City of Summit
Fire Department

Standard of Cover 2011

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Executive Summary

This Standard of Cover document has been produced to document the ability of the Summit Fire Department to respond to calls for emergencies within the City of Summit.

The document includes an overview of the community with a description of some of the major institutional and commercial occupancies in the city. A short history of the Summit area is also included as well as a history of the fire department in Summit. An explanation of the organization of City government outlines the lines of authority within which the fire department operates.

One of the intents of this document is to examine and validate the current level of services. The operational capability of the fire department to respond and mitigate various types of emergencies is examined including structural fires, vehicle fires, technical rescues and extrications, hazardous materials incidents, emergency medical responses, and other emergency and non-emergency service calls.

A detailed risk hazard assessment that examines the natural hazards that the residents of the City may encounter such as storms, hurricanes, flooding, and earthquakes is presented. Manmade hazards such as hazardous materials incidents, transportation accidents including highway, rail and air, structure fires, and utility failures including power, communications, and water services are also examined. Security risks involving civil disorders, nuclear and terrorist attacks are also surveyed. The fire department response to such risks is detailed in the report.

Fire and rescue response policies should be established based on factual data including the level of hazard assigned to a particular property. Factors such as occupancy type, building construction type, building status, building size, and available water supply are fixed factors which can be used to determine an appropriate level of emergency response to a fire or other serious emergency that may occur in a given property.

Another factor that greatly influences the likely success of a fire department in mitigating an emergency is the total response time to an incident. This factor includes components such as call processing time, turnout time, and travel time. An analysis of response times collected during the years 2007 through 2010 has shown that the Summit Fire Department has met its response time goal of arriving at the scene of all types of emergencies in less than 6 minutes in more than 84 percent of the more than 8,000 incidents during the time period. The median response time was 4 minutes 24 seconds. Firefighters were on the scene in all structural fire responses within the response time goal in almost 90 percent of the time. Detailed graphic analysis of the response data is also included in the report.

Community Overview

ered a suburban community. It is located 19 miles due west of New York City in Union County, is 6.1 square miles, and populated by 22,643 residents (per 2009 U.S. Census estimate). There are 8,763 households in the city, of which 97% are occupied, which gives Summit an average population density of 3,490 people per square mile. The median age of Summit residents is 36.2 for males, and 38.3 for females. 13 % of the residents are over age 65, and 27% are under 18.

Long considered an affluent community, the 2008 estimate places the median income at $115,606, with 23% earning over $200,000, and the median house price at $1,006,081. These factors combine to give Summit the 16th ranking for per capita income in the state. The 2008 Cost of Living Index was 150.4, which is considered very high against the U.S. average of 100.0.

While the city is predominately residential in nature, there are a number of large commercial and institutional properties:

Overlook Hospital is a 10 story 600-bed regional medical center that is Summit's largest employer. The hospital campus includes several medical specialty wings, two medical arts buildings, the area's busiest emergency department and several large parking deck structures.

Summit Oakes Hospital, a private psychiatric and chemical dependence center, has been serving the Northeast region since 1902. The facility includes a 126-bed hospital and an outpatient counseling center that serves children, adolescents and adults.

Merck Pharmaceutical Corporation includes 12 large office and pharmaceutical research and development facilities that occupy a business campus of 88 acres, and is the city's 2nd largest employer with over 3000 employees on site.

Celgene Corporation is a biopharmaceutical corporation with corporate headquarters in Summit, as well as research facilities. Over 800 employees work at the site that specializes in the development of cancer treatment drugs.

In addition to these large corporations, Summit has a vibrant business district that is home to many merchants and businesses. About 200 stores and restaurants with 800 municipally operated shopper parking spaces occupy the compact, nine-block downtown area.

In addition to being a home for many residents and businesses, Summit is also a transportation hub. New Jersey Transit operates the busiest rail station on the Morris & Essex commuter rail line to Manhattan. The station is the 11th busiest station statewide and draws riders from many of the surrounding towns with almost one million riders reported in 2007. Additionally two busy highways, State Route 24 and Interstate Route 78, traverse the city.

Beautifully restored, turn-of-the-century homes, off set by mature tree lined streets and a thriving downtown area, reflects the town's century-old pride and soul. This combined with a top rated school system makes Summit a desirable address for many moving into the area.

Summit High School

The City of Summit School District has over 3800 students and 500 faculty members in two primary schools, five elementary schools, and a middle school and high school. The district's students consistently have earned top academic honors with 94 percent of high school graduates continuing their education in college.

Summit is also home to several prominent private schools including Oak Knoll School, Kent Place School and Oratory Preparatory High School. Total enrollment at the campuses of these schools is 1351 students with 259 facility members.

Oak Knoll School

Kent Place School

Oratory Preparatory High School

City History

Summit's earliest settlers came here about 1710. Most of the founding fathers brought Puritan heritage from the British Isles, and from neighboring New England, Connecticut and Long Island. Finding a true paradise, the Summit area was abundant in timber for building cabins, rabbits for food and pelts, plentiful turkey, and a fertile valley for growing wheat and corn. Plus the Passaic River was full of fish to eat and water to float boats.

During the Revolutionary period and for some time afterwards, Summit was called the "Heights over Springfield" and was considered a part of the neighboring town of New Providence. The original name of Summit was "Turkey Hill" to mark it apart from "Turkey", as New Providence was known until 1750. This high point between New York City and Morristown made it a perfect view point for General Washington's troops during the war. A signal beacon and alert cannon were placed atop "Beacon Hill" and were used to alert troops to repulse the British advance at the Battle of Springfield in 1780. This beacon has factored prominently in the city's past, and is the basis for the city seal today.

Originally, Summit was a cozy farming community populated by about 300 people until middle of the 1800s when the community began to change from a rural farming and milling hamlet to a thriving quasi-commercial center. In 1837, the railroad came over the "The Summit" hill, whose name was later shortened to Summit. The railroad was to have a major impact on the future of the city. After the Civil War, Summit became a summer resort area because of its crisp, clean mountain air and convenient proximity to New York City. Summit attracted extremely wealthy people who built extensive summer estates. In 1869, Summit separated itself from New Providence and became the "Township of Summit". Thirty years later on April 11 1899, The City of Summit was incorporated. Now Summit is a mostly residential community with many of the estates having given way to single family homes and large garden apartment complexes.

Summit City Hall

City Government

The City of Summit has a Common Council and a Mayor. The Common Council is the legislative body of the municipality. It approves all laws and adopts the city budget. . The Council consists of three members from Ward I and three members from Ward II and one member elected at-large. The six ward members serve three year terms and the at-large member serves a two year term. The Council elects from its membership a President for a one year term and a President Pro Tem for a one year term. The President presides at all Council meetings and the President Pro Tem presides in the President's absence. The President Pro Tem also serves as Acting Mayor in the absence of the Mayor. The council is further broken down to committees that oversee the following city operations; Buildings and Grounds, Finance and Personnel, Law, Public Safety, Public Works, and General Services. The day to day operations of the city are delegated to the city administrator who is responsible for the execution of policies adopted by the Mayor and Common Council.

The Mayor shall be elected by the voters of the city at large and serve for a term of four years and until his successor shall have qualified, and is the chief executive officer of the city. While not normally voting, the Mayor can speak on all topics, cast a vote to break a tie, must sign or veto all city ordinances, shall be the head of the police department and shall have the power to appoint, suspend or remove all employees of the police department, and shall supervise the official acts of the city employees and report derelictions to the council.

Fire Department History

The late 19th century saw Summit growing by leaps and bounds. The train had come to the area in the 1830's but it would take years to reap the benefits. Businessmen from the city began to flock to Summit to enjoy the pure air of the country and the cool summers. With growth came some of the problems associated with progress. Several devastating fires in the late 1880's convinced town fathers fire protection was a necessity. However, there was no adequate source of water for firefighting. The town depended on wells for their water needs.

In 1887, Carroll Bassett, a young engineer from Lafayette College, moved to town. He soon began negotiations with the town. His company agreed to install at least four miles of water mains and fifty double nozzle fire hydrants. This project was completed by April of 1890. The town now had a water supply but no firefighting equipment. In April of 1890 the state legislature passed a resolution that allowed municipalities to use liquor license fees for any municipal purchase. It was decided that the money collected in Summit should be used to purchase firefighting gear. So it was, in April 1891, that the Summit Fire Department was established. The first volunteer fire companies were the Summit Hose and Ladder Company and Hose Company #2.

Union Hose Company No. 1 – circa 1900

The department continued to expand as several more volunteer companies were added. Union Hose in 1898, Board of Fire Wardens in 1893 and the Chemical engine in '02. Each company was housed in their own quarters which were scattered across the city. They came under the direction of a chief appointed to a 2 year term. This worked well for a number of years until 1938 when changes were made.

Summit Fire Headquarters – circa 1956

In 1938, Thomas Murray was appointed the first paid Fire Chief and took over command of the department. In 1948, all fire companies were moved to a new building located in the center of the city. All companies were now housed at 396 Broad Street where the department continues to be headquartered today. Additional career staff was gradually added over the next few years to supplement the efforts of the volunteer members. By the early 1950's the career staff numbered 32 members strong.

The Summit firefighters of today work hard to continue the traditions of the past and strive to be the best to this day. Equipment and training have changed, but we still feel the call to serve the community in good times and bad.

Current Levels of Service

Currently the Summit Fire Department is a combination department with volunteer members supplementing the 32 career firefighters. Each of the four career platoons consists of 5 firefighters, 1 lieutenant, and 1 battalion chief. Additionally there is a chief, deputy chief, administrative assistant, and 2 firefighter/fire inspectors that work daytime hours Monday through Friday. The Volunteer Division roster presently consists of 12 on call firefighters. Four full time telecommunicators are supplemented by three part-time per diem telecommunicators to operate the city 9-1-1 and Fire Dispatch Center. Total staffing including career staff, volunteer members and telecommunications personnel is 52 personnel.

All of the Summit Fire Department equipment is kept in a centrally located station located at 396 Broad Street. This large station contains 2 engines, 1 tower ladder, 1 medium-duty rescue truck, 1 utility vehicle, 1 incident command vehicle, 2 reserve engines, and 4 administrative vehicles that are available for emergency response. An antique pumper is also kept at Fire Headquarters that is only used for public events, and does not respond.

The current on duty response personnel available to respond to emergencies consists of 1 first due engine staffed with 2 firefighters and 1 lieutenant, 1 tower ladder with 2 firefighters, 1 second due engine with 1 firefighter, and the incident command vehicle with 1 battalion chief. Manpower available, as well as the number of vehicles responding is dependent upon staffing levels available at the time, however a minimum of 5 firefighting personnel are always on duty at any given time. If the call received is of a nature indicating a structural fire, the first due assignment is automatically upgraded to include 1 engine with 1 officer and 2 firefighters and a battalion chief from the Township of Millburn. On-duty staff personnel including the two staff chiefs and two fire inspector/firefighters are available to also respond to all structural fire calls during their on-duty hours. Combined this puts an effective first due firefighting force of up to 15 personnel on scene.

For certain moderate hazard occupancies including Overlook Medical Center, Summit Oakes Hospital and the Merck Pharmaceuticals research complex, an automatic aid upgrade response (2nd Alarm) consisting of an additional engine from Springfield FD with 3 firefighters, and an additional ladder truck with 4 firefighters from Union FD responds upon an initial report of fire in these occupancies. A full department recall of off-duty members is also automatically initiated through the activation of radio pagers issued to all department members. This response, when added to the standard automatic aid structural fire response from both Summit and Millburn FDs, brings a total of up to 24 on-duty personnel to an emergency scene. Additional off-duty personnel are used to deploy reserve apparatus to provide further assistance at the fire scene and/or for providing station coverage for the duration of the event.

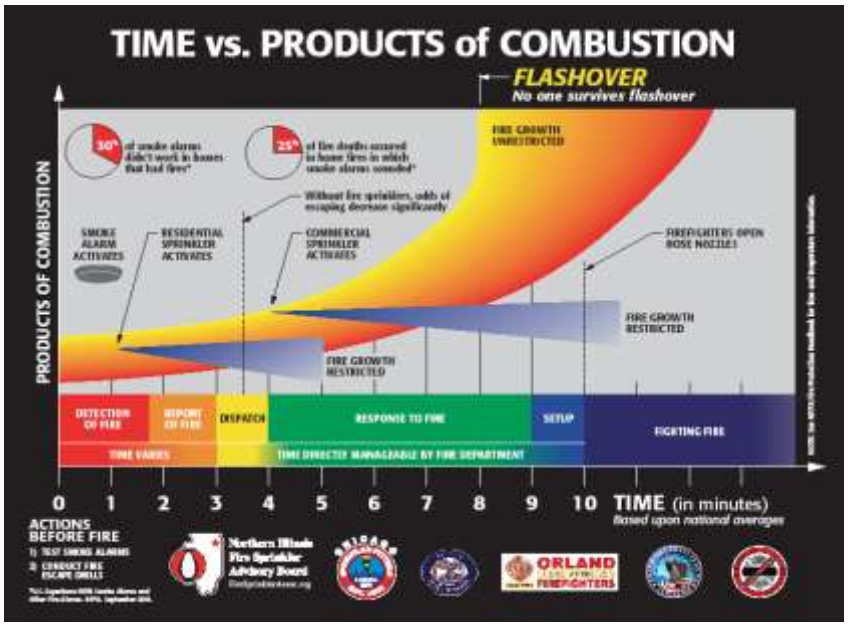
The automatic response of an ambulance crew from the Summit Volunteer First Aid Squad with a minimum of 2 EMS personnel is also dispatched to the scene of all confirmed structural fires for firefighter safety and rehab.

The Summit Fire Department provides emergency fire services, rescue services, back up first responders for emergency medical calls (non-transport), initial response to hazardous materials, and a variety of non-emergency public service calls that range from keys locked in a car to deep water removal from structures. The Fire Prevention Bureau provides inspections services for existing buildings (in accordance with New Jersey State Uniform Fire Code provisions), new construction inspections (in accordance with New Jersey State Uniform Construction Code provisions), and coordinates all public fire safety education efforts. Together, both the fire prevention and fire suppression personnel conduct post fire investigations, school fire safety education, as well as fire safety inspections for small businesses and multi-family residential properties ("in-service" inspections).

In order to have a chance of positively mitigating emergency incident, sufficient resources must be deployed in a timely manner. Since resources are required to perform time critical tasks and functions, the Summit Fire Department must be able to put enough resources on scene in a timely manner to be compliant with legislation and accepted fire service standards (NFPA 1710). This Standard of Cover document is meant to define the Summit Fire Department's response to emergency incidents in a given period of time with a given amount of personnel.

Fire Growth Timeline

Properly staffed, trained and equipped fire companies must arrive, deploy, and attack the fire within specific time frames if successful fire ground strategies and tactical objectives are to be met. The same holds true for rescue operations, major medical emergencies, and other situations that require varying levels of resources. Every minute the fire keeps burning, the more damage results and the likelihood of any victims surviving decreases. The following graphic shows the timeline of a fire inside a structure as it develops from the ignition stage and progresses through the growth stage. When the fire reaches the flashover stage all combustible materials in the space are heated to their ignition temperatures and simultaneously ignite in a violent and sometimes explosive event. Flashover is deadly to both firefighters and any victims that may yet still be in the building.



The first step of any fire response is risk assessment. The Summit Fire Department has developed a risk assessment model using the VISION system created by the United States Fire Administration since 2006. VISION enables fire and emergency service agencies to analyze and categorize the fire risks in their communities (Maximum Hazard, Significant Hazard, Moderate Hazard, and Low Hazard), allowing them to formulate the response needed for an emergency at that structure.

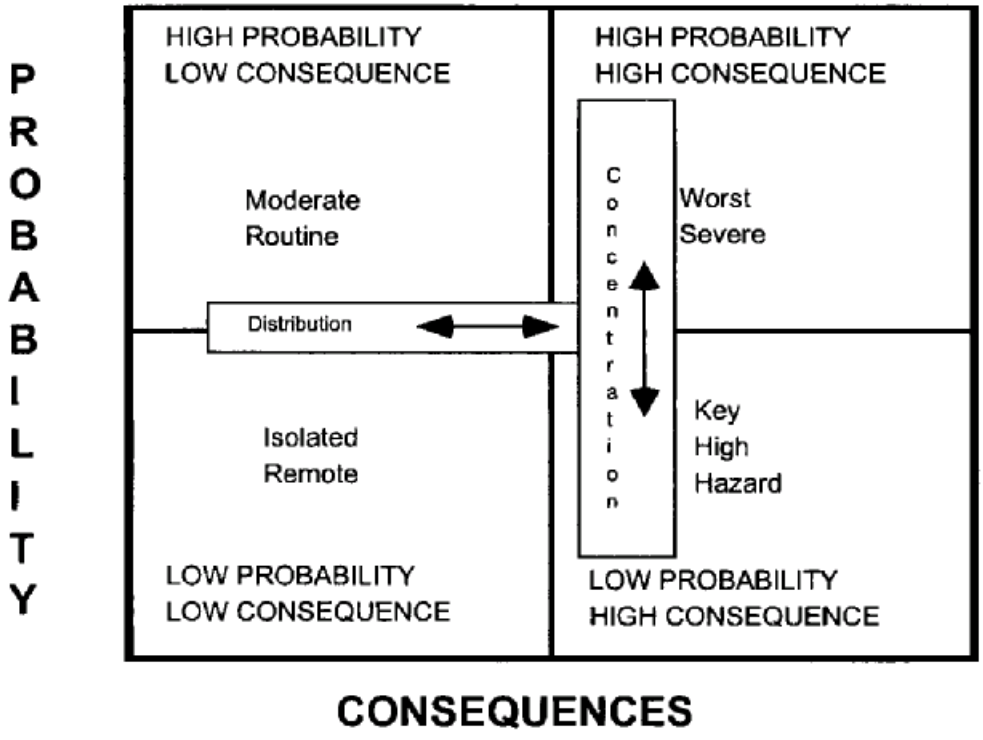
- Maximum Hazard – characterized as occupancies that would pose a very significant fire containment challenge to the local fire forces. Extensive use of fire mutual aid resources would be required to control and contain a well involved fire and prevent fire spread to adjacent properties.

- Significant Hazard – characterized as occupancies that would pose a significant fire control challenge to the local fire forces. Use of fire mutual aid would be required to control and contain a well involved fire in these types of structures.
- Moderate Hazard – characterized as occupancies that pose a moderate fire containment challenge to the local fire forces. Use of fire mutual may be required to assist the local fire forces with control and containment.
- Low Hazard – characterized as occupancies that pose a low fire containment challenge to the local fire forces. The use of fire mutual aid would not usually be needed to effect control and containment.

VISION is also a pre-fire planning system that allows firefighters to evaluate and document building characteristics that can later be reviewed at the scene of the emergency by the incident commander.

After knowing what hazards are present, the next step is to evaluate what are the potential risks that may have to be addressed. Without knowing the risks, and the probability that a given type of incident will occur, further planning cannot take place.

The following chart illustrates the relationship between probability and consequences for emergency incidents. Both of these factors must be looked at to properly acquire and allocate resources for emergency response. Low probability and low consequence incidents cannot receive the same emphasis as high probability and high consequence ones.



With this in mind, the following community risk assessment has been completed for the City of Summit.

Community Risk Assessment

In order for a fire agency to make specific observations about the scope and complexity of the fire, rescue and EMS challenges that it faces daily in a given community, key risk factors must be evaluated including the structural fire problem, the mobile fire problem, and the non-structural hazards and risks present in the community.

Structural Fire Risk Assessment

The structural risk assessment was performed at three levels:

Community- the overall profile of the community based on the unique mix of individual occupancy risks, planning zone risk levels, and the level of service provided to mitigate those risks.

Fire Planning Zones – areas used to measure the management of fire and non-fire risks in a geographic section of the community.

Target Hazards – individual buildings or properties that by their construction or occupancy characteristics may pose a special risk hazard to the community.

Part of any valid assessment of a community's fire and non-fire risks includes a comprehensive survey of the type and amount of structures that are located within the service area.

All properties located in the city were surveyed and analyzed as part of this portion of the risk assessment. Data was obtained from several sources including on-site building pre-planning activities by in-service fire companies, records available from the fire department record management system including inspection records & NFIRS reports, building information data made available by ISO, and the city's integrated GIS asset and work management software solution.

Data collected was input into a software tool called VISION developed through a grant from the research section of the U.S. Department of Homeland Security Assistance to Firefighters Grant Program (the Fire Act) that helps fire departments better assess the risks in their local communities. The resulting numeric scoring, known as the Occupancy Vulnerability Assessment Profile (OVAP), is generated for all commercial, institutional, and large multi-family occupancies.

All surveyed structures have been placed into structural fire risk hazard categories:

Low Hazard: Detached garages, storage shed and out buildings fewer than 1000 square feet.

Moderate Hazard: One and two-family dwellings, older multi-family dwellings two stories or less, industrial and commercial occupancies under 10,000 square feet without a high fire load, commercial, institutional and residential occupancies of fire resistant and non-combustible construction with built-in fire suppression systems.

Significant Hazard: Multi-family swellings more than two stories without fire suppression systems, commercial, industrial and residential occupancies over 10,000 square feet, assisted care living centers, educational and public assembly uses.

Maximum Hazard: Medical and psychiatric hospitals, medical and pharmaceutical research facilities, government and infrastructure risks, and vacant/abandoned structures.

Each structure was analyzed using the following criteria:

- **Age of the Structure**
- **Construction Type**
- **Area of the Structure**
- **Height of the Structure**
- **Density of Structures (separation distance between buildings and the type of exterior finish)**
- **Built-In Protection Systems (fire sprinklers, standpipes, alarm systems, etc.)**
- **Fire Flow Requirements (amount of water necessary to control the emergency, based on structure, contents and exposures)**
- **Occupancy and Use of the Structure**
- **Building Access Issues**
- **Life Safety Considerations**
- **Economic Impact (dollar losses in property value, income, or irreplaceable assets)**

Age of the Structure

The age of a structure including the year of initial construction and any renovation or retrofit activity performed to the structure affect the overall fire risk of a building. Much of the commercial and institutional buildings constructed in the City are of older construction types. Many have been renovated several times, resulting in multiple voids above ceilings and possible structural deficiencies. While a program to retrofit many of the older structures to upgrade the fire protection systems is in progress, many of the buildings remain unprotected.

Construction Type

Construction types are generally classified in categories for fire analysis purposes. For purposes of this analysis, the Insurance Services Organization (ISO) building construction classification system was used. They are listed in order of fire resistance:

Frame Construction (ISO Class I)

Frame buildings are buildings with exterior walls, floors, and roofs with combustible construction — or buildings with exterior walls of noncombustible or slow-burning construction with combustible floors and roofs.

Joisted masonry (ISO Class 2)

Joisted Masonry buildings are buildings with exterior walls of masonry or fire-resistive construction rated for not less than one hour and with combustible floors and roofs.

Light noncombustible (ISO Class 3)

Light Non Combustible buildings are buildings with exterior walls of light metal or other noncombustible material and with noncombustible floors and roofs.

Masonry Noncombustible (ISO Class 4)

Masonry non-combustible buildings are buildings with exterior walls of masonry material and with noncombustible or slow burning floors and roofs.

Modified Fire Resistive (ISO Class 5)

Modified Fire Resistive Buildings are buildings where the exterior bearing walls and load-bearing portions of exterior walls must be of noncombustible materials or of masonry, but exterior nonbearing walls and wall panels may be slow-burning, combustible, or with no fire- resistance rating.

Fire Resistive (ISO Class 6)

The exterior bearing walls and load-bearing portions of exterior walls must be of noncombustible materials or of masonry, but exterior nonbearing walls and wall panels may be slow burning, combustible, or with no fire-resistance rating.

The vast majority of single and two- family dwellings in the City are of frame construction with little fire resistance. Most of the buildings in the Central Retail Business District are of joisted masonry construction. Several of the newer office and retail buildings are of light noncombustible and masonry noncombustible construction. The hospitals, most schools, and newer research laboratory buildings at both of the pharmaceutical research companies are modified fire resistive and fire resistive construction.

Height and Area of Structure

The height and area of a structure affect both the fire and non-fire risk of a building. Large area buildings generally feature large undivided open areas that increase fire risk in the structure due to the rapid spread of smoke and heat within these spaces. The height of the building affects both the fire department ability to reach the upper floors for the rescue of entrapped occupants in both fire and non-fire situations. While most of the structures in the City are limited to three stories or less, there exist several areas, notably an area along Summit Avenue just north of the Central Retail Business District, where

several five to six story multi-family apartment houses and condominium buildings are located.

Density of Structures

The closeness of spacing between structures affects the likelihood of fire spreading to adjacent buildings. While building spacing is generally wide enough in most of the areas in the City to prevent the possible spread of fire between structures, there exist several neighborhoods where the concentration of wood frame dwellings presents a severe fire exposure risk. Neighborhoods in the East Zone are particularly vulnerable to this hazard as the lot sizing and spacing in this area of the City are generally smaller. Several streets located in the North Zone along the Morris Avenue corridor also present increased risk to fire exposure. The density and closeness of the commercial structures in the Central Retail Business District presents the greatest risk to fire exposure as the buildings are densely packed into a nine-block area with the structures spaced immediately adjacent to one another. In some cases, the buildings share party walls with the adjacent structures with no fire division walls being present.

Built-In Fire Protection Systems

The presence of built-in fire protection systems greatly affects the vulnerability of a structure to fire. Automatic fire sprinklers systems and various fire detection and suppression systems provide the highest level of fire protection for a structure. While most buildings in the City lack fire sprinklers, many of the institutional and commercial uses are equipped with fire detection systems. High hazard life safety uses such as hospitals, assisted care living and day care facilities are equipped with automatic fire sprinkler systems, as well as, fire detection systems.

Perhaps the area where the lack of built-in fire protection systems affects the vulnerability of structures to fire risk is in the Central Retail Business District. Densely packed older buildings with little or no fire division walls to check the spread of fire between structures exists with most of the properties lacking automatic fire sprinklers. Recent upgrades to some of these structures include the addition of fire sprinklers in the basement areas; however, fully fire sprinklers building in the district are few in number.

Fire-Flow Requirements

The amount of water that is available to extinguish a building fire obviously has a great deal of bearing on fire risk. The Fire Flow Formula developed by the National Fire Academy was used to determine the amount of water that may required to control a fire in a particular structure in the City. The formula is based on the floor area of the building (length x width) divided by 3. The formula also assumes 100% fire involvement of structure's first floor. The VISION software tool provides for the calculation after

entering the available water flow figures for the hydrant system in the immediate area of the subject building. The resulting fire flow is then expressed in gallons per minute.

Fortunately, the City of Summit is blessed with a very strong water system that is provided by a private utility company, New Jersey American Water Company. There are 516 hydrants strategically located throughout the city that are generally spaced no more than 500 feet apart. Hydrant spacing in the compact but densely structured Central Retail Business District is more closely spaced. The average flow rate for a hydrant is more than 2700 gallons per minute. Both of the large pharmaceutical research firms have their own private fire protection water systems that have adequate flow and pressure. Several multi-story apartment houses and large area buildings have fire pumps located in the buildings to supplement the flow and pressure demands on the upper floors.

Occupancy and Use of Buildings

The use and occupancy of a building is one of the greatest factors that govern fire and non-fire risks in any particular property. Using the available GIS and tax map data for the city, an analysis of the use of all structures by use group was developed.

Use Group Definitions:

Group A – Assembly – Buildings used for the gathering of persons for purposes such as civic, social or religious functions: recreation, food or drink consumption: or awaiting transportation, i.e.: churches, theaters, restaurants, funeral homes, gyms, libraries, train stations.

Group B – Business – Buildings used for office, professional or service-type transactions, including storage of records and accounts, i.e.: banks, barber and beauty shops, civic administration, outpatient clinics and medical offices, research laboratories, motor vehicle showrooms, post offices, professional offices, telephone exchanges.

Group E – Educational – Buildings used for educational purposes through the 12th grade, i.e.: public and private schools, nursery schools and child day care centers for children older than 2 ½ years.

Group F – Factory/Industrial – Buildings used for assembly, fabrication, finishing, manufacturing, packaging, repair or processing operations that not classified as Group H or Group S, i.e.: Automotive repair, bakeries, dry cleaning, furniture repair and refinishing, laundries, woodworking and cabinetry.

Group H – High Hazard – Buildings used for the manufacture, processing, generation or storage of materials that constitute a physical or health hazard i.e.: refineries, chemical plants, storage of flammable and combustible liquids, explosives, corrosives, large amounts of combustible and/or hazardous materials.

Group I – Institutional – Buildings used for the care of persons having physical limitations because of age or health, or are detained for penal or correctional purposes, i.e.: hospitals, nursing homes, assist care living facilities, adult day care facilities, child day care center caring for children under 2 ½ years, prisons, detention centers.

Group M – Mercantile – Buildings used for the display and sale of merchandise, i.e.: department stores, drug stores, markets, motor fuel dispensing facilities, retail stores, sales rooms.

Group R-1 – Residential occupancies containing sleeping units where the occupants are primarily transient (less than 30 days), i.e.: hotels and rooming houses (transient).

Group R-2 – Residential occupancies containing more than two dwelling units where the occupants are primarily permanent in nature, i.e.: apartment houses, monasteries, rooming houses (non-transient).

Group R-3 – Residential detached one and two-family dwellings greater than three stories in height, multiple single-family townhouses greater than three stories in height, rooming houses with no more than five roomers, adult and child day care facilities with fewer than five persons, therapeutic residences with no more than five residents.

Group R-4 – Therapeutic residences including more than five but not more than 16 occupants excluding staff, i.e.: group homes.

Group R-5 – Detached one and two-family dwellings not more than three stories in height and multiple single-family townhouses not more than three stories in height designed in accordance with the one- and two-family dwelling sub code, i.e.: single and two-family homes.

Group S – Storage – buildings used for storage that is not classified as a hazardous occupancy , and motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials, i.e.: storage warehouses, vehicle repair garages, parking garages.

Group U – buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy, i.e.: carports, greenhouses, barns, sheds, stables, tanks and towers.

Group DG – accessory buildings used for the storage of private automobiles, i.e.: private detached garages.

The results of the analysis are displayed in the following tables:

Use Group Distribution By Census Tract

Description	North Zone	South Zone	East Zone	West Zone	Totals	Percentages
Group A	16	1	17	25	59	0.78%
Group B	35	6	30	75	146	1.93%
Group E	3	8	2	8	21	0.27%
Group F	4	0	3	3	10	0.13%
Group H	0	0	0	0	0	0.00%
Group I	0	0	9	5	14	0.18%
Group M	20	0	18	71	109	1.44%
Group R1	0	1	0	0	1	0.01%
Group R2	29	9	58	115	211	2.79%
Group R3	0	0	0	0	0	0.00%
Group R4	0	0	0	0	0	0.00%
Group R5	1396	1594	1432	1053	5475	72.43%
Group S	29	0	29	12	70	0.92%
Group U	3	4	7	9	23	0.30%
Group DG	315	238	620	247	1420	18.78%
Totals	1850	1861	2225	1623	7559	100.00%
Percentages	24.47%	24.61%	29.43%	21.47%	100.00%	

Housing Density by Population and Zone

					Population	Housing
Geographic	Census	Total	Housing	Total Area	Density	Unit Density
Area	Tract	Population	Units	Sq. Miles	per Sq. Mile	per Sq. Mile
North Zone	Tract 377	4616	1717	1.67	2764	1028.1
West Zone	Tract 378	5606	2488	1.49	3752.4	1665.3
South Zone	Tract 379	5725	1942	1.92	2986.7	1013.1
East Zone	Tract 380	5184	1999	0.97	5329.9	2055.3
Total City		21131	8146	6.05	3490.7	1345.7

Analysis of this data shows that the vast majority of structures in the city are single and two-family dwellings representing over 72% of all buildings. Detached garages and out buildings accounted for an additional 19% of buildings. Given that both of these classifications of buildings are commonly built of combustible wood frame construction, it can be said that a full 91% of all structures in Summit are of ISO Type 1 Combustible Wood Frame construction.

The R-2 Group which includes several types of the residential buildings account for another 2.8% percent of structures. This leaves only the categories of business, mercantile, educational, storage and assembly making up the remaining significant percentage of buildings in the city.

While the numbers of buildings types and percentages tell the story of the make up of the city's building stock, it is interesting to note that while there is only 1 R-1 building use in the town, it is a significantly large older construction non-fire resistant hotel that poses a special risk to firefighting operations.

The use group distribution by census track also shows that there are significant differences in the housing characteristics in the various precincts in the city. The South Zone is almost exclusively a residential area with little commercial development and the largest number of private homes. The West Zone while the center of commercial development has significant numbers of multi-family buildings and apartment complexes. The North Zone has areas of mixed commercial and residential development while the East Zone has a high population density with the second highest number of residences in the city. It is also interesting to note that the East Zone has twice the number of detached garages and out buildings as any other zone in the city. This is a reflection of the older housing stock in the zone as modern residential construction generally accommodates attached garages in most residences.

Building Access Issues

The accessibility of a given structure by the fire department is also a factor that is weighed in both fire and non-fire risk assessment. The number of sides of a building that the fire department is able to access is relative to the ability to advance interior attack hose lines and place apparatus for use of aerial devices. Most fire codes reference the ability to place fire apparatus within a certain distance of exterior walls. There are relatively few structures in the City that present access issues for the fire department, however, several of these structures are to be considered high risks due to the height of the structure and the life hazards contained within the buildings. Overlook Medical Center presents some unique access challenges to emergency responders due to its placement along a steep slope with very constrained access driveways. The adjacent Medical Arts Center 1 and 2 buildings and the Overlook Apartments also present similar access issues due to the constraints of their positioning on steeply sloping terrain.

Life Safety Considerations

Several occupancies located in the City present unique life hazard issues due to age or incapacity of the occupants. Both hospitals, an assisted care living center, a senior housing project, and several child and adult day care facilities would present rescue and evacuation challenges should a fire or non-fire emergency occur in one of these buildings. The number of occupants that may have to be rapidly relocated within the

structure or removed from the building would present a high hazard fire and non-fire risk due to the limited number of initial responding personnel.

Economic Impact

The economic value of a structure to the community can be assessed using several factors. High value structures that provide a large number of employment opportunities to residents of the community may have a substantial impact of the tax base should the loss of the building impact the economic vitality of the community. Loss of structures that are critical to the infrastructure of the area or the cultural or historical value to the community are also assessed for the economic loss to the community.

Several large institutional buildings located in the City represent a moderate risk to the community should their use are lost due to fire or non-fire event:

The Overlook Medical Center complex, in addition to being the City's largest employer, provides vital emergency medical care to the City as well as the surrounding region. Loss of use of the facility would prove an economic burden to the community with the loss of employment. Members of the community would be further burdened by having to travel out of the area to receive medical care.

Several of the large research laboratory buildings at the Merck pharmaceutical research campus, the second largest employer in the City, are considered to be of very high value due to the nature of the research that is conducted on site. Loss of use of any of these buildings would represent a significant loss to the economic base of the City.

Loss of use of any of the public school buildings in the City would have a detrimental effect on the residents of the community. The relocation of displaced students to other schools in the City would cause significant disruption in the lives of many city residents. Increases in student attendance at the other public school buildings would increase the life hazard load in each building as many of the buildings are already at peak capacity. Disruptions to traffic patterns during peak school drop off and pick up times would also causing traffic delays in several areas of the city and would increase response times for emergency services.

In addition to high value structures in the City, there is vital infrastructure that would represent a burden should their uses are lost:

The Summit Transit Station is the hub of the Central Retail Business District. Thousand of commuters pass through the station on a daily basis. Loss of the train station and/or access to rail traffic would cause significant hardships on residents and area commuters as they would have to travel out of the City to make transit connections elsewhere. The loss of the daily commuter traffic from the Central Retail Business District would prove an economic blow to the local shop owners and restaurants.

Damage and/or loss of use of the area highways, Interstate Route 78 and State Route 24, would prove a hardship to area residents. An event such as a transportation accident that damages components of the highways such as an overpass or an entrance/exit ramp would shift traffic onto local roadways which would be quickly overburdened by the influx of commercial and passenger traffic. The resulting additional traffic on local roadways will increase response times for local emergency services, as well as, expose local roadways to a heavy volume of truck traffic which may damage the roadway surfaces. The possibility of traffic gridlock during peak travel times would be very disruptive to many aspects of life for residents and commuters in the area. Any long term disruption would have a lasting economic impact on the City.

Development and Population Growth

The City of Summit is considered a "built out" community with little available vacant land for new development. Redevelopment of existing structures has become a trend which is seen as the future of development in the City.

The population of the City has remained fairly stable with the 2010 U.S. Census projections expected to add a small increase in residents. Demographic shifts since the last census are expected to show an increased percentage of Hispanic residents. There appears to be no significant change in the average age of "at risk" populations such as the elderly or young.

Workforce Populations

The total work force population has increased in the City primarily due to the redevelopment of the former Schering Plough Corporation Summit Site by the Merck Corporation. Several new pharmaceutical research laboratory buildings have been constructed or redeveloped at the site which has increased the work force to 3500 employees. The Celgene Corporation has also increased the work force at their Summit Site with over 800 employees currently on location with plans for further development in the near future. It has been estimated that the increase in city population caused by the local workforce during the daytime work week swells the total population to over 35,000 persons.

Fire Planning Zones

For analytical purposes, the City of Summit has been divided into four fire planning zones. The boundaries of the four zones mirror the four census tracts that are used by the U. S. Census Bureau to divide the city into demographic areas. They were chosen because of the availability of demographic data for each zone and because they divide the city into geographic neighborhoods that have unique features.

North Zone – Census Tract 377

The North Zone is characterized as mostly residential with some of the largest single family residences in the city. There are 1850 structures located within this zone with 4616 residents.

While this area of the city has the smallest segment of the total city population, it also has few large multi-family housing complexes. It shares a concentration of retail storefronts and commercial office space along the Summit Avenue corridor along the eastern edge of the central retail business district with the West Zone. There is small commercial area along the lower end of Morris Avenue that it also shares with the adjoining West Zone. A small but concentrated area of commercial businesses and small industrial buildings exists along the extreme northern part of the zone bounded by Chatham Road. Two large commercial office buildings with limited vehicle access are located near the entrance ramps to State Route 24. The zone is bounded to the north by the Passaic River and along the eastern edge by State Route 24. A large segment of the zone is occupied by a golf course.

The majority of the buildings in the zone are single and two-family dwellings (1396 units), detached privates garages (315 units), mercantile occupancies (20 units), and low hazard storage and utility buildings (32 units) that are considered to be a low to moderate fire risk. There are 29 multi-family apartment buildings that are considered moderate to significant hazard due to the lack of fire sprinklers in most of the occupancies. Several school buildings, both public and private are also located here that would be considered moderate to significant fire risks due to the life hazard as well as the potential impact of loss of use to the community.

There are several buildings that are considered targets hazards in the North Zone:

Hosokawa Micron International at **10 Chatham Road** operates an industrial facility that is dedicated to the research and development of powder processing technology also known as nanotechnology. The facility also operates a small section that specializes in the development and manufacture of filters and scrubbers for industrial use in powder and particle processing. The main hazards at this facility are the presence of fine particulate materials that may constitute an explosion hazard while in the processing stage. The building has built-in fire protection systems; however the potential volatile nature of the powder processing systems poses a unique response hazard to emergency personnel.

Jersey Central Power & Light maintains the **Traynor Electrical Power Sub Station** on **Chatham Road** at the city line near the Passaic River that is a major electrical power transmission and supply center for the area. Very high voltage and specialized electrical transmission equipment pose a unique response hazard to emergency personnel.

Wachovia/Wells Fargo occupies a large 336,000 square foot 5-story office building at **190 River Road** with over 400 employees. The building consists of three upper stories

of office space with two lower stories of parking garages, one of which is partially underground. While the complex is equipped with wet standpipes and fire sprinklers, fire department access is limited due to the location and configuration of the building adjacent to the Route 24 freeway.

Two former car dealership buildings which have been vacant for several years pose an increased risk to emergency responders.

The former **Summit Chevrolet** building at **36 River Road** is an ISO Class 6 fire resistive concrete structure that contains no built in fire protection systems other than a very basic fire alarm system. The building was vacated several years ago and most combustible contents were removed. The size and configuration of the building with an integrated parking garage within the structure would pose a challenge to firefighters due to the unprotected openings created between floors by the parking garage access ramps.

The former **Ford Motor Land** dealership located at **68 River Road** poses a significant threat to emergency responders due to the large area of the building and the metal bowstring roof truss system that supports the roof. While the building fire sprinkler system remains in service, doubt lingers regarding the reliability of the system. The building owner has been cited to make repairs; however, there has been only limited movement towards completing work to the system.

Several older apartment houses located along **Summit Avenue** also pose an increased risk to emergency responders. The **DeForest Court Apartments** at **123-127 Summit Avenue, the Parmley Court Apartments** at 133 Summit Avenue, and the **Claremont Apartments** at **145-147 Summit Avenue** each have the presence of unprotected open stairwells and lack any built-in fire suppression systems. The buildings due to their size, height, and construction configuration pose a significant fire risk to both the occupants and firefighters who may be called to combat a fire in one of these large and heavily occupied buildings.

State Route 24 forms the northern border of the municipality with Millburn and Essex County. This six lane freeway features a depressed section of roadway as it passes through the Hobart Gap area. The roadway is depressed up to thirty feet from grade in this area and has limited access. The roadway is a major connector route between Interstate Route 78 and Interstate Route 287 providing access to points west of the New Jersey/New York Metro Area. In addition to significant commuter traffic, the roadway carries a high volume of commercial traffic. Water resources for the depressed area have been enhanced following the installation of dry standpipes located at strategic overpasses that can be used to deliver water down onto the roadway in the event of a serious fire incident. Due to the high volume of commuter and commercial traffic on this high speed roadway and the limited access points, the fire and non-fire risks for this area are considered to be high hazard.

South Zone – Census Tract 379

This area of the city contains the largest segment of residential population in the city with 5725 residents. It also has the greatest number of single and two-family dwellings (1594 units) and the lowest number of commercial and institutional uses in the city with only 19 non-residential buildings in total. It occupies the largest geographic segment of the city within its 1.92 square miles.

The area is characterized by the general lack of commercial uses and by the abundant park areas afforded by the athletic fields surrounding two public elementary schools and one private school. The area is bounded along its southern perimeter by Interstate Route 78 but is shielded from the bustle and noise of the highway by a steep natural slope. The area also is bordered along this same southern edge by the 1945 acre Watchung Reservation, a county owned park adding to the openness and serenity of the area.

Due to the concentration of single family dwellings and the general lack of commercial uses in the area, the fire risks for much of the zone would be consider to be low to moderate. There are however, several large high-value buildings located in the zone that would be considered target hazards.

The **Grand Summit Hotel**, located at **570 Springfield Avenue**, is an ISO Class 2 joisted masonry construction four story 150 room hotel with large banquet hall facilities. While the building was retrofitted with fire sprinklers and standpipes in the early 1990's, there are several critical void areas within the building that remain unprotected. The building has also been cited under Sub-Chapter 4 of the NJ Uniform Fire Code to have an additional egress stairway installed to reduce the exit path distance for occupants of the western wing. A compliance plan has been filed by the property owner and plans to move forward with construction are imminent. Due to the older construction and the large potential life hazard, this building would be considered a significant hazard to emergency responders.

Kings Supermarket, located at **784 Springfield Avenue**, is an ordinary constructed supermarket with a large unprotected wood bowstring truss roof. While the building is equipped with a fire sprinkler system that covers the occupied areas, the lack of fire protection in the large overhead attic space poses a significant fire risk to emergency responders.

The **New Jersey American Water Company** maintains the **Glenside Avenue Pumping Station** that is an integral part of the public water supply for the area. While the water company maintains cross-connections from other water sources within its system, the loss of the pumping station could pose an increased risk to the community especially the East and South Summit zones due to lowered water pressures in these areas.

Interstate Route 78 runs along the southern edge of the South Zone for a distance of 2 miles through an area of open parkland known as the Watchung Reservation. Access to the highway is limited to one westbound entrance from Glenside Avenue. Additional

access points are located several miles to the west and east. This heavily travelled interstate highway is major road linking ports in the New York City and New Jersey area to points west, and sees over 4 million trucks annually, with trucks representing 24% of all traffic. Truck traffic on the road is projected to rise once the widening of the Panama Canal is completed in 2015. In the event of a fire incident along the roadway, there are very limited water resources along the right of way. Due to the heavy amount commercial traffic on this high speed roadway and the limited access points, the fire and non-fire risk risks for this area are considered to be significant hazard.

East Zone – Census Tract 380

This area has traditionally been a working class neighborhood with a lower socio-economic population than other areas of the city. While it consists of the smallest geographic area (0.92 square miles), it has the highest population density with 5329.9 persons per square mile. This density factor is almost twice the population densities of the North and South Zones, and almost 50 % higher than the West Zone.

The area is characterized by older wood frame single and two-family dwellings placed on smaller lot sizes with many commercial uses scattered along the Broad Street corridor. Many blocks have narrow lots that place the structures in close proximity to each other. Given the tight building spacing in the area, exposure problems would be expected under fire conditions in many of the neighborhoods.

The area is dominated by the Overlook Medical Center complex which consists of several hospital buildings, outpatient facilities, medical office buildings and open parking deck garages. A densely populated neighborhood of wood frame multi-family dwellings surrounds the hospital area.

The zone has a very diverse population with 21.4 % of the residents of Hispanic descent. According to the most recently available census statistics, the area has the highest housing unit density in the city with 2055.3 housing units per square mile. The area has a history of overcrowding in some multiple dwellings. The Fire Prevention Bureau has been working with other city agencies to help resolve these issues when they are encountered.

The zone is bounded to the north by the NJ Transit commuter rail line and a large section of Union County parkland along the southern border. The topography ranges from steep slope areas in the vicinity of the hospital complex to a distinct valley area known locally as East Summit.

Due to the heavy population density and many areas of closely spaced structures, the bulk of the structures located in this zone would be categorized as of moderate risk. There are several large commercial buildings that are considered to be significant risk target hazards.

Overlook Medical Center occupies a compact site atop the crest of a steep slope. This 11-story 500 bed medical center consists of a large central hospital building with several attached wings and accessory uses including a busy outpatient facility and several open deck parking garages. Due to the natural constants of the site caused by steep slopes, fire department access is constrained on several sides of the complex. Due to the high life safety factors with multiple patients that may not be able to be evacuated quickly from the upper floors and the site constraints, this complex is considered to be a significant hazard fire risk for emergency responders.

Part of the Overlook Medical Center complex, the **Overlook Apartments** at **10 Overlook Road** is a seven story 51 unit high rise apartment building that has site constraints due to its construction along a steep slope. This results in the building having a seven story configuration on the north side of the building and a two story configuration on the south side. The building lacks an automatic fire suppression system in the tenant occupied areas and presents access issues for the apartments on the south side of the building. Due to the high-rise nature of the structure, the lack of an adequate fire suppression system in the tenant occupied spaces, and access problems compounded by the steeply sloped site, this building represents a significant hazard fire risk for emergency responders.

The **Celgene Corporation** located at **86 Morris Avenue** occupies a semi-secluded wooded 45 acre site along the southern edge of the zone. This multi-building bio-pharmaceutical research and development firm employs over 800 workers at the site. Due to the highly technical nature of the research which involves the use of biohazard materials, this site is considered to be a significant fire and non-fire risk hazard for emergency responders.

West Zone – Census Tract 378

This area of the city is characterized as having the most diverse type of structures ranging from large neighborhoods of single family housing, garden style apartment complexes, two large school campuses, a pharmaceutical research corporate center, and a thriving commercial downtown area spread across 1.49 square miles. The area has a broad range of commercial and institutional uses and also features several important government buildings including City Hall and Fire Headquarters.

Topography of the zone is characterized by gentle hills sloping from the central retail business district to the banks of the Passaic River that forms the northwestern border of the municipality. The zone shares a small portion of the central retail business district with the adjacent North Zone along Summit Avenue. The railway right of way for NJ Transit cuts across the zone and divides the area into southern and northern halves.

The area features the highest number of total housing units (2488) and the second highest population density (3752.4 persons per sq. mile) in the city. Housing is generally

individual single family units on moderately sized lots. There are several large mid-rise apartment houses located in the zone near the central retail business district.

Due to the concentration of mid-rise apartment buildings and the concentration of commercial uses in the central retail business district, the fire risks for much of the zone would be consider to be moderate to high. There are however, several large high-value buildings located in the zone that would be considered target hazards.

The **Merck Corporation** pharmaceutical research campus located at **556 Morris Avenue** features 12 large office and research laboratory buildings contained on a secure 88 acre site. It is the city's second largest employer with over 3500 employees currently on site. It is also the largest tax paying ratable property in the city. The site features a mix of office and research and development uses and is currently undergoing considerable redevelopment of existing facilities and construction of new buildings. The site is equipped with a water tower and a looped fire protection system with yard hydrants. The majority of the buildings are equipped with state of the art fire protection systems including addressable fire alarm systems and automatic fire sprinklers. Some of the buildings are very large in area and mid-rise in height. A small corporate fire brigade that is equipped with its own fire and Haz-Mat response vehicles operates during business hours on the site.

Due to the highly technical nature of the research that is conducted on site, presence of small quantities of hazardous materials in the research labs and the large area of some of the structures, this site is considered to be a significant fire and non-fire risk hazard for emergency responders.

The **Central Business Retail District (CBRD)** occupies a compact nine-block downtown area along **Springfield Avenue** that features a diverse mix of structures containing retail stores, professional and medical offices, restaurants, and personal service establishments, with some residential apartments on the upper floors. The district also has a below-grade theater, several churches, a busy rail transit station and two multi-story open-deck parking garages. Most of the structures were originally built in the 1900's and have been renovated several times over the years. Many of the buildings lack modern fire protection systems and do not have automatic fire sprinklers. In addition, many of the buildings are placed directly against the adjacent structures without adequate fire division walls.

The retail heart of the city, the CRBD has a large working population present during the day and enjoys a very active night time scene with many restaurants and stores open through the evening hours. Due to the density of the buildings, the lack of fire walls, and the lack of modern fire protection and suppression systems in the buildings, this district is considered to be a significant fire hazard risk area.

Summit Train Station is the center piece of the Central Retail Business District and is located along **Union Place** with the building straddling the depressed railway tracks. Among the busiest stations along the Morris & Essex commuter rail line to Manhattan,

the station draws more than one million riders yearly. The building was built in the early 1900's of wood frame and brick construction and does not have fire sprinkler protection. The electrified railway tracks running beneath the station are depressed about twenty feet below street level for a distance of more than one mile. Access to the track level is limited to several access stairways in the immediate area of the station. Access to the depressed section of railway west of the station is severely limited with no access stairways available.

Due to the high value nature of a railway station to a town that depends on resident commuters, and the lack of an adequate fire suppression system, the transit station is considered to be a high hazard fire risk for the community. In addition with the limited access to the depressed railway bed, the railway cut through the transit station and the area west of the station is considered a significant non-fire risk area for emergency responders should a major transportation accident occur.

Non-Fire Risks

Natural Hazard Assessment

The following natural hazards have been identified as risks to the City of Summit. These hazards have the ability to create conditions that would strain the resources of the Summit Fire Department.

Severe Thunderstorm

The City of Summit is located in northeastern New Jersey and is vulnerable to severe thunderstorms. While this hazard is most common in the spring and summer months, it can occur at almost any given time of the year depending on climatic conditions at the time. Severe thunderstorms usually bring high winds, lightning, flooding rains, and occasionally hail. Lightning strikes are common with severe thunderstorms and may cause structure fires, loss of electricity and other utilities, and even injury and death. Loss of utilities may result in a delay of response if phone lines are damaged in a severe storm.

The City of Summit is vulnerable to the adverse severe effects thunderstorms may produce. The Summit Fire Department has the capability of providing services for fire and rescue services caused by severe weather. If needed, additional resources are available from surrounding communities via mutual aid.

Hurricane & Tropical Storm

The City of Summit is potentially at risk for severe weather caused by hurricanes and tropical storms. While this is a relatively rare occurrence, it is classified as a high consequence event. The city is located along the Eastern Atlantic Seaboard of the United

States and has been struck by several severe tropical storms and hurricanes in the past. The most common threat during hurricane season, which runs between June and November of each year, is that of a hurricane that has been downgraded to a tropical storm after expending a great deal of its energy along the southern half of the coast before striking the New York/New Jersey metropolitan area. The area has however been struck in the past by full force hurricanes. Such storms may produce high winds, flooding rains, and isolated severe thunderstorms and, in rare instances, isolated tornados.

The City of Summit is vulnerable to the adverse severe effects hurricanes and tropical storms may produce. The Summit Fire Department has the capability of providing services for fire and rescue demands caused by severe weather. If needed, additional resources are available from surrounding communities via mutual aid. The Summit Fire Department working in conjunction with the City of Summit Office of Emergency Management has the capability of coordinating a community-wide response to the effects of such storms.

Flood

The majority of landmass in the City of Summit is not generally vulnerable to flooding due to the topography of the area. Summit is located at the crest of the Watchung Mountains in the northeastern part of the state. There are several small streams and ponds located within the city limits that do pose a very limited threat of localized flooding, however, most homes and businesses are located outside the established flood plain. While the Passaic River does comprise the western border of the city, the topography of the area in which the river flows consists of steep banks along the Summit side of the river. Flooding from the river does not pose a severe threat to the city. Localized street flooding during periods of torrential rains from seasonal storms passing through the area may pose a threat to several neighborhoods and may affect response times to emergencies should the street flooding require rerouting of emergency vehicles. The city has a storm water management plan administered by the Division of Public Works.

The City of Summit has a limited vulnerability to flooding. The Summit Fire Department will work with the Summit Police Department, the Division of Public Works, and the Office of Emergency Management to maintain access to all areas of the city when street flooding occurs during heavy rainstorms.

Drought

The City of Summit is vulnerable to drought conditions at any given time depending on climate patterns. The risk of this hazard is low. Summit has a reliable and adequate water supply provided by a private water utility company, the New Jersey American Water Company. Summit is located in the center of the water utility's district and is

supplied by a combination of deep wells and surface water. Supply to all parts of the city is generally excellent.

The Summit Fire Department maintains an active relationship with the private water utility to insure that the water supply is adequate and properly maintained. Areas in need of supply improvement have been identified and a long-range capitol plan is in effect to address these areas.

Wildfire

The risk of wildfires caused by drought conditions is recognized in a number of wooded tracts located throughout the city. A wildfire occurring in a steeply sloped wooded area along the commuter railroad right of way east of the city center has been identified as a moderate risk to homes located along the crest of the slope. Fires have occurred in this area in the past that have severely taxed the capabilities of the Summit Fire Department. A large tract of wooded area that comprises the Watchung Reservation, part of the Union County Parks System, borders the southern part of the City. Wildfires that have occurred in the reservation historically have proven to be a challenge to the Fire Department due to limited road accessibility in the area.

The Summit Fire Department has the capability to combat small wildfires that occur within the city. Large brush fires occurring in areas identified as a moderate risk to surrounding properties will require supplemental services in the form of mutual aid from surrounding fire departments and the New Jersey State Forest Fire Service.

Winter Storm

The City of Summit is located in an area known for moderate to harsh winters. The city is likely to experience severe weather conditions each winter that may hamper firefighting efforts. Rapid snow accumulations may slow initial response times for fire and rescue emergencies. Severe cold can make firefighting activities hazardous and thus put firefighters in danger.

The City of Summit Division of Public Works has an effective and efficient snow removal and street maintenance program when winter storms occur. Fire department personnel maintain communications with Publics Works personnel during severe storms. Precautions are taken by the fire department when icy conditions are present. The Fire Department maintains supplemental on-duty staffing during periods of heavy snow and ice.

Earthquake

The City of Summit is located in a moderate-risk area for earthquakes. According to NFPA 13, 2002 ed., Summit including the New York/New Jersey metropolitan area, is in the category 2 for seismic activity. The area could feel the effects of a major earthquake should one occur in the area.

The Summit Fire Department is capable of handling a situation caused by the effects of an earthquake. The risk of this hazard is moderate and existing fire and emergency management response plans will be utilized should an earthquake occur.

Technological/Human Hazard Assessment

The following manmade hazards were identified as potential risks to the citizens of Summit. These hazards have the ability to strain the resources of the City should they occur.

Hazardous Materials – Fixed and Mobile

The City of Summit is vulnerable to incidents involving hazardous materials. With both Interstate Route 78 and State Route 24 traversing the city and the close proximity of the Port Newark/Port Elizabeth sea terminal, the likelihood of a transportation accident occurring while hazardous materials are being moved through the district is apparent. Also, two large research firms located in the city utilize generally small but sometime volatile amounts of hazardous substances in their processes. There are also many smaller commercial occupancies within the city that use hazardous materials in their regular course of business. The risk for a hazardous materials incident is low to moderate with the consequence, should one occur, being moderate to high.

The Summit Fire Department has trained its personnel to the Hazardous Materials Operations certification level. Personnel are capable of isolating and controlling minor hazardous spills and leaks, however, the Union County Hazardous Materials team is relied upon to mitigate any serious hazardous materials threats. The county team is on-call 24 hours a day, 7 days a week to respond to hazardous materials incidents anywhere in Union County. The team consists of trained hazardous materials technicians and specialists from the various county fire agencies who operate in a combination career/volunteer basis. The Fire Department also maintains a close relationship with members of the Merck Corporation Summit Site Hazardous Materials Response Team, which can provide supplemental personnel and materials for mitigating serious hazards in the community.

Utility Failure

The City of Summit is vulnerable to a utility failure whether it is water, natural gas, phone or electricity. The risk for this particular hazard is low to moderate with the consequences being moderate to high. A utility failure could affect the response time of

emergency services. The failures that have occurred in the past have lasted only a few hours; but the possibility of an incident of longer duration exists.

Power Outage

The Summit Fire Department maintains an independent emergency power supply. Fire personnel maintain a large diesel powered generator capably of powering all systems and areas of the fire station, including the 9-1-1 & Fire Dispatch Center and the Emergency Operations Center. The emergency power systems is load tested once a week and is designed to provide automatic emergency electrical power to the building in the event of a local power failure. All department heavy apparatus are equipped with on-board and portable electrical generators which may be utilized to power critical systems both commercial and/or residential should the need arise.

Telephone System Failure

Procedures are in place to provide for emergency backup communications to the 9-1-1 & Fire Dispatch Center and the EOC in the event of a failure of the local telephone system. First-due apparatus, all staff cars, and the dispatch center are equipped with wireless telephones to enable communications with the dispatch center and other agencies should the landline system fail.

Water Supply Failure

Ruptures of large water transmission mains have occurred in the past in the City that have rendered sections of the community without adequate water pressure for domestic and fire service use. The Summit Fire Department has a contingency plan for dealing with long-term water service interruptions by utilizing the Union County Fire Mutual Aid System. Water Tenders from surrounding county rural fire departments could be requested though the New Jersey State Fire Mobilization Plan to provide a reliable source of firefighting water in the event such need would arise.

Structure Fire – Conflagration

The Summit Fire Department provides fire protection for 6 square miles of commercial, industrial and residential structures. The fire department responds to an average of 10 structure fires per year. The risk of a structure fire is moderate while the consequence being moderate as well. The City has few areas of building configuration, size, and type that would create a conflagration hazard.

The fire department has the resources to deal with the hazard of structure fires. Existing automatic aid agreements with surrounding fire departments provide additional resources for all working structural fires. For larger incidents, the Union County Fire Mutual Aid system would be relied upon to deliver further fire suppression resources to the city.

Transportation Accidents: Highway, Rail and Air

Highway

The Summit Fire Department provides service to two major state highways within the boundaries of the city. Automatic aid agreements are in place to provide additional resources and adequate coverage of these areas. These highways are considered to be high-traffic "arteries' of the New York/New Jersey metropolitan area.

The fire department is capable of providing service to the highways via automatic aid agreements with surrounding fire departments. The risk to the community should an event occur on one of the roadways would be low.

Railroad

The Morris & Essex line of the New Jersey Transit Midtown Direct commuter railway runs through the center of the city. The Summit station is the busiest station on the commuter link to New York City. Thousands of commuter passengers use the station or pass through on the railway each day. The line is occasionally used for freight operations during the overnight hours. A decommissioned freight railway line running through the east side of the city is in the planning stages for reactivation. There are no grade level rail crossings in the city.

The Summit Fire Department has a mass casualty plan for incidents that would include a train derailment. Automatic and Mutual Aid would likely be called upon to provide additional resources that would be needed should an event occur on the railways. There is the potential for an incident that would put many lives at risk with the amount of residential and commercial buildings located in close proximity to the tracks.

Air

The City of Summit is exposed to large aircraft flight patterns from Newark Liberty Airport, one of the busiest airports in the nation. The airport is located approximately 9 miles from the City. The potential for a passenger or cargo plane to go down within the response area is a risk the Summit Fire Department and surrounding area departments must deal with. The risk for this particular hazard is low with the consequence being very high.

The Summit Fire Department is a member of the Union County Fire Mutual Aid System, which has a disaster response plan for incidents such as a plane crash. With the amount of residents concentrated in this area of the state, the potential for a mass casualty incident should a plane go down is a reality.

Security Hazard Assessment

The following hazards have been identified as risks to the City of Summit. Although many of the hazards identified below have little or no chance of occurring, the City of Summit Fire and Police Departments are aware of these risks and will act accordingly should the situation take place. These hazards have the ability to strain the resources of the City of Summit.

Civil Disorder

The City of Summit is an upper middle class suburb west of the City of New York. The population is currently estimated at 21,000 residents. The daytime population swells to approximately 30,000 persons due to the wide variety of commercial, industrial, and residential occupancies. The risk of an event involving civil disorder in the City of Summit is low with the consequence being very high.

Civil disorder would include riots, violent protests, and large outbreaks of vandalism and/or malicious behavior. This particular hazard would be the primary responsibility of the Summit Police Department. The Summit Fire Department will not have any involvement with crowd suppression. The fire department would be responsible for fire and rescue services should they be requested. Traditional firefighting operations would be utilized if the resources were available. The Union County Fire Mutual Aid System would be used to supplement city firefighting resources if needed.

Increased Readiness

The City of Summit has in the past exercised increased readiness procedures. City officials determine when a particular situation could pose a threat to the citizens of Summit and will suggest extra resources be available should an incident occur. An example would be the extra police personnel and increased fire department staffing during the 2005 PGA Tournament at the Baltusrol Golf Club in the adjacent community of Springfield that had the potential to cause response difficulties due to increased traffic on City roadways and large crowds of golf tournament patrons utilizing the Summit NJ Transit rail station as a rallying point for shuttle transportation to the golf club.

The City of Summit hosts several large events annually including the Fourth of July Fireworks that draws several thousand people from surrounding communities. The City prepares for the events by staffing extra police and fire personnel at the events.

Nuclear Attack

The City of Summit is part of a major metropolitan area where the possibility of a nuclear attack does exist but is not probable. The risk of a nuclear attack is low with the consequence, should one occur, being very high. This hazard has the ability to strain the resources of the City in every respect.

There is little the Summit Fire Department could do in the event of a nuclear attack. The fire department may be called upon to assist with the evacuation of residents or to assist with state or federal actions.

Terrorism

The events of September 11, 2001 demonstrated that acts of terrorism could occur anywhere, anytime. The City of Summit is vulnerable to an act of terrorism. The risk of this particular hazard is low with the consequence, should one occur being high.

The Summit Fire Department and the Summit Police Department will work together should an act of terrorism occur. The fire department will be responsible for fire and rescue operations should the situation exist. The police department will be responsible for any activities that involve bomb diffusion and/or evidence collection and suspect arrest.

Operational Capability

Structural Fires

Prevention and suppression of fire is the primary mission, as well as the underlying reason for the existence of the Summit Fire Department. Aggressive firefighting actions are needed to minimize fire damage, rescue any trapped occupants, contain the fire to the area or building of origin, and must begin prior to flashover occurring to be effective. After flashover has occurred, the fire becomes more difficult to control and extinguish, the damage is more severe, and the likelihood of any victims surviving drastically decreases. The conditions that firefighters are required to work in are also significantly more difficult and dangerous after flashover has occurred.

To make an aggressive interior attack for reported structure fires, the Summit Fire Department dispatcher sends the following resources on a structural fire response (Signal 9); a first due engine (3F/F), a tower ladder (2 F/F), a second due engine (1 F/F), an incident command vehicle (1 F/F), and a Rapid Intervention Crew (3 F/F) with an additional officer (1 F/F) from Millburn Fire Department. On weekdays 2 chief officers and staff firefighters from the Fire Prevention Bureau also respond adding up to 4 more firefighters. This response puts up to 16 firefighters responding for a reported structure fire.

These firefighters are needed to complete the following tasks in order to make a safe interior fire attack.

Command	1 F/F	(Summit BC)
Attack Hose Line	2 F/F's	(Summit CO & FF)
Pump Operator	1 F/F	(Summit FF)
Water Supply	1 F/F	(Summit FF)
Search and/or Ventilation Team	2 F/F's	(Summit FFs)
Rapid Intervention Crew	3 F/F's	(Millburn CO & FFs)
Safety Officer	1 F/F	(Millburn BC)
Back Up Hose Line	2 F/F's	(Summit FFs)
Aerial Operator (If Needed)	(1 FF)	(Summit FF)
Total	14/16 F/F's	

Additional firefighters are needed to sustain safe fire operations, complete these and additional tasks at large buildings, as well as fires that have gone beyond incipient stage of fire growth. Additionally, the Incident Commander will need staff members to help safely manage the fire operations. Upon determining that the incident is a "working" structure fire, the Incident Commander orders a full department recall (Signal 11) of all off duty Summit firefighters and officers as well as the volunteer firefighters. Upon their arrival at fire headquarters, these additional firefighters respond in the reserve apparatus to the scene of the incident. This type of recall has statistically brought an average of 18 firefighters back to duty.

If additional firefighters are still needed, resources are requested through the Union County Mutual Aid system, or from other contiguous communities. Per county procedures, each request for an additional "alarm" will have 2 engines and 1 ladder truck with 9 to 12 additional firefighters responding to the scene. 2 engines and 1 ladder truck will also be dispatched to the fire station for coverage of any additional emergencies calls on the first request for assistance, as well as mutual aid coordinators being dispatched to the scene to assist with accountability and resource management. Unique fire units (foam tenders, collapse rescue, Haz-Mat team, command vehicle, etc) may be special called through county mutual aid as well.

Summit EMS is dispatched to respond to provide firefighter rehab, as well as a standby Basic Life Support transport unit.

Special Rescue Operations

Upon receipt of a report of persons trapped, the Summit Fire Department sends a "Signal 8" response that includes 1 rescue truck, 1 incident command vehicle, and either 1 engine

or tower ladder depending on the type of incident. If needed, Summit EMS is also notified to respond to provide Basic Life Support and transportation, with Advanced Life Support provided by Atlantic Health. If specialized equipment or additional resources are needed the incident commander may order a department recall of off-duty personnel, and Union County Mutual Aid notified to obtain the desired resources.

Technical rescue incidents also fall into this category of requests for service. The Summit Fire Department is equipped and trained to respond to confined space, low angle, still water, ice and elevator rescues. A minimal amount of training and equipment is available to begin operations at trench, building collapse, wilderness, and urban search and rescue (USAR) incidents. Due to combined training completed with the Millburn Fire Department, and the combined efforts of all on duty personnel from both departments (11 personnel from Summit and 15 personnel from Millburn, 26 personnel in total), initial operations at technical rescue incidents can be initiated until additional resources with a higher level of training can arrive on scene to supplement the rescue of the trapped individual(s). Union County Mutual Aid, Essex County Mutual Aid, Urban Area Security Initiative (UASI), and NJ USAR Task Force #1 units are also available by request to have enough resources on scene in a timely manner to complete an effective rescue.

Hazardous Materials Incident

The Summit Fire Department is trained to the Operations level for hazardous material incidents. This allows the department to act as initial responders to assess the situation and determine what resources are needed to mitigate the situation. If the incident commander finds the situation warrants the services of Technician level personnel, the Union County Haz-Mat team is requested to respond. The county team has the ability to mitigate most incidents. The county team also maintains contracts with commercial hazardous waste clean-up teams that may be called upon to support their emergency operations. In addition to the county team, the Merck Pharmaceutical Summit Site maintains a Haz-Mat response team that can be requested to respond to assist the Summit Fire Department during weekday hours between 0700 and 1500 hours.

A “Signal 5”, single unit response, is made for small releases of household materials such as motor oil or anti-freeze. This response has typically been adequate to investigate and mitigate small releases, by either 1 rescue or 1 engine with 2 to 3 personnel.

Larger reported releases of materials generate a “Signal 8” response of 1 engine, 1 rescue, and 1 incident command with 5 to 7 personnel. These personnel can investigate, identify, and possibly contain the incident with material carried on the apparatus depending on the level of personal protection equipment (PPE) needed. All personnel will respond in structural firefighting PPE, but “Level B” PPE and some decontamination equipment are carried on the apparatus if it is needed. Stockpiles of “Level B” PPE are kept in fire headquarters, as well as personnel decontamination equipment, and “Level C” PPE.

Life safety of the firefighters and public are the primary considerations for the incident commander in deciding what strategies and tactics, as well as resources, will be employed in the mitigation of the incident.

Motor Vehicle Accidents

The Summit Police Department is the primary response agency for all motor vehicle accidents that occur on the city surface streets. Additional response resources from the Summit Fire Department and the Summit Volunteer First Aid Squad are also dispatched to serious motor vehicle accidents under mutually agreed upon response criteria. Fire units are automatically dispatched to all types of motor vehicle accidents with reported personal entrapment, vehicle off the roadway, vehicle overturned, and vehicle collision with pole/tree/structure.

Fire department response to motor vehicles accidents generates a "Signal 8" response of 1 engine with 2/3 personnel, 1 rescue truck with 2 personnel and 1 battalion chief. Fire personnel are trained in crash injury management, vehicle stabilization and extrication, and fluid spill control. Fire personnel also rely on the response of personnel from the Summit EMS unit and paramedics from Overlook Hospital to assist with patient care issues during these types of incidents.

The New Jersey State Police is the primary response agency for all motor vehicle accidents that occur on State Highway 24 and Interstate Route 78. Fire apparatus are automatically dispatched to all reports of motor vehicle accidents on either highway. Fire department response to motor vehicles accidents on the highways generates a "Signal 8" response of 1 engine with 2/3 personnel, 1 rescue truck with 2 personnel and 1 battalion chief. Automatic response of multiple fire and EMS units from adjacent jurisdictions is also made based on mutually agreed upon location criteria.

Incidents that occur on the highways often utilize the combined resources of the multiple responding agencies to deal with the situation encountered. Due to the limited access nature of the highways and traffic tie ups resulting from the incident, fire units must often travel extra long distances to access emergency scenes. The automatic dispatch of fire units from adjacent jurisdictions to designed to ensure that a fire unit is able to reach an incident in a reasonable time frame regardless of the incident location and/or traffic conditions.

Emergency Medical Responses

While the Summit Volunteer First Aid Squad (Summit EMS) is the primary agency for emergency medical incidents, the Summit Fire Department provides a response to incidents when an ambulance is not immediately available for response. A 2 firefighter and 1 supervisor response is made during times when the on-duty ambulance crew is already committed, or for Advanced Life Support (ALS) calls during the period 2300-0700 hours when the ambulance station is not staffed. Additionally the fire department can be special called to medical incidents if the first aid crew chief deems fire department assistance is needed (lift assist, forcible entry, rescue, etc.). Some special requests calls

have required a structural fire response of all on duty firefighters in order to complete the assignment given.

Vehicle Fires

Upon receipt of a reported vehicle fire, the Summit Fire Department dispatches one of the following responses:

a. If the vehicle is reported in or near a structure, a full structure fire response is dispatched. (w/Automatic Aid engine from Millburn, up to 15 personnel in total)

b. If the vehicle is located on a city street, 2 engines and the incident command vehicle is dispatched. (5 to 7 personnel in total)

c. If the vehicle is located on the State Route 24 highway, 1 engine, 1 rescue, and one incident command vehicle is dispatched from both the Summit and Millburn Fire Departments. If the incident is believed to be located in the Township of Springfield, an engine from that department is also requested. (5 to 7 personnel from Summit, 5 to 6 personnel from Millburn, 3 to 4 personnel from Springfield, as many as 17 personnel in total depending upon reported location and daily staffing levels)

d. If the vehicle is located on the Interstate Route 78 highway, 1 engine, 1 rescue and one incident command vehicle is dispatched. Assistance is also requested from the Springfield and Berkeley Heights Fire Departments. (5 to 7 personnel from Summit, 3 to 4 personnel from Springfield, 5 to 7 personnel from Berkeley Heights, as many as 18 personnel in total depending upon reported location)

These responses are varied due to the nature of accessibility, as well as firefighter safety. Vehicle fires located on the highways are typically more difficult to locate, have a limited water supply, and may or may not be the result of a motor vehicle accident. Because of this the department sends the rescue truck, and has additional towns automatically dispatched. Fire apparatus are also needed to provide for scene safety by providing a physical barrier for firefighters who may be working in a lane of travel. Past experience has also found that the unit responding from the opposite direction is often the first to arrive on location due to the traffic tie-ups that are created.

Other Responses

The Summit Fire Department is called to respond to a wide variety of non-fire incidents annually. These calls include requests for animal rescue, water conditions, storm

damage, vehicle or house lock-outs, downed power lines, gas leaks, police assists, unintentional fire alarm activations, and good intent calls. These calls make up the majority of fire department responses and the response made to them varies by what the initial call for service that was received in the dispatch center. Calls of an emergent nature, with a high risk to life or property, receive a structural fire response with the immediate response of all on duty firefighters. Calls of a non-emergent nature may receive a single unit response of 2-3 firefighters responding in non-emergency mode. Pre-selected response levels have been determined, and are listed in the Apparatus Response Signal Guidelines of the Telecommunicators Standard Operating Procedures (SOP) Manual. These guidelines are flexible enough for changes to be made by the on duty shift commander for upgrades of response signals as needed.

Current Response Performance

Essential to the analysis of the response performance of a fire and emergency response agency is the examination of the actual on-time arrival data of the response units to the various types of emergency calls for service that the agency responds to. The establishment of baseline performance levels is necessary in order to compare the agencies current performance with industry accepted response time standards. Only after an agency has determined what their current performance levels are can a plan be developed for maintaining and/or improving their response performance timelines. Analysis of the response time data can determine if certain benchmarks are being completed by the responding fire personnel, in a timely manner.

The measure of the Summit Fire Departments performance in providing fire and emergency services is drawn from response time data for the years 2007 – 2010. Response data for specific types of emergency calls for service were analyzed to evaluate the current response time performance including first unit arrival of all types of emergency calls for service, first unit arrival for EMS calls, first unit arrival for structural fire calls, first unit arrival for special operations rescue calls, and first unit arrival for hazardous materials calls. Response time performance was also analyzed for compliance with the national standard for the initial attack force (2 IN/2 OUT) and the Effective Response Force for structural fire calls.

Most modern emergency response agencies utilize a computer aided dispatch system (CAD) that generates response time data and statistical analysis for emergency calls for service. The Summit Fire Department Dispatch Center does not currently have access to a CAD system, however, funding for such a system has been secured, a vendor has been selected and it is anticipated that the system will be designed, installed and implemented in the second quarter of 2011.

Response time data is currently collected manually from the time clock punch cards that are used by dispatch personnel for documenting all calls for service. After collecting the necessary dispatch information from the caller, dispatchers are required to record the

receipt time of the call, the time that the first responding units begin the response, the time that each responding unit arrives at the scene, and the time that critical tactical benchmarks are accomplished such as requests for additional response resources, primary and secondary searches completed, water supply established, fire under control, etc. These times are collected via the manual time punch cards and an incident worksheet that the dispatchers are required to fill out for all significant incidents.

Accuracy of this response time data collected from the time clock punch cards was verified by listening to audio tape logs of all emergency calls for service. The data that was collected from the incident worksheets was also verified in the same manner. This statistical data was then analyzed using the NFIRS 5 Alive program which yields information such as response times by fractile percentages as well as compliance with the 2 IN/2 OUT standard and Effective Response Force for structural fire calls.

Response Times

Of primary importance is the measure of response time:

Response Time = Alarm Handling Time + Turnout Time + Travel Time.

Alarm handling time begins as soon as the call is received in the Dispatch Center, and is the amount of time it takes for the telecommunicators to identify what the request for service is, and then notify the unit that is assigned to respond via the station alert system. Due to the lack of a fully featured CAD system, the calculation of alarm handling times cannot be easily completed for all calls. Periodic call reviews are conducted using voice recorders to ensure telecommunicators are able to process calls accurately and on a timely basis. The nationally accepted baseline for alarm handling for all types of emergency calls is 90 seconds with a benchmark of 60 seconds in 90% of all calls.

Turnout time is the amount of time it takes the on duty firefighters to process the nature and location of the emergency, the level of response to be made, start calculating the best response route to take, don personal protective equipment, board the apparatus, and begin responding to the incident.

Travel time is the amount of time required to travel from their pre-alarm location to the location of the reported emergency. This must be completed in a safe manner, and can be affected by weather, time of day, traffic, and the distance from the pre-alarm location of the apparatus to the emergency location. While Summit Fire Headquarters is centrally located in the city, often the apparatus and staff are out in the district performing inspections, completing training at a remote location, pre-planning buildings, undergoing vehicle maintenance, performing public fire safety education, or are already on the scene or returning from a previous incident. During these times the apparatus may have a longer response route, which can affect the time of their arrival on the incident.

Travel time is also affected by the type of response made. Non-emergency responses are not included in this analysis because responses of this nature do to warrant the use of

emergency lights and sirens and are of a lower priority. Non-emergency responses are sometimes stacked in favor of pending higher priority emergency requests, thus an analysis of response times would be distorted by the longer response times of non-emergency calls should they be included in the data.

Response Goals

All Types of Emergency Calls

Benchmark: The goal of the Summit Fire Department is that the initial arriving apparatus shall arrive with a total response time of 5:00 minutes or less for 90% of all types of emergency calls.

	2007-2010 Response Times - All Emergency Calls For Service						
2007	2008	2009	2010	Totals	Response Time	%	Fractile Percentages
34	40	35	43	152	0:00 - 0:59	3.21%	3.21%
36	33	58	47	174	1:00 - 1:59	3.68%	6.89%
148	136	172	193	649	2:00 - 2:59	13.72%	20.61%
314	302	267	303	1186	3:00 - 3:59	25.08%	45.69%
285	263	235	254	1037	4:00 - 4:59	21.93%	67.62%
177	148	161	200	686	5:00 - 5:59	14.50%	82.12%
121	95	69	66	351	6:00 - 6:59	7.42%	89.54%
51	49	38	46	184	7:00 - 7:59	3.89%	93.43%
28	25	24	30	107	8:00 - 8:59	2.26%	95.69%
19	21	22	20	82	9:00 - 9:59	1.73%	97.42%
10	13	5	8	36	10:00 - 10:59	0.76%	98.18%
21	19	23	21	84	> 11:00	1.77%	99.95%
1244	1144	1109	1232	4728	All Emergency CFS	99.95%	
67	60	88	47	262	Cancellations		
1311	1204	1197	1279	4990	Total All Emergency CFS		

Response performance goals for all types of emergencies for suburban communities such as Summit are recommended by the CFAI at a benchmark of 5 minutes for the first arriving unit, 8 minutes for the second arriving unit, and 10 minutes for the balance of the 1st alarm assignment. Baseline performance time frame for suburban communities are 8 minutes, 30 seconds for the first arriving unit, 10 minutes, 24 seconds for the second arriving unit, and 13 minutes for the balance of the 1st alarm assignment.

Analysis of the response time data reveals that the Summit Fire Department is able to deliver fire apparatus and adequate personnel on the scene of all types of emergencies within the baseline time frame for the first arriving unit of 8 minutes, 30 seconds in 90% of all calls. This timeline allows for 90 seconds of alarm processing, 90 seconds for

turnout time, and 210 seconds of travel time (8 minutes, 30 seconds total response time) for 90% of all emergency responses. This is within the baseline time standard established for suburban communities by the CFAI.

The Summit Fire Department will continue to seek opportunities to reduce the overall response time to all types of emergency incidents though the continued analysis of alarm handling times, turnout times and travel times. Opportunities to reduce overall response times through changes in dispatch and response procedures will be actively pursued.

The implementation of the new CAD system will greatly assist the department with the analysis of response time data by automating the collection of response data. This will allow for a more detailed examination of all the components of response time and will yield a more accurate analysis of response performance.

Structural Emergency Calls:

Benchmark: The department will respond to all suppression events in 8 minutes and 30 seconds or less total response time, 90% of the time. The first-due unit shall be staffed with 3 firefighters and be capable of establishing command, providing a size-up of conditions and advancing the first line for fire control or starting rescue as indicated.

Benchmark: For 90% of all residential structure fires, an effective response force shall arrive within 10 minutes 24 seconds total response time. The response assignment will be capable of establishing command, establishing a rapid intervention crew, establishing an uninterrupted water supply, advancing an attack line and a backup line for fire control, forcible entry, utility control, victim search and rescue and ventilation in accordance with Example Operational Directives and Procedures.

	2007-2010 Response Times - Structural Response CFS						
2007	2008	2009	2010	Totals	Response Time	%	Fractile Percentages
2	13	10	9	34	0:00 - 0:59	1.51%	1.51%
2	20	43	30	95	1:00 - 1:59	4.23%	5.74%
13	82	121	130	346	2:00 - 2:59	15.41%	21.15%
15	216	182	204	617	3:00 - 3:59	27.49%	48.64%
20	193	149	168	530	4:00 - 4:59	23.61%	72.25%
13	107	100	125	345	5:00 - 5:59	15.37%	87.62%
10	58	36	39	143	6:00 - 6:59	6.37%	93.99%
5	28	18	20	71	7:00 - 7:59	3.16%	97.15%
0	11	7	10	28	8:00 - 8:59	1.24%	98.39%
2	5	5	4	16	9:00 - 9:59	0.71%	99.10%
0	3	2	1	6	10:00 - 10:59	0.26%	99.36%
4	5	2	2	13	> 11:00	0.57%	99.93%
86	741	675	742	2244	SFire CFS	99.93%	
13	2	4	4	23	Cancellations		
99	743	679	746	2267	Total SFire CFS		

The above table shows the response time data for the arrival of the first unit for all types of structural fire responses for the years 2007-2010. The data shows that the Summit Fire Department was able to deliver the first arriving unit in less than six minutes for 87% of all structural fire calls. Data to accurately track the arrival times of the balance of the initial response force due to the lack of a modern computer aided dispatch (CAD) system, however, the full initial response force generally responds to these types of calls for service from the same station under the task force concept of two engines and one ladder truck with a battalion chief. Therefore arrival times of the additional units can be accurately projected to be within one minute of the arrival of the first arriving unit. Under the automatic aid agreement with the Millburn Fire Department, an additional engine company manned by a minimum of three firefighters responds from a nearby Millburn fire station on all reports of fire and/or smoke in a structure. An additional chief officer from Millburn also responds automatically based on this protocol. The arrival of these resources completes the response of the effective response force. Data from the years 2008-2010 was tracked to verify that the additional automatic aid engine with personnel arrived on the scene in 10 minutes and 30 seconds or less in 91% percent of all incidents.

Structural Fire Responses with Automatic Aid - 2008 - 2010			
Fractile Percentages			
Response Time	**Number of Calls**	**Percent of Total**	**Cumulative Total**
5:30 to < 6:00	**2**	**4.08**	**4.08%**
6:00 to < 6:30	**0**	**0**	**0%**
6:30 to < 7:00	**4**	**8.16**	**12.24%**
7:00 to < 7:30	**2**	**4.08**	**16.32%**
7:30 to < 8:00	**10**	**20.4**	**36.72%**
8:00 to < 8:30	**6**	**12.24**	**48.96%**
8:30 to < 9:00	**6**	**12.24**	**61.20%**
9:00 to < 9:30	**7**	**14.28**	**75.48%**
9:30 to < 10:00	**3**	**6.12**	**81.60%**
10:00 to < 10:30	**5**	**10.2**	**91.80%**
10:30 to < 11:00	**2**	**4.08**	**95.88%**
11:00 to < 11:30	**1**	**2.04**	**97.92%**
11:30 to < 12:00	**0**	**0**	**0%**
12:00 to < 12:30	**1**	**2.04**	**99.96%**
	49	**99.96**	

The Summit Fire Department will continue to work closely the Millburn Fire Department under the existing automatic aid agreement to provide additional manpower and

apparatus to supplement the effective response force for all structural fire incidents in the City. We will also seek opportunities to expand the existing agreement with Millburn to provide additional resources in a timely manner to structural fire scenes. We will seek additional opportunities to partner with other neighboring fire departments to expand the existing fire mutual aid agreements and to explore additional opportunities for automatic aid agreements that would mutually benefit the shareholder communities.

Special Rescue Operations

Benchmark: The goal of the Summit Fire Department is that the initial arriving apparatus shall arrive with a total response time of 5 minutes or less for 90% of allspecial rescue operations calls for service. The balance of the first alarm and automaticaid assignment will arrive on scene in 10 minutes 24 seconds for 90% of all special rescue incidents. The initial arriving units shall be capable of establishing command, providing a scene size-up, begin atmospheric monitoring as needed, and providing entry, backup and support teams to initiate a rescue as indicated.

	2007-2010 Response Times - Special Rescue Operations Calls For Service						
2007	2008	2009	2010	Totals	Response Time	%	Fractile Percentages
0	0	2	0	2	0:00 - 0:59	1.09%	1.09%
0	0	2	1	3	1:00 - 1:59	1.64%	2.73%
0	8	9	12	29	2:00 - 2:59	15.93%	18.66%
20	17	22	25	84	3:00 - 3:59	46.15%	64.81%
7	3	7	10	27	4:00 - 4:59	14.83%	79.64%
4	2	4	7	17	5:00 - 5:59	9.34%	88.98%
4	2	2	3	11	6:00 - 6:59	6.04%	95.02%
0	1	0	3	4	7:00 - 7:59	2.19%	97.21%
0	2	0	1	3	8:00 - 8:59	1.64%	98.85%
0	0	1	0	1	9:00 - 9:59	0.54%	99.39%
0	0	0	0	0	10:00 - 10:59	0.00%	99.39%
0	0	0	1	1	> 11:00	0.54%	99.93%
35	35	49	63	182	Rescue CFS	99.93%	
3	2	1	6	12	Cancellations		
38	37	50	69	194	Total Rescue CFS		

The above table illustrates the response time data for the past four years for all special rescue operations. Special rescue operations include all types of technical rescue calls including confined space rescue, trench rescue, high angle rescue, water/ice rescue, elevator entrapment and vehicle extrication, building collapse and USAR incidents. The data shows the department has historically placed the first arriving unit at the scene of all types of special rescue operations in under 5 minutes in almost 80% of all calls. Because of the relative infrequency of complex special operations calls for service, it is difficult to analyze the response data for such incidents. However, the data that has been collected

for structural fire response can be used as a fair comparison because the data involves the same response units. Given this fact, it can be stated that the effective response force for special operations calls for service would arrive on the scene within the prescribed time frame of 10 minutes and 24 seconds in 90% of all incidents.

The Summit Fire Department will continue to seek opportunities to reduce the overall response time to all types of special rescue operations incidents though the continued analysis of alarm handling times, turnout times and travel times. Opportunities to reduce overall response times through changes in dispatch and response procedures will be actively pursued. The department will further seek opportunities through the expansion of existing automatic aid agreements and possible new partnerships to deliver needed supplemental resources to special operations incidents in a timely manner.

Hazardous Materials Incidents

Benchmark: The goal of the Summit Fire Department is that the initial arriving apparatus shall arrive with a total response time of 5:00 minutes or less for 90% of all hazardous materials calls for service. The balance of the effective response force shall arrive on the scene in 10 minutes and 24 seconds or less in 90% of all hazardous materials incidents. The initial arriving units shall be capable of establishing command, providing a scene size-up, establishing a safety officer, providing an recon/rescue team and providing a rapid intervention crew. Response time for the initial arriving technician level personnel from a Hazardous Materials Team to the scene of an incident involving hazardous materials will be less than 30 minutes from time of notification in 90% of all incidents.

Given that the incidence of hazardous materials incidents is extremely low with very few incidents that require the response of technician level personnel to the scene, the sample size of the data makes analysis of response times difficult for these types of calls for service. Based on the data that the department is able to place the first arriving unit on scene in six minutes, 30 seconds in 90% of all types of emergency calls, it can be reliably assumed that these numbers can be used to validate the arrival of the first due apparatus at these types of emergencies.

Again, due to the low incidence of these types of incidents, data for the response of personnel from the Union County Hazardous Materials Team or the Merck Pharmaceuticals Hazardous Materials Response Team cannot be reliably relied upon for analysis. Given that the county team maintains an on-duty staff of technician level personnel during the weekday hours and has a call out system for off-duty personnel during nights and weekends, it can be reliably assumed that the response time from the Westfield location of the unit would be in the thirty minute range. The Merck team is only manned during business hours (7 AM to 3 PM) during weekdays. While a weekday call out for the Merck team can be relied upon for a timely response, calls out that may

occur after business hours would result in response times that would exceed thirty minutes. As a result, response of the Merck team can only be relied upon as a supplement to the response of the county team for incidents that occur outside o f business hours.

The Summit Fire Department will continue to seek opportunities to partner with the resources of the Union County Hazardous Materials Team and the Merck Pharmaceuticals Hazardous Materials Response Team to provide timely response to hazardous materials incidents. Joint training exercises will be developed and conducted on an annual basis with both agencies.

Motor Vehicle Accidents

Benchmark: The goal of the Summit Fire Department is that the initial arriving apparatus shall arrive with a total response time of 7:00 minutes or less for 90% of all motor vehicle accident calls for service. The initial arriving units will be capable of establishing command, completing a scene size-up, establishing a safety officer, and providing patient care and hazard control teams. A safety officer will also be established for all motor vehicle accident calls for service on the highways.

	2007-2010 Response Times - Motor Vehicle Accident Calls For Service						
2007	2008	2009	2010	Totals	Response Time	%	Fractile Percentages
6	6	7	3	22	0:00 - 0:59	4.39%	4.39%
5	2	1	4	12	1:00 - 1:59	2.39%	6.78%
12	8	7	5	32	2:00 - 2:59	6.38%	13.16%
22	19	15	13	69	3:00 - 3:59	13.77%	26.93%
23	19	15	11	68	4:00 - 4:59	13.57%	40.50%
19	13	10	15	57	5:00 - 5:59	11.37%	51.87%
15	13	10	9	47	6:00 - 6:59	9.38%	61.25%
14	9	9	11	43	7:00 - 7:59	8.58%	69.83%
12	8	9	11	40	8:00 - 8:59	7.98%	77.81%
11	10	13	9	43	9:00 - 9:59	8.58%	86.39%
8	6	2	4	20	10:00 - 10:59	3.99%	90.38%
14	9	13	12	48	> 11:00	9.58%	99.96%
161	122	111	107	501	MVA CFS	99.96%	
29	30	45	26	130	Cancellations		

Response protocols for fire department response to motor vehicle accident on city streets within the boundaries of the city have been mutually agreed upon with the Summit Police Department. Fire response criteria includes reports of motor vehicle accident with one or more vehicle overturned or off the roadway, in contact with a tree, pole, or structure, and any vehicle involved in a collision that shows signs of smoke and/or fire. All other

reported types of motor vehicle accidents on the city streets are the primary response responsibility of the Summit Police Department.

Response protocols for motor vehicle accidents on Interstate Route 78 and State Route 24 have been established through automatic aid agreements with the fire departments from the townships of Millburn, Springfield and Berkeley Heights. Depending upon the location of the reported incident as many as three jurisdictions will commit apparatus and manpower to response onto the highway for all types of reported motor vehicle accidents.

Timely response to motor vehicle accidents on the highway presents a particular challenge to the Summit Fire Department. One factor that greatly influences response times is the distance that the apparatus must travel to arrive at the scene of an emergency. Due to the limited access nature of the two highways that we provide response coverage to, travel distances are lengthened resulting in considerably longer response times than similar calls for service on the city surface streets. As a result, these longer response distances skew our overall response times for motor vehicle accidents. Our current response times for all types of motor vehicle accidents show that we reach the 90^{th} percentile for on the scene times at all types of motor vehicle accidents in less than 11 minutes. Response to our goal of having the first arriving unit on scene in less than 7 minutes is currently met in only 61% of all calls for service.

The Summit Fire Department will continue to participate in the existing automatic response protocols for motor vehicle accidents occurring on the limited access highways in order to ensure the timely arrival of response personnel. Opportunities to improve and/or expand these existing agreements will also be explored.

Emergency Medical Responses

Benchmark: The goal of the Summit Fire Department is that the initial arriving apparatus shall arrive with a total response time of 5:00 minutes or less for 90% of all emergency medical calls for service. The initial arriving unit shall be capable of initiating patient care, providing patient care support, and medical documentation.

	2007-2010 Response Times - Emergency Medical Responses						
2007	2008	2009	2010	Totals	Response Time	%	Fractile Percentages
17	17	14	17	65	0:00 - 0:59	8.38%	8.38%
16	8	12	9	45	1:00 - 1:59	5.80%	14.18%
25	27	30	40	122	2:00 - 2:59	15.74%	29.92%
35	32	41	49	157	3:00 - 3:59	20.25%	50.17%
32	37	48	48	165	4:00 - 4:59	21.29%	71.46%
18	17	41	46	122	5:00 - 5:59	15.74%	87.20%
9	11	19	6	45	6:00 - 6:59	5.80%	93.00%
3	5	6	7	21	7:00 - 7:59	2.70%	95.70%
0	2	6	4	12	8:00 - 8:59	1.54%	97.24%
3	1	0	5	9	9:00 - 9:59	1.16%	98.40%
0	0	1	2	3	10:00 - 10:59	0.38%	98.78%
1	2	4	2	9	> 11:00	1.16%	99.94%
159	159	222	235	775	EMS CFS	99.94%	
21	19	28	5	73	Cancellations		
180	178	250	241	849	Total EMS CFS		

The Summit Fire Department provides secondary coverage for the Summit Volunteer First Aid Squad for all emergency medical calls in the city. Fire department response is limited to backup emergency calls when ambulance volunteers are unavailable and also includes primary response to Advanced Life Support (ALS) calls during the overnight hours. Two firefighters and one supervisor are dispatched with fire apparatus equipped with First Responder level medical equipment and an Automatic External Defibrillator to all emergency medical calls for service.

Response data from 2007 to 2010 shows that the response time goals of reaching the scene of an emergency medical call in under 5 minutes occurs in 71% percent of all incidents. More than 90% of all emergency medical calls are reached by the first responding unit in less than 7 minutes.

The Summit Fire Department will seek to improve overall response times to emergency medical calls by exploring opportunities to improve turnout times for fire department personnel.

All Other Types of Fires

Benchmark: The goal of the Summit Fire Department is that the initial arriving apparatus shall arrive with a total response time of 5:00 minutes or less for 90% of all calls for service for all other types of fires. The initial arriving unit shall be capable of establishing command, providing a scene size-up, and providing a fire control team.

	2007-2010 Response Times - All Other Types of Fires						
2007	2008	2009	2010	Totals	Response Time	%	Fractile Percentages
2	4	2	14	22	0:00 - 0:59	7.11%	7.11%
2	3	0	3	8	1:00 - 1:59	2.58%	9.69%
13	11	5	6	35	2:00 - 2:59	11.32%	21.01%
15	18	7	12	52	3:00 - 3:59	16.82%	37.83%
20	11	16	17	64	4:00 - 4:59	20.71%	58.54%
13	9	6	7	35	5:00 - 5:59	11.32%	69.86%
10	11	2	9	32	6:00 - 6:59	10.35%	80.21%
5	6	5	5	21	7:00 - 7:59	6.79%	87.00%
0	2	2	4	8	8:00 - 8:59	2.58%	89.58%
2	5	3	2	12	9:00 - 9:59	3.88%	93.46%
0	4	0	1	5	10:00 - 10:59	1.61%	95.07%
4	3	4	4	15	> 11:00	4.85%	99.92%
86	87	52	84	309	Other Fire CFS	99.92%	
13	7	10	6	36	Cancellations		
99	94	62	90	345	Total Other Fire CFS		

Response to all other types of fires includes the response to grass, brush, mulch, rubbish, trash, vehicle fires, and all types of fires involving power lines, poles and transformers. Because of the inclusion of vehicle fires in this category, the overall response times are lengthened due to the location of many of these fires on the interstate highways. As previous stated, due to the limited access nature of our response area on the highway, travel distances are increased resulting in longer response times. Response data for calls for service for all other types of fires showed that the first responding unit arrives on the scene less than 5 minutes in 58% of all incidents. More than 90% of all calls for other types of fires are reached by the first responding unit in almost less than 9 minutes.

Travel Time

Travel time is the time interval that begins when a unit is en route to an emergency and ends when the unit arrives at the scene. While travel time usually makes up a large portion of overall response time, it is the one component of the equation that is generally static. The distances that must be covered by a responding apparatus are generally fixed. It has been long standing fire service industry practice that fire stations are located within the community to provide travel distances of five miles or less for the first due engine. While variations in travel distances do occur while fire units are out of the station and performing duties such as fire inspections, pre-fire planning or public fire education, the

majority of emergency responses are made by a unit from the fire station. While travel times can be affected by units that are operating outside of the station, because the units are usually performing these auxiliary duties while located within the boundaries of their first alarm response district, travel times are only marginally affected.

The benchmark for travel time when conducting travel time analysis is 4 minutes or less for the first due unit and 8 minutes or less for the balance of the first alarm assignment for 90% of all emergency calls for service.

. This map indicates the distance that can be traveled from fire headquarters in 4-7 minutes, and graphically shows how centrally located the station is. (Dark Blue is 4 minutes, Green is 5 minutes, Red is 6 minutes, and Light Blue is 7 minutes)

Actual travel time performance has been analyzed using the same methodology that was previously used to tract overall response times. Review of this data shows that baseline performance for travel times for the first due unit for all types of emergency calls for service in 2010 was 5 minutes or less in 90% of all calls. The benchmark level of travel time for the first responding unit in less than 4 minutes was achieved in more than 83% of all emergency calls for service.

2010 Travel Times									
Structural	Rescue	Other Fire	EMS	MVA	Totals	Travel Time	%		
112	11	22	44	6	195	0:00 - 0:59	15.81%	15.81%	
231	28	10	49	11	329	1:00 - 1:59	26.68%	42.49%	
189	10	18	57	18	292	2:00 - 2:59	23.68%	66.17%	
135	11	8	44	14	212	3:00 - 3:59	17.19%	83.36%	
46	1	10	25	12	94	4:00 - 4:59	7.62%	90.98%	
15	1	4	7	7	34	5:00 - 5:59	2.75%	93.73%	
8	0	4	1	13	26	6:00 - 6:59	2.10%	95.83%	
4	0	1	6	10	21	7:00 - 7:59	1.70%	97.53%	
0	0	4	3	4	11	8:00 - 8:59	0.89%	98.42%	
1	0	0	1	2	4	9:00 - 9:59	0.32%	98.74%	
1	1	0	0	1	3	10:00 - 10:59	0.24%	98.98%	
0	0	3	0	9	12	> 11:00	0.97 %	Percentages	
742	63	84	237	107	1233	All Emergency CFS	99.95%		
4	6	6	5	26	47	Cancellations			
746	69	90	241	133	1279	Total All Emergencies CFS			