

Leland Township Fire & Rescue Staffing and Deployment Analysis



APRIL 2018

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EXECUTIVE SUMMARY

This analysis identifies the factors that need to be considered in planning the future needs of the Leland Township Fire & Rescue Department. It should serve as the building block by which we direct our efforts relative to structural fire protection.

The document starts with an explanation of the considerations and assumptions that are utilized in analyzing and planning fire protection systems. It discusses and describes what fire companies (a.k.a. fire crews) do on the scene of an incident and how fire progresses through the structure. It also defines the response time model and how and why our firefighters and fire trucks are strategically located where they are.

An explanation of NFPA 1710 – the *Standard for Organization & Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations* – is also given; this is an important section for the reader to understand.

Included in this document is a review of the key components of our 2015 Insurance Services Office (ISO) report that assessed the fire department's capabilities, our water supply system, and our emergency communications – including how quickly things happen when you dial 9-1-1.

Additionally there are some staffing models that the board of trustees may want to consider when it comes to setting the level of fire protection and readiness moving into the next decade.

FROM THE FIRE CHIEF

As the fire chief in Leland Township it is important for me to emphasize that our department is not only here to respond to emergency incidents – regardless if it may be what the public has been led to believe. The reality is that we must remain proactive in efforts to reduce, prevent, and mitigate the devastating impacts fires cause. I believe that pretty, big, red trucks can only account for so much when it comes to our fire suppression, medical treatment, and most importantly, the prevention of fire, injuries, and loss through community risk reduction efforts.

I believe it is important for me to emphasize to my command staff and the entire department that we must begin to shift from “just” responders to strategic problem-solvers that are committed to making efforts to identify, reduce, and mitigate risks. As Gordon Graham, a national risk management advisor says, “What is predictable is preventable” and that is where we are aiming our sights.

For me the argument about staffing one station or the other is really short-sighted. Arguments can be made that on call “1021” the public would have been better served if the crew was in Leland – as true as that may be there is a high probability that the public was better served on call “1022” by the crew being in Lake Leelanau. The same argument could be made if the crew was rotated daily, as some have suggested, because there is just as much likelihood that a call may be in Lake Leelanau or Leland on a “Wednesday”.

We must look beyond which “one” station is more appropriate than the other. We must look at long term plans, with the support of the community, so that we can strive to follow the best practice recommendations when responding to emergencies. In addition, I must be an advocate of organizational change so that other Leland Township firefighters become champions of integrating our response capabilities with prevention and mitigation strategies. I am becoming a champion of reducing risk in our community by creating the county’s first “Community Risk Reduction Coordinator” and by being the only Leelanau County Fire Chief that sits on the state Fire Marshal’s Community Risk Reduction committee. I also co-represent the International Association of Fire Chiefs on the NFPA Code 72 -Fire Alarm and Signaling Devices- Technical Committee – striving to make fire detection more efficient when it comes to alerting others of danger.

Michigan continues to be among the unfortunate leaders in fire deaths in the United States. Across this nation we still average 90 firefighter line-of-duty deaths despite having seen a gradual decrease in the number of structure fires, number of civilian deaths, and fire losses (between 2006 and 2015). We all must do our part to minimize the impacts fire can have.

In closing, I appreciate the opportunity to share where our department has been, where we are now, and where we hope to be in the future.

Respectfully,



Dan Besson
Fire Chief

INTRODUCTION TO FIRE PROTECTION EFFORTS

Most people are not informed about the complexities associated with the efforts to plan a department's structural fire protection efficiencies. Oftentimes the general public views a fire department's response to a fire or Emergency Medical Services (EMS) incident as simple, routine, or uncomplicated. Their view of the fire and EMS system(s) may be based on the following beliefs:

1. "My" emergency is the only one in progress.
2. The fire station is close by and, therefore, firefighters and/or EMTs will be on scene very quickly.
3. Only one big red fire truck will be required.
4. There will be adequate staffing on that truck to handle the emergency.

As public fire protection professionals (such as the National Fire Protection Association, Insurance Services Office, and the United States Fire Administration) will point out, these beliefs may be quickly proven incorrect.

In reality, the planning model is much more complex and that complexity can increase or decrease as the following items change:

1. Size of population served.
2. Size of service area.
3. Environmental factors (topography, street system, weather, etc.)
4. The potential risks associated with a community's target hazards.
5. Number of fire companies deployed.
6. Number of fire stations servicing the area.
7. Staffing model utilized (paid, volunteer, or combination).

The purpose of this analysis is to identify the factors that must be considered in planning for the future needs of the Leland Township Fire & Rescue Department. The Leland Township Board of Trustees must have a good understanding of the existing system before they can make effective decisions about its future. This analysis attempts to do the following:

1. Create a common understanding about basic structural fire protection planning issues affecting the township.
2. Present recommendations to the Board to improve upon existing deficiencies.
3. Identifies options for the Board in considering the longer term planning issues that will affect the township.

STRUCTURAL FIRE PROTECTION PLANNING

Tactical Responsibilities of our Duty Crew

Under normal circumstances when a structure fire is dispatched in Leland Township our on-duty crew, comprised of two firefighters, will respond to the call in a fire engine. Our paid-on-call firefighters, if they are available to respond, have the duty to respond to the scene in other LTFR fire apparatus.

Typically fire engines carry a limited supply of water, various amounts and sizes of hose, and are designed with a large capacity fire pump on board. Engine 511, for example, carries only about 750 gallons of water on it. Considering that the average house fire requires 5,000 to 15,000 gallons of water, depending on the size of the home and extension of the fire, the duty crew must rely on help to bring additional water and assist with fighting the fire. In Leland Township, these homes could range anywhere from 1,200 square feet to over 10,000 square feet and our fire apparatus carry only about 5,150 gallons of water – usually short of what we need. Since we do not have any hydrants on a municipal water supply, we must bring water with us or turn to some sort of a water shuttle system.

First-arriving Duty Crew members, and other subsequent help, must spring into action in order to save lives and property and begin tackling these duties:

- Perform a scene size-up to identify what is on fire and where it is coming from.
- Secure electrical and gas supplies as safely as possible.
- Determine the closest water point (i.e. dry hydrant or pond /lake) to help supplement fire suppression capabilities.
- Lay a large diameter hose line to a position of greatest advantage.
- Extend a hose line from the engine to protect exposed homes from heat and flames from the involved structure.
- Advance a hose line from the engine into the fire building to extinguish the fire and prevent it from spreading any further. In compliance with OSHA and NFPA standards, we can only enter a structure that is on fire when there is a potential for life safety or if at least four firefighters are on scene (two-in/two-out).
- Extinguish the fire with minimal structural and contents damage from fire, smoke, and water.
- Search and remove fire victims from the areas of risk.
- Force entry into the structure and open up concealed spaces.
- Raise portable ground ladders to affect rescue of fire victims on upper floors and gain access to the roof for ventilation.
- Control the flow path and move super-heated smoke from the interior of the structure to the outside by creating openings in the roof and utilizing existing openings.

The fireground incident commander can find it extremely difficult to manage all of these tasks with a limited number of firefighters on scene. They may have to choose one tactical operation over another. Occupational Health and Safety Administration (OSHA) regulations and National Fire Protection Association (NFPA) standards require that we have a minimum of four personnel on the scene before entering the interior of a burning structure. This is commonly referred to as the “two-in two-out” rule. While two firefighters enter the structure for fire attack/rescue, two firefighters must remain outside the structure in position that will allow them to attempt a rescue of the firefighters during a catastrophic incident.

Fire Behavior in Structures

The services of the fire department are requested when conditions at the scene of an emergency are degrading very quickly. Whether the emergency is a fire, cardiac arrest, vehicle entrapment or similar “emergency in progress,” conditions at the scene are rapidly deteriorating. In the case of fire control efforts, it is important to develop an understanding of fire behavior within structures to gain an appreciation of the explosive growth of uncontrolled fire within a structure.

Through scientific testing conducted by the NFPA and the United States Fire Administration (USFA), as well as actual assessment of fire ground conditions, it has been determined that the first five to eight minute “window period” in the early phases of a structure fire correlates directly with factors that influence the chances of survival of building occupants and the extent of fire damage to the structure.

In a routine fire in a home where actual flame exists, the combustion process produces heated gases that, in turn, heat adjacent combustible surfaces. As a result of the rapidly developing fire, the temperature within the room rises very quickly from the fire's incipiency, to a point when all the combustible contents within a confined area will ignite in a flashover condition. This process normally takes place at about 400 to 1000 degrees Fahrenheit. As the room contents and wall/ceiling surfaces become heated, simultaneous ignition of all combustible material occurs resulting in a condition where high levels of superheated gases and fire rapidly spreads. Anyone who has not escaped from the room at the point of flashover is unlikely to survive – including firefighters despite wearing a full ensemble of protective gear and breathing apparatus.



The mitigation plan is considered easy – fire is extinguished by taking away heat, fuel, or an oxidizer. Putting water on a fire quickly improves your chances for saving lives and minimizing property loss – while simultaneously reducing the potential for a flashover. In addition, attacking the fire prior to flashover significantly increases the chance of survivability of the occupants, increases the chance of saving the structure, and reduces the risk to firefighters. The slower your response or inability to get the essential tasks completed the more likely the fire is going to grow in size, enter void spaces, and then weaken the integrity of the structure. Simply put, the tactical objective of any fire department is to provide sufficient firefighting resources on the scene to attack the fire prior to flashover.

Fire behavior can also be altered by educating the public about things to do or things not to do when it comes to fire safety. We have all heard the importance of having working smoke alarms and fire extinguishers in our homes but do we all know the potential life and property losses that can be avoided in a home by simply closing doors in our home? This simple act can mean the difference between protecting lives and losing lives.

Sometimes a fire department’s “approval” rating in the community is based on the numbers of houses saved as compared to the number of houses that are completely burned down. Yet simple things like early detection (smoke alarms or smoke detectors that report directly to a central alarm, residential sprinklers, regular cleaning of a fire place, eliminating fire causes, and closing the door, as mentioned above, will have a dramatic impact on a fire’s behavior, a department’s response, and an incident’s positive outcome.



This picture depicts the effects a fire has on rooms with an open door and a closed door.

Response Time Model

There are five critical time periods that must be considered in establishing the ability to attack structure fires in their incipiency prior to flash-over. The five time span periods are:

- A. **DISCOVERY OF FIRE:** The time span that elapses between the inception of the fire, detection of the fire, and time to make initial contact with the Public Safety Answering Point (PSAP).
- B. **ALARM HANDLING TIME:** The amount of time required to receive the call at the PSAP, determine the appropriate fire company assignments, and to initiate the dispatch of those companies to the scene of the emergency.
- C. **TURNOUT TIME:** The amount of time required for the fire company to receive the dispatch from the PSAP, don the appropriate personal protective clothing, get on the engine, and start in the direction of the incident.
- D. **TRAVEL TIME:** The elapsed time span from the moment the fire truck or ambulance starts moving towards the incident and the arrival time of that truck or ambulance on the scene.
- E. **SET-UP TIME:** The time span required to actually “set-up” operations where a full-scale fire attack has been initiated.

In Leland Township the fire department can only control the turn-out time (C) and the set-up time (E). We can practice how quickly we can get our gear on and get out the door (C) and how long it takes us to complete the initial set-up tasks (E) once we get there. In order to improve either “D” or “E” we must consider the staffing of the second station, in this case the Leland Station, which will help us reduce the travel time to certain parts of the township as well as adding personnel that can tackle some of the set-up operations quicker.

The same is true for medical emergencies - time is of the essence! During a cardiac or respiratory crisis we must intervene quickly otherwise the heart, brain, and other vital, oxygen-dependent organs will begin to deteriorate and fail. Scientific proof, provided by the American Heart Association, indicates that irreversible brain damage occurs after about four to six minutes and biological death begins to take place. If emergency medical personnel can be placed on the scene of a medical emergency prior to biological death, mortality rates decline and intervention effectiveness increases. The time period for effective EMS intervention closely correlates to the window we have to intervene before flash-over in a structure fire. So whether you consider yourselves a fire department that provides EMS services or an EMS service that provides fire suppression services the 4 to 6 minutes are very relevant to an incident’s successful outcome.

Strategically Locating Firefighters

When considering that firefighters spend about half to two-thirds of their 48 hour shifts working in the fire station it is pretty obvious that the station location and the assignment of our firefighters are focal points when determining the quickest, most efficient, and developing a plan for providing the greatest good for the greatest number of people.

To determine the most appropriate fire station location for our firefighters several factors must be considered in such an essential strategic planning effort. These factors are:

- A. The level of demand for service. This is usually based upon population density. In some cases, unusual hazards and risks will come into play.
- B. The travel time to reach different locations in Leland Township from our stations.
- C. Consideration of future growth and development patterns.
- D. Consideration of topographical as well as traffic features.
- E. Acceptable elapsed time for an appropriate number of firefighters to arrive on scene and begin fire attack.

The NFPA is a global nonprofit organization that is committed to eliminating death and injury, as well as property and economic loss, due to fire, electrical, and related hazards. This organization, whose mission is to reduce loss through information, knowledge, and passion, is well-respected by professional fire leaders throughout the globe.

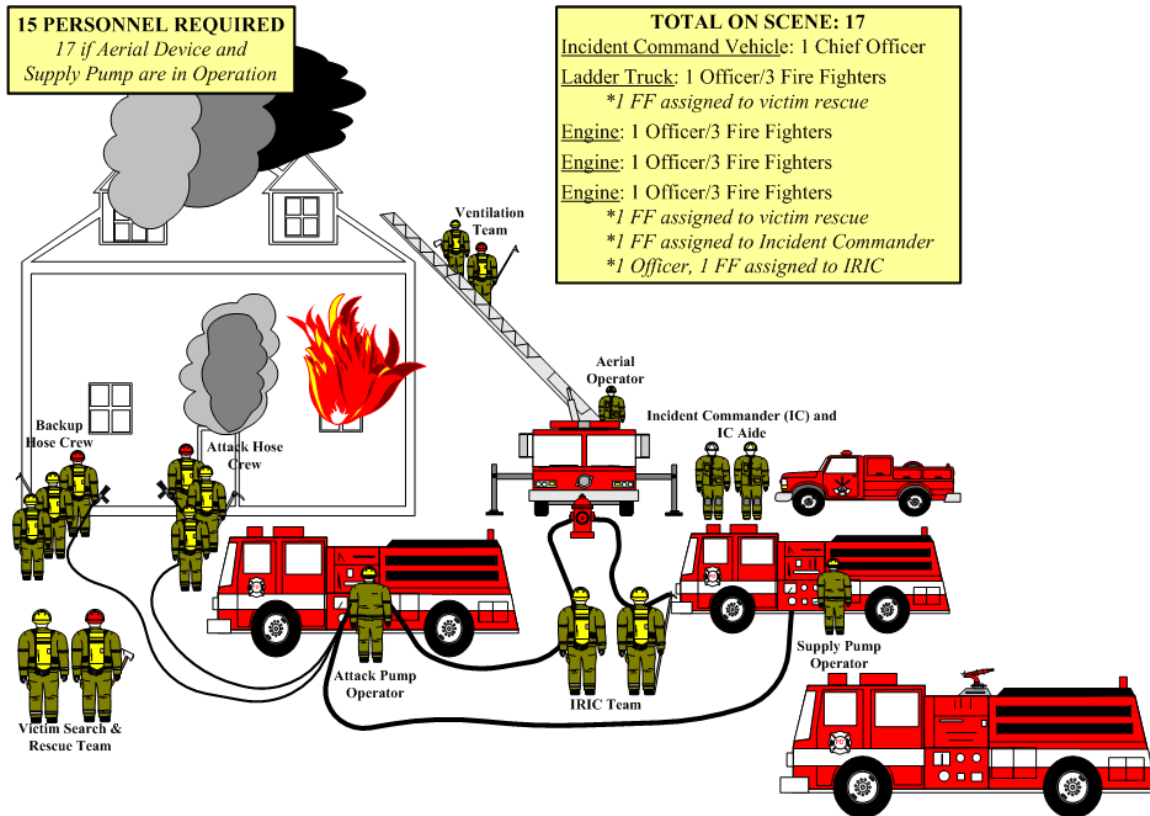
The NFPA, in 2001, adopted Standard 1710- the *Standard for Organization & Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations* – which helps guide us toward adequate staffing, apparatus response, and incident matrix.

It is important to point out that we have not, as an organization or municipality adopted this standard so there is no legal obligation to follow NFPA 1710 but it should help guide us toward what is perceived as reasonable.

Part of NFPA Standard 1710 identifies target “numbers” to strive for as an organization. Those target numbers are:

Type of Measurement	Target Numbers
First unit travel time	4 minutes (90% of the time)
Initial full-assignment travel time	8 minutes (90% of the time)
First unit staffing	4 minimum
Full Assignment Staffing	15-17
First BLS unit travel time	4 minutes*
First ALS unit travel time	8 minutes*

(*) includes turnout time of 1 minute

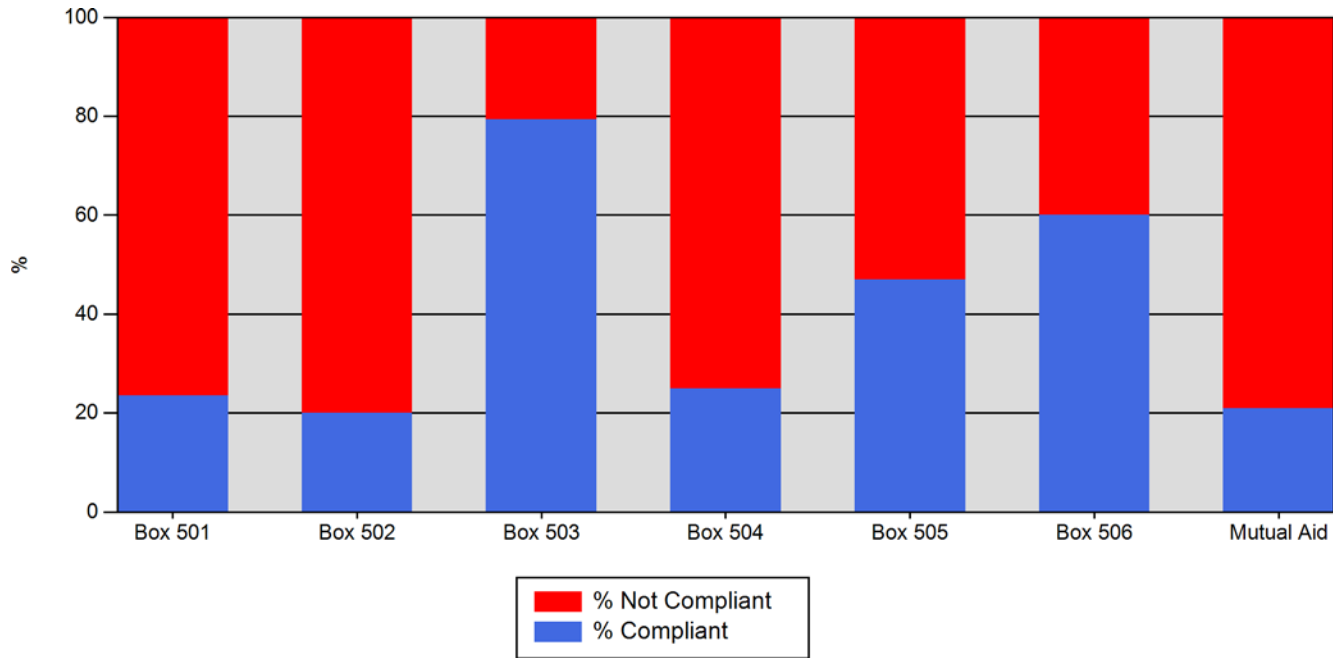


Leland Township Average Response Time

In 2017 the Leland Township Fire & Rescue Department had an average response time of 8.29 minutes for calls when we responded with our lights and sirens – indicating our highest priority calls.

Using the standards established in NFPA 1710 of having our initial fire apparatus or ambulance responding to the call within four minutes we were compliant only 12.73 % of the time (based on 139 calls where we left the station with our lights and sirens on all the way to the call). If we used eight minutes as our standard, which the NFPA identifies as a standard for a full-alarm travel time, we would improve our compliance to 39.37%. As identified in the chart below we were most compliant in Box 503 (Lake Leelanau & surrounding area) followed by Box 505 & 506 (Leland and Fishtown). However with a staffing of two firefighters we would still fall short of the initial apparatus staffing of four firefighters and, therefore, with the exception of a bona fide life rescue attempt, we could not start any sort of an interior attack.

Pop. Density: All | Response Mode: Lights and Sirens | Start Date: 01/01/2017 | End Date: 12/31/2017 | Compliance Time: 00:08:00

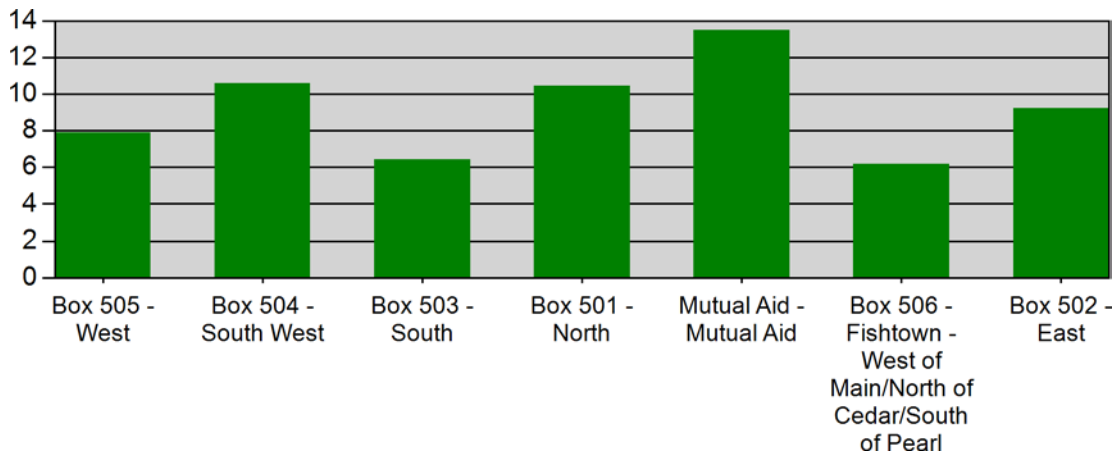


ZONES	# RESPONSES	AVG TIME (m)	% COMPLIANT
Box 501 – North	17	9	23.5%
Box 502 – East	5	10	20.0%
Box 503 – South	29	6	79.3%
Box 504 – South West	8	9	25.0%
Box 505 – West	32	7	46.9%
Box 506 – Fishtown	5	6	60.0%
Mutual Aid – Mutual Aid	43	11	20.9%
TOTAL:	139	8.29	39.37%

When we compare our average emergency response time with our response times for all calls, with or without our lights and sirens, we averaged under eight minutes in Box 503 (Lake Leelanau area), Box 505 (Leland area) and Box 506 (Fishtown area). Of course we staffed the Leland Fire Station during the peak part of the tourist season and that helped lower the response times in a few of those areas. For instance we had additional staffing on site for several special events in Leland last summer and crews were there almost immediately. Having the fire chief’s office in Leland also helps put a trained fire and emergency medical services person on scene quickly during the day, too.

The chart below identifies our average response times to specific parts of the township in 2017.

Year: 2017



ZONE	AVERAGE RESPONSE TIME in minutes (Dispatch to Arrive)
Box 505 - West	07:53
Box 504 - South West	10:35
Box 503 - South	06:26
Box 501 - North	10:27
Mutual Aid - Mutual Aid	13:29
Box 506 - Fishtown -	06:11
Box 502 - East	09:13

Response times also calculate overlap times, meaning two calls for service occurring at the same time, and in 2017 we had 38 overlap calls (8.29% of our calls). 10 of those occurred in Box 503, 4 occurred in Box 505, and 2 occurred in Box 506. Obviously with only two people on duty having multiple calls occurring at the same time will force our response times to go up as our paid-on-call staff or mutual aid will be summoned to help cover those calls.

Response time statistics do not factor in individual delays to a call either. For instance, if the Duty Crew transports a patient to Munson Medical Center, in Traverse City, they are going to be “Out of service” for about an hour and a half. During that time a second call may come in forcing them to request a response from paid-on-call staff, request mutual aid, or respond to the call while returning to the Leland area. The statistics also do not account for responding to a call in severe weather or other factors. Obviously responding during a snow storm or at night – dodging animals – may cause more delays as compared to a nice sunny, light traffic kind of day.

Looking at the statistics from January 1st through April 1st and June 1st through September 1st (2017) points out a few interesting things:

When the fire department responded with lights and sirens to calls, from January 1st- April 1st, the response time to Box 503 (Lake Leelanau Area) was just over six minutes as compared to Box 505 (Leland Area) which was under seven minutes. Traveling without lights and sirens to the call added about a minute and a half to Box 503 but it also added a full two and a half minutes to Box 505.

Taking another three month sample, this time June 1st through September 1st, the fire department's response time, with lights and siren, to Box 503 was about nine minutes but remained the same in Box 505 (seven minutes). Responding without lights and siren actually demonstrated the department was quicker to Box 503 (just over six and a half minutes) but slower to Box 505 (about nine and a half minutes). Again it would be very difficult to pinpoint why there are some swings in trends because there are so many factors or potential outliers. Perhaps there were multiple calls, there may have been a delay in dispatching the call or indicating the fire apparatus had arrived on scene, perhaps a call for a structure fire came in and the duty crew was out in an ambulance and had to return to the station, maybe they encountered heavy traffic in downtown Leland during a non-emergency call, or maybe the call came in during a time when we did not have the Leland station staffed.

THE CURRENT CONDITION OF DEPLOYMENT AND STAFFING

Staffing and Apparatus Deployment

At the present time, the fire department staffs the Lake Leelanau Fire Station with two firefighters. These two firefighters provide our initial fire response and our advanced life support (ALS) ambulance services. The Lake Leelanau station is staffed 24 hours a day, 365 days a year.

The Leland Fire Station is staffed by the fire chief administratively. Although we staffed that fire station seasonally in the summer of 2017, it is typically not staffed.

The Lake Leelanau Fire Station houses the following equipment:

- Engine 511
- Tanker 522
- Brush 542
- Gator 583
- Snowmobile 582
- Hydrant 581
- Alpha 591 (Ambulance)
- Alpha 592 (Ambulance)

The Leland Fire Station houses:

- Engine 512
- Tanker 521
- Brush 541
- Marine 571 (boat)
- Car 584 (administration)

The Lake Leelanau Fire Station houses most of our equipment because of the staffing of the duty crew **and** due to the fact that a vast majority of our paid-on-call firefighters live closer to that station **than** Leland's so strategically it makes the most amount of sense.

INSURANCE SERVICES OFFICE (ISO) REVIEW OF STRUCTURAL FIRE SUPPRESSION DELIVERY SYSTEM

The ISO's Public Protection Classification (PPC) program plays an important role in the underwriting process for insurance companies especially when it comes to making a decision about what businesses to write and what coverage to provide for personal and commercial businesses.

In 2015 Leland Township had the ISO evaluate our department's capabilities. In a broad sense the township was evaluated in three key areas: *emergency communications*, the *fire department* itself, and *water supply*. Each category was then broken down into key parts and they were scored accordingly. For instance the fire department, the biggest factor of the three, is evaluated for its *engine companies*, *reserve pumpers*, *pump capacity*, *aerial ladder companies*, *reserve ladder/service trucks*, *deployment analysis*, *company personnel*, *training*, *operational considerations*, and *community risk reduction*.

Of the ten categories listed above the five key "point getters" are company personnel (15 points possible), department analysis (10 points), training (9 points), engine companies (6 points), and community risk reduction (5.5 points). Obviously the fire administration should continue to evaluate these areas and make marked improvement when they can.

The ISO determined during their review that the emergency communications, handled by Leelanau County, fared fairly well and awarded Leland Township 8.4 points out of 10. The fire department and our water supply did not fare so well.

The fire department needs to make improvements in the areas of reserve pumpers, ladder service, our deployment analysis, company personnel, and training. Here is a synopsis of what the ISO reviews:

- *Reserve Pumpers*: This item reviews the number and adequacy of each reserve pumper (i.e. fire engine) and its equipment. Leland Township has two front line fire engines, one at each station, but no reserve/back-up units. Therefore, we were awarded no points.
- *Ladder Service*: The ISO considers aerial trucks to be dependent upon the number of buildings three stories in height (or 35 feet), buildings where a fire flow of 3,500 gallons per minute, and the method of operation. Leland Township does not have an aerial truck within its jurisdiction, but does have tall ground ladders. That, in conjunction with some automatic mutual aid agreements for Fishtown, gained us less than a point of credit (0.93). In the 2018-2019 budget we are looking to purchase a used aerial ladder truck in order to improve our operations at commercial and residential fire that are large or have a long setback from the road.
- *Deployment Analysis*: In addition to the credit for distributing our equipment across the township along with how they are staffed (duty crew versus paid-on-call) through a road-mile analysis ISO analyzes information from our Computer Aided

Dispatch (CAD) system to determine how compliant (or non-compliant) we are with the thresholds of NFPA 1710 – *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public* as outlined above. We received 3.12 points out of 10.

- *Company Personnel*: This is dependent on the average number of existing firefighters and company officers (i.e. sergeant, lieutenant, captain, and chiefs) available to respond to reported first alarm structure fires in the township. We earned credit for on-duty staffing but only earned partial credit for on-call responders because of the response time factors. Paid-on-call/off-duty firefighters are divided by 3. For example, 8 on-duty personnel may earn a municipality 8 points, but 2 on-duty firefighters and 6 average on-call responders would earn a municipality 4 points. Automatic Aid responders earn credit as well depending on their response distances and capabilities. We earned 3.33 points out of 15.
- *Training*: The training aspect of the PPC review consists of our facilities and use, annual training in structure fire related subjects (per NFPA 1001), company officer continuing education in accordance with NFPA 1021, new driver and operator training (per NFPA 1002 and NFPA 1451), existing driver and operator training (also per NFPA 1002 and NFPA 1451), hazardous materials (NFPA 472), recruit/probationary training (NFPA 1001), and pre-fire plan inspections of each commercial, industrial, institutional, and other similar building types. For maximum credit these inspections should be made annually and built into training. We have made major strides towards compliance with the requirements for training, including the amount of training, medium of those trainings, and the way we document our training. In 2015 we received 2.31 points out of 9.
- *Community Risk Reduction*: How much of a role does a fire department play in the reduction of fire-related risks? That is the focus of this area. Credit is given for *Fire Prevention and Code Enforcement, Public Fire Safety Education, and Fire Investigation Programs*. In Leland Township, we do not have an adopted fire code, nor did we have formalized public education and investigation programs. In 2017, we created a *Community Risk Reduction Coordinator* position, but shortly after hiring a candidate for that position, he was hired as a fire chief elsewhere. As the budget allows we will re-post that position and continue our efforts to reduce fire risk in Leland Township. We have sent two full-time firefighters to Fire Inspector school to help us work on pre-fire plans, inspecting commercial occupancies, and adopting a fire code. It is a slow process, but we are making progress. We earned 1.37 points out of 5.5 points.

Also in the 2015 report, the ISO evaluated our water supply system. Typically a community can earn credit for their number of inspections and flow testing of fire hydrants. Since 2015, we have added and/or repaired four dry hydrants, with two more scheduled to be added in 2018. We have been testing the dry hydrants, however, we failed to document those tests so we earned minimal points for them. We are working on better solutions to document the semi-annual testing we do on the dry hydrants and we continue to look for places to install more.

At the conclusion of ISO’s Public Protection Classification assessment, Leland Township scored 45.46 points out of a possible 105.5 points, earning a classification of 6/10. There are several areas upon which we have improved and there are plans to improve on others. However, boots on the ground is what really helps a community’s PPC. An overall PPC summary is located on below.

LELAND TOWNSHIP PUBLIC PROTECTION CLASSIFICATION OVERVIEW

FSRS Feature	Earned Credit	Credit Available
Emergency Communications		
414. Credit for Emergency Reporting	2.55	3
422. Credit for Telecommunicators	2.98	4
432. Credit for Dispatch Circuits	2.61	3
440 . Credit for Emergency Communications	8.14	10
Fire Department		
513. Credit for Engine Companies	5.82	6
523. Credit for Reserve Pumpers	0.00	0.50
532. Credit for Pump Capacity	3.00	3
549. Credit for Ladder Service	0.93	4
553. Credit for Reserve Ladder and Service Trucks	0.00	0.50
561. Credit for Deployment Analysis	3.12	10
571. Credit for Company Personnel	3.33	15
581. Credit for Training	2.31	9
730. Credit for Operational Considerations	2.00	2
590. Credit for Fire Department	20.51	50
Water Supply		
616. Credit for Supply System	10.62	30
621. Credit for Hydrants	2.10	3
631. Credit for Inspection and Flow Testing	3.04	7
640. Credit for Water Supply	15.76	40
Divergence	-0.32	-
1050. Community Risk Reduction	1.37	5.50
Total Credit	45.46	105.50

POTENTIAL STAFFING MODELS

Across the nation, there are always debates about different ways to provide public safety protection to the community. The decisions usually come down to money, efficiency, and practicality. The question must be asked, “What level of service do you want the fire department to provide?” before a model can be chosen. For instance, does the community want only one fire station to be staffed forcing the township board and/or the fire chief to pick one based on efficiency and doing the greater good for the greater number of people? Perhaps the community, as a whole, just wants someone “at the ready” who is able to drive a fire truck from the closest station? Does the community want a staffed Advanced Life Support ambulance at both fire stations? Without the input from the community, we have to believe that they are content with the current level of funding they provide through the millage and leave it to the fire chief to “pick the best model”. There are several additional staffing models the community may choose to support. These are not the only options, of course, but some that may be worth considering.

Full-time Advanced Life Support/Fire Suppression staffing at both stations 24/7

This model would basically double up the service we provide now. Instead of two full-time firefighters on duty we would move to four full-time firefighters – two at each station. The fire department’s full-time firefighter count would go from 6 to 12.

Advantages: Under normal circumstances the response times to all areas of the township would improve. It would provide two fully functional advanced life support ambulances for EMS calls or two fully functional fire suppression units (i.e. fire engine or tanker) to be ready to respond as needed. The retention rate on full-time firefighters is traditionally better than paid-on-call firefighters. The additional full-time staffing would play a significant role in being compliant with the OSHA two-in/two-out rule, initial fireground operations, and the Insurance Services Office (ISO) public protection classification for our commercial districts.

Disadvantages: It is expensive – efficient but expensive. With full-time staffing comes providing an annual salary, overtime, health/dental insurance, retirement (401K), workman’s compensation, stipends, social security, uniforms, and training/certificate renewals.

The average full-time Leland Township firefighter makes about \$42,800 annually. As you add the factors listed above, each full-time firefighter costs the department about \$71,000 annually. Altogether six full-time firefighters cost us about \$425,000 annually in salary and benefits. The number projected, based on insurance premiums and contractual raises, is estimated to increase to about \$499,000 in 2022 (five years). Adding 6 more full-time firefighters would cost about \$851,000 in the first year.

Cost: \$851,000 in year one; \$999,000 in year five.

Full-time Fire Suppression staffing at both stations & one Advanced Life Support ambulance 24/7

This model would provide one full-time firefighter at one station, capable of providing fire suppression and some initial non-transport medical care. The other fire station would continue to have the same business model we have in place now: two full-time firefighters that are able to provide fire suppression and Advanced Life Support. Instead of two firefighters on duty at one time, we would have three spread out across the township. Our full-time ranks would grow from six to nine.

Advantages: Under normal circumstances the response times to all areas of the township would improve. It would provide two fire suppression units (i.e. fire engine or tanker) to be ready to respond as needed. It would also provide a firefighter that could provide initial medical assessment and care if they were closer than the responding ALS ambulance. We may see some slight improvement in our ISO public protection classification for our commercial districts. We would not be initially compliant with the OSHA “two-in/two-out rule” until our paid-on-call staff or mutual aid gets there; however, the time it takes to complete our initial fireground task checklist would improve. The retention rate on full-time firefighters is traditionally better than paid-on-call firefighters.

Disadvantages: It is expensive but it would provide a more efficient and effective service than our current model has. As mentioned above, full-time staffing requires that we provide an annual salary, overtime pay, health/dental insurance, retirement (401K), workman’s compensation, stipends, social security, uniforms, and training/certificate renewals.

As mentioned in the model that would add two full-time firefighters per shift (six total), the average full-time Leland Township firefighter makes about \$42,800 annually. As you add the factors listed above each full-time firefighter costs the department about \$66,000 annually. Altogether six full-time firefighters cost us about \$396,000 annually in salary and benefits. The number projected, based on insurance premiums and contractual raises, is estimated to increase to about \$479,000 in 2022 (five years). Adding three more full-time firefighters would cost about \$638,000 in the first year.

Cost: \$638,000 in year one; \$749,000 in year five.

PROPOSED STAFFING COSTS FOR ADDITIONAL PERSONNEL

Annual Cost for:	year 1	year 2	year 3	year 4	year 5
Salary	\$ 42,800.00	\$ 45,000.00	\$ 47,250.00	\$ 49,600.00	\$ 52,000.00
Overtime	\$ 4,250.00	\$ 4,450.00	\$ 4,685.00	\$ 4,920.00	\$ 5,175.00
Health/Dental	\$ 10,400.00	\$ 10,920.00	\$ 11,470.00	\$ 12,000.00	\$ 12,600.00
Holiday Hours	\$ 2,000.00	\$ 2,060.00	\$ 2,120.00	\$ 2,185.00	\$ 2,300.00
401K	\$ 2,140.00	\$ 2,250.00	\$ 2,363.00	\$ 2,480.00	\$ 2,600.00
Stipends	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00
SS	\$ 3,595.00	\$ 3,790.00	\$ 3,962.00	\$ 4,175.00	\$ 4,368.00
Workman's Comp	\$ 2,250.00	\$ 2,250.00	\$ 2,250.00	\$ 2,250.00	\$ 2,250.00
Uniforms	\$ 2,500.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00
TOTAL PER PERSON	\$ 70,935.00	\$ 72,720.00	\$ 76,100.00	\$ 79,610.00	\$ 83,293.00
Staffing Options					
2 PERSONNEL (Current)	\$ 425,610.00	\$ 436,320.00	\$ 456,600.00	\$ 477,660.00	\$ 499,758.00
3 PERSONNEL					
(1 ADDED PER SHIFT)	\$ 212,805.00	\$ 218,160.00	\$ 228,300.00	\$ 238,830.00	\$ 249,879.00
TOTAL (Annually)	\$ 638,415.00	\$ 654,480.00	\$ 684,900.00	\$ 716,490.00	\$ 749,637.00
6 PERSONNEL					
(2 ADDED PER SHIFT)	\$ 425,610.00	\$ 436,320.00	\$ 456,600.00	\$ 477,660.00	\$ 499,758.00
TOTAL (Annually)	\$ 851,220.00	\$ 872,640.00	\$ 913,200.00	\$ 955,320.00	\$ 999,516.00

This chart helps breakdown the costs of adding one or two additional full-time firefighters per shift (which would add three to six full-time firefighters):

Combination Full-time/Part-time Advanced Life Support/Fire Suppression staffing at both stations 24/7

This model would basically duplicate the coverage we provide now by adding part-time firefighters to the mix. Instead of two full-time firefighters on duty, we would move to two full-time supplemented by two part-time firefighters: two at each station. The fire department's full-time firefighter count would remain the same (6), but it would require the recruitment, hiring, training, and retention of a lot more part-time people. There is usually a big learning curve for the part-time employee because of their lack of availability, to get up to speed and be fully-functional.

Advantages: It is usually significantly cheaper because you are not paying for the health insurance and other benefits usually afforded a full-time employee. Under normal circumstances, the response times to all areas of the township would improve. It would provide two fully functional ALS ambulances for EMS calls or two fully functional fire suppression units (i.e. fire engine or tanker) to be ready to respond as needed. The additional staffing would play a significant role in being compliant with the OSHA two-

in/two-out rule, initial fireground operations, and the ISO public protection classification for our commercial districts.

Disadvantages: These models can have a tendency to create some unforeseen gaps in the coverage. For instance, what if no part-time employee wants to work Christmas Day or any other holiday? What if they do not want to work the months of July or August? What if they are sick or injured? I came from an agency that used part-timers to staff the stations and we were forced to have about 50 part-timers to fill four shifts per day, and yet, there were still days that I, as the fire chief, was riding on the big, red truck because no one wanted to work an open shift because they conflicted with their full-time jobs. There would be additional costs associated with providing annual physicals, uniforms, firefighter turn-out gear, and training. An area of concern would be the on-again/off-again limitations imposed on part-time employees under the Affordable Healthcare Act before the township may need to offer healthcare coverage. The retention rate of full-time employees is typically better than part-time employees.

Because, despite our efforts, fire departments in Leelanau County are having trouble attracting good candidates for part-time positions, this plan may not be viable. We do not have enough part-time/paid-on-call employees that have the credentials needed that would make a long-term permanent part-time model effective. We would have to recruit outside of Leelanau County.

Costs: Using \$16.50 an hour (\$24.75 for holiday pay) as a factor to determine costs, it would cost the fire department about \$291,000 a year in salary and about \$100,000 in turn-out gear and uniforms (outfitting 10 more part-time firefighters). If we are fortunate to recruit and *retain* part-time people to make this model successful we will not have to purchase turn-out gear annually. It may cost about \$400,000 to make this model work the first year.

Combination of Full-time & Part-time to provide Fire Suppression staffing at both stations & one Advanced Life Support ambulance 24/7

This model would add a part-time firefighter to the mix every day. Instead of 2 full-time firefighters on duty we would move to 2 full-time supplemented by 1 part-time firefighter – 2 at one station and 1 at the other. The fire department’s full-time firefighter count would remain the same (6) but it would require the recruitment, hiring, training, and retention of a lot more part-time people. As mentioned above there is usually a big learning curve for the part-time employee because of their lack of availability, to get up to speed and be fully-functional.

Advantages: It is usually significantly cheaper because you are not paying for the health insurance and other benefits usually afforded a full-time employee. Under normal circumstances the response times to all areas of the township would improve. It would provide one fully functional ALS ambulance for EMS calls but two fully functional fire suppression units (i.e. fire engine or tanker) to be ready to respond as needed. We would not be initially compliant with the OSHA “two-in/two-out rule” until our paid-on-call staff or mutual aid gets there, however, the time it takes to complete our initial fireground task checklist would improve. With this model, we would not be forced to recruit as many part-time guys to supplement our current staff and make this work.

Disadvantages: As mentioned above, these models can have a tendency to create some unforeseen gaps in the coverage around the holidays, school breaks, and summer vacations. Schedules often conflict with their full-time jobs. There would be additional costs associated with providing annual physicals, uniforms, firefighter turn-out gear, and training. Again an area of concern would be the on-again/off-again limitations imposed on part-time employees under the Affordable Healthcare Act. The retention rate of full-time employees is typically better than part-time employees.

Costs: Using the same pay rates as in the previous model, it would cost the fire department about \$146,000 a year in salaries and about \$50,000 in turn-out gear and uniforms (outfitting 5 more part-time firefighters). There would be additional costs associated with training.

Seasonal Staffing of 1 Fire Station

This model would add a part-time firefighter to cover an unoccupied vacant fire station 24 hours a day during the peak tourist season (i.e. Memorial Day through Labor Day weekends). This would supplement our current practice of only having 2 full-time firefighters and having the other fire station “browned out”. This staffing could easily be in place by the summer of 2019 if the funding is there.

Advantages: It is a decent stop gap during our peak times of the year by adding a firefighter around the clock at a station that is usually unstaffed. The firefighter would have access to medical supplies and fire suppression equipment. Under normal circumstances the response times to all areas of the township would improve. It would provide one fully functional ALS ambulance for EMS calls, but two fully functional fire suppression units (i.e. fire engine or tanker) to be ready to respond as needed. We would not be initially compliant with the OSHA “two-in/two-out rule” until our paid-on-call staff or mutual aid gets there, however, the time it takes to complete our initial fireground task checklist would improve. There would be little concern of what impacts the Affordable Healthcare Act would pose.

Disadvantages: This model is only a stop gap for the peak times of the year; meaning the remaining 9 months of the year our current business practice would continue. Therefore, fire, medical, and other specialty rescue calls would continue as normal and for those 9 months our response times would remain about the same. It is not a great model but it is relatively cheap, it works, and would be something from which we could build in the future. Some of our part-time/paid-on-call staff find it difficult to work these shifts because their full-time jobs are at full-peak during the summer.

Costs: Anticipating about a 15 week (105 days) coverage scenario it would cost about \$42,000 per year. We would be able to use our current part-time/paid-on-call staff to make this work. Depending on funding we could stretch the 15 weeks out longer into the fall color season.

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