



Shared Services Study

Laurentian North Fire Fighters Organization

Final Report - June 24, 2013



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I. The Study

The purpose of this feasibility study is to provide ways to increase efficiency, effectiveness, and/or cost saving methods through voluntary and cooperative shared services. The report also includes possible alternatives for the departments to share fire and rescue services.

The consultant performed a feasibility study and prepared a written report on sharing fire and rescue services for the following entities: Pike-Sandy-Britt Fire Department, Vermilion Lake Fire Department, Breitung Fire Department, Tower Fire Department, Eagles Nest Fire Department, and Greenwood Fire Department; including Breitung, Greenwood, Vermilion Lake, Wuori, Pike, Sandy, Kugler and Eagles Nest townships; Sand Lake and Hay Lake Unorganized Townships governed by St. Louis County, and Bois Forte Reservation.

The study considered the following:

1. What can the above entities do better or differently to provide effective emergency services to their citizens?
2. What do they share or provide regionally to benefit everyone?
3. The possibilities of creating administrative positions that might be beneficial, such as a mechanic certified in pump testing and a training coordinator.
4. The feasibility of implementing agreements for automatic mutual aid based on call types.
5. The possibilities of joint power agreements or fire districts.
6. A set of Standard Operating Guidelines (SOG) that could be shared and tweaked for any department's specific needs.

II. Laurentian North Fire Fighters Organization

Location: "Up North" - Approximately 90 miles north of Duluth in the Arrowhead region of Northeast Minnesota, including portions of the Superior National Forest and Boundary Waters Canoe Area Wilderness (BWCA), as well as many other state parks and recreational areas.

Service Area: We help protect people, property and environment in an area that covers over 2000 square miles (bigger than Rhode Island or Delaware); much of the area is heavily forested wildland that is subject to periodic wildfire hazards. Virtually all of the inhabited areas are considered rural/urban interface areas. Four major federal/state highways (1, US-53, 135 & 169) traverse the entire area along with heavily used county highways. A main railroad line goes into Canada carrying a wide variety of goods and hazardous materials.

Population Served: Combined service area population is more than 23,000 permanent residents, doubling in population based on seasonal homes/cabins and tourism.

Stations: Member fire departments operate out of 17 land and water based stations employing approximately 240 career, volunteer, and paid on call firefighters. Some member communities also operate Emergency Medical Services (EMS).

Diverse Staff: Firefighters come from all walks of life and represent a true cross-section of the population. They are people who care about their neighbors and their communities. Many members are also cross-trained in Emergency Medical Services, Wilderness Search and Rescue, Hazmat specialties, Confined Space Operations, Vehicle Extrication and Wildland Firefighting.

Diverse Communities: Many of the municipalities and townships served range in population from 83 to 8,712 people. The estimated market value also varies from 37 million to over 1 billion dollars. Each community is unique and diverse from its neighbor making emergency service responses as challenging as the larger populated areas of the country. For example, some residents are non-English speakers.

Member Departments

1. Pike-Sandy-Britt Fire Department

Pike-Sandy-Britt Fire Department (PSBFD) is a three station operation covering 260 square miles started in 1964. PSBFD utilizes 8 apparatus: 3 engines, 2 water tenders, 1 wildland truck, 1 UTV, 1 utility pickup truck, and a rehab unit. The department has 20 members to provide fire and rescue services including a fire chief, assistant chief, 2 captains, 2 lieutenants, and 13 firefighters (5 EMTs and 2 Paramedics). PSBFD responded to 121 calls in 2012 counting 39 fires and 82 EMS. Budget annually was \$102,000 in 2010; \$104,000 in 2011; \$106,000 in 2012; and \$108,000 in 2013. PSBFD trains monthly and has by-laws and SOG's.

2. Vermilion Lake Fire Department

Vermilion Lake Fire Department (VLFD) is a one station operation covering 39 square miles of area organized in 1974. VLFD utilizes 5 apparatus: wildland2 engines, 1 water tender, and 2 wildland truck. VLFD has 17 personnel including a fire chief, assistant chief,3 captains, 11 firefighters (2 are First Responders and 1 EMT), and 1 first responder only. VLFD responds to 20 calls per year. Annual budget is \$10,400. VLFD trains monthly and has by-laws and SOG's

3. Breitung Fire Department

Breitung Fire Department (BFD) is one station and one fire boat station operation covering 40 square miles started in 1958. Apparatus utilized: 1 engine, 1 water tender, 1 wildland truck, and 1 fire boat. Twenty personnel include a fire chief, assistant chief, captain; training/safety officer, and 16 firefighters. BFD responded to 39 calls last year counting 31 fires and 8 other calls. Annual budget was \$140,000 in 2010; \$129,000 in 2011; \$104,000 in 2012; and \$79,000 in 2013. BFD trains monthly and has by-laws and SOG's

4. Tower Fire Department

Tower Fire Department (TFD) is one station covering 39 square miles operating since1889. Apparatus utilized: 1 engine/water tender, 1 -50' Quint, 1 wildland truck, and an ATV. Fifteen personnel include a fire chief, assistant chief, captain, safety officer, training officer, and 10 firefighters including 5 EMT's. The department responded to 15 calls counting = 12 fires and 3 other. Budget annually was \$66,972 in 2010; \$66,821 in 2011; \$53,102 in 2011 and \$42,793 in 2013. TFD trains monthly and has by-laws and SOG's

5. Eagles Nest Fire Department

Eagles Nest Fire Department (ENFD) is one station covering 30 square miles organized in 1990. Apparatus utilized: 1 engine, 1water tender, and 2 wildland trucks. Fourteen personnel include a fire chief, assistant chief, 7 firefighters, 1 EMT, and 4 First1st Responders. ENFD responds to 24 calls per year

counting 6 fires and 18 EMS calls. Annual budget was \$32, 920 in 2010; \$44,337 in 2011; \$44,337 in 2012; and \$39,670 in 2013. ENFD trains monthly and has by-laws and SOG's.

6. Greenwood Fire Department

Greenwood Fire Department (GWFD) is a one station and 2 fire boat station operation covering 127 square miles organized in 1977. Utilized apparatus: 2 engines, 2 water tenders, 1 rescue, 2 fire boats, 1 air boat 2 snowmobiles, and 1 UTV. Sixteen personnel include fire chief, assistant chief, captain, lieutenant, and 12 firefighters. GWFD also includes an administrative assistant, 3 EMTs, and 3 first responders. Runs were 135 in 2010, 184 in 2011, and 211 in 2012. Budget annually was \$40,690 in 2010; \$205,391 in 2011; \$208,038 in 2012; and \$171,071 in 2013. GWFD trains monthly and has by-laws and SOG's.

7. Babbitt Fire Department

Babbitt Fire Department (BAFD) operates out of one station covering 230 square miles and was organized in 1956. Utilized apparatus: 2 engines, 2 water tenders, 2 ambulances, 2 wildland trucks, 1 snowmobile, 1 ATV, and a suburban. 26 personnel include a fire chief, assistant chief, 3 captains, and 20 firefighters, of those 21 are EMTs. BAFD runs about 250 calls per year with 75% EMS and 25% being fire and other emergencies. Annual budget was \$109,982 in 2011; \$102,882 in 2012; and \$105,495 in 2013. BAFD trains monthly and has by-laws and SOG's.

8. Ely Fire Department

Ely Fire Department (ELFD) has one fire station covering approx. 40 square miles. Apparatus utilized: 3 engines, 1 aerial ladder, 2 water tenders, and 2 wildland trucks. 34 personnel include a fire chief, assistant fire chief and captains. ELFD trains monthly and has by-laws and SOG's.

9. Embarrass Fire Department

Embarrass Fire Department (EMFD) operates from one fire station covering approximately 80 square miles and was organized in 1960. Apparatus utilized: 2 engines, 1 rescue, 1 water tender, 2 wildland trucks, 1 snowmobile, and 1 ATV. EMFD also has a cascade air trailer. 23 personnel including a fire chief, assistant chief and 21 firefighters (40% are first responders). The department runs 50 to 60 calls per year counting 10 fires, 40 EMS calls and 5 calls of other nature. The annual budget is \$36,000. EMFD trains monthly and has by-laws and SOG's.

10. Virginia Fire Department

Virginia Fire Department (VFD) operates from one station covering 640 square miles and was organized in 1893. Utilized apparatus: 2 engines, 1 aerial ladder, 1 rescue, 1 wildland truck, 5 ambulances, 2 staff vehicles, an ATV, and 4 trailers. 24 personnel include a fire chief, 3 assistant chiefs, 4 captains, 6 equipment operators, and 9 firefighters. All personnel are paramedics. Budget annually was \$3,136,964 in 2010; \$3,197,462 in 2011; \$3,244,807 in 2012; and \$3,103,798 in 2013. VFD has finalized and complete SOG's. The department trains monthly for all personnel plus daily shift training.

11. Morse/ Fall Lake

Morse/Fall Lake (MOFD) has 2 stations covering 720 square miles and was organized in 1991. Apparatus utilized: 2 engines, 2 rescues, 2 water tenders, 1 engine/tender, 5 wildland trucks, 1 boat, 2 snowmobiles, and 1 ATV. 25 personnel include fire chief, assistant chief, 2 captains, 2 lieutenants, a safety officer, secretary/treasurer and 17 firefighters. The department has 25 first responders of which 13 are EMTs. Calls in 2012 were 40 fires and 100 EMS for a total of 140 calls. The annual budget has been \$103,660 for 2010 through 2013. MOFD trains monthly and has by-laws and SOG's.

III. Findings

A study of this nature is designed to organize and represent a snapshot in time; workplace cultures vary and change all the time. In some instances by reporting this information we are memorializing what is already known, but not being addressed. In other cases the reporting of this information can stimulate ideas and action. We include this information for the purposes of the later choice.

Operations

Laurentian North Fire Firefighters Organization (LNFF) is an organization of fire departments in northeastern Minnesota beginning in February of 1991 with 6 original fire departments. It has grown to the current 11 member departments covering an area of over 2,000 square miles. The departments respond to about 150 fire calls and 3575 other calls annually, based upon State Fire Marshall's Office data. EMS is the largest part of most member departments' calls for those which provide first responder or transport EMS services. The most widely recognized standard used in response time analysis for volunteer fire departments is outlined in National Fire Protection Association (NFPA) Chapter 1720: Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments.

National Fire Protection Association (NFPA) 1720

NFPA 1720 was updated in 2004 and addresses benchmarks to be used by volunteer organizations in the delivery of their services, including specific recommendations regarding staffing and response times.

Table 1: NFPA 1720 - Staffing and Response Time Standards

Demand Zone	Demographics	Staffing/Response Times	Percentage of Calls
Special Risks	Authority Having Jurisdiction (AHJ)	AHJ	90
Urban	>1000 people/mi	15/9	90
Suburban	500-1000 people/mi	10/10	80
Rural	<500 people/mi	6/14	80
Remote*	Travel distance \geq 8 mi.	4	90

* Upon assembling the necessary resources at the emergency scene, the fire department should have the capability to safely commence an initial attack within 2 minutes 90 percent of the time. Source: NFPA 1720, 2004 Edition.

Laurentian North is comprised of about 2000 square miles of land area and a population of 23,000. This creates a jurisdictional population density of 11.5 people per square mile. Summer population is 40,000 with density of 20 people per square mile. This population density puts LNFF in the "rural" demand zone classification and recommends an initial response of 6 personnel responding to fire calls within 14 minutes, 80% of the time. Some areas are also considered remote which NFPA 1720 recommends at least 4 firefighters 90% of the time, but has no response time requirement.

Additionally, the National Fire Protection Handbook makes staffing and initial response complement recommendations based on the number of firefighters arriving on the scene of a fire depending upon the risk of occupancy (low, medium, and high-hazard occupancy). The NFPA staffing recommendations by the type of hazard areas:

High-Hazard Occupancies (schools, hospitals, nursing homes, explosive plants, refineries, high-rise buildings, and other high-risk or large fire potential occupancies): *at least 4 pumpers, 2 ladder trucks (or combination apparatus with equivalent capabilities), 2 chief officers, and other specialized apparatus as may be needed to cope with the combustible involved; not fewer than 23 firefighters and 2 chief officers.*

Medium-Hazard Occupancies (apartments, offices, mercantile and industrial occupancies not normally requiring extensive rescue or firefighting forces): *at least 3 pumpers, 1 ladder truck (or combination apparatus with equivalent capabilities), 1 chief officer, and other specialized apparatus as may be needed or available; not fewer than 16 firefighters and 1 chief officer.*

Low-Hazard Occupancies (one-, two-, or three-family dwellings and scattered small businesses and industrial occupancies): *at least 2 pumpers, 1 ladder truck (or combination apparatus with equivalent capabilities), 1 chief officer, and other specialized apparatus are recommended to be available; not fewer than 12 firefighters and 1 chief officer.*

The recommendations and guidelines outlined in the Chapter 1720 and the *NFPA Handbook* should be considered, but are not necessarily the final word as the NFPA guidelines do not address how fire departments will also be able to comply with the OSHA-mandated “Two-in/Two-out” rule (discussed below). Also, the NFPA guidelines do not address OSHA’s requirement that a rapid intervention team (RIT) be on-scene at a working fire.

Occupational Safety and Health Administration (OSHA) Regulations

Additional mandated requirements for staffing are related to OSHA’s regulations for firefighter safety. To protect the safety of firefighters, the United States Department of Labor and OSHA have enacted 29CFR1910.134, known as the two-in/two-out rule that requires four personnel on scene at all structure fires before initial interior attack begins.

OSHA - Firefighting is a dangerous and physical labor-intensive profession. Although technologically the tools and equipment used by firefighters have changed dramatically over the years, the basic goals have remained almost unchanged: to preserve life and protect property by successfully extinguishing fires—and not get hurt in the process. To accomplish this, firefighters must be able to quickly and efficiently gain access to a fire and apply an extinguishing agent (typically water, but foam and other agents are gaining in popularity). This requires emergency responders to operate in dangerous environments where they are at high risk for serious injury or death.

To protect the health, safety, and welfare of firefighters, the federal government enacted regulations to ensure that firefighters operate safely in and around structure fires. Enacted by the Department of Labor and the Occupational Safety and Health Administration (OSHA), 29 CFR 1910.134, also known as “Two-in/Two-out,” mandates that there must be a minimum of four personnel on the scene of a

structural fire before personnel can initiate interior operations. Two firefighters must remain on the exterior of the structure, properly equipped with full turnout gear and self-contained breathing apparatus (SCBA) to act as a Rapid Intervention Team (RIT) in the event the firefighters operating inside the structure become incapacitated or trapped. Although OSHA allows one RIT member to have an additional role such as incident commander or safety officer, as long as rescue activities can be performed without jeopardizing the safety of other firefighters, a pump operator cannot make up part of the RIT unless the apparatus utilizes a positive water source, which allows the pump to be unstaffed for a period.

LNFF departments should be sure their response standards address all OSHA requirements.

Insurance Services Office (ISO)

Insurance Services Office (ISO) community fire protection ratings have been a benchmark for jurisdictions for decades. The system measures the effectiveness and efficiency of three key parts of community fire protection; fire department, water distribution, and alarm notification system. However there are two key limitations of this benchmark. First is that the evaluation is only used by some insurance companies, with several large insurers doing their own risk assessment by individual occupancy. Second is the fact that residential insurance rates for participating insurers are banded for class #2 through class #8 communities. This means that the premium for insurance to homeowners is the same for these communities. The only occupancy type which has separate rates for each class number (#) is commercial occupancies where the needed fire flow is below 3500 gpm for suppression. The bottom line is that ISO ratings are a good benchmark for suppression activities of a community but do not evaluate the key areas of prevention, code enforcement, and planning and zoning which are the proactive functions of community fire defense planning.

LNFF should work on SOG procedures to receive maximum credit for ISO ratings especially for non-hydranted areas of the jurisdictions.

Standard Operating Guidelines (SOG)

Each department in LNFF indicates that they have SOG's for operations. The question is how these individual procedures work with other department's SOG's since incompatibility can be dangerous on the emergency scene. This issue should be a key area of investigation in the near future as well as creating a single master SOG for all departments to use during joint response.

The Departments have the personnel resources to meet NFPA #1720 and response capabilities for all hazard occupancies. All hazard occupancies would require additional outside equipment resources on the initial assignment.

The Departments will need to create box alarm assignments to address this need.

LNFF will need a full set of response policies (box alarms) which provide 1st through 7th alarm assignments for all fires and related emergencies. The SOG's should include mutual aid departments to provide adequate equipment and personnel to handle any anticipated incident. These SOG's should be

in alignment with the NFPA standards cited above. An example of a complete box alarm or response policy for a Minnesota department is included in Appendix A of this report to assist.

Training

Most LNFF departments train once each month and have additional training whenever possible. Each department establishes its own schedule and the topics to be covered in these training sessions. Some shared training occurs between member departments when a training session is of interest to multiple departments (who respond together routinely).

Expanding joint training and establishing a master training calendar for member departments would help to enhance training and standardize joint operations procedures.

Organization and Management

LNFF is a very unique organization created almost a quarter century ago to help individual jurisdictions in the northeastern area of St. Louis County, Minnesota by providing water resources during emergency incidents. Today this assistance has expanded to become the overall organization for area fire departments, sharing resources and services in the area. LNFF is a nonprofit organization as set out in federal standards under 501(c) 4 provisions.

Individual fire departments in the area remain autonomous but have realized the advantages to solving problems which cross jurisdictional boundaries or which present risks which exceed individual resources. To that end, LNFF is now being used to tackle issues of staffing, training, communications, and equipment, to name a few.

LNFF is structured in a traditional way with a president, vice president, etc. LNFF meets regularly to discuss issues of mutual concern and to allow members to network as needed.

Finance

LNFF operated without dues from 1991 to 1995. In 1996 dues were created at \$100 and raised in 1997 to \$300, with the highest due of \$600. Currently dues are \$400 to cover basic operational needs of the organization. The organization is now evaluating the possibility of expanding to help individual departments with major purchases and seeking grants to improve service delivery.

Individual department budgets range from \$10,000 to \$3,00,000 annually and Capital Improvement Plan (CIP) programs go from nonexistent to an annually adjusted project.

Assisting members in budget work will likely also become a goal of LNFF in the future.

Apparatus and Facilities

Apparatus

Individual member department's equipment ranges from 1 engine, 1 water tender, and 1 wildland truck to 15 pieces of fire and EMS apparatus. There are 87 pieces of apparatus and major equipment listed in department information. Condition of this apparatus and equipment is from adequate to excellent with most being in good to excellent condition, even if over 25 years old. Maintenance is mostly done by staff with outside companies used for pump testing, aerial testing, ladder testing, and hose testing in some member departments.

Capital apparatus issues could be identified and addressed using APWA and NFPA guidelines to develop the projected Capital Improvement Plan (CIP) timing for each member department.

Replacement Scoring System

Many U.S. fire departments use a scoring system developed by the American Public Works Association (APWA) Fleet Service Committee for assessing fire apparatus for replacement, or a scoring system similar to it. The scoring system entails considering a combination of variables that include age, mileage, maintenance costs, and operating conditions. A replacement score is calculated for each vehicle based on the sum of its scores for age, usage, and condition. The data for these calculations are usually obtained from computerized vehicle maintenance records and work orders, but can also be obtained otherwise.

The age of the vehicle is scored by assigning one point for each month from the date on which it was purchased. The usage score assigns one point for each 1,000 miles traveled or 3.5 points for each 100 hours of use, whichever is higher. The condition of the vehicle is scored on a scale of zero to four (with zero being the best and four the worst) for each of five aspects: body, interior, functionality, maintenance/repair cost, and mission. These values are summed with the points assigned for age and mileage to obtain the overall vehicle score. If the overall score exceeds the point limit established for the respective vehicle category, the vehicle is recommended for replacement.

Table 4-1: Maximum Vehicle Points Before Disposal/Replacement is Recommended :

(APWA System)

Vehicle Category	Maximum Vehicle Points
Sedans, station wagons, and jeeps	162
Light-duty trucks	196

Medium- to heavy-duty trucks (including ambulances)	220
Fire apparatus	225

American Public Works Association (2003). *Fleet Service Committee*.

<http://www.apwa.net>

The critical component in any service-life-assessment system is the absolute requirement that a vehicle must be able to safely and reliably perform in a manner consistent with the vehicle’s design purpose, regardless of mileage or hours of use. Elected officials and organizational leaders must remember that fire service vehicles are subject to much more demanding operational conditions than other vehicles in a jurisdiction’s fleet. Rapid acceleration and deceleration, hard turns, quick stops, and other extreme demands are placed on fire apparatus on a regular basis. Additionally, fire apparatus are almost always fully-loaded with equipment. The water carried on a pumper can easily weigh several tons (over 12 tons in the case of a pumper-tanker), and aerial ladders may weigh more than 40 tons. Public works type trucks are not always at their maximum load, which reduces wear and tear on suspension, brake, and driveline systems.

Facilities

There are 14 stations including land and water based facilities. These stations range in condition from new, up to date buildings to century old facilities which were originally built for horse drawn apparatus. Station condition also ranges from up to date and code compliant to undersized, structurally unsound, and non-code compliant.

The location of these stations was based upon needs at the time the structures were constructed, but may not be optimum for today’s needs. This includes facilities which are within 2 to 3 miles of another jurisdiction’s station, and areas where population growth or recreational activities have caused increased risks.

Studying these risks and current response capabilities should be part of the strategic planning process presented later in this study.

Fire Prevention

Fire prevention in LNFF departments is very basic with most departments limiting efforts to tours and demonstrations during fire prevention week annually. Inspections, code enforcement, and investigation are simply not part of individual department missions due to lack of personnel and funding for these critical support services.

Area Risks

Risks in the area are both natural and man-made. Natural risks include wildlands and lakes as well as seasonal issues such as snow, flooding, spring and fall seasonal issues, and severe storms. Man-made risks are the Fortune Bay Casino, two iron ore mines, CN rail line to Canada, numerous resorts and campgrounds, and large gatherings of people at various events. Of these risks the Fortune Bay Casino is the biggest single issue for fire services.

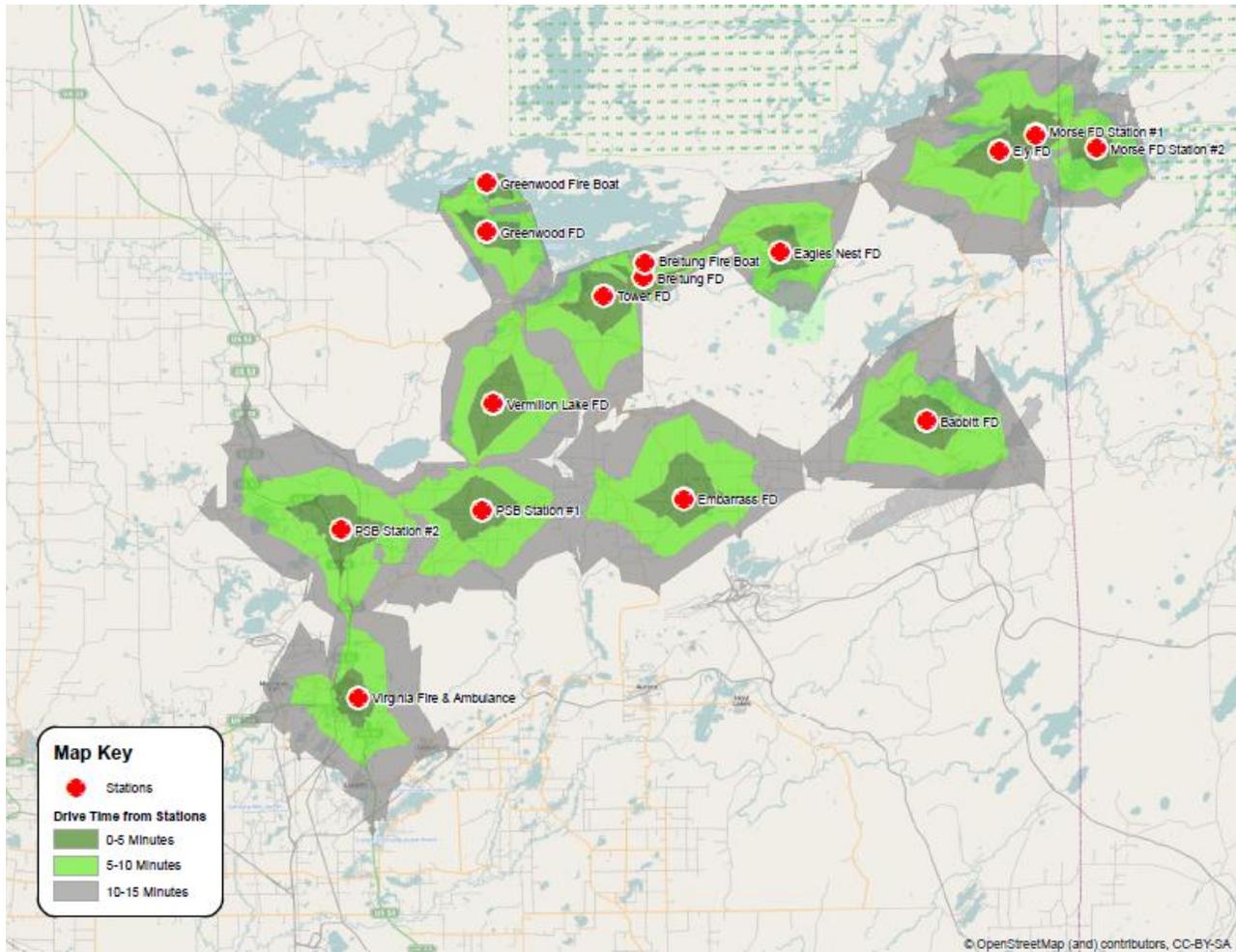
Fortune Bay Casino is occupied daily by many patrons who do not know the facility and may require rescue in event of an emergency. Additionally, being a type V construction, should a fire overrun the in-house suppression system, it is likely the area fire departments do not have sufficient personnel and/or equipment to prevent the loss of the structure. Some main factors contributing to the concerns regarding the Casino for the member departments are:

- Limited water supply in water tower, lasting approximately 20 minutes.
- Being a Sovereign Nation, there are no requirements for fire code standards.
- Half of the hotel rooms are not fire suppressed with sprinklers.
- A water sprinkler system is located in the 3rd Floor electrical room.
- The building is not accessible to fire equipment on all sides.
- Security restricts firefighter access to secured areas. Fire panel has been moved to the security room on the top level.

An additional risk for the area is simply the remoteness of structures due to the makeup of the land. Dense forests and woodland lakes make it difficult to conduct fire and rescue services.

Current Coverage

LNFF departments cover a large response area. In the following map, response is broken down into 5minute, 10minute, and 15 minute polygons. Each polygon shows the drive time from the individual stations and the overall coverage for the area.



Comparing risks to current coverage indicates not only where there is good coverage but also indicates areas where there is a gap or long response time issue for fire protection.

Using this map, master planning for regional protection can be developed by LNFF member departments and a more holistic fire protection plan developed.

V. Future Options

The key focus of this study is to develop a plan to include ways LNFF members can work together to provide additional, improved, and expanded services to the citizens they serve. To discuss these future options this chapter is separated into operations, training, Capital Improvement Plan (CIP), prevention, information management, joint purchasing, apparatus and equipment maintenance areas, and facilities sections.

Operations

Fire – The future fire service delivery for LNFF departments will likely revolve around using shared and joint responses. Each department is limited by apparatus, staff or by both. Such a need to use outside resources is now the norm for most jurisdictions in the country. To proactively plan for the eventual use of mutual aid and designating specific outside resources for these target hazards is routinely used by many fire departments across the country. Mutual -aid Auto Box Alarm System (MABAS) has become a state standard in Illinois, Wisconsin, and Michigan and is currently being considered in Iowa and Minnesota for a state-wide system. LNFF needs to create a predetermined response system for these medium and high hazards and preplan with other responders to ensure an effective and efficient response to these scenarios.

A copy of a MABAS system is included in Appendix A of this report for reference and to be used as a model for LNFF.

EMS – EMS is provided by several of the LNFF member departments and by several third party companies or stand-alone municipal departments. EMS service delivery is a varied system nationally, with governmental and private companies delivering this critical service. The real bottom line is getting high quality EMS to the victim in the shortest amount of time. Several LNFF departments run BLS/EMS and several run first responder service. This current system is doing a good job of service delivery but it should be a goal of LNFF to seek ways to continue to enhance EMS to the area.

Training

Based upon numerous after action analysis performed by OSHA, NFPA, and Federal Emergency Management Agency (FEMA), it is a well-established fact that fire departments which train consistently will perform well on the emergency scene and departments which train less frequently or not at all will be ineffective and inefficient during emergency operations.

Most LNFF departments train on a monthly basis and cover both mandated and elective topical areas. The schedule for each department's training is set by the FD and members are responsible to get the necessary training when available.

Developing a training group to coordinate the individual department's schedules into a single interrelated system would help personnel get needed training and probably help firefighter retention.

Fire Prevention

Fire prevention is primarily only a fire prevention week activity for member departments, because prevention demands a lot of time and personnel to be a full service operation, including fire safety education, fire inspections, fire code enforcement, and fire investigation. With some substantial risks such as the Fortune Bay Casino, and numerous resorts and campgrounds, LNFF members need to put more emphasis on a proactive fire prevention program. This could include using some type of auxiliary staff trained to deliver individual programs.

Information Management

In today's world of electronic communications and data access, it is a high priority for fire/rescue departments to have up to date information management systems. LNFF could benefit from establishing a system to move email between jurisdictions as well as being able to send information to members using a LNFF server. Future planning could also explore members having a singular incident reporting system so response data can be tracked individually as well as organization wide.

Joint Purchasing

Each department is currently purchasing equipment and supplies individually. From station supplies to apparatus, there are savings to reap by working collectively to buy these products in larger quantities. An especially significant savings could likely be found in the large ticket items such as gear, Self-Contained Breathing Apparatus (SCBA), and other needed apparatus and safety items.

Developing a Capital Improvement Plan (CIP) for apparatus would help get the best bang for the buck. This would include individual member departments building their equipment replacement plan and LNFF members working together to develop a multi-year plan for the entire group. This process could also be used for gear, SCBAs, hose, and many other substantial needs.

Apparatus and Equipment Maintenance

This is also an area where working together will reap savings for all. LNFF could develop contracts for annual pumper testing, SCBA testing, and health screening, to name a few. This could also be used to have a company on retainer for emergency repair and regular maintenance issues such as tune ups, oil changes, and vehicle records maintenance.

Facilities

Area fire stations range from new facilities with 21st century features to nearly 100 year old fire barns converted to handle today's large, very heavy apparatus. Most lack space for training, offices, and crew quarters. While building a fire station is an individual jurisdictional decision, there are the possibilities to look at combining two departments into a joint operation strategically located to protect both jurisdictions. Though this is a dramatic shift in the organizational paradigm, it can also allow combining financial resources to get a needed facility when it would be impossible to do alone.

Regional planning for fire/rescue service delivery should evolve from joint work groups. This is a natural progression of joint planning of operational, training, CIP, information management, joint purchasing, apparatus and equipment maintenance areas, and facilities issues by member departments.

Regional fire/rescue service delivery can take many forms. From mutual and automatic aid, where multiple jurisdictions respond together to safely mitigate an emergency incident, to forming a single fire protection district to deliver all area fire/rescue services, this long range planning for a fire protection district or some other overall fire/rescue organization will take several years to complete and require participation, planning and buy in by departments, jurisdictions, and personnel.

V. Recommendations

The final section identifies general recommendations and considerations for future service delivery and organizational efficiency based on the interviews, data analysis, and professional observations. The recommendations are presented below.

1. Operations

The first need of all LNFF member departments is to get enough resources to an incident to safely mitigate the situation. Each department will likely need neighboring departments responding to major calls, such as a confirmed structural fire or mass casualty incident. To do this there is a need to develop a joint response protocol better known as a Mutual Aid Automatic Box Alarm System (MAABAS). The process for developing this system starts with obtaining a full listing of each department's equipment, personnel (including certifications), and map showing proximity to each other.

Equipment listings need to include each piece of apparatus's pump size, carried water, carried hose, ladder complement, and specialized equipment.

Personnel listing should include number of authorized personnel, each member's position title, training certifications, and special skills such as equipment operator, fire investigator, haz-mat technician, EMT/PM, etc.

Area maps should show the location of each station: a single map with all stations plotted on the map and response polygons for 5-10-15 minute travel distances.

Using this data the LNFF can develop 1st; 2nd; 3rd alarm assignments for each response type, such as structural fire, wildland, water emergency, and mass casualty incident for each department. This then becomes the MAABAS with individual sections or pages for each jurisdiction. A copy of this full document should also reside at the 911 dispatch center.

2. Training

Data indicates that each LNFF department is currently training at least once per month. This is usually the frequency seen in most volunteer departments. The schedule will provide enough time in training to cover required topical areas and some time for classes of interest to the individual departments. However, if a required session is missed, volunteers can find themselves missing recertification for topics like CPR, right to know, and several other key requirements.

To avert this potential problem, which can cause departments to lose valuable members; it would be a wise process to develop a LNFF master training schedule of all departments and their monthly training. Using this document, personnel who need a specific class could then go to another department to get the class. This would allow everyone access to needed training more than once per year and also promote interaction between departments and staff outside of emergency incidents.

The training could also be expanded to include a training seminar once or twice per year for all departments at a centralized location. These seminars would focus on key topics of interest to all, as well as a time and place to get key speakers to address new ideas and processes in fire/rescue service.

3. Fire Prevention

LNFF departments currently provide fire prevention at the level found in most volunteer departments nationally. However, with shared resources, the fire prevention program could become a model for the area and the State of Minnesota. LNFF could take on fire prevention as a service provided area wide. Using interested members from departments and volunteers from volunteer corps and other programs in the area build a team to deliver an all hazards safety program for citizens from 1 to 100.

Another area of concern is fire inspections and fire investigation. Fire inspections not only make businesses safer from fire, they help educate business owners and staff on issues which can cause a fire.. Fire investigation is also a key to spotting reoccurring fire origins and working to deliver safety education to prevent more similar cases in the future. This area wide inspection and investigation program could also be coordinated with State Fire Marshal's (SFM) office for consistency with SFM goals and objectives.

4. Information Management

In today's world of electronic data and communications it is essential that fire departments be able to gather, store, and interpret their call information as part of their records management system. This process starts with using a software package which is user friendly and can interact with other department's programs to gather not only individual but area information. LNFF members would benefit with a single package shared by all to allow everyone to get and keep the same information as well as to individually be able to track departmental data. A single program with multiple licenses is usually cheaper than multiple programs.

Subsequently a large part of the information is call data. It would also be wise to work with county dispatch to see that the program will interact with the E911 program to allow such incident issues as run numbers, incident times, and unit tracking to be automatically populated into the individual departmental records.

5. Apparatus/Equipment Maintenance and Joint Purchasing

Support services functions are currently being completed on an individual member departmental level and seem to be quite effective and efficient for the most part. However, there is also the case to be made that getting bids for annual pump certification tests for one pumper is not as cost effective as getting a bid for annual pump testing for 25 pumpers. This is also true for SCBA testing, hose and ladder testing, and apparatus routine maintenance, to name a few.

Joint purchasing is area to be explored by LNFF members because there are 19 pumper, 13 tankers, and 19 wildland rigs in the organizational departments' rosters. This means that two to three apparatus are

replaced annually if all types of apparatus are included. Savings for buying more than one unit tend to be at least 10% or more. Also, turnout gear has a life of about 10 years and with a total membership of over 200 firefighters this means there are an average of 20 sets of gear replaced annually. The list continues with hose, nozzles, hand tools, etc. All these items can be purchased cheaper in larger quantity. LNFF members could develop specs for many items and bid them out annually for substantial cost savings. A master CIP would help keep all apparatus and equipment within industry standards and get the best value for all member departments and jurisdictions.

6. Facilities

Fire stations are by far the most expensive asset of any fire department. While LNFF covers over 2000 square miles from 17 stations, not all stations are in the most effective location and some are within 2 to 3 miles of another station. Optimum station location is a very complex issue for any jurisdiction and when 11 jurisdictions look at the big picture for station location, what is best for a single jurisdiction may not be optimum for the area. Current and future station locations should be reviewed based upon response polygons and call volume to see what may be best in the future.

7. Recruitment and Retention

Recruitment – Recruiting citizens to become volunteer fire/rescue responders can be a daunting task if not approached in a systematic manner. This systematic approach begins with identifying the most likely demographic groups where potential volunteers may be included. Groups that are becoming more prominent in communities include: stay at home moms, college students, and empty nesters. These three groups of potential candidates are generally found in most communities. Motivating citizens from these three groups to join the local fire department is a challenge involving planning by department members, local leadership, and volunteer leaders, but the future viability of a volunteer force is at stake and should be the focus of future recruitment efforts. This will mean looking for future members in citizen groups either under-represented or not represented in the current department roster.

Retention – While people join volunteer fire-rescue departments for many reasons, retention issues boil down to two distinct reasons: problems that arise in one's life and factors relating to the individual fire department or the fire service itself. To retain new and current members, volunteer departments must display four essential characteristics that address these two root problems with volunteer retention:

- The program must meet the individual's needs.
- The program must provide its membership with reward and recognition.
- The program must provide adequate supervision and leadership.
- The program must challenge its members.

Any recruitment or retention programs that are to be considered must take into account the four aforementioned characteristics that must be present in a quality fire-rescue program.

There are numerous professional organizations that have developed model programs that can be used in this recruitment and retention effort. There is no reason to “reinvent the wheel” if tried and proven programs exist to assist volunteer fire-rescue organizations with these matters. The National Volunteer Fire Council at www.nvfc.org and the Fireman’s Association of the State of New York (FASNY) at www.fasny.com both have quality programs and provide assistance that can help this program get started.

Assistance can also be obtained through the Federal Emergency Management Association (FEMA) and the United States Fire Administration (USFA) at www.fema.gov and www.usfa.fema.gov respectively. Both of these organizations have published numerous free reports on recruitment and retention among the volunteer fire service. One such resource publication, *Recruitment and Retention in the Volunteer Fire Service: Problems and Solutions Final Report December 1998* outlines numerous programs and resources that have been tried and have proven successful throughout the nation. There is also a similar report titled: *Emergency Medical Services (EMS) Recruitment and Retention Manual* written in 1995 for FEMA and the USFA that deals with these specific problems in the EMS community. Although now dated, there is still valuable information in the material.

Volunteer Incentives and Recognition – Incentive and recognition programs are very important for fire and rescue volunteers. Given the enormous time demands, training demands, and personal risks, it is easy for volunteers to burn out and quit after only a few years of service. Incentives and recognition programs are essential components to maintaining a strong cadre of experienced volunteers and to prevent a revolving door situation. Many local governments across the nation have strengthened their incentive programs for volunteer firefighters. The cost of incentives is small and economically justifiable if they help recruit and retain volunteers and forestall hiring more career employees. Volunteers in the fire and rescue service today are the first line defenders for any type of emergency or disaster.

VI. Strategic Plan

A strategic plan is a step by step plan to improve delivery of fire-rescue services within the Laurentian North area. This plan will be set out on a timeline and include the six topical areas listed in the recommendations section of this report. LNFF should be the central entity to coordinate this plan and keep the multiple programs and work groups on point.

2013

Operations

Preparing a MAABAS document for safe and effective emergency operations should be the first goal of this organization. This would be best accomplished by a work group with a representative from each member department working to gather the information as listed in this report. From this information they should build the individual MAABAS cards for each jurisdiction as well as incorporating the master document for dispatch use.

2013

Training

Again, the process should start with establishing a work group to pull together the individual department's training schedules and building a master calendar of training. This group should also work to be sure the training for required classes are similar in all departments and that all departments will allow outside members to attend training at another.

2013

Fire Prevention

LNFF departments are currently focused on school fire safety programs and tours during fire prevention week. While this is a noble approach to fire prevention the most likely age groups to have a fire are being missed, the elderly and the very young. It would be wise to build a fire prevention team from across member departments and outside civic groups to begin providing a full service public fire safety education program. A team of fire service members should head up the planning and implementation of the all hazards fire prevention program.

2013

Information Management

Currently information management is across the board in member departments ranging from very well laid out to doing only what has to be done. This is mostly due to time and personnel available at each department but prevents consistent data collection and analysis. Also, on a larger scale is the need to work with county 911 services to have a single records management program which will populate incident reports with information from the Computer Assisted Dispatch (CAD) system. These are both significant projects which will need a strong dedicated work group to identify software needed and work with St Louis County Sheriff's Office (SLCSO) leadership to build relationship bridges and move toward a goal of a single records management system for LNFF members with licenses for each member department.

2013

Apparatus/Equipment Maintenance and Joint Purchasing

Again, these support service areas will become the task of a working group who can use the APWA guidelines and onsite observation to assess apparatus condition. From this assessment each department can be given a listing of their apparatus condition and a proposed replacement plan. Working with this matrix the departments can plan together and develop a master Capital Improvement Plan for replacement using quantity as a cost saving tool.

Equipment such as turnouts, SCBA's, and hose can also be cataloged and a replacement plan (CIP) developed using joint purchasing to lower individual costs. Finally, bids can be sought by LNFF to allow member departments to get maintenance issues such as pump testing at reduced rates since the vendor can do multiple agencies in a single trip.

2014

Operations

Implementation of the MAABAS program should be a goal of LNFF in 2014. This will mean stakeholder buy in and training as well as education of local governing bodies as to the improved safety for firefighters and citizens using these procedures. Dispatch familiarization with the process could also be a goal of the group since this will help everyone work from the same plan.

2014

Training

Once the master training schedule is developed and cross jurisdictional training is used for keeping personnel current in professional requirements, it would be a good plan to work toward developing a rotational training process where member departments plan for key topics to be presented at 3 or 4 locations in the area. It would also be time to start developing a cadre of qualified instructor for these key topics.

2014

Fire Prevention

Getting the all hazards fire prevention message out to all member jurisdictions would be the next goal of the team. This will mean not only onsite programs but working with local agencies and the media to reach as many citizens as possible.

2014

Information Management

Getting a single information management system on line for LNFF should be the goal for 2014. The final product should be able to handle departmental data collection and reporting as well as incident reporting. The product should be a LNFF purchase with individual licenses for each member department. The product should also be vetted through County 911.

2014

Apparatus/Equipment Maintenance and Joint Purchasing

Implementing joint purchasing and maintenance options for member departments should be the goal for this program in 2014. Also looking at developing standard

specifications for various apparatus to allow multi-jurisdictional purchasing should be a goal for this working group.

2015 and Beyond **Master Planning**

There is also a need to develop a long range plan for fire/rescue services in LNFF. This is clearly a priority. Using the Fire Chiefs, key staff, and identified stakeholders LNFF should set a plan for the next 2, 5, and 10 years. The long range plan (master plan) must have sufficient detail to build the structure, operations, and financial foundations for the future financial and operational needs of these essential services.

All stakeholders must be identified and included in this process and all input should be well-structured to avoid allegations of favoritism or exclusion.

Figure 1: LNFF Strategic Planning Process



Step 1 – Identify the future mission and vision for fire/rescue services. This is the who, what, when, where, why, and how of the process. It is imperative that this process be consensual between the fire/rescue departments. The recommendations from the body of this report should be used as the framework to build this mission and vision statement.

Step 2 – Analyze and prioritize the recommendations that are identified from this assessment of LNFF and the associated agencies to develop direction for the plan. The recommendations should be triaged and each recommendation evaluated using the scoring process provided to establish the basis for the level of urgency.

Step 3 – From the prioritized recommendations, establish broad brush goals to achieve your desired outcomes. These goals will be general statements of the outcomes needed to achieve and maintain the mission and vision of the fire/rescue services for the townships.

Step 4 – Set objectives and activities under each goal area to achieve the desired results. This should include specific steps and timelines for these steps, as well as overall timelines for the objectives.

Step 5 – Feedback and re-evaluation of the plan is essential to the overall success of the process. This must be done routinely during the entire implementation cycle of the plan and at least annually thereafter.

Prioritizing Recommendations

There are 7 recommendations listed in this report. Not all of the recommendations are equal in importance. To assist with the assessment process, we developed a method to evaluate each recommendation using the following criteria:

What is the overall value of the recommendation to the stakeholders? Does it improve the level of fire/rescue service provided to the area?

What is the overall value of the recommendation to LNFF as an organization? Does it contribute to firefighter safety and welfare?

What is the overall level of difficulty to implement the recommendation? Can the recommendation be implemented quickly or does it require a long or difficult planning process?

What is the overall cost to implement the recommendation? Is the cost a one-time expenditure or does it require repeated funding?

Criteria Defined – A general definition for each criterion follows:

Value of Recommendation to the Stakeholders: Recommendations with very high value to the stakeholders would be those with the potential to significantly improve service delivery such as adding a new service or improving an existing one. An example may be a recommendation that has the potential to significantly reduce loss or response time. A value judgment score of five means the recommendation has very high potential to improve community safety and emergency service delivery. Conversely, a judgment value of 0 means the recommendation will have no impact on community safety.

Value of Recommendation to the Fire/Rescue Services: Recommendations with a very high value to the fire/rescue services are those that improve daily operations, improve efficiency and effectiveness, or change the organizational culture and management in a positive way. These can also be recommendations that are perceived by firefighters as improving their quality of work life or that improve their safety and health. A value judgment score of five means the recommendation has the highest potential to improve the organization; a score of zero means the recommendation will have no impact on the Department.

Level of Difficulty to Implement: Recommendations with a high level of difficulty to implement are those that have long planning cycles, require significant changes to infrastructure, changes to codes or labor agreements, or require major policy changes. Recommendations with a judgment value score of zero means the recommendation has an extreme level of difficulty to implement; a score of five means there is no difficulty.

Cost of Implementation: Recommendations with high implementation costs are those requiring significant capital outlays like new fire stations, land purchases, or large recurring general fund costs such as additional personnel. A recommendation that requires only a minor change in policy, for example, would likely have a low cost of implementation. Recommendations with a judgment value score of five means that it has no implementation cost; a score of zero means that it has an extremely high cost to implement.

Scoring – For each recommendation a value judgment was made using the four evaluation criteria above and a numerical score was assigned. The score ranges are shown in **Table 2**.

Table 2: Criteria Scoring Range

Criteria	Low Score (Poorest)	High Score (Best)
Value to the Community	No Value = 0	Extreme Value = 5
Value to the Organization	No Value = 0	Extreme Value = 5
Level of Difficulty to Implement	Extreme Difficulty = 0	No Difficulty = 5
Cost of Implementation	Extreme Cost = 0	No Cost = 5

For example, a recommendation with the highest possible value to emergency services and to the communities would have a combined score of 10 for benchmarks 1 and 2. If the same recommendation had the lowest “level of difficulty to implement”, and it also had little (or no) cost to implement, its total score would be 20 points. Such a recommendation would be considered to be a high priority because it could be implemented easily and economically; it would also be of significant value to the community and to the fire department. The composite score values can be interpreted as follows:

Lowest Priority	0 to 4
Low Priority	5 to 8
Moderate Priority	9 to 12
High Priority	13 to 16
Highest Priority	17 to 20

VII. Conclusion

The study RFP asked for consideration of the following key points:

1. What can the above entities do better or differently to provide effective emergency services to their citizens?
2. What do they share or provide regionally to benefit everyone?
3. The possibilities of creating administrative positions that might be beneficial, such as a mechanic certified in pump testing and a training coordinator.
4. The feasibility of implementing agreements for automatic mutual aid based on call types.
5. The possibilities of joint power agreements or fire districts.
6. A set of Standard Operating Guidelines (SOG) that could be shared and tweaked for any department's specific needs.

This study has provided several recommendations, several detailed analyzes, and comparison of LNFF fire/rescue services to national benchmarks. The study is in essence a cookbook of fire/rescue service recipes. The recipes you choose to use and the exact ingredients you add are in fact up to LNFF members. Whether you choose to make dessert before the main course is a decision for your leadership, hopefully with stakeholder input.

Whichever options are chosen, one thing is certain: the process will have its share of supporters and non-supporters who will have a great effect on the outcome of the decisions. The leaders must always keep the mission of all fire/rescue services at the sharp point of this endeavor. That mission is simply to save lives and protect property, and to do what is right for Mrs. Smith.

Appendix A – Mutual Aid Automatic Box Alarm System Example

All Structure Fires - Box Alarm Assignment Grid						
Response Area		Station 1	Station 2	Station 3 (Planned)	No Hydrants	
Map		North of Lyman & East of Galpin	West of Galpin	Lyman & South	Various, mostly south of Pioneer Trail**	
Initial Alarm	All Call*	Chanhassen	Chanhassen	Chanhassen	Chanhassen	
	Utilities	Excel/Centerpoint/MN Valley Coop				
	EMS***	Ridgeview	Ridgeview	Ridgeview	N/A	
	*Confirmed Structure Fire - Request Carver County Fireground Tactical Channel & 3rd Page for Manpower					
Stand By Engine Company @ CFD #1		Eden Prairie	Eden Prairie	Eden Prairie	N/A	
1st Alarm	Engine	Excelsior	Excelsior	Chaska**	Tender 1	Victoria
	Engine	Minnetonka	Minnetonka	Shapkopee**	Tender 2	Carver
	Ladder	Eden Prairie	Eden Prairie	Eden Prairie	Tender 3	Colgne
	Patching	Request Dispatch to set up patch for MA Depts that do not have Carver County Fireground Tactical Channels				
	Air Truck	Minnetonka	Minnetonka	Minnetonka	Tender 4	Waconia
2nd Alarm	Engine	Chaska	Chaska	Excelsior	Tender 5	Prior Lake
	Engine	Victoria	Victoria	Victoria	Tender 6	Chaska
	Ladder	Minnetonka	Minnetonka	Minnetonka	Tender 7	Shapkopee
	Mutual Aid Chiefs	Hopkins/Edina	Hopkins/Edina	Hopkins/Edina	Tender 8	St Boni
	LSU Rehab	Excelsior/SW Metro Bus	Excelsior/SW Metro Bus	Excelsior/SW Metro Bus	Tender 9	Mound
3rd Alarm	Engine	Edina	Edina	Edina	N/A	
	Engine	Hopkins	Hopkins	Hopkins		
	Ladder	Chaska	Chaska	Chaska		
	Mutual Aid Chiefs	Bloomington/SLP	Bloomington/SLP	Bloomington/SLP		
	Command Van	SLP	SLP	SLP		
	Air Truck	Bloomington	Bloomington	Bloomington		
4th Alarm	Engine	Carver	Carver	Carver	N/A	
	Engine	Bloomington	Bloomington	Bloomington		
	Ladder	Shapkopee	Shapkopee	Shapkopee		
	LSU Rehab	Eden Prairie/Gold. Val.	Eden Prairie/Gold. Val.	Eden Prairie/Gold. Val.		
5th Alarm	Engine	Victoria	Victoria	Victoria	N/A	
	Engine	Wayzata	Wayzata	Colgne		
	Engine	SLP	SLP	SLP		
	Engine	Waconia	Waconia	Waconia		
	Engine	Mound	Mound	Mound		
6th Alarm	Engine	Plymouth	Plymouth	Plymouth	N/A	
	Engine	Colgne	Colgne	Wayzata		
	Engine	Richfield	Richfield	Jordan		
	Engine	St Boni	St Boni	Savage		
	Engine	Long Lake	Long Lake	Prior Lake		
*IC initiates all call via 3rd page once structure fire is confirmed.						
** For areas with no hydrants, the normal box assignments apply. Request "Pumper/Tankers from Chaska/Shakopee in lieu of engines on the 1st Alarm.						
**Tenders (Tankers) are requested as needed in order.						
Stand by coverage beyond the call should be filled with the initial alarm once confirmed.						
***EMS resource to be dedicated to responder health & Safety.						

Appendix B – Fire Service Terms Definitions

Engine or pumper – A fire apparatus which has a pump; onboard water tank; hose; ladders and is used as the primary response vehicle for structural fires.

Ladder or aerial – A fire apparatus with a hydraulically operated ladder from 50 to over 100 feet long used for rescue and elevated water application. May or may not have a pump or onboard hose. But will have an extensive complement of ground ladders.

Tender or tanker – A fire apparatus whose primary purpose is to transport large amounts of water to the fire scene to supply other apparatus engaged in suppression. May or may not have a pump. Usually does not carry large amounts of hose or ground ladders.

Rescue – A fire apparatus whose primary role is rescue and extrication at emergency incidents. Likely carries rescue tools; cribbing; air bags; specialized saws; and has an onboard generator for power supply and on scene lighting.

Pumper/Tanker – A combination apparatus which has pumper and tanker capabilities in a single vehicle.

Rescue/Pumper – a combination apparatus which has pumper and rescue capabilities in a single vehicle.

Quint – A combination apparatus which pumper and ladder capabilities in a single vehicle.

ATV – A tracked or multi-wheeled vehicle used in fire service to fight fire in very remote areas and to perform rescue in such areas.

SCBA – self-contained breathing apparatus used for respiratory protection of fire fighters in hazardous atmospheres.

Turnouts – The protective uniform worn by fire fighters to allow entry into hazardous environments.

NFPA – National Fire Protection Association provides standards for fire services in all areas of service delivery and fire prevention.

ISO – Insurance Services Office is a not for profit entity which produces fire risk information to insurance companies and communities.

Mutual Aid – A system where neighboring jurisdictions agree to help each other during emergency incidents with personnel and equipment.

Automatic Aid – A system where neighboring jurisdictions agree to respond together to specific incidents where the local department does not have sufficient resources to safely mitigate the incident.

CIP – A plan where capital needs are projected over multiple years and balanced to prevent very large capital costs to citizens for a single year and no or very little costs for several years (peak and valleys).

Appendix C – Engine and Tender Types

Engine and Water Tender Resource Types Minimum Requirements

Engine Types

Components	STRUCTURE ENGINES		WILDLAND ENGINES				
	1	2	3	4	5	6	7
Pump Rating							
minimum flow (gpm)	1000+	250+	150	50	50	30	10
at rated pressure (psi)	150	150	250	100	100	100	100
Tank Capacity Range (gal)	400+	400+	500+	750+	400-750	150-400	50-200
Hose (feet)							
2.1/2 inch	1200	1000	-	-	-	-	-
1.1/2 inch	400	500	500	300	300	300	-
1 inch	-	-	500	300	300	300	200
Ladders	48'	48'	-	-	-	-	-
Master Stream (GPM)	500	-	-	-	-	-	-
Personnel (minimum)	4	3	2	2	2	2	2

Common additional needs. Request as needed.

- All wheel drive
- Pump & Roll
- High pressure pump (minimum 40 gpm @ 250 psi)
- Class A Foam Proportioner
- Compressed air foam system (CAFS) with minimum 40 cfm compressor.
- Additional personnel

Water Tender Types

Components	Water Tender Types		
	1	2	3
Tank Capacity (gallons)	5000+	2500+	1000+
Pump Capacity (GPM)*	300+	200+	200+
Off Load Capacity (GPM)	300+	200+	200+
Max. Refill Time (minutes)	30	20	15

* Portable pump acceptable.