



AFTER-ACTION REPORT

FOR THE TOWN OF ANDOVER'S RESPONSE TO
THE 2018 MERRIMACK VALLEY GAS EXPLOSIONS

Prepared for the Town of Andover

Andover Town Hall
36 Bartlet Street
Andover, MA 01810

Prepared by The Edward Davis Company

2 Atlantic Avenue, 3rd Floor
Boston, MA 02110



TABLE OF CONTENTS

EXECUTIVE SUMMARY	5
SUMMARY OF KEY EVENTS	5
SUMMARY OF FINDINGS.....	6
Key Successes	6
Key Recommendations	7
AFTER ACTION REVIEW TEAM	9
ACKNOWLEDGEMENTS	9
INTRODUCTION.....	10
PURPOSE AND SCOPE	10
METHODOLOGY	10
ORGANIZATION OF THE REPORT	12
SECTION 1: INCIDENT TIMELINE	13
MAJOR EVENTS TIMELINE	13
DETAILED TIMELINE	14
SECTION 2: OVERVIEW OF EVENTS	22
BACKGROUND.....	22
Andover Fire and Police Department.....	22
OVERVIEW OF THE RESPONSE	26
Fire Department.....	26
Police Department.....	26
Dispatch.....	27
Town Manager's Office	27
Department of Public Works	28
The Facilities Department	28
Health Department	29
Department of Information Technology.....	29
SECTION 3: ANALYSIS OF CAPABILITIES.....	30
FIRE DEPARTMENT	30
Initial Response	30
Recovery	36
Preparedness	36
EMERGENCY OPERATIONS CENTER	36



Initial Response	36
Recovery	41
Preparedness	42
POLICE DEPARTMENT	42
Initial Response	42
Recovery	44
Preparedness	44
DISPATCH	45
Initial Response	45
Recovery	48
Preparedness	48
TOWN MANAGER'S OFFICE	48
Initial Response	48
Recovery	52
Preparedness	52
DEPARTMENT OF PUBLIC WORKS.....	53
Initial Response	53
Recovery	55
Preparedness	55
THE FACILITIES DEPARTMENT	55
Initial Response	55
Recovery	57
Preparedness	57
HEALTH DEPARTMENT	57
Initial Response	57
Recovery	58
Preparedness	59
DEPARTMENT OF INFORMATION TECHNOLOGY	59
Initial Response	59
Recovery	60
Preparedness	60
CONCLUSION	61
SUMMARY OF SUCCESSES	61



SUMMARY OF RECOMMENDATIONS	61
APPENDIX A.....	64
APPENDIX B.....	70
APPENDIX C	72
APPENDIX D	75



EXECUTIVE SUMMARY

The *After-Action Report for the Town of Andover's Response to the 2018 Merrimack Valley Gas Explosions* describes the findings from an after-action review conducted by the Edward Davis Company. This report details observations, successes, and areas for improvement related to the Town of Andover's preparedness, initial response, and recovery operations following the gas explosions that occurred on September 13th, 2018. Primary and secondary data collection and analyses were conducted in order to gain a full understanding of the Town of Andover's response through a number of critical departments including: the Fire Department, the Police Department, the Town Manager's Office, the Department of Public Works, Facilities, the Health Department, the Department of Information Technology, and the Director of Business, Arts, and Culture.

This report highlights substantive, actionable recommendations and strategies to assist the Town's preparedness and response in any future disasters or related events. Overall, the Town of Andover's response to the Merrimack Valley Gas Explosions in September of 2018 (hereafter: "the Gas Event") was a success. There were no fatalities and two civilians were injured during this unpredictable and sudden incident. However, as with any critical incident, a full after-action review reveals important areas for improvement along with actions that were effective and should be repeated during any future incidents. Although the Gas Event impacted three communities (i.e., Lawrence, North Andover, and Andover), the focus of this report is specifically on the Town of Andover (hereafter: "the Town"). Mention of other communities will be made as they relate to the Town's actions and response.

The National Transportation Safety Board (NTSB) published a preliminary report titled, "Over-pressure of a Columbia Gas of Massachusetts Low-pressure Natural Gas Distribution System Merrimack Valley, Massachusetts, September 13, 2018, PLD18MR003," (NTSB, PLD18MR003) summarizing the events that led to the September 13 Merrimack Valley Gas Explosions. The preliminary report is available online and referenced throughout this report.

Disclaimer: The Edward Davis Company provided security officers for TRC during the response and recovery phases of the Merrimack Valley Gas Explosions.

SUMMARY OF KEY EVENTS

On September 13, 2018 at approximately 4:18 PM (EST), 9-1-1 dispatch in the Town received its first call related to the Gas Event. This call was for a building fire in a restaurant that originated from the oven. Just six minutes later, a second fire was called into dispatch for a residential basement. During the next ten minutes that followed, two additional residential fires were called into dispatch and relayed to fire personnel. Simultaneously (at approximately 4:31 PM), dispatch relayed a message from the State that the fires were gas related and fire personnel directed dispatch to call Columbia Gas to, "shut the gas lines down...see if we can get any answers from them¹," as well as call all off-duty firefighters back into work and request mutual aid. Within the first two hours after the first fire in the Town, the Fire

¹ Quoted from the Dispatch Center's audio recording with fire personnel.



Department and the Police Department responded to 21 call for fires (17 actual fires) and 8 calls for gas leaks.

Columbia Gas of Massachusetts, a subsidiary of NiSource owned, operated, and maintained the effected gas distribution system, and by 4:30 PM, the key regulator causing the Gas Event was shut off. By 7:24 PM all critical valves were closed by Columbia Gas (NTSB, PLD18MR003).

At approximately 4:40 PM (22 minutes after the first fire call), a Code Red alert was sent to residents of the Town over the phone stating, “This is the Andover Fire and Police, please shut off your gas service immediately and please evacuate your home due to multiple natural gas-related incidents going on in town².” Approximately 30 minutes after the first fire call in the Town, the Emergency Operations Center (EOC) was set up. Department heads from all sectors of the Town, who are also part of the Town’s Emergency Management Working Group (EMWG) began to arrive at the EOC and an external Public Relations expert (John Guilfoil) who was on retainer for the Town was called in to assist. By 5:30 PM the Town’s twitter page, under the direction of the Town Manager’s Office, posted the following, “If you know how to safely shut off your gas, please do so. Residents and businesses are being advised to evacuate. We will post updates as soon as we have information.”

As calls related to the Gas Event continued to flow into the Town’s dispatch center, the EMWG led by the Emergency Management Director (Police Chief) in the EOC worked together to address immediate needs and plan for the recovery process for the hours and days to come. Two staging areas were established in the Town for the Police Department at Brickstone Square and for the Fire Department at Andover High School. A Unified Command Center (UCC) for the Town, North Andover, and Lawrence was established at the Showcase Cinema parking lot in South Lawrence. Andover was represented by the Town Manager and Police Chief at the UCC.

Between 6:00 PM and 7:00 PM, in Andover, a media staging area was established, and two shelters were opened at the Senior Center and the Youth Center. Just after 7:00 PM, National Grid shut off electricity in the Town to reduce the likelihood of fire ignition. Later in the evening, teams of fire personnel, police personnel, locksmiths, and Columbia Gas representatives went from home to home to turn off the gas. Over the next few days, more resources were gathered and set up by multiple town departments to assist residents. A more detailed outline of the timeline of events is provided below in Section 1.

SUMMARY OF FINDINGS

Key Successes

The Town of Andover successfully and uniformly responded to the needs of their community during the Merrimack Valley Gas Explosions. The report details the capabilities of each Town department, but first, a summary of the key successes is provided to help frame the after-action report:

² Quoted directly from recording of the Code Red alert provided by the Town.



1. The EOC was activated promptly and the training experience and professionalism of the members of the EMWG was excellent.
2. Emergency personnel, both fire and police, took immediate actions to address life safety needs and were adaptable to the unpredictable and sudden event. Both departments showed dedication by responding to the call back for assistance and working tirelessly to help residents. Zero fatalities occurred and two civilian injuries were reported in the Town.
3. Nine dispatchers were available to take calls and communicate with first responders. They performed excellently during an extremely complex situation and without the assistance of their back up control point dispatch center (North Andover).
4. Staging areas for mutual aid were established soon after the Town became aware of the severity of the Gas Event.
5. The Town Manager's Office facilitated a uniform and consistent voice to keep residents updated on the situation through the Town's website and social media pages.
6. Using the Senior Center and the Youth Center as shelters for displaced residents was successful.
7. The EOC's modern capabilities enabled the EMWG to operate effectively.
8. The establishment of a procedure to obtain permits and inspections, as well as set up a Customer Service Center at Old Town Hall, was critical during the recovery phase.
9. The Department of Public Works, the Facilities Department, and the Town's GIS systems were instrumental during the recovery phase and they limited potential issues with water and sewer mains.
10. Each department quickly recognized the need to track costs during the incident and observed procurement laws during a very hectic situation.

Key Recommendations

As with any emergency response situation, there are areas for improvement worth exploring to further bolster the Town's response in future large-scale emergencies. Recommendations are provided throughout the after-action report and summarized here:

1. One key recommendation has been proactively addressed by the Town of Andover. In an effort to most effectively utilize the ladder truck during an emergency, the Town has made the budgetary commitment that will allow for the addition firefighters needed to staff the ladder truck with at least two firefighters. However, The Fire Department would benefit from staffing each station with a Fire Captain to oversee daily operations. Other resources that would benefit the Fire Department during future incidents include an additional radio channel for ground operations, multi-gas meters, and a designated Aide to assist the Deputy during large-scale emergencies.
2. Activating the EOC and utilizing the EMWG was an important initial response; however, the EOC can be improved with the utilization of a tiered response system, an Incident Command



Management Team, and the incorporation of WebEOC. WebEOC should be used in similar incidents as a communication tool and a resource management tool. An activation plan/checklist should be developed that assigns roles to EMWG members and ensures equipment, such as landlines, radios, printers and data access, are set up.

3. The Town's Comprehensive Emergency Management Plan (CEMP) needs to be updated, dispersed to all Town departments, and practiced routinely. The CEMP was not utilized during the Gas Event, but if it is updated and used regularly, the CEMP can be an extremely useful tool for facilitating a fast, unified, and strategic response during large-scale emergencies.

4. One of the main compounding factors that emergency responders had to work against during the Gas Event was traffic. The Police Department should work on developing an evacuation route management plan, as part of their CEMP, so that they can deploy their response strategically when the Town or surrounding communities call for an evacuation.

5. The Town needs to upgrade the entire radio communications system. This is reported as currently being done with fiber optic and microwave technologies. Cell phones were used as the primary means of communication between departments and within many departments. This worked sufficiently during the Gas Event, but is not a dependable plan because many large-scale emergencies can result in loss of cell service. Additionally, the Town should conduct training exercises using only radio communications to prepare for events that disrupt cell service.

6. The Town's Code Red System should be reviewed further and modified. Specifically, a number of pre-scripted alerts should be written, tested, and recorded with a human's voice to be used in future emergency situations. Smaller designated groups of contacts should be created within the Code Red System to assist in the simultaneous notification of the EOC's activation to the EMWG.

7. Fuel cells or other means of providing fuel to portable light units and generators need to be acquired. Additionally, contracts with fuel supply companies that can respond during an emergency are needed. Similar contracts can be utilized with other companies to plan for other resources such as showers.

8. The Town's Senior Center should be designated as a shelter and the proper certifications from the American Red Cross should be obtained. Relatedly, a shelter operations plan should be developed with a Shelter Manager, volunteer list, and checklist for opening up.

9. The EMWG should work toward incorporating more of the technological tools that the IT Department has. In particular the "InformaCast" application should be explored further as it is an emergency notification system and crisis alert system that the Town already has access to. A set of procedures should be developed to direct how this application should be used during an emergency.

10. Each department in the Town should receive further training. In particular, ICS training for large scale emergencies, WebEOC training, and OSHA training are needed. The Town should



utilize more diverse table top exercises and practice implementing ICS training during town-wide events, such as food festivals and road races. Conducting training exercises on a regular, periodic basis is the only way to increase the likelihood that the proper emergency response protocols are implemented during an actual emergency.

AFTER ACTION REVIEW TEAM

The Edward Davis Company

Edward F. Davis, Chief Executive Officer

William Taylor, Senior Security Specialist

William Desrosiers, Fire Expert Consultant

Paul Fitzpatrick, Director of Security Services

Chelsea Farrell, Ph.D., Research Consultant

Sheehan McCarthy, Research and Policy Analyst

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Town of Andover

Andrew Flanagan, Town Manager

Michael Lindstrom, Deputy Town Manager

Patrick Lawler, Chief of Administrative Services

Fire Department

Michael Mansfield, Fire Chief

Police Department

Patrick Keefe, Police Chief

Department of Public Works

Chris Cronin, Director of the Department of Public Works

Facilities Department

Janet Nicosia, Director of the Facilities Department

Paul Puzzanghera, Chief Information Officer

Thomas Carbone, Director of Health

Ann Ormond, Director of Business, Arts, and Culture

Tonia Magras, Executive Assistant to the Town Manager's Office



INTRODUCTION

On September 13, 2018 at 4:18 PM the Andover Fire Department was dispatched to a building fire at a local restaurant. Their response was standard and followed established protocol, but within minutes they, along with other departments in the Town, realized that the rest of their day would be far from typical. Fire personnel responded to 41 calls for assistance and police personnel responded to 104 calls for assistance within the following twenty-four hours according to Computer Aided Dispatch (CAD) call logs. The NTSB report states that over-pressurized gas lines caused this initial fire in Andover and multiple other fires and explosions across the Merrimack Valley. Despite the unexpected and unpredictable events that occurred, the Town and the critical departments within it performed their jobs exceptionally well. A number of factors, including training, professionalism, and some fortunate timing, led to a fatality-free emergency response and recovery process in the Town.

PURPOSE AND SCOPE

The purpose of this report is to describe and constructively assess the events and actions that took place in response to the Merrimack Valley Gas Explosions that occurred on September 13, 2018. This report covers the Town of Andover's preparedness, response, capacity, internal/external communications, policies, and procedures before, during, and after the Gas Event. The scope of this after-action review includes the Town Manager's Office, the Fire Department, the Police Department, the Department of Public Works, Facilities, the Department of Information Technology, and the Health Department.

This report does not cover the response taken in other impacted communities, such as North Andover or Lawrence, nor does it cover the actions taken by Columbia Gas and other companies involved, such as Eversource and National Grid. It is important to note that the long-term recovery process is ongoing in the Town, but our report is focused on the first week following the Gas Event, particularly the initial 24 hours.

METHODOLOGY

The *After Action Report for the Town of Andover's Response to the 2018 Merrimack Valley Gas Explosions* was conducted by a team at the Edward Davis Company at the request of the Town of Andover. The team utilized primary and secondary data collection and in-depth qualitative and quantitative analyses to obtain a full understanding of the Town's response to the Merrimack Valley Gas Explosions. Secondary data collection and analysis consisted of gathering and reviewing several key sources of existing material. We reviewed the following material:

1. Preliminary reports related to the Gas Event produced by the Massachusetts Emergency Management Agency (MEMA) and the National Transportation Safety Board (NTSB)
2. Computer Aided Dispatch (CAD) logs from the Andover Police Department and Fire Department



3. Audio files capturing radio communications between dispatch and the Andover Fire Department and Police Department
4. Archived calls for service data from 2016 and 2017 for the Andover Fire Department and Police Department
5. Publicly available materials including social media posts

We collected primary data through a series of semi-structured interviews and focus groups with instrumental personnel from a number of the Town's departments. Please refer to Appendix A for a sample interview protocol and a sample focus group protocol and Appendix B for consent forms. To ensure accuracy, our team had at least two members present at all interviews/focus groups and we audio recorded³ the sessions to enable our team to refer back for any needed clarification. We conducted interviews and focus groups with the following individuals and groups from the Town of Andover:

1. Town Manager, Andrew Flanagan
2. Fire Chief, Michael Mansfield
3. Police Chief, Patrick Keefe
4. Deputy Town Manager, Michael Lindstrom
5. Facilities Director, Janet Nicosia
6. Director of the Department of Public Works, Chris Cronin
7. Chief Information Officer, Paul Puzzanghera
8. Director of the Health Department, Thomas Carbone
9. Firefighters on duty during the Gas Event
10. Police officers on duty during the Gas Event
11. Department of Public Works personnel
12. Facilities personnel
13. Chief of Administrative Services, Patrick Lawlor
14. Director of Business, Arts, and Culture, Ann Ormond

The data gathered through both the material review and the interviews/focus groups was examined and analyzed to build a comprehensive understanding of the timeline of events, the actions that each department took during the response and recovery process, the successful measures utilized by the Town, and the areas that need improvement. By combining the results of the analysis and the expertise of each after action review team member, we developed a series of recommendations to assist the Town in future emergency events.

³ All interview and focus group participants completed and signed a consent form granting permission for audio recording. All audio recordings were destroyed after the completion of this report.



ORGANIZATION OF THE REPORT

The after-action report is organized into the following main sections:

EXECUTIVE SUMMARY

INTRODUCTION

SECTION 1: Incident Timeline

This section details key events related to the Gas Event in the Town of Andover in a chronological order.

SECTION 2: Overview of Events

This section utilizes information gathered from material review and interviews/focus groups to describe the response and recovery actions taken by a number of key Town departments.

SECTION 3: Analysis of Capabilities

This section provides the results from our analysis of the capabilities of each of the key Town departments. This section provides observations and highlights successes and indicates areas for improvement with associated recommendations.

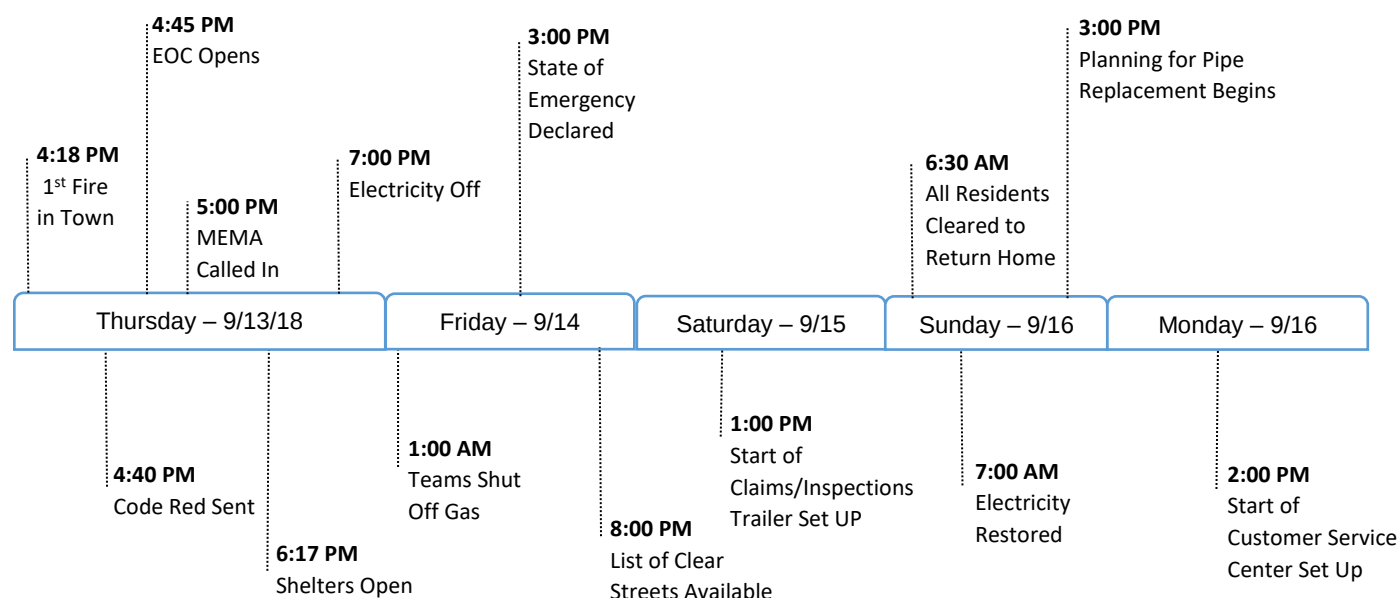
CONCLUSION



SECTION 1: INCIDENT TIMELINE

The following timelines detail events during the initial response period covering the immediate 24 hours and the recovery period. The events included in each timeline pertain primarily to the Town of Andover. The after-action review team selected the following events to demonstrate a useful outline of events in chronological order. The events included relate to the actions taken by the key Town departments of interest in this report. Accuracy was the objective; however, some timestamps are approximations based on multiple data sources.

MAJOR EVENTS TIMELINE





DETAILED TIMELINE

The following timeline details the initial response or the first 24 hours of the Gas Event. Images referenced in the timeline can be found in Appendix C. The timeline is based on information gathered from a number of key sources differentiated by color:

Black = Interviews and focus groups

Pink = MEMA and NTSB reports

Red = Information gathered from Fire Department CAD call log

Blue = Information gathered from Police Department CAD call log

Purple = Information gathered from dispatch recordings

Green = Information gathered from the Town of Andover's twitter feed

Orange = Information gathered from Andover PD's and DPW's twitter feeds⁴

⁴ The tweets included were chosen because they assisted in building a chronological record of events, but not every tweet is utilized in this report.



INITIAL
RESPONSE

First 24 hours/
Sept. 13th - 14th

4:04 PM – First high pressure alarm for the South Lawrence gas system received by Columbia Gas monitoring center in Columbus, Ohio

4:05 PM – Second high pressure alarm for the South Lawrence gas system received by Columbia Gas monitoring center in Columbus, Ohio

4:06 PM – High pressure event reported by the Columbia Gas controller to the Meters and Regulations group in Lawrence, MA

4:11 PM – First 9-1-1 call related to the gas explosions made to Lawrence emergency services

4:18 PM – First building fire call in Andover (Restaurant on Main Street; response time: 2:54; time on scene: 0:30:33)

4:24 PM – Basement fire in Andover (Home on Maple Street; response time: 4:37; time on scene: 0:44:53)

4:30 PM – Regulator at issue shut down by Columbia Gas

4:31 PM (approx.) – Dispatcher states, “State is letting us know the fires are gas related, we also have another confirmed fire at McKenney Circle...State is letting us know the fires are gas related, gas related fires.”

4:32 PM – Basement fire in Andover (Home on McKenney Circle; response time: 23:13; time on scene: 0:34:38)

4:33 PM – Fire in Andover (Multifamily home on High Street; response time: 20:05; time on scene: 3:17:54)

4:33 PM (approx.) – Fire to Dispatch, “Call gas company to shut the gas lines down...Get call out to Columbia gas and see if we can get any answers from them...get all personnel called in.” Fire to dispatch, “have mutual aid come in...” Dispatcher states, “...surrounding town having the exact same issues, multiple fires, multiple towns, Lawrence included.”

4:34 PM – Fire alarm (no fire) in Andover (Home on Carlisle Street)
CHELMSFORD ENGINE IN ROUTE

4:35 PM – Fire alarm (made safe) in Andover (Home on Smithshire Es.)

4:38 PM – Fire alarm (no fire) in Andover (Home on Post Office Road)

4:39 PM – Fire in Andover (Building on Cuba Street)

4:39 PM (approx.) – Police radio recordings direct residents from High Street and other displaced residents to the Senior Center



INITIAL
RESPONSE
Continued

4:39 PM – Basement gas leak/fire in Andover (Home on Main Street; response time: 9:54; time on scene: 0:17:19)

4:38 PM – Fire personnel discuss using the Code Red system and dispatch acknowledges their request to send out a Code Red telling residents to, “evacuate the home and if they have an opportunity to shut the gas down, do that as well.”

4:40 PM (approx.) – Code Red alert called out to residents stating, “This the Andover Fire and Police, please shut off your gas service immediately and please evacuate your home due to multiple natural gas related incidents going on in town.”

4:42 PM – Smoke/fire in Andover (Apartment on Elm Street; response time: 29:44; time on scene: 0:30:33)

4:44 PM – Fire in Andover (Home on Main Street; response time: 7:21; time on scene: 1:18:35)

4:45 PM (approx.) – Police radio recording telling officers to take down addresses of people who are telling them of gas odor

4:45 PM (approx.) – EOC opened (according to PD focus group)

4:45 PM – Shift change time at dispatch. All dispatchers stayed creating double the number of dispatchers on duty and double the PSAPs than would typically be on duty.

4:48 PM – Basement fire in Andover (Home on Haverhill Street; response time: 5:48; time on scene: 0:53:33)

4:50 PM – Basement boiler fire in Andover (Home on Dufton Road; response time: 19:30; time on scene: 1:06:52)

4:50 PM – EMS call (15 YO seizure) in Andover (Home on Lowell Street)

4:51 PM – Fire in Andover (Building on Brechin Terrace) WILMINGTON ENGINE ON SCENE

4:55 PM – Fire (gas in boiler room) in Andover (Home on School Street; response time: 28:10; time on scene 3:28:48) CAR 2 and NORTH READING ENGINE IN ROUTE

5:00 PM – Basement fire in Andover (Home on Locke Street; response time: 14:09; time on scene: 0:38:50)

5:00 PM – Gas leak in Andover (Home on Smithshire Es.)

5:00 PM – MEMA called in to assist

5:16 PM – Evacuated (shut of gas) for gas leak in Andover (Home on Central Street; response time: 5:06; time on scene: 0:21:00)



INITIAL
RESPONSE
Continued

5:20 PM – Basement boiler fire in Andover (Home on Cassimere; response time: 7:09; time on scene: 2:29:10)

5:22 PM – Fire in Andover (Building on River Road)

5:25 PM – Gas Leak (nobody on scene) in Andover (Home on Pine Street; response time: 12:01; time on scene: 0:18:18)

5:28 PM – Town of Andover twitter page released first tweet related to gas incident. “If you know how to safely shut off you gas, please do so. Residents and businesses are being advised to evacuate. We will post updates as soon as we have information.”

5:30 PM – Gas Leak (gas shut off) in Andover (Home on Marwood Drive; response time: 18:25; time on scene: 0:18:28)

5:30 PM – Gas Leak (gas shut off) in Andover (Home on North Main Street)

5:35 PM – Gas Leak (made safe) in Andover (Home on Howell Drive)

5:35 PM – First tweet from Andover PD posted stating, “Our social media team is on the way in. They’ve been tied up with emergencies from the gas issue. Follow instructions from our code red systems. More information to follow soon.”

5:42 PM – Fire (deemed no fire) in Andover (Building on Tech Drive)

5:44 PM – Fire (deemed no fire/gas shut off) in Andover (Building on Federal Street)

5:44 PM – Gas Leak (nobody on scene) in Andover (Home on Oriole Drive; response time: 13:47; time on scene: 17:24)

5:47 PM – Gas Leak (gas shut off) in Andover (Home on William Street; response time: 25:21; time on scene: 0:30:58)

5:49 PM – Basement fire in Andover (Home on Ridge Street; response time: 3:26; time on scene: 0:28:19)

5:57 PM – EMS call (report of fall) in Andover (Apartment on Haverhill Street)

6:07 PM – EMS call (patient refusal) in Andover (Holt Road)

6:08 PM – Andover PD tweets image of Emergency Operations Center (EOC) (see Image #3) and directs residents to follow @AndoverMaGov for information.

6:10 PM – Media staging area announced via Town of Andover twitter (Memorial Hall Library parking lot, 2 N. Main Street). Hashtag #MVGasfire started being used in tweets.



INITIAL
RESPONSE
Continued

6:11 PM – Andover PD tweets post stating Senior Center and Youth Center open for shelter

6:13 PM – Gas leak in Andover (Home on Haverhill Ave) BILLERICA ENGINE AND LADDER, MALDEN ENGINE

6:13 PM – Andover DPW retweets WCVB-TV Boston's street, "URGENT! From @ MassStatePolice: Residents in #Lawrence # North Andover # Andover who have @ColumbiaGasMA should EVACUATE THEIR HOMES IMMEDIATELY! Gas lines are currently being depressurized by the company it will take some time."

6:17 PM – Residents directed to town website (andoverma.gov) to find the latest information about the event and residents notified that the Senior Center and Youth Center will be open for displaced residents via Town of Andover twitter

2 – 3 hours after first fire MUTUAL AID TASK FORCE arrived (according to fire dept. focus group)

6:17 PM – Andover PD retweets Town of Andover's tweet above.

6:21 PM – Andover PD tweets post stating, "#AndoverMA is under an evacuation order due to #MVGasFire."

6:27 PM – Andover DPW tweets, "#AndoverMA is under evacuation order due to #MVGasFire" and notifies residents of shelters at the Youth Center and Senior Center and instructs them to follow Andover's Town twitter and Andover PD's twitter.

6:29 PM – Andover PD tweets revision to previous post stating, "Evacuation Order is for GAS SERVICED neighborhoods only."

6:37 PM – Andover PD tweets, "Alternate shelter is open at Wilmington Middle School; 25 Center Lane in Wilmington."

6:30 PM – Smoke scare in Andover (Home on Smithshire Es; response time: 1:52; time on scene: 0:12:40)

6:46 PM – Gas leak (gas shut off) in Andover (Home on Poor street; response time: 7:11; time on scene: 0:25:33)

7:03 PM – Fire call (none found) in Andover (Home on Dufton Road; response time: 5:50; time on scene: 0:13:44)

7:04 PM – EMS call in Andover (Home on Carisbrooke Street; response time: 33:19; time on scene: 2:09:54)

7:04 PM – Andover PD tweets post notifying residents that electricity will be shut off by National Grid in impacted areas to prevent spark-started fires.

7:08 PM – Andover PD tweets correction to earlier tweet stating, "Alternate Shelter in Wilmington is not open yet."



INITIAL
RESPONSE
Continued

7:13 PM – Andover PD posts official update (See Image #4) and notifies residents that “All Andover fires are out.”

7:15 PM – Andover PD tweets that no shelter will be open at Wilmington.

7:19 PM – Roof fire in Andover (Home on Central Street; response time: 6:07; time on scene: 0:44:46)

7:23 PM – Andover PD tweets the following, “If you are in a gas-serviced area and your electricity is shut off, DO NOT use candles. Recommendation is to evacuate the house pending an all clear.”

7:24 PM – All critical valves involved were closed by Columbia Gas.

8:16 PM – Carbon monoxide alarm (low battery) in Andover (Home on Railroad Street; response time: 4:46; time on scene: 0:43:25)

8:41 PM – Fire rekindled in Andover (Home on High Street; response time: 2:31; time on scene: 1:56:12)

9:25 PM – EMS call in Andover (Assisted Living on Stevens Street; response time: 3:45; time on scene: 0:45:52)

9:30 PM – Town of Andover twitter page notifies residents of school closure for Friday, Sept. 14th

9:34 PM – Andover PD tweets post directing residents to dial 2-1-1 for updates on the gas emergency (translation available).

10:45 PM – Carbon monoxide alarm (negative reading) in Andover (Apartment on Elm Street; response time: 10:32; time on scene: 0:22:21)

10:49 PM – Gas leak (odor detected by police) in Andover (Home on Main Street, response time: 9:17; time on scene: 0:13:44)

11:41 PM – Andover PD tweets about press conference starting momentarily from the regional command post in Lawrence.

12:00 AM – Emergency responders escort two Columbia Gas technicians into each house to shut off meters

12:33 AM – Town of Andover twitter shares link to Update #2 from public safety officials



INITIAL
RESPONSE
Continued

12:41 AM – Andover PD tweets image for first phase of recovery and returning to homes (See Image #1).

12:41 AM – Town of Andover retweets Andover PD tweet with image indicated first phase of recovery and returning to homes (See Image #1).

12:59 AM – Inquiry to turn gas on in Andover (Hotel on Campanelli Road; response time: 8:57; time on scene: 0:17:30)

2:19 AM – Carbon monoxide alarm (nobody on scene) in Andover (Home on School Street; response time: 4:59; time on scene: 0:18:09)

2:40 AM – Andover PD tweets reminder to warn residents not to turn their gas on themselves.

6:09 AM – Town of Andover retweets Andover DPW tweet regarding delayed trash and recycling pick up.

4:18 AM – Faulty smoke detector alarm in Andover (Home on Heartstone Place; response time: 9:49; time on scene: 0:26:15)

8:46 AM – Andover PD tweets link to Columbia Gas page which lists current streets to stay away from.

9:14 AM – Gas odor (from day before) in Andover (Elderly housing on Main Street; response time: 4:22; time on scene: 0:36:05)

9:31 AM – Andover PD tweets out image (See Image #5) of color coded cards that are posted on the 35+ homes that experienced a fire to direct residents whether or not they can occupy the home.

9:49 AM – Gas odor (negative reading) in Andover (Home on Central Street; response time: 16:20; time on scene: 0:46:43)

10:24 AM – Carbon monoxide alarm (negative reading) in Andover (Home on Glen Meadow Road; response time: 4:25; time on scene: 0:23:51)

10:26 AM – Gas leak (negative reading) in Andover (Home on Federal Street; response time: 19:07; time on scene: 1:19:02)

10:36 AM – Andover PD tweets link to updated “good and bad streets” from Columbia Gas.

10:29 AM – Town of Andover tweets link to view cleared and not cleared streets in the town.

11:36 AM – Gas odor (negative reading) in Andover (Home on Avon Street; response time: 8:50; time on scene: 0:15:49)



INITIAL
RESPONSE
Continued

11:58 AM – Town of Andover retweets Andover Public Schools tweet regarding the cancellation of weekend activities

12:28 PM – Andover PD tweets that National Grid set up a community service van at the Old Town Hall to answer questions.

12:31 PM – Fire (other) in Andover (Home on Old South Lane; response time: 3:26; time on scene: 0:38:48)

12:34 PM – Fire prevention in Andover (Home on Andover Country Club Lane; response time: 7:04; time on scene: 0:38:55)

1:02 PM – Andover PD tweets that Revision Energy has a trailer set up behind the Senior Center for people to charge their phones.

1:11 PM – Gas odor (negative reading) in Andover (Home on Gould Road; response time: 9:44; time on scene: 0:20:51)

1:11 PM – Town of Andover tweets about e-mail address for people to send donation inquiries to (AndoverCommunitySupport@andover.ma.us)

1:15 PM – Gas odor (negative reading) in Andover (Home on Mortimer Drive; response time: 24:45; time on scene: 0:45:58)

3:00 PM – Governor declares a State of Emergency and puts Eversource in charge to take over for Columbia Gas

3:38 PM – Gas odor (negative reading) in Andover (Home on Stirling Street; response time: 6:45; time on scene: 0:23:37)

3:56 PM – Andover PD retweets John Guilfoil's tweet with link to update

4:07 PM – Town of Andover tweets link to situational update



SECTION 2: OVERVIEW OF EVENTS

This section provides a narrative overview of the events that occurred in response to the Gas Event in the Town. Background information about the source of the Gas Event is described first, followed by a comparison between typical fire and police call volume versus fire and police call volume on September 13, 2018. An overview of each department's response to the Gas Event is included to provide a broad perspective of the actions taken. More nuanced descriptions of department's capabilities are included in the analysis section (Section 3).

BACKGROUND

Andover Fire and Police Department

The after-action review team compared fire incidents and police incidents during the week of September 12th through September 20th from 2016, 2017, and 2018. Examining the week of the Gas Event to the same week during the prior two years allows for the comparison of a typical September week to an atypical week full of unpredictable incidents, revealing the massiveness and complexity that the Gas Event created for the Town and responding departments.

In 2016 the Fire Department responded to 235 incidents from September 12th through the 20th and during the same week in 2017 they responded to 284 incidents. During the week of the Gas Event in 2018, the Fire Department responded to 586 incidents. The number of incidents that the Fire Department had to address was nearly 2.5 times the number they responded to on a typical September week in prior years. The ability of the Fire Department to handle this massive influx of incidents in a fatality-free manner with minimal injuries is both praiseworthy and impressive.

Graph #1 below depicts incident counts for several relevant incident types from 2016, 2017, and 2018. During the week of the Gas Event there were 72 calls for building fires, which is 3 to 5.5 times the number of calls for building fires during the same week in 2017 and 2016, respectively. As depicted in Graph #1, the Fire Department responded to 85 gas leak incidents during the week of the Gas Event, which is over 28 times the average number of gas leak incidents from the prior two years of data. In 2016 and 2017 they were called to only 1 and 5 gas leak incidents. It is also important to recognize the massive number of incidents of false alarms and alarms without fire (i.e., alarm system sounded, no fire – unintentional) that occurred during the week of the Gas Event. For example, there were 47 incidents of alarms sounding without fire in 2018 from September 12th – 20th and only 10 in 2016 and 14 in 2017.

The severe difference between the incidents that the Fire Department responded to during the week of the Gas Event and the same weeks in two years prior is mirrored, but to a lesser extent, in the data for the Police Department. During the week of the Gas Event there were 846 police incidents. In the same week in 2016 there were 703 police incidents and in 2017 there were 675. There were 157 more police incidents during the Gas Event week than the prior two-year average (689). A sample of relevant



incident type counts are pictured in Graph #2. The largest variation over the three years is seen in building checks. During the Gas Event week there were 270 building checks, which is approximately 2.5 times the amount that occurred in the same week in 2016 and 2017.

Other types of incidents were less common during the Gas Event week in comparison to prior years, such as motor vehicle stops. The police were more concerned with life safety issues and assisting the Fire Department in their response that other actions the police typically perform were less of a priority. Focus group data revealed that police likely assisted the Fire Department more so than the data logs suggest. Graph #2 indicates that the police assisted the Fire Department 13 times and assisted other agencies 36 times. Although these values are much larger than those from 2016 and 2017, they may be conservative based on information gathered during focus groups.

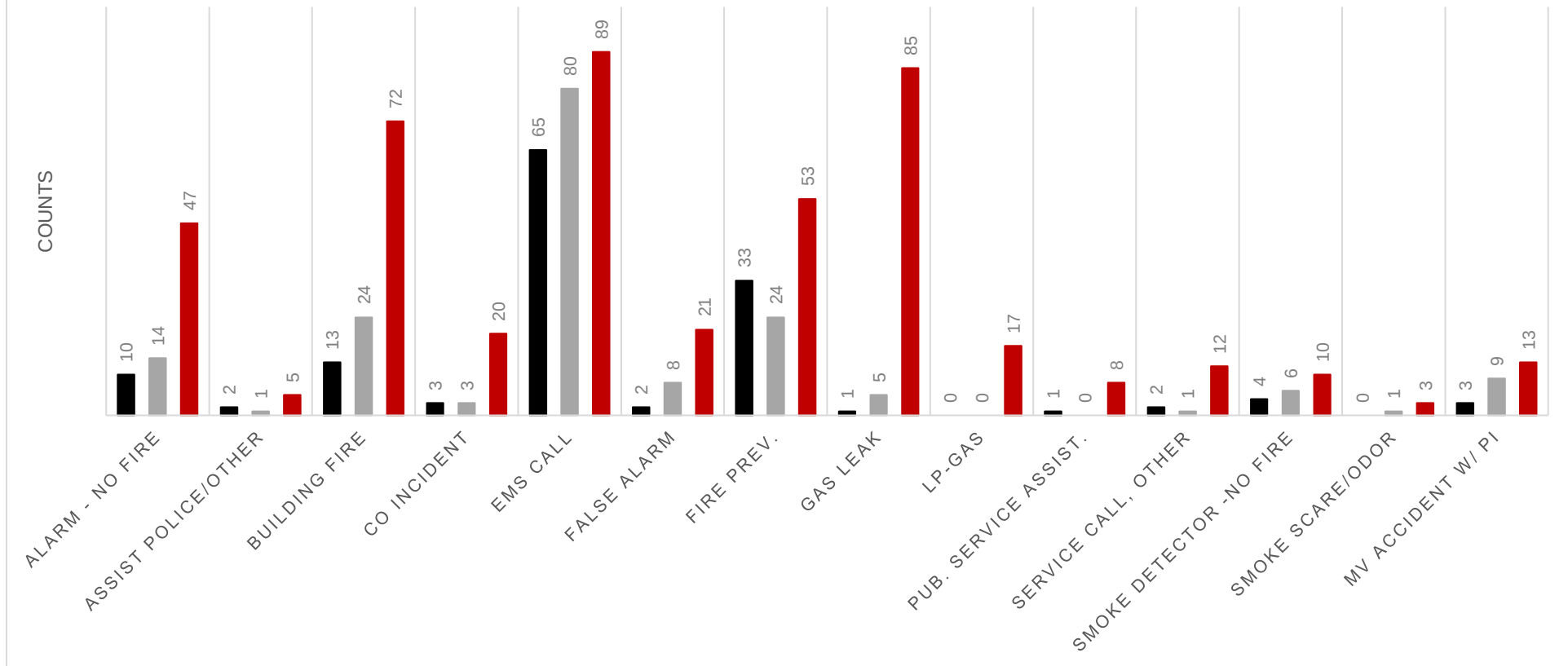
It is important to recognize that both police and fire personnel likely responded to more scenes or locations than the logs depict. As will become clear in Section 3, radio communications were overloaded and first responders were assisting people who were simply waving them down. These types of incidents are likely not captured in the material review. Therefore, the comparisons above are arguably conservative and were likely even more extreme.

On September 13th, and any other typical day, the Fire Department has 15 firefighters on duty and one fire prevention officer who operate three engines, one ladder, and two ambulances. This allows for the Fire Department to fully respond to one fire and one medical emergency simultaneously. On a typical day the Police Department has one Shift Commander, a Patrol Supervisor, and four patrol cars with one officer in each on duty. Both the Fire Department and Police Department are dispatched by the same dispatch center



GRAPH #1
INCIDENT COUNTS BY TYPE:
ANDOVER FIRE DEPT. FROM SEPT. 12TH - 20TH OF 2016, 2017, AND 2018

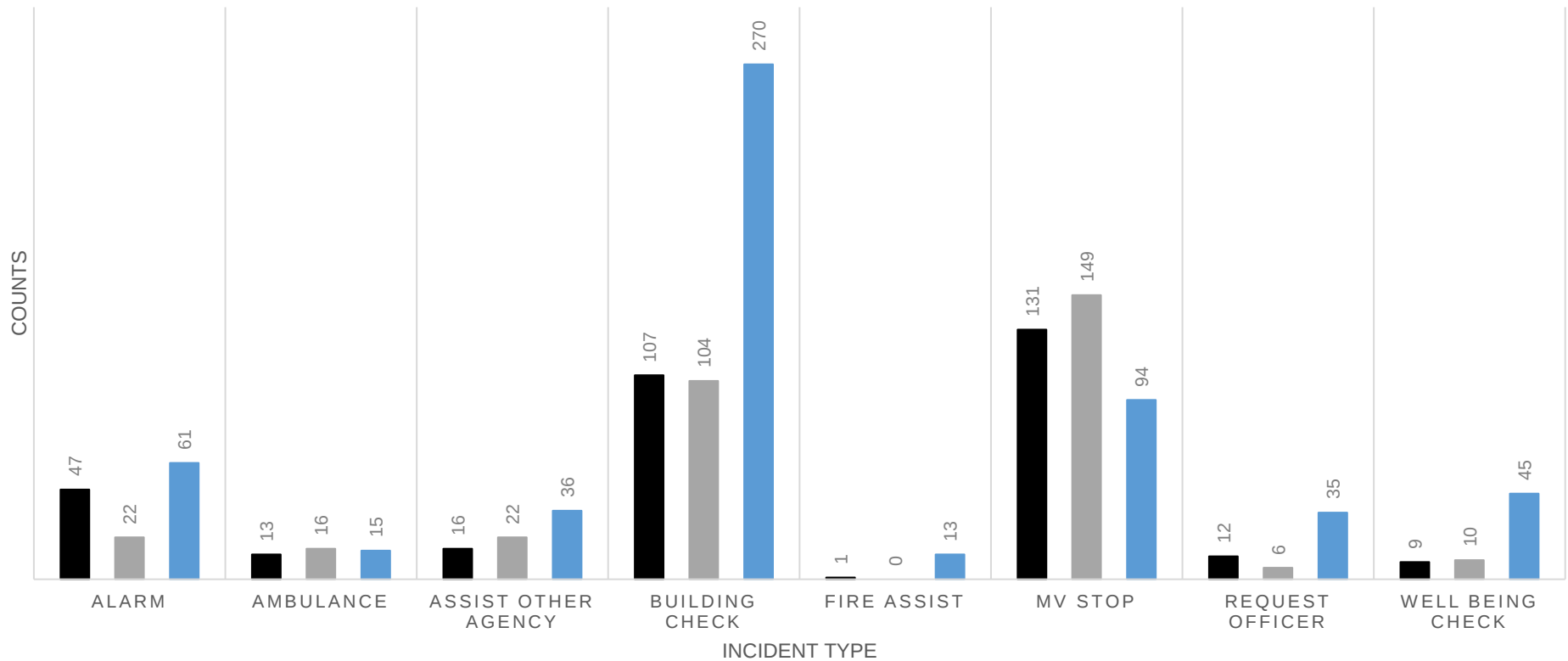
■ 2016 ■ 2017 ■ 2018





GRAPH #2
INCIDENT COUNTS BY TYPE:
ANDOVER POLICE DEPT. FROM SEPT. 12TH - 20TH OF 2016, 2017, AND 2018

■ 2016 ■ 2017 ■ 2018





OVERVIEW OF THE RESPONSE

The following subsections provide a summary overview of each department's response following the Gas Event in the Town. Interview and focus group data were the primary sources of information used to inform these overviews. An analysis of each department's response is detailed in Section 3.

Fire Department

On September 13, 2018 at approximately 4:15 PM the Fire Department's Engine-2 was in route to North Andover to provide mutual aid for a gas-related call. Engine-2 never made it North Andover because it was called back to Andover as the Fire Department was responding to multiple gas-related fires in the Town. Communication between responding personnel was challenging due to the volume of calls and the unexpected nature of the Gas Event. Fire personnel continued to go from call to call and simultaneously responded to residents who were waving them down for assistance.

As the complexity of the Gas Event grew, all off-duty firefighters were called back to assist in the response, along with mutual aid. A Code Red alert was issued to town residents through a reverse 9-1-1 call to shut off the gas, if possible, and evacuate homes. A reverse 9-1-1 call is a public safety communication tool that allows for the fast dissemination of information to a designated list of phone numbers. Fire personnel, along with police personnel, worked through the first few chaotic hours without any serious injuries or fatalities and then regrouped that evening to plan for the next twelve hours. A staging area for fire mutual aid was established at the Town's high school and for a few hours overnight, teams with firefighters, police officers, locksmiths, and Columbia Gas representatives went around to homes in the impacted area to shut the gas off.

The Fire Chief reported to the Emergency Operations Center (EOC) and worked with the Town Manager and other Town department heads to develop and implement a plan to provide assistance to residents and begin the recovery process to get the Town back to "business as usual" as soon as possible.

Police Department

Upon notification of the initial fire related to the Gas Event, and further calls for fires and gas leaks, the Police Department responded as is their normal procedure. Ultimately police personnel went door to door, along with the Fire Department, to evacuate and notify residents of the gas situation. The police helped to alleviate the traffic complications that were caused by the evacuation order for the city of Lawrence because the main evacuation route south of the city was through Andover. This, along with residents trying to leave Andover, caused significant traffic build up and required major police work to increase the flow of traffic. Additionally, the Police Department helped fire apparatus navigate to incident locations by directing traffic and clearing congestion.

After realizing the severity of the Gas Event, the Police Chief who is also the Town's designated Emergency Management Director, a Police Lieutenant, and a Police Sergeant assigned to the



NEMLEC Team, called for the Northeastern Massachusetts Law Enforcement Council (NEMLEC) Response Team. NEMLEC is a consortium of police departments from Middlesex and Essex Counties that collectively provides resources and services to other departments within NEMLEC. A police staging area was established at Brickstone Square and NEMLEC handled the assigning of all police resources. Law enforcement mutual aid was requested and responded to the staging area. Simultaneously the Massachusetts State Police (MSP) self-dispatched and immediately assisted with the initial response in the Town.

Dispatch

The dispatch center routinely handles radio communications and dispatch roles for the Town's Police Department, Fire Department, and EMS. Although dispatchers are not assigned to either the Police or Fire Department, they are all trained to handle all call types and on the day of the Gas Event they adapted and had designated dispatchers for each.

Dispatchers handled the first few calls for assistance with issues related to gas and fire according to normal policy and procedure. They remained calm as the situation grew increasingly complex. The dispatch center performed very well under an extremely complex situation. It was fortunate that this incident occurred during the time when the dispatchers normally change shifts. This allowed for the off-going dispatchers to stay on duty and assist, which effectively doubled the number of dispatchers available from two to four. In addition, even more dispatchers were called in to work, bringing the number of dispatchers to nine. This was vital to the response and the dispatch center was able to go from two active Public Safety Answering Points (PSAPs) to four, with an additional station to answer telephone calls.

In addition to answering calls and dispatching emergency responders, the dispatch center was responsible for sending out the Code Red alert to residents at approximately 4:40 PM. This was the first alert to the public and was critical for getting residents out of their homes and to safer locations.

Town Manager's Office

The Town Manager ultimately approves and oversees all emergency actions. Normally, these roles and duties delegate to the Police Chief and Fire Chief. In addition, the Department of Public Works Director (DPW), Facilities Director, Information Technologies, Finance and Health Department Directors work in a very cohesive way with the Fire and Police Chiefs.

The Town Manager first received notice that there was a significant incident in Town when he received a telephone call from the Fire Chief. This occurred at the same time he received the Code Red alert. He was informed that they may have up to 35 house fires going on and decided, with the Fire Chief, to activate the Emergency Operations Center (EOC). He instructed his Deputy Town Manager to call in all department heads to respond to the EOC. These department heads are also members of the Emergency Management Working Group (EMWG).



Shortly after arriving at the EOC the Town Manager, along with the Police Chief, were requested to report to the Unified Command Center (UCC) in Lawrence at the Showcase Cinemas. From the UCC, the Town Manager was in telephone communication with the EOC, specifically with the Deputy Town Manager, the Fire Chief, and the Chief of Administrative Services.

As was the standing practice for the Town, The Town Manager's Office would approve all communications to the public. This was vital so that the town spoke with one voice and eliminated false or inaccurate messages. Social media platforms and the Town's website were utilized to keep residents updated. John Guilfoil, a private public relations and media relations company contracted by the Town, was brought in to assist with the Public Information Officer duties.

The Director of Business, Arts, and Culture is part of the Town Manager's Office. During the recovery phase, her role was instrumental in assisting restaurants to reopen. Specifically, the Director of Business, Arts, and Culture went from restaurant to restaurant to ask business owners what they needed and how she could help.

Department of Public Works

The Department of Public Works (DPW) consists of nine divisions: Engineering, Facilities and Field Rentals, Highway, Parks and Grounds, Forestry, Spring Grove Cemetery, Recycling and Solid Waste, Water Distribution and Sewer Collection, and Water Treatment.

The DPW Director was called to the EOC by the Deputy Town Manager. Once there he assumed a role in the EMWG and began organizing public works duties. The DPW, along with the Facilities Department, was tasked with setting up the Senior Center as a shelter for displaced residents. They also assisted other departments in setting up the temporary housing trailers and shower trailers. The DPW was successful in obtaining a number of varied resources from outside communities.

The DPW Director worked with the two other impacted communities to decide which engineering firm to hire to assist in the recovery phase. Eventually DPW personnel worked with the gas repair crews during the installation of new gas lines in the longer-term recovery phases.

The Facilities Department

The Facilities Director is part of the EMWG and reported to the EOC. The Facilities Department was initially focused on shutting off the gas to all public buildings and making sure all employees were safe. Facilities had to address all public buildings including the schools and eventually assisted at the Senior Center shelter and the temporary housing trailers, as well as the temporary shower facilities.

Facilities also set up a temporary office trailer at the Old Town Hall, which was used for permitting and inspection services. Generators were supplied by Facilities to locations that needed them, such as the fuel pumping station, the shelter, and water stations.



Health Department

The Director of the Health Department was notified by a police lieutenant to respond to the EOC. The major role for the Health Department during the Gas Event was to support the inspectional services dealing with food service industries and the sixty-two impacted restaurants in the Town. Because electricity was shut off in the entire Town, perishable food could not be kept fresh. Eventually they developed a protocol to allow businesses to reopen with the focus on safety of residents and employees and the Health Department assisted in establishing food pantries and hot showers.

The Health Department was also a liaison with long term health care facilities and assisted with the care of senior citizens and residents in need of long-term health care. They utilized their nurses at the shelter. During this time, they were assisted by the Medical Reserve Corps, which proved to be a tremendous asset.

Department of Information Technology

The Chief Information Officer (CIO) is part of the EMWG and is responsible for all technology for the Town, the schools, police, and all communications technologies. The IT department first received notice of the Gas Event through a telephone call from a non-employee member of the Town, not the Code Red alert.

While working at the EOC the CIO addressed IT needs and then reported to the shelters at the Senior Center and Youth Center to address any IT needs. The IT Department would later help set up the Claims Center, the Customer Service Center, and build a database for the permitting process.



SECTION 3: ANALYSIS OF CAPABILITIES

The following section provides an analysis of the actions taken by and the capabilities of the responding departments in the Town. Results from this analysis were obtained through qualitative and quantitative assessment of: 1) existing material, such as social media posts, CAD logs, and dispatch recordings; and 2) primary data from interviews and focus groups with personnel from eight town departments. The analysis is organized by departments with a specific section for the EOC and Dispatch Center. Within each department section, the analysis is presented by observations, successes, and recommendations pertaining to a specific capability within initial response (first 24 hours). This is followed by an assessment of the recovery operations and preparedness of each department.

FIRE DEPARTMENT

Initial Response

Capability 1.1: Notification and Response to Initial Fire-Related Call

Observations: The initial fire response was part of the normal routine and was dispatched and handled as such. It took 2 minutes and 54 seconds for fire personnel to arrive on scene. One of the Fire Department's Deputy Chiefs was initially the Incident Commander upon arrival at the Grassfields Restaurant fire. The fire occurred in the restaurant's oven and was caused by gas. One of the restaurant employees was able to extinguish the oven fire. Command was transferred to the Fire Prevention Lieutenant to file the appropriate documentation. According to CAD logs, fire personnel remained on scene for 30 minutes and 33 seconds.

Successes: All actions taken by fire personnel while responding to the initial call were appropriate and followed established protocols and normal procedure.

Recommendations: One Captain should be assigned to each station to oversee all station operations.

Capability 1.2.: Fire Response to Escalating Calls for Assistance

Observations: Following the initial call for a fire at Grassfields Restaurant, multiple calls came into the dispatch center for fire and gas issues on Maple Street and High Street. Eventually similar calls came in for addresses all over the Town. It quickly became clear that this was not going to be a typical day and that the incidents were beyond their normal capabilities which prompted a second alarm. With this second alarm, requests for mutual aid for both the Fire and Police Department were processed.

The average response time by the Fire Department during the first 24 hours was 11 minutes and 20 seconds. Response times ranged from 1 minute and 52 seconds to 33 minutes and 19 seconds. CAD log data was used to create Graph #3 which provides



the response times for each of the 41 calls that occurred during the initial 24 hours. The range in response times is wide and the average is higher than ideal. NFPA⁵ 1710 indicates that after a 60 second turn out time, the first engine company should arrive within 4 minutes and the full assignment should arrive on scene within 8 minutes for a minimum of 90% of all fire calls (NFPA, 2018).

The average time spent on scene during the initial response was 48 minutes and 26 seconds, with a range of 12 minutes and 40 seconds to 3 hours, 28 minutes, and 48 seconds. See Graph #4 below for time spent on scene for each of the calls during the initial response.

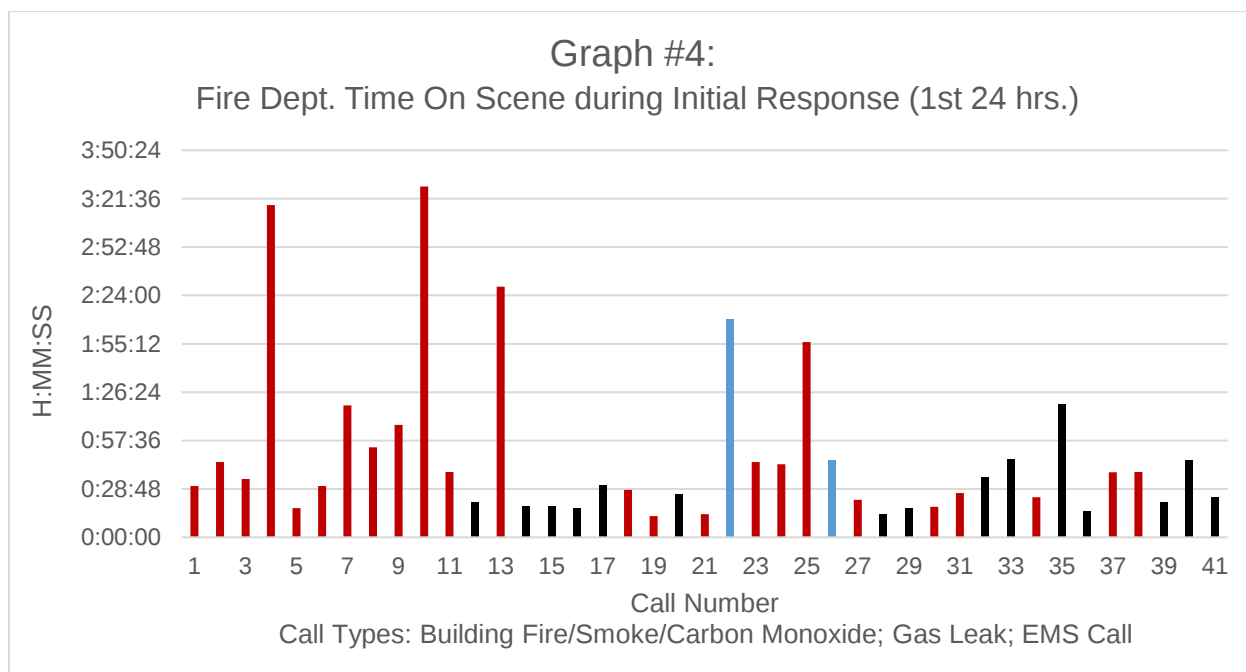
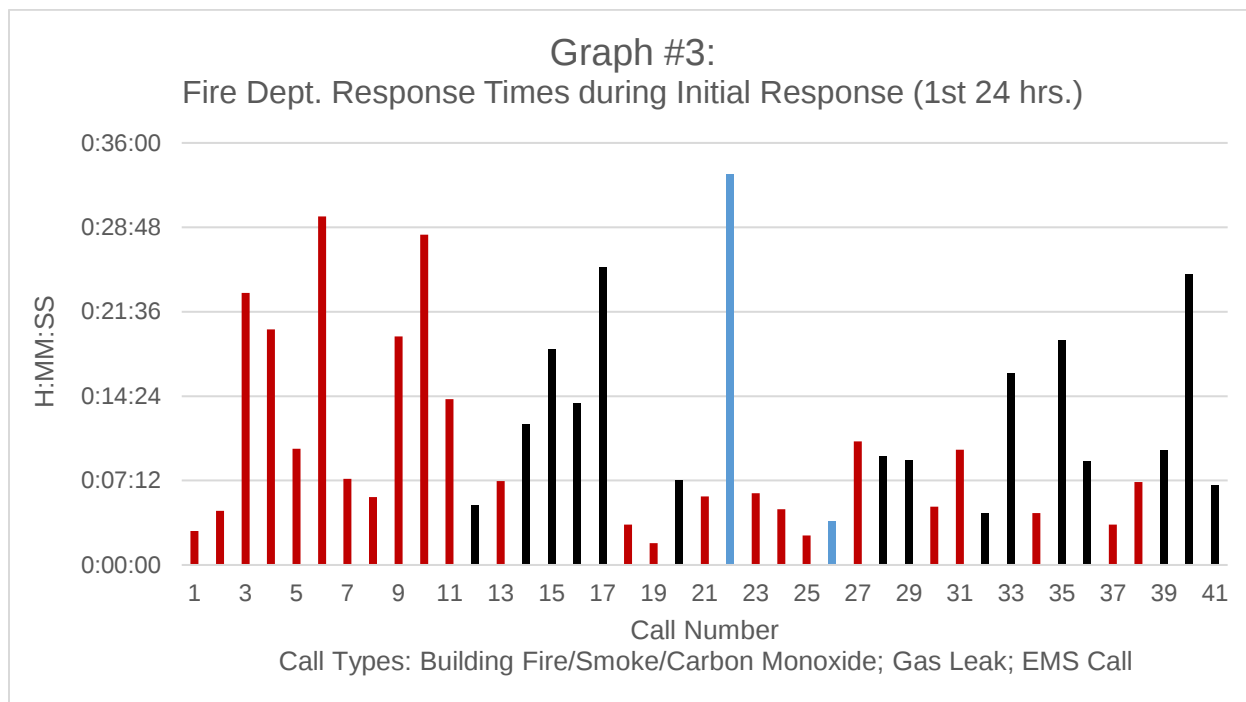
Focus group and interview data with fire personnel indicated that radio communications were difficult because of the call volume. Firefighters were not always able to notify dispatch of their actions and locations, which likely impacts the accuracy of the CAD log data presented in Graphs #3 and #4. Fire personnel did their best navigating a challenging situation and continued to move from call to call with the priority of life safety in mind. Firefighters referenced the added fatigue from having to get into homes that were locked to shut gas off, but they continued to perform their jobs.

Successes: Given the severity and sudden nature of the Gas Event, longer response times are expected. Moreover, the multi-community nature of the crisis impacted response times because mutual aid was not quickly accessible. Although data from the CAD logs would suggest a poor response time to multiple calls, focus group and interview data paint a more successful picture. The firefighters' ability to think quickly, work together, perform efficiently can be seen as a major success as evidenced by interview data, minimal injuries, and zero fatalities.

Moreover, many focus group participants indicated that the chaos experienced during the initial response was always under control. For example, one participant stated, "At no time did I feel like it wasn't under control. It was chaos, but it was controlled. We always had control on the scene. I didn't know what everyone was doing, but I knew that they knew what they had to do and were doing it." The Fire Department effectively prioritized calls and prevented many small fires from growing into much larger ones.

Recommendations: As will be highlighted in subsequent capabilities, multiple factors likely contributed to the long response times that occurred during the immediate response. Recommendations regarding each of these factors will be provided in their associated capability.

⁵ The National Fire Protection Agency (NFPA) provides guidelines, resources, trainings, and safety standards on fire and electrical-related hazards.



Capability 1.3: Communications between Fire Personnel and the Dispatch Center



Observations: Communication between fire personnel and the dispatch center during the initial response was very difficult due to the extremely high number of radio communications on a single channel.

Focus group data indicated that radio messages were not going through to fellow firefighters or to the dispatch center. This was particularly apparent during the fire calls on Maple and High Streets, which occurred within 15 minutes of the first fire call. During the first 30 minutes of the Gas Event, there were 8 calls for building fires. The radio was overloaded with traffic and fire personnel and dispatchers were often trying to talk at the same time, as evidenced by both focus group data and radio communication recordings.

With the lack of successful communications, many fire personnel were relegated to responding to individual homes without successfully relaying their actions to the dispatch center. This is very dangerous and hinders the ability to track responders and deploy them to various locations. Focus group data indicated that fire personnel ended up responding to neighboring homes to extinguish fires that were in sight of their initial call and dispatch was therefore unaware of their locations. After the Gas Event, fire commanders were forced to attempt to recreate these response locations for appropriate record keeping.

Recommendations: The Fire Department only utilized one radio frequency/channel, which is inadequate and dangerous during large, complex incidents such as the Gas Event. A second radio frequency for the Fire Department should be obtained, implemented, and regularly utilized as a fire ground operations channel. The school department has a reported 11 channels, one of which might be better utilized as a secondary fire radio frequency. As mentioned below in the recommendation for dispatch capability 4.3, modern data terminals in each fire apparatus would further facilitate communication during particularly hectic events. These would allow firefighters to notify dispatch and other fire personnel of their status and provide access to critical location-specific data (e.g., floor plans, hazardous materials).

An additional radio frequency and mobile data terminals would increase clarity of communication and reduce the likelihood of dangerous “freelancing.” Reducing this risky practice is critical. Although no firefighters were seriously injured during the Gas Event, the lack of tracking individual firefighters could have potentially created a situation where responders in need of assistance might not have been able to receive lifesaving support.

A written Communications Plan, similar to the ICS Form 205 Communications Plan, should be developed. This plan should include the EOC and include frequencies of mutual aid communities because other Fire Departments use different frequencies. It may require the use of multi-band radios or a “radio frequency patching system” to accomplish. MEMA has a group of licensed radio channels that can be utilized during critical events. The use of MEMA’s licensed radio channels, which would increase the



number of channels for use at specific/defined locations or assignments, should be included in the Communications Plan. This normally requires MEMA's permission, but could be arranged quickly if these frequencies are pre-programmed into existing radios. Additionally, if a shortage of portable radios should occur, the caches of portable radios from MEMA, the Department of Fire Services (DFS), or the Northeast Homeland Security Regional Advisory Council (NERAC) can be requested.

Moreover, adapting these recommendations will also facilitate report filing through the National Fire Incident Reporting System and ensure accuracy in that reporting process. Communications on the additional frequency would be recorded and there would be a digital record through the fire apparatus terminals for fire personnel to refer back to, enabling them to write a complete report after each incident.

Capability 1.4: Command Structure on Scene

Observations: Focus group and interview data, as well as radio communication recordings, revealed that the Fire Department follows the Incident Command System. However, due to radio communication challenges, not all communications went through the Incident Commander. The Incident Commander needs to know where all fire personnel and equipment are located, but this is challenging when communication cannot go through the appropriate command structure. Even with these challenges, firefighters noted that they knew they could trust one another to adapt responsibility and continue to prioritize life safety while shutting off gas and extinguishing fires.

Successes: Under the direction of the Deputy Chief, firefighters quickly took measured risks and adapted normal procedures to move from one home to the next. Prior training that emphasized teamwork allowed rapid change to normal procedures as calls for gas incidents continued to build up.

Recommendations: The Fire Department should further investigate and follow reporting relationships between the Incident Commander, the fire apparatus, and the dispatch center. All communications between the fire ground operations and the dispatch center should go through the Incident Commander. ICS communications procedures should be referenced to further develop policies and procedures related to communications.

During complex situations, such as the Gas Event, the Deputy Chief could use a designated Aid to assist in communications, tracking individuals and fire apparatus. A few senior firefighters could be trained to fill this role during similar events.

Capability 1.5: Fire Department Equipment and Personnel Staffing

Observations: Focus group data indicated there was a lack of gas and explosive meters. This led to responders entering areas that may have been unsafe because they were not checked with a meter beforehand.



As is the case in most crisis events, more manpower would have been useful. In particular, having only one firefighter on the ladder truck renders it inoperable. After just a few minutes, as the severity of the Gas Event became clear, the Deputy requested a call-back for all firefighters, resulting in ample firefighters to staff the ladder truck.

Successes: The quick action and decision making of firefighters on the ground was effective. The number of calls for assistance was, by far, above and beyond the normal volume for the number of firefighters typically on duty. The call-back process was a success with nearly all firefighters reporting back to assist.

The equipment that the Fire Department has is considered to be the “best it can be,” according to interviews with fire personnel.

The Fire Chief’s decision-making regarding staffing was forward thinking. He modified staffing based on need, but did not overstaff, despite requests from others who apparently saw other towns doing so. The Fire Chief knew that all costs would have to be justified if an auditor were to review the staffing and if not, the Town would ultimately end up paying the difference.

Recommendations: The Fire Department (and Police Department) needs to have at least one gas and/or explosive meter on each piece of fire apparatus. Every firefighter needs to be trained on the use and limitations of each metering device, as well as the hazards of natural gas and any other chemicals they are likely to come in contact with in the Town. A safety policy will need to be developed to go along with each metering device and each fire company.

At the beginning of the event, one firefighter was assigned to the ladder truck. As the scale of the disaster was realized, a “callback” of firefighters resulted in additional staffing for the ladder truck. The call-back allowed the staffing of three firefighters throughout the duration of the event. Our interviews and focus groups determined the Town of Andover has proactively funded additional staffing for the ladder truck beginning July 1, 2019. This will facilitate staffing the ladder truck with two firefighters on a full-time basis.

Capability 1.6: Mutual Aid

Observations: After the second fire, the Deputy requested mutual aid, but dispatch notified him that it was not possible because the Gas Event was impacting surrounding communities as well. A standard mutual aid request would not suffice, particularly because towns that are standard mutual aid responders were also experiencing the same fire and gas crisis. Mutual aid from other communities not impacted by the Gas Event, such as Wilmington, Chelmsford, and Billerica, responded to calls for assistance after approximately 45 minutes.



The Fire Chief had a dispatcher call Massachusetts Emergency Management Agency (MEMA) by 5:00 PM on the first day and requested two fire task forces and an ambulance strike team through the Fire Mobilization Plan. It took approximately two hours for secondary mutual aid through the fire task force to arrive. Focus group data indicated that there was a disconnect between the staging area at the high school and dispatch because mutual aid from the staging area was not deployed to help in the response the evening of the 13th.

Recommendations: Although multi-community crisis events are rare, it is important to plan for them. The Fire Department and dispatch should consider developing a secondary mutual aid plan that calls upon cities and towns further out from their immediate bordering communities to respond in similar scenarios. Emergency management table-tops and exercises for multi-community events should be developed and practiced.

Recovery

After the first 24 hours, fire operations operated “fairly normally” with an additional apparatus that was designated to assist with other needs, not response operations. After 4:00 PM on the 14th through the 19th, the Fire Department responded to 46 calls for assistance. The average response time by the Fire Department during the recovery period was 6 minutes and 30 seconds. Response times ranged from 13 seconds to 25 minutes and 44 seconds. The average time spent on scene during the recovery period was 29 minutes and 31 seconds, with times ranging from 16 seconds to 2 hours, 6 minutes, and 54 seconds.

Columbia Gas needed the Fire Department to assist them as they purged gas lines. The extra apparatus was primarily used for this and gave residents peace of mind to see firefighters with Columbia Gas.

Preparedness

Although the Fire Department had not trained for this exact event, they were prepared to respond effectively. Their training and experience were made evident by their quick thinking, team work, and tireless effort. All firefighters had gone through ICS 100 and 200 level training. Command staff have received ICS 400 level training and the Fire Chief has gone through ICS 800 level training.

EMERGENCY OPERATIONS CENTER

Initial Response

Capability 2.1: Emergency Operation Center Activation

Observations: The Fire Chief and the Town Manager activated the EOC. The Town Manager had his Deputy and Chief of Administrative Services call all department heads, who make up the Emergency Management Working Group (EMWG), to respond to the EOC. The Town Manager had his staff call or text the members of the



EMWG to report to the EOC and everyone arrived quickly and began working immediately.

In the Town, the training room inside the Public Safety Center is designated as the EOC and the Police Chief is the Emergency Management Director. Thanks to the strong working relationship between the Fire and Police Chiefs, the Fire Chief was comfortable making the call to open the EOC. The Fire Chief set up a unified command structure where the Fire Chief, the Deputy Town Manager, and the Police Lieutenant were the Unified Commanders together. The Police Chief had to stay in Lawrence at the Unified Command Post. The EOC communicated with Unified Command Post in Lawrence over the phone through the Town Manager and Police Chief. This was critical because the Governor of Massachusetts, MEMA, MSP, FEMA, and Columbia Gas were all operating from there.

The Fire Chief would communicate to the Deputy via phone about any updates and plans. Three deputies were on a rotating schedule to allow for two of the three to be working at all times until Monday, September 17th. Focus group data indicated that firefighters were not always receiving updates from the EOC and suggested that the Fire Department have more of a presence at the EOC to allow for regular updates to responding firefighters at the stations.

During the first 24 hours, the Fire Chief at the EOC did not communicate with North Andover's or Lawrence's fire chiefs. The Chief utilized the white board to post information about what needed to be done in the next 12- and 24-hour periods.

MEMA had a liaison in the EOC by 8:00 PM, but MEMA did not utilize WebEOC from the Town (although it might have been utilized at the Unified Command Post in Lawrence). Interview data indicated that WebEOC was not utilized in the EOC, but it would have been useful for communications purposes across the three impacted communities.

Successes: The Town's EOC was established very quickly during the Gas Event. It proved instrumental in dealing with the numerous and varied tasks need to protect the residents of Andover. The Town was very progressive in both its training, preparation, and development of its EOC. The EOC was effective because of the formation of the Emergency Management Working Group (EMWG), which meets monthly and has facilitated several training sessions and exercises. Neither of the other two impacted communities activated their EOCs. As will be detailed in the Town Manager's Office section, the support from and membership of the Town Manager in the EMWG was a significant factor in why this group and the EOC ran so smoothly.

All department heads reported to the EOC as quickly as possible and utilized their experience from the Emergency Management Working Group's (EMWG) monthly meetings.



The EOC is a large room equipped with telephones, data access, Wi-Fi, ports, video presentation capabilities, television, white boards, and food serving capabilities. Screens in the EOC allowed department heads to follow the news while they worked together to generate plans for the coming hours. Additionally, white boards are available in the EOC to post updates and any other pertinent information.

Recommendations: The EOC can base many of its actions and receive direction from the Comprehensive Emergency Management Plan (CEMP). The CEMP was not utilized during this event because members of the EMWG thought it did not address the needs for the Gas Event. As an overall recommendation, the CEMP should be updated regularly, reviewed often, and exercised frequently to facilitate its use under the pressure of a crisis event.

Although cell phone communication between the EOC and the Fire Deputy was effective, it may be unreliable in future crisis events. The use of landlines through the crash cart or radio communication is preferable in case cell phone connections are weak or inoperable. Additionally, the Code Red system should be adapted (See Dispatch Capability 4.4) to send a notification about the activation of the EOC to the EMWG. This would be more efficient than using cell phone calls and text messages, as was done during the Gas Event, and notify all members simultaneously. A pre-scripted message can be developed and used to notify the EMWG to report to the EOC. It is important to note that all department heads must keep their information up to date in the Code Red system to ensure they are notified.

All members of EMWG responded to the EOC quickly, but it took some time for them to understand each of their roles. In future events, each member of the EMWG should take on a role under the EOC ICS Management and Operations System that is within their training and understanding.

Mention of WebEOC training was made, but it had been a while since the Fire Department had utilized it. It would be useful to have one member of the EMWG trained and up to date on the WebEOC platform, and for it to be utilized with regular frequency so that it can be utilized to its full potential in a future crisis. WebEOC would also automatically generate a log of actions, which is particularly beneficial for debriefing and learning from an event after the fact.

Although evidence indicated that the white board in the EOC was utilized for planning purposes, focus group data indicated that it was not utilized to display an organizational chart of personnel. The EMWG should train using the white board to display an organizational chart, and the CEMP should include this step to assist in future crisis events.

Capability 2.2: Management of the Emergency Operation Center

Observations: The EMWG has participated in several table-top exercises and training sessions. This proved to be very worthwhile as they responded in a cohesive and



unified manner to protect the citizens of the town during the Gas Event. The EMWG accomplished their objectives of protecting life and limiting damage during a very complex and difficult situation.

The EOC functioned for several days, 24 hours per day, and then on limited hours for several weeks. The staff inside the EOC had to develop a 12-hours-on, 12-hours-off work schedule to provide coverage 24 hours per day. All departments were represented inside the EOC almost constantly.

Early on in the incident, the EOC identified the need to establish a shelter. According to radio communications recordings, first responders were notified early on that the Senior Center would be utilized as a shelter for displaced residents. The EOC members assigned staff to equip the shelter and prepare for long term operations. A backup shelter was later established at the Youth Center.

Successes: Based on the interview and focus group data, the after-action review team is confident in commending the work dynamic that occurred in the EOC. Everyone worked extremely well together and no egos overtook command. The EMWG listened to direction that came from the Town Manager and the Police Chief in Lawrence through the Fire Chief, Deputy Town Manager, and Police Lieutenant in the EOC. Department heads felt as though they could contribute their advice and offer input as plans were being made together to address the many needs of the Town.

Recommendations: The EMWG should continue with the monthly meetings and training exercises. The EMWG can further educate its members on the tools available in the EOC, such as the telephone systems and data terminals. An EOC Check List should be developed to outline the numerous tasks that need to be performed during the activation and operation of the EOC.

The CEMP should be updated regularly and each member of the EMWG should have a copy to review on a regular basis. Additionally, all members of the EMWG should be certified in ICS 100, 200, and 300 at a minimum. Employees under the supervision of each department head should be certified in ICS 100 or 200, depending on their role. It is worth considering having MEMA come to the Town for an EOC Operations and Management course.

The CEMP should specify an EOC staffing plan with a tiered response to help members of the EMWG understand their immediate role. An Incident Command Management Team may be useful for coordinating these efforts. Colored vests should be used in the EOC to clearly identify the command structure.

As noted earlier, training and use of WebEOC is recommended. This cloud-based emergency management information sharing and communication tool used by MEMA and local communities provides several key benefits including: 1) a global perspective for multi-community events, 2) detailed asset requests to MEMA, 3) the creation of a detailed log of key events. WebEOC should be utilized for all training events so that



EMWG members can become familiar with it and develop the skills needed to operate it during a crisis. MEMA can also provide this training.

The shelter at the Senior Center was set up quickly, as will be described in later sections, but it is important to expedite the process further by designating this location as a shelter for any future similar events. The Town should request that the American Red Cross inspect the shelter and certify it as an approved shelter. Additionally, a designated Shelter Manager role should be given to someone to further expedite the shelter's opening.

Capability 2.3: EOC Internal and External Communication

Observations: Communications from inside the EOC were almost exclusively conducted via cell phone. Although this worked for this incident, cell phones can be unreliable during national incidents or when the cell towers go down, such as during tornadoes or violent storms.

There was little use of the data terminals inside the EOC. The transfer of data can be a significant asset during town wide emergencies, including live video transmission from the field.

Social media was a success from inside the EOC. The Deputy Town Manager, Police Lieutenant, and a contracted Public Information Officer John Guilfoil coordinated sending out information on Twitter, Facebook, and the Town Website. The social media sites were monitored and appeared to be a success with many citizens looking at them. More detail about social media communications is provided in the Town Manager's Office subsection below.

There was no use of the State's WebEOC communications system. This could have been implemented with the assistance of the MEMA representative in the EOC. This is a vital communication tool that was designed to be utilized during large scale incidents to communicate with MEMA and other communities.

Successes: Communication with the EOC, both transmitting and receiving, appeared to work sufficiently. Additionally, access to television news channels were a communications asset that was utilized during the activation.

Focus group and interview data indicated that it was established procedure to go through the Town Manager's Office for guidance about what to post on each departments' social media pages. This was generally followed and created a single voice for residents to get consistent information from.

Recommendations: The EOC was equipped with a telephone bank, this was via a cart with multiple telephones. It appears this was not utilized. When the EOC is activated, including during training exercises, all communication systems, including telephone, internet, data and televisions need to be set up as early as possible. A protocol and assignment for the Information Technology Department to install and set



up all the communications assets immediately after EOC activation should be established. The telephones should have established stations with assigned telephone numbers and recorded in the CEMP for distribution to the EMWG. Additionally, interview data noted the need for printing capabilities. It is unclear if the capability was there and it was not utilized or if this capability needs to be added to the EOC.

The use of a centralized message from the Town through social media platforms associated with different departments should be continued and used in future events, as this appears to have been a success.

A dispatcher should be assigned to work inside the EOC at the radio terminals which already exist in the EOC. The EOC should utilize the WebEOC communications system. A dispatcher or member of the EMWG would need to stay familiar with the WebEOC platform and practice logging in and using the various options.

Early on, regularly scheduled update meetings should be established in the EOC for all members of the EMWG and key employees. During prolonged events, two meetings with specific agendas are recommended, one in the morning and one 8-12 hours later. Meeting notes should be distributed with objectives and assignments, as in the Incident Action Plan (IAP). At following meetings, notes from previous meeting should be reviewed.

As with all EOC training, it is important to train to “real-world” conditions as much as possible, including the use of equipment and pre-developed plans.

Recovery

The EOC remained open for several weeks following the initial response. After several days, 24-hour operations were replaced with specified hours of operations. Members of the EMWG continued to work in the EOC to ensure that recovery phase went smoothly and to respond to new needs as they emerged. Although most of the life safety concerns were alleviated after the first 24 hours, the EMWG had the daunting task of returning the Town to its original status and normal operations. The presence of the Facilities Department and the Department of Public Works was particularly important after the initial response. Focus group and interview data indicate that the EMWG and the employees within each department continued to work together to accomplish the goals of business as usual.

The EMWG in the EOC facilitated the opening of the Claims Office and Permitting at the Old Town Hall. This was a critical step and it was accomplished quickly. Because the Town did not have gas and electric service fully restored, a number of coordinated efforts were made. First, the shelters remained open and three free meals were provided to anyone who needed them. Second, hot plates were brought in and distributed to residents. Although the intention of this process was good, it did not function as planned. The hot plates and “operation temporary heat” were not Town specific, but rather part of the multi-community response. Neither of these operations were effective. In fact, they both proved to be dangerous as one hot plate caused a fire and residents were using space heaters without the proper electrical capacity to do so.



Preparedness

The EOC was effective because of the preparation of the EMWG. The monthly meetings and training exercises implemented by the EMWG were critical for the functionality of the EOC. Not only did these meetings help prepare department heads for what to do in a large-scale emergency, they also bolstered the working relationships between members of the EMWG. Interview and focus group data indicated that the department heads respected one another, were cognizant of how their department's actions could impact other departments, and willing to accept input from one another. Teamwork and positive group dynamics cannot be overlooked in terms of proper preparation for a large-scale crisis like the Gas Event.

POLICE DEPARTMENT

Initial Response

Capability 3.1: Evacuation and Incident Response

Observations: Focus group data indicated that the Police Department, operating in cohesion with the Fire Department, helped to evacuate the impacted area and shut off gas to structures in and around the suspected impacted area.

The Police Chief, Lieutenant (Executive Officer), and a NEMLEC Sergeant requested assistance from NEMLEC to the Town. This occurred within 45 minutes of the first call of fire and was beneficial because the NEMLEC Command Vehicle established the Andover Police Staging Area, at Brickstone Square, and performed as the police dispatch center.

Successes: The evacuation process was successful and protected the residents of the Town. It is remarkable that there were no gas or evacuation related fatalities in the Town.

CAD logs and police radio dispatch recordings demonstrate the wide variety of incidents that the Police Department responded to. The police response to address a high volume of calls and assist fire personnel with shutting off gas in homes was effective. Within 5 minutes the police were utilizing state troopers to respond to ongoing calls efficiently.

NEMLEC set up a police staging area at Brickstone Square after being called in by the Town's NEMLEC Response Team. NEMLEC took over directing police personnel and mutual aid to assist in the response.

Recommendations: Focus group data did not mention the use of the Incident Command System (ICS) as far as field Commander(s) or reporting relationships. Our recommendation is to further investigate and develop ICS procedures and to implement a Unified Command Post with other responding departments in the Town. This would further facilitate the development of common priorities, goals, and



objectives. Additionally, tracking and record keeping of all police actions that were dispatched from the NEMLEC Command Vehicle should be conducted.

Capability 3.2: Traffic Control

Observations: The Town's police officers were working with a very difficult traffic situation and ultimately utilized mutual aid police to assist in directing traffic. Traffic complications were exacerbated by Lawrence's decision to order an evacuation south of the Merrimack River and Andover was not notified prior about this decision. Traffic routes were established to assist vehicles trying to leave the city and to move the drastically increased traffic load from Lawrence.

Successes: In dealing with an overwhelming situation the Police Department performed many diverse tasks. They had to cover a large area of the Town during an extreme and instantaneous situation, requiring police officers to perform duties not normally required of them on a daily basis. The Police Department rose to the occasion and worked very well with mutual aid to control traffic issues.

Recommendations: Given the severe traffic issues caused by evacuating vehicles from the Town and surrounding area, it is important to review the "Evacuation Plans" in the CEMP (Comprehensive Emergency Management Plan).

The use of WebEOC could have provided a tool for the communities to notify one another of their actions. The Town's Police Department could have been notified of the evacuation order from Lawrence through WebEOC. The use of WebEOC is strongly recommended for EOC operations and the police and fire staging areas.

Capability 3.3: Police Radio Communications

Observations: Radio communications with the Police Department vehicles and personnel appears to have been completed without many problems. The Police Department has two radio channels to work with, but the second radio channel was not utilized due to time constraints. However, the focus group data did not indicate any communications problems despite the use of only one channel. The NEMLEC Command Vehicle had other radio frequencies to use if needed.

Successes: One asset for police communications was that the Northeastern Massachusetts Law Enforcement Council (NEMLEC) Command Vehicle handled dispatching and communications with the Andover Police vehicles as well as mutual aid police vehicles. This Command Vehicle was located at the Brickstone Square parking lot.

Radio communications recordings were clear and effective overall. This is an impressive accomplishment given the chaotic nature of the first few hours of the Gas Event.



Recommendations: Focus group and interview data did indicate the use or description of a communications plan, although it would be easy to assume that the NEMLEC Command Vehicle implemented a communications plan. It would be well served for the Police Department to have a Communication Plan in writing, have it available in the Town's Comprehensive Emergency Management Plan (CEMP), and in practice on a daily basis.

The second radio channel was not utilized during the Gas Event, but it is recommended that it be used as an Operations Channel during similar large-scale emergencies. A written Communications Plan similar to the ICS Form 205 Communications Plan should be developed to facilitate the use of multiple radio channels. The use of MEMA's licensed radio channels should be included in the Communications plan, which would increase the number of channels for use at specific/defined locations or assignments. This normally requires permission from MEMA, but could be arranged very quickly if these frequencies are pre-programmed into the existing radios. MEMA should develop and provide a communications plan that takes into account communicating with agencies that are on different communication networks. The EOC should also be included in the communications plan and the frequencies used by mutual aid Police Departments should be identified and included in the Communications Plan.

If a shortage of portable radios should occur, there are caches of portable radios that could be requested such as from MEMA, NEMLEC, and the Northeast Homeland Security Regional Advisory Council (NERAC).

Recovery

After the immediate response, the Police Department shifted to 12-hour shifts and continued to assist with teams going from building to building. Police Department operations shifted back into a more standard routine of responding to calls for assistance. From 4:00 PM on September 14th through September 16th the Police Department responded to 104 calls for assistance, with the majority of the calls being related to gas leaks and fire alarms. Additionally, the Police Department and mutual aid addressed security concerns in specific areas across the Town.

Preparedness

The Police Department was well-prepared for responding to the unpredictable event on September 13, 2018 despite the fact that they had not trained for this exact type of multi-community Gas Event. Radio communication recordings and focus group data indicated that all police personnel performed extremely well, worked as a team, and demonstrated immense dedication to the residents of the Town. All police officers had gone through ICS 100 – 200 level training and the command staff had ICS 400 level training. The Police Chief had ICS 800 level training.



DISPATCH

Initial Response

Capability 4.1: Notification of Initial Call for Assistance

Observations: According to computer aided dispatch (CAD) logs, radio communications, and focus group data, at 4:18 PM a dispatcher received a call for a fire at Grassfields Restaurant in the Town. This call would later be identified as the first call for an emergency related to the Gas Event in the Town.

Successes: The dispatcher relayed the information to both fire and police personnel in the appropriate manner and provided important details about the situation, including that the fire was in the oven. Standard procedures were implemented by the dispatcher.

Recommendations: Standard operating procedures were implemented, therefore no recommendations are provided for this capability.

Capability 4.2: Dispatch Staffing

Observations: Focus group data indicated that the typical number of dispatchers on duty is two; however, the Gas Event occurred near shift change time which allowed for double the number of dispatchers to be available. All dispatchers stayed after their shift to assist. A total of nine dispatchers were eventually working after an additional dispatcher was called in to help.

Successes: The Gas Event was a crisis event, but the timing was arguably serendipitous. Had the first few hours of calls into dispatch occurred at a different time of the day, the communication challenges would have been exponentially worse between callers and dispatchers, as well as between dispatchers and emergency responders. More than double the normal of dispatchers utilizing all four PSAPs was critical for the Town's response. The dispatchers' willingness to remain at work and continue to perform their vital roles during such an unpredictable event is laudable.

Recommendations: The dispatch center's normal routine is not to assign a designated dispatcher for police and a different dispatcher for fire services. This procedure was appropriately changed during this complex incident and should be reviewed for all normal operations.

During large-scale emergencies with multiple staging areas, it would be particularly useful to send a dispatcher to both the fire and police mutual aid staging areas to log calls into the CAD system and assist with the flow of communication. During the Gas Event, the dispatchers would send police related calls to the EOC, and then to the NEMLEC Command Vehicle. This process would be expedited if a dispatcher was present at each staging area.



Capability 4.3: Information Transmission between Dispatch and Fire/Police Personnel

Observations: Radio communications between dispatch and fire personnel was effective and clear for the first ten minutes following the initial call. As the dispatchers received more and more calls for assistance, and later calls to clarify the Code Red alert, radio communications became interrupted and challenging to follow. In particular, fire personnel voiced many challenges with communicating back to dispatch because the radio line was too congested.

Police personnel and radio communications recordings indicate a smoother communications process with dispatch. It appears that the NEMLEC command post assigned and tracked police response calls after they arrived at the staging area.

Successes: Given the circumstances, dispatch communication was generally successful, particularly with police personnel. This may have been a result of NEMLEC's quick role and action at the police staging area.

Recommendations: All fire apparatus and police vehicles should be equipped with modern data terminals that allow for silent dispatch, mapping, and quick reference to mission-critical information such as building diagrams and hazardous materials information. Data terminals in Fire Department apparatuses and police vehicles should allow for the filing of National Fire Incident Reporting System (NFIRS) reports. Most importantly, these data terminals would clear up radio lines and allow fire and police personnel to get notifications from dispatch, send updates to dispatch when a call is cleared, and notify dispatch when available to respond to another call without the use of radio communication. This is particularly useful when information transmission is unclear and interrupted due to radio channels being inundated with communication, as was the case during the Gas Event.

The Fire Department has computer terminals located in each fire apparatus and in the Deputy Chief's vehicle, but interview and focus group data indicated that these computer terminals were not fully utilized.

As noted in Fire Department Capability 1.3, an additional radio frequency should be made available and utilized when the primary channel is overly congested with radio traffic. A procedure to utilize the licensed MEMA radio channels during large-scale emergencies should be developed. Additionally, it would be useful for dispatch to have the option of using radio communication to connect with the EMWG.

The backup dispatch control point is North Andover, but they could not assist during this incident as they were overwhelmed with the same incident. In addition to North Andover, a designated backup control point needs to be established in a non-neighboring community.



Capability 4.4: Code Red Alert

Observations: The dispatch center performed extremely well considering the difficulties it faced. As was previously said, it was very fortunate that this incident occurred just prior to the change of shift thus enabling double the number of dispatchers to be present and work the incident.

The dispatch center routinely handles police, fire, and EMS calls for assistance. During this incident the dispatch center was in communication with the Fire Department's Deputy Chief on duty and was able to receive and clarify his message regarding the activation of the Code Red Alert. The Code Red is the Town's reverse 9-1-1 system used for sending out alerts throughout the Town.

The Deputy Chief asked the dispatcher to issue a Code Red alert at 4:40 PM to all residents and ask that they turn off their gas, if possible, and evacuate their home due to an ongoing gas incident in the Town. Residents in the Town have to "opt in" to the Code Red system by registering and updating their phone number.

Recommendations: The Code Red system should not be optional for employees. Some residents and employees indicated that they did not receive the Code Red alert.

Data from focus groups and interviews indicated that the Code Red message may have been confusing. The message lasted 13 seconds and utilized a computer-generated voice, not a human's voice. The quickness and type of voice may have caused the confusion many residents experienced. Ultimately this confusion created issues for first responders and dispatchers because many people called 9-1-1 to verify that the Code Red was legitimate and many residents thought they had to evacuate the Town, not just their home which only increased traffic issues further.

Fire and police personnel should work with the dispatch center to develop pre-scripted messages for a variety of potential events. Each of these pre-scripted messages should be recorded using a human's voice and piloted with a focus group of residents to ensure that each message is understandable and easy to interpret.

The Code Red system can be used to send follow-up messages and updates to residents. These messages should be approved by the EOC and preferably delivered by a Senior Town Emergency Management Official. Residents who cannot access social media platforms or the internet would benefit particularly from this process.

A clear message is vital to ensure that dispatch does not get backed up with codes from residents to ask for clarification. The Chief Information Officer indicated that a new public information system called "InformaCast" is available for use. This system should be further investigated and implemented in conjunction with the Code Red system.

The Town should consider exploring the option of creating specific smaller groups of people to be notified using the Code Red system. Specifically, the EMWG should be



one group that is pre-programmed into the Code Red system to facilitate simultaneous notification regarding the activation of the EOC.

Recovery

During the recovery phase following the Gas Event, dispatchers continued to address calls for assistance and direct emergency responders according to standard policies and procedures. The call volume during the first few days following the Gas Event remained higher than usual, with many residents calling for gas leaks and the smell of gas in their homes. The dispatchers continued their critical roles as usual even after working a very hectic and tiring day on the 13th.

Preparedness

All dispatchers are trained to handle calls for the Fire Department, Police Department, and EMS. That type of preparation was instrumental in the success of their response on the day of the Gas Event. As noted above, additional channels should be utilized during large-scale events and practiced during exercises prepare. North Andover is the backup control point for dispatch, but during this emergency they were tied up with their own response. To prepare for future multi-community incidents, another control point should be established as a secondary back up. Additionally, dispatchers should go through regional training as part of the State 9-1-1 system for emergency communications.

TOWN MANAGER'S OFFICE

Initial Response

Capability 5.1: Immediate Action in Response to the Gas Event

Observations: The Town Manager first received notice that there was a significant incident in town when he received a telephone call from the Fire Chief. This occurred at the same time he received the first Code Red alert. He was informed that they may have up to 35 house fires going on and decided to activate the Emergency Operations Center (EOC) with the Fire Chief. The Town Manager instructed his Deputy Town Manager and Chief of Administrative Services to call in all Department Heads (the EMWG members) to respond to the EOC.

Shortly after arriving at the EOC and observing the set-up, the Town Manager, along with the Police Chief, needed to report to the Unified Command Post (UCC) in Lawrence at Showcase Cinemas. The Town Manager communicated to the EOC via cell phone. At the UCC the Town Manager, with others, decided that the priorities were to: 1st) shut off all gas meters, 2nd) to evacuate and inspect all homes for safety of the residents, and 3rd) to shut off and ultimately turn the electricity back on when the situation was safe. This would be accomplished by each community developing a "Team" to go house to house to ensure safety.

Successes: The Town Manager quickly delegated the task of calling all members of the EMWG to the EOC which facilitated the prompt setup of the EOC.



The Town Manager's support for the EMWG is progressive and invaluable. He should continue to provide the necessary structure and support the EMWG to further bolster the Town's use of the EOC during large scale emergencies.

Recommendations: The Town Manager updated his staff at the EOC, typically the Deputy Town Manager, on a regular basis via cell phone. This worked well during this incident but, as noted throughout the report, a backup option for communication should be in place and used during practice exercises with the EMWG, such as radio communication.

Capability 5.2: Controlling the Release of Public Information

Observations: The Town Manger has established the policy that all vital, emergency related information is to be approved by him before it is released to the public. Focus group and interview data indicated that following the Gas Event, the Town Manager's Office would approve all communications before it became available to the public. John Guilfoil and his Public Relations firm were brought in to assist with the Public Information Officer duties. A staging area for media outlets was established at the Memorial Hall Library and posted on social media at 6:10 PM.

All focus groups and interviews specified that each department head and the employees responsible for various social media pages understood and followed the procedure of the Town Manager's review process for information related to the Gas Event. The Town Manager also gave personnel responsible for social media the authority to publicize regular day-to-day information that was not sensitive or emergency related.

An in-depth review of social media platforms for the Town, particularly the Town's Twitter and Facebook pages and the Police Department's Twitter and Facebook pages was generally consistent with the opinions voiced during the interviews and focus groups. A review of the detailed timeline in Section 1 provides key posts from the Town and Police Department's twitter pages. The Town posted their first tweet related to the Gas Event at 5:28 PM, just 1 hour and 10 minutes after the first fire and the Police Department quickly followed suit at 5:35 PM.

There are a few instances where inconsistencies between the Town's twitter and the Police Department's twitter can be seen. Most notably, the Police Department posted information directing residents to an additional shelter at Wilmington Middle School at 6:37 PM, but this shelter was never opened and the Police Department had to retweet a correction at 7:08 PM. The second key inconsistency found between social media accounts was in the wording used by the Police Department's twitter. For example, they tweeted “#AndoverMA is under evacuation order” and “the Evacuation Order is for GAS SERVICED neighborhoods only.” The using of “evacuation order” may have misled residents and was not consistent with the wording used by the Town's social media platforms which would specify the evacuation of *homes*, not the *town*.



Generally, the other Town department's used social media platforms to retweet either the Town's or Police Department's posts and relay information related to their services. For example, the DPW twitter posted about updates related to trash and recycling removal.

Successes: The review process previously established by the Town Manager was vital to ensure that that the town spoke with one voice and eliminated false or inaccurate messages as much as possible.

Overall, the dissemination of information to the public through social media was consistent and effective. They even found some time to respond directly to some resident questions and comments posted on the various social media platforms.

The prompt opening of a media outlet staging area and the use of John Guilfoil was a smart and effective strategy.

Recommendations: The Town should continue to keep John Guilfoil, or a similar public relations expert, on retainer and utilize him in a similar manner during any future large-scale emergency events to assist with the dissemination of information to the public.

The established review protocol should continue to be used to ensure that the Town speaks in one unified voice. Given the few inconsistencies related to wording and some misinformation, it is important to go over this review process on a regular basis. In particular, it is important for wording to be consistent across department's social media platforms to ensure residents receive accurate information. An evacuation order needs to be specified with exactly what structures or areas need to be evacuated.

The use of public access television (if power is available) to relay pertinent information should be explored and potentially utilized in future large-scale emergencies. Additionally, the "InformaCast" platform noted by the Department of Information Technology should be investigated as it may offer a straightforward tool to post important information during similar events.

Capability 5.3: Command Structure of the Town Manager's Office

Observations: The Deputy Town Manager and Chief of Administrative Services worked under the direction of the Town Manger and performed several varied, vital tasks including calling back all department heads to report to the EOC and implementing social media information sharing.

The Deputy Town Manager and Chief of Administrative Services became part of the Unified Command structure inside the EOC and participated in developing the overall priorities of the operations. They performed the vital tasks of publicizing information on the Town's web site, establishing a shelter, and writing up a fact sheet to be dispersed to Town employees to be used in answering questions from the general public. They



also handled direct questions from residents and tried to eliminate any confusion or panic.

The Deputy Town Manager and Chief of Administrative Services were in frequent contact with the Town Manager and represented him in the EOC. They also made sure the Shelter operated as a food bank, developed a “google map” of the affected area for public release, assisted in developing a procedure to improve the permitting and inspections of businesses in the town, and acted as liaisons with the other two communities. The Deputy Town Manager also acted as a buffer between the public and media trying to enter the EOC for information.

Interview data indicated that donations from so many organizations and people were rushing in and it was difficult to take advantage of the donations or organize them in any systematic way.

Successes: The Deputy Town Manager and Chief of Administrative Services, working within the Unified Command structure, played a hands-on role to stabilize the situation by working inside the EOC. Their position was vital in that they represented the Town Manager while he was at the UCC in Lawrence.

The Deputy Town Manager and Chief of Administrative Services were forward thinking in their establishment of a live, sharable google spreadsheet where they recorded streets that had experienced a fire and/or gas leak. This was a smart tactic that enabled the Town to track which areas were impacted and notify residents.

Recommendations: As with all members of the EMWG, we suggest that the Deputy Town Manager and Chief of Administrative Services attend ICS training and EOC exercises. These two roles might be well-suited for ensuring the Code Red system is updated with the EMWG member’s contact information.

Although the Deputy and Chief of Administrative Services in the EOC were keeping the EMWG updated as they received information, it would be useful to develop a schedule of briefings twice daily with an agenda for EMWG members and other key town employees.

A procedure to handle donations should be developed and implemented when any large-scale emergency takes place. This procedure can be posted on the Town’s website and other social media platforms to direct donors soon after the incident.

Capability 5.4: Town Finances

Observations: The Town Manager made sure the Finance Director, Town Planning director, and Town Accountant were called back right away and they were on hand by 6:00 PM on the 13th. By the second day they had a chart of accounts to track that were referred to as “gas disaster expenses.”



Successes: The Town Manager recognized on the evening of the Gas Event that financing needing to be addressed. Tracking finances was critical for providing accurate information to Columbia Gas during the settlement process.

Recommendations: The procedure used during the Gas Event to immediately track finance expenses should become part of the Town's CEMP and implemented in the same manner in future large-scale emergencies. Additionally, a special policy should be put into place and used when a State of Emergency is declared.

Recovery

During the subsequent days, expectations and the need for ongoing communication remained high. 8,600 gas meters needed to be shut off in a reasonable manner. After the first night on, 264 gas meters had been shut off, which prompted the Governor's declaration of a State of Emergency and placing Eversource in charge. It took two days to shut off the balance of gas meters.

At the UCC a decision was made to keep all notifications and updates unified across all three communities. The goal was to get everyone returned to their homes as quickly and safely as possible, but the UCC recognized that it might cause public unrest if one town started this process before the others. Late during the second day and into the third day following the Gas Event, people who lived in homes that were not impacted were allowed to return home.

On Tuesday, September 18th the Town had established a fully operational claims center for all three communities to utilize at the Old Town Hall. This was staged with 15 claims representatives and there were mobile trailers for all state inspectors so that temporary permits could be issued.

According to focus group and interview data, there was continued frustration with Columbia Gas and the lack of information they provided. It took 6 days to get actual maps from them that depicted which homes were impacted and which were not impacted by the Gas Event.

During the recovery process, there were community liaisons in the neighborhoods helping to get information out to residents.

The Director of Business, Arts, and Culture played an integral role during the recovery phase following the Gas Event. On the 16th, she started going from restaurant to restaurant to see what they needed and provide any help possible. In particular, owners needed resources for insurance questions and assistance with taking steps to reopen. As restaurants began to reopen, the Director of Business, Arts, and Culture would generate a list to give to the Town Manager's Office for social media release. Recovery efforts to return all restaurants to their normal operations was still ongoing at the time of Davis Team interviews.

Preparedness

The Town Manager, Deputy Town Manager, and Chief of Administrative Services were well-prepared to handle a large-scale emergency. The Town Manager's use of the EMWG was instrumental. The EMWG, along with the strong professional relationships between the Town Manager's Office and the



Town departments helped prepare them to respond to an unexpected scenario, like this Gas Event. All three of these roles should attend ICS training and take part in any EMWG meetings and exercises.

As noted throughout this report, the Town Manager's Office should help facilitate the maintenance of the CEMP. This plan should be practiced regularly to familiarize Town personnel with the protocols and therefore increase the likelihood it is utilized in future emergencies. Updating and practicing with the CEMP is key for future preparation.

DEPARTMENT OF PUBLIC WORKS

Initial Response

Capability 6.1: Immediate Action in Response to the Gas Event

Observations: The Department of Public Works (DPW) Director was called to the EOC by the Deputy Town Manager. Once there he assumed a role in the EMWG and began organizing public works duties.

DPW was tasked with helping to set up the shelters at the Senior Center and Youth Center. They also assisted other departments in setting up the temporary housing trailers and shower trailers.

The DPW Director realized early on this would potentially be a "reimbursable event" so he began to track expenses right away and only made purchases and ordered supplies and equipment that was needed. All procurement laws were followed.

During the initial response DPW also gathered and set up light towers, sign boards, generators, and barricades. DPW continued to fuel generators and equipment.

Successes: The positive working relationship between the DPW Director and other members of the EMWG facilitated a smooth initial response in the EOC. The Director of DPW was able to voice opinions and advice regarding how DPW could contribute to the response.

Recommendations: Interview data indicated that it would have been helpful to have the engineers in the EOC earlier as well as an office staff person to assist in the logging of actions.

Capability 6.2: Internal and External Communications

Observations: Focus group and interview data indicated that all communications were through cell phone. DPW has access to basic radio capabilities, but they were not used during the Gas Event because of reception issues in certain areas around the town and because their radios were only in vehicles and not portable. Additionally, there isn't an established routine of using radios in DPW.

Communications and information sharing was very limited from the gas company, but the DPW director effectively communicated to foreman via cell phone and the foremen would communicate to their personnel to accomplish necessary tasks.



DPW utilized their social media pages to reiterate information posted by the Town and the Police Department, as well as update residents about changes to routine expectations such as trash and recycling delays.

Successes: Communication through the chain of command in the DPW was productive. External communication to the public was also effective and the DPW social media platforms followed the established procedure of having the Town Manager review information before it was released.

Recommendations: DPW had access to basic radio capabilities, but they were not utilized during the Gas Event. Instead, cell phones were the primary means of communication. Portable radios should be purchased for all vital employees and supervisors because cell phones may not always work during a large-scale emergency. Policies and procedures for the use of portable radios should be developed as well.

The Town is already in the process of expanding radio capabilities via microwave and fiber-optic lines. This may be the best time to improve all town-wide radio communications for departments that utilize radios, both portable and base radios.

Capability 6.3: DPW Equipment and Mutual Aid

Observations: The DPW was very successful at receiving mutual aid equipment from the North East Homeland Security Region (NERAC), such as light towers, sign boards and cots for the shelter.

Fueling generators was both an immediate as well as long term need that was complicated because the Town did not have a fuel cell.

Focus group and interview data indicated that the use of the Town's GIS system was instrumental in locating water and sewer mains for the gas repair crews. Unfortunately, the Gas Company would not provide maps making it very challenging for the DPW to know which structures were connected low- or high-pressure lines.

Successes: With past experience the DPW had the knowledge base to call upon NERAC for vital resource needs to keep the town safe and functioning. The mutual aid supply of light boards, lighting towers and shelter cots was instrumental in making for a safe and efficient response.

Recommendations: The DPW understood how to utilize their resources and request what they needed from NERAC in an efficient manner. Fueling generators and equipment was a major challenge and the Town should procure additional fuel cells and a contract with an external company to assist during large scale emergencies to avoid using 5-gallon gas cans to refill, which wastes time, energy, and manpower.



Recovery

The DPW and Town engineers were deeply involved in the recovery phase following the Gas Event. Included in this phase was the streamlining of the inspection and permitting procedures. DPW had to streamline the permitting process because they had to get the work done quickly and could not wait two weeks for the Town selectman to give out permits as was typically done. Requesting blanket permits was forward-thinking and effective. A policy should be drafted to allow for expedited permitting procedures when a State of Emergency is declared.

Eventually the DPW worked closely with the gas repair crew during the installation process of new gas lines. The DPW and Town engineers established working teams with the gas company representatives and work crews. During this time they utilized the Town's GIS system, by using town supplied iPads to identify underground piping, thus keeping the disruption of water and sewer lines to a minimum.

The Andover DPW Director worked with the two other communities to decide which engineering firm to hire to assist in the recovery phase. Deciding to use the same firm was a strategic choice given the multi-community nature of the Gas Event.

Preparedness

Interview and focus group data demonstrated some gaps in preparation and training for the DPW. Specifically, DPW personnel felt as though they knew how to handle natural disasters and storms, but had not trained for an event similar to the Gas Event. However, a month prior to the Gas Event the DPW had a training seminar that reviewed command structure and communication procedures which likely served the DPW and the Town well overall.

DPW personnel should attend ICS training and additional safety trainings related to handling large scale emergencies and live electrical wires. Additionally, it would be useful for someone in the DPW to become involved with other Town departments to update the CEMP and get introduced to the capabilities of the WebEOC platform to determine how DPW utilize it during emergencies.

THE FACILITIES DEPARTMENT

Initial Response

Capability 7.1: Immediate Action in Response to the Gas Event

Observations: The initial action of the Facilities Department Director was to go to the EOC. The Facilities Department was initially focused on shutting off the gas to all public buildings and making all employees safe.

Facilities assisted at the Senior Center shelter and the temporary housing trailers as well as the temporary shower facilities. They also set up the temporary office trailer at the Old Town Hall which was used for permitting and inspection services.



Facilities placed electric generators at needed locations such as the fuel pumping station, shelter, and water pumping stations. Many town facilities have fixed generators supplying electric power when the power was shut off.

Although the Town had a contract with a diesel delivery company, they were unable to quickly supply the Town with fuel and estimated a three-week delay.

Successes: Facilities personnel worked 24 hours per day maintaining and checking on generators. The generators required regular refueling and maintenance, both of which were coordinated effectively given the circumstances and limitations.

The Facilities personnel are extremely knowledgeable and knew which buildings had emergency backup generators and were able to identify which generators were supplied by natural gas and appropriately place portable generators. One strong aspect was the installation of “Quick Connect” electrical connectors for generator connections.

Recommendations: “Quick Connect” generator connections should be installed at all vital buildings that have either do not have a generator or have generators that operate on natural gas.

A contract with a reliable fuel supply company that will supply fuel 24 hours a day during emergencies needs to be established. A local vendor with connections to community may be best.

Although the showers that were used in shelters turned out to work great, they were very expensive. The Town should consider contracting with vendors ahead of time for large-scale emergencies to expedite the process and reduce costs.

ICS training should be required for all Facilities personnel with different levels for different supervisory status. OSHA 10- and 40-hour training courses should also be attended by Facilities personnel.

Capability 7.2: Internal and External Communications

Observations: All communications inside and out to the Facilities staff was done through cell phones or through face-to-face communication. The Facilities’ vehicles have some limited radio capabilities, but this was not utilized during the Gas Event.

Focus group and interview data noted that Columbia Gas did not provide maps of gas lines and were not responsive to Facilities personnel about which public buildings they knew were supplied by high pressure lines. Communication with the Gas Company was limited.

Facilities personnel did not communicate to the public through social media and understood that the Town Manager’s Office was responsible for disseminating information to the public.



Successes: Focus group and interview data indicated that all Facilities personnel performed their roles with the upmost professionalism and general sense of caring.

The active choice to not communicate with the public was smart and further bolstered the Town's goal of a unified message.

Recommendations: Facilities needs to be equipped with mobile and portable radios. These can operate from the DPW Base Station.

If at all possible, the GIS system should be updated with gas line information. This may be challenging, but any effort to accomplish this could prove to be fruitful in future events.

Recovery

The Facilities Department Director primarily remained at the EOC and had her personnel continue performing both their routine duties as well as continue fueling generators during the recovery phase. Over the weekend Facilities personnel helped set up Red Park with approximately 50 temporary housing trailers.

Preparedness

The experience and knowledge of Facilities personnel regarding public buildings was impressive and beneficial. ICS and OSHA training should be implemented to better prepare for any similar large-scale emergencies in the future. Key to the preparation was the Facilities Department Director's role and participation in the EMWG. As was stated earlier, the EMWG meetings were critical for being ready to handle the Gas Event successfully.

HEALTH DEPARTMENT

Initial Response

Capability 8.1: Immediate Action in Response to the Gas Event

Observations: The Health Department Director was told to respond to the EOC by the Police Department and later received the Code Red alert which was addressed to all residents of the town.

The Director of the Health Department initially directed the Assistant Health Director to coordinate the shelter's needs with DPW and gathered volunteers to staff the shelters. The Health Department Director began generating a list of food establishments that were impacted by the Gas Event and provided support wherever need.

The main role of the Health Department occurred after the initial response to Gas Event when they needed to support the Inspectional Services dealing with food service industries and the 62 restaurants in Town that were impacted.



Successes: The Director of the Health Department responding quickly to the EOC and was willing to assist wherever he was needed.

Recommendations: The Health Department is not typically in charge of coordinating resources or staffing for the shelters. A shelter staffing plan should be developed to expedite the process of gathering health care professionals and other volunteers. An individual should be designated as the shelter manager and behavioral health councilors should be coordinated ahead of time to respond during emergency situations that require the Town to open shelters.

The Director of the Health Department relied on voluntary compliance of restaurant owners, but indicated that he wished he had ordered them all closed until inspections could be conducted. If a similar incident occurs in the future, this latter option should be utilized to ensure compliance.

Capability 8.2: Mutual Aid

Observations: The Health Department requested mutual aid from the State Department of Public Health and received one person to assist. They also requested mutual aid from the Health Coalition, but did not receive any assistance.

Successes: Although mutual aid did not respond in the expected manner, the Health Department's choice to seek mutual aid was appropriate. After not receiving the assistance he expected, the Director of the Health Department reached out to other town Health Department Directors for advice.

Recommendations: The Health Department should work to identify the reasons why there wasn't more mutual aid available from the State Department of Public Health for more inspectors. Protocols for requesting and receiving mutual aid should be developed. The Health Department should continue to utilize the Greater River Valley Medical Reserve Corp (MRC) and develop agreements to address any short falls or issues.

Recovery

During the recovery process, the Health Department along with the MRC assisted with shelter operations and food distribution. They also worked to help people get rid of food that had spoiled due to losing power.

Approximately 62 of the 170 restaurants in the area were impacted by the Gas Event. During the recovery process the Health Department worked tirelessly with minimal inspectors to ensure safety standards in restaurants before permitting them to reopen.

According to interviews, during the second weekend, the Director of the Health Department brought in behavioral and mental health professionals from the Office of Preparedness and Emergency Management at the Department of Public Health to help Town residents.



Preparedness

The Health Department should coordinate ICS training beyond the 100 level and conduct table top exercises to prepare for similar emergencies in the future. All Health Department staff were trained to ICS 100, but did not exercise it. ICS procedures should be practiced and utilized to get staff comfortable and familiar with the proper process. A protocol for power outages should be developed and exercised to prepare for steps that would be needed to notify restaurants about how to proceed.

DEPARTMENT OF INFORMATION TECHNOLOGY

Initial Response

Capability 9.1: Immediate Action in Response to the Gas Event

Observations: The Chief Information Officer (CIO) is part of the EMWG and he responded to the EOC after being notified via text message. He did not receive the Code Red alert that was sent out.

While working at the EOC he addressed Information Technology (IT) needs, although few needs were reported.

The CIO went to the shelters to help with the set-up process. He utilized a projector so that people staying in the shelter could watch the news and stay updated.

The following morning, the Fire Chief asked the CIO to prepare to equip the trailers, which were arriving Saturday, with computers, internet access, printers, and full communications systems.

Successes: The IT Department completed several key tasks during the response and recovery operations, both in the immediate response and more so during the recovery phase.

The CIO was forward thinking in his decision to provide news media access in the shelters and he, along with his staff, were able to address IT needs when other Town personnel requested them.

Recommendations: A procedure should be developed to take advantage of the technology capabilities within the EOC. The CIO also noted the availability of the “InformaCast” platform. This should be explored further and adopted into the CEMP for EOC operations.

Although IT needs often appear secondary to life safety concerns, it is important to develop a checklist related to IT needs that can be quickly followed when the EOC is activated.

All members of the EMWG should keep their information up to date in the Code Red alert system to ensure they are notified to report to the EOC during an emergency.



Recovery

During the recovery phase, the IT Department helped set up the Claims Center, the Customer Service Center, and build a database for the permitting process. IT personnel equipped mobile trailers with computers, internet access, printers, and communications systems. A database was created on the spot by IT personnel for the inspections and permitting process. This database was updated over the next few days to ensure that it was capturing the necessary information.

Preparedness

Although the IT Department has a number of useful capabilities to utilize, they were under-utilized during the Gas Event response. To prepare for future incidents, IT-specific protocol should be incorporated into the CEMP and practiced within the EMWG exercises. ICS training from the 100 to 300 level should be required for all IT personnel.



CONCLUSION

SUMMARY OF SUCCESSES

The Town of Andover successfully and uniformly responded to the needs of their community during the Merrimack Valley Gas Explosions. The success of the Town's response can be attributed to a number of actions, as detailed in our analysis above. The key successes are summarized here:

1. The EOC was activated promptly and the training experience and professionalism of the members of the EMWG was excellent.
2. Emergency personnel, both fire and police, took immediate actions to address life safety needs and were adaptable to the unpredictable and sudden event. Both departments showed dedication by responding to the call back for assistance and working tirelessly to help residents.
3. Nine dispatchers were available to take calls and communicate with first responders. They performed excellently during an extremely complex situation and without the assistance of their back up control point dispatch center.
4. Staging areas for mutual aid were established soon after the Town became aware of the severity of the Gas Event.
5. The Town Manager facilitated a uniform and consistent voice to keep residents updated on the situation through the Town's website and social media pages.
6. Establishing the Senior Center and Youth Center as shelter locations for displaced residents was successful.
7. The EOC's modern capabilities enabled the EMWG to operate effectively.
8. The establishment of a procedure to obtain permits and inspections, as well as set up a Customer Service Center at Old Town Hall, was critical during the recovery phase.
9. DPW, Facilities, and the Town's GIS systems were instrumental during the recovery and limited potential issues with water and sewer mains.
10. Each department quickly recognized the need to track costs during the incident and observed procurement laws during a very hectic situation.

Ultimately, the Town's personnel stayed ahead of potential problems by thinking ahead, prioritizing needs, and working together. Given the severity of the incident, it is remarkable that there were no fatalities and the number of injuries did not exceed the two reported to the Town. The Town should be proud of their response to the Gas Event and willing to address areas that can be improved for the future.

SUMMARY OF RECOMMENDATIONS

As highlighted throughout this report, the Town of Andover's response to the Merrimack Valley Gas Explosions was commendable and effective. However, this after-action review revealed a number of



key areas for improvement, and our analysis has supplied recommendations to address those areas. It is important to note that focus group and interview data identified a number of issues that occurred as a result of limited communication and collaboration from Columbia Gas during initial response efforts. For several days, maps of gas lines were not available to the Town, making the identification of impacted areas and overall response efforts more difficult to accomplish. Our recommendations pertain specifically to the Town's actions, as the Town was the focus of this after-action review, but it is important to view these areas for improvement with an accurate understanding of the challenges.

The key recommendations are summarized here:

1. One key recommendation has been proactively addressed by the Town of Andover. In an effort to most effectively utilize the ladder truck during an emergency, the Town has made the budgetary commitment that will allow for the addition of firefighters needed to staff the ladder truck with at least two firefighters. However, The Fire Department would benefit from staffing each station with a Fire Captain to oversee daily operations. Other resources that would benefit the Fire Department during future incidents include an additional radio channel for ground operations, multi-gas meters, and a designated Aide to assist the Deputy during large-scale emergencies.
2. Activating the EOC and utilizing the EMWG was an important initial response; however, the EOC can be improved with the utilization of a tiered response system, an Incident Command Management Team, and the incorporation of WebEOC. WebEOC should be used in similar incidents as a communication tool and a resource management tool. An activation plan/checklist should be developed that assigns roles and ensures equipment, such as landlines, radios, printers, data access, are set up.
3. The Town's Comprehensive Emergency Management Plan (CEMP) needs to be updated, dispersed to all Town departments, and practiced routinely. The CEMP was not utilized during the Gas Event, but if it is updated and used regularly the CEMP can be an extremely useful tool for facilitating a fast, unified, and strategic response during large scale emergencies.
4. One of the main compounding factors that emergency responders had to work against during the Gas Event was traffic. The Police Department should work on developing an evacuation route management plan so that they can deploy their response strategically when the Town or surrounding communities call for an evacuation.
5. The Town needs to upgrade their entire radio communications system. This is reported as currently being done with fiber optic and microwave technologies. Cell phones were used as the primary means of communication between departments and within many departments. This worked sufficiently during the Gas Event, but is not a dependable plan because many large-scale emergencies can result in loss of cell service.
6. The Town's Code Red System should be reviewed further and modified. Specifically, a number of pre-scripted alerts should be written, tested, and recorded with a human's voice to



be used in future emergency situations. Smaller designated groups of contacts should be created within the Code Red System to assist in the simultaneous notification of the EOC's activation to the EMWG.

7. Fuel cells or other means of providing fuel to portable light units and generators need to be acquired. Additionally, contracts with fuel supply companies that can respond during an emergency are needed. Similar contracts can be utilized with other companies to plan for other resources such as showers.

8. The Town's Senior Center should be designated as a shelter and the proper certifications from the American Red Cross should be obtained. Relatedly, a shelter operations plan should be developed with a Shelter Manager, volunteer list, and checklist for opening up.

9. The EMWG should work toward incorporating more of the technological tools that the IT Department has. In particular the "InformaCast" application should be explored further as it is an emergency notification system and crisis alert system that the Town already has access to. A set of procedures should be developed to direct how this application should be used during an emergency.

10. Each department in the Town should receive further training. In particular, ICS training for large-scale emergencies, WebEOC training, and OSHA training are needed. The Town should utilize more diverse table-top exercises and practice implementing ICS training during Town-wide events, such as food festivals and road races. Conducting training exercises on an ongoing, periodic basis is the only way to increase the likelihood that the proper emergency response protocols are implemented during an actual emergency.

Produced by:

The Edward Davis Company
2 Atlantic Avenue, 3rd Floor
Boston, MA 02110

For use by:

The Town of Andover, MA
Andover Town Hall
36 Bartlet Street
Andover, MA 01810



APPENDIX A

Semi-Structured Interview Protocol & Questionnaire for Fire Department Personnel (Chief Michael Mansfield)

Introduction: Thank participant and introduce individuals present. Explain the background of the project.

Background: *The purpose of this interview is to learn more about the Town of Andover's preparedness and response to the Merrimack Valley Gas Explosions. Our goal is to gain your insight into what took place, what worked well, and what needs improvement. Some of the areas we will ask you about include, but are not limited to, the following: 1) communication methods, 2) existing policies and procedures, and 3) equipment. As you answer different questions we would appreciate your thoughts on both things that you think went well and suggestions for improvement. The focus of this project is on the first week following the explosions, with particular attention placed on the immediate 24 hours after the event (approximately 4:00 PM on September 13, 2018 – 4:00 PM on September 14, 2018). This interview will be audio recorded so our team can go back and review this conversation for verification and clarification purposes. The audio file will be destroyed after the completion of our final report and no identifying information will be used. Do you have any questions before we begin?*

Open-Ended Questions:

1. To begin, please describe how the Fire Department responded to the gas explosions in Andover starting with the immediate response.

-How did the response change, if at all, after the first 24 hours?

-How did the response change after the first 72 hours?

2. About how many firefighters were on duty at the time of the initial incident?

-About how many alarms can Andover FD respond to immediately?

3. Does Andover provide EMS services?

-If so, how many ambulances are typically available?

-Are the ambulances staffed by firefighter/EMTs?

4. What actions were successful or what went well in terms of the Fire Department's response? Why?

5. What challenges did your department face during its response?

6. What would have made the Fire Department's response even more effective?

7. How was the Incident Command System (ICS) initiated and implemented?



8. What command structure was established (e.g., Incident commander, Safety Officer, Liaison Officer, Public Information Officer)?

-If at all, when was command transferred?

9. Did a transition from Incident Command (IC) to Unified Command (UC) take place? Please explain this process.

-Was an Operations Chief designated?

10. Was communications with emergency operations center's multi-agency coordinating center (EOC/MACC) established? Please explain this process.

11. Was an incident command post (ICP) established? Explain this process.

12. How were resources such as personnel, equipment, and supplies released, tracked, and managed?

-Was there a modified staffing plan already in place for emergency situations? If so, was it used?

-What could be improved on in terms of resource management?

13. After the immediate on-site responses, was an Incident Action Plan (IAP) generated?

-Explain this process in terms of incident objectives, priorities, and operational periods.

-How well was this plan executed?

14. What communication methods were used by your department and were they effective?

-How many dispatchers are typically on duty during a shift?

-Is there more than one fire radio frequency?

-How does dispatch work when a Unified Command Post is established?

-Was a previously established communications plan utilized or was it determined as the incident occurred?

-Based on response from above: What suggestions do you have for improving communication in the future?



15. What mutual aid did you receive and how was that process coordinated?
- Who calls for mutual aid under normal circumstances?
 - Does mutual aid go directly to an address, staging area, or the main station?
16. Did you have access to all of the resources you needed such as equipment and personnel?
17. How did you communicate with other responding agencies?
- How were the Department of Public Works and Facilities utilized?
 - Is there interoperability between fire, police, DPW, and mutual aid responders, etc.?
 - Does Essex county dispatch play a role in communications and mutual aid?
18. What role did MEMA play during the incident?
19. How did you communicate with town officials?
20. How did you communicate with the public, if at all?
- Who approved information before public release?
 - Was there a designated spokesperson?
21. Prior to the gas explosions on September 13th, what types of training exercises were in place for your department to prepare for such an event?
- Are all Andover firefighters trained to handle “gas emergencies”?
 - How effective or relatable were these training exercises during the event?
 - If at all, how would you improve or add to existing training protocol?
22. What policies and procedures were in place to guide your department’s response to the gas explosions?
- Did these policies and procedures unfold as planned and were they effective?
 - If at all, how would you modify existing policies and procedures to address a similar event in the future?



23. Is there anything else you would like us to know about the Fire Department's response to the Merrimack Valley Gas Explosions?

Thank participant for their time and contribution. Reiterate how their responses will be used to inform the after-action report. Provide contact information



Focus Group Protocol & Questionnaire for Firefighters

Introduction: Thank participants and introduce individuals present.

Background: *The purpose of this focus group is to learn more about the Town of Andover's preparedness and response to the Merrimack Valley Gas Explosions. Our goal is to gain your insight into what took place, what worked well, and what needs improvement. Some of the areas we will ask you about include, but are not limited to, the following: 1) communication methods, 2) existing policies and procedures, and 3) equipment. As you answer different questions we would appreciate your thoughts on both things that you think went well and suggestions for improvement. The focus of this project is on the first week following the explosions, with particular attention placed on the immediate 24 hours after the event (approximately 4:00 PM on September 13, 2018 – 4:00 PM on September 14, 2018). This focus group will be audio recorded so our team can go back and review this conversation for verification and clarification purposes. The audio file will be destroyed after the completion of our final report and no identifying information will be used. Do you have any questions before we begin?*

Open-Ended Questions:

1. To begin, please describe the actions taken by the Fire Department during the immediate response to the gas explosions in Andover.
2. What actions were successful or what went well in terms of the Fire Department's response? Why?
3. What challenges did your department face during its response?
4. What would have made the Fire Department's response even more effective?
5. What communication methods were used by your department and were they effective?
 - Was there a previously established communications plan or was it established during the incident?
 - Was there access to a liaison to relay information?
6. Was there a unified command post?
 - How effective was it?
7. Did you have access to all of the resources you needed such as equipment and personnel?
 - How were off-duty firefighters notified of the incident?
7. How effective or relatable was your prior training experience during the event?



-If at all, how would you improve or add to existing training protocol?

8. How did established policies and procedures operate during the event?

-If at all, how would you improve or add to existing policies and procedures?

9. Is there anything else you would like us to know about the Fire Department's response to the Merrimack Valley Gas Explosions?

Thank participants for their time and contribution. Reiterate how their responses will be used to inform the after-action report. Provide contact information in case follow up is needed.



APPENDIX B

Edward Davis, LLC

Andover After-Action Assessment

Request to Participate

Research Team: William Taylor, Paul Fitzgerald, William Desrosiers, Sheehan McCarthy, and Chelsea Farrell.

We would like to invite you to take part in an assessment we are conducting to understand the town of Andover's preparedness and response to the Merrimack Valley gas explosions. The information gathered today will be used to assess the actions taken after the explosions and develop recommendations to improve the Town's response to similar events in the future. During this interview/focus group you will be asked to respond to a brief list of open-ended questions. Please answer honestly and to the best of your knowledge. Feel free to discuss any related topics that you think may be important.

If you agree, your answers will be recorded, and all audio recordings will be destroyed once the report is complete (September, 2019). Everything you report to us will be kept in confidence. Only the people doing the research (listed above) will see any information that identifies you personally and your decision to participate in this study. The answers you provide during the interview/focus group will be combined with answers from many individuals and will be reported in the aggregate without a connection to your name.

There are no foreseeable risks or discomforts to you for taking part in this interview/focus group. There are no direct benefits to you for participating. However, the information gathered from this interview/focus group will inform our After-Action report and may help your Town and department improve.

The decision to participate in this interview/focus group is voluntary. You do not have to participate and you can refuse to answer any question. After starting the interview/focus group you may withdraw and stop at any time.

If you have any questions, please feel free to ask them now or contact Bill Taylor at wtaylor@eddavisllc.com.

I am signing this form to show that I have read you this information and have promised confidentiality to the extent allowed by law. If you agree to participate, please sign this form to show that I have explained this information to you and you agree to be interviewed.



Interviewer's Signature and Date

I consent to participate in this study. I understand that my participation is voluntary. I understand that I can stop participating at any time or refuse to answer questions.

Please check **one**:

☐ I agree to the interview being audio-taped

☐ I do **not** agree to the interview being audio-taped

Name _____

(PLEASE PRINT)

Signature _____ Date _____



APPENDIX C

Image #1:

ANDOVER — Town Manager Andrew P. Flanagan, Police Chief Patrick Keefe and Fire Chief Michael B. Mansfield report that certain town residents are clear to return home at this time.

- Residents SOUTH of the intersection of Rt. 28 and Salem Street (toward North Reading) and those WEST of the intersection of Beacon Street and Reservation Road (toward Tewksbury) may return home at this time. They are not in the affected area.

- Residents NORTH of Rt. 28 at Salem Street (toward Lawrence and the Merrimack River) should remain out of their homes at this time. A total of 20 teams, each consisting of a police officer, firefighter and natural gas technician will be going house-to-house to 1,800 affected natural gas customers in this area to verify that the gas meters are shut off, or to shut them off. The gas service will not be restored until the gas company determines it is safe to do so.

- Residents in the unaffected zone (South of Rt. 28/Salem Street) but turned off your gas service manually, LEAVE IT OFF until a gas technician can come to your home and restore service properly.

The Town of Andover has made facilities available to residents displaced by today's gas emergency and resulting fires. The Andover Senior Center and Youth Center, located at 30 Whittier Court are open to displaced residents.

An estimated 8,000 people across Andover, North Andover and Lawrence have been displaced by today's incident.

National Grid has cut off the power to a portion of town. Power will be restored as soon as the utility companies determine it is safe to do so.

Andover Public Schools are closed Friday, and after-school activities are cancelled.

"Ensuring safety in the area and protecting residents is the highest priority at this time," Town Manager Flanagan said. "This is a major event, and I want to thank our first responders and residents for their teamwork as we prepare to begin the recovery process."



Image #2:

My situation	Can I go home?
My street is on the cleared list	Yes
My street is NOT on the cleared list	No
My street is NOT on the cleared list, but I do not have gas service in my house	Yes
I have electricity, but my gas is shut off	Yes
I have electricity and gas	Yes

Reminder: do not attempt to turn your gas service back on, only the gas company should turn it on



Image #3:





Image #4:

UPDATE:

Town Manager Andrew P. Flanagan, Police Chief Patrick E. Keefe, and Fire Chief Michael Mansfield report that the Town of Andover is currently involved in a major gas-related emergency.

At 5:01 p.m., Andover Fire-Rescue Department struck a 10-alarm response, its maximum traditional fire response. That directed 20 fire engines and 10 fire ladder trucks to the Town of Andover plus the town's entire fire department. However, a lot of those resources were diverted by concurrent 10-alarm situations in Lawrence and North Andover.

Chief Michael Mansfield requested through the Massachusetts Emergency Management Agency, two additional fire task forces to respond to Andover. This sent an additional 20 engines and ladder trucks total to Andover. Chief Mansfield also requested an ambulance task force, sending 10 ambulances to Andover.

Andover responded and put out 35 total fires in Andover. At peak, 18 fires were burning at the same time. ALL FIRES HAVE BEEN EXTINGUISHED however fire crews will remain in Andover throughout the evening.

These are gas-related fires. Columbia Gas is working to shut off gas service, and we will re-evaluate from there.

At least three people have been injured in Andover, including one firefighter and at least two civilians.

Chief Keefe notes that police resources from throughout Massachusetts have responded to Andover, including the Northeastern Massachusetts Law Enforcement Council (NEMLEC) Rapid Response Team, the NEMLEC Motor Unit, and the Massachusetts State Police. Chief Mansfield is grateful for the response of so many agencies including MEMA, The State Fire Marshal's Office, and fire departments from as far away as Boston Needham, and Belmont.

The Andover Senior Center and Andover Youth Center have been open for residents who have been displaced. Additional facilities may be opened if necessary.

More information will be provided as soon as it becomes available. Updates will be made at www.andoverma.gov and on the town's Facebook and Twitter feeds.

Image #5:

The image shows three safety placards for a structure under emergency management. The placards are yellow, red, and green, each with specific instructions and fields for information.

RESTRICTED USE (Yellow Placard):

Caution: This structure has been inspected and found to be damaged as described below.

Entry, occupancy, and lawful use are restricted as indicated below:

Facility Name and Address: _____

Date: _____ Time: _____

This facility was inspected under emergency conditions for: _____ (Jurisdiction)

Inspector ID / Agency: _____

Do Not Remove, Alter, or Cover this Placard until Authorized by Governing Authority

UNSAFE (Red Placard):

DO NOT ENTER OR OCCUPY (THIS PLACARD IS NOT A DEMOLITION ORDER)

This structure has been inspected and found to be unsafe and is unsafe to occupy as described below.

Facility Name and Address: _____

Do not enter, except as specifically authorized to enter for inspection. Entry may result in death or injury.

Date: _____ Time: _____

This facility was inspected under emergency conditions for: _____ (Jurisdiction)

Inspector ID / Agency: _____

Do Not Remove this Placard until Authorized by Governing Authority

INSPECTED (Green Placard):

NO RESTRICTION ON USE OR OCCUPANCY

This structure has been inspected and found to be safe and is safe to occupy. No further action is required.

Facility Name and Address: _____

Inspector ID / Agency: _____

Date: _____ Time: _____

This facility was inspected under emergency conditions for: _____ (Jurisdiction)

Do Not Remove this Placard until Authorized by Governing Authority



APPENDIX D

References for External Sources

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<https://www.mass.gov/files/documents/2018/11/26/MEMA%20Reports%2017-7.pdf>.

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