dispatch personnel are cutting calls and radio transmissions short. This impacts service levels both to field units and the public.

The project team used a task-loading factor of 30 minutes of actual call/radio activity per dispatch personnel per hour. The basis of this assumption is that one-half of every working hour should be used for direct communications workloads. This 30-minute factor is divided into the hourly workload amount in the dispatch center.

The next sections show how the project team applied this methodology to the City of Middletown’s Communication Center. First, however, the following shows the basic assumptions made by the project team that determines the overall staffing requirements.

- The staff would work 8-hour shifts, for a shift factor of 3 (24 hour day divided by 8), and a workweek factor of 1.4 (7 total days divided by 5 working days).
- Staff are available for approximately 82% of the annual working hours, after leave times (i.e., sick, vacation, comp time, training, holidays), which equals 1,706 available hours out of 2,080 total annual gross hours, or a leave shift factor of 1.22 (2,080 divided by 1,706).
- Turnover is assumed to be 10%.

These are important shift factors that will be utilized to calculate total staffing need, once the project team calculates the hourly shift requirements for police, fire, and EMS call processing and dispatching, followed by a summary showing the total staffing requirement based on the individual workload.

(2.2) Police Call and Dispatch Staffing Requirement

Based on the number of community-generated police dispatches of 44,286 (excluding officer-initiated activity), an estimated time requirement of 8.9 minutes to process the dispatch and factoring in multiple calls, etc., and a 50% per hour personnel utilization, the following shows the average hourly staffing requirement to handle the workload.

Hour	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun	Annual Total	CFS /Hour	CFS @ 2 Std Dev	Staffing /Hour
0000	103	138	145	128	132	242	282	1,170	3.2	7.4	2.2
0100	115	111	114	73	116	205	218	952	2.6	6.8	2.0
0200	105	85	97	82	113	170	166	819	2.2	6.5	1.9
0300	78	74	72	50	90	151	129	643	1.8	6.0	1.8
0400	56	76	50	66	67	71	131	516	1.4	5.6	1.7
0500	78	67	73	70	75	123	79	565	1.5	5.8	1.7
0600	141	127	156	127	148	115	106	921	2.5	6.8	2.0

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0700	232	221	211	193	197	158	121	1,334	3.7	7.9	2.3
0800	309	306	321	267	317	266	174	1,960	5.4	9.6	2.8
0900	352	335	347	302	295	280	235	2,145	5.9	10.1	3.0
1000	371	356	351	302	344	344	248	2,315	6.3	10.6	3.1
1100	347	369	355	320	330	359	293	2,373	6.5	10.7	3.2
1200	389	365	391	316	346	360	296	2,462	6.7	11.0	3.3
1300	375	348	390	372	410	319	272	2,486	6.8	11.0	3.3
1400	376	383	408	387	412	332	284	2,582	7.1	11.3	3.4
1500	420	456	403	374	419	365	307	2,744	7.5	11.7	3.5
1600	422	424	436	346	475	334	307	2,745	7.5	11.7	3.5
1700	428	427	413	379	466	346	307	2,765	7.6	11.8	3.5
1800	422	394	383	386	405	324	334	2,649	7.3	11.5	3.4
1900	330	367	328	311	328	314	301	2,280	6.2	10.5	3.1
2000	288	307	296	286	321	304	280	2,083	5.7	9.9	2.9
2100	285	324	302	275	281	363	291	2,120	5.8	10.0	3.0
2200	234	263	268	250	346	355	266	1,982	5.4	9.7	2.9
2300	184	211	181	212	315	333	239	1,674	4.6	8.8	2.6
Total	6,441	6,534	6,490	5,875	6,748	6,532	5,666	44,286	121.3	222.8	2.8

As shown above, the project team estimates that 2-3 dispatchers utilized at 50% are required per hour to handle the police dispatch workload.

(2.3) Fire / EMS Call and Dispatching Staffing Requirement

Based on the number of fire / EMS unit dispatches of 8,011 (includes fire, EMS, assists, investigations, etc.), an estimated time requirement of 8.2 minutes to process the dispatching of units and factoring in multiple calls, etc., and a 50% per pour personnel utilization, the following shows the average hourly staffing requirement to handle the workload.

HOURL	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun	Annual Total	CFS /Hour	Staff / Hour	CFS @ 2 Std Dev	Staffing / Hour
0000	19	25	26	23	24	44	51	212	0.58	0.2	1.0	0.3
0100	21	20	21	13	21	37	39	172	0.47	0.1	0.9	0.2
0200	19	15	18	15	20	31	30	148	0.41	0.1	0.9	0.2
0300	14	13	13	9	16	27	23	116	0.32	0.1	0.9	0.2
0400	10	14	9	12	12	13	24	93	0.25	0.1	0.9	0.2
0500	14	12	13	13	13	22	14	102	0.28	0.1	0.9	0.2
0600	26	23	28	23	27	21	19	167	0.46	0.1	0.9	0.2
0700	42	40	38	35	36	29	22	241	0.66	0.2	1.0	0.3

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0800	56	55	58	48	57	48	31	355	0.97	0.3	1.1	0.3
0900	64	61	63	55	53	51	43	388	1.06	0.3	1.1	0.3
1000	67	64	63	55	62	62	45	419	1.15	0.3	1.1	0.3
1100	63	67	64	58	60	65	53	429	1.18	0.3	1.1	0.3
1200	70	66	71	57	63	65	53	445	1.22	0.3	1.1	0.3
1300	68	63	70	67	74	58	49	450	1.23	0.3	1.1	0.3
1400	68	69	74	70	75	60	51	467	1.28	0.3	1.1	0.3
1500	76	82	73	68	76	66	56	496	1.36	0.4	1.2	0.3
1600	76	77	79	63	86	60	55	497	1.36	0.4	1.2	0.3
1700	77	77	75	69	84	63	55	500	1.37	0.4	1.2	0.3
1800	76	71	69	70	73	59	60	479	1.31	0.4	1.2	0.3
1900	60	66	59	56	59	57	55	412	1.13	0.3	1.1	0.3
2000	52	56	54	52	58	55	51	377	1.03	0.3	1.1	0.3
2100	51	59	55	50	51	66	53	384	1.05	0.3	1.1	0.3
2200	42	48	48	45	63	64	48	359	0.98	0.3	1.1	0.3
2300	33	38	33	38	57	60	43	303	0.83	0.2	1.0	0.3
Total	1,165	1,182	1,174	1,063	1,221	1,182	1,025	8,011	0.91	0.2	1.0	0.3

As shown above, to handle the fire and EMS call and dispatching workload requires less than 1 position utilized at 50% per hour.

(2.4) Total Staffing Requirement

Based on the staffing requirements calculated above for police, fire, and EMS call handling and dispatching, the following shows the hourly staffing requirement for the combined center:

Hour	POLICE	FIRE	TOTAL
0000	2.2	0.3	2.5
0100	2.0	0.2	2.3
0200	1.9	0.2	2.2
0300	1.8	0.2	2.0
0400	1.7	0.2	1.9
0500	1.7	0.2	1.9
0600	2.0	0.2	2.2
0700	2.3	0.3	2.6
0800	2.8	0.3	3.1
0900	3.0	0.3	3.3
1000	3.1	0.3	3.4
1100	3.2	0.3	3.5
1200	3.3	0.3	3.5
1300	3.3	0.3	3.6

Hour	POLICE	FIRE	TOTAL
1400	3.4	0.3	3.6
1500	3.5	0.3	3.8
1600	3.5	0.3	3.8
1700	3.5	0.3	3.8
1800	3.4	0.3	3.7
1900	3.1	0.3	3.4
2000	2.9	0.3	3.2
2100	3.0	0.3	3.3
2200	2.9	0.3	3.2
2300	2.6	0.3	2.9

Based on this, the project team recommends the following staffing for each shift:

Element	Calculated Value
Shift 0700 – 1500	4
Shift 1500 – 2300	4
Shift 2300 – 0700	3
Total Per Day	11
Shift Factor (5/7)	1.4
Sub-Total Staffing Required	15.4
Net Availability	82%
Total Staffing Required	19

This analysis shows that the current staffing in the dispatch center is approximately three people below optimal staffing. The City has chosen to cover these three FTE's using overtime under the current approach (note that the current 16 are sufficient to cover the shift rotation). The current staffing per shift (3,5,3) is slightly different than the approach supported by the project team's analysis given the distribution of workload.

To add the three personnel, the City would need to spend \$146,000. This needs to be balanced against the overtime cost of covering these positions. Current experience would suggest that adding the positions would result in savings of approximately \$27,300 (overtime to fill the three FTE's is approximately \$173,700).

Recommendation: The City should explore the feasibility of increasing the staffing in the dispatch center by three positions. Compared to overtime costs

for the unit, hiring these three positions could generate annual savings of \$27,300.

2. EVALUATION OF TRAINING, FIRE PREVENTION, PUBLIC EDUCATION AND INSPECTIONAL SERVICES

This section provides information and analysis relating to the training, inspections, investigations, and public education activities of the Middletown Fire Department Administration Division. These activities are primarily conducted by 5 full-time personnel; including the Deputy Chief, 1 EMS training Captain and 1 Fire training Captain who supervises two Fire Marshal positions. The following points summarize the primary responsibilities of these personnel.

Personnel	Roles and Responsibilities
Captain (EMS)	<ul style="list-style-type: none"> • Manages all EMS reporting, statistics and provides annual reports to the Chief, as well as fills requests by 3rd party agencies for EMS information and ensures HIPPA compliance. • Responds to incidents and operates as incident safety officer. • Manages infection control program for the Department. • Serves as the EMS quality assurance coordinator, reviewing emergency runs and monthly reports. • Manages EMS training programs for personnel recertification. • Works with Medical Director in reviewing and updating Department EMS operating protocols for patient care. • Manages EMS budget for training and equipment.
Captain (Fire)	<ul style="list-style-type: none"> • Responsible for developing and administering tests for streets, pump operator, aerial operator, and other equipment. • Develops and instructs training sessions, as well as tracks all training hours of all Department personnel. • Develops specifications and orders the appropriate equipment for the fire companies and also conducts inventories on current equipment. • Assists with all equipment maintenance and repair. • Records and tracks certifications for fire personnel. • Responsible for conducting and coordinating training classes for the new hires. • Oversees the fire inspectors/investigators.

Personnel	Roles and Responsibilities
Fire Marshal	<ul style="list-style-type: none"> • Responsible for conducting the inspections of commercial properties, day cares, preschools, and final building plans in coordination with the Building Department. • Conducts follow-up inspections that are conducted by engine companies. • Responds to all Department fire calls and conducts investigations for origin and cause when necessary. • Conducts the Juvenile Fire Setters class on a referral basis. • Conducts the fire education classes as requested by businesses schools, and other entities. • Identifies and orders appropriate fire education/prevention materials to be handed out to the community, or to Department personnel. • Personnel work a 4/10 schedule M-TH and T-F, and are on-call every other week.

The following sections provide analysis of workload and staffing requirements.

(2.1) Training Staffing is Appropriate Given the Workload, Mandated Training and Other Duties of the Personnel Assigned.

Fire Departments face two major demands for training – EMS and Fire / technical skills. The MFD has developed a widely varied training program in both major areas that appear to be well designed to ensure that the firefighters receive on-going training and skills maintenance. The challenges and demands for both of these types of training are different and require varying approaches:

- **Fire Training** is driven less by mandates than by the need to maintain infrequently used critical skills.
- **EMS Training** requires the Fire Department to meet mandates for training for EMS personnel. In addition, the training provided by the MFD appears designed to introduce new skills to the EMS professionals in the Department. In many cases the skills and techniques practiced are used frequently by the EMT's and Paramedics.

The Fire Department has centrally developed a series of annual and continuous requirements for both EMS and Fire skill training, which are appropriately tracked by the respective training captains.

As shown in the table on the following page, personnel assigned to all the stations and platoons engaged in a total of 12,299 hours of fire-related training. This equals an estimated 195 hours of training per year per line firefighter (12,299 divided by 63 firefighters), or approximately 16 hours per month. The following points further summarize the training data above.

- Platoon 2 had the highest number of training hours for 2003 with 4,760, followed by Platoon 1 with 4,034, and Platoon 3 with 3,506.
- Headquarters had the highest number of training hours for 2003 with 3,007, followed by Station 1 with 2,656, Station 2 with 2,554, Station 5 with 2,234, and finally, Station 4 with 1,849 training hours.
- The MFD logged the most fire training hours in the months of May, June, and July, and the least number of training hours in the month of December.

The training hours were utilized for the following topic areas, which include, but are not limited to, the following.

• Haz-Mat Equipment and Supplies	• Equipment Maintenance/Repair
• Building Inspections	• Fire Suppression
• Equipment Placement on Engines	• Equipment Management
• EMS Cardiac Monitoring	• ACLS Skills Management
• EMS Protocol	• Ventilation
• Hydrocarbon Spill Mitigation	• Streets and Pre-Plans
• SCBA	• Radio Communications
• District Familiarization	• Aerial Training
• AED	• Rules and Regulations
• Ropes	• Pump Operations
• Natural Gas Emergencies	• Hypothermia
• Nozzle and Hydraulics	• Vehicle Extraction
• Ladder Operations	• RIT
• Chimney Fire Extinguishment`	• Hydrant Locations
• Preplans	• Cold Emergencies

Based on a sampling of 10 line staff of the Middletown F.D., the following table shows the number of EMS training hours each received between 2001 and 2003.

Employee	1	2	3	4	5	6	7	8	9	10	TOTAL	Avg./Employee
2003	51	43	36	19	52	54	45	35	27	36	398	39.8
2002	43	35	55	47	43	51	31	35	44	35	419	41.9
2001	28	37	29	20	33	25	34	21	28	25	280	28

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	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	TOTAL
St. 1													
1	57	65	69	95	119	103	44	55	53	80	50	33	823
2	40	53	54	68	145	110	100	132	115	88	65	30	1,000
3	50	46	38	103	72	156	85	43	49	62	80	50	834
St. 2													
1	65	58	70	109	85	76	20	55	20	15	89	72	734
2	171	185	184	110	157	140	53	90	56	77	10	56	1,289
3	40	45	32	75	79	54	47	35	46	17	61	0	531
HQ													
1	82	70	110	107	157	168	97	95	101	80	40	68	1,175
2	57	88	120	82	78	151	55	87	66	63	86	26	958
3	37	32	30	152	92	135	78	5	91	84	56	83	875
St. 4													
1	33	48	36	74	69	82	48	33	63	56	68	71	680
2	33	48	29	39	54	78	42	39	39	49	42	18	510
3	39	42	61	66	76	101	54	49	39	36	51	45	659
St. 5													
1	33	30	38	66	72	84	39	39	39	72	54	57	623
2	78	102	98	84	114	135	87	96	56	81	30	43	1,004
3	30	50	27	47	74	78	80	52	66	39	41	24	608
TOTAL	845	961	996	1,277	1,443	1,650	928	905	899	899	822	676	12,299
Platoon	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec	TOTAL
1	270	271	323	451	502	512	248	277	276	303	301	301	4,034
2	379	476	485	383	548	614	336	444	332	358	233	173	4,760
3	196	215	188	443	393	524	344	184	291	238	289	202	3,506
TOTAL	845	961	996	1,277	1,443	1,650	928	905	899	899	822	676	12,299

The two certifications for personnel to maintain include: EMT certification through the State of Ohio renewed every 3 years, and ACLS recertification through the American Heart Association every 2 years. As shown in the table above, Division personnel engaged in approximately 40 hours of EMS training last year, which include training in, but not necessarily limited to, the following topic areas:

• EMS Protocol/Trauma	• Clinical Decision Making
• EMS Protocol/Start Triage	• MRH Trauma Alert
• Heart Related and Near Drowning	• Pediatric Emergencies
• PEPP Training Part 1	• ACLS Skills Management
• PEPP Training Part 2	• Musculoskeletal Injuries
• 12 Lead EKG	• Pediatric CPR
• Airway Management	• Adult CPR
• Blood Glucose Monitoring	• Geriatrics-Dealing with Death and Dying
• Traction Splint	• MRL PIC/EKG Monitor
• Vacuum Splint	• Auto-ventilation
• Helmet Removal	• Standing Orders Review, EMT-B Comp. Test
• KED	• AED
• Trauma Triage Rules	• Trauma Seizures are Medical Emergencies
• BLS for Healthcare	• Endotracheal Incubation
• Unconscious	• Diversity Training
• EMS Operations	• Stroke/Geriatric/Trauma Assessment
• Do Not Resuscitate Orders/Geriatric	• Protocol Training/Quality Assurance
• Trauma Update, Careflight	• Morphine

This information shows that the Department is engaged in a number of positive elements related to training:

- The training program is centrally developed and tracked by the 2 respective training captains. This helps ensure consistency in training and in exposure to training opportunities.
- The Department uses electronic tracking systems which enables the fire and EMS training captains to track training requirements and to ensure appropriate training is being delivered.
- Company officers are required to deliver the training, thereby making them more accountable for their own personnel, their own skills and enabling them to assess the skills of the people that work with and for them on a daily basis, as well as facilitates the “peer pressure” approach that facilitates training compliance.

Overall, the project team finds the training programs to be efficiently and effectively managed, delivered, and tracked, ensuring that MFD line personnel are up to date with their respective certifications.

Recommendation: Continue with the current approach to providing training. The Fire Department has developed an approach to training which is varied, comprehensive and which encourages consistency, accountability and participation among staff at all levels.

(2) The Staffing of Two Fire Marshals Is Appropriate Given the Nature of the Workload Assigned to the Unit.

The table, that follows, provides a summary of the workload handled by the dedicated fire marshal staff in the Division:

INSPECTIONS	Workload	Time Estimate per Activity (Hours)	Total Annual Time Required (Hours)
Occupied Commercial Properties (factories, churches, etc.)*	245	4	980
Vacant Addresses	206	1	206
Other Inspections (homes, day care, preschools, final building inspections, etc.)	36	1.5	54
Total Inspections	487		1,240

* - Of the 245, 178 Fire Safety Inspections were completed

Investigations	Workload	Time Estimate per Activity (Hours)	Total Annual Time Required (Hours)
Fire Call Responses	282	2	564
Fire Investigations*	72	16	1,152
Other Investigations (w/Butler County Fire)	5	16	80
Fire Safety Classes	20	2	40
Hours of Juvenile Setters Class	36		36
Total Investigations			1,872
TOTAL HOURS			3,112

* - Of the 72 Fire Investigations, 32 required after-hours call out

As shown above, based on the workload indicators and associated estimated time requirements to conduct those activities (which includes the actual activity, follow up communications, associated administrative tasks, etc.), a total annual time of 3,112 hours of workload is generated. Thus, the following number of staff is required.

Element	Hours / FTE
Total Inspection Hours	1,240
Total Investigation Hours	1,872
Total Time Commitment (Hours)	3,112
Estimated Personnel Availability (Hours) @ 85% Utilization	1,768
Personnel Required for Workload	1.76

As shown above, the total personnel required for workload is 1.76, or the current two positions, with available capacity being utilized for planning meetings, class preparations, etc.

Recommendation: Continue with the current approach to providing prevention-related services. The Fire Marshal staff, in addition to their primary responsibilities of inspections and investigations, engages in public education related activities which are vital to the prevention of incidents.

4. ORGANIZATION AND MANAGEMENT SYSTEMS

This section provides evaluation of the various management systems which support the proper operation of the Division of Fire. These elements include the policies and procedures, the collective bargaining agreement between the City and IAFF Local 336, current mutual aid agreements and the organizational structure of the Division of Fire.

1. EVALUATION OF POLICIES AND PROCEDURES

The project team reviewed the current policies and procedures of the Division of Fire. The focus of this review was to determine the following:

- Are the policies and procedures available to all staff? Are they distributed to new hires when they arrive?
- Are policies organized in a clear and concise manner?
- Do the Division's policies and procedures address major issues in areas such as administration, operations, training, staff utilization and other key areas?
- Are the policies and procedures evaluated on a regular basis to ensure that they are up to date and that they are in accordance with current actual practice?
- Is there a clear process by which policies are reviewed, edited, distributed for comment and finalized? Are staff from various functions and ranks involved in this process?

The project team found that the Division of Fire is generally well-supported by clear and well-organized policies and procedures. Specifically, the project team's review shows the following:

- Policies and procedures are available to personnel through a number of media and locations.
- New employees are provided with a copy of the policies and are effectively educated on key issues. New personnel are required to study the policies and

procedures and a review of key elements is a part of the on-going training for all personnel.

- The policy and procedure manual is well and logically organized. Key policies and procedures are easy to find in the manual. The project team found no major policies to be missing.
- Observation showed that key policies and procedures are followed during routine and emergency responses.
- The Division is aware that several non-critical policies need to be reviewed for potential modification. This process is done with input from all levels of the Division's command and line staff. Lead responsibility for review and recommended modification is distributed to personnel in the Department.
- There is not an annual or on-going review process in place. Issues are generally addressed as they arise and personnel determine that policies and procedures may be impacted or influenced by changes.

Recommendation: The Division of Fire should focus on the development of a program of regular review and revision of policies and procedures. The Division should continue its current practices of distributed review and revision responsibility and involvement.

2. ASSESSMENT OF CURRENT COLLECTIVE BARGAINING AGREEMENT

The relationship between the City of Middletown and the majority of employees in the Division of Fire is governed by a collective bargaining contract that will expire on December 31, 2005. The Matrix Consulting Group was asked, as part of our scope of work, to assess the contract and to identify whether there may be opportunities to change the agreement in such a way as to enhance the effectiveness and efficiency of the Division of Fire. Specifically, the project team committed to the following:

- Issues which appear to restrict the ability of the Chief and the City Manager (as the City's representative) from exercising key management rights.
- Issues which impact the ability of the City to maximize the utilization of staff while they are on-duty.
- Areas which appear to be contrary to other best practices.

The project team reviewed each element of the contract with these specific issues in mind. The results of this review are summarized, below:

Issues Impacting Management Rights	Issues Impacting Utilization of Staff	Issues Contrary to “Best Practice”
<ul style="list-style-type: none"> • Several instances where overtime is to be computed at 40-hour rate (even for tour employees). • Overtime defined as “any time worked outside the employee’s normally scheduled hours” instead of “in excess of their normally scheduled work week.” 	<ul style="list-style-type: none"> • Average workweek of 51 hours is less efficient than FLSA maximum of 53. • No requirement to minimize overtime cost through scheduling of vacation, holiday, EDO and other foreseeable time off. • Designation of personnel as “squad man” limits distribution of paramedics and may over-compensate some and under-compensate others. 	<ul style="list-style-type: none"> • Call-in of five (5) members for emergencies rather than 1:1 depending on need. • Requirement that “hiring authority” take top name from eligibility list rather than from top three candidates.

The issues identified, above, may have widely variant impacts on operations, efficiency and effectiveness of Division operations. Key general findings include the following:

- The contract specifically reserves management rights for the City for both specific and broadly defined areas of interest. The project team recommends that the City address to issues in the contract:
 - Change language occurring several times that requires payment of overtime based on a 40-hour workweek to reflect the employee’s actual workweek (i.e., either 40 or 51 hours).
 - Change the language in the contract to specifically state that, with the exception of emergency call-back, that overtime be paid for hours worked in excess of the regularly scheduled workweek.
- There are no limitations on activities that can be required of line units in the Division. This means that utilization of employees can be managed by the City and the Division command staff. The project team found only a pair of issues that should be considered:
 - Average workweek for personnel who operate under the 7(k) FLSA exemption (including fire personnel) should be as long as practical. A 53-hour workweek is more efficient than a 51-hour workweek (53 hours is the maximum average workweek allowable under the FLSA without the

payment of overtime). In some case where the benefit rate is more than 50%, it is more cost-effective to maintain an average workweek of 56-hours (this is the average that is achieved with no “extra days off”) because the benefit rate is more than the overtime premium of 50% - thereby making the extra hours per week cheaper than they would be otherwise. This issue is explored in more depth in the operations chapter of this report.

- Consider changing sub-classification of “squad man” to one where paramedics are compensated for holding the classification. If the issue is one of fairness (i.e., not compensating those who do not actively participate) consider changing compensation system so that those who work the squad for a given shift are paid for it. This will encourage more participation of those who are paramedic qualified.
- Few elements of the contract run contrary to “best practices” based on the project team’s experience. The two issues identified by the project team include the following:
 - Emergency call-back requires that five personnel be recalled and paid a minimum of four hours at the overtime rate. Payment of four hours at the overtime rate is a frequently applied compensation for emergency call back. However, the City should be able to call back only those personnel required by the emergency.
 - Lack of flexibility in the promotion of personnel to Lieutenant, Captain and Deputy Chief limits the ability of the Division to take into account prior experience, education, initiative shown by potential candidates (to obtain training, to take on special projects, etc.) may not allow the Division to reach a consensus “best” candidate.

Recommendation: The City should approach future negotiations with an effort to change an number of issues. The project team does not view any of these issues as critically impacting current operations, management, supervision or efficiency of operations (except as evaluated elsewhere in this report). With the exception of the average workweek (which is addressed elsewhere) the project team is unable to estimate potential savings resulting from these changes in overtime definition, requirements and calculation.

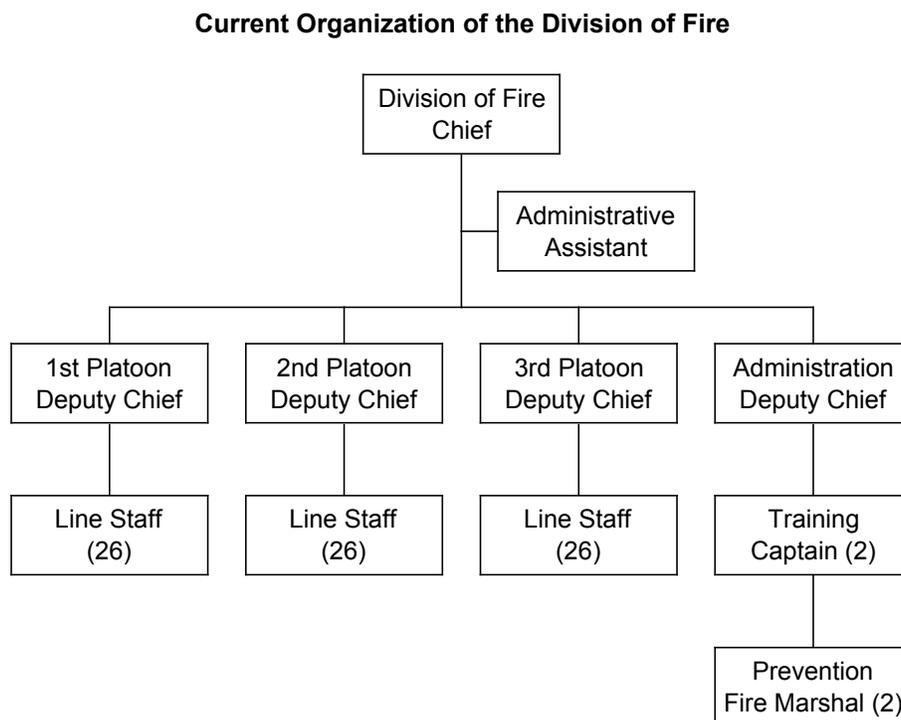
3. ANALYSIS OF THE ORGANIZATION OF THE DIVISION OF FIRE

This section of the report is focused on an evaluation of current organization of the Division of Fire. The project team examines several key questions in this section.

Specifically,

- Is the organizational structure of the Division too tiered or too flat?
- Are reporting relationships and span of control appropriate at all levels?
- Have responsibilities been appropriately distributed? Are their imbalances in these assignments that can be corrected organizationally?
- Do classifications and ranks impact operations?

The current organization of the Division of Fire is shown in the organizational chart which follows:



The project team considered the viable options for organizing the Department. They include the following:

- Continue with the current approach.

- Eliminate the Deputy Chief for Administration and create an Assistant Chief position (outside of the collective bargaining unit).

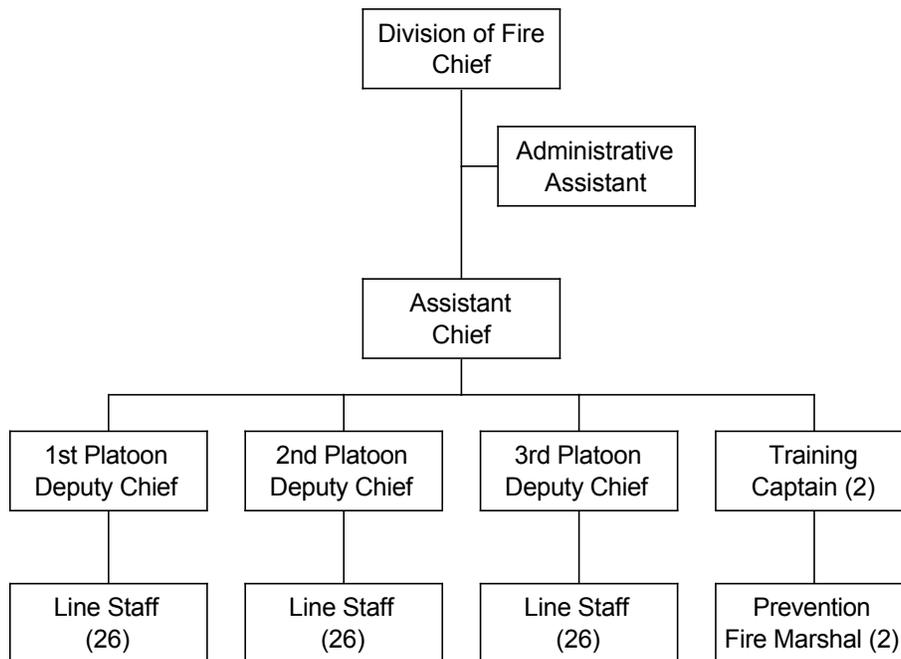
The project team developed a summary of our analysis, presented in the matrix, which follows:

Option	Tiered / Flat	Span of Control / Reporting Relationships	Appropriate Distribution of Duties	Classifications / Rank Structure
Current Approach	<ul style="list-style-type: none"> • No issues. 	<ul style="list-style-type: none"> • No issues. 	<ul style="list-style-type: none"> • No issues. 	<ul style="list-style-type: none"> • Lack of second position outside the bargaining unit creates situations for Chief and for management of the Division.
Create Asst. Chief	<ul style="list-style-type: none"> • No issues. 	<ul style="list-style-type: none"> • No issues. 	<ul style="list-style-type: none"> • No issues. 	<ul style="list-style-type: none"> • No issues.
Eliminate Deputy Chief for Administration	<ul style="list-style-type: none"> • Places some line functions in a direct reporting relationship with the Chief. 	<ul style="list-style-type: none"> • Chief's span of control becomes excessive. 	<ul style="list-style-type: none"> • Would impact ability of the Chief to focus on policy, budget and other "big picture" issues. • Would also impact administrative tasks (maintenance, vehicles, planning, research, etc.). 	<ul style="list-style-type: none"> • Does not solve the current issues of the Chief as the only management position in the Department.

A review of the summary, above, shows that the clear choice for the City is to pursue the re-creation of an Assistant Chief position in the Division of Fire. The cost of accomplishing this should be offset by eliminating the current administrative position. The exhibit, which follows, provides a graphical depiction of the organizational structure represented by the elimination of the Deputy Chief for Administration and the creation of an Assistant Chief's position. The project team's analysis shows that the cost for

making this transition (in additional salaries, benefits and payroll taxes) would be approximately \$13,000 (assuming that the salaries were set at 14% above Deputy Chief – the same spread as exists between the Captain and Deputy Chief classifications).

Recommended Organization of the Division of Fire



There are several issues which need to be clarified regarding this transition for the Division of Fire:

- The new Assistant Chief position would continue to be responsible for day to day administrative duties. Some that are not time critical could be shifted to the three Deputy Chiefs working on the platoons.
- The Assistant Chief would be responsible for the oversight of the operations and administrative / support functions of the Division of Fire.
- In this approach, the Chief continues to be responsible for the “big picture” issues but is no longer the immediate supervisor of the line Deputy Chiefs. This should enable increased focus on policies, budget management and other issues.

Recommendation: The Division of Fire should be authorized to create an Assistant Chief position. Concurrently, a Deputy Chief position should be eliminated. The estimated additional cost of this change would be approximately \$13,000 annually.

APPENDIX

SUMMARY OF THE EMPLOYEE SURVEY

The Matrix Consulting Group conducted an employee survey of the City of Middletown's Division of Fire to allow employees the opportunity to provide confidential input with regard to organizational, operational, and other issues within the Division. This survey was conducted as part of the Strategic Analysis and Master Plan study. Surveys were distributed to the Division's administrative and operations personnel. Of the 84 employee surveys that were distributed, 48 were received for a response rate of 57%. The points, which follow, provide a description of the survey instrument.

- While the survey was confidential, respondents were asked to indicate their assignment in the Division. The table below presents those results.

Assignment	Number	Percent
Administration	1	2%
Operations	31	65%
Did not select	16	33%
Total	48	100%

As the table shows, 33% of respondents did not select their current assignment and, with the exception of one respondent, all of the respondents selecting their assignment were assigned to operations. Because 33% of respondents did not select their assignment the results were not reviewed by this category.

- The survey contained forty-five statements to which respondents were asked to select one of the following responses: "don't know," "strongly agree," "agree," "neutral," "disagree," and "strongly disagree." For purposes of analysis, each response was assigned a number; the lower the number the more positive the response.
- The close-ended statements were organized into several sections to address various aspects of the Division. The following presents a discussion of those sections.

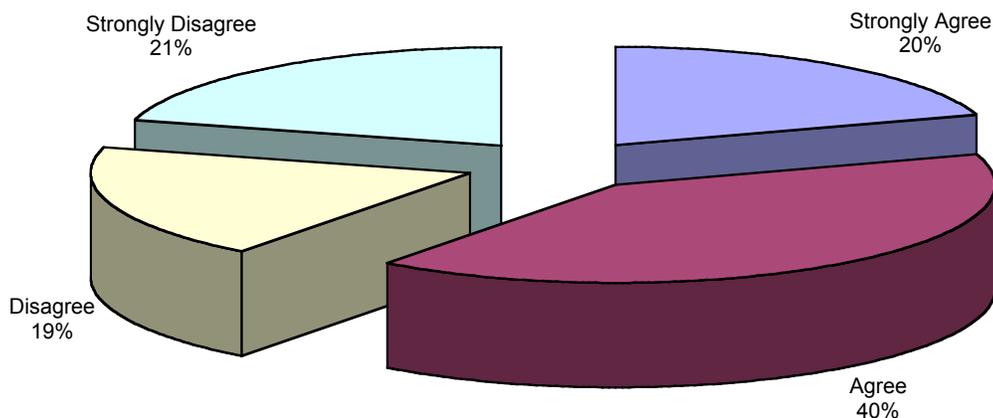
- Service to the Community: This section provided respondents with statements regarding the level and quality of fire / rescue, emergency medical, hazardous materials and special rescue, and dispatch services provided to the community.
- Organization and Operations: This section included statements regarding leadership and management, staffing and operations, training and equipment and apparatus.
- The final section of the survey included two open-ended questions, which provided respondents an opportunity to identify the most important strengths as well as opportunities for improvement within the Division of Fire.

The section, which follows, presents a brief overview of the results of the employee survey. Provided at the end of this chapter is the detailed results for the survey, which includes actual response for each statement provided in the employee survey.

1. GENERAL FINDINGS

In reviewing the results to the quantitative responses in the first section of the employee survey, it is important to look at the pattern of responses for the entire group versus individual responses. The chart below summarizes the overall distribution of responses to statements to which employees were asked to select a response. It should be noted that the chart does not include responses where the employees selected “no response” or did not make a selection.

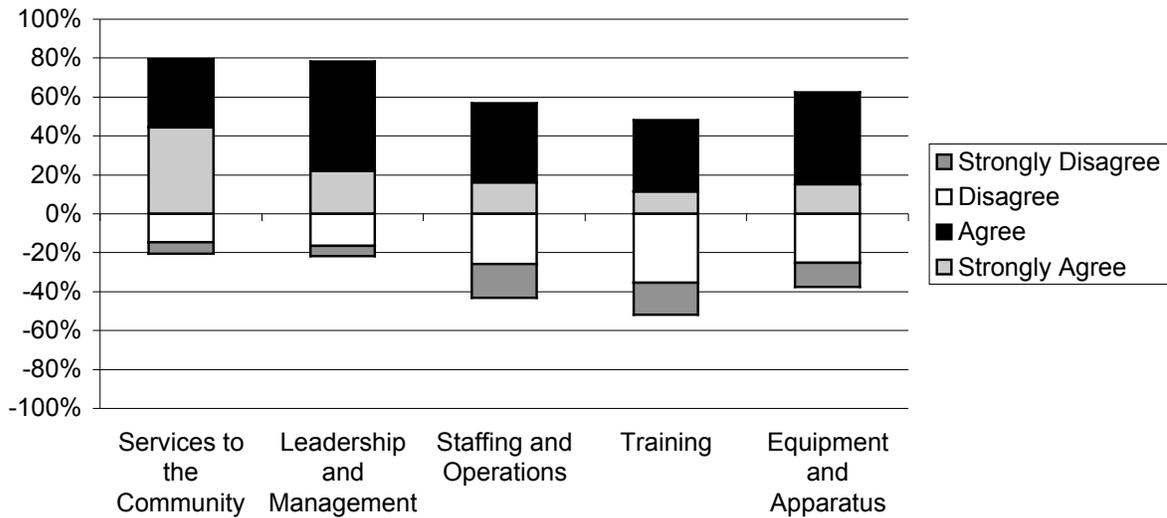
Overall Response Distribution



As the above chart illustrates, the response pattern for the close-ended statements were generally positive as 60% of responses were “strongly agree” or “agree.”

To gain a more detailed sense of the responses from close-ended statements by general topic of the employee survey (e.g., services to the community, leadership and management, staffing and operation, training, and equipment and apparatus) it is useful to look in greater detail at the topics that elicited the strongest positive and negative responses. The chart, found below, plots the percentage of responses that were positive and negative responses for each topic area.

Postive - Negative Distribution by Section



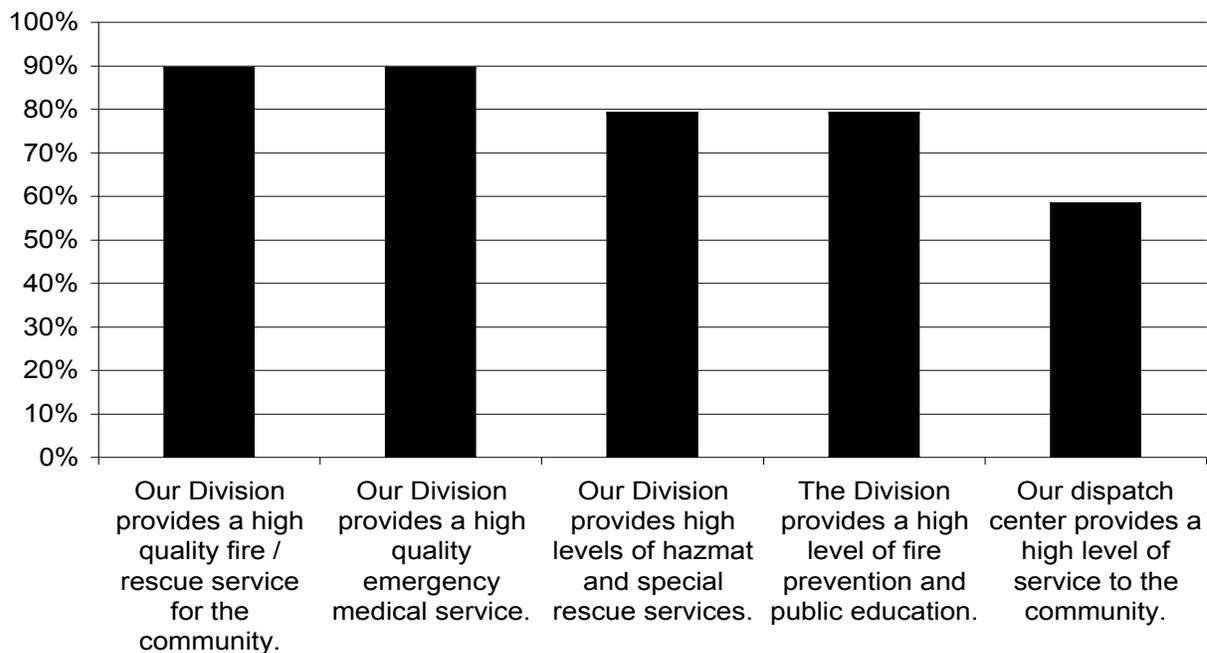
As the above chart shows, respondents generally maintained positive perceptions and attitudes with respect to the various aspects of the Division. However, there were certain topic areas, such as training, equipment and apparatus, and staffing and operations to which responses were mixed.

The sections, which follow, provide a detailed discussion of the results of the employee survey for each of the topic areas identified.

2. SERVICES TO THE COMMUNITY

The first section of statements included in the survey addressed the attitudes and perceptions of employees regarding the Division’s service to the community, as well as two statements relating to City residents. The chart below provides a comparison of the responses relating to the level and quality of services provided by the Division of Fire.

% of Respondents Selecting "Strongly Agree" or "Agree"

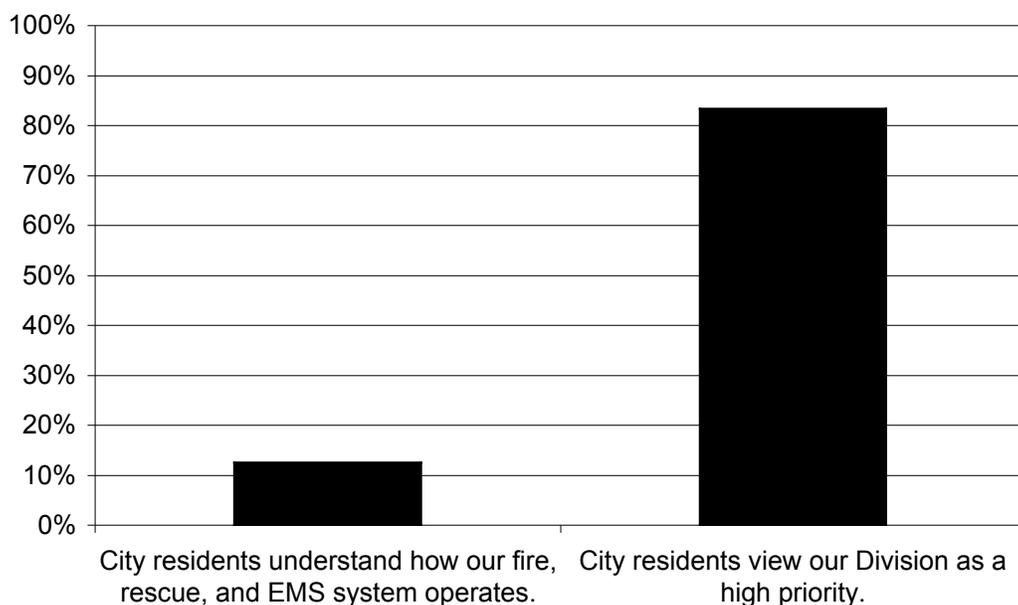


The majority of respondents viewed the services provided by the Division of Fire positively. The following points present a discussion of the above graph.

- In response to the statement, “our Division provides a high quality fire / rescue service for the community,” 90% selected “strongly agree” or “agree.”
- Similarly, 90% of respondents maintained positive perceptions with respect to the statement, “our Division provides a high quality emergency medical service.”
- Approximately 79% of respondents had positive attitudes in response to the statement, “our Division provides high levels of hazmat and special rescue services.”
- When presented the statement, “the Division provides a high level of fire prevention and public education,” 79% of respondents selected either “strongly agree” or “agree.”
- While the majority of respondents maintained positive perceptions with respect to the services provided by the Division to the community, employees had mixed opinions in response to the statement, “our dispatch center provides a high level of service to the community.” Slightly more than half, 58%, selected “strongly agree” or “agree” and 25% selected “neutral.”

In addition to providing statements regarding the services provided to the community by the Division and the dispatch center, employees were asked to respond to statements about the community. The points below present a summary of the response to those statements. As the following graph shows, respondents had mixed perceptions.

% of Respondents Selecting Agree or Strongly Agree



While only 13% of employees selected “strongly agree” or “agree” in response to the statement, “City residents understand how our fire, rescue and EMS system operates,” 79% selected “disagree” or “strongly disagree.” On the other hand, respondents felt positively when provide the statement, “City residents view our Division as a high priority,” with 83% of respondents selecting “strongly agree” or “agree” and 13% selected “neutral.”

3. ORGANIZATION AND OPERATIONS

The employee survey included a variety of statements relating to the organization and operations of the Division of Fire. Statements were provided regarding leadership and management, staffing and operations, training and equipment and apparatus.

(1) Leadership and Management

Employees were provided a series of statements relating to leadership and management in the Division of Fire. Statements addressed such areas as the general leadership of the Division, communication and expectations.

(1.1) Employees Maintained Mixed Perceptions About the Overall Direction of the Division.

Respondents were provided a series of statements relating to the general vision, direction and management of the Division of Fire. The following points present a discussion of the results.

- In response to the statement, “our division has a clear vision / direction for the future,” 42% of respondents selected “strongly agree” or “agree” while an equal percentage, 23% selected “neutral” and 25% selected “strongly disagree” or “disagree.”
- When provided the statement, “our Division seems to be innovative and progressive,” 50% of respondents selected “strongly agree” or “agree,” while 21% selected “disagree” or “strongly disagree.”
- With respect to the statement, “our Division does a good job planning and scheduling our shift assignments,” 83% of respondents selected “strongly agree” or “agree.”

Overall, employees maintained positive perceptions with respect to the general management of the Division of Fire. However, employees had mix perceptions regarding the future direction of the Division.

(1.2) Overall, Employees Positively Viewed the Communication and Interaction with Management.

Employees were asked to respond to several statements regarding communication from management staff. The same statements were provided for the Chief, as well as the Deputy Chiefs. Results did not vary significantly. The table below provides a comparison of the results.

% of Respondents Selecting “Strongly Agree” or “Agree”		
Statement	Chief	Deputy Chief
The Chief / Deputy Chiefs keep us informed of important decisions.	67%	75%
The Chief/ Deputy Chiefs care highly about my opinions on important issues.	63%	63%
The Chief / Deputy Chiefs is/are properly ‘in-touch’ with line staff and operations.	53%	73%

As the table shows, the majority of respondents viewed the communication they received from the Chief and the Deputy Chiefs positively. While the results did not vary significantly, slightly more respondents had positive attitudes with respect to the level of information and interaction with the Deputy Chiefs.

(1.3) Respondents Had Mixed Attitudes With Respect to Performance, Accountability and Disciplinary Actions.

Employees were provided several statements regarding performance expectations, as well as the application of disciplinary actions. The following graph presents the results.

% of Respondents Selecting Agree or Strongly Agree



Overall employees maintained positive perceptions with respect to performance expectations and accountability. Respondents were slightly less positive with respect to the consistent application of disciplinary actions and the quick handling of problems. The following points present a brief discussion of the graph.

- In response to the statement, “my work performance expectations are made clear,” 81% of employees selected “strongly agree” or “agree.”
- With respect to the statement, “when problems arise, they are resolved quickly,” 52% of respondents selected “strongly agree” or “agree;” 27% selected “neutral.”
- Respondents generally maintained positive perceptions with respect to the statement, “staff are held accountable for their actions.” Approximately 58% of respondents selected “strongly agree” or “agree,” while 21% selected “disagree” or “strongly disagree.”
- Employees had mixed attitudes with regard to disciplinary action. When provided the statement, “our Division is consistent when taking disciplinary action,” 35% of respondents selected “strongly agree” or “agree,” while slightly fewer (33%) selected “strongly disagree” or “agree.”

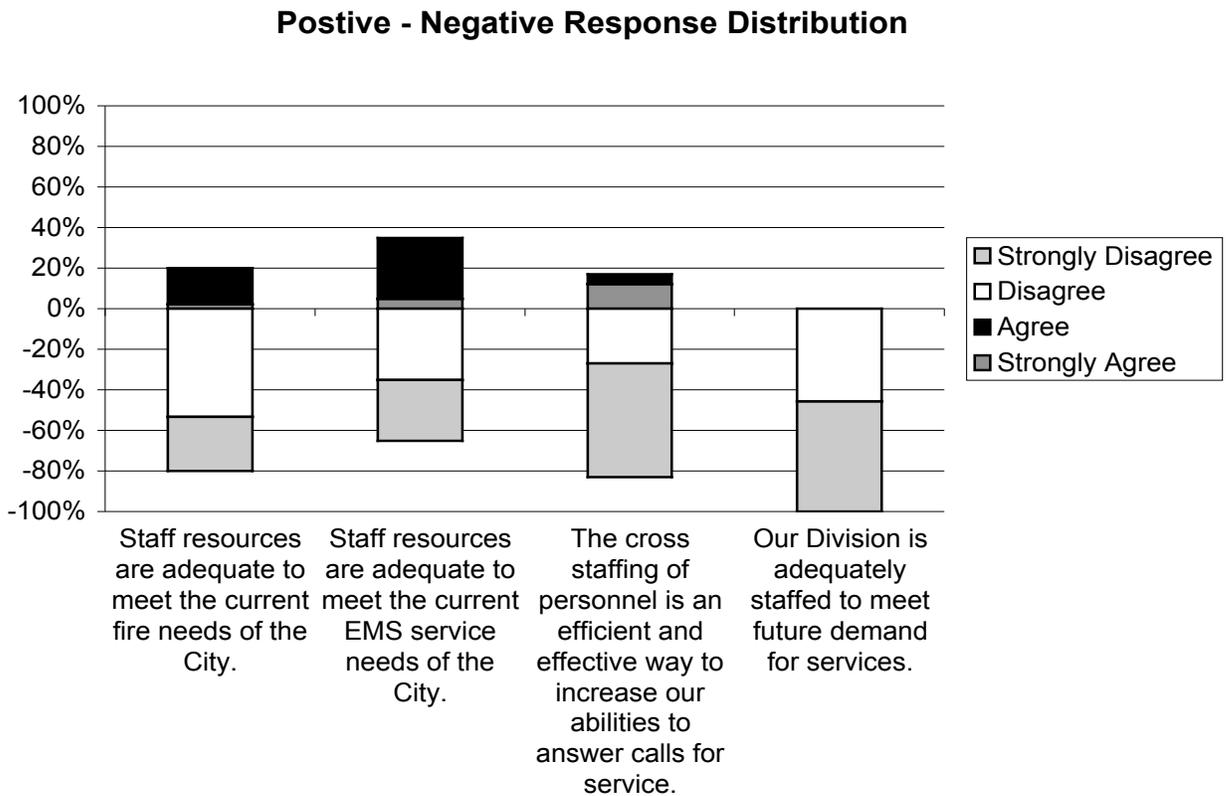
The following section presents a review of the survey results with respect to staffing and operations.

(2) Staffing and Operations

Respondents were provided several statements relating to staffing and operations, including staffing levels, policies, and delivery of services in the Division of Fire.

(2.1) Employees Had Mixed Attitudes With Respect to Current and Future Staffing Needs in the Division of Fire.

Respondents were provided several statements regarding current staffing, as well as future staffing. As the following graph illustrates, employees had mixed perceptions and attitudes.



The points, which follow, present a discussion of the above graph.

- With respect to the statement, “staff resources are adequate to meet the current fire needs of the City,” 19% selected “strongly agree” or “agree;” 75% selected “disagree” or “strongly disagree.”
- In response to the statement, “staff resources are adequate to meet the current EMS service needs of the City,” 39% of respondents had positive attitudes, selecting “strongly agree” or “agree.” On the other hand, 54% of respondents selected “disagree” or “strongly disagree.”
- Approximately 15% of respondents selected “strongly agree” or “agree” when provided the statement, “the cross staffing of personnel is an efficient and effective way to increase our abilities to answer calls for service, while 71% of respondents selected “disagree” or “strongly disagree.”
- When provided the statement, “our Division is adequately staffed to meet future demand for service,” 0% of respondents selected “strongly agree” or “agree,” in fact 96% of respondents selected “disagree” or “strongly disagree.”

Overall, the results indicate that while some respondents felt that the Division had sufficient staff to meet current service needs, the majority of respondents maintained negative attitudes regarding the Division’s staffing to meet future demand for services.

(2.2) Overall Employees Viewed Issues Relating to Policies and Procedures Positively.

Respondents were provided several statements regarding the policies and procedures utilized in the Division of Fire. The following points provide a discussion of the results.

- In response to the statement, “our Division has standardized policies and procedures for operations,” 71% of respondents selected “strongly agree” or “agree.”
- With respect to the statement, “our policies and procedures are clear, concise and relevant to our actual experiences,” 56% of respondents selected “strongly agree” or “agree.”

- When provided the statement, “our medical director provides clear protocols for EMS care, 98% of respondents “selected “strongly agree” or “agree;” 2% selected “don’t know.”
- While 31% of respondents selected “strongly agree” or “agree,” 42% selected “disagree” or “strongly disagree” in response to the statement: “our policies and procedures are consistently followed throughout our Division.”

In general, respondents maintained positive perceptions regarding policies and procedures in the Division with the exception of them being consistently followed.

(2.3) Employees Had Mixed Perceptions Regarding Some Aspects of Operations.

Respondents were provided several statements regarding operations, which related to dispatch, response times, quality assurance, pre-fire plans, and inspection programs. The points, which follow, provide a discussion of the results.

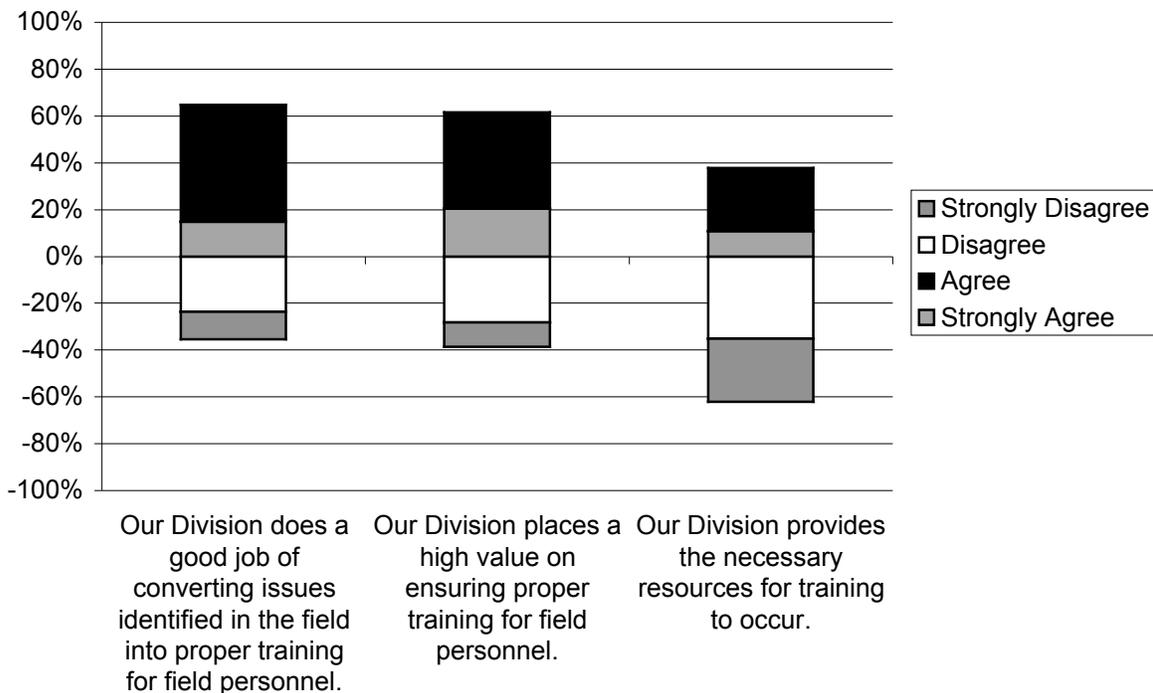
- In response to the statement, “our response times to fire, rescue, and emergency medical incidents are good,” 94% of respondents selected “strongly agree” or “agree.”
- With respect to the statement, “the fire, rescue, and EMS related dispatch information provided to us on incidents is accurate and timely,” 50% of respondents selected “strongly agree” or “agree,” while 25% of respondents selected “disagree” or “strongly disagree.”
- The majority of respondents, 75%, selected “strongly agree” or “agree” in response to the statement, “we do an effective job doing quality assurance on our EMS calls.”
- Respondents had mixed attitudes regarding the statement “our pre-fire plans are well maintained and up to date” with 25% selecting “strongly agree” or “agree” and 52% selecting “disagree” or “strongly disagree.”
- When provided the statement, “our inspection programs are efficient and effective,” 56% of respondents selected “strongly agree” or “agree;” 27% selected “neutral.”

While respondents viewed response times and emergency services positively, they maintained mixed perceptions regarding inspections and fire pre-plans.

(3) Training

Employees were asked to respond to statements regarding training, including training they received, as well as company officers and the ability of training to address issues encountered in the field. The chart, which follows, shows the positive – negative response distribution for statements that addressed overall issues relating to training.

Positive - Negative Response Distribution



Overall, respondents had mixed perceptions with respect to general training.

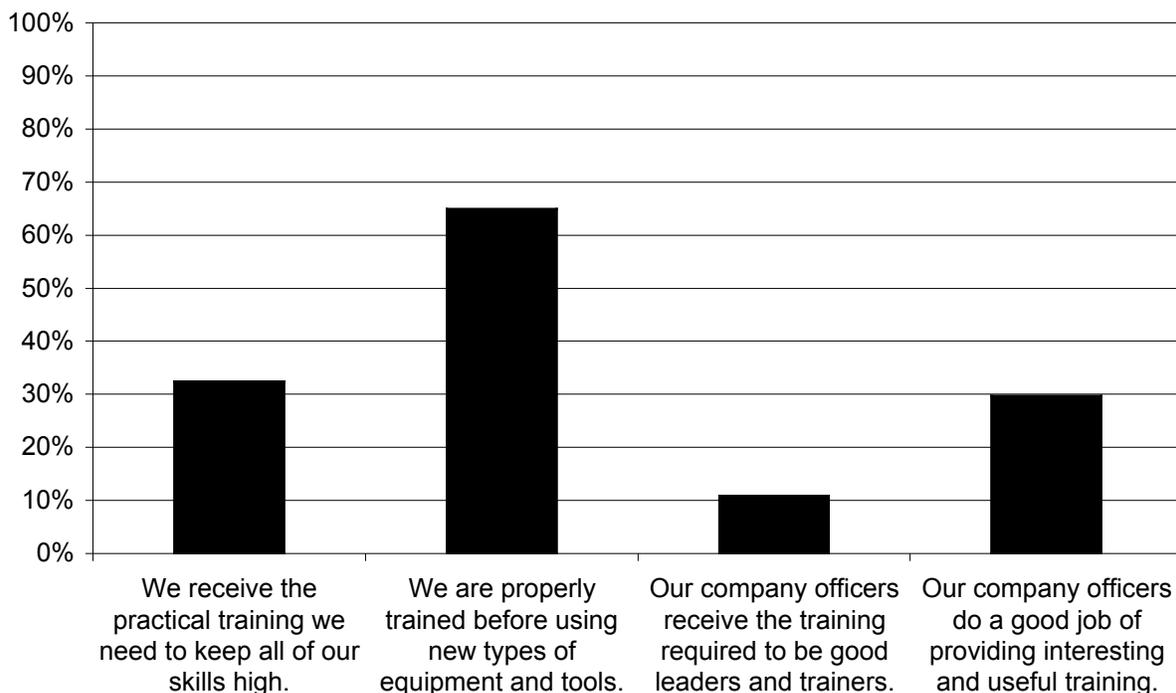
The points, which follow, provide a brief discussion of the graph.

- In response to the statement, “our Division does a good job of converting issues identified in the field into proper training for field personnel,” 46% of respondents selected “strongly agree” or “agree” and 25% of respondents selected “strongly disagree” or “disagree.”
- When provided the statement, “our Division places a high value on ensuring proper training for field personnel,” 50% of respondents selected “strongly agree” or “agree,” while 31% of respondents selected “strongly disagree” or “disagree.”

- While 29% felt positively towards the statement, 48% selected “strongly disagree” or “disagree” in response to “our Division provides the necessary resources for training to occur.”

Respondents had mixed perceptions regarding the training provided by the Division. Additionally, respondents were provided several statements regarding their perceptions about the training they receive, as well as the company officers. The following graph presents the results.

% of Respondents Selecting Agree or Strongly Agree



Respondents maintained mixed perceptions regarding the training they received.

The points below provide a discussion of the graph.

- While 27% of respondents selected “strongly agree” or “agree,” 54% of respondents selected “strongly disagree” or “disagree” in response to the statement, “we receive the practical training we need to keep all of our skills high.”

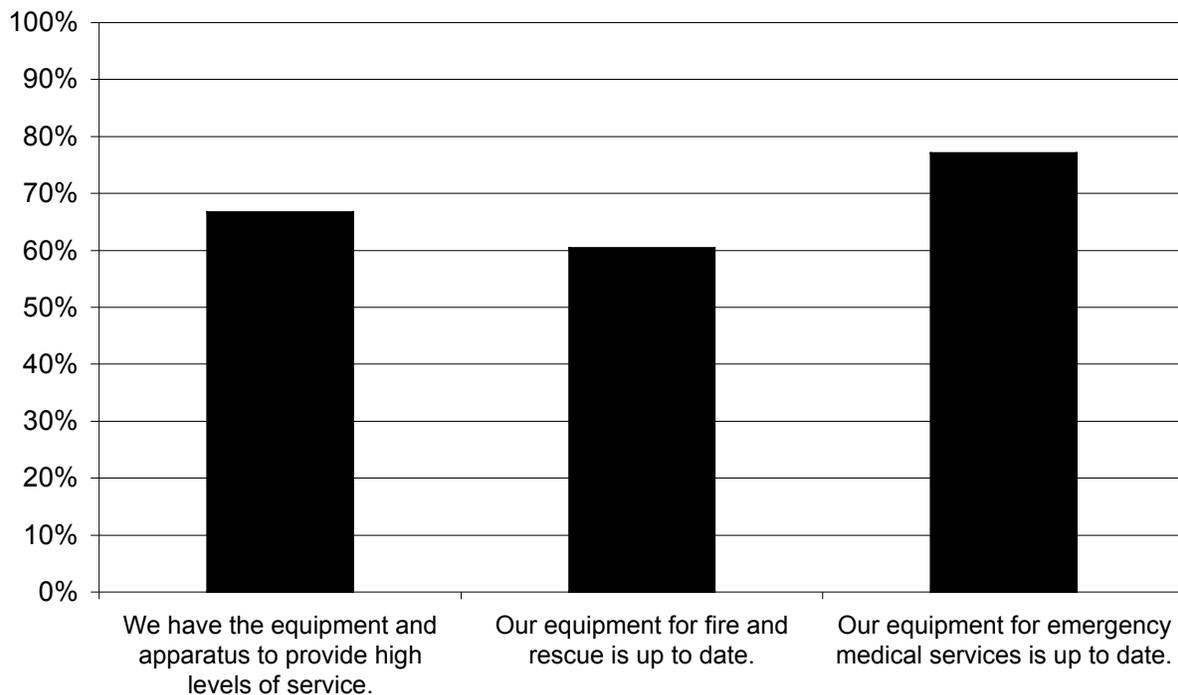
- In response to the statement, “we are properly trained before using new types of equipment and tools,” 65% of respondents selected “strongly agree” or “agree,” 22% were neutral.
- Approximately 8% of respondents selected “strongly agree” or “agree” in response to the statement, “our company officers receive the training required to be good leaders and trainers,” 75% of respondents viewed this statement negatively by selecting “disagree” or “strongly disagree.”
- When provided the statement, “our company officers do a good job of providing interesting and useful training,” 31% of respondents selected “strongly agree” or “agree,” while 31% of respondents selected “neutral.” Slightly more, 35% selected “disagree” or “strongly disagree” in response to the statement.

Employees maintained mixed attitudes with respect to the training. The following section provides the survey results regarding equipment and apparatus.

(4) Equipment and Apparatus

Employees were asked to respond to statements regarding equipment and apparatus, as well as the fire station facilities. While respondents maintained positive attitudes about the equipment and apparatus, opinions and attitudes were mixed with regard to the condition and location of fire stations. The chart, which follows, presents a comparison of the results of the responses for statements relating to equipment and apparatus.

% of Respondents Selecting Agree or Strongly Agree



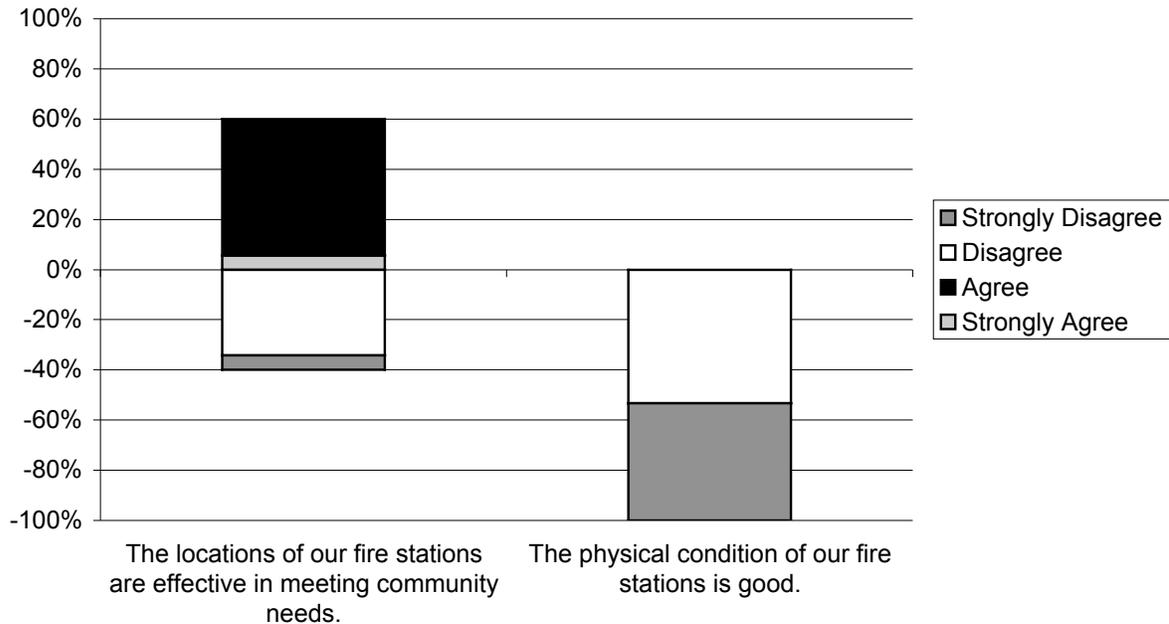
As the graph illustrates, the majority of respondents maintained positive perceptions. The points below present a discussion of the information contained in the graph.

- In response to the statement, “we have the equipment and apparatus to provide high levels of service,” 67% of respondents selected “strongly agree” or “agree.”
- When provided the statement, “our equipment for fire and rescue is up to date,” 60% of respondents selected “strongly agree” or “agree,” and 27% of respondents selected “neutral.”
- With respect to the statement, “our equipment for emergency medical services is up to date,” 77% of respondents selected “strongly agree” or “agree.”

Overall, respondents maintained positive perceptions with respect to the Division providing them with the proper equipment and apparatus to provide high levels of

service to the community. As the graph below illustrates, respondents viewed fire station location and condition less favorably.

Positive - Negative Response Distribution: Fire Stations



The points, which follow, provide a discussion of the results contained in the above graph.

- Respondents had mixed attitudes with respect to the statement: “the locations of our fire stations are effective in meeting community needs,” with approximately 44% of respondents selecting “strongly agree” or “agree” and 29% of respondents selecting “strongly disagree” or “disagree.”
- Respondents maintained negative perceptions regarding the condition of fire stations with 94% of respondents selected “strongly disagree” or “disagree” in response to the statement, “ the physical condition of our fire stations is good.” Approximately 6% of respondents selected “neutral.”

While respondents maintained mixed opinions regarding equipment and apparatus, the majority of respondents viewed the physical condition of fire stations negatively.

4. COMMENTS AND IMPROVEMENT SUGGESTIONS

The final section of the employee survey presented two open-ended questions to which employees were asked to respond. Respondents were asked to identify what they felt were the most important strengths of the Division, as well as the most important improvement opportunities facing the Middletown Division of Fire. Of the 48 surveys received by the project team, 46 included responses to all or portions of this section of the survey.

(4.1) Respondents Identified Key Strengths Within the Division.

Respondents were asked to identify what they considered to be the most important strengths within the Division of Fire. While comments varied among the respondents, the common themes and the number of respondents commenting on those themes are presented in the table below.

Key Strength	Number of Responses	% of Responses
Personnel	37	39%
Quality Services	26	27%
Response Times	10	11%
Management	10	11%
Equipment	7	7%
Training	5	5%
Total	95	100%

The points below present a discussion of the responses received by the project team.

- The majority of respondents identified personnel as a key strength of the Division. This included comments relating to teamwork, support and knowledge of staff.
- Approximately 27% of responses reflected staff's positive perception of the quality of services provided by the Division. Respondents felt that the Division was customer-oriented and provided a high level of service to the community.
- Also, 11% of responses discussed the Division's fast response times and aggressive methods.

- Several respondents (10) commented on the Division’s management as a key strength in the Division, citing good training, leadership and communication from management.
- Additionally, 7 respondents identified equipment as a key strength, stating that the equipment provided to staff is up to date and well maintained.
- Some respondents viewed training as an important strength in the Division. It is interesting to note that the majority of responses discussing training viewed it as a key opportunity for improvement.

Overall, respondents viewed personnel and the quality of services provided by staff as the most important strengths within the Division.

(4.2) Respondents Provided Key Opportunities for Improvement Within the Division of Fire.

In addition to identifying the important strengths of the Division, respondents were asked to identify what they considered to be the most important opportunities for improvement within the Division. The table, which follows, presents the common themes identified by the respondents.

Improvement Opportunity	Number of Responses	% of Responses
Training	24	24%
Personnel	22	22%
Condition of Facilities	20	20%
Community Support	17	17%
Policies and Procedures	11	11%
Long-term Planning	7	7%
Total	101	100%

The points, which follow, present a discussion of the common themes identified by employees with respect to the opportunities for improvement within the Division of Fire.

- As the above table shows, the most common improvement opportunity identified by respondents was training. Several respondents commented on a desire for more training opportunities and improved management and leadership training, as well as more practical training for field staff.

- While a key strength of the Division was the morale and skills of its personnel, 22% of responses identified understaffing and lack of personnel as a key improvement opportunity.
- As noted in the close-ended section of the survey, respondents maintained negative perceptions of the physical condition of the fire stations. Approximately 20% of responses to this section of the survey reflected this same perception.
- Similarly, responses to statements in the close-ended section of survey indicated that employees felt that the City did not understand how it provides services. Respondents commented on the level of support and understanding the Division received from the City as a key area for improvement.
- Approximately 11% of response received identified the Division's policies and procedures, particularly as they relate to the promotional process as an area for improvement. Additionally, some respondents commented on the need to update standard operating procedures.
- Several respondents commented on the Division's need to perform long-range planning and to provide a clearer direction of the Division.

Overall, there were several common themes that respondents viewed as improvement opportunities, such as the need for increased personnel, improved training opportunities, and up to date procedures.

Results of Employee Survey
Middletown Division of Fire

Please indicate your assignment in the Division of Fire:

Administration: 2%
 Operations: 65%
 Did not select: 33%

Please respond to the following statements by indicating which response best matches your opinion.

1. SERVICE TO THE COMMUNITY

	Don't Know	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Our Division provides a high quality fire / rescue service for the community.	0	37	6	2	3	0
Average: 1.4	0%	90%		4%	6%	
2. Our Division provides a high quality emergency medical service.	0	39	4	2	3	0
Average: 1.4	0%	90%		4%	6%	
3. Our Division provides high levels of hazmat and special rescue services.	2	19	19	4	3	1
Average: 2.0	4%	79%		8%	8%	
4. The Division provides a high level of fire prevention and public education.	1	18	20	5	4	0
Average: 2.0	2%	79%		10%	8%	
5. Our dispatch center provides a high level of service to the community.	0	5	23	12	7	1
Average: 2.5	0%	58%		25%	17%	
6. City residents understand how our fire, rescue, and EMS system operates.	0	0	6	4	23	15
Average: 4.0	0%	13%		8%	79%	
7. City residents view our Division as a high priority.	1	14	26	6	0	1
Average: 2.0	2%	83%		13%	2%	

2. ORGANIZATION AND OPERATIONS

Leadership and Management		Don't Know	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
8.	Our Division has a clear vision / direction for the future.	5	4	16	11	8	4
	Average: 3.1	10%	42%	23%	25%		
9.	The Chief and command staff keep us informed of important information.	1	7	25	9	6	0
	Average: 2.4	2%	67%	19%	13%		
10.	The Deputy Chiefs keep us informed of important information.	1	10	26	5	6	0
	Average: 2.2	2%	75%	10%	13%		
11.	The Chief cares highly about my opinions on important issues.	1	10	20	10	5	2
	Average: 2.4	2%	63%	21%	15%		
12.	The Deputy Chiefs care highly about my opinions on important issues.	1	10	20	8	7	2
	Average: 2.5	2%	63%	17%	19%		
13.	The Chief is properly 'in touch' with line staff and operations.	0	5	21	9	10	3
	Average: 2.7	0%	54%	19%	27%		
14.	The Deputy Chief is properly 'in touch' with line staff and operations.	1	14	21	9	3	0
	Average: 2.1	2%	73%	19%	6%		
15.	My work performance expectations are made clear.	1	15	24	6	2	0
	Average: 2.0	2%	81%	13%	4%		
16.	When problems arise, they are resolved quickly.	1	2	23	13	6	3
	Average: 2.8	2%	52%	27%	19%		
17.	Staff are held accountable for their actions.	1	4	24	9	8	2
	Average: 2.6	2%	58%	19%	21%		
18.	Our Division is consistent when taking disciplinary action.	0	3	14	15	11	5
	Average: 3.0	0%	35%	31%	33%		

CITY OF MIDDLETOWN, OHIO
Strategic Analysis and Master Plan for the Division of Fire

		Don't Know	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
19. Our Division seems to be innovative and progressive.		1	5	19	13	7	3
	Average: 2.7	2%	50%	27%	21%		
20. Our Division does a good job planning and scheduling our shift assignments.		0	19	21	4	2	2
	Average: 1.9	0%	83%	8%	8%		
Staffing and Operations							
21. Staff resources are adequate to meet the current fire needs of the City.		0	1	8	3	24	12
	Average: 3.8	0%	19%	6%	75%		
22. Staff resources are adequate to meet the current EMS service needs of the City.		0	2	12	8	14	12
	Average: 3.5	0%	29%	17%	54%		
23. Our Division is adequately staffed to meet future demand for services.		0	0	0	2	21	25
	Average: 4.5	0%	0%	4%	96%		
24. The cross staffing of personnel is an efficient and effective way to increase our abilities to answer calls for service.		3	5	2	4	11	23
	Average: 4.1	6%	15%	8%	71%		
25. Our Division has standardized policies and procedures for operations.		0	6	28	7	4	3
	Average: 2.4	0%	71%	15%	15%		
26. Our policies and procedures are clear, concise and relevant to our actual experiences.		1	5	22	11	5	4
	Average: 2.7	2%	56%	23%	19%		
27. Our policies and procedures are consistently followed throughout our Division.		2	4	11	11	19	1
	Average: 3.2	4%	31%	23%	42%		
28. Our response times to fire, rescue, and emergency medical incidents are good.		0	22	23	3	0	0
	Average: 1.6	0%	94%	6%	0%		

CITY OF MIDDLETOWN, OHIO
Strategic Analysis and Master Plan for the Division of Fire

		Don't Know	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
29. The fire, rescue and EMS related dispatch information provided to us on incidents is accurate and timely.		0	2	22	12	11	1
Average: 2.7		0%	50%	25%	25%		
30. Our medical director provides clear protocols for EMS care.		1	24	23	0	0	0
Average: 1.6		2%	98%	0%	0%		
31. We do an effective job doing quality assurance on our EMS calls.		2	7	29	7	3	0
Average: 2.3		4%	75%	15%	6%		
32. Our pre-fire plans are well maintained and up to date.		1	1	11	10	16	9
Average: 3.5		2%	25%	21%	52%		
33. Our inspection programs are efficient and effective.		1	5	22	13	7	0
Average: 2.5		2%	56%	27%	15%		
Training							
		Don't Know	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
34. We receive the practical training we need to keep all of our skills high.		1	4	9	8	19	7
Average: 3.4		2%	27%	17%	54%		
35. Our company officers receive the training required to be good leaders and trainers.		1	0	4	7	24	12
Average: 4.0		2%	8%	15%	75%		
36. Our company officers do a good job of providing interesting and useful training.		1	1	14	15	13	4
Average: 3.2		2%	31%	31%	35%		
37. Our Division does a good job of converting issues identified in the field into proper training for field personnel.		1	5	17	13	8	4
Average: 2.8		2%	46%	27%	25%		
38. Our Division places a high value on ensuring proper training for field personnel.		2	8	16	7	11	4
Average: 2.9		4%	50%	15%	31%		

CITY OF MIDDLETOWN, OHIO
Strategic Analysis and Master Plan for the Division of Fire

	Don't Know	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
39. Our Division provides the necessary resources for training to occur.	2	4	10	9	13	10
Average: 3.4	4%	29%	19%	48%		
40. We are properly trained before using new types of equipment and tools.	1	8	24	10	3	2
Average: 2.4	2%	67%	21%	10%		
Equipment and Apparatus						
41. We have the equipment and apparatus to provide high levels of service.	1	10	22	10	4	1
Average: 2.3	2%	67%	21%	10%		
42. Our equipment for fire and rescue is up to date.	1	8	21	13	5	0
Average: 2.4	2%	60%	27%	10%		
43. Our equipment for emergency medical services is up to date.	0	9	28	8	3	0
Average: 2.1	0%	77%	17%	6%		
44. The locations of our fire stations are effective in meeting community needs.	0	2	19	13	12	2
Average: 2.9	0%	44%	27%	29%		
45. The physical condition of our fire stations is good.	0	0	0	3	24	21
Average: 4.4	0%	0%	6%	94%		