

4.3.16 Fire (Urban/Structural Fire)

4.3.16.1 Location and Extent

Structural fires within the Lehigh Valley have had a detrimental impact on life, property, and the local economy over the past decade. The age of many residential structures within the region combined with changes in building construction and materials has created a threat of fire loss that is occurring on a regular basis. In addition, the advancement of the regional economy has brought in businesses and industry that use the Lehigh Valley for their industrial manufacturing. These business and industrial locations, due to their operations, are prone to a variety of types of fire.

As defined by the National Fire Protection Agency (NFPA), in the *NFPA 901: Standard Classifications for Incident Reporting and Fire Protection Data*, a structure fire is defined as “Any fire inside, on, under, or touching a structure.” This definition includes any mobile living structure such as a mobile or modular residence, but does not include roadworthy vehicles such as recreation vehicles (National Fire Protection Agency, 2011).

4.3.16.2 Range of Magnitude

The severity of structural fires varies due to the losses associated with the incident. The impact to the local economy is minimal with the loss of a residential structure but the loss of a large manufacturing facility that employs a large number of people can be extensive. Likewise, the impact to the local environment from a single residential fire is minimal while the impact from an industrial or commercial fire can take years to measure. Finally, the loss of life due to structural fires appears to be opposite of the previous two impacts. The loss of life during a residential fire is more likely than that of an industrial or commercial building fire. The building composition combined with the hour of the incident combine to increase the loss of life during a residential type fire.

The structural fires within the Lehigh Valley are usually small, and generally affect residential structures. These fires are limited in duration and are generally contained within the local jurisdiction. While the average fire is small in nature, the threat from a large or even catastrophic fire is always present. Many operations within larger industrial and commercial sites within the Lehigh Valley are prone to small fires that if improperly contained can, and do, lead to catastrophic fire losses. Combined with the presence of materials that are volatile in nature, these threats are ever changing and increasing within the region.

In the last ten years, the Lehigh Valley has seen some notable fires. In March of 2008, City of Bethlehem, Northampton County reported a fire loss in a row of joined homes. The fire claimed the life of four juveniles and injured one additional civilian and four emergency workers. This loss of life is noted as the greatest single loss of life from a non-explosion related fire in the past decade.

In addition to the City of Bethlehem fire, Plainfield Township, Northampton County experienced a catastrophic fire within an industrial site. The site provided a scrap recycling service that received and collected materials and through various processes provided the plastics industry with plastic, glass and metal separation and grinding services. In March of 2011, a fire was reported within the structure, which led to a five-county fire response that continued for over 36 hours. Once extinguished, the building and all products on site were deemed a loss, bringing the loss total to an excess of \$9 million dollars.

4.3.16.3 Past Occurrence

Within the Lehigh Valley over the last decade, 1,142 structural fires have been reported to the Pennsylvania Emergency Management Agency (PEMA). While not an all-encompassing listing, these

fires represent the threshold set forth by the state to be a reportable incident. Table 4.3.16-1 shows an annual fire report by county for both Lehigh and Northampton Counties from 2001 - 2011.

Table 4.3.16-1: Reported Structural Fires 2001-2011

County	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Lehigh	9	5	2	2	15	16	19	10	195	194	189	656
Northampton	4	2	0	0	2	7	91	73	90	135	82	486
Total	13	7	2	2	17	23	110	83	285	329	271	1142

Source: Pennsylvania Emergency Incident Reporting System (PEIRS); Knowledge Center, County 9-1-1 Databases (Due to archiving processes and reporting requirements prior to 2007, databases are not complete and do not accurately represent the total number of fires reported)

4.3.16.4 Future Occurrence

Based upon the Risk Factor Methodology Probability Criteria, structural fires are categorized as *Highly Likely*. According to the NFPA 2009 report *A Few Facts at the Household Level*, based on historical data collected, an average household is expected to experience a fire within a structure every 15 years, based on an average expectance of the household to be 78 years. While most of these fires will be considered small and may not cause any significant damage, the possibility of a catastrophic loss due to fire is present (see Table 4.3.16-2).

Table 4.3.16-2: Likelihood of Future Occurrences of Structural Fire

County	Avg. #/Year	% Probability	Category
Lehigh	65.6	100	Highly Likely
Northampton	60.5	100	Highly Likely

** Due to archiving processes and reporting requirement changes prior to 2007, data collected does not fully reflect the number of fires prior to 2007, thus increasing the % Probability and Average Occurrences per year.**

The NFPA reports a decreasing trend in structural fires within the United States over the past 30 years. Based upon public outreach campaigns to promote fire safety awareness and smoke detector use, the agency is reporting a decrease of over 7,000 deaths per year in the 1970's to just under 3,000 deaths in 2010 (NFPA, 2011). Despite the decrease being reported in fire fatalities, the Lehigh Valley remains consistent with the number of fires being reported over the previous five years. The quantity of residential structures within the Lehigh Valley, especially within the City of Easton, City of Bethlehem, and the City of Allentown, combined with a varying range of fire code enforcement equates to a greater probability of loss in the future. In addition, the influx of commercial and industrial sites within the Lehigh Valley also increases the possibility of future commercial and/or industrial fires.

4.3.16.5 Vulnerability Assessment

Structural fires most frequently affect the residential communities within the Lehigh Valley. While the impact of most structural fires is considered minimal due to the availability of support services following a fire, these fires need to be classified as a high threat due to the frequency and potential for injury and loss of life.

Within the Lehigh Valley, as the population density increases, there is a greater probability of structural fires. The increased population combined with the dense building saturation increases the threat from

structural fires, increasing the likelihood of a larger loss. The continued growth within the Lehigh Valley, both commercial and residential, will continue to impact the threat of structural fires in the future.