Bellevue Fire Department
Standards of Cover

Effective Date: January 1, 2019

Jerome “Jay” Hagen, Fire Chief

Bellevue Fire Department | PO Box 90012 | Bellevue WA, 98009-9012

Bellevue Fire Department

Standards of Cover Development Team

Kieron Gillmore, Business Analyst
CRA/SOC/CRRP Project Manager/Facilitator, Lead Writer, Gap & Data analysis

Deputy Chief Todd E. Dickerboom,
Accreditation Manager, CRA Group

Babette Bechtold, Senior Administrative Assistant
SOC Proofreader

Curry Mayer, Emergency Manager,

CRA Group, Community Risk Reduction Plan Development

Fire Marshal Ken Carlson, CRA Group, Community Risk Reduction Plan Development

Heather Wong, Community Risk Reduction Specialist, CRA Group, Community Risk Reduction Plan Development

Deputy Chief Andy Adolfson, Bureau of Operations, CRA Group

Battalion Chief Steve P. Thomas, Commander, C Platoon, CRA Group

Captain Dean Harm, Eastlink/Sound Transit Liaison, Light Rail Response Strategies

Introduction

The following report serves as the Bellevue Fire Department Standards of Cover. Its purpose is to identify, assess and document local needs and circumstances, community risks and response capabilities. This process will identify opportunities for improvement, help to maintain current services and highlight areas to enhance our service delivery. The Bellevue Fire Department is dedicated to ensuring a safe and effective response force for fire suppression, emergency medical services and specialty response situations. Mitigation of the effects of these unplanned emergency events is best achieved by working with the community to provide; information, public education, code enforcement, training and other outreach whenever possible. The department's accrediting body, The Commission of Fire Accreditation International (CFAI) defines the Standards of Cover as, "Those written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization."

In creating this report, the department analyzed many factors: demographics, population densities, socio-economic factors, community profiles, community risks, fire-scene tasks, and both the type and quantity of emergency calls. This Community Risk Analysis (CRA) enables the department to evaluate changes in risk profiles and manage performance standards which are rooted in community expectations. Additionally, by periodically committing to this analysis, the department provides a more responsive outreach/mitigation strategy that can be tailored to the changing demographics and make-up of the community served. Performance reporting and evaluation will demonstrate where the department is meeting its established standards, where shortfalls exist and measure programs efficacy in achieving desired outcomes. Ultimately, the analysis of these factors leads to the justification of changes in the placement and staffing of fire department resources, the addition of new resources, the creation of detailed response plans to mitigate the effects of events and the prioritization of outreach strategies to prevent and mitigate behaviors that contribute to risk.

Table of Contents

TABLE OF FIGURES

TABLE OF TABLES

Executive Summary

The Bellevue Fire Department's fundamental role is to provide emergency medical, fire suppression, technical rescue, and hazardous materials response; as well as emergency management, fire prevention and public education. The goal is to preserve and protect both life and property and minimize risk by educating our community. Since its inception in 1965, we have evolved from a single station to a nine-station configuration serving a growing, vibrant and diverse community. Throughout the years, we have been at the forefront of incorporating efficiencies and new services in response to changing demands, and have built a reputation as a leader and innovator in the delivery of emergency services within our region.

Our employees are proud of what they do and who they serve. But, as is often the case in emergency services, the ability to precisely explain our roles is sometimes overly general, vague or even idealistic. In response, this document is designed to explain the details of *what* we do, along with the *how* and *why* we operate. Rather than resting on inflexible traditions, we will demonstrate that we have set standards based on achieving measurable outcomes, and our performance will be measured according to those standards. These methods of measuring performance and self-evaluation help promote accountability.

We start with a description of how we began and how we have grown. Not only will each jurisdiction we serve be described, but unique facts about climate, population, development and funding will be included.

The balance of this report will describe the resources we use to deliver our services along with how we staff and respond. One section will detail what the community thinks about our service and how our service is matched to community desires. Additionally, we will detail our strategies for educating and ensuring our community has the necessary information to minimize the most probable types of risk.

One of the most important sections of this report is the Community Risk Assessment (CRA). The CRA is an analysis of physical hazards, human related factors and mitigating influences within our service area; each risk is quantified according to the likelihood of occurrence and consequence to both the community and the Fire Department. The CRA serves as the foundational tool for strategies and programs related to the mitigation of risk in the community and is vital to recognizing changing risk profiles within our service area.

The on-scene operations and critical tasks section describes in detail what our personnel do when they respond to an emergency. It is these required tasks that drive us to establish response plans designed to get the right number of firefighters and equipment to an emergency to have the greatest chance at a positive outcome.

This *Standards of Cover* document establishes performance standards and corresponding metrics designed to measure program performance and outcomes. These metrics will be reported and evaluated in concert with system resource reliability to illuminate areas within the jurisdiction where the placement of additional resources, changing response strategies or additional education/outreach would be most beneficial.

Finally, this document serves to;

- document the type of analysis performed,
- establish our intent to repeat this analysis at regular intervals that allow for corrective adjustments in response performance, resource positioning, staffing requests, outreach efforts, and
- ensure that this analysis becomes self-sustaining by making it transparent, iterative and repeatable for many years to come.

Section 1 Documentation of Area Characteristics

Legal basis for agency

The Bellevue Fire Department was established on January 1, 1965 by the passage of Bellevue ordinance No. 698. In addition to the organizational structure provided in Bellevue City Code, additional rules and regulations exist in Washington State law found primarily in RCW 35.103.

The Bellevue Fire Department exists as one of 15 separate departments that provide municipal services through the City of Bellevue. Under the powers granted to cities and towns by state law (RCW 35.22.280), and under the state law (RCW 35.103.030 1a) that requires that they must have a written statement establishing the existence of a fire department, the City of Bellevue passed Ordinance No. 6410, establishing the Bellevue Fire Department's existence as the provider of emergency fire service to the city of Bellevue.

Governance and Administration

Current city code 3.35 mandates the existence of an administrative organization for the function of emergency and safety services, to include the functions of crime suppression, transportation safety, fire prevention, fire control, civil defense, emergency medical services, structural safety, community education for crime prevention and for fire prevention and control, and such other related duties as may be assigned by the city manager.

The City Council is the governing body for the City of Bellevue. The Fire Chief is the head of the Fire Department and serves as a member of senior management on task forces and committees participating in the City's strategic planning efforts, and addressing City-wide policy and management issues. The Fire Chief reports directly to the City Manager and Deputy City Manager, who, in turn, inform the City council. The Fire Chief may not initiate communication with the Council on matters related to Fire Department policies or planning, however, the Chief's duties include informing the Council on matters of budget, planning and policies when called upon while remaining accountable to the City Manager. The City Manager may also direct the Chief to prepare studies and reports that are eventually used to guide the policy decisions of the Council. This communication process is meant to prevent department heads from circumventing established lines of authority.

The primary means by which the Bellevue City Council reviews and approves the programs and compliance of the Department is through the two-year "Budget One" process. Budget planners begin with a "Request for Results" that outlines the City's service expectations based on one or more "Outcomes". The six outcomes are rooted in what matters most to the community. The Department responds by submitting budget proposals that directly address requests for results. Budget One proposals concisely explain the services provided and the associated costs. The City Council approves and funds the proposals during the month of November in even numbered years.

The implementation of the Budget One process has given an additional level of accountability by requiring all city departments to give clear descriptions of their programs and service level objectives.

The success of the Bellevue Fire Department can be directly related to the professional oversight and assistance provided by the Administrative Staff. While small, this dedicated group is key to creating a supportive culture, initiating the organizational change needed to establish a High Performing Organization (HPO); directly impacting employee engagement. The Department's administrative structure has been largely unchanged for the past 10 years. The 2013-2014 budget cycle brought some consolidation of city services that allowed the Department to

pass facility management and fleet maintenance to the City's Civic Services department. The department, however, has maintained oversight of all its functions.

Historical perspective

The Bellevue Fire Department was first organized in 1965 as an emergency response agency with one fire station and 16 employees, 12 of which worked a three-platoon 24-hour shift schedule. In 1969, the Department merged with King County Fire District 14, which added three additional stations, primarily staffed by volunteers.

The most significant fire department growth was a direct result of the 1979 Fire Protection Master Plan. This plan, adopted in principle by the City Council through the Public Safety Bond issue of 1980, provided an integrated means of addressing existing and future service-level needs within the fire department sphere of influence. The plan was a blueprint for providing a more consistent level of service to at least 80% of the city, instead of the existing 50% coverage. While the facility, resource and personnel growth afforded by the measure may have seemed aggressive at the time, it proved to be visionary and remains a vital part of our current service delivery.

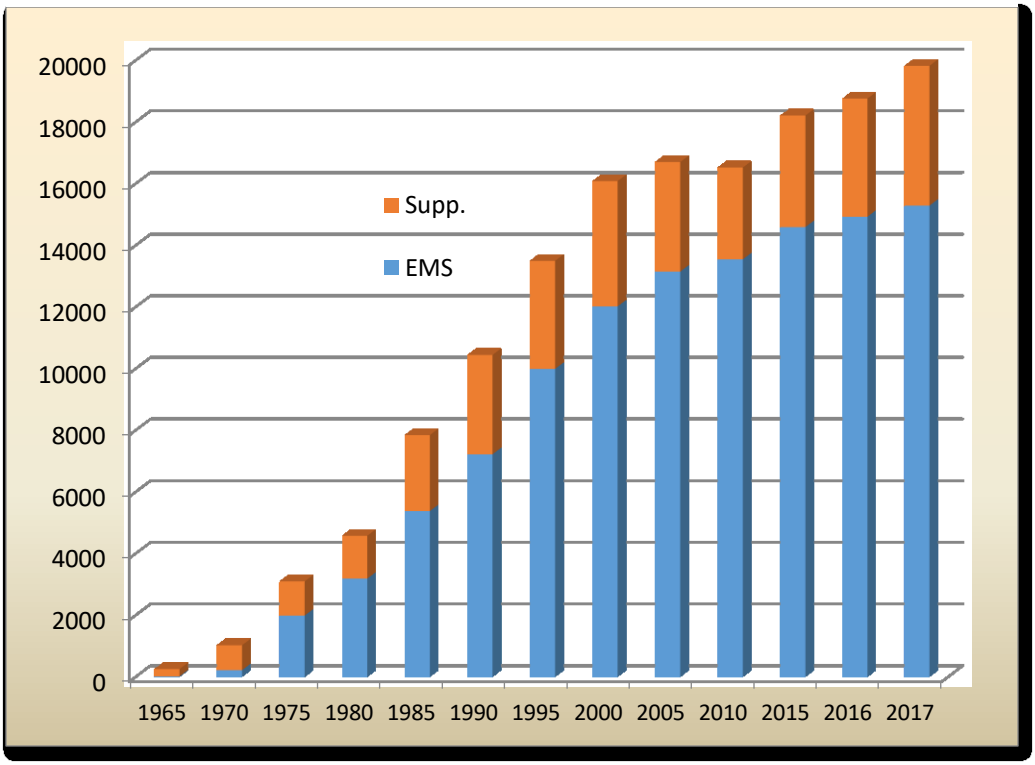
In addition to the growth brought through increased investment, the city continued to expand by annexation. The department also expanded through the contracting of services to neighboring jurisdictions. Some of the city's greatest growth during the 70's came from the expansion of fire department services in the realm of prehospital care.

Prior to 1970, the Bellevue Fire Department was primarily focused on responding to fires, catastrophic emergencies, fire prevention, code enforcement, and education. At the time, limited effort was directed toward emergency medical incidents. A growing national movement and a concerted effort by local citizens and physicians put the Department in a place to respond by offering a comprehensive emergency medical response system for the community.

Bellevue began by sending several firefighters to Harborview Medical Center in Seattle to study under the guidance of doctors looking to change the way emergency services were delivered to the community. The Medic One training program, as it is now known, was then in its formative stages. Upon completion of training, the Bellevue Fire Department placed its first Mobile Intensive Care Unit that went into service in the fall of 1972.

The importance of emergency medical service (EMS) cannot be overstated. In 1965, emergency medical responses accounted for 7% of the Department's run activity. Today, EMS accounts for over 78% of emergency response activity. Early recognition of the public's desire for high-quality, emergency medical care is one of the great and lasting achievements of the Department. The Department, along with other regional Medic One providers, takes great pride in what is widely considered one of the most progressive and successful emergency medical response systems in the world.

Figure I - Call Volumes



Throughout the period of EMS growth, the City's business and residential footprint expanded as well. In addition to the increasing fire response needs this growth represents, the importance of fire prevention and code enforcement became clear. The increasing complexity of commercial construction drove the City and Department to adopt modern codes designed to lessen the chances of major fire-loss disasters. The resulting proliferation of office high-rises and high-density residential occupancies, without a significant increase in fire incidents or fire loss, is proof of the effectiveness of the department's code enforcement and prevention programs.

Further proof of progressive code enforcement is found in the City's mandate for fire sprinklers in all new construction that is over 10,000 square feet. The City further incentivizes residential fire suppression in smaller homes by waiving service upgrade fees if homeowners install the systems.

Along with the delivery of emergency services, the events of September 11th, 2001 demonstrates the value of effective emergency management. The Department and community recognized the need for better planning considering the threats surrounding terrorism, natural disasters and man-made catastrophes. Predating the heightened awareness caused by 9/11 and Hurricane Katrina, the department took several steps as far back as 1991 towards improving its response to these situations. The Fire Department's Office of Emergency Management (originally Emergency Preparedness Division) was established to create an emergency operation plan designed to coordinate City departments and regional authorities during a disaster. In addition, the office began working with the community to help citizens and businesses to both prepare for and respond to local disasters.

Funding

The department submits budget proposals every two years through a "zero-based" budgeting process called "budgeting for outcomes", or internally called "Budget One." The Budget One process puts the emphasis on the community outcomes, not departments. It involves a series of steps that create a government based on available funding, which is then connected to these outcomes and their associated service delivery results. The primary

change in the budget process is that all current programs, services and activities must be submitted as "proposals" in order to retain ongoing funding, expand existing funding or to fund new programs. All proposals must align with at least one of the community outcomes. Other jurisdictions that follow the same budgeting process can be found in Fort Collins CO, Savannah GA, Redmond WA, and Mesa County CO.

Administrative resources are in place to oversee the Department's four main functions: operations, prevention, administrative support and emergency management. All those functions have their roots within the established fire department mission, vision, goals and objectives. There is some overlap as some resources perform multiple functions. For example, operations resources are engaged in fire prevention efforts through company level inspections. In addition, resources may have specialty roles within each function that directly address the department's mission, vision and goals. An example would be operations resources are allocated to address both fire suppression and emergency medical service.

Table I - 2017 Fire Budget

Budget Item	Expenditure	Revenue	Balance
Fire Suppression and EMS	$25,224,561	$6,289,420	$18,798,163
Advanced Life Support (ALS) Services	$7,879,121	$7,879,121	$0
UASI Grant	$334,000	$334,000	$0
Fire Management and Support	$1,287,123	$270,314	$951,588
Fire Prevention	$943,649	$221,484	$835,582
Fire Training	$707,642	$71,866	$633,276
City-Wide Emergency Management	$465,841	$122,929	$342,911
Fire Facilities Operations & Maintenance	$715,054	$75,668	$639,386
Small Grants and Donations	$670,000	$670,000	$0
Community Outreach & Education	$317,217	$29,4840	$294,145
Public Safety Dispatch Services	$4,101,275	$276,335	$3,824,940
East Metro Training Group	$245,965	$0	$245,965
Bellevue Fire CARES Program	$85,413	$17,131	$68,282
Electronic Records for Patient Care	$33,593	$33,593	$0
Total	**$43,010,454**	**$16,556,701**	**$26,634,238**

Particularly significant in the Bellevue Fire Department budget **[Table I]** is the ratio of expenditures to revenue. While many jurisdictions would find it notable to have even 20 percent of expenditures from revenue, the Bellevue Fire Department's current ratio is over 38 percent. The most notable sources of revenue come from the contracting of fire services, the funding from the Medic One property tax levy, UASI funding and BLS transport fees.

Service Area and Jurisdictions served

The City of Bellevue has an established jurisdictional boundary and a Comprehensive Plan that defines and documents those boundaries. King County established the original boundary when the City of Bellevue was incorporated in 1953 through King County Resolution #13925. Since then the City has expanded through a series of annexations. The last annexation of unincorporated county land within the service area jurisdiction occurred in 2012. This annexation has resulted in fixing the City's geographical boundaries, as all other boundaries are in direct contact with other city jurisdictions.

The Bellevue Fire Department directly serves the City of Bellevue and contractually provides services to six neighboring jurisdictions: Beaux Arts Village, Clyde Hill, Hunts Point, Medina, Newcastle, and Yarrow Point. Fire service contracts are subject to jurisdictional boundaries of the client cities and are constrained by either the City of Bellevue, other jurisdictions boundaries or geographic obstacles (lakes). These contracts are renegotiated every 10 years and approved by the Bellevue City County and the governing bodies of the other communities. Annual performance meetings are held with all communities.

Bellevue is also one of five ALS provider in King County for a much larger area that covers approximately 300 square miles.

The Department has current automatic and mutual aid agreements, contract for service agreements, and service level agreements that all support organizational objectives. Automatic aid agreements have been established with agencies immediately contiguous to the City of Bellevue. These agreements are reciprocal and cover all emergency responses into neighboring jurisdictions. The Department also has agreements in place for state-wide support.

Table II – City Data

Jurisdiction	2016 Population	Land Area	2016 Assessed Valuation	2016 Median Residential Value	Levy Rate	Average 2016 Tax for Median
		Square miles				
Bellevue	140,700	31.97	$ 44,546,137,547	$ 640,000	8.78%	$ 5,621.88
Beaux Arts	300	0.09	$ 147,755,613	$ 1,141,000	8.96%	$10,226.89
Clyde Hill	3,015	1.06	$ 2,077,404,209	$ 1,604,000	8.34%	$13,371.54
Hunts Point	415	0.29	$ 960,687,171	$ 2,786,000	7.67%	$21,374.02
Medina	3,205	1.44	$ 3,355,367,836	$ 1,682,000	8.64%	$14,538.96
Newcastle	11,280	4.45	$ 2,501,920,738	$ 585,000	12.43%	$ 7,269.05
Yarrow Point	1,040	0.36	$ 994,522,281	$ 1,661,000	7.92%	$13,163.16
Total	**159,955**	**39.66**	**$ 54,583,795,395**	**$ 1,604,000**	**8.96%**	**$12,223.64**

Bellevue

The city of Bellevue is the 5th largest of 281 cities in the State of Washington with a 2016 estimated population of 140,700. It is located on the east shore of Lake Washington near the population and geographical center of the Puget Sound region. It is just 11 miles east of Seattle and 40 miles north of Tacoma with the mountains of the Cascades towards the east, and Mount Rainier to the south. Bellevue is about three hours north of Portland, Oregon, and two hours south of Vancouver, Canada.

Figure II: Washington State

With over 150,000 jobs within the city, Bellevue was the second largest city in terms of employment in Washington State in 2015. Despite fluctuations that correlate with the ups and downs of the economic cycles, the number of jobs in Bellevue has grown at an average annual growth rate of 1.12 percent since 2000. By 2035, the number of jobs in Bellevue is projected to reach 192,800.

The city's name is derived from a French term for "beautiful view". Under favorable weather conditions, scenic vistas of the Olympic and Cascade Mountains can be viewed from hilltops and high-rise buildings within the city.

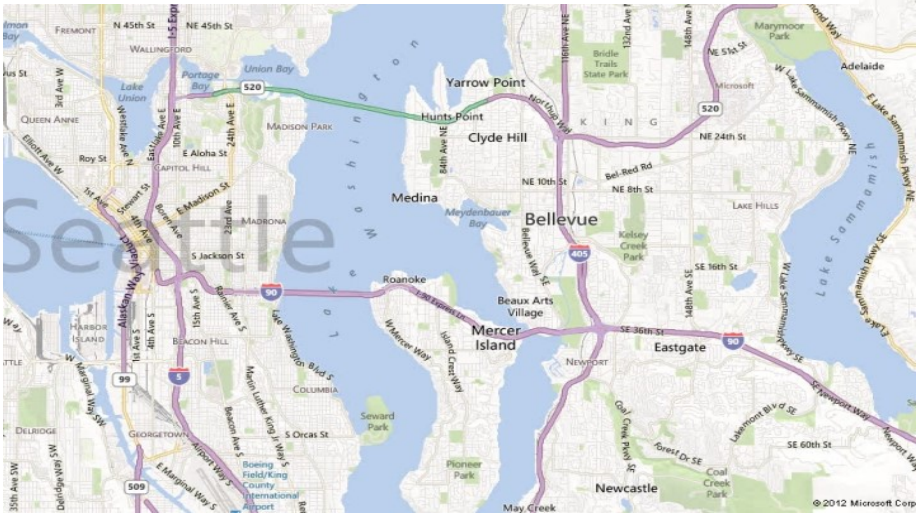
In Bellevue's earliest years, it was primarily known as a "bedroom community" or an extended suburb of Seattle. Since then, the business and retail sectors have grown dramatically and have been the driving force behind the formation of a modern downtown core which today boasts 1,400 businesses with about 50,000 employees that creating a premier regional economy. Over 145 of these businesses claim Bellevue as their headquarters. The Central Business District (CBD) is home to many well-known companies such as Symetra Financial, Expedia, Eddie Bauer, Paccar and Puget Sound Energy. T-Mobile USA is headquartered within the city but outside of the CBD in an area known as Factoria. Regional employers such as Microsoft and Boeing have a substantial presence in Bellevue as well.

Bellevue has gained national and regional attention. CNN Money ranked Bellevue the 4th best city to live in their 100 Best Places to Live in America 2010 edition. In 2014, Bellevue was ranked as the 2nd best place to live in the United States by USA Today.

The city has grown significantly over the past 20 years. Bellevue now has more than 30 million total square feet of office space, a half of which is located downtown. In the Bellevue CBD, Vulcan has revealed plans for an immense 800,000 SF office development adjacent to the Bellevue Transit Center. Amazon recently leased its first building outside of Seattle when it took over 100,000 SF of space in the Centre 425 building. Much of this new development supports premier regional shopping complexes such as the Bellevue Collection and The Bravern.

The city lies between Lake Washington to the west and the smaller Lake Sammamish to the east. Much of Bellevue is drained by the small Kelsey Creek watershed, whose source is in the Larsen and Phantom Lake green belt and whose outlet is near where Interstate 90 meets Lake Washington's eastern shore. The city is bisected by Interstate 405 running north-south, and the southern portion is crossed from east to west by Interstate 90 **[figure III]**. The State Route 520 freeway roughly delineates the northern reaches of Bellevue. South of I-90 the city surrounds the most recently annexed area of Eastgate. South of Eastgate, the city continues up to the western flanks of Cougar Mountain. On top of Cougar Mountain exists the recently incorporated area called Hilltop and to the west of Cougar Mountain are the Somerset, Coal Creek and Factoria neighborhoods.

Figure III: Highway Network



Bellevue is bordered by the cities of Kirkland to the north and Redmond to the northeast near the Overlake and Crossroads neighborhoods. Across the short East Channel Bridge, I-90 connects Bellevue to Mercer Island to the southwest. The City of Issaquah lies to the east, along I-90 at the south end of Lake Sammamish. At the south end of Bellevue lies the City of Newcastle, which as stated before, contracts with Bellevue for its fire protection **[figure IV]**. Beyond the south end of Newcastle lies the city of Renton. Renton, Kirkland, Redmond, Mercer Island and Issaquah have established Fire Departments that provide suppression and EMS services to their citizens.

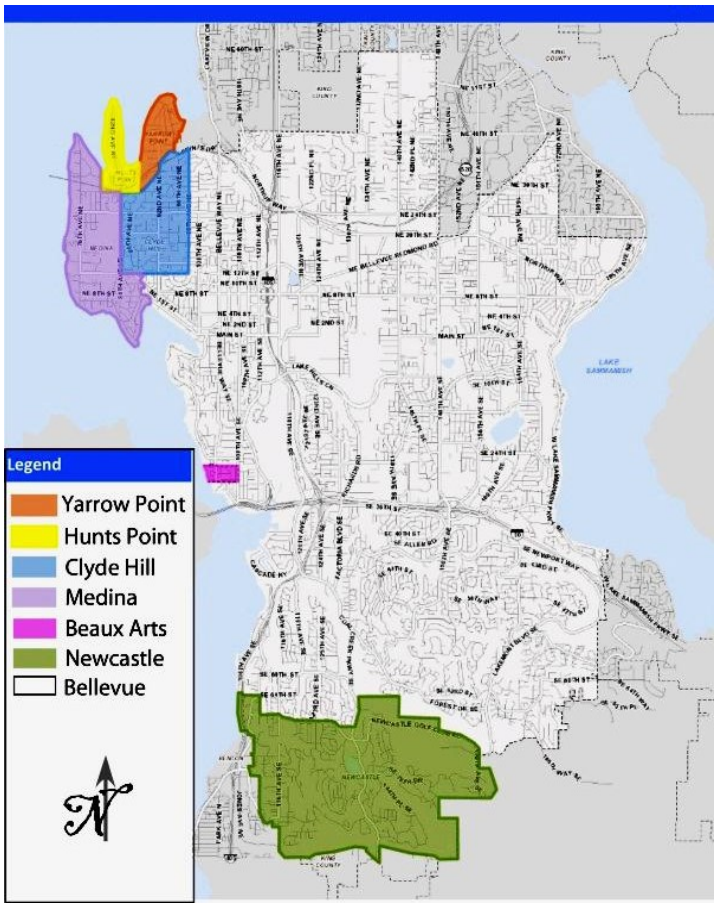
Beaux Arts Village

Incorporated in 1954, Beaux Arts Village is located on the eastern shore of Lake Washington just north of the I-90 east channel bridge. With its population of around 300 residents, Beaux Arts is one of the smallest municipalities in Western Washington, yet its proximity to Seattle and the Eastside help make it a highly desirable place to live. The total land area is only 0.1 square miles.

Residents relish the "small town" feel of Beaux Arts, often referring to themselves as "Villagers", as they have since well before incorporation. The streets are narrow and tree-lined. The community is 100 percent residential and the homes are an eclectic mix of new and vintage, old-fashioned and modern.

Beaux Arts Village was founded in 1908 as an artists' colony and named after the Western Academy of Beaux Arts to which its founders belonged. At the time, one could purchase membership in the Academy for $200. Today, membership in the Academy comes with home ownership.

Figure IV – Bellevue and Contract Cities



The City of Clyde Hill

The City of Clyde Hill is in the northwest corner of the department's service area and is also the home of fire station number five. The majority of Clyde Hill is zoned for single-family use apart from two commercially zoned areas: a gas station and a former coffee shop. In addition to a small government zone, the City is home to four schools: two Bellevue district 405 public schools - Clyde Hill Elementary and Chinook Middle School; and two private schools: Bellevue Christian School and Sacred Heart School.

The total land area is about one square mile and according to the 2016 estimate, there are 1,099 households and 3,015 residents. The city's minimum lot size is 20,000 square feet, although many smaller lots exist which pre-date the incorporation of the City. Clyde Hill is best described as a low-density residential community, and its minimum lot size requirement is meant to preserve that look and feel. The City works to retain and maintain the original spacious and wooded character of the community and to remain relatively small, simple and intimate.

The Town of Hunts Point

The Town of Hunts Point is located on the middle of the three land peninsulas that make up "The Points communities". It was incorporated in 1955 and still is comprised of its original 0.3 square mile. There are 186 housing units, 165 households and 415 residents. Except for the community center and town hall, the rest of the community is zoned residential. A drive down the community's main access road will show that the typical house is set back from away from the road and down towards the water on long, narrow lots.

The Town of Medina

Medina, along with its neighboring cities of Hunts Point and Yarrow point, is often referred to as the "Eastside Gold Coast". This predominantly affluent community occupies 1.44 square miles along the eastern shore of Lake

Washington and offers some of the best western views of Seattle. Like its immediate neighbors, the city is almost completely residential except for a small convenience store, a post office, gas station, one public elementary school, two private elementary schools, a country club/golf course and a town hall. There are 1,165 dwelling units and 1,111 households with a population of 3,205. Notable residents include Microsoft founder Bill Gates and Amazon CEO Jeff Bezos.

The City of Newcastle

Newcastle extends across the southern border of the City of Bellevue and is just north of the City of Renton. Incorporated in 1994, one of its first actions was to begin contracting for fire suppression and EMS services from the Bellevue Fire Department, changing from a fire district that contracted with the Renton Fire Department.

The community is predominantly residential. Unlike the other contract communities that Bellevue serves, Newcastle has a growing commercial zone with several grocery stores, shops and small businesses. Recently, an assisted living facility focusing on the Asian community has been built. Perhaps the most notable point of interest here is the Golf Club at Newcastle, a premier public golf course with stunning views of Bellevue, Seattle and the Olympic Mountain ranges.

The city has 3,117 housing units, 3,028 households and 2,189 families with a population of 11,280. Its total land area is 4.45 square miles.

The Town of Yarrow Point

The easternmost of "The Points communities", Yarrow Point lies on another peninsula extending into Lake Washington just north of Clyde Hill. First homesteaded in the late 1880's, the Town was incorporated in June 1959 to preserve its unique characteristics in the face of significant changes throughout the greater Puget Sound region. While one-fourth of the homes in Yarrow Point enjoy waterfront locations or water access, the remaining three-quarters offer views ranging from expansive to territorial.

The town is zoned residential apart from a town hall. There are 393 housing units over its 0.36 square miles. 2016 census estimates reflect a population of 1,040 people.

Topography and geology

The service area is situated in Western Washington and is part of what is commonly referred to as the Puget Sound region. The waterways of the Puget Sound, along with the Cascade Range to the east and the Olympic mountains to the west are its major geographic features.

The service area is mostly low and modestly rolling hills situated between Lake Sammamish to the east and Lake Washington to the West. The lack of a sizable watershed means that the few streams that drain into the surrounding lakes are small and not prone to urban flooding.

Elevation varies from near sea-level to about 1,400 feet on the slopes of Cougar Mountain, which is in the southeast area of the city. Elevation differences become more evident in the winter months when it is not uncommon to get a dusting of snow on the higher hilltops while the lower areas remain untouched.

Thirty miles directly to the east are the foothills and mountains of the Cascade Range. Formed mainly through volcanic and tectonic forces, the Cascades form both a geographical and climatological border between the

western and eastern portions of the state of Washington. Sixty miles to the southeast is Mount Rainer; the most prominent Cascade Range feature with its 14,410-foot peak visible on clear days.

The hills and lakes in and around the service area were mainly formed through glacial processes and the lack of rocky outcroppings and firm bedrock indicates most of the area is a form of deposited glacial till.

Seismic activity is not uncommon as the region is crisscrossed with several major and minor fault lines. Most notably is the Cascadia subduction zone which is located off the western coast of Washington and has been known to cause earthquakes more than 8.0. The last major earthquake associated with this fault occurred in 1700 and historic intervals for these quakes are between 300-600 years apart. The next major earthquake associated with this fault is expected to produce widespread destruction throughout western Washington.

Climate

The climate is typically described as coastal mild. The 47º northern latitude would normally lead to appreciably hot summers and equally cold winters. But the proximity to the Pacific Ocean and Puget Sound means that temperatures are moderated and extremes are rare. When temperature extremes occur, they typically last for short periods as the weather patterns that brought them are typically fast moving and infrequent.

Table III - Climate data for Bellevue Washington

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °F (°C)	64 (18)	66 (19)	78 (26)	83 (28)	89 (32)	92 (33)	96 (36)	93 (34)	93 (34)	87 (31)	66 (19)	62 (17)	96 (36)
Average high °F (°C)	46 (8)	50 (10)	54 (12)	58 (14)	65 (18)	69 (21)	75 (24)	76 (24)	71 (22)	60 (16)	52 (11)	46 (8)	60 (16)
Average low °F (°C)	35 (2)	36 (2)	38 (3)	42 (6)	47 (8)	52 (11)	55 (13)	57 (14)	52 (11)	46 (8)	40 (4)	35 (2)	45 (7)
Record low °F (°C)	18 (−8)	19 (−7)	28 (−2)	32 (0)	35 (2)	42 (6)	48 (9)	47 (8)	42 (6)	29 (−2)	20 (−7)	10 (−12)	10 (−12)
Precipitation inches (mm)	4.49 (114)	3.67 (93.2)	3.84 (97.5)	2.84 (72.1)	2.10 (53.3)	1.68 (42.7)	0.97 (24.6)	0.97 (24.6)	1.71 (43.4)	3.32 (84.3)	4.92 (125)	5.45 (138.4)	35.96 (913.4)

Development

The City of Bellevue and its contract jurisdictions are unique when compared with other cities of similar size. As an urban environment, the area's residential and commercial areas are very prominent, but noticeably absent are the manufacturing, transportation and agriculture sectors. The city's light industrial area known as the "Spring District" was previously home to two beverage bottling plants, an ice cream plant and a bakery. Most remaining businesses are smaller and mainly service the needs of the surrounding community (e.g. automotive repair, sales, home construction, and various services). Development master plans for the Spring District are replacing what little light industry remains with Transit Oriented Development (TOD) a mixture of residential and business construction with an emphasis in urban concentrations around planned rail stations. Currently, expansion of light rail transportation to Bellevue and neighboring cities is ongoing. The completion of tunneling and station construction is projected by 2021 and the new Eastlink light rail line is projected to begin operations in 2023. Additionally, a light rail Operations and Maintenance Facility - Eastside (OMFE) will be constructed on the edge of the "Spring District"

adjacent to the former BNSF rail line. This facility will be designed to maintain, store and deploy up to 96 rail vehicles.

Also noticeably absent is the lack of a freight rail corridor and airport. The only rail line through the area was decommissioned in 2009 after the removal of a vital bridge during a highway widening project. The small amount of freight that used the line was redirected onto roads or alternate rail lines. The light rails' alignment will briefly run next to this previous rail line, but much of this alignment is being converted into a bicycle/pedestrian corridor. The area's air transportation needs are served by the regional Sea-Tac airport that is a 20-minute drive away.

The development within Bellevue's central business district (i.e. high-rise area), has driven the city's population and valuation growth. Since the 2009-2013 downturn, construction in the CBD and elsewhere in the City has proceeded at near historic levels and shows no signs of abating in the near future.

The driving force behind this development is the number of high-tech jobs related to Microsoft, Amazon and other major players in the technology sector. Employers in that sector have found that their workforce's have specific office, urban and social needs. Bellevue's development in recent years has attracted these businesses because their employees find the housing, recreation, entertainment and infrastructure appealing. Bellevue's governing leaders are driven to create a competitive tax structure, pro-business environment and efficient/responsive government to foster this growth.

What is expected to be a major project in terms of cultural significance is the Tateuchi Center, a 2,000-seat performing arts center in the downtown core. The project appears to have its base of private funding and is projected to begin construction in mid-2018 and open in the fall of 2020.

The City of Bellevue has reached the limit of its growth boundaries with the last annexations of unincorporated area occurring in 2012. Now confined to its borders, growth is still expected as properties are fully developed or redeveloped. The recent trend in residential single-family development is houses built in the 1950's are razed and modern, larger ones are constructed. The growth of higher-density housing is also significant as urbanization continues. The manifestation of urban growth has been the increase in the "five-over-one" buildings (upper floors built with type-5 construction for residential use and a ground-level built with type-1 construction for retail/business) over the past 10 years. In late 2017, the City Council approved a modification to height restrictions within the CBD, raising the limit for designated portions of the city to 600 feet from 450 feet.

Section 2 Description of Agency Programs and Services

The services provided by the Bellevue Fire Department include:

- Fire Suppression
- Emergency Medical Services
    - Basic Life Support (BLS), first response and transport
    - Advanced Life Support (ALS), first response and transport
    - CARES – Citizen Advocates for Referral and Education Services
- Hazardous Materials "Technician Level" Response
- Specialized Rescue: Trench, confined space, high angle, heavy rescue, structural collapse, surface water rescue
- Public Education/Outreach
- Fire Prevention
    - New construction plans review
    - New construction inspection
    - Fire and Life Safety inspection
    - Fire Investigation
- Emergency Management

The basic organizational structure for these services can be found in our departmental organizational chart.

The Department's service area is part of the Seattle-Tacoma-Bellevue Metropolitan Statistical Area and is classified as "urban". While the downtown core has achieved a metropolitan classification, the total jurisdiction population remains under the 200,000-resident threshold needed for the higher rating. In order to better evaluate the increasing population density in the two Census Tracts that comprise the Downtown neighborhood, these areas have been designated as "High Density" planning zones and will be evaluated on a benchmark standard that uses a 2:00 minute travel time instead of the urban area 4:00 minute standard. This "High Density" threshold is achieved when a Census Tract exceeds 12,499 individuals per square mile. This threshold will be updated using the data from the most recent American Community Survey (ACS) conducted by the United States Census Bureau. Additionally, the reduced benchmark for response will better reflect the "verticality" of these more densely populated zones and highlight the increasing challenges in ensuring risk is minimized in these areas. Apart from the Downtown and Bel-Red Corridor, the recurrence and locations of incidents also indicates a mostly-uniform risk level throughout the service area.

Locations of existing fire stations and companies

The Bellevue Fire Department operates out of nine stations within our service area. In addition, four medic units staffed with Bellevue firefighter/paramedics operate out of four locations, two of which are within the Bellevue Fire Department coverage area.

The other two medic units operate east of the department's jurisdiction and serve the ALS needs of those communities. All staffing operates under one battalion; however, medic resources operate under a shift supervisor (Medical Service Officer that is within the battalion), that oversees their needs/activities.

Fire Department administration offices are located at Bellevue City Hall. However, there is no fire station at city hall.

The address and staffing of each station is listed in **[Figure V]**.

Station maps show what is historically referred to as "first-due" area. Currently computer aided dispatch (CAD) sends responders to nearby calls by using automatic vehicle locators (AVL) that transmit GPS locations of each available unit. Once the CAD determines the exact location of an emergency, it assigns and notifies the closest response unit.

Figure V - Station addresses, apparatus and staffing

Station *Neighborhood*	Location	Companies	Staffing
Station 1 *Enatai, Downtown*	766 Bellevue Way SE, 98004	Battalion 1 Engine 1 Aid 1 (BLS)	2 3 2
Station 2 *Eastgate*	2802 148th Ave SE, 98007	Engine 2 Aid 2 (BLS) Medic 2 (ALS) MSO 5 MCI One	3 2 2 1 cross/select
Station 3 *Crossroads*	16100 NE 8th St, 98008	Lightforce 3 Aid 3 Rescue 3	5 2 cross/select
Station 4 *Factoria/Somerset*	4216 Factoria Blvd. SE, 98006	Engine 4	3
Station 5 *Clyde Hill/Points*	9621 NE 24th St, 98004	Engine 5	3
Station 6 *Bel-Red/Overlake*	1850 132nd Ave NE, 98005	Engine 6 Aid 6 HM 1	3 2 – OT PT cross/select
Station 7 *Wilburton*	11900 SE 8th St, 98005	Lightforce 7	5
Station 8 *Lakemont*	5701 Lakemont Blvd. SE, 98006	Engine 8 Air Unit 1	3 cross/select
Station 9 *Newport/Newcastle*	12412 Newcastle Way, 98006	Engine 9	3
Overlake Hospital	1035 116th Ave NE, 98004	Medic 1 (ALS)	2
Outside City Medic Units			
Issaquah	1280 NE Park Dr., Issaquah 98029	Medic 14	2
North Bend	112 W Second St., North Bend 98045	Medic 3	2
		Suppression	39
		Medic EMS	9
		Daily Total	48

Resource descriptions

Battalion One- A Battalion Chief shift commander responsible for the supervision of all personnel in the battalion. Under the current Department resource configuration, there is a single battalion chief on 24-hour duty assisted by a Staff Firefighter who serves as driver, manages personnel accountability and assists during incidents

Engines companies – The department currently staffs seven triple-combination fire engines that specialize in fire suppression and EMS. These resources are equipped with a fire pump, hose complement, and 500-gallon water tank. Bellevue's fire engines are rated at a minimum of 1500 GPM.

Figure VI - Engine 1 in the Vuecrest neighborhood of West Bellevue

Lightforces - The Department currently staffs two ladder/pumper companies called lightforces. Both lightforces are tillered aerial trucks that respond as one unit with a pumper. These resources and the personnel that staff them perform both general response and specialty functions at fire and rescue scenes. Specifically, their role is to support forcible entry, ventilation (vertical, horizontal, positive pressure), search, rescue, salvage, overhaul, above-ground ladder operations, and Specialized Rescue (i.e. Trench, confined space, high angle, heavy rescue, structural collapse, and surface water rescue).

Aid/Medic Units – The Department currently provides Basic Life Support transport services (BLS) through the deployment of three Type I/Type III ambulances. Advanced life support (ALS) services are provided through the deployment of four Type I/Type III medic units.

The primary role of these units is the treatment and transport of sick and injured citizens as defined by emergency medical dispatch protocols.

Medical Services Officer (MSO) - A MSO is a 24-hour shift officer that is responsible for supervision of all On-Duty ALS medic personnel as well as assisting, as needed, on EMS responses. The MSO is an operations officer and may also fulfill fire-scene duties such as safety officer.

Rescue- A specialty apparatus that carries technical rescue equipment that is used by the lightforces. While the ladder/tiller apparatus has basic "jaws-of-life" and rope rescue equipment, the rescue apparatus has additional equipment for trench, heavy and surface water rescue. The rescue is cross/select staffed by On-Duty personnel.

HazMat-A specialty apparatus that carries equipment needed for a technician-level hazmat response. The hazmat apparatus is cross/select staffed by On-Duty personnel.

MCI One-The Medical Supply Unit is a specialty apparatus that carries equipment needed for a mass-casualty incident (MCI). The MSU is cross/select staffed by on-duty personnel.

Air Unit- The air unit is a specialty apparatus that is capable of refilling self-contained breathing apparatus bottles (SCBA). The air unit is cross/select staffed by on duty personnel.

Staffing levels and staffing patterns

The Bellevue Fire Department's minimum daily staffing is 39 suppression personnel and 9 advanced life support (medic) personnel. All suppression and medic personnel work 24 hour shifts on a three-shift, modified Detroit schedule.

The use of "acting above grade" positions ensures that companies are staffed with appropriately qualified personnel. A Firefighter/actor may fill an officer and/or driver role while regularly assigned personnel are on compensated leave. Actors must meet basic training requirements and complete skills during an evaluation period that prove they are able to perform the duties of the position. The use of acting positions also meets a department goal of developing skills in firefighters prior to promotional opportunities.

Compensated leave in the form of vacations, holidays and Kelly days are scheduled a year in advanced and are subject to rules that are designed to minimize department exposure to overtime. In addition, leave is restricted when specialty skills are required to staff a company. For example, the company officer, engineer and acting firefighter on a crew may not take the same day off to ensure that someone with area knowledge is either driving or navigating.

Engine companies are staffed with three personnel: a company officer, engineer/driver and a firefighter. Staffed aid cars (BLS) and medic units (ALS) have two personnel assigned of firefighter or FF/paramedic rank. Lightforce 3 and Lightforce 7 are staffed with 5 personnel and the normal response is with two apparatus: a tillered aerial and a pumper.

The Battalion Chief, designated as Battalion One, responds in a command SUV with a firefighter staff assistant as the driver.

All suppression personnel are trained to the EMT-D Basic level and are certified through King County EMS. The paramedics that staff the medic units are trained through the King County Medic One program and are also nationally certified. Bellevue is one of five ALS providers in the county.

Automatic Aid

The Bellevue Fire department has automatic aid agreements with four neighboring jurisdictions to ensure that the closest unit responds to an emergency.

- Kirkland
- Redmond
- Eastside Fire and Rescue (Issaquah)
- Mercer Island

Mutual Aid

Mutual aid responses are specified in the King County Fire Resource plan. The department can both request and provide resources to regional task forces and strike teams under the agreements in the plan. Bellevue Fire and the surrounding agencies dispatched by NORCOM operate under automatic/mutual aid agreements and strive to ensure inter-operability. King County has designated geographic regions of the county as Zones, and Bellevue is in Zone One. Other Zone One fire agencies include Bothell, Duvall, Eastside F&R, KCFD 27, Kirkland, Mercer Island, Northshore FD, Redmond, Shoreline, Snoqualmie, Snoqualmie Pass and Woodinville F&R. Discussions are ongoing

in Zone 1 on how to best ensure seamless response and inter-operability across geographic boundaries, as all the agencies in the Zone recognize the need to minimize obstacles in emergency situations.

Operations - Response

An emergency response is typically broken down into the following sequence of steps:

- **Dispatch:**
  - **Call processing:** begins with phone pickup in the dispatch center and ends when the information from the phone interview is sent to the CAD (Computer Aided Dispatch) to determine an initial response.
    - Each call is classified into one of 114 different "emergency problems". The CAD automatically classifies the problem based on its scope and location with an "incident type". Location is important because most properties have risk classifications that will affect the incident type (e.g. the difference between a single-family residential AFA and a high-rise residential AFA). Once the incident type is determined, one of 51 pre-determined response plans is chosen by the CAD. The breakdown of response plans is: 12 EMS, 17 special rescues and 22 suppression/other.
  - **Unit assignment and Unit notification**: This step is near-instantaneous since the CAD uses the jurisdiction-specific response plan to assign the needed response apparatus to the emergency. Additionally, the CAD uses AVL (GPS) information to assign the closest available units. After assignment, Locution instantaneously and simultaneously notifies all assigned response units through an automated voice in the station and alphanumeric personal pagers. An automated voice is also sent out over an 800 MHz dispatch radio channel when airtime is available. However, station and pager notification always precedes the 800 MHz notification.
- **Turnout:** Upon notification, personnel proceed to apparatus and, if needed, don protective clothing that is needed for the emergency response. Once personnel are seated in the vehicle and ready to respond, a touchscreen entry on a mobile data computer (MDC) or a voice report over an 800 MHz tactical channel will notify the dispatch center that they are responding.
- **Travel:** While driving to the call, crews may read updated information over the MDC or may receive important voice messages from a dispatcher over the tactical channel. Dispatchers can monitor the locations of response units and their progress toward the incident. The crew will use an MDC touchscreen or voice report to indicate arrival on scene. First-arriving crews on major emergencies are expected to give appropriate voice size up reports in lieu of touchscreen notifications.

Emergency Medical Service (EMS) Response

EMS providers in King County use a "tiered EMS response" through the Medic One System that is internationally known for its proficiency and success rates. 911 calls are answered at the call center where trained dispatchers using focused questions employ a criteria-based system to determine both the nature of the call and the appropriate level of care that is needed. Life threatening emergencies such as cardiac events and trauma with shock are given the highest response with both the nearest BLS suppression crew (either aid, engine or lightforce/ladder) along with the nearest ALS Medic unit. Lower risk calls (e.g. falls less than 10 feet, broken bones without shock, anxiety, etc.) are handled by the closest BLS crew only.

Tiered-response plans meet several performance goals, the first one being that the high-level ALS responders will primarily handle calls where their advanced skills are most needed, and lower risk-but-more-frequent calls are handled by BLS responders. Second, fewer paramedics are needed and the training costs of maintaining their advanced technical skills is minimized.

Suppression response

Suppression calls are dispatched according to the 22 pre-determined suppression response plans. In the event of extreme call volume (e.g. severe weather, power outages, etc.) the on-duty battalion chief, or higher, may enact a "resource emergency". During a resource emergency, automatic fire alarms and most low risk incidents will only receive a single-engine response.

Rescue Response

Rescue responses are provided by Ladder/Lightforce personnel at Stations Three and Seven. These personnel are trained to the Technician level. The remainder of Bellevue Fire Operations personnel are trained to an Operational level for rescue response.

Hazardous Materials Response

Hazardous materials response is accomplished through standard response plans for low and moderate risk incidents and through a consortium of agencies comprising what is known as the Eastside Hazardous Materials Group (EHMG) for high and special risk calls. Bellevue Fire has participated in EHMG for many years and houses one of the two dedicated Haz-Mat apparatus at Fire Station Six. Personnel at Station Six are trained to the Haz-Mat Technician level and provide a cross-staffed response capability for Haz-Mat incidents. The remainder of Bellevue Firefighters are trained to an Operational level of Haz-Mat awareness.

Aviation Rescue and Firefighting

Bellevue has no aviation facilities and has not experienced an aviation related incident in the last twenty plus years, therefore, this program is not addressed in this document or in our response plans.

Marine and Shipboard Rescue and Firefighting

Bellevue has no commercial marine facilities and has not experienced a commercial marine related incident in the last twenty plus years. Private waterborne vehicle fires and medical incidents are addressed by mutual aid agreements with Mercer Island Fire, Seattle Fire and the King County Sheriff's Office Marine Unit. Therefore, this program is not addressed in this document or in our response plans.

Wildland Fire Services

The City of Bellevue has not experienced a significant wildland fire incident in its history. There is a small area of the community that has some exposure to a Wildland-Urban Interface (WUI) type incident and this possibility is addressed under normal vegetation fire response plans. Therefore, this program is not addressed in this document.

Other Programs/Services

Fire Prevention Division (FPD)

FPD operates under a civilian Fire Marshal and covers Fire Investigation and Fire Prevention activities. This division is staffed with 15 fulltime positions, 13 of these positions function either as plan reviewers, inspectors or fire investigators or as a combination of all three. A fire investigator is on-call at all times to investigate fires that require additional expertise and to assist Operations staff with origin/cause determinations.

Table IV – 2017 Fire Prevention Services

Construction Inspection	Plan Review	Maintenance Inspections	Fire Investigations
6,946	3,967	1,735	38

Community Liaison/Risk Reduction

The department utilizes an operations Lieutenant as a Public Information Officer (PIO)/Community Liaison Officer (CLO) in a rotating administrative assignment that typically last two (2) years. This officer supervises the Community Risk Reduction Specialist and functions as the primary departmental media spokesperson as well as coordinating outreach, education, community events, Fire Prevention Week and other duties as assigned. Programs either coordinated or conducted include; No Dragons for Tea, Firefighters are our Friends, Remembering When, Heart Health, Fire extinguisher training, etc.

Table V – 2017 CLO/PIO Performance Metrics

Level 1 Outreach (Class/training)	Level 2 Outreach – (In Person Attendance)	Level 3 Outreach – (Avg Social media posts/day)
4,778	28,390	1.88

Office of Emergency Management (OEM)

OEM consists of two and one-half full-time positions funded through the City general fund and three other limited-term positions funded through grant programs. Although a division of the fire department, OEM is tasked with strengthening and managing all emergency preparedness and management programs within the City of Bellevue

Table VI – 2017 OEM Performance Metrics

City Employees Meeting NIMS requirements	Number of findings after State Audit of Grants	Percentage of Strategic Plan action items complete	Residents who agree that Bellevue plans for and well prepared to respond to emergencies
95%	0	75%	93%

Citizens Advocates for Referral and Education Services (CARES)

CARES consists of a three-quarters (.75) time Program Manager who coordinates up to twenty (20) unpaid Masters of Social Work (MSW) students from multiple colleges. These student advocates meet with residents who have been identified by either police, fire or other agencies as needing assistance in connecting to community resources who can provide better support than first responders. CARES1 is a response unit provided through grant funding that delivers timely assistance to non-emergency incidents by providing an immediate resource staffed with licensed MSW advocates at the time of need. Additionally, the CARES Program Manager partners with the Community Risk Reduction Specialist to provide Juvenile Firesetter Interventions when necessary.

Table VII – 2017 CARE Performance Metrics

CARES Referrals	CARES 911 Call Reduction after case closure	CARES Clients with no new 911 calls after case closure	CARES Client Satisfaction Index
310	54%	59%	68%

Citizen satisfaction and engagement

The city of Bellevue conducts a Budget Survey every two years to learn about resident budget priorities, the importance and level of satisfaction with city services and the value residents feel they receive for their tax dollars. The 2016 survey indicated that the services the fire department provides are both highly desired and give high satisfaction.

Of the seven highest-ranked city services, “responding to fires” is number two, and “providing emergency medical services” is number four.[1] In addition, responding to fires and providing emergency medical services ranked first and fourth respectively in a standardized satisfaction rating.[2] “Responding to calls for police”, and “Ensuring clean and well-maintained parks and facilities ranked fifth and second.

In previous years, residents were asked if the City should increase taxes and services, decrease taxes and services, or keep taxes and services the same. During the years that question was asked, most residents said to keep taxes and services the same; the balance of residents was split nearly evenly between increase and decrease taxes and services. The question was revised in 2016 and respondents were asked to pick from four statements that more accurately reflect the real-world issues the City faces.

A new question shows that sixty-eight percent (68%) of residents are willing to pay more in taxes:

- Thirty-six percent (36%) say that they are willing to pay more in taxes only if it will result in an increase in the level of services.
- Thirty-two percent (32%) say they are willing to pay more in taxes if it is necessary to support the increased costs of providing the current levels of service.

One quarter of respondents do not want any tax increases.

- Eighteen percent (18%) say they are not willing to pay more taxes even if that means the city must reduce services due to increased costs.
- Seven percent (7%) want the city to reduce the services provided in hopes it will provide tax cuts.

[1] 2016 Budget Survey p. 27
[2] Ibid p. 27

In the 2017 performance measures survey, 97 percent of surveyed residents were either "confident" or "very confident" in the Bellevue Fire Department.[3]

A question that tends to linger in the minds of city leaders is, "Is the fire department properly sized?" When residents are asked the same question, most will not know how to answer. However, most would state that the fire department just needs to be able to respond quickly when they are called.

While it is generally true that adding resources usually leads to more successful outcomes (e.g. smaller fires, less property loss, more lives saved), there is also a point of diminishing returns that should not be surpassed.

To address this "right sized" question, the city uses the Budget One process previously mentioned in this document. The City Council endorsed the following seven outcome areas which form the basis for developing the city-wide budget, which in turn funds the various levels of services.

- Economic Growth and Competitiveness
- Healthy and Sustainable Environment
- Improved Mobility
- Innovative, Vibrant and Caring Community
- Quality Neighborhoods
- Responsive Government
- Safe Community

All city departments respond to the outcome areas by submitting budget proposals that support the above goals. The budget proposals describe the services that will be provided, the outcomes that will be achieved and the overall costs. Budget proposals are also typically required to have both cost containment options and growth options.

City-wide, cross-department employee teams evaluate the proposals and rank them by importance and sometimes recommend cost adjustments. Ultimately, the important services are funded and lesser ones are sometimes dropped. A packet of recommended service proposals is sent to city leadership for consideration.

Prior to the finalization of the budget, the City also holds three budget hearings and two budget open houses. The result is that the City can say that the services provided have been thoroughly justified, evaluated and approved.

Community Loss and Save Data

Table VIII – 5 Year Cardiac Arrest Survival

Year	Cardiac Arrest Survival Rate	Methodology
2017	**56.3%**	Utstein-(Witnessed, presumed cardiac, presents with VF or VT) – 5 year rolling average as reported for Bellevue Fire by King County Emergency Medical Services. KCEMS follows patient to discharge.

[3] 2017 Bellevue Performance Measures Survey p. 93

2016	**60.14%**	Utstein-(Witnessed, presumed cardiac, presents with VF or VT) – 5 year rolling average as reported for Bellevue Fire by King County Emergency Medical Services. KCEMS follows patient to discharge
2015	**56.1%**	Utstein-(Witnessed, presumed cardiac, presents with VF or VT) – 5 year rolling average as reported for Bellevue Fire by King County Emergency Medical Services. KCEMS follows patient to discharge
2014	**58.33%**	Utstein-(Witnessed, presumed cardiac, presents with VF or VT) – 5 year rolling average as reported for Bellevue Fire by King County Emergency Medical Services. KCEMS follows patient to discharge
2013	**58.59%**	Utstein-(Witnessed, presumed cardiac, presents with VF or VT) – 5 year rolling average as reported for Bellevue Fire by King County Emergency Medical Services. KCEMS follows patient to discharge

Table IX – 5 Year Fire Loss

Year	Total Fire Loss
2017	**$3,486,127**
2016	**$6,255,687**
2015	**$20,907,905**[4]
2014	**$2,635,786**
2013	**$4,312,615**

Table X – 5 Year Civilian Fire Casualties

Year	Civilian Injuries	Civilian Deaths
2017	7	**0**
2016	8	**6**
2015	3	**0**
2014	1	**1**
2013	4	**0**

[4] $20,000,000 attributed to Auto Nation Ford fire

Table XI – 5 Year Structure Fires Confined

Year	Confined to Room of Origin
2017	**85.2%**
2016	**79.2%**
2015	**91.2%**
2014	**90.1%**
2013	**91.7%**

Agency goals

The Bellevue Fire Department's agency goals are explained more in-depth in our *Strategic Plan*. A summary of the goals developed in that plan are as follows:

I. Keep Our Community Safe

A. Prevent Fire & Medical Emergencies
   a. Prioritize resources for prevention activities to reduce the frequency and severity of fires and medical emergencies in the communities we serve.
   b. Ensure the effectiveness and consistency of fire inspections

B. Prepare for Disasters
   a. Enhance our public education and disaster preparedness outreach.
   b. Strengthen our ability to communicate with the public during a disaster.
   c. Increase our awareness of local hazards and vulnerabilities.
   d. Improve operational and recovery planning.

C. Provide timely, effective and consistent emergency responses across the communities we serve.
   a. Adopt and adhere to measurable standards and clear performance targets.
   b. Formalize our process of analyzing, evaluating and communicating our performance.
   c. Make changes to address under-performance.
   d. Develop a system of measures to indicate when and where additional staffing should be considered in the Department.

D. Maintain our standard of excellence in pre-hospital medical care.
   a. Continue to effectively partner with King County Emergency Medical Service (KCEMS).
   b. Reintroduce the robust review of Basic Life Support (BLS) medical incident report forms (MIRF) and expand it for our partner agencies as part of a countywide effort.

E. Assert a leadership role in crafting regional solutions.
   a. Advance the provision of regional public safety services.
   b. Develop and support agreements or relationships that allow agencies to look at resources regionally rather than locally when considerations for deployment are made.

II. Invest in Our Employees & Expertise

A. Continue to invest in & find more efficient ways to provide employee training and professional development.
   a. Focus our training efforts on core and emerging areas of need.
   b. Increase the efficiency and impact of our training resources by exploring opportunities to provide training regionally or adopt "train-the-trainer" approaches

B. Improve our internal communications.
    a. Continue to conduct an annual detailed survey focused on internal communications to better understand how we can more effectively communicate in our modern environment.
C. Continue to invest in our employees' safety, health, career and future.
    a. Prevent injuries and speed recovery through a robust wellness program.
    b. Create a diverse and rewarding workplace to attract and retain quality employees.
    c. Establish a team to advance proactive succession management throughout the organization.
D. Empower our employees to take initiative.
    a. Create and manage a program that aligns individual talents with organizational needs.
    b. Create a workplace environment that rewards initiative and promote professional development.

III. Maintain Appropriate Infrastructure

A. Ensure our facilities meet current and future department needs.
    a. Maintain current facilities to ensure a safe and livable work environment.
    b. Plan for future growth through the implementation of the 2014 Facilities Master Plan.
B. Ensure all necessary apparatus and equipment are in good working order.
    a. Inspect and evaluate apparatus and equipment annually.
    b. Strengthen our systems and procedures for regular equipment6 testing and maintenance.
    c. Work with the Apparatus and Equipment Teams to establish clear responsibilities and apparatus and equipment standards.
    d. Continue to work to establish a replacement plan for all firefighting, rescue, and personal protective equipment.
C. Employ technology and communication solutions that provide efficiencies and improve services.
    a. Continue to advance and advocate the multi-faceted use of technology tools for efficiencies.
    b. Continue to meet monthly with the Technology Team to discuss emerging technology ideas, trends and need.

IV. Strengthen Our Ability to Engage Effectively with Our Public

A. Build the Department's multicultural connections and capabilities.
    a. Expand a prevention outreach program to use data-based research to target and communicate with groups facing the highest risk from fires, disasters and health emergencies.
    b. Increase the cultural competency of all staff through specialized training in multicultural connections and capabilities.
    c. Leverage technology to improve communications with diverse communities when we are unable to deploy specialized personnel with relevant experience.
B. Expand our opportunities for effective, quality public engagement.
    a. Increase the effectiveness of our outreach efforts by prioritizing and coordinating with partners to develop new tools.
    b. Increase communication with contract city officials and outreach to residents of contract cities.
    c. Continuously improve our efforts through data-based assessments of the effectiveness of outreach programs.

Insurance rating

The Bellevue Fire Department maintains a Class 2 rating from the Washington State Survey and Rating Bureau (WSRB). The operation of WSRB is funded by an annual assessment of its subscribers, based on premiums written in Washington. WSRB has been in continuous operation since 1911, with roots that go back into the 19th century.

WSRB evaluates all Washington communities for their fire protection/suppression capability using a schedule approved by the Washington State Office of the Insurance Commissioner. WSRB assigns each community a Protection Class of 1 through 10, where 1 indicates exemplary fire protection capabilities, and 10 indicates the capabilities, if any, are insufficient for insurance credit. This rating system, used throughout the state of Washington, is generally considered more rigorous than the more common Insurance Services Office (ISO) rating used throughout the rest of the country.

A Class 2 rating places Bellevue in the top 1 percent of the 46,699 rated departments in the U.S. and among the top three departments in the state. As of January 2018, there are no Class 1 rated departments in the state.

To determine a community's Protection Class WSRB objectively evaluates four major areas:

- **Fire Department**
  - WSRB reviews such items as engine companies, ladder companies, distribution of fire stations and fire companies, automatic aid received, response to alarms, equipment carried on apparatus, apparatus maintenance, pumping capacity, reserve apparatus, department personnel and training.
- **Water Supply**
  - Water supplies used are reviewed to determine their adequacy for fire-suppression purposes. Major tasks include calculating required fire flows (gpm) for buildings and conducting flow tests to measure water pressures (psi) and volume (gpm). They also consider hydrant size, type, and installation, as well as the inspection frequency and condition of fire hydrants.
- **Emergency Communications Systems**
  - The community's 911 system is evaluated including facilities, handling and dispatching fire alarms, dispatch personnel and training.
- **Fire Safety Control**
  - Fire prevention activities such as fire code enforcement, public education and building code enforcement are reviewed.

The Fire department score accounts for 40% of WSRB's evaluation. Another 35% of the evaluation focuses on the public or private water supplies available to fight fires. Other factors include the capabilities of the 911 emergency communications/dispatch center (9%) and community fire prevention activities (16%). About half of a community's classification is based on capabilities that are not under the direct control of the fire department.

The rating was last conducted in November 2014, and the rating bureau will reevaluate the department at its discretion, or at the request of the department

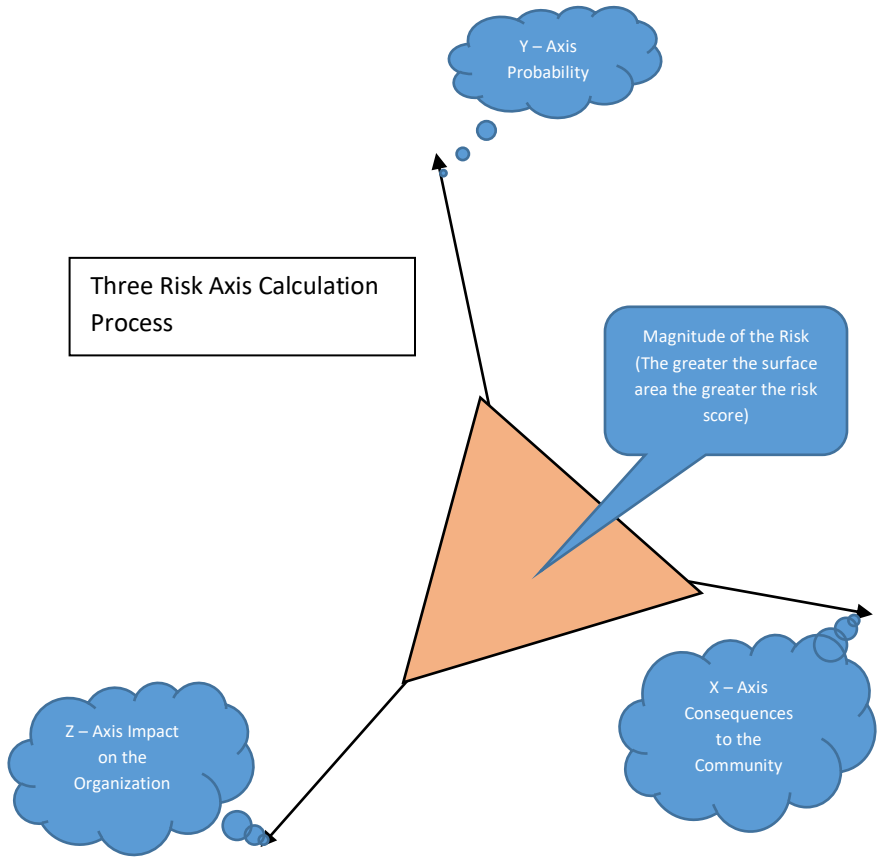
Section 3 All-Hazard Risk Assessment of the Community

A comprehensive risk assessment is a critical aspect of creating standards of cover by assisting the Department in quantifying the risks that it faces in the community served. Once those risks are known, the Department is better equipped to determine if the current response resources are sufficiently staffed, equipped, trained and positioned. In this component, the factors that drive the service needs are examined in a precise and scientific manner to determine the response capabilities needed to adequately address the existing risks.

The risks that the Department faces can be natural or man-made and may be affected by the changing demographics of the community served. In the past, the ability to analyze these risks has been very limited or non-existent. With the extensive amount of information available from databases, and public research, departments now can start recognizing these risks and can begin working towards mitigating and minimizing their effects.

Prior risk analysis has only attempted to evaluate two factors of risk: probability and consequence. This risk analysis will also consider the impact of each risk to the organization. This three-axis approach to evaluating risk is depicted in the probability/consequence/impact matrix. **[Figure VII]**.

Figure VII - Probability, consequence and impact matrix



The general qualitative and quantitative measurements of each risk are listed within the graphically-designed matrix. The matrix rates consequences to the community **[Table XII]** (consequence = C) on the X axis ranging from insignificant to catastrophic. Event likelihood **[Table XIII]** (probability=P) is rated on the Y axis, ranging from unlikely to frequent. The impact to the organization **[Table XIV]** (impact = I) is rated on the Z axis and ranges from insignificant to catastrophic. Total risk is calculated using Heron's Formula **[Figure VII]**.

Figure VIII - Heron's Formula

$$RC = \frac{\sqrt{(PC)^2 + (CI)^2 + (IP)^2}}{2}$$

Table XII - Consequence to Community Matrix

Risk Score	Descriptor	Impact Categories	Description
2	Insignificant	Life Safety	1 or 2 people affected, minor injuries, minor property damage, and no environmental impact.
4	Minor	Life Safety Economic and Infrastructure Environmental	Small number of people affected (<10), no fatalities, and small number of minor injuries with first aid treatment. Minor displacement of people for <6 hours and minor personal support required. Minor localized disruption to community services or infrastructure <6 hours. Minor impact on environment with no lasting effects.
6	Moderate	Life Safety Economic and Infrastructure Environmental	Limited number of people affected (11 - 50), no fatalities, but some hospitalization and medical treatment required. Localized displacement of small number of people for 6 – 24 hours. Personal support satisfied through local arrangements. Localized damage that is rectified by routine arrangements. Normal community functioning with some inconvenience Some impact on environment with short-term effects or small impact on environment with long-term effects.
8	Significant	Life Safety Economic and Infrastructure Environmental	Significant number of people (51-100) in affected area impacted with multiple fatalities, multiple serious or extensive injuries, and significant hospitalization. Large number of people displaced for 6 - 24 hours or possibly beyond. External resources required for personal support. Significant damage that requires external resources. Community only partially functioning, some services unavailable. Significant impact on environment with medium to long-term effects.
10	Catastrophic	Life Safety Economic and Infrastructure Environmental	Very large number of people (>100) in affected area(s) impacted with significant numbers of fatalities, large number of people requiring hospitalization with serious injuries with long term effects. General and widespread displacement for prolonged duration and extensive personal support required. Extensive damage to properties in affected area requiring major demolition. Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support. Significant long-term impact on environment and/or permanent damage.

Table XIII - Probability Matrix

Risk Score	Descriptor	Indicative chance of occurrence in each 5-year period	Description
2	Unlikely	2%-25%	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or no recent incidents in associated organizations, facilities or communities; and/or little opportunity, reason or means to occur; may occur once every hundred years.
4	Possible	26%-50%	Might occur at some time; and/or few, infrequent, random recorded incidents or little anecdotal evidence; and/or very few incidents in associated or comparable organizations, facilities or communities; and/or some opportunity, reason or means to occur; may occur once every twenty years.
6	Probable	51%-75%	Likely to or may occur/recur every 1– 5 years; regular recorded incidents and strong anecdotal evidence and will probably occur in many circumstances.
8	Highly Probable	76%-90%	Likely to or may occur/recur every year or less; high level of recorded incidents and/or strong anecdotal evidence.
10	Frequent	90%-100%	Occurs at least yearly with very infrequent year's event does not occur.

Table XIV - Impact to Organization Matrix

Risk Score	Descriptor	Impact Categories	Description
2	Insignificant	Personnel and resources	One apparatus out of service for period not to exceed 1 hour.
4	Minor	Personnel and resources	More than one but not more than three apparatus out of service for a period not to exceed 1 hour.
6	Moderate	Personnel and resources	Two to four apparatus out of service for a period between 1 hour and 4 hours. More than 50% of available resources committed to incident for over 30 minutes.
8	Significant	Personnel and resources	More than four apparatus out of service for a period over 4 hours or more than 80% of available resources committed to an incident for over 30 minutes.
10	Catastrophic	Personnel, facilities and resources	More than 90% of available resources committed to incident for more than two hours or event which limits the ability of resources to respond due to facility damage, infrastructure denigration and/or personnel inability to respond.

Risk Categorization process

This section contains an analysis of the various risks considered within the Bellevue Fire Department service area. As part of the analysis, historical and statistical data are used to determine trends based on the type and location of the emergency. Additional parameters utilized include natural barriers or locations for risk potential, mobility of risks, and socio-economic factors that might contribute to the risk within the city, economic impact factors if applicable, and the likelihood for an incident occurring.

The following factors/hazards were identified and considered:

- **Demographic Factors**
  - Population Density
  - Poverty Rates
  - Age Distribution
  - Language other than "English"
- **Man-Made Hazards**
  - Olympic Pipeline
  - Tier II Sites
  - Eastlink Light Rail
- **Natural Hazards**
  - Earthquake
  - Severe Weather
  - Flood
  - Liquefaction
- **Structural Risk**
  - Life Hazard
  - Mission Criticality
  - Water Supply
  - Building Usage
  - Building Construction
  - Special Hazards
  - Number of Stories
  - Square Footage

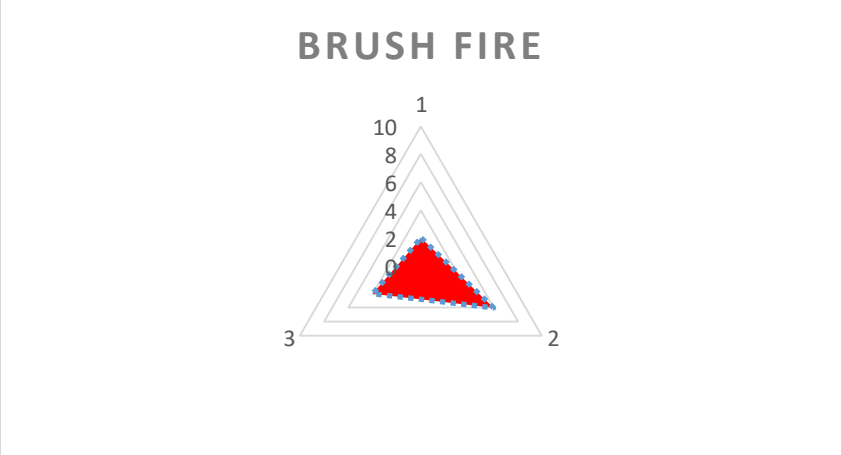
The assessment of each factor and hazard as listed took into consideration the likelihood of the event, the impact on the City itself, and the impact on our organization's ability to deliver emergency services.

The absence of an airport and shipping port preclude the need to conduct such analysis. As a result, the Department has chosen not to conduct risk analysis on aircraft and shipboard hazards.

Risk Classification and Categories

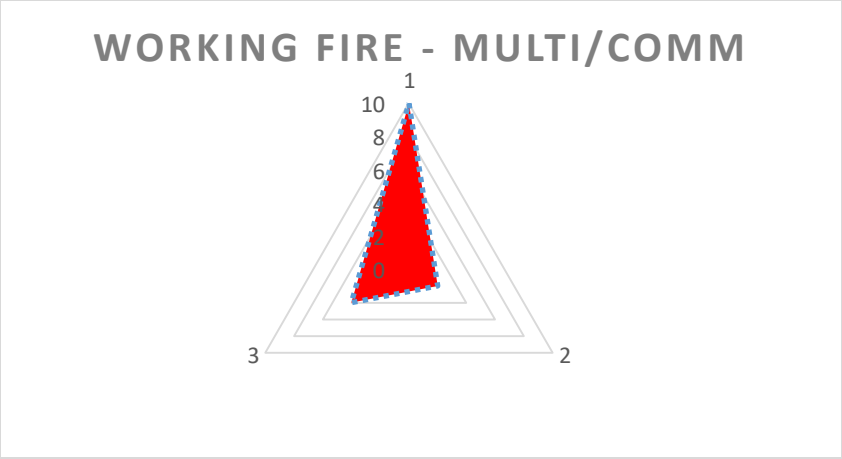
Low Risk

- BLS EMS Medical/Trauma
- Automatic Alarm – MFR/Comm
- Automatic Alarm – SFR
- Minor Flooding
- Trail Rescue
- Vehicle Fire
- Dumpster Fire
- Carbon Monoxide Investigation



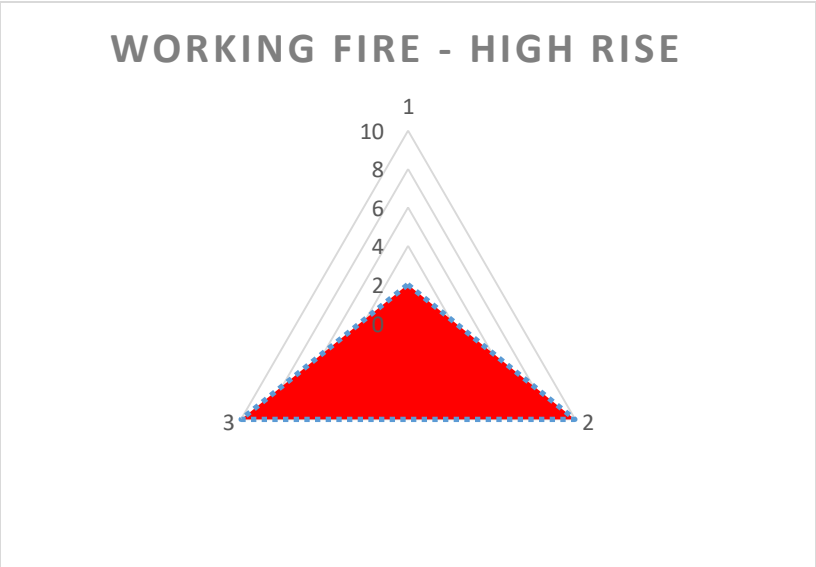
Moderate Risk

- Working Fire – SFR/MFR/Comm
- Suspicious Substance Investigation
- ALS Medical/Trauma
- Motor Vehicle Accident (MVA)
- MVA – FWY
- Vehicle Entrapment
- Brush Fire
- Low Angle Rescue
- Surface Water Rescue



High Risk

- Working Fire – Targeted Hazard
- Cardiac Arrest
- Mass Casualty Incident under 10 patients
- Confined Space Rescue
- Structural Collapse
- High Angle Rescue
- Trench Rescue
- Suspicious Substance with Injuries
- Industrial Leak

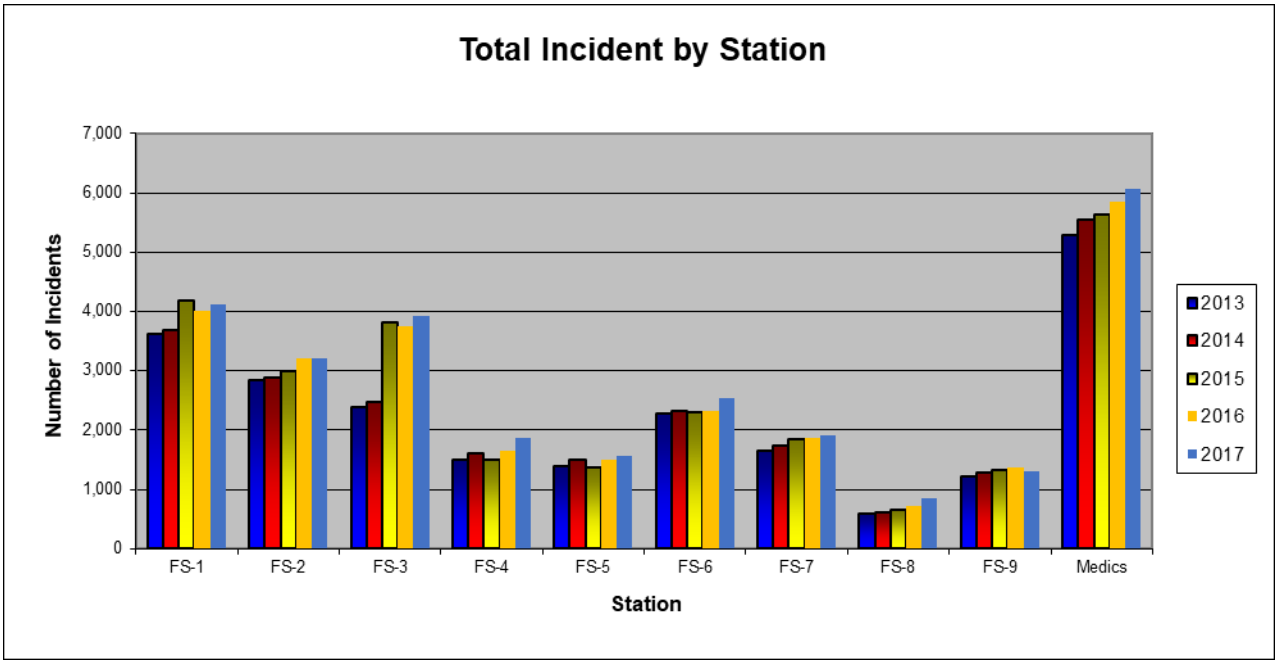


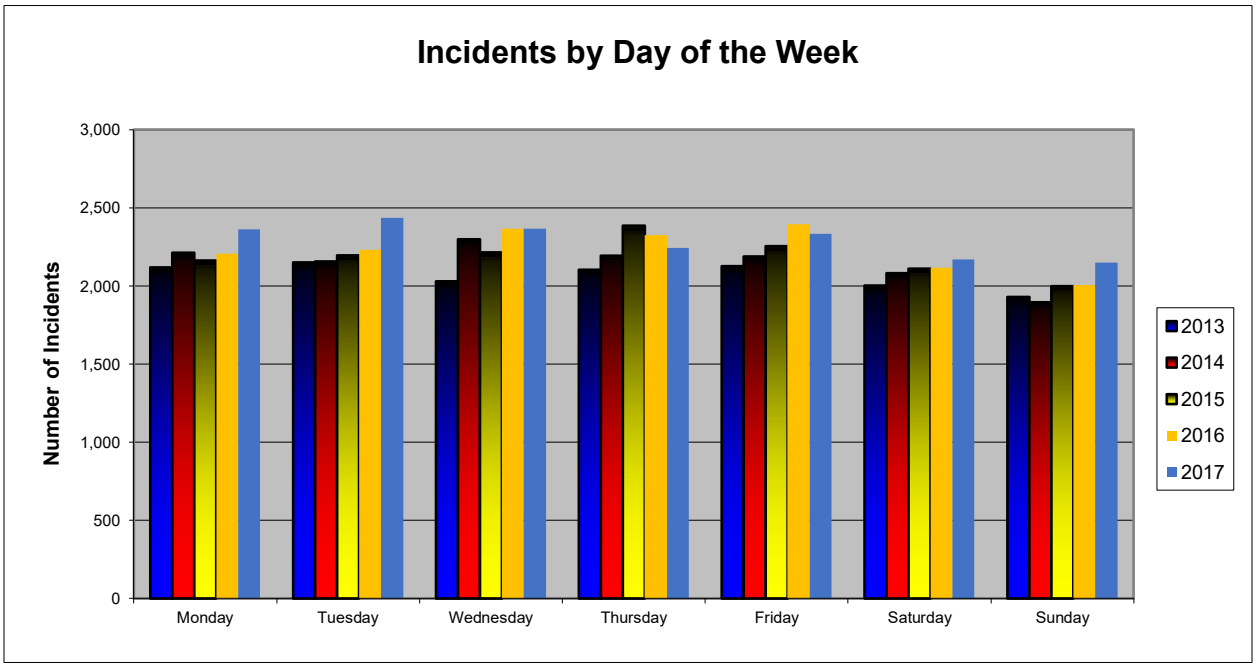
Special Risk

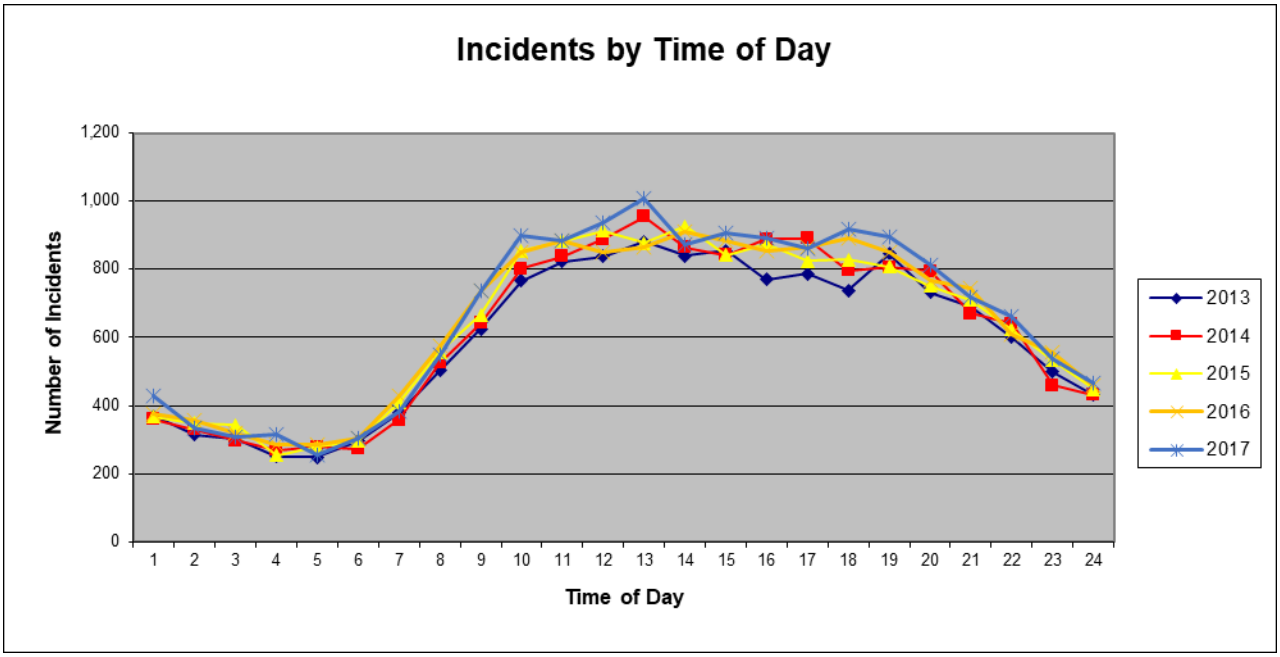
- Working Fire – High Rise
- Fire at Industrial with hazards
- Explosion - Major
- Tunnel Rescue
- Building Collapse
- Mass Casualty Incident over 10 patients

Geographical Planning Zones - Bellevue's Fire Station response areas

Fire station areas will be the primary planning zones used to determine and document the different categories and classes of risk. Additionally, these areas will be used to perform response time analysis according to the Benchmark Service Level Objectives and determine incident/response distribution. These planning zones will be the default geographic area used for communication, reporting and resource allocation decisions unless modifying factors exist.

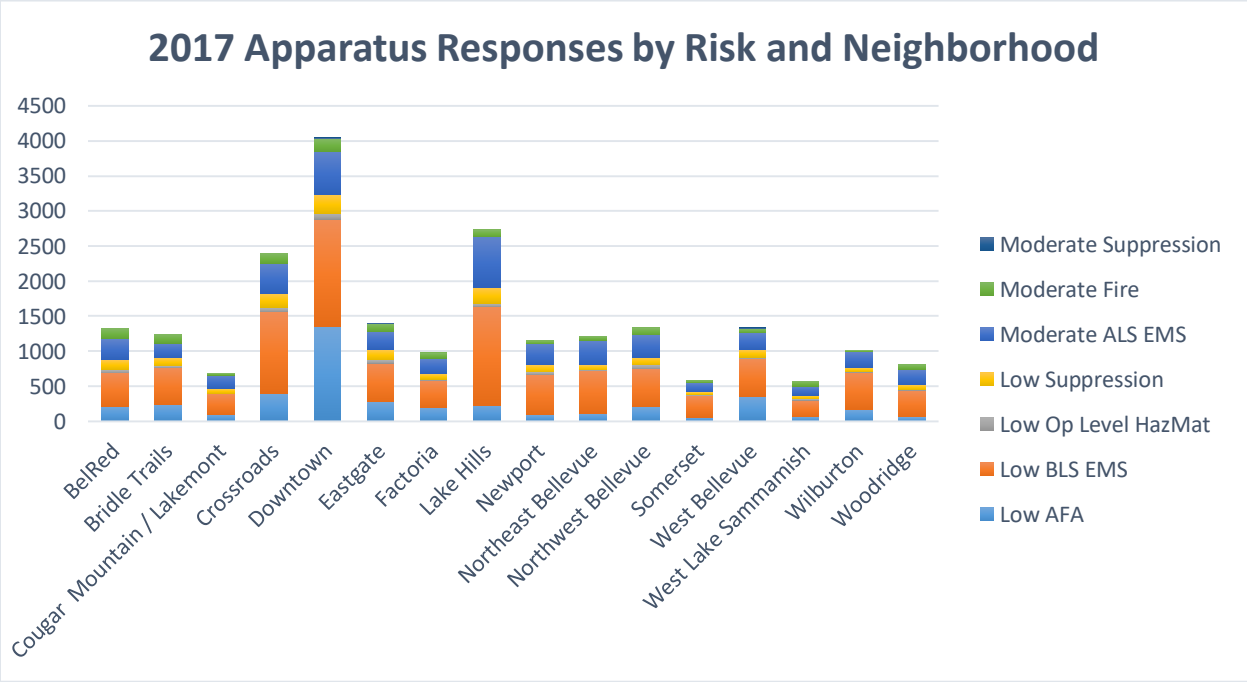

Total Incident by Station
Number of Incidents
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
FS-1
FS-2
FS-3
FS-4
FS-5
FS-6
FS-7
FS-8
FS-9
Medics
Station
2013
2014
2015
2016
2017


Incidents by Day of the Week
Number of Incidents
3,000
2,500
2,000
1,500
1,000
500
0
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
2013
2014
2015
2016
2017



Geographical Planning Zones - City of Bellevue Neighborhoods

These fifteen (15) planning zones will be used to validate response time component performance, incident/response distribution and communication/presentations to neighborhood groups. However, due to their exclusion of communities and areas served by Bellevue Fire that are outside the City limits, they do not represent overall system workload or performance.



Downtown –

Population: 11,931
Estimated Employment (2015): 50,562
Percentage of City: 9 percent
Under 18: 1,079 (9 percent of the area)
Housing Units: 8,805
Downtown Bellevue is the primary economic and employment center for the city and the region – and over the past two decades, has become Bellevue's fastest growing residential neighborhood. Downtown Bellevue sets a high bar for urban living. With a great mix of senior housing, young professionals and families, downtown Bellevue has become home to an intergenerational community.

BelRed -

Population: 1,244
Percentage of City: 1 percent
Under 18: 245 (19.7 percent of the area)
Housing Units: 493
BelRed is being transformed from a light industrial area into one of Bellevue's newest mixed use, transit oriented neighborhoods. The transformation will include the addition of three Sound Transit light rail stations, new investments in arterial street improvements, pedestrian and bike facilities, an arts district, parks and open spaces and the daylighting of the Kelsey Creek salmon-bearing headwaters and Golf creek. Located between Downtown Bellevue and Microsoft Headquarters, the Spring District is already under construction, adding new residential and office space, as well as a new brewpub. This development will primarily consist of a mix of mid-rise and high-rise structures. BelRed will also be welcoming the campus of the new Global Innovation Exchange, a partnership between two leading research universities, the University of Washington and Tsinghua University of China.

Bridle Trails

Population: 10,469
Percentage of City: 8 percent
Under 18: 1,847 (17.6 percent of the area)
Housing Units: 4,943
Bridle Trails is Bellevue's equestrian neighborhood area, with acres of residential property devoted to pastures and trails for horses. Bridle Trails is heavily wooded, with an extensive trail system and a predominance of large single-family lots. Nearly two-thirds of the area is covered with second-growth timber and residents have accepted extra regulation to protect trees on public and private property. Local residents also have taken the initiative to preserve Bridle Trails State Park, a 482-acre preserve with 28 miles of equestrian and pedestrian trails.

While most of Bridle Trails has a quiet, semi-rural appearance with horses grazing in lush green meadows, the area includes a strip of apartments and condominiums along 148th Avenue NE, across from Microsoft's main campus.

Cougar Mountain/Lakemont

Population: 11,416
Percentage of City: 8 percent
Under 18: 2,680 (23.5 percent of the area)

Housing Units: 4,134

Predominately single-family residential neighborhoods rise up the slopes of Cougar Mountain in this scenic neighborhood area adjacent to natural, untamed stretches of countryside. A pedestrian trail network links homes to neighborhood parks, neighborhoods to each other and the regional Cougar Mountain Park (in Newcastle) and the neighborhood shopping center at Lakemont. Steep grades, upscale developments with large newer homes and spectacular views are characteristic of Cougar Mountain/Lakemont. The area is home to a large number of recently built planned neighborhood communities, including the Summit, Forest Ridge, Vuemont and Cougar Mountain/Lakemont developments.

Crossroads

Population: 14,404
Percentage of City: 10 percent
Under 18: 2,897 (20.1 percent of the area)
Housing Units: 6,137

Crossroads is the heart of East Bellevue. It's the focal point for entertainment, cultural exchange, shopping and community services for area residents. Bustling, densely populated and richly diverse, Crossroads is characterized by an abundance of large apartment complexes, established single-family neighborhoods and restaurant and retail establishments. Crossroads Shopping Center, located at Northeast Eighth Street and 156th Avenue Northeast, is a hub of activity, featuring regular stage entertainment and special events, a seasonal Farmer's Market, a popular ethnic food court and an activity area where local residents gather to play chess and other games. The city operates three major facilities to address the needs and interests of East Bellevue residents: Mini City Hall, offering information and referral services in many languages; the Crossroads Community Center and the Crossroads Police substation. Many of the community's nonprofit human service providers are located nearby.

Eastgate & Factoria

Population: 9,633
Percentage of City: 7 percent
Under 18: 2,321
Housing Units: 4,003

The Eastgate and Factoria neighborhoods are located along the east-west spine of I-90 and its intersection with I-405, providing a mix of commercial office space and retail, multi-family apartments and established single family neighborhoods, including Bellevue's most recently annexed neighborhood, Eastgate. Marketplace at Factoria provides an assortment of retail services, a movie theater and a number of local restaurants, and the majority of high-rise structures located outside the CBD. The Eastgate Park and Ride provides commuters with easy access to both the Eastside and Seattle.

Lake Hills

Population: 16,692
Percentage of City: 12 percent
Under 18: 3,436 (20.6 percent of the area)
Housing Units: 6,909

Lake Hills is Bellevue's most populous residential neighborhood area, including a number of smaller neighborhoods and multi-family communities. Lake Hills has two local commercial shopping centers, both recently redeveloped, including Lake Hills Village and Kelsey Creek Center. It is also home to the growing campus of Bellevue College.

Newport

Population: 9,667
Percentage of City: 7 percent
Under 18: 2,138 (22.1 percent of the area)
Housing Units: 3,786
The Newport area includes four distinct communities; the Newport Hills/Lake Heights neighborhoods east of Interstate 405, Greenwich Crest uphill to the west of I-405, Lake Lanes nestled along Lake Washington and the Newport Shores district built around a series of man-made inlets. Newport Shores and Lake Lanes are neighborhoods built with homes oriented toward the waterfront, boating and lake activities.

Northeast Bellevue

Population: 11,024
Percentage of City: 8 percent
Under 18: 2,349 (21.3 percent of the area)
Housing Units: 4,127
Stretching from Lake Sammamish to the Microsoft campus in Redmond, Northeast Bellevue is a tapestry of neighborhoods, parks and schools. Most of the neighborhoods in the western portion of Northeast Bellevue were built in the late 1960s, 1970s and 1980's, reflecting a woodsy character in subdivision names such as Sherwood Forest, Lakewood Park, Bretton Wood, Tam O' Shanter and Ardmore. Northeast Bellevue is home to three elementary schools; Ardmore Elementary, Sherwood Forest Elementary and Bennett Elementary, as well as, Interlake High School. The southeastern portion of the area features two miles of frontage along Lake Sammamish, with large homes hugging the lakeside and other homes nestled in the heights above the lake. The northern, triangular portion of this neighborhood juts into Redmond.

The future of Northeast Bellevue will be served by easy access to the Redmond light-rail station at the Microsoft campus. It will also provide close proximity to the Overlake Village, a major new urban center on the Bellevue/Redmond border

Northwest Bellevue

Population: 9,480
Percentage of City: 7 percent
Under 18: 2,085 (22 percent of the area)
Housing Units: 4,340
Northwest Bellevue includes some of the oldest neighborhoods in Bellevue, including Meydenbauer Bay, Vuecrest, Diamond S Ranch, Bellewood Farms, Apple Valley and Northtowne. Northwest Bellevue maintains a diversity of neighborhood charm, with distinct neighborhood communities, ranch estates, single-family ramblers, extensive remodels and larger newly-built residential homes. Located close to downtown, residents have easy access to the downtown amenities, as well as, freeway access to 520.

Somerset

Population: 8,311
Percentage of City: 6 percent
Under 18: 2,089 (25.1 percent of the area)

Housing Units: 2,890

The hill called Somerset, which tops out just under 1,000 feet, gazes out across Lake Washington and Seattle to Puget Sound and the Olympic mountains. Somerset has many neighborhoods, including Somerset, Forest Hill, Eaglesmere, Westwood Highlands, Forest Park, Forest Park Meadow, Forest Glen and the Woods. Due to its proximity to Interstate 90 and Interstate 405, Somerset provides quick and easy access to employment, entertainment, shopping and recreation.

West Bellevue

Population: 8,382
Percentage of City: 6 percent
Under 18: 1,790 (21.4 percent of the area)
Housing Units: 3,948

Located south of Downtown Bellevue, west of I-405 and north or I-90, West Bellevue is home to some of Bellevue's most established and historic neighborhoods, with borders on Lake Washington and the Mercer Slough, the area consists of the neighborhoods of Enatai, Bellecrest, Surrey Downs, Killarney Circle and Meydenbauer Point.

The future of West Bellevue will be served by the South Bellevue light rail station and South Bellevue Park & Ride, providing easy access to Seattle and downtown Bellevue.

West Lake Sammamish

Population: 6,252
Percentage of City: 5 percent
Under 18: 1,308 (20.9 percent of the area)
Housing Units: 2,397

West Lake Sammamish is oriented toward the waterfront of Lake Sammamish and Phantom Lake. Including the neighborhoods of Spiritridge, Phantom Lake, 41.5, Sammamish Heights, Rosemont Beach, Lake Manor and West Lake Sammamish.

West Lake Sammamish is known for its original waterfront vacation homes, as well as, the newer neighborhoods along the steep slopes of the hillside or at the waterfront, with panoramic views to the east Cascades.

Wilburton

Population: 3,790
Percentage of City: 3 percent
Under 18: 713 (18.8 percent of the area)
Housing Units: 1,914

Platted in 1904 as the company town for the Hewitt-Lea Logging Company, Bellevue's historic Wilburton neighborhood is an enclave of single-family and multifamily housing known for its rich history and its parks and wooded areas. Wilburton is ideally situated surrounded by major parks, including the widely acclaimed Bellevue Botanical Garden and the 160-acre Kelsey Creek Park, as well as its close proximity to downtown Bellevue.

Wilburton's business district on the west will provide the destination for the Grand Connection linking to the pedestrian corridor across I-405, through downtown to Meydenbauer Bay. The Wilburton light rail station on NE 8th will provide easy access across Bellevue and into Seattle.

Woodridge

Population: 5,115
Percentage of City: 4 percent
Under 18: 1,058 (20.7 percent of the area)
Housing Units: 2,237

Woodridge is characterized by quiet streets and comfortable family homes In the center of Woodridge is Norwood Village, a neighborhood built by World War II veterans in the late 1940s, which adds to the historical and architectural significance of the community.

Geographical Planning Zones - U.S. Census Tracts

28 census tract currently exist within the service area. The two tracts that currently exceed the "High Density" population threshold (0238.03 & 0238.04) will be evaluated under the adopted Benchmark Service Level for those areas.

- In order to better evaluate the increasing population density in the two Census Tracts that comprise the Downtown neighborhood, these areas have been designated as "High Density" planning zones and will be evaluated on a benchmark standard that uses a 2:00 minute travel time instead of the urban area 4:00 minute standard. This "High Density" threshold is achieved when a Census Tract exceeds 12,499 individuals per square mile. This threshold will be updated using the data from the most recent American Community Survey (ACS) conducted by the United States Census Bureau. Additionally, the reduced benchmark for response will better reflect the "verticality" of these more densely populated zones and highlight the increasing challenges in ensuring risk is minimized in these areas.

Apart from the Downtown and Bel-Red Corridor, the recurrence and locations of incidents also indicates a mostly-uniform risk level throughout the service area. Otherwise, Census demographic data will primarily be used for Community Risk Reduction efforts and decisions on where and how to focus outreach strategies by the Community Risk Reduction Group (CRRG).

Demographic factors for Community Risk Reduction

Population

The density of the population within a given geographical area should be evaluated to determine the likelihood of service requests. While there is no definitive number that indicates when resources may be required, the density of the population is both a good indicator of service request activity and a necessary input into outreach/prevention efforts.

Poverty

Socio-economic factors such as poverty and income distribution can greatly affect the use of the pre-hospital system. Poverty rates are evaluated to determine the areas more likely to use pre-hospital providers in lieu of scheduled medical providers. While Bellevue is considered a prosperous community, almost one out of every five Bellevue School District students were eligible for the National School Lunch Program in the 2014-15 school year. Keeping these economic disparities in mind is important for the Department when determining diverse outreach efforts and a focus on vulnerable populations.

Age Distribution

The age of the population within a given area can greatly determine its use of pre-hospital care. Evaluation of the number of seniors and children by geographical districts can provide insights into trends in service delivery and quantitate the probability of future service requests.

Language other than English spoken in the home

Increasing cultural and ethnic diversity within a community can be challenging. Contacting diverse, multi-cultural groups in advance of emergencies can reduce the barriers to response and help to mitigate incidents by providing information prior to the situation arising. Additionally, the data allows the limited resources available for outreach/prevention to better focus on the most "at-risk" populations.

Geologic/natural/manmade environmental risks

Manmade Hazards

From protection of critical infrastructure like the Olympic Pipeline to Tier II storage of hazardous materials to the future placement of the Eastlink Light Rail line and Maintenance Facility, human caused hazards are addressed through a GIS based analysis of properties' and geographical areas likely to be affected in the event of a significant event.

Liquefaction

Defined as the change of state that occurs in soil whereby a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, usually earthquake shaking or other sudden change in stress condition, causing it to behave like a liquid. Analysis of properties potential damage due to liquefaction gives us a better understanding of where this is likely to occur and promotes future planning to ensure response strategies account for this hazard.

Floodplain

Floodplain analysis promotes more awareness of inherent dangers within the watershed area and provides information for pre-planning efforts to mitigate the effect of rising waters.

Earthquake

The effectiveness of pre-planning and mitigation activity is severely impacted by the damage a significant event would have on the entire region. However, awareness and highlighting of this hazard serve the community and the organization by reinforcing the need for preparedness activity and education, and encouraging individuals to take individual responsibility during a high impact event.

Windstorm/High Wind Event

Wind events are the most likely natural hazard to occur within the service area with most of years experiencing at least one significant wind event. Evaluation of geographic areas most likely to suffer significant damage from wind event allows for modification of response strategies, focused outreach efforts and partnerships with other organizations to reduce the impact these events have on the community.

Building Structural Risk

The design, construction, fire protection systems, occupancy use, life hazard and water supply contribute to the structural risk associated with an incident within the building. [**Table XVI**] indicates buildings that have less than 1,000 gallons per minute of water available at the nearest hydrant.

Table XV – Building with Fire Flow under 1000GPM

	Occupancy Use							
Fire Flow 1000 GPM or Less	**A**	**B**	**E**	**M**	**R**	**S**	**U**	**Grand Total**
Beaux Arts								
Number of Buildings					70			70
Square Footage					259,700			259,700
Bellevue								
Number of Buildings	26	31	10	16	11,530	13	3	11,629
Square Footage	226,326	777,809	131,362	117,722	40,318,242	439,099	1,670	42,012,230
Clyde Hill								
Number of Buildings					400			400
Square Footage					1,835,782			1,835,782
Hunts Point								
Number of Buildings					15			15
Square Footage					46,580			46,580
Medina								
Number of Buildings		1			180			181
Square Footage		8,662			1,040,374			1,049,036
Newcastle								
Number of Buildings					149			149
Square Footage					396,570			396,570
Yarrow Point								
Number of Buildings		1			333			334
Square Footage		3,016			1,500,613			1,503,629
Total Number of Buildings	**26**	**33**	**10**	**16**	**12,677**	**13**	**3**	**12,778**
Total Square Footage	**226,326**	**789,487**	**131,362**	**117,722**	**45,397,861**	**439,099**	**1,670**	**47,103,527**

Structural risk assessment score

Structural risk assessment involves three important aspects:

- Categorizing each building according to its unique level of risk.
- Quantifying the numbers of each building with similar risk levels.
- Geographically analyzing and depicting the locations and concentrations of these buildings.

The Bellevue Fire Department structural fire risk assessment utilized the risk assessment matrix developed for military agencies (DODI 6055.6), which examines eight specific factors including life hazard, mission criticality, special hazards, water supply, building usage, building construction, number of stories, and square footage. Each of these factors were assigned a point total ranging from 1 to 3, and the total number of points determine the risk factor associated with the occupancy and the corresponding response requirements, as outlined below:

Standard of Response Coverage Worksheet
DODI 6055.6

Occupancy address: _____

Date: _____

Life Hazard
High Life Hazard (100>) 3
Medium Life Hazard (25-99) 2
Low Life Hazard (<25) 1

Mission Criticality
Mission Critical 3
Part Mission Critical 2
Non-mission Critical 1

Special Hazards
Hazmat or Explosives Rack Storage/Flammables 3
Small quantities hazmat or explosives 2
No Special hazards 1

Water Supply within 800 Feet*
One hydrant less than 1000 GPM 3
One hydrant less than 1000 GPM,
and one hydrant between 500 to 700 GPM 2
Two hydrants 1000 GPM or greater 1

* Current Information Technology Department GIS data is unable to assign the water supply category due to inability to compute distances. This is primarily due to multiple-building lots on large parcels. Although many buildings would qualify for a "1" (low risk) a default "2" was given to all parcels.

Building Usage
Industrial/Commercial 3
Single Family 2
Office 1

Building Construction
Type 5 Construction Combustible 3
Type 4 and Type 3 Construction 2
Type 2 and Type 1 Construction 1

Number of Stories

Three or more stories (40 feet or more) 3
Two stories building 2
Single Story building 1

Square Footage
15,000 square feet or greater 3
7,501 square feet to 14,999 square feet 2
7,500 square feet or less 1

The total numbers will be added and the following Total Risk Factor (TRF) will be assigned to the occupancy.

Table XVI – Structural Risk Score

Total Number	Risk Factor	Response Requirements
8 to 12	RF 1 = Low Risk	Single Engine Response
13 to 16	RF 2 = Moderate Risk	Full Response
17 to 21	RF 3 = High Risk	High Value Response
22 to 24	RF 4 = Special Risk	Special Value Response

The department utilized data from King County Geographical Information System (KCGIS) to calculate information specific to each of the eight factors identified in the military model (DODI 6055.6). Each building type resulted in a report created to determine a Total Risk Factor for each Assessor's File Number (AFN) located within the Bellevue Fire Department's, Fire Suppression/Basic Life Support (BLS) coverage zone. Because KCGIS maintain separate tables for each building type; separate reports were created for Apartments, Single Family Residential, Condominiums, and Commercial buildings. After determination of the Total Risk Factor (TRF) for each AFN, the data was exported to MS Excel and imported and geocoded using ArcMap Geographic Information Services (GIS). The resulting data was evaluated by TRF and Station response area to determine stations with the greatest areas of increased risk.

Table XVII - Structural Risk Evaluation by Station Area

Station ***Number of Buildings***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Grand Total**
Low Risk	1,066	4,166	5,962	2,027	2,440	1,131	995	1,448	2,909	22,144
Moderate Risk	1,272	1,449	2,523	1,230	2,502	1,556	338	3,479	3,015	17,364
High Risk	108	42	60	39	43	134	35	7	12	480
Special Risk	4	0	0	0	0	0	0	0	0	4
Total Number of Buildings	**2,450**	**5,657**	**8,545**	**3,296**	**4,985**	**2,821**	**1,368**	**4,934**	**5,936**	**39,992**

Table XVIII – Buildings

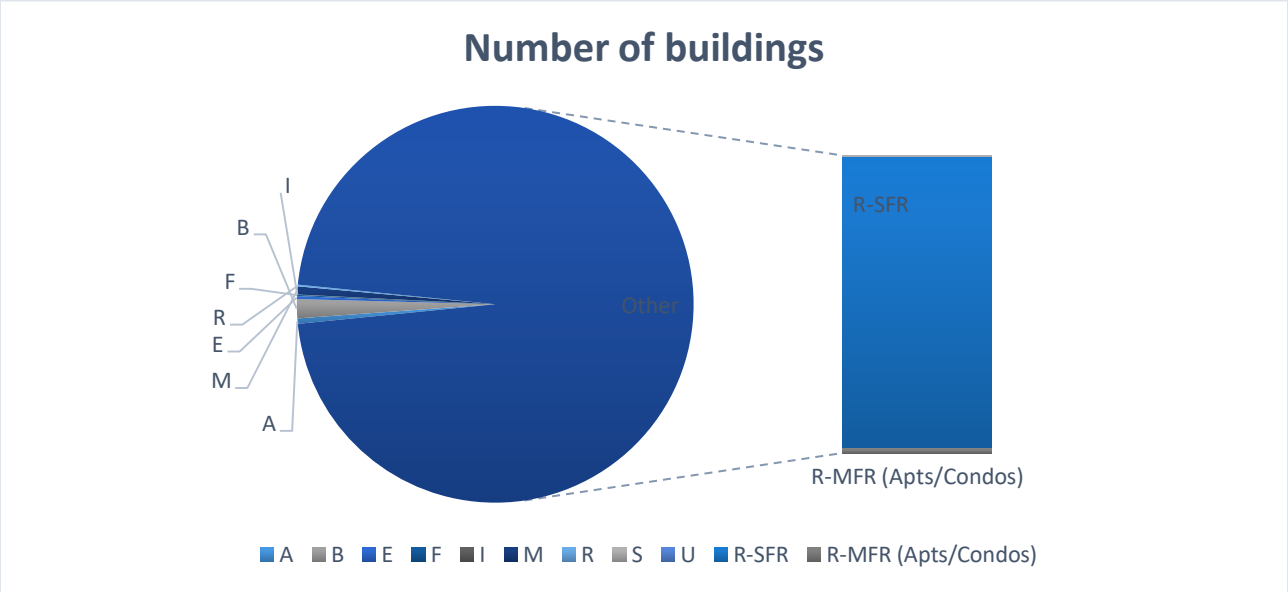
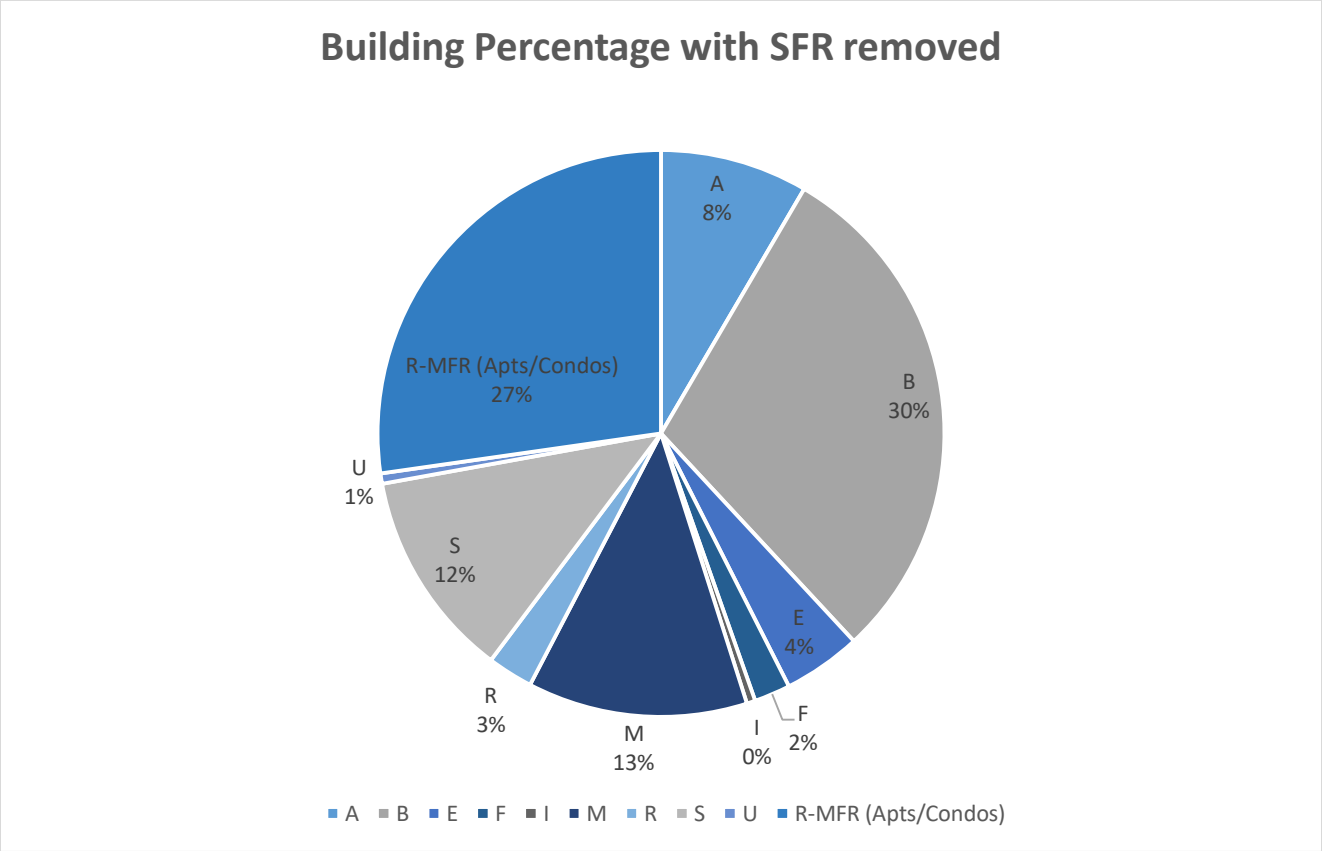


Table XIX – Buildings without single family



All hazard risk assessment

All risk data was then populated to the All Hazards Community Risk Assessment Visualization tool. This tool was used by the Community Risk Assessment (CRA) Group to evaluate overall risk, response plans and outreach strategies to mitigate that risk. The CRA Group was comprised of the following department staff: Fire Chief, Deputy Chief Operations, Deputy Chief Support Services, Fire Marshal, Emergency Manager, Community Liaison/Public Information Officer, Community Risk Reduction Specialist and the Business Analyst. The intent of creating the tool was to provide a framework for periodically reevaluating risk within the community by minimizing the effort and time involved in performing this task. This tool also provides a visual representation of various risks and their inter-dependencies. Multiple meetings were held with the CRA Group to evaluate the types of incidents, response plans and current outreach efforts to determine both the adequacy of current strategies and identify areas where we are deficient. Additionally, a gap analysis was performed to help inform the development of a Community Risk Reduction Plan (CRRP) and any other response plans that may require more complex analysis beyond the scope of the CRA group.

Response strategies - human caused events

Emergency Medical Incidents

- *BLS Medical/Trauma Risk Score: 24.66 - – **Low Risk***
- *Mass Casualty Incident (MCI) <10 patients Risk Score: 47.33 – **High Risk***
- *MCI >10 patients Risk Score: 60.46 – **Special Risk***
- *ALS Medical/Trauma Risk Score: 35.1 – **Moderate Risk***
- *MVA & MVA Freeway Risk Score: 29.59 – **Moderate Risk***
- *Cardiac Arrest Risk Score: 49.64 – **High Risk***

Definition

Emergency Medical Service (EMS) is all medical treatment and care which may be rendered at the scene of any emergency or while transporting any patient in a transport capable apparatus to an appropriate medical facility, including ambulance transportation between medical facilities.

History

EMS incidents represent nearly 78 percent of all Bellevue Fire Department responses. EMS responses include all trauma, medical, and motor vehicle accidents. BLS incidents mostly involve a single patient, are low risk and typically require a single fire department resource response. ALS incidents are moderate risk and typically receive two-resource responses: one ALS and one BLS.

Location and Extent

As expected, the greatest concentration of incidents is in the areas that have the highest population densities. The area known as the Central Business District (CBD) has the greatest concentration of calls for service. Other areas with significant concentrations are in the east Bellevue/Crossroads area, the Overlake area, and 148th Ave NE north of SR 520, Factoria, and high-density housing in the Coal Creek/Newcastle area, these concentrated areas represent the areas with greatest risk for EMS incidents.

Recurrence and Impacts

EMS incidents are clearly the most prevalent type of response within the Bellevue service area and determining outreach and prevention strategies to mitigate these incidents whenever possible will provide the most benefit to reducing strain on response resources.

Structure Fire

- *Working Fire - Single Family Residential Risk Score: 35.1 – **Moderate Risk***
- *Working Fire - Multi-Family Residential/Commercial Risk Score: 35.1 – **Moderate Risk***
- ***Working Fire – Targeted Hazard Risk Score: 50.28 – High Risk***
- ***Working Fire – High Rise Risk Score: 74.83 – Special Risk***

Definition

A structure fire is a fire involving the structural components of various types of buildings and, and for the purposes of this document, will also include fires within buildings of various types. Fires inside buildings that do not involve the structural components are typically called “room and content fires”. Buildings are places where people normally live, work or frequent and can include residences, businesses, assembly occupancies and even storage facilities.

Table XX - 5 Year Structure Fires

	2017	2016	2015	2014	2013
Kitchen	67	58	56	60	35
Structure	125	138	105	109	99
Total Structure Fires	192	196	161	169	134
Structure Fires % of Total	0.97%	1.04%	0.88%	0.95%	0.79%
Total Incidents	***19,822***	***18,764***	***18,214***	***17,739***	***16,943***

History

Structure fire responses average less than 200 incidents per year are typically moderate risk and comprise about 1% or less of total incidents. However, they are the highest-profile and the most demanding of response resources of recurring incidents that the department typically faces. It is notable that despite significant growth in both population and number of buildings, structure fire responses have not trended upward. The factors that contribute to the decline in suppression responses, include; safer home appliances, safer home construction, more durable automobiles as well as fire prevention and safety awareness efforts (e.g. the recent emphasis on smoke and carbon monoxide detectors in Multi-family residential dwellings). This decreasing trend in suppression responses is likely to continue as additional advancements in these areas are made. The next table **[Table XXI]** represents the amount and occupancy use of buildings within the Bellevue service area. Columns represent the nine fire stations in Bellevue and the occupancies within their first-due area.

Table XXI - Buildings by Occupancy

	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Grand Total
Assembly	36	24	35	19	9	21	6	6	8	164
Business	81	69	59	38	66	177	80	6	13	589
Educational	5	15	16	12	12	13	6	5	6	90
Factory	1	4	1	5	3	22	2	1		39
Institutional	1	1	2	1		4			1	10
Mercantile	78	20	22	13	17	79	16	1	5	251
Residential	2,235	5,503	8,402	3,176	4,864	2,396	1,225	4,914	5,896	38,611
Storage	9	20	7	32	13	109	30	1	5	226
Utility	4	1	1		1		3		2	12
Grand Total	**2,450**	**5,657**	**8,545**	**3,296**	**4,985**	**2,821**	**1,368**	**4,934**	**5,936**	**39,992**

Recurrence and impacts

Occurrence of fires are directly related to many factors that are unique to each community. Most of these factors are described earlier in this document and include variables like population densities, income levels, Climate, age of structures and even cultural influences.

One significant factor in the recurrence of structure fire not previously discussed is the ongoing fire prevention and code enforcement activities of the department. The Bellevue Fire Department Self-Assessment Manual has a more complete description of the ongoing efforts to reduce or prevent the occurrence of fire in the Bellevue service area. Both Fire Prevention staff and line firefighters take a very active role in education and enforcement efforts and the department believes that these efforts contribute to a safer community by reducing fire hazards.

An associated impact of structure fires is fire deaths. Bellevue averages less than one fire death per year and in most of these cases there are the following contributing factors:

- No working smoke detector.
- Alcohol or drug intoxication.
- Combination of the two.

The combination of fire code enforcement, relatively modern building construction and an educated and moderately affluent population, ensures that the department's overall structure fire risk is both manageable and moderate. High-rise structures, however, pose a special risk and those are separately assessed in the next sub-section.

High-rise Fires

- *Risk Score: 74.83 – Special Risk*

Definition

A high-rise fire is a fire involving the structural components of a building having floors more than 75 feet above the lowest level of fire department vehicle access.

History

High-rise development in the City of Bellevue has been one of the major components of the city's growth over the past 25 years. As the region's high-tech sectors have grown, so has the need for high-rise office spaces and the benefits that they provide for their employees. As recently as 10 years ago, Bellevue's use of high-rises was predominantly for business purposes. Recent development of residential high-rises has not only created a more urban living environment in the downtown core, but contributed the most to the city's overall population growth.

Apart from two high-rise buildings in the downtown core, all have been built with fixed fire sprinkler suppression systems. The two high-rises that were built prior to the code requirements for fire sprinklers are now partially sprinklered and retrofits are required as occupancy spaces undergo major renovation. The prevalence of fire protection and modern construction in the city is a major factor in the *Recurrence and Impacts* section to follow.

Previously, Bellevue's building code has limited the height of high-rises to 450 feet or less. The height restriction is variable based on the location of the property within the downtown core and the base elevation. The city's tallest high-rise structures are the twin 43 story towers called Bellevue Towers. In late 2017, the Bellevue City Council approved a building code amendment permitting buildings up to 600 feet in height to be constructed in certain areas of the downtown core. Currently, there are at least two projects under consideration for this new height restriction and three building in excess of 40 stories under construction.

Location and Extent

Figures IX, X and XI illustrate the locations of the high-rise developments within the city. There are approximately 61 high-rise structures in the jurisdictional area. Current development has eight additional high-rise buildings in the plan review stage of construction and three high-rise buildings in the excavation stage.

Figure IX - CBD High Rise – FS10 location and proposed new HR in red, existing high-rise buildings in yellow

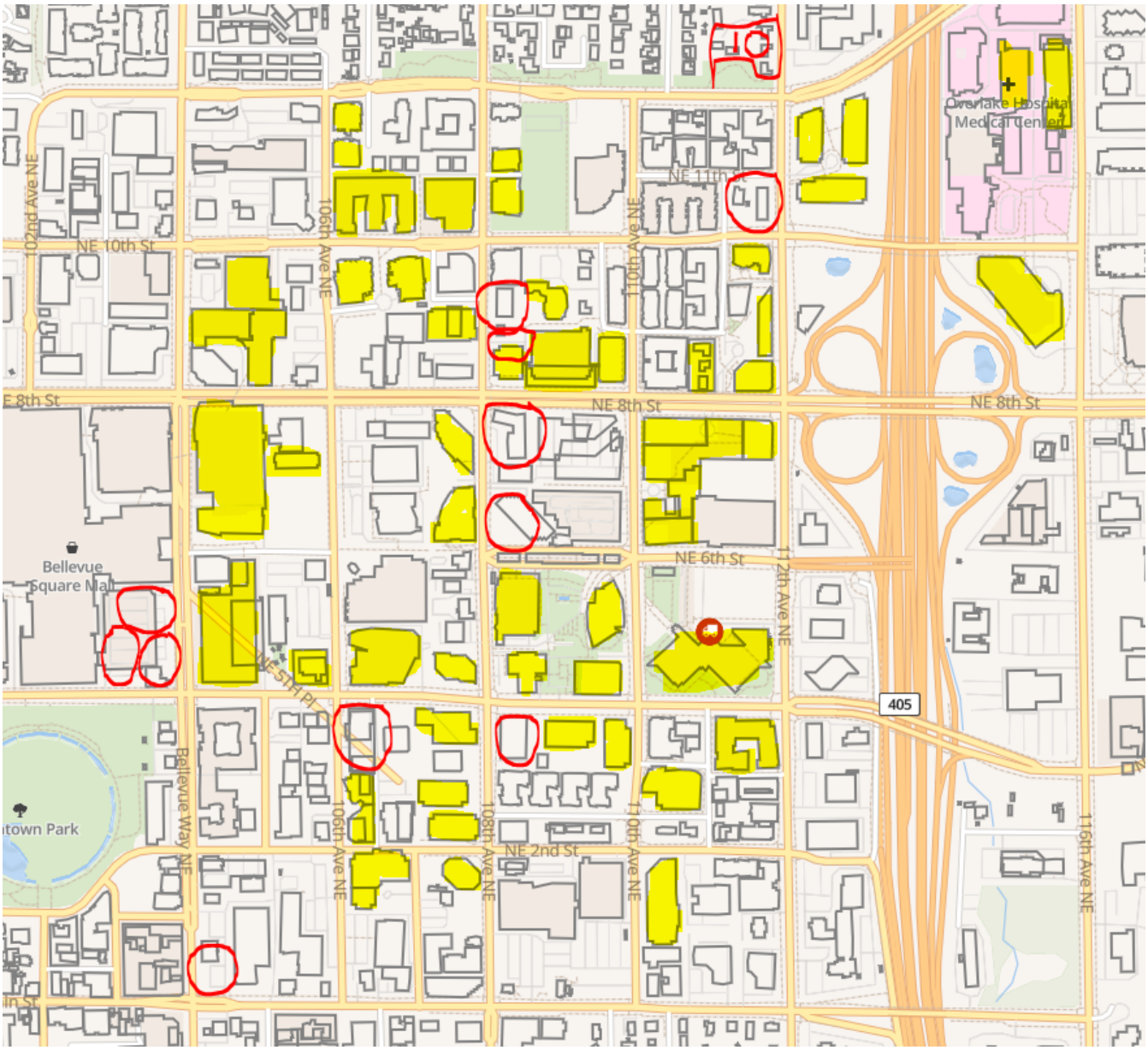


Figure X - Factoria High Rises, existing high-rise buildings in yellow

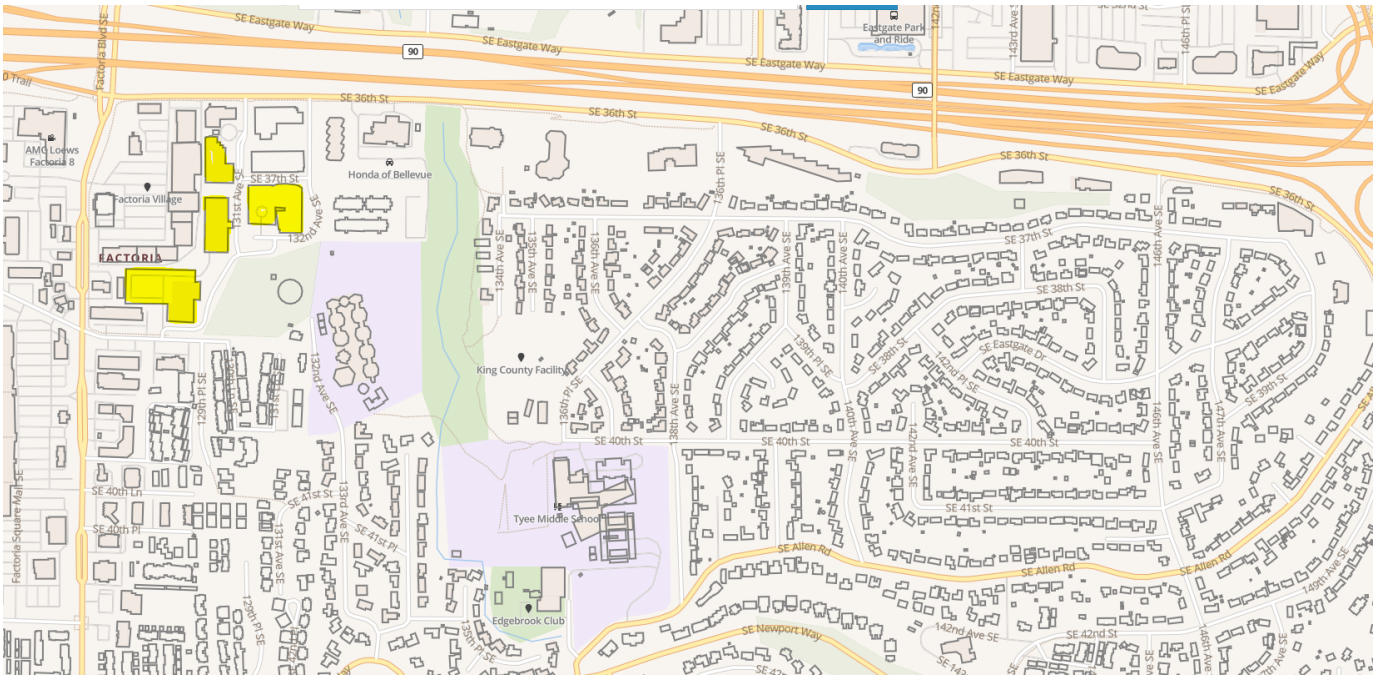
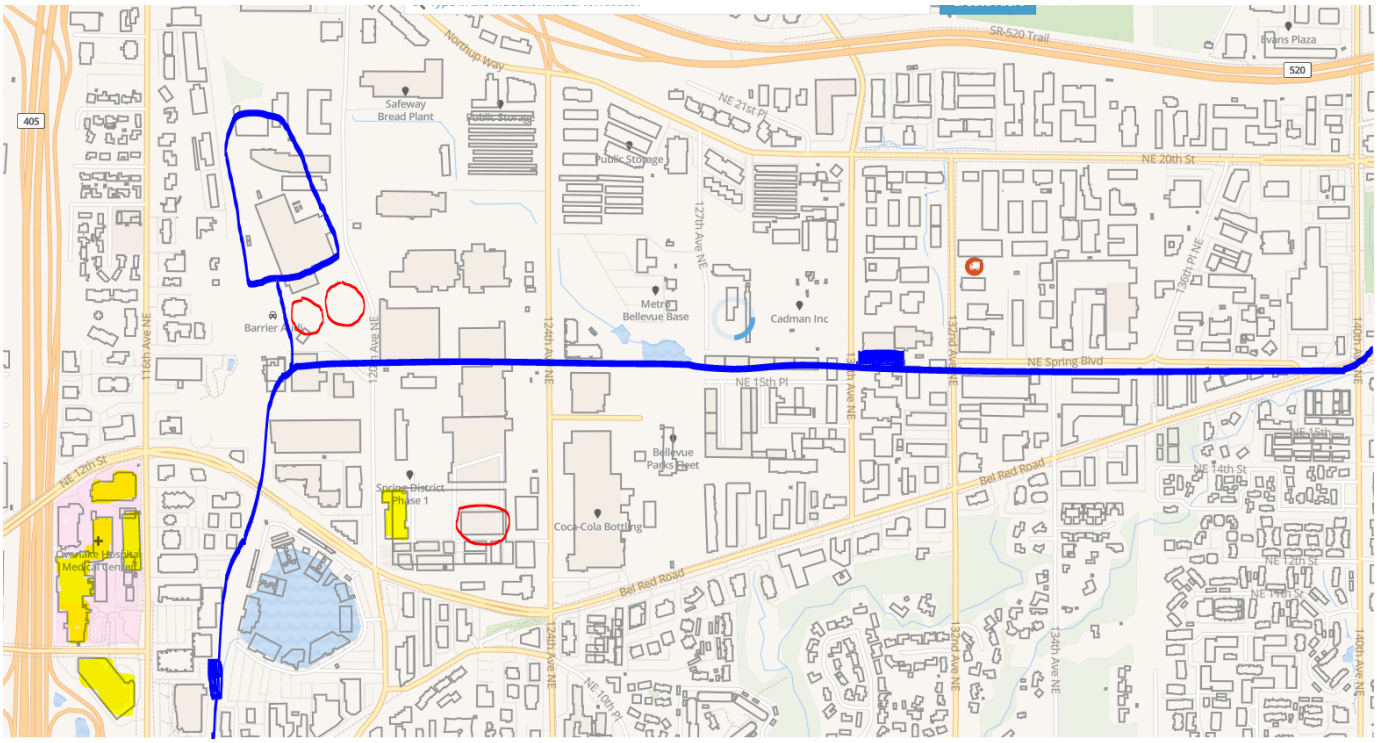


Figure XI - Spring District High Rises – Eastlink rail alignment and maintenance facility in blue, proposed new HR in red, existing high-rise buildings in yellow



Recurrence and Impacts

In the past 20 years there have been no significant fires in high-rise buildings within Bellevue. In every case a fire occurred, automatic sprinklers and/or hood-and-duct systems have successfully confined and/or suppressed the

fires prior to the arrival of firefighters and prevented fire spread to structural components. The existence of modern construction and advanced monitoring and fire suppression systems throughout the city has resulted in decreased risk to the community. Despite the installation of state-of-the-art monitoring and fire suppression systems in high rise building, which include smoke detectors and pull-stations, automatic fire alarms remain a prevalent reoccurring problem for response resources. To encourage proper maintenance of such systems the department utilizes a progressive "preventable response" enforcement program to identify and correct system malfunctions that create these false alarms.

The probability for a significant high-rise fire in the City of Bellevue is minimal. Although some small fires have occurred, all have been controlled by properly maintained suppression systems. As a result, there has been no meaningful impact to the community to date. Nationally, the recurrence of destructive high-rise fires in sprinklered building remains very low. Even so, the impact of a destructive high-rise fire remains classified as special risk because the risk of both substantial life and property loss from such an incident is very high. Additionally, it has been identified that high-rise structures represent an "additional risk" due to the vertical access challenges that responders will face. The associated life safety issues of high-density occupancies along with the personnel and equipment needed to sustain an offensive attack heighten the risk of this hazard. This is one of the primary factors in advocating for the addition and placement of a new fire station in the downtown core and the adoption of the "High Density" response time standard.

Vegetation Fires

- *Brush Fire Risk Score: 8.94 – Low Risk*

Definition

A Wildland/Urban Interface (WUI) area is a geographic area in which structures and other human development meets or intermingles with wildland or vegetative fuels. A WUI fire is a fire located in that geographic area.

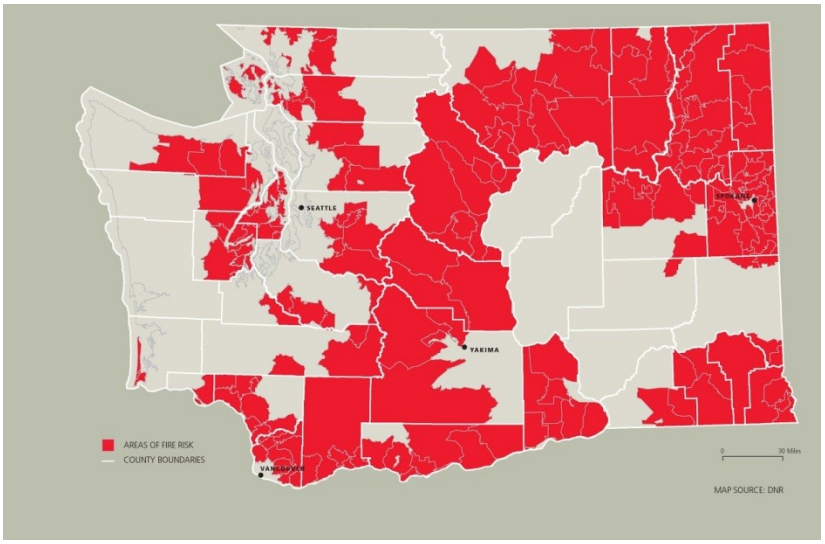
History

There are some locations within Bellevue city limits where residential development meets and intermingles with wildland areas. This condition gives rise to the possibility of WUI fires, especially when weather conditions are dry and vegetation fuels are abundant. Compared to other areas of the region, the risk in this jurisdiction is low.

The climate of the Puget Sound region limits the possibility of this risk significantly. A "dry season" typically occurs in the months of July through mid-September. However, despite periods of dryness that can reach 50-60 days, the prevailing mild temperatures do not facilitate the extreme drying of fuels that is required for a high-risk WUI fire. Also uncommon are the high winds that drive uncontrolled WUI fires. High-wind events are highly uncommon in the summer and early fall when WUI risk is highest. When high-wind events have occurred in late fall and early winter, fire danger has already returned to "low". The City has not had a single life lost due to a WUI fire and there has not been a structure lost due to WUI fire for at least 20 years.

Additionally, the Washington Department of Natural Resources (WDNR) has not classified the Seattle/Bellevue region as an "area of risk" **[Figure XII]**. By deduction, this jurisdiction is either low risk or no risk.

Figure XII – DNR Wildfire Areas of Risk



Location and Extent
Small roadside, grass or brush fires, and beauty bark fires are not uncommon during the dry portion of the year. They can occur anywhere within the jurisdictional boundary and no area is more susceptible than others. The extent of damage is typically minor and it is very rare that one would exceed one acre in total size. Most often these fires are caused by inappropriately discarded smoking materials or machinery that has been used improperly. Education campaigns can serve to increase the publics' awareness of the potential for uncontrolled fires.

Recurrence and Impacts
Due to "Climate Change", past occurrence may not be a reliable indicator of the future probability and severity of these types of fire.

Findings
An in-depth Wildland-Urban Interface analysis is recommended to assess the changes in exposure, review response strategies, and develop outreach/mitigation plans to ensure that the community is protected and prepared.

Response strategies - geologic and meteorological hazards

Earthquake

- *Less than M4.0 – Risk Score: 31.5 – **Moderate Risk***
- *M4.0 to M6.0 – Risk Score: 59.87 – **High Risk***
- *Greater than M6.0 – Risk Score: 74.83 – **Special Risk***

Washington State is situated in a highly active geologic area which contains shifting tectonic plates, crustal faults, and a subduction zone that all produce frequent earthquakes. Earthquakes occur here almost on a daily basis, and many of them go unnoticed. There are three types of earthquakes which may occur in our region: megathrust, intraplate (deep), and crustal (shallow).

Crustal faults are caused by the deformation within the North American Plate due to compression by neighboring tectonic plates. Crustal earthquakes occur no deeper than 18 miles below the surface, and can produce earthquakes as large as M7.5. Several major population hubs are situated directly atop such faults, such as the Seattle Fault which runs directly beneath the Cities of Seattle and Bellevue. The most recent Seattle Fault earthquake occurred about 1,100 years ago, and has been active 3-4 times over the past 3,000 years.

The most frequent types of earthquakes in Washington are Interplate (deep). These earthquakes rupture faults within the subducting Juan de Fuca Plate, and are usually less than M7.5. Because these earthquakes are so deep (18-42 miles beneath the surface), the seismic wave energy spreads over a much larger area than a shallow quake, thus shaking is felt over a larger geographic extent. Historically, interplate earthquakes occur every 10 to 30 years. The USGS estimates that there is an 84% chance of an interplate earthquake of M6.5 or great occurring within the next 50 years. Deep earthquakes larger than M6.0 occurred in 1909, 1939, 1946, 1949, 1965, and most recently on February 28, 2001 with the epicenter under the Nisqually Delta.

Megathrust earthquakes occur at subduction zones, and produce earthquakes as powerful as M9.0. In the Pacific Northwest, megathrust earthquakes occur along the Cascadian Subduction Zone. Historically, these earthquakes reoccur at a 500-year interval.

The Seattle fault earthquake scenario posits a M7.2 earthquake caused by a 63 kilometer (40 mile)-long rupture on the northernmost strand of the Seattle fault zone from the Kitsap Peninsula to just east of Lake Sammamish. The scenario is based on an earthquake that probably caused a surface rupture on the fault in the Bellevue area thousands of years ago. That event caused about 2 meters (6.5 feet) of surface displacement west of Lake Sammamish near SE 38th Street. Unlike deep earthquakes, which usually produce few or no aftershocks strong enough to be felt, a M7.2 shallow earthquake like the one in this scenario would likely be followed by many aftershocks, a few of which could be large enough to cause additional damage. The number of people injured is likely to be high, particularly if the earthquake occurs during or at the end of the business day. King County is expected to suffer the highest number of casualties (as many as 15,615) or which a significant portion would be in Bellevue and the adjacent communities.

Figure XIII – Seattle Fault

The Washington State Geologic Information Portal contains estimates of earthquake damage for a variety of faults in the State of Washington.

Liquefaction:

If sediments (loose soils consisting of silt, sand, or gravel) are water-saturated, strong shaking can disrupt the grain-to-grain contacts, causing the sediment to lose its strength. Increased pressure on the water between the grains can sometimes produce small geyser-like eruptions of water and sediment called sand blows. Sediment in this condition is liquefied and behaves as a fluid. Buildings on such soils can sink and topple, and foundations can lose strength, resulting in severe damage or structural collapse. Pipes, tanks, and other structures that are buried in liquefied soils will float upwards to the surface.

The department's response plans for earthquakes is described more thoroughly in internal SOP's. In summary, the plan is to move apparatus to safe areas, assess station damage, report assessments to the Battalion Chief via a radio roll call, and then resources will perform an area damage assessment prior to any emergency response. The on-duty Battalion Chief will then form an area command that will prioritize the incidents and assign resources via a

"resource emergency" plan designed to place them at incidents where they will be most effective for the greatest outcome.

Despite the response capabilities of the department, a catastrophic earthquake will quickly deplete those resources and widespread damage is inevitable. The Department's Office of Emergency Management (OEM), along with county and state agencies, encourages residents to plan for these occurrences by maintaining emergency food supplies and abating hazards in their homes and businesses.

Recurrence and Impact

None of the earthquakes of the past 50 years have had any significant impact on the City of Bellevue. However, with this type of event, the next one could be devastating and there should be no attempt to discount future risk based on past occurrences.

Severe Weather

Definition

Severe weather includes a variety of meteorological phenomena that are detrimental to citizens and/or infrastructure in Bellevue. These atmospheric disturbances are usually characterized by strong winds frequently combined with rain, snow, sleet, hail, ice, thunder, and lightning. This definition includes unusual weather disturbances such as tornadoes or funnel clouds, which appear infrequently in the region. In addition, any heavy snowfall or rain might be considered a severe storm. Secondary hazards or impacts that can result from severe storms include flooding, landslides, power outages, and closed transportation routes limiting emergency response, increasing pollution, and causing environmental damage.

History

Over the years Bellevue has had many instances of severe weather. While not all have caused major long-term problems, they have all disrupted people's day-to-day activities and posed a burden, especially on the most vulnerable.

Location and extent

Severe weather of all types directly and indirectly affects the entire city. Due to variations in geographic location and elevation, certain areas are more vulnerable to certain types of severe weather than others. Higher elevations are particularly susceptible to snow events. Areas with above-average tree cover are more susceptible to windstorm damage, however, conifer cover is more prevalent in open spaces (i.e. parks) and damage in those areas typically has minimal community impact.

Hail

- *Risk Score: 10.2 – **Low Risk***

To date, the hail storms in the city have not caused significant damage. A local weather condition known as the Puget Sound Convergence Zone is capable of producing hail up to ¼" in size, but typically no larger. Convergence zone conditions are most common in the winter and spring and rare in summer and fall. The most significant impact brought on by this risk is a disruption in transportation brought on by localized hail accumulations that result in poor driving conditions.

Ice storms

- *Risk Score: 8.94 – **Low Risk***

Ice storms and/or freezing rain conditions are extremely rare in the city of Bellevue. The City's proximity to the relative warmth of the Puget Sound waters disrupts the ability to create the cold air conditions necessary for freezing rain. In addition, the Cascade Mountain range to the east provides a barrier to the colder inland air of eastern Washington. Lastly, weather fronts from the Pacific Ocean are known for quickly scouring away stagnant and colder surface air, thus removing ideal icing conditions. The most significant impact brought on by this risk is a disruption in transportation brought on by poor driving conditions.

Snowstorms

- *Risk Score: 10.2 – **Low Risk***

Snowstorms are not uncommon in this lowland region, but they tend to be both brief and without appreciable accumulation. It is rare to have snow conditions that persist longer than 10 days at a time and it is not uncommon to have a snowless year. The moderating effect of the relatively warm Pacific and Puget Sound waters limits the ability of cold air to persist long enough to create snow conditions.

An occasional and disruptive weather condition related to snowstorms in the area is a 6" or more accumulation of snow followed by rain. The absorption of rain into existing snow loads has been known to cause roof collapses, particularly on carports, porches and lightly constructed utility buildings. Weighted tree branches are also susceptible to breaking and electrical grids can be disrupted.

Loss of electrical power during snowstorms often results in a greater incidence of EMS calls due to the elderly and shut-in population's loss of home heating. Snowstorms also create an increase in EMS incidents as people that would normally drive themselves to the hospital turn to first responders to navigate snowy streets. There is a slightly higher risk of structure fires as people turn to alternate heating sources during power outages and cold spells. There is also a slightly higher risk for CO Poisonings due to cooking and heating with outdoor equipment.

The most significant impacts brought on by this risk are a disruption in transportation brought on by impassible roads and power grid failures due to downed lines.

Tornados/Funnel Clouds

- *Risk Score: 5.66 – **Low Risk***

Tornados are an extremely rare occurrence in the region. Only a small handful of localized wind damage events are known to have occurred in the Puget Sound area and the National Weather Service would rate all of them at the F0 to F1 level. This weather event only occurs in association with the Puget Sound Convergence Zone weather phenomena previously described and areas to the north and south of Bellevue are more likely to be affected. Tornado and/or funnel clouds events in this region, when they do occur, are always very brief and would not generally affect an area greater than half a football field.

The most significant impact brought on by this risk is localized property damage.

Windstorms

- *Risk Score: 55.71 – **High Risk***

Wind has played a prominent role in the history of emergencies and disasters impacting the community. Bellevue can expect some wind-related problems on a near-annual basis; however, windstorms such as the 1962 Columbus Day Storm, 1993 Inaugural Day Storm, and the 2006 Hanukkah Eve storm brought widespread and significant property damage. Even so, the likelihood of loss-of-life due to these events remains historically low.

Windstorm events, when they do occur, typically happen during the fall and early winter. There are relatively low incidences of significant windstorms during the spring and summer.

The most significant impacts brought on by this risk are widespread power outages, downed trees blocking transportation routes, and property damage. In addition to the damage, emergency responders experience much higher call volumes and periods of resource depletion. These incidents are best responded to under current response plans until the number of requests requires the initiation of the "resource emergency" plan. This plan prioritizes life safety incidents, followed by property damage and leaves resource requests to be dealt with in a non-emergent manner when circumstances permit.

Flooding

- *Risk Score: Minor = 19.8 – **Low Risk***
- *Risk Score: Major = 38.47 – **Moderate Risk***

Definition
A flood is typically a temporary condition of partial or complete inundation of normally dry land areas from:

- The overflow of inland or tidal waters,
- The unusual and rapid accumulation or runoff of surface waters from any source, or
- Mudflows or the sudden collapse of shoreline land

History
Bellevue's flood hazards are primarily based on urban stream/groundwater events. Due to the absence of sizable rivers and no significant watershed, there is no risk to widespread inundation. However, the urbanization of Bellevue and an increase in impervious surfaces has led to a greater risk of localized urban flooding events.

The most severe flooding on Bellevue's major streams and creeks results from low-to-moderate elevation (1,000 to 3,800 feet) snowmelt runoff occurring in conjunction with a prolonged moderate-to-high intensity rainfall event. This is commonly referred to as a rain-on-snow event. Accumulating snowfall usually occurs for brief periods (one-to-three days) and can be followed by accelerated warming from Pacific frontal storm systems arriving from the tropics and which contain a significant amount of precipitation. Rain-on-snow events typically result in a sharp rise in stream flow. Occasionally, those streams will overrun their banks.

Flooding in Bellevue usually occurs when runoff exceeds the conveyance capacity of natural and manmade drainage systems. Surface-water runoff volumes in urban stream channels, roadway ditches, culverts and conveyance pipe systems can exceed the available conveyance and storage capacity of such systems. This typically occurs with moderate- to high-intensity storms that can last for several days or occur in succession over a period of weeks. These events are characterized as rainfall of three inches or more in a 24-hour period. Urban area flooding

generally occurs gradually and allows time for property owners to identify an impending flood situation and prepare for it. In some areas, however, flooding can occur rapidly and may leave little time for preparation.

In many cases, debris can accumulate in storm water collection systems and reduce the capacity of the system to convey flow. Such a reduction in capacity can lead to more frequent flooding events.

Location and Extent

Bellevue has 235 properties located within the 100-year flood plain defined by the Federal Emergency Management Agency (FEMA). According to the modeling conducted by the King County Flood Control District, in a 100-year flood event, Bellevue could face up to $10,162,000 in damages to buildings and property.

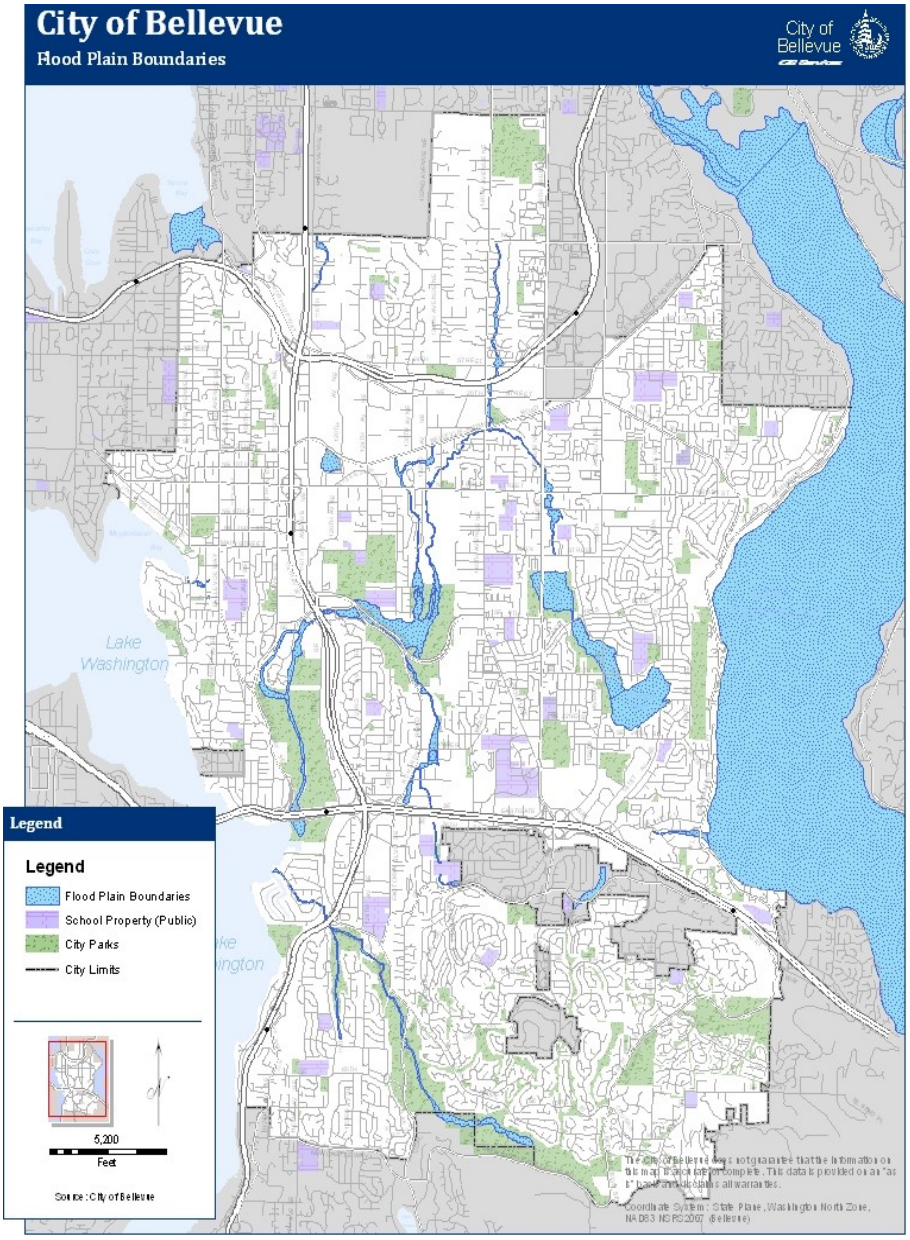
Bellevue has undertaken considerable effort to manage storm water since 1994. Recent activity has included increasing storage capacity of a regional pond, replacing culverts and conducting levee improvements near the I-405 corridor.

Bellevue is divided into two major drainage basins--Lake Washington and Lake Sammamish, and 26 watersheds or minor basins. A watershed or basin is the land area that drains to a particular body of water, such as a stream or lake. These watersheds range in size from the Wilkens Creek watershed at 900 acres to the Coal Creek watershed at about 4,000 acres.

Recurrence and Impacts

Despite 11 instances of Federally-Declared flood disasters in King County since 1990, those events had relatively minor effect on the Bellevue area. Significant flooding during those declarations took place in river basins outside of Bellevue. Bellevue only has two properties in the jurisdiction that are susceptible to recurring flooding.

Figure XIV - Flood plain boundaries in Bellevue



Response strategies – hazards to infrastructure

Petroleum Pipeline Fire

- *Risk Score: 61.06 – **Special Risk***

Definition

A petroleum pipeline is a conduit used for the transport of liquid petroleum products and is distinctly different than a natural gas pipeline. A petroleum pipeline fire is a fire involving the products that have leaked or escaped from that conduit.

Description

The Olympic Pipeline is a 400-mile underground pipeline extending from refineries in northwest Washington to Portland, Oregon. This pipeline carries refined liquid petroleum products such as diesel, aviation fuel and gasoline. The pipeline extends approximately 10 miles through the center of Bellevue from NE 60th Street at the city's northern border to SE 59th Way at the City's southern border. The easement follows a close approximation of the 136th Ave NE line and the Puget Sound Energy transmission line utility corridor. The pipeline route is clearly marked with right-of-way or "warning" marker signs **[Figure 3-9]**, but the signs do not indicate the precise location of the pipe. The City of Bellevue publishes a GIS based hazard layer map that identifies the approximate location of the pipeline and the Bellevue Fire Department has established a component in the All Hazards Risk Assessment Visualization Tool that represents the recommended 1,000 feet evacuation radius for structures and citizens around the pipeline.

Figure XV - Sample pipeline warning sign

Built in 1965, the pipeline serves the transportation energy needs of the region by delivering an average of 18.7 million gallons of fuel each day to both Sea-Tac International Airport and to tank farm refuelers that supply the region's service stations. Without the pipeline, it would take an average of 1,800 tanker trucks per day to deliver the same amount of fuel.

The pipeline consists of two separate steel pipes that lay side-by-side for most of the 400-mile length, but then separate in Bellevue for an approximate 2 mile stretch. One pipe is 16 inches in diameter and the other is 20 inches. Pressures, fluid characteristics, and rates of flow are monitored and controlled remotely by telemetry from central control or dispatch rooms equipped with Supervisory Control and Data Acquisition Systems (SCADA). The control center is staffed 24 hours a day, 7 days a week.

Other facts about the pipeline include:

- The pipeline is buried between 30 and 48 inches in depth. Where it crosses under roads and railroad tracks it is 8 feet deep and encased in additional steel protection.
- The pipeline is constructed of carbon steel with walls 0.281 inches thick and caries a small electrical charge to reduce corrosion.
- Sixty percent of the time the pipeline carries gasoline that travels at about 4 mph producing 5,900 gpm at pressures between 250 and 1440 psi.
- Flow and pressure are controlled by computers in the Olympic Pipe Line Company (OPLC) Control Center in Renton. Shut down of the pipeline for maintenance or emergency is done by using valve blocks located throughout the system. OPLC uses three types of valve blocks:

- Check Valves that prevent backflow.
- Hand-Operated Valves (HOV's) are shut by OPLC personnel only, in the field. An HOV takes approximately 2 to 8 minutes to shut once the person arrives at the valve site (travel to a valve site can take anywhere from 5 to 60 minutes).
- Remotely-Operated Valves (ROV's) are controlled by the OPLC Control Center in Renton. It takes approximately 45 to 90 seconds to completely close the valve using a computer-enhanced system.

History

There have been no incidences of pipeline fires or leaks within the city of Bellevue. However, this particular pipeline has had incidents that resulted in both environmental contamination and loss of life.

Figure XVI - Aerial photo of damage area from 1999 Bellingham Olympic Pipeline rupture and fire. The rupture occurred upstream to the right of the photo. Resulting fire extended several hundred feet on both sides of creek.

The most notable incident occurred on June 10, 1999, when the 16-inch fuel line ruptured in Bellingham, WA, spilling 277,200 gallons of gasoline into Hanna and Whatcom creeks. The volatile fuel found an ignition source and the ensuing explosion killed three children playing near the creeks. The massive fireball sent a plume of smoke 30,000 feet into the air, visible from Anacortes, WA to Vancouver, B.C., Canada. The rupture was traced to a cascading series of failures instead of one problem or event.

The Bellingham incident brought closer scrutiny of pipeline operations and the safety features that are to be used to prevent future spills. The software that controls the pipeline has a leak detection system that gives operators the ability to detect unusual conditions and begin shutdown procedures when leak conditions are possible. Automated valve and pump shutdown is designed to prevent another catastrophe.

Pipeline damage in the US due to malicious or terrorist acts has not occurred and has not been factored into this risk analysis.

Location and Extent

Anecdotal evidence of prior pipeline ruptures indicates that leaks and ruptures can result in spills of several hundred gallons to over 100,000 gallons. However, some of the greatest spills occurred during the early history of the pipeline when automation and monitoring was more limited or non-existent. As such, a catastrophic rupture with a near-immediate pipeline shutdown can still result in a spill well of well over 10,000 gallons. Where the spill occurs, where it travels to, and whether it finds an ignition source will largely determine the extent of possible damage. Low lying areas near the pipeline are most at risk for this hazard.

Table XXII – Pipeline by Station area

Olympic Pipeline

Total Length (feet)		Fire Stations Impacted					
Pipeline Size	Outside Area	2	4	6	7	9	Grand Total
16 INCH	102,725	792,002	907,429	560,815	138,465	1,463,745	3,965,181
20 INCH	102,725	726,002	1,334,455	1,059,317	138,465	1,317,371	4,678,334
Grand Total	**205,450**	**1,518,004**	**2,241,884**	**1,620,132**	**276,930**	**2,781,116**	**8,643,516**

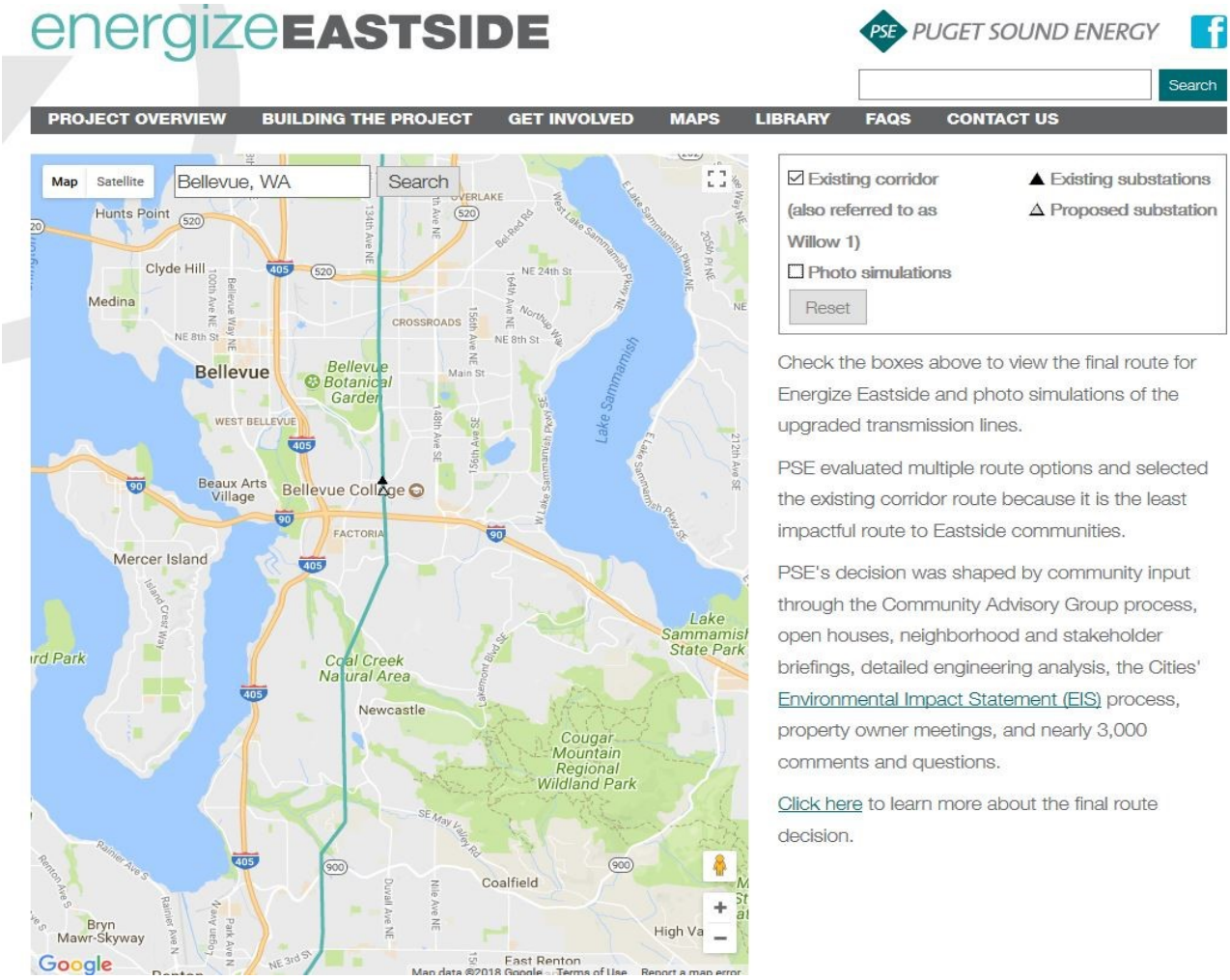
Recurrence and Impacts

Despite stricter Environmental Protection Agency (EPA) reporting measures for spills, pipeline safety appears to be improving with smaller and less impactful spills. Therefore, this hazard has less frequency risk within the Bellevue service area than even a standard highway tanker spill. However, aging infrastructure and rupture risks due to seismic events may put the community at additional risk. Given all factors, the probability of an event remains in the "unlikely" category. However, pipeline incidents continue to occur in this country, and many for undetermined reasons. The combination of a highly flammable liquid, in large quantities, and in urban environment translates into a significant consequence and impact that approaches the "catastrophic" level. Response and recovery from a significant pipeline event would deplete the response and mitigation abilities of the City of Bellevue. During the CRA process, the existing Bellevue Fire Department Olympic Pipeline Plan was reviewed and determined to still be relevant.

Findings

As this plan was originally formulated in June 2000, and last reviewed and updated in June 2005, it is recommended that this plan be updated and reviewed for changes in response plans, community development and topography every 10 years. Additionally, OPLC technology and procedure changes should be routinely evaluated against response plans. Plans to install new high capacity electrical transmission lines known as "Energize Eastside", [Figure XVII] should be factored into this study.

Figure XVII - Energize Eastside Alignment



Light rail - Eastlink

The Sound Transit (ST) light rail system is an electrically powered public transportation system. Sound Transit is the owner and governing body.

Currently under construction, it will be completed in late 2021 and ready for a yearlong test period. The East Link light rail is due to begin revenue service in 2023. The project includes building light rail infrastructure-at-grade, elevated, and tunnel. The City of Bellevue Fire Department has assigned a full time Administrative Captain to liaison with the East Link project. This position currently reports to the Deputy Chief of Operations and has the following duties and responsibilities:

1. Development of policies/procedures for fire department operations personnel for responding to East Link project incidents during construction.
2. Providing a single point contact for ST for the coordination of fire department support outside of the routine permitting/inspection process.
3. Development of Incident Action Plans (IAP's) for ensuring a coordinated response to any emergencies that arise at the multiple construction projects that will be ongoing for this project.
4. Delivering training to operations personnel related to light rail both during construction and prior to the system operating. This is an ongoing function as construction progresses.
5. Facilitate inspection of fire life safety elements (Not related to permit process and plans review).
6. Managing up to date traffic control plans and changes and notifying NORCOM Fire Dispatch for adjustments to response routes
7. Engage with Sound Transit and East Link contractors in early planning of construction work activities and help identifying practical solutions.

These duties are more than what is required under city permitting, plan reviews, and inspection.
In partnership with Sound Transit, the position is funded 50% by Sound Transit and 50% by the City of Bellevue. A concurrence memo funds the Administrative Captain position until March of 2020. In general, the position has supervisory responsibility for training, developing incident action plans, performing as a liaison with Sound Transit construction and interfacing with project and safety managers, and emergency response coordination.

Table XXIII – Light Rail segments by station area

Eastlink Light Rail

Count of Segment	Fire Stations				
Type of segment	Outside area	1	6	7	Grand Total
Elevated	**6**	**8**	**6**	**2**	**22**
Crossover		2			2
Eastbound	3	3	3	1	10
Westbound	3	3	3	1	10
Surface	**4**	**12**	**20**	**15**	**51**
Crossover	2			2	4
Eastbound	1	6	10	9	26
Westbound	1	6	10	4	21
Tunnel		**4**		**2**	**6**
Eastbound		2		1	3
Westbound		2		1	3
Grand Total	**10**	**24**	**26**	**19**	**79**

Eastlink rail components

Tunnel*:* Construction began in April 2016 with the excavation of a 2,500-foot tunnel using the Sequential Excavation Method (SEM). The tunnel will have two portals. The south portal, where excavation started, is at Main

Street and 112th Ave SE (101 – 112th Ave SE). The tunnel heads into the hillside, makes a right turn and heads directly below 110th Ave NE. When complete, there will be a northbound track and a southbound track on opposite sides of a dividing wall. The north portal will be at the NE corner of Bellevue City Hall campus, NE 6th and 110th Ave NE which is the location of the Bellevue Transit Center Station. There will be high-angle, tunneling, and confined space components involved.

***Elevated Guideways**:* The guideways will vary but will carry trains full of passengers typically 30-50 feet above grade. There will be approximately three miles of elevated guideway throughout the City of Bellevue in four separate locations. The construction of columns is a long and drawn out process. The first step is the creation of the rebar cage. After drilling (digging the hole with cranes) these cages will become the foundation. They will be lowered into the ground until they are essentially flush with the surface. The depths of the holes and lengths of the rebar cages range from 80-120 feet. The construction then continues as more rebar cages are married up to create a column. Horizontal girders will be constructed and installed over bent caps as the columns are completed. There will be high angle and confined space components involved.

***At Grade**:* Construction involves utility relocations, land clearing, geology stabilization, and wet land protection. As the "systems" contract follows, the rail and electrical will be installed. There will be potential for high voltage electrical firefighting and heavy machinery rescue.

In any construction activity that involves a technical aspect (i.e., confined space, tunneling/mining) the company performing the activity can opt to provide their own rescue capability under the laws of the State of Washington. Most projects are designed to have the local fire jurisdiction perform these activities, thus the reason the Bellevue Fire Department has members trained in technical rescue operations (trench, rope, and confined space). However, in the case of tunneling and/or mining, we have not been exposed to this activity inside the city. As a result, we do not have the training required to mitigate a tunnel rescue incident. Due to financial impacts of developing a tunnel rescue team (TRT), the tunnel contractor has made the choice to provide for and train their own members for tunnel rescue.

To mitigate an emergency within a tunnel under construction, a fire department must have members trained at a technician level per State and Federal laws. The Bellevue Fire Department does not have this capability and thus is faced with Federal and State laws that say **we shall not enter** a tunnel past the portal in the event of a fire or aid/rescue.

- NFPA 1006, chapter 17
- NFPA 1670, chapter 14
- CFR 48, 49
- WAC 296-155, part Q

Per NFPA 1670, as it applies to tunneling operations in the City of Bellevue, members of the Bellevue Fire Department shall be trained to a minimum of an Awareness Level. Members were trained in late 2016 to the Awareness Level through a 3-part training package. Following the training, members can:

1. Recognize the need for tunnel search and rescue.
2. Initiate contact and establish communications with victims where possible.
3. Recognize and identify hazards associated with non-entry tunneling emergencies.
4. Implementing the emergency response system for tunneling emergencies
5. Implement site control and scene management.

Per the State of Washington Department of Labor and Industries, once the tunnel construction meets 100% of the structural design, it will no longer be considered a tunnel under construction. It is at this point, the contractor based tunnel rescue team will no longer be required.

Eastlink rail operation maintenance facility

Bellevue has also been identified as the location for a second light rail maintenance facility. This facility will be constructed at the same time as the rail line, and will support the maintenance and storage of up to 96 Light Rail Vehicles (LRV) with their associated equipment, parts, supplies and repair facilities. Additionally, Sound Transit will co-locate administrative and support staff at the facility. This project is currently in the Design/Build Procurement phase and will be complete and operational by December 2020.

Eastlink rail service operations:

Light rail terms:

- **LRV**: Light Rail Vehicle, 103,000 lbs., 200 passengers, up to 4 LRV's linked
- **OCS**: Overhead Contact System (overhead light rail electrical wires)
- **TPSS**: Traction Powered Substation
- **ETS**: Emergency Trip W=Switch (located at TPSS)
- **LCC**: Link Control Center (center for communications and operations of light rail)
- **Pantograph**: big mechanical arm that connects the LRV to the overhead wires

Orientation*:* The light rail uses a two-track system that typically run parallel to each other. The LRVs operate on DC electric current supplied from the substations (TPSS) by two overhead wires (OCS). LRV's connect with the OCS via a pantograph (big arm) that can be raised and lowered. The tracks operate as the negative return (not a significant electrical threat) for the current. The Link Control Center (LCC) functions as the nerve center for the light rail and can communicate, coordinate, and remotely shut off power to the OCS. It is in Seattle. The estimated train frequency is every 6-8 minutes during peak operations. The LRV's have an operator located in the forward cab (each end has a cab) of the LRV. The (conductor/driver) must operate the train by utilizing a throttle equipped with a "dead man" switch. In the event the operator becomes incapacitated, the LRV will come to a stop. The system times traffic lights using predicative GPS technology and changes the signals much like the pedestrian button and car sensors do, but the only system that actively takes control of traffic signals is the Opticom system (when equipped) used by emergency responders. Train operators are required to stop for red lights and hazards.

Eastlink potential emergencies

All the following will require interagency collaboration and coordination under emergency conditions (COB and Sound Transit). In any emergency, a Seattle Fire Department Battalion Unit is dispatched to the LCC for initial operations. A Bellevue Fire Department Battalion Chief is expected to relieve the SFD member as soon as practical.

Examples of emergencies include:

- LRV fire
- LRV de-rail
- LRV vs. vehicle accidents
- LRV vs. pedestrian involving heavy vehicle rescue
- Operating in and responding through Light Rail Intersections

- Incidents involving elevated guideways - high angle rescue, fire, derailment, MCI
- Confined Space Rescue within the elevated guideway
- Electrical Hazards of the OCS
- Incidents involving the 2500-foot tunnel – confined space beyond current BFD capabilities and involving Closed Circuit Breathing Apparatus (CCBA), tunnel firefighting, MCI
- Terrorist activity involving LRV's on elevated guideways or tunnel
- Access and Extrication of LRV's
- Fire in the TPSS
- Accidents involving the switching locations
- Responding to EMS calls on the LRV

Eastlink incident response training

Following construction and prior to revenue service, the Bellevue Fire Department will be actively engaged in training activities with Sound Transit representatives (i.e. full scale MCI drills, training involving light rail electrical systems, drills involving patient extrication from an LRV, training for approaching elevated guideways with aerial ladders, high voltage electrical fires, training and drills on lifting LRV's, and confined space drills and firefighting in the tunnel).

The Bellevue Fire Department will be required to be prepared for any emergency involving the Sound Transit light rail.

Other Critical Infrastructure

There are 16 Critical Infrastructure (CI) Sectors identified by the Regional Threat Hazard identification and risk assessment (THIRA) as defined by FEMA. The City of Bellevue Emergency Manager is serving as the co-chair of the Critical Infrastructure Working Group for King County. This effort is working in conjunction with the Department of Homeland Security (DHS) to refine CI for Bellevue and Washington State. An inventory of CI that affects our ability to mitigate incidents has been compiled. This inventory will be evaluated by ARAPPEG in order to develop policies and response strategies around CI, such as; bridges, interchanges, highways, water mains, reservoirs, pumping stations, and communications facilities.

Table XXIV – Bridges by station area

Bridges

Length of Bridge	Fire Station									
	Outside Area	1	2	4	5	6	7	8	9	10	Grand Total
Freeway		**13,210**	**261**	**28,874**	**2,181**	**11,164**	**7,301**	**375**	**1,405**		**64,773**
405		1,199		10,817	813	7,866	2,800		1,405		24,900
520					1,369	3,298					4,667
90		12,011	261	18,057			4,501	375			35,207
Surface	**1,688**	**2,660**	**6,277**	**2,321**	**6,231**	**18,026**	**2,585**	**2,865**	**324**	**403**	**43,382**
104TH		-									-
12TH					321	1,498					1,820
134TH						309					309
140TH						256					256

142ND			1,210								1,210
148TH	1,688		779			965					3,432
150TH			2,831								2,831
36TH				1,092							1,092
4TH		453					474				927
8TH		-				838	1,226				2,064
BELLEVUE					4,003						4,003
EASTGATE				1,058							1,058
FOREST								426			426
LAKEMONT								1,278			1,278
LK WA		117									117
MAIN		290					886				1,176
NORTHUP						501					501
W LK SAMM								511			511
(blank)		1,800	1,457	171	1,907	13,660		651	324	403	20,372
Grand Total	**1,688**	**15,870**	**6,539**	**31,195**	**8,412**	**29,190**	**9,887**	**3,241**	**1,730**	**403**	**108,154**

Table XXV – Communications by station area

Communication Facilities

Number of Facilities	**Fire Stations**				
Description	**2**	**4**	**5**	**6**	**Grand Total**
Bellevue Service Center				1	1
Century Link Building (East Bellevue)	1				1
Century Link Building (West Bellevue)			1		1
IT Hub/Switch House	1		1		2
T-Mobile		1			1
Grand Total	**2**	**1**	**2**	**1**	**6**

Table XXVI – Water mains by station area

Water Mains

Total Length	Fire Station Area										
Main Size	Outside Area	1	2	3	4	5	6	7	8	9	10	Grand Total
No Data	3	231	742	261	391	66	301	482	131	-		2,608
1						-						-
2		115			97				-			212
2	-	1,781	1,280	1,672	298	2,866	5,805		1,601			15,303

3		39	241	145	31	455	264	5		2		1,182
4		10,927	31,672	30,432	13,696	21,128	10,881	5,429	37,423	3,717	653	165,958
6	1,525	55,940	141,033	234,467	76,793	122,414	62,370	52,456	22,950	41,427	1,398	812,771
8	10,077	116,631	212,100	195,483	176,851	224,060	280,299	74,731	282,832	115,395	7,099	1,695,560
10	8,525	4,275	18,488	19,759	10,809	6,099	21,690	67	3,721	1,130		94,563
12	5,784	61,329	60,349	43,624	53,314	46,701	78,661	38,918	56,845	10,519	3,843	459,886
14	1,857		3,158	1,179	581		1,686	7,062				15,524
16	146	2,535	20,277	3,368	2,171	17,064	18,301	7,866	3,758			75,485
18							2,812					2,812
20	-	178					1,906					2,084
24		4,007	8,055	1,448	32		571		1,757			15,870
30		201	-		96							297
36	-		-	-	-		24			-		24
48			272									272
Grand Total	**27,917**	**258,188**	**497,666**	**531,837**	**335,158**	**440,853**	**485,571**	**187,016**	**411,019**	**172,190**	**12,993**	**3,360,407**

Section 4 Current Deployment and Performance

On scene operations, critical tasking and an effective response force are the key elements of the department Standards of Cover. Ultimately those factors determine staffing levels, resource types, resource numbers, and expected duties performed at emergency incidents. The ability to perform duties or tasks has a direct influence on the outcome of a situation.

2017 Incidents by Type	
Structure Fire	67
Kitchen Fire	125
Other Fire	325
Non-Fire Suppression	4,007
EMS	15,319

Total Incidents per year	
2017	19,843
2016	18,764
2015	18,214
2014	17,739
2013	16,943

EMS Incidents (does not include Cancelled EMS calls)		
	Total ALS	Total BLS
2017	5,421	14,177
2016	5,046	13,970
2015	4,946	13,669
2014	4,888	13,359
2013	4,664	12,996

Fire Incidents - Total number of fires each year	
2017	517
2016	446
2015	499
2014	397
2013	356

Consistent Provision of service

The Bellevue Fire Department (BFD) has established performance benchmarks to provide consistently the highest quality service to protect the lives, property, and the environment of our community. In establishing its benchmarks the BFD understands that applying a single benchmark standard to all service areas and planning zones of the community is in line with NFPA 1710. However, BFD proposes to require a more stringent baseline performance standard in the planning zones that reflect the greatest population density. This “High Density” standard will ensure that a consistent performance goal is applied to the entire jurisdiction by more accurately accounting for the “vertical” response component of the structures in these planning zones.
To provide this level of consistency, the BFD has developed a service provision methodology to measure its baseline performance against its established benchmarks in the following manner:

Service Provision Methodology

In performing its community risk assessment, the agency was able to assess, categorize, and classify its risk within its service area. This Standards of Cover is designed to evaluate available resources and match them against the risk to provide consistent provision of service across all demand zones in the community. This is accomplished by:

- Conducting a critical task analysis of each service type
- Measure baseline performance for each service type
- Establish consistent benchmarks for each service type across the entire agency

- Analyze baseline performance against established benchmarks
- Identify opportunities to improve service and close the gap between baseline performance and benchmark goals.

Fire on-scene operations

The variables of fire growth dynamics, along with property and life risks, combine to determine the fire ground tasks required to mitigate losses. The tasks are interrelated but can be separated into two basic types; suppression and/or rescue. Suppression tasks are those actions necessary to confine and extinguish the fire, while rescue tasks are those associated with finding trapped victims and safely removing them from the involved structure.

Fire suppression tasks are generally accomplished by using one of two methods; deployment of hand held hose lines or fixed master streams. The decision to use hand lines or master streams depends upon the stage of the fire, water supply, available personnel and resources and the recognized threat to life and property. If the fire is in the pre-flashover stage firefighters can make an offensive fire attack into the building by using hand lines. Properly positioned hand lines can quickly extinguish fires or protect trapped victims until they can safely exit the building.

If the fire is in the post-flashover stage and has extended beyond the capacity of hand-held hose lines, or if structural damage is a threat to firefighter safety, the structure is typically declared lost. In this situation, master streams are typically deployed defensively to extinguish the fire and keep it from advancing to surrounding exposures.

First-arriving firefighters may use a “quick hit” strategy to rapidly move from the exterior to interior firefighting operations to limit or abate an environment suspected of presenting an immediate danger to life or health (IDLH) for trapped victims. This tactic can also be used while awaiting the arrival of additional resources to mount a more aggressive offensive fire attack.

Rescue tasks are based upon many variables including: the number of occupants, their location, their status, and their ability to take self-preserving action. For example, ambulatory adults need less assistance than those with restricted mobility, while the very young and the elderly may require more assistance.

Before initiating actions, the Incident Commander (IC) must select an appropriate initial strategy or mode of operation, namely: Offensive, Defensive or Rescue. Each strategy has its own critical task demands:

- **Offensive strategy** – This strategy typically employs an aggressive seat-of-the-fire attack by the first-arriving firefighters. The top priorities of this strategy are to: immediately stabilize the incident, rescue trapped victims and/or minimize property losses. Because the objective is to confine and extinguish the fire in in a specific area, the ultimate goal of protecting life in unaffected areas can be achieved simultaneously. The offensive strategy is a preferred fire attack method because its use has dual benefit. Before its use, responders must consider the; survivability for fire victims, dangers to firefighters, and availability of needed resources.
- **Defensive strategy** – This strategy generally consists of an exterior attack designed to either confine the fire to the structure of origin; or, block a fire’s expansion to nearby exposures by taking a stand at a defensible position. No attempts are made to rescue civilian victims from the active fire area due to either non-survivable conditions or structural risks that outweigh the chances of success. Nearly all firefighting is performed from outside the involved structure or from unaffected areas on or in the structure.
- **Rescue strategy** - An operational mode which is focused on immediate actions meant to protect or rescue occupants to prevent serious injury or death. The initial company on-scene may utilize 2-in/1-out while

performing imminent rescue. Rescue mode ends when the second company arrives on-scene or when the rescue situation is resolved, whichever occurs first.

Operational service objectives

The Department's service objectives are based on a thorough consideration of all the preceding sections:

- Community profile
- Community Risks
- Task analysis
- Community expectations that are based on surveys and funding commitments
- Evolving service demands

The overall objective of a response, whether a fire or EMS emergency, is:

Getting the…
…properly trained responders, and the
…right equipment, at the
…right time, to a
…given emergency,
…to have the best chance of achieving the desired outcome.

Because of the wide variety of conditions at each emergency, it is often complicated to attempt to define department capabilities considering desired outcomes. With staffing, equipment and even the types of calls remaining mostly constant, the remaining variable is *time.* As is often the case, time determines success or failure in emergency situations. Ideally, the actions taken by responding personnel should stop further harm or damage from taking place. As is the case in many emergencies, the more time that passes before responders can intervene, the less chance there is of limiting damages or even death/ The same principle applies to EMS responses. Total response time performance (911 call to intervention) and its relationship to cardiac-arrest survival have been examined extensively. Agencies that can incorporate CPR trained citizens with early defibrillation (from either bystanders or responders) and rapid ALS interventions are known to have higher cardiac arrest survival rates. **[Figure XVIII]**. Due to *time's* significance in successful outcomes, aside from cardiac arrest save rate and success rate at confining fires to the room of origin, it is *the only other* factor measured in department performance reports and is the basis of the baseline and benchmark standards.

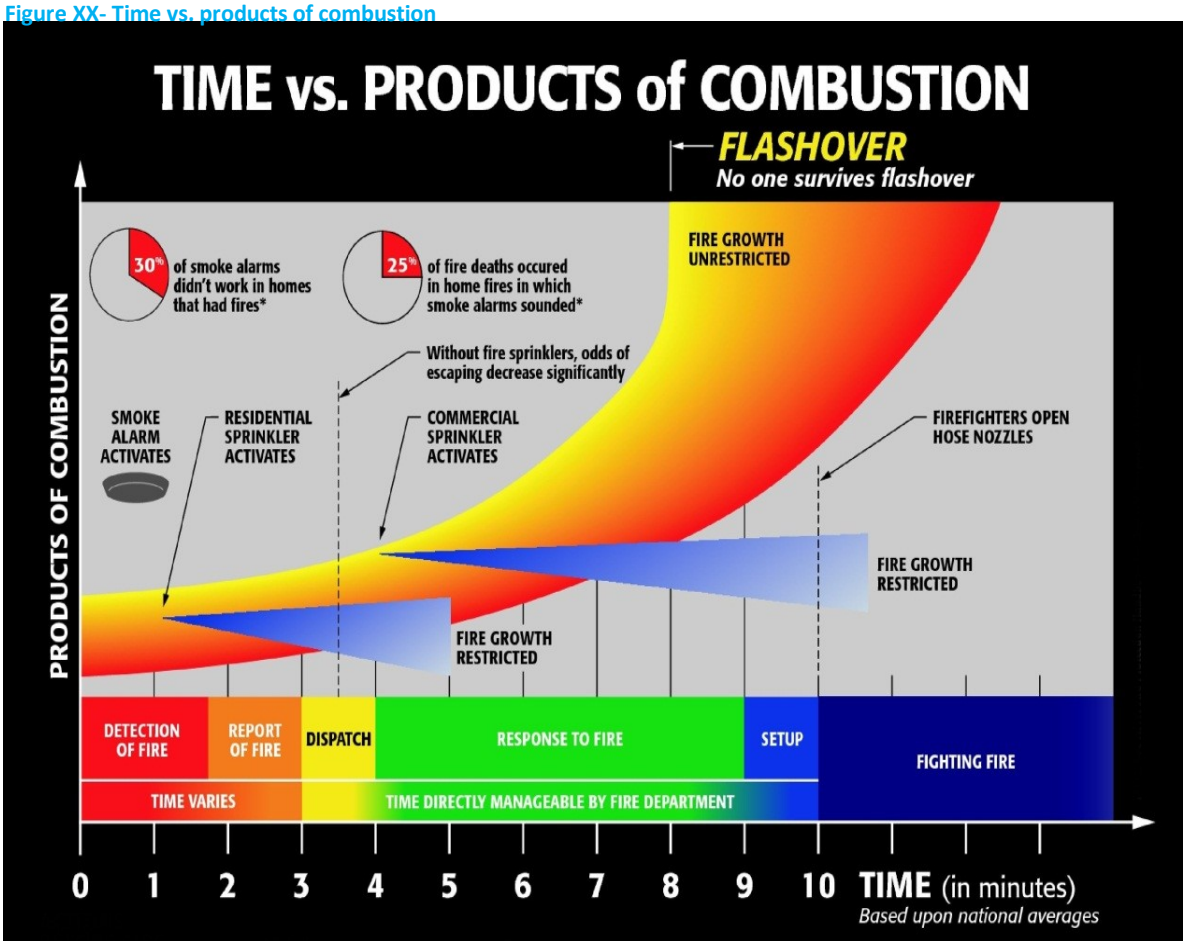
Figure XVIII -The chain of survival

Type of Care for Sudden Cardiac Arrest Victims after Collapse	Chance of Survival
No care after collapse	0%
No CPR and delayed defibrillation (after 10 minutes)	0-2%

CPR from a non-medical person (such as a bystander or family member) begun within 2 minutes, but delayed defibrillation	2-8%
CPR and defibrillation within 8 minutes	20%
CPR and defibrillation within 4 minutes; paramedic help within 8 minutes	43%

The illustration that best depicts the effect of time on a fire emergency is the time vs. products of combustion chart.

Figure XX- Time vs. products of combustion



In summary, the stage of the fire affects both staffing and equipment needs. Early smoke detector notification or early suppression by installed fire protection systems can have a significant impact on restricting (or stopping) fire growth. However, if neither of these mitigation sources is present, the firefighters must arrive within a certain timeframe and additional time is required to adequately apply water to the fire. This suppression effort must occur prior to the flashover stage to have the most beneficial results. In addition, the crew's proficiency at fulfilling their tasks has a direct impact on time. The inability to quickly deploy a hose line or a delay in giving a fire ground assignment will invariably prolong the time that a fire has to develop.

Critical tasks

Those items that must be conducted in a timely manner by firefighters to ensure the highest chance of mitigating an emergency. Critical tasks are important for all emergency types whether it be an uncontrolled fire, sudden cardiac arrest or an extrication rescue. Tasks, when properly executed at a fire incident can prevent property loss and/or civilian death. EMS tasks such as CPR, defibrillation, advanced airway management and drug therapy can increase a patient's survivability chances.

Response plans are based on the *initial* as well as *subsequent alarm* task-needs for each incident type. When the department determines that an incident type requires a change in standard resources assignment, the response plan is modified. In addition, the first arriving crew or IC always has the option to request additional resources to assist with specific tasks. See Appendix A for additional details.

System resiliency

System resiliency is defined as "An organization's ability to quickly recover from an incident or events, or to adjust easily to changing needs or requirements."[5]

Resistance/Reliability

By definition resistance is a systems ability to suffer repeated shocks or events without being compromised. Location of facilities and geographic/spatial features greatly determine a given systems ability to "bounce back" from a catastrophic incident or series of significant events. By the proactive placement of response apparatus, ensuring facilities can continue to operate after an event and designing response plans to account for spatial limitations, an organization can maximize its' ability to withstand catastrophic incidents without compromising system integrity.

In general, reliability is the ability of a system to perform and maintain its functions in routine circumstances, as well as in hostile or unexpected circumstances. "Efficient, optimized systems fail from unanticipated shocks. Resilient systems survive shocks because they are overbuilt and redundant. Response models need to be resilient to survive the shock that overturns the efficient system. When efficient systems fail, they rely on a fast, resilient response model to survive the collapse and mitigate the damage. Therefore, the mission of the fire service is to be resilient and fast, not necessarily efficient. The superseding quest to maximize efficiency in the fire service removes surge capacity, making the fire service fragile"[6]. In the case of emergency services, reliability looks at

[5] CPSE – Community Risk Assessment: Standards of Cover, 6th Edition
[6] medium.com/elitecommandtraining 12-31-2016

actual incident history data to measure historical performance in accordance with adopted performance baselines. System reliability revolves around the time it takes to respond to the incident while overcoming distance and traffic conditions.

Reliability can be measured or depicted by several different methods. Some jurisdictions track the amount of time that response units are committed to emergencies with the goal of keeping unit availability at or above a certain percentage **[Table XXVII]**. The assumption is that out-of-service time results in simultaneous-call response time failure. For example, Bellevue strives to ensure that Unit Hours Utilization (UHU) remains below twenty percent (20%) for all BLS transport capable apparatus. Other jurisdictions might track the number of incident's in a stations area that are handled by out-of-district crews with the rationale that this is less-than-desirable because they assume that an out-of-district response time is automatically below standard. However, neither of these methods is a true predictor of degrading performance. In Bellevue's case, AVL dispatches and resource repositioning (coverage for units that are out-of-service for training) *can* and *does* ensure that response time standards are met even in out-of-district responses.

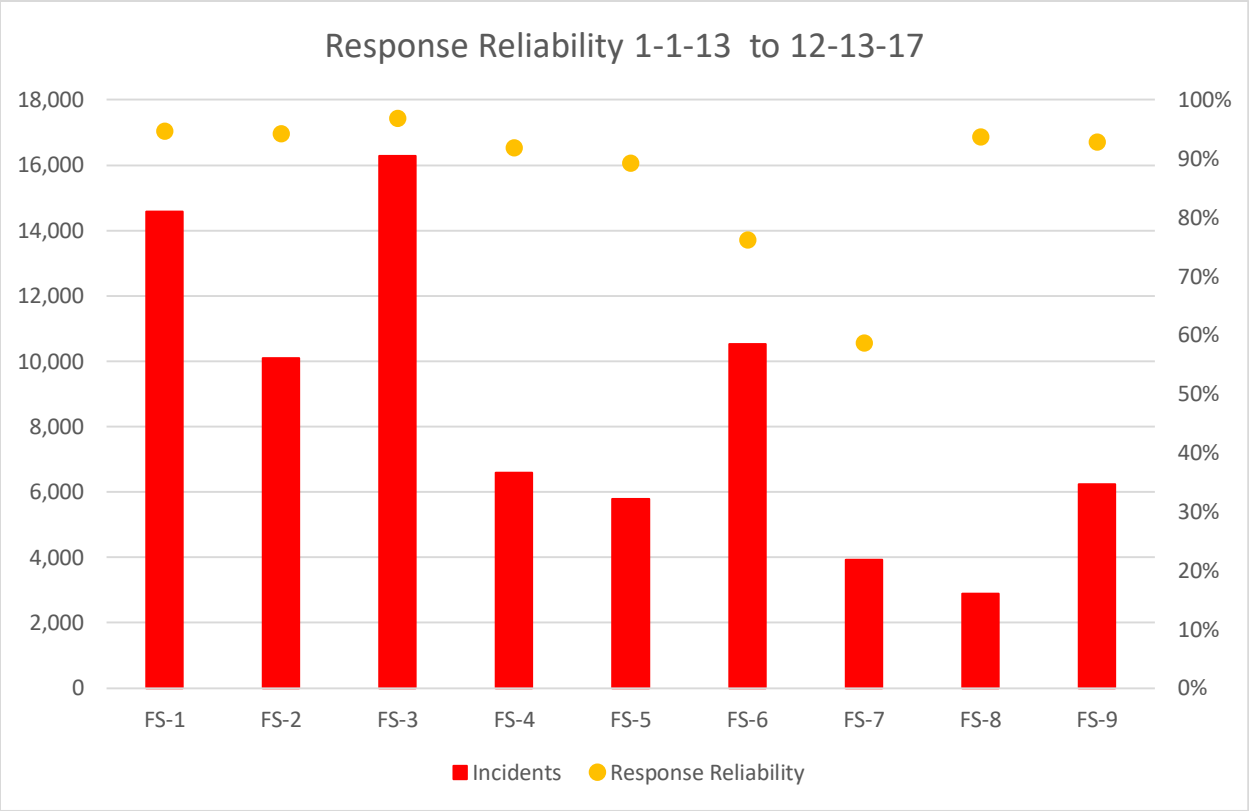
Table XXVII – 2017 Apparatus Unit Hour Utilization

Unit	Hours Committed	% Utilization	Number of Responses
A3	1561.8	17.83	2,451
A2	1550.0	17.69	2,238
A1	1507.1	17.20	2,677
M2	1315.9	15.02	1,900
M1	1074.4	12.27	1,730
M14	1036.6	11.83	1,407
E6	808.2	9.23	2,348
M3	690.8	7.89	796
E9	603.3	6.89	1,290
E1	601.1	6.86	1,581
LF3	583.2	6.66	1,830
LF7	582.2	6.65	1,915
E2	495.9	5.66	1,294
MSO5	403.7	4.61	969
E8	361.0	4.12	830
B1	216.7	2.47	822

M21	215.2	2.46	252
A6	129.4	1.48	217
CARES1	54.0	0.62	57
AU1	26.1	0.30	24
M2A	24.2	0.28	36
A1A	20.1	0.23	21
E9A	4.9	0.06	1
HM1	4.5	0.05	4
A9A	3.3	0.04	5
B2	3.2	0.04	8
R3	1.4	0.02	2
A9	0.7	0.01	1
L3	0.7	0.01	2
L7	0.6	0.01	2

A reliability problem does, however, manifest itself in one measurable outcome; failure to meet a response time standard. The value of seeing where these failures are occurring can help the department understand if response problems are more common in certain areas. The reasoning is, that clusters or concentrations of calls that fail to meet response standards highlight areas that would benefit the most from either additional resources or implementation of response efficiencies (e.g. moving a resource closer to the problem area, removal of traffic calming devices, etc.).

Table XXVIII - Response Reliability



[7]

Failure to meet response time standards can also be the result of process problems. For example, an agency's failure to have credible turnout time performance will have a significant impact on response time. Poor data entry into the incident Records Management System (RMS) can also have an effect. For example, where non-emergency calls with long response times are misclassified as priority responses. It is only reasonable to expect that turnout time standards and data entry integrity be monitored and maintained before a resource request can be completely justified.

The Bellevue Fire Department Office of Emergency Management's (OEM) primary mission is to strengthen overall city resilience by incorporating a whole community approach in its' daily operations. It does this internally by coordinating training and exercises of emergency operations with all City Departments, managing and facilitating the City of Bellevue's Continuity of Operations Plan (COOP) and externally by providing all hazards public education, preparedness and volunteer opportunities to businesses and residents of Bellevue.

Additionally, in the event of 800MHz radio system failure in an emergency, alternative communications resources will be used to attempt to reestablish communications between the Emergency Operations Center (EOC), Incident Command Posts, individual units, and Department Command Centers. These may include VHF radio, cellular phones, amateur radio, email, and runners. To this end the Department has developed and supported the Bellevue

[7] Response reliability for Bellevue stations ranges from 98% to 63%. Both FS-6 and FS-7 low reliability can be attributed to call volumes in the CBD requiring multiple out of area responses.

Communications Support (BCS) group, volunteer "Ham" radio operators who meet monthly and who train to be able to provide support during emergency events.

Absorption

Absorption is an agency's ability to quickly add or duplicate resources necessary to maintain service levels during incident levels beyond normal reliability demands and incidents of rare occurrence and/or magnitude[8].

To this end, the department has automatic and mutual aid agreements with all King County Zone One fire agencies and has been participating with the East Metro Training Group (EMTG) for the last five years to increase interoperability, increase familiarity with surrounding departments' and reduce variability in fireground tasks. This regional training provides a more seamless integration of "best practices" across the Zone One regional partners and provides additional resiliency for all participating members.

During periods of high incident volume such as a windstorm, the on-duty Battalion Chief may request that the Dispatch agency initiate "Resource Emergency". This action will place all non-emergent incidents into a queue awaiting the next available resource. Emergency incidents will always take priority over these non-emergent situations, thus ensuring that resources are always available when a more urgent situation arises.

Restoration/recovery

Restoration is defined as the systems' ability to return to normal operations.

This factor can be best accomplished by ensuring policies and procedures are in place to provide the supplies, equipment, personnel, apparatus and facilities necessary to resume normal operations as quickly as possible. To that end, the department has moved to ensure that reserve response apparatus are fully equipped to minimize the amount of time required to place them in service.

In order to ensure rapid recovery for the City, OEM manages the Comprehensive Emergency Management Plan (CEMP). This plan describes the basic strategies, assumptions, operational objectives, and mechanisms through which the City of Bellevue Emergency Management Program will mobilize resources and conduct activities to guide and support local emergency management efforts through preparedness, response, recovery, and mitigation.

[8] CPSE - Community Risk Assessment: Standards of Cover, 6th Edition

Section 5 Evaluation of Current Deployment and Performance

Overall jurisdiction performance

Alarm handling – Priority dispatch from call pick-up at 911 center Public Safety Answering Point (PSAP) to assignment of first fire apparatus. Adopted benchmark standard is 1:00 for 90% of incidents dispatched by NORCOM at Priority level P0 – P4.

Turnout – Priority response from the time the first fire apparatus is assigned/notified by dispatch of the incident until vehicle is "moving" on incident. Adopted benchmark standard is 1:00 for 90% of EMS and Rescue incidents. Adopted benchmark standard is 1:20 for 90% of Suppression and Haz-Mat incidents.

First-due travel – Priority response from the time the first responding apparatus is "moving" on the incident until first unit arrives at the scene of incident. Adopted benchmark standard is 4:00 for 90% of incidents dispatched priority where the first apparatus arrived emergency and did not downgrade or "reduce" enroute. Planning zones meeting the "High Density" threshold established will have an adopted benchmark standard of 2:00 for 90% of priority incidents.

Fractile factoid

Performance standards described with percentages are commonly referred to as "fractiles". Accredited departments prefer this reporting method over other statistical methods like "average response time" because fractiles state the *performance that is expected to occur*. When a fractile standard is set at a 90% level, it means the agency will *meet* or *beat* the given time standard in *at least* nine responses out of ten.

Total Response Time (TRT) – Evaluated on time from PSAP to first arriving fire apparatus on priority responses, includes all the three components of response (alarm handling/Dispatch, Turnout, & Travel). Adopted benchmark standard is 6:00 for 90% of EMS and Rescue incidents. Adopted benchmark standard is 6:20 for 90% of Suppression and Haz-Mat incidents. Incidents falling within planning zones designated "High Density" shall be 4:00 for EMS and Rescue and 4:20 for Suppression and Haz-Mat incidents, 90% of the time.

ERF travel time – The time necessary to travel to the incident for an "Effective Response Force". This time will depend on the call/incident type; for low risk EMS calls, ERF may be one apparatus with two firefighters, for a moderate risk structure fire the ERF may be multiple engines, ladders, chief officers and other apparatus until 17 firefighters are present. Adopted standard for ERF travel will be between 4:00 and 8:00, 90% of the time depending on the incident risk and critical tasking.

ERF TRT – The total time necessary to establish an "Effective Response Force". This time will depend on the call/incident type; ERF may be one apparatus with two firefighters, for a High risk structure fire the ERF may be multiple engines, ladders, chief officers and other apparatus until 19 firefighters are present. Adopted standard for ERF TRT will be between 6:00 and 10:00, 90% of the time depending on the incident risk and critical tasking.

Table XXIX - 90% Performance Incidents

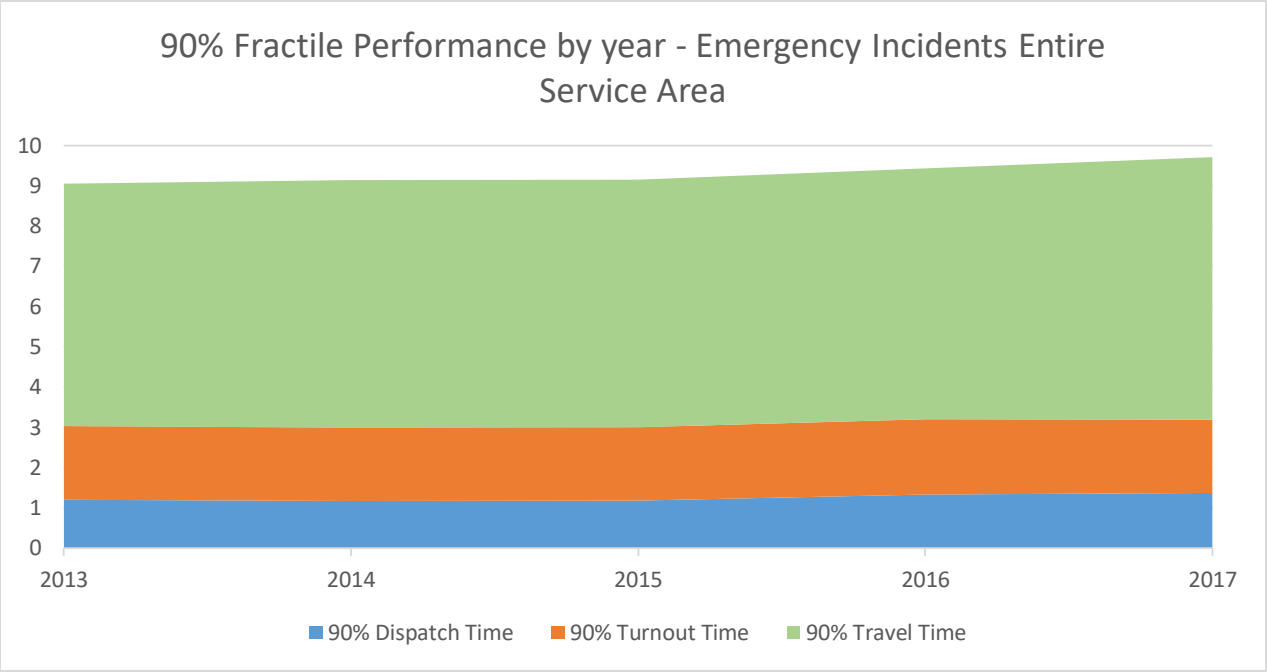
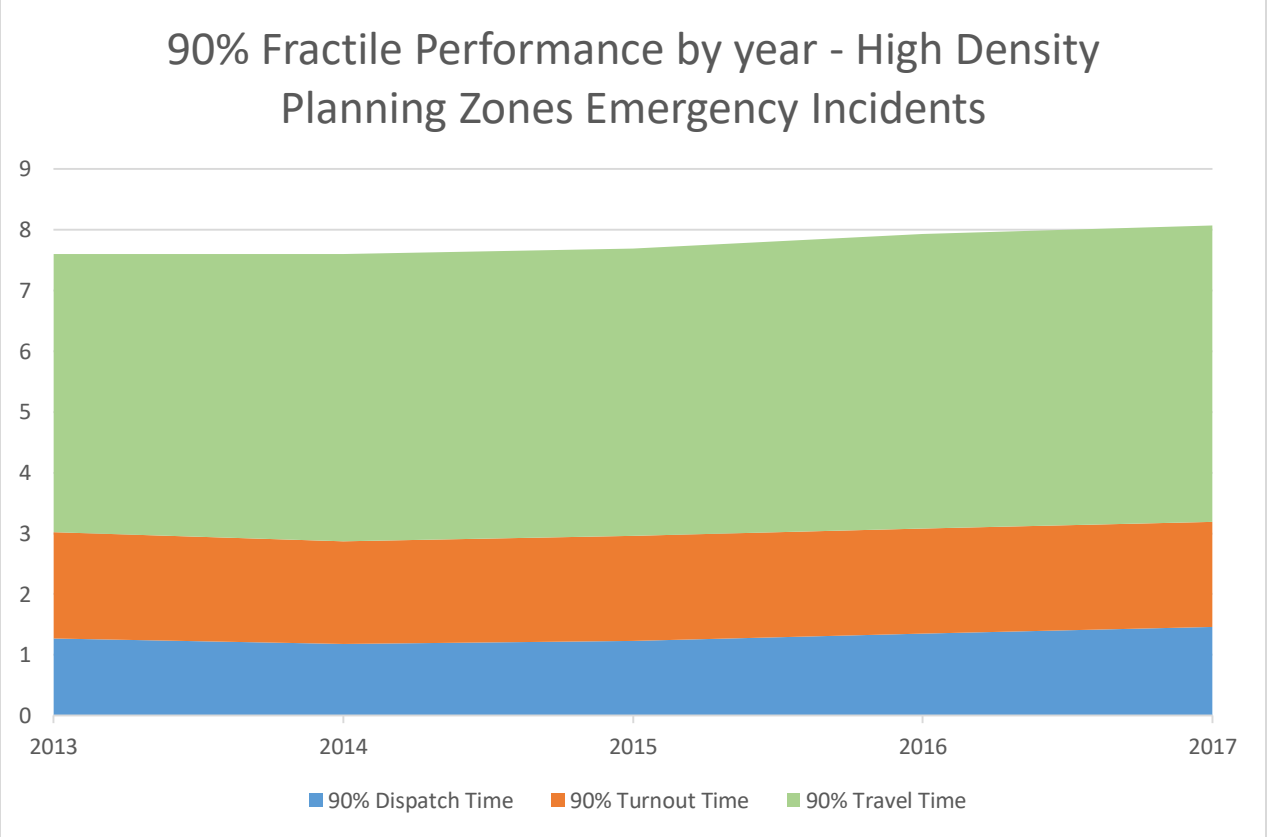


Table XXX - 90% Performance High Density



Planning Zones

Bellevue Fire Station response areas will be the primary planning zones used for response time analysis according to the Benchmark Service Level Objectives and incident/response distribution. These planning zones will be the default geographic area used for communication, reporting and resource allocation decisions unless modifying factors exist.

Table XXXI - Total Incidents by Station

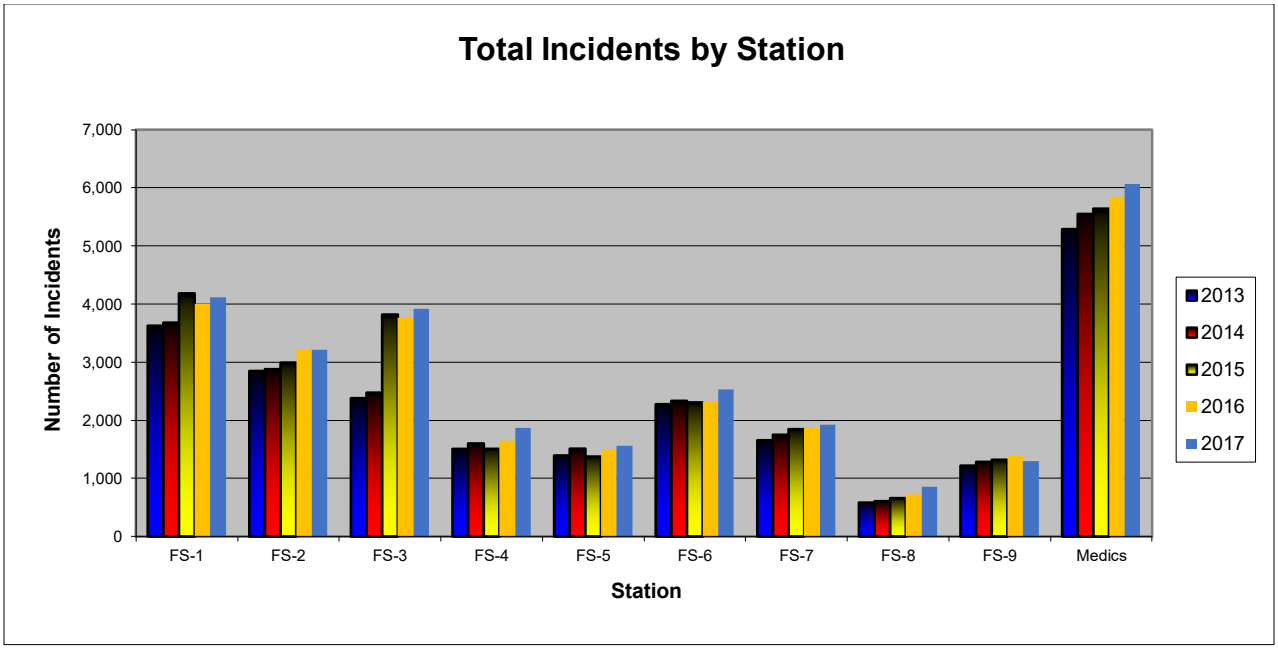


Table XXXII- Incident by Day

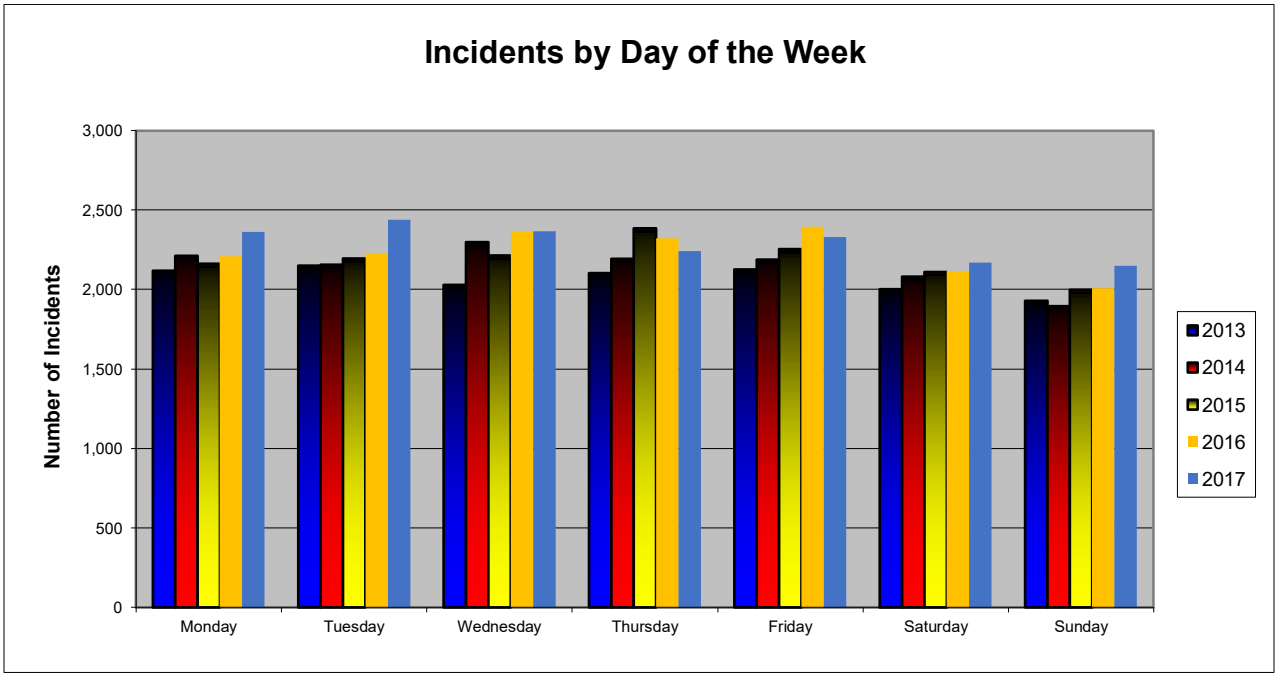
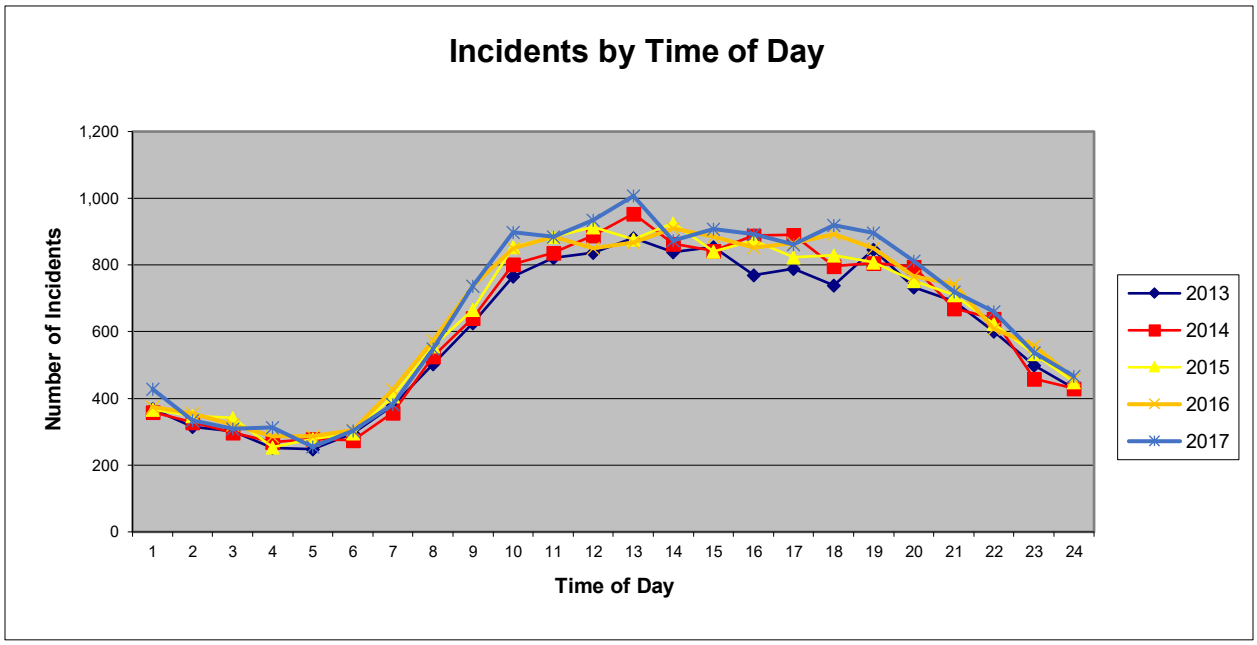


Table XXXIII - Incidents by Time



City of Bellevue Neighborhood planning zones will be used to validate response time component performance, incident/response distribution and communication/presentations to neighborhood groups. However, due to their exclusion of communities and areas served by Bellevue Fire that are outside the City limits, they do not represent overall system workload or performance.

Table XXXIV - Heat Map Downtown Planning Zone

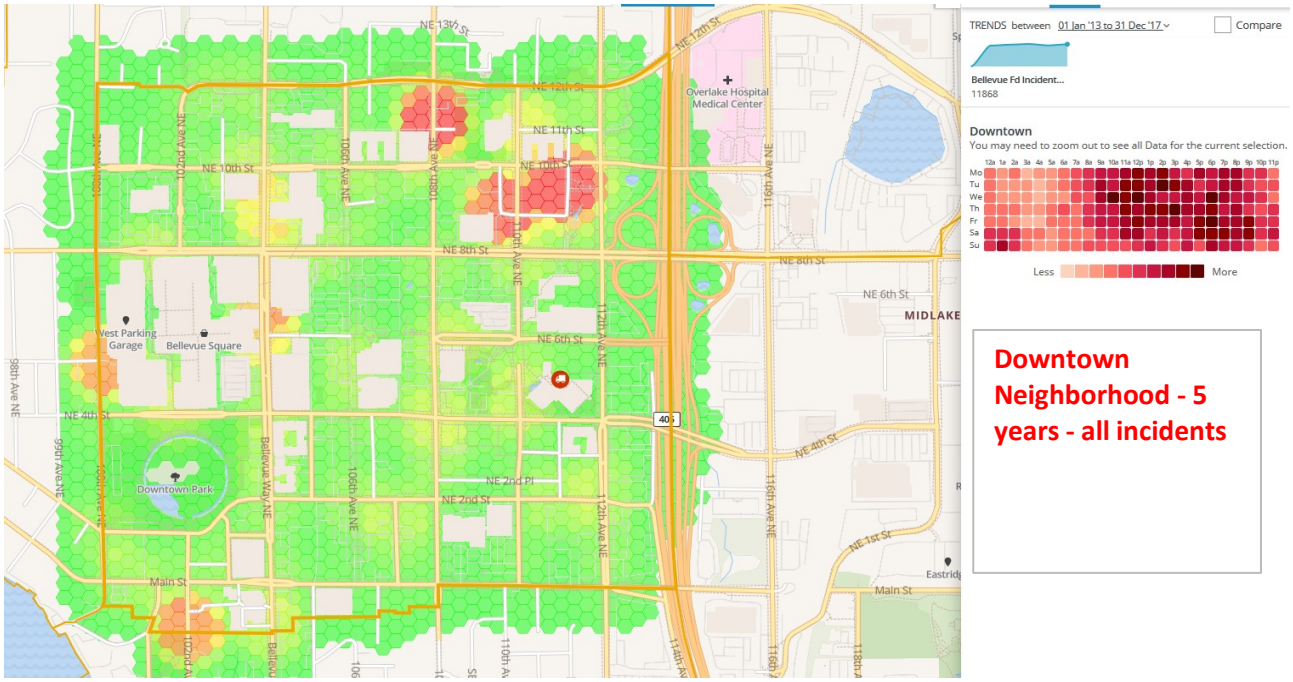


Table XXXV - Heat Map Downtown Planning Zone - Fires

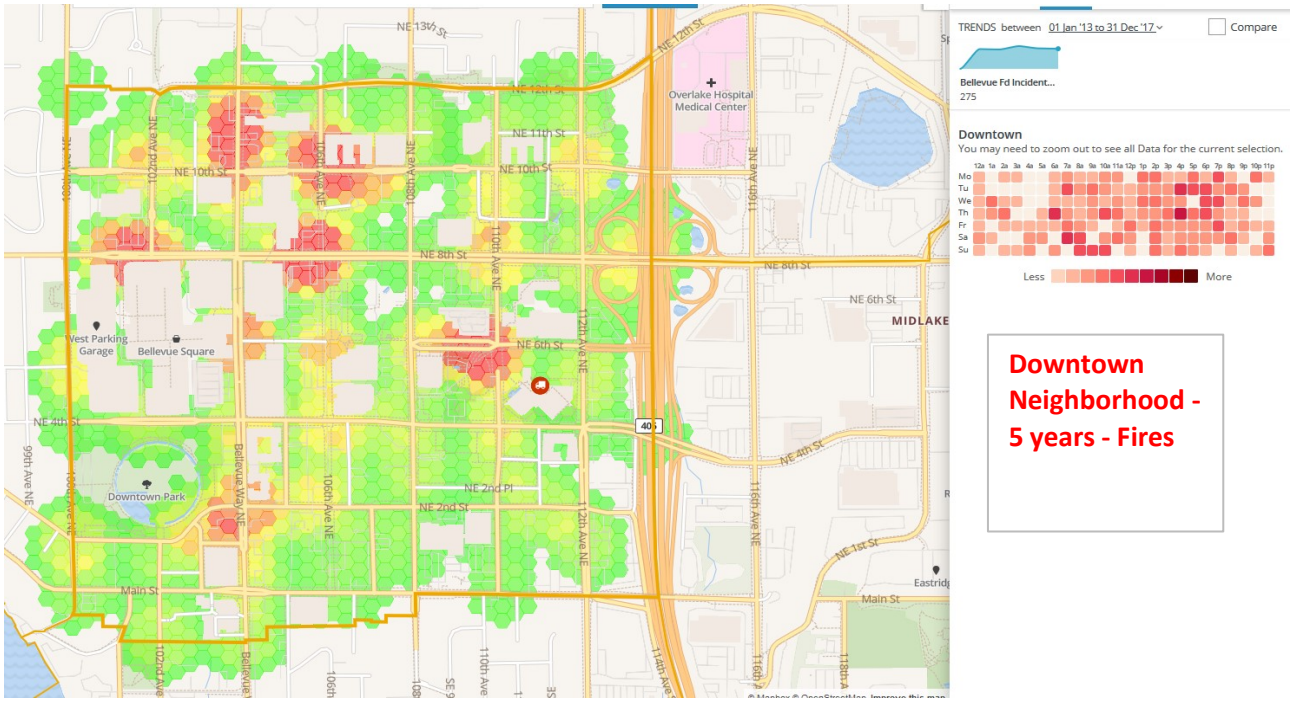


Table XXXVI - Risk by Neighborhood

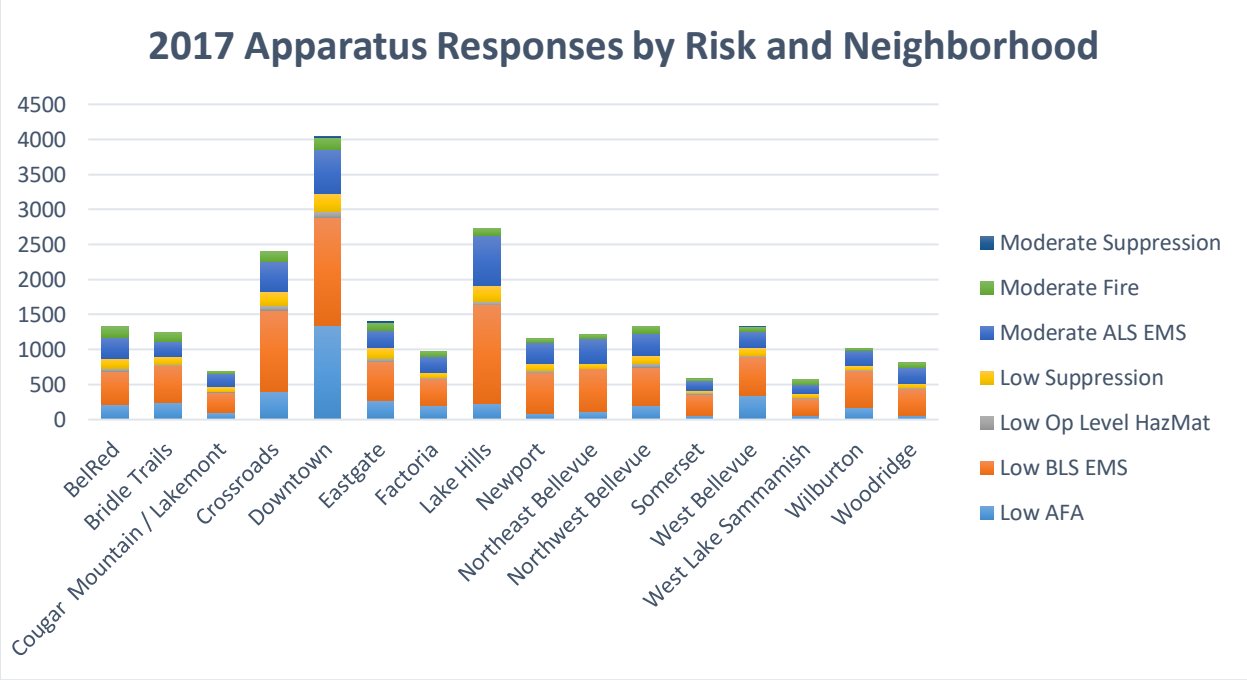
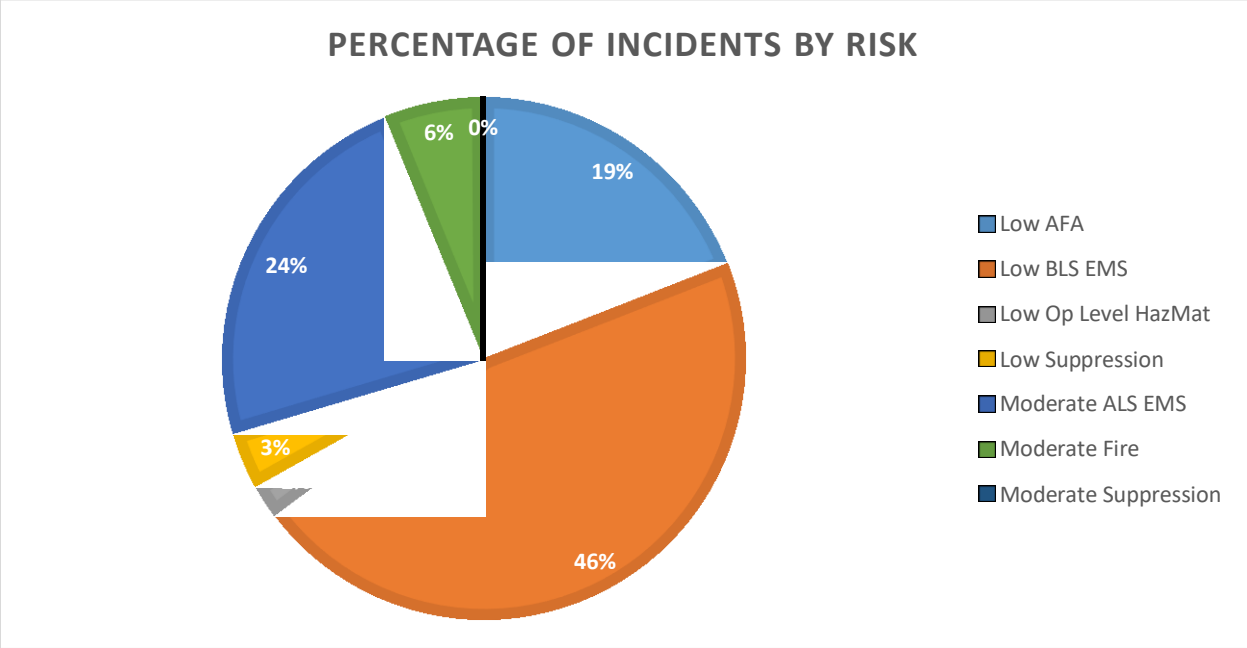
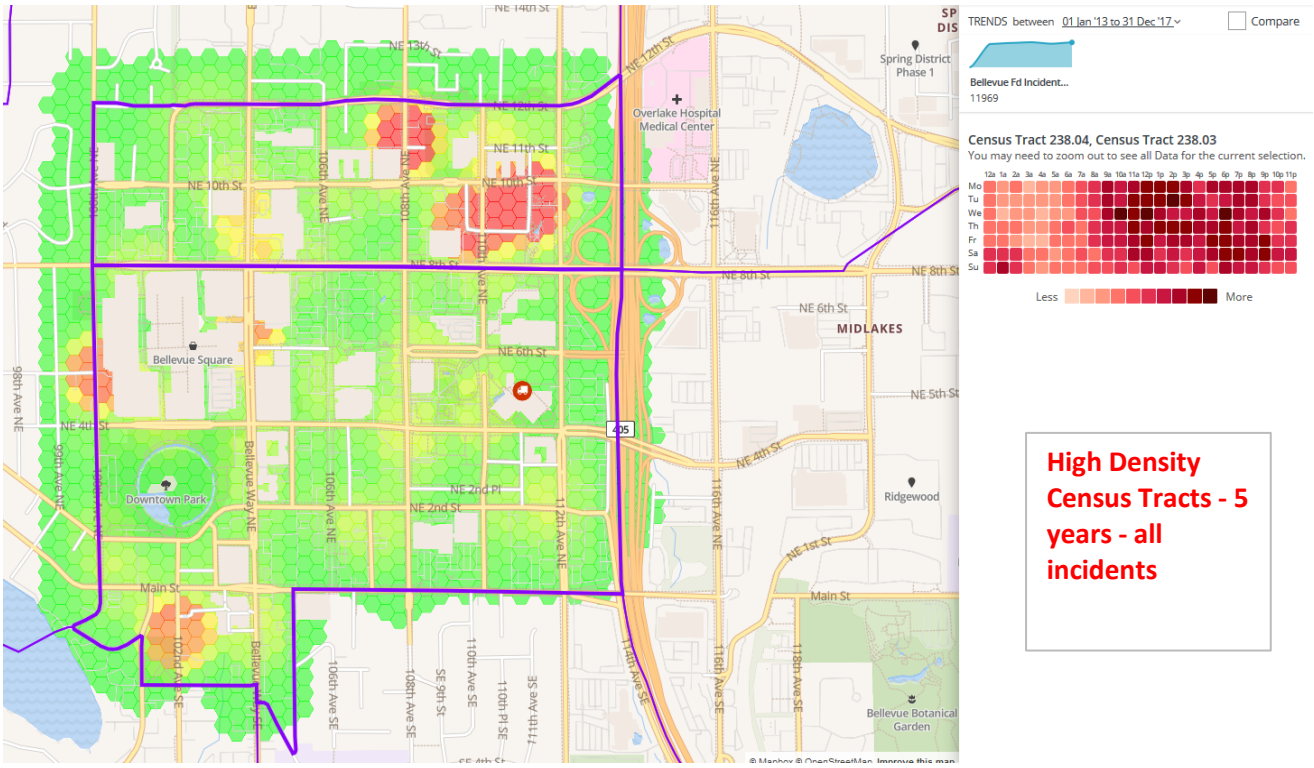


Table XXXVII - Percentage of Incident by Risk



U.S. Census Tracts exceeding the "High Density" threshold will be evaluated under the adopted Benchmark Service Level for those areas. But otherwise, Census demographic data will primarily be used for Community Risk Reduction efforts and decisions on where and how to focus outreach strategies by the Community Risk Reduction Group (CRRG).

Table XXXVIII - Heat Map High Density Planning Zones



High Density Census Tracts - 5 years - all incidents

Section 6 Plan for Maintaining and Improving Response Capabilities

Public safety continues to be a high priority for Bellevue residents. The expectations of the community are clearly stated in the 2016 Budget survey. The City of Bellevue's 2010, 2012, 2014, and 2016 Budget Surveys asked Bellevue residents about their top budget priorities for City services. "Provide a "Safe Community" was identified as the most important priority in both 2010, 2012, 2014 and the second most important priority in 2016. Survey respondents were also asked to rank the importance of a long list of City services, as well as their relative satisfaction with each. "Responding to fires" was identified as both the most important service and the function residents are most satisfied with for 2010, 2012, 2014, and 2016. "Providing emergency medical services" ranked second in 2014 and fourth in 2016.This is evidence that the services provided by the Department are both valued by the community, and meeting their expectations.

While the risk analysis has shown a broad spectrum of hazards in the jurisdiction, the concentration of highest risks near the more developed areas is properly addressed by the current positioning of response resources. Additionally, the modern construction and advanced fire protection that is typical for special and high-risk occupancies in this jurisdiction helps to lessen the overall community risk. Additionally, the 2016 approval of the Fire Facilities Master Plan Levy and associated Property Tax Levy will serve to improve response and reliability across the jurisdiction with the construction of a Downtown Fire Station and the addition of an engine company. This station will be operational in 2022.

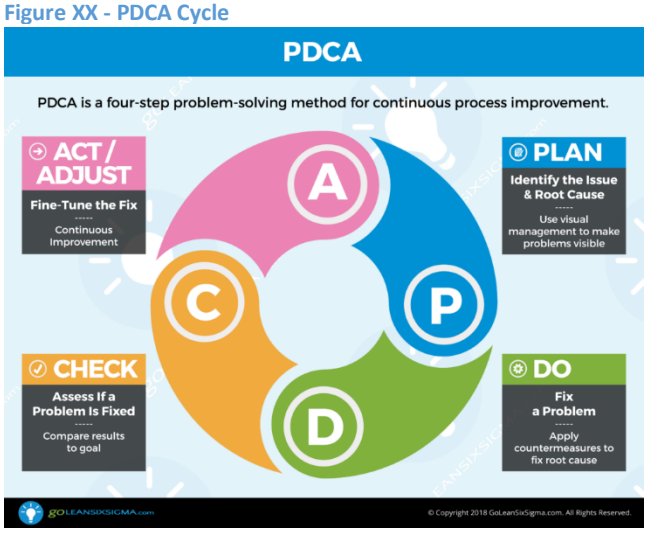
Ensuing Compliance/validation of Response Plans

Continuous improvement requires development of a methodology to ensure that planning occurs, problem are addressed, results are evaluated and adjustments are made. This process is best illustrated by the Plan, Do, Check Act (PDCA) method, also known as the Deming Cycle. To continually improve, an organization must use the PDCA method in an iterative manner. In order to further develop this competency, an Annual Risk Assessment Performance Planning Evaluation Group (ARAPPEG) has been established. The ARRAPPEG shall meet by the end of the first quarter of each calendar year, and shall be comprised of;

- Deputy Chief – Operations
- Accreditation Manager
- Commander, EMS Division
- Commander, Training Division
- Battalion Chief, any platoon
- Community Risk Reduction Specialist
- Community Liaison Officer
- Fire Marshal or designee
- Emergency Manager or designee
- Data Analyst
- Other staff as needed

This group shall be tasked with performing the following:

Figure XX - PDCA Cycle



1. Review previous years' service demand by planning zone
2. Validate categorization of risk for each program area and class within each planning zone and document validation
3. Validate critical infrastructure inventory and changes within each planning zone, discuss and document
4. Review program areas that exceed threshold levels established by policy document, determine if changes need to be made and document discussion
5. Assess adequacies, consistencies, reliabilities and opportunities for improvement for the total response area and document discussion
6. Evaluate altering conditions, population growth, traffic, development and changing risk and document discussion
7. Evaluate community risk reduction, public education and outreach efforts and their effect on incident mitigation by program area and document findings
8. Discuss industry research findings that are relevant to each program area and document discussion
9. Update the Performance Improvement Plan (PIP) that details findings, action recommended, plans and efforts to address identified gaps
10. Produce a Summary report for the Fire Chief to use when briefing the City Manager and City Council

Monitoring reports and risk visualization tools will help the Department determine the changing service demands. Those service demands will, in turn, cause the department to look for ways to optimize performance and improve overall outcomes. For example, changing EMS service demands or increased call volume in specific areas will lead the Department to consider revising resource staffing and/or positioning.

Performance Policy

Emergency response time data for the previous year will be evaluated by the ARRAPPEG to ascertain performance for each program area. Program areas are defined as:

- Suppression
- Basic Life Support (BLS)
- Advanced Life Support (ALS)
- Hazardous Materials (Haz-Mat)
- Rescue.

Response data to be evaluated will include;

- Number of responses
- Dispatch time
- Turnout time
- Travel time
- Total response time (TRT)
- Effective response force (ERF) travel
- ERF TRT

Every category of risk by program area will be evaluated whenever the number of responses meets the accreditation minimum (n=>10).Threshold limits for each program area shall consist of:

- An increase or decrease of 10% in any component of response time (n>100);
- An increase or decrease of 10% in any number of responses by program area (n>500);

- An increase or decrease of ERF travel or ERF TRT by 10% or greater by program area (n>50).

Data will be analyzed against previous year and historical performance following the *Policy – Use of Planning Zones* to determine trends. Program areas or categories of risk where two (2) or more components of response exceed threshold limits and result in a **Confidence interval** of 95% or higher will be identified and highlighted for additional evaluation

Ongoing efforts to ensure performance

In November 2016, Bellevue voters approved the Fire Master Facility Levy to fund a downtown fire station (Station 10), rebuild Fire Station 5 and improve and update our facilities over the next twenty years. This levy is the culmination of over twenty years of effort towards establishing a fire station in the downtown area. This new response resource will help to ensure that current and future development can be mitigated, incident ERFs' achieved and limit the effect of increasing density and population.

Additionally, the rezoning and development of the transit oriented "Spring District" will affect both call location and nature in yet unknown ways. By working towards mitigation strategies, partnering with developers and Sound Transit to anticipate issues and by constantly reevaluating our practices and response plans, we encourage innovation, analyze incidents, plan response and discard non-optimal methods.

Turnout time performance reports are produced on monthly intervals and are then distributed to the platoon battalion chiefs. Battalion chiefs are tasked with reviewing the reports and counseling crews that are falling below Department standards. Additionally, a dispatch based trigger has been implemented to alert on-duty BC's of units that fail to meet minimum turnout standards. The Battalion chiefs have the discretion to document performance-improvement efforts in this area.

Lastly, the department will work towards using demographic data to focus community risk reduction outreach and mitigation efforts to ensure that these are "right-sized", timely and relevant to the community.

Community Risk Reduction Plan (CRRP)

In 2015, the department leveraged existing resources to establish a community risk reduction group (CRRG), consisting of the CLO/PIO and the Community Risk Reduction Specialist. This group was tasked with coordinating community outreach, prevention, education, training and mitigation activities to ensure consistent messaging and adequate resource allocation.

The 2016 Strategic Plan defined the following action items towards strengthening our ability to effectively engage with the public:

1. Build the department's multicultural connections and capabilities.
2. Expand a prevention outreach program to use data-based research to target and communicate with groups facing the highest risk from fires, disasters and health emergencies.
3. Increase the cultural competency of all staff through specialized training in multicultural connections and capabilities.
4. Leverage technology to improve communications with diverse communities when we are unable to deploy specialized personnel with relevant experience.
5. Expand our opportunities for effective, quality public engagement. Increase the effectiveness of our outreach efforts by prioritizing and coordinating with partners to develop new tools.

6. Increase communication with contract city officials and outreach to residents of contract cities.
7. Continuously improve our efforts through data-based assessments of the effectiveness of outreach programs.

In accordance with CFAI "Best Practices", a budget proposal was submitted for the 2019-2020 budget to enhance the structure of this group and develop a more focused CRRP. The long-term goal of this plan is to ensure that Fire Prevention, Emergency Management, Emergency Medical Services, CRRG and Suppression staff coordinate to deliver "community risk reduction" that is relevant, timely, well-coordinated and makes the best use of limited resources.

Future efforts will focus on raising the participation of community members and other city departments in our outreach planning efforts to leverage other programs/services/partnerships, define community concerns, increase the effectiveness of our efforts, make more use of volunteers and increase the level of trust between the department and the diverse communities we serve. This participation will have the following effects:

- Improve access to public safety information through partnerships with community specific media.
- Support public safety programs that provide outreach to vulnerable people groups, including the elderly, disabled, and isolated communities.
- Establish policies and procedures to ensure that materials and outreach events are culturally-appropriate to reach the greatest percentage of our target audiences.
- Leverage existing expertise in other COB departments to take advantage of established programs, services, partnerships and relationships.
- Prioritize a data-driven approach to outreach and focus on "what works".
- Increase ownership of community risk prevention and mitigation activities within the organization to ensure that Operations staff participate fully where practical.

Programs - changing demographics and vulnerable populations

The region is becoming more diverse by any measure, including race, ethnicity, country of origin, and language spoken at home. In the Bellevue School District, more than 80 languages are spoken, 11% of the population qualifies for the English-Language-Learners Program, and 34% of the student population speaks a language other than English. While enriching the fabric of the communities we serve, this diversity creates challenges for the department. More than half of the residents of some neighborhoods and one third of the City of Bellevue's overall population speaks a language other than English at home. The presence of populations with different cultural backgrounds, life experiences, and native languages requires fire personnel to be flexible, creative, and sensitive in communicating and interacting effectively. This is true both during preparedness outreach prior to an emergency and during an actual event.

Community feedback was gathered through an online survey conducted in May of 2016, and 339 service-area residents responded. An increase from the 271 respondents who responded to the same survey in January of 2012. This survey explored service priorities, levels of satisfaction with department services, community expectations, and desired formats for ongoing communication.

In response to the survey results, the department has focused its efforts on strengthening current community engagement strategies and developing additional engagement strategies that improve access to public safety information for all populations. One of the ways we accomplish this goal is by providing cultural competency

training to help staff interact appropriately with people of different cultural and language backgrounds during all departmental actions per the Bellevue Diversity Advantage Initiative.

Planning for a changing community and mitigating risk

- **Comprehensive Emergency Management Plan (CEMP)** – Last updated in 2013 and currently being updated, this serves as the foundational framework for citywide prevention, mitigation, response and recovery activities.
- **Vulnerable Populations** – defined by the CEMP as elderly, the very young and those who don't speak English, mitigation and education of this "at-risk" population provides for reduction in call volumes, greater resiliency within the Community and ensures the most likely individuals to require assistance are better prepared in the event of an incident.
- **Community Risk Reduction Plan (CRRP)** – Preparation and education is the best way to ensure the public, community and fire department can recover from a significant event. In a disaster, family, neighbors, and friends may be the primary source of support and assistance. Preparedness is essential in building community resilience and ensuring Bellevue can recovery efficiently and effectively.
- **Leverage volunteers wherever it makes sense:**
  - BCS - The Bellevue Communications Support team is a group of approximately 30 volunteer amateur radio operators in the Bellevue area. The group provides auxiliary communications support to Bellevue and agencies serviced by NORCOM, the Eastside's 9-1-1 service provider, during a disaster or emergency.
  - **CERT/CERT Lite** - The Community Emergency Response Team (CERT) is a federal program that educates people about disaster preparedness and basic response skills. Bellevue's CERT program is designed to empower citizens who live or work in Bellevue to be better prepared for unexpected emergencies. The CERT course incorporates the following units: disaster preparedness, fire and safety utility controls, disaster medical operations, light search and rescue operations, organization, disaster psychology, and terrorism.
  - **Citizen Corps Council** - The Citizen Corps Council (CCC) is a federal program coordinated by the Department of Homeland Security's Federal Emergency Management Agency (FEMA). Its purpose is to bring together volunteers, city staff, and stakeholders to create strategies for outreach, as well as report information to the Emergency Operations Center (EOC).
- **CARES** - **Citizen Advocates for Referral and Education Services**. In recent years, a few fire agencies throughout the country have established community outreach and assistance programs. This internal referral service utilized by the Bellevue Fire and Police departments is a truly innovative way to reach residents in our community outside of the 911 emergency system. Both the Fire and Police Departments frequently respond to incidents where additional needs are identified but fall outside of their scope of responsibilities. For example, a fall patient who calls 911 frequently for help and would benefit from grab bars or alterations to their home to help prevent falls and provide for more independent living. A homeless person who needs a gateway to housing, substance abuse programs or job opportunities. Even the elderly woman who tries tenaciously to care for her ailing husband at home but is overwhelmed. These are just a few examples where fire or police can notify the CARES team for intervention. CARES advocates meet with residents in their homes, identify their needs and connect them to community resources that will better meet those needs than a call to 911. In 2017, CARES provided response on 715 non-emergency service incidents.

Goals and objectives

The goal of creating the *Standards of Cover* document is to provide the Bellevue Fire Department with a rational, data-based analysis for the justification and effectiveness of the services provided. The previous chapters have helped develop a full inventory of fire, Suppression, EMS, rescue, Haz-Mat, demographic and other environmental hazards present in the communities served. Considering those risks, the department can create and better manage a response force that can minimize the impact of those hazards.

In reviewing the *Standards of Cover*, staff and field personnel have a more comprehensive understanding of the department's ability to provide fire protection and related services based on actual data. The value of this type of document cannot be understated; as it also provides leaders and citizens with a clear picture of the justification for fire department staffing and resources. By ensuring that a comprehensive Community Risk Assessment evaluates all inputs, accounts for changing demographics, is responsive to the needs of the community and occurs more frequently; we ensure that these documents are actively used to formulate and evaluate plans and programs. The CRA and SOC ultimately inform the Goal and Objectives of the department by; highlighting areas in need of improvement, identifying programs in need of expansion and illuminating new trends in community risk reduction. This information should then be used to formulate and inform the strategic planning effort.

Recommendations

1. The department does have the ability to report the number of certified Technicians on-duty each day. Staffing of technician level resources is required per contract and the department strives to ensure that an adequate number are working each shift. However, no validation of Technician certification by response unit exists to ensure ERF requirements are met. Determining a method of assessing unit response and certified personnel present should be investigated and developed.
2. The department does not currently have the ability to report the number of certified Technicians on-duty in the Zone each day. High/Special risk HazMat and Rescue incidents rely on resources from surrounding agencies to achieve ERF technician requirements. Currently, no validation of Technician certification by responding automatic/mutual aid unit exists to ensure ERF requirements are met. Working with Zone One Operations Chief to create a method of assessing unit response and certified personnel present should be pursued.
3. An in-depth Wildland-Urban Interface analysis is recommended to assess the changes in exposure, review response strategies, and develop outreach/mitigation plans to ensure that the community is protected and prepared**.**
4. As the Olympic Pipeline plan was originally formulated in June 2000, and last reviewed and updated in June 2005, it is recommended that this plan be updated and reviewed for changes in response plans, community development and topography every 10 years. Additionally, OPLC technology and procedure changes should be routinely evaluated against response plans. Plans to install new high capacity electrical transmission lines known as "Energize Eastside" should be factored into this study.
5. The department must work to ensure the presence of fire protection system are considered in response plan development.
6. The department should work to better integrate critical infrastructure (CI) into response strategy formation and ensure that clear guidelines exist to define CI.

Section 7 Correlation of CRA-SOC Document to CFAI Accreditation Model

Correlation Matrix

Performance Indicator/Core Competency	Performance Indicator/Core Competency Text	CRA-SOC Location Page/Section/Area
1A.4	The governing body of the agency periodically reviews and approves services and programs.	Page 13
1A.7	The governing body or designated authority approves the organizational structure that carries out the agency mission.	Page 13
1A.9	A communication process is in place between the governing body and the administrative structure of the agency.	Page 13
1B.2	Financial, equipment, and personnel resource allocation reflects the agency's mission, goals, and objectives.	Page 13
2A.1	Service area boundaries for the agency are identified, documented, and legally adopted by the authority having jurisdiction.	Page 15
2A.2	Boundaries for other service responsibility areas, such as automatic aid, mutual aid, and contract areas, are identified, documented, and appropriately approved by the authority having jurisdiction.	Pages 15 - 19
CC 2A.3	The agency has a documented and adopted methodology for organizing the response area into geographical planning zones.	Pages 40 - 47
CC 2A.4	The agency assesses the community by planning zone and considers the population density within planning zones and population areas, as applicable, for the purpose of developing total response time standards.	Page 47
2A.5	Data that includes property, life, injury, environmental, and other associated losses, as well as the human and physical assets preserved and/or saved, are recorded for a minimum of five immediately previous years.	Pages 30 -32
2A.6	The agency utilizes its adopted planning zone methodology to identify response area characteristics such as population,	Page 38

	transportation systems, area land use, topography, geography, geology, physiography, climate, hazards and risks, and service provisions capability demands.	Pages 40 - 48
2A.7	Significant socio-economic and demographic characteristics for the response area are identified, such as employment types and centers, assessed values, blighted areas, and population characteristics.	Pages 15 -19 & Pages 43 - 47
2A.8	The agency identifies and documents all safety and remediation programs, such as fire prevention, public education, injury prevention, public health, and other similar programs, currently active within the response area.	Page 28
2A.9	The agency identifies critical infrastructure within the planning zones.	Page 73
CC 2B.1	The agency's documented and adopted methodology for identifying, assessing, categorizing, and classifying risks throughout the community or areas of responsibility.	Pages 38 - 48
2B.2	The historical emergency and non-emergency service demands frequency for a minimum of three immediately previous years and the future probability of emergency and non-emergency service demands, by service type, have been identified and documented by planning zone.	Page 85 - 92
2B.3	Event consequence loss and save data that includes property, life, injury, environmental, and other losses and saves are assessed for five immediately previous years.	Pages 30 - 32
CC 2B.4	The agency's risk identification, analysis, categorization, and classification methodology has been utilized to determine and document the different categories and classes of risks within each planning zone.	Pages 38 - 48
2B.5	Fire protection and detection systems are incorporated into the risk analysis.	
2B.6	The agency assesses critical infrastructure within the planning zones for capabilities and capacities to meet the demands posed by the risks.	Page 92
CC 2C.1	Given the level of risks, area of responsibility, demographics, and socio-economic factors, the agency has determined, documented, and adopted a methodology for the consistent provision of service levels in all service program areas through response coverage strategies.	Page 77

CC 2C.2	The agency has a documented and adopted methodology for monitoring its quality of emergency response performance for each service type within each planning zone and total response area.	Pages 86 - 95
2C.3	Fire protection systems and detection systems are identified and considered in the development of appropriate response strategies.	
CC 2C.4	A critical task analysis of each risk category and risk class has been conducted to determine the first-due and effective response force capabilities, and a process is in place to validate and document the results.	Appendix A & Page 93
CC 2C.5	The agency has identified the total response time components for delivery of services in each service program area and found those services consistent and reliable within the entire response area.	Appendix B
2C.6	The agency has identified the total response time components for delivery of services in each service program area and assessed those services in each planning zone.	Appendix B
CC 2C.7	The agency has identified efforts to maintain and improve its performance in the delivery of its emergency services for the past five immediately previous years.	Page 95 & Appendix C
2C.8	The agency's resiliency has been assessed through its deployment policies, procedures, and practices.	Pages 81 - 85
CC 2D.1	The agency has documented and adopted methodology for assessing performance adequacies, consistencies, reliabilities, resiliencies, and opportunities for improvement in the total response area.	Page 93
2D.2	The agency continuously monitors, assesses, and internally reports, at least quarterly, on the ability of the existing delivery system to meet expected outcomes and identifies the remedial actions most in need of attention.	Pages 93 -94
CC 2D.3	The performance monitoring methodology identifies, at least annually, future external influences, altering conditions, growth and development trends, and new or changing risks, for purpose of analyzing the balance of service capabilities with new conditions or demands.	Pages 93 -94
2D.4	The performance monitoring methodology supports the annual assessment of the efficiency and effectiveness of each service program at least annually in relation to industry research.	Pages 93 -94

2D.5	Impacts of incident mitigation program efforts are considered and assessed in the monitoring process.	Pages 93 -94
CC 2D.6	Performance gaps for the total response area, such as inadequacies, inconsistencies, and negative trends, are determined at least annually.	Pages 93 -94
CC 2D.7	The agency has systematically developed a continuous improvement plan that details actions to be taken within an identified timeframe to address existing gaps and variations.	Appendix C
2D.8	On at least an annual basis, the agency formally notifies the AHJ of any gaps in the operational capabilities and capacity of its current delivery system to mitigate the identified risks within its service area, as identified in its standards of cover.	Page 93
2D.9	On at least an annual basis, the agency formally notifies the AHJ of any gaps between current capabilities, capacity, and the level of service approved by the AHJ.	Page 93
2D.10	The agency interacts with external stakeholders and the AHJ at least once every three years, to determine the stakeholders and AHJ's expectations for types and levels of services provided by the agency.	Page 93

Summary

The Bellevue Fire Department has committed to both the intent and spirit of achieving and maintaining International Accreditation. While rigorous, the process ensures that even the most professional and competent of organizations recognize and identify gaps in their service delivery and take steps to address those shortfalls. This periodic reassessment is necessary to continue to evolve; the organization, our procedures, response plans, outreach, education and delivery of services to the community.

The CRA process and SOC document are a foundational piece to ensure that our Strategic Plan, Community Risk Reduction Plan (CRRP), Goals and Objectives and Performance Improvement Plan (PIP) address the correct issues, identify areas of shortfall, facilitate discussions about resource positioning and allocation and provide data informed community outreach and education.

Section 8 Appendices

Appendix A – Critical Tasks and ERF Determinations

Low Risk

Category	Program Area	Type of Calls	Critical Tasks	Minimum Personnel
Low Risk	EMS			
		EMS BLS Medical/Trauma	Command/Assess scene safety	1
			Assess patient/provide treatment	1
			Transport (if needed)	
			Total ERF Required	**2**
Low Risk	Suppression			
		AFA SFR/MFR/Comm	Command	1
		Service Call	Pump Operator/Alarm Panel	1
		Minor Flooding	Attack Line/Investigation	1
		Vehicle Fire		
		Dumpster Fire		
			Total ERF Required	**3**
Low Risk	HazMat			
		CO Call	Command/Size up	1
		Other Operational HazMat	Mitigation	2
			Total ERF Required	**3**
Low Risk	Rescue			
		Trail Rescue (BLS)	Command/Safety	1
			Search/Rescue	2

			Total ERF Required	**3**

Moderate Risk

Category	Program Area	Type of Calls	Critical Tasks	Minimum Personnel
Moderate Risk	EMS			
		ALS Medical/Trauma	Command/scene safety	1
			ALS Meds/IV/Shock/Airway	2
			BLS Support/Transport	1
			Total ERF Required	**4**
Moderate Risk	EMS			
		MVA Street	Command/scene safety	1
			Triage and assessment	2
			BLS Support/Transport	2
			Total ERF Required	**5**
Moderate Risk	EMS			
		MVA - Freeway	Command/Blocking/scene safety	1
			Water supply/pump operator	1
			Attack Line	1
			Triage and assessment	2
			BLS Support/Transport	2
			Total ERF Required	**7**
Moderate Risk	Suppression			
		Working Fire - SFR	Command	2
		Working Fire - MFR	Water supply/Pump operator	1
		Working Fire - Comm	Fire Attack / Backup line	5

			Forcible entry/Search	2
			Ventilation	3
			RIT	3
			Support/Utilities	2
			Safety	1
			Total ERF Required	**19**
Moderate Risk	Suppression			
		Brush Fire	Command/Scene safety	2
			Water supply/Pump operator	2
			Fire Attack - 2 lines	4
			Total ERF Required	**8**
Moderate Risk	HazMat			
		Suspicious substance	Command/Size up	1
			Air Monitoring/Investigation	1
			Establish zones	1
			Water Supply / Pump operator	1
			Attack Line	1
			Total ERF Required	**5**
Moderate Risk	Rescue			
		Vehicle Entrapment	Command	2
		Low Angle	Safety	1
		Surface Water Rescue	Triage	1
			Rescue Technicians	4
			Rescue Supervisor	1
			EMS Treatment	2
			Total ERF Required	**11**

High Risk

Category	Program Area	Type of Calls	Critical Tasks	Minimum Personnel
High Risk	EMS			
		Cardiac Arrest	Command/Safety	1
		MCI <10	Med Control / Family Liaison	1
			Triage/CPR	2
			ALS Meds/IV/Shock/Airway	2
			BLS Support/Transport	2
			Total ERF Required	**8**
High Risk	Suppression			
		Working Fire - Targeted Hazard	Command	2
		Target Hazards include:	Water supply/Pump operator	2
		I Occupancies		
		Hospitals	Fire Attack - 4 lines	8
		Convention Center	Forcible entry/Search	2
		5 over 1 under construction	Ventilation	3
		Building with Political or Religious Factors	RIT	2
			Fire Panel	1
			Utilities	2
			Lobby Support	2
			Safety	1
			Total ERF Required	**25**
High Risk	HazMat			
		Suspicious substance with injuries	Command/Size up	2
		Industrial Leak	Safety (tech)	1

			Haz Group Supervisor (tech)	1
			Entry Team (tech)	2
			Backup Team (tech)	2
			Air Monitoring (ops)	2
			Research (tech)	1
			Logistics/Support (ops)	4
			Decontamination (ops)	6
			Medical Treatment (ops)	4
			Total ERF Required	**25**
High Risk	Rescue			
		Confined Space	Command	2
		Structural Collapse	Safety	1
		High Angle Rescue	Pump operator	1
		Trench Rescue	Rescue Group Supr	1
			Rescue Technicians	8
			Triage	2
			BLS treatment and transport	2
			Medical Group Supr	1
			Logistics/Support (ops)	2
			Total ERF Required	**20**

Special Risk

Category	Program Area	Type of Calls	Critical Tasks	Minimum Personnel
Special Risk	EMS			
		ALS MCI >10	Command/safety	2
		Active Shooter	EMS Operations	1

			Command Staff	1
			ALS Meds/IV/Shock/Airway	6
			Triage	2
			BLS Support/Transport	8
			Total ERF Required	**20**
Special Risk	Suppression			
		Working Fire - High Rise	Command	2
			Water supply/Pump operator	2
			Fire Attack - 2 lines	6
			Forcible entry/Search	4
			Ventilation	5
			RIT	4
			Fire Panel	1
			Building evacuation	4
			Lobby Support/Control	2
			Rehab	2
			Medical Treatment	4
			Safety	1
			Total ERF Required	**37**
Special Risk	HazMat			
		Fire at Industrial Plant	Command/Size up	2
		Explosion - Major	Safety	2
			Water supply/Pump operator	2
			Fire Attack - 2 lines	4
			Haz Group Supervisor (tech)	1
			Entry Team (tech)	2

			Backup Team (tech)	2
			Air Monitoring (ops)	2
			Research (tech)	1
			Logistics/Support (ops)	4
			Decontamination (ops)	6
			Medical Treatment (ops)	3
			Total ERF Required	**31**
Special Risk	Rescue			
		Tunnel Rescue (light rail)	Command	2
		Entire building collapse	Safety	1
			Search/triage	8
			Rescue Group Supr	1
			Rescue Technicians	8
			Recon	4
			Backup Team (tech)	4
			ALS/BLS treatment and transport	4
			Medical Group Supr	1
			Air Supply	2
			Air Monitoring (ops)	2
			Total ERF Required	**37**

Appendix B – 90th Percentile Performance

(Low Risk) Suppression - 90th Percentile Times - Baseline Performance ERF = 3			2013 - 2017	2013	2014	2015	2016	2017
Alarm Handling	Pick-up to Dispatch	Urban	0:57	0:55	0:54	0:54	1:03	1:02
Turnout Time	Turnout Time 1st Unit	Urban	1:44	1:45	1:42	1:38	1:46	1:48
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:22	5:04	5:20	5:15	5:27	5:46
		High Density	3:24	3:20	3:17	3:15	3:31	3:29
	Travel Time ERF **Concentration**	Urban	5:22	5:04	5:20	5:15	5:27	5:46
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:32	7:12	7:25	7:19	7:39	7:53
			n=5,904	n=1,117	N=1,1179	n=1,150	n=1,138	n=1,320
	Total Response Time ERF **Concentration**	Urban	7:32	7:12	7:25	7:19	7:39	7:53
			n=5,904	n=1,117	N=1,1179	n=1,150	n=1,138	n=1,320
(Moderate Risk) Suppression - 90th Percentile Times - Baseline Performance ERF = 19			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	0:44	0:49	0:45	0:44	0:43	0:42
Turnout Time	Turnout Time 1st Unit	Urban	1:14	1:20	1:22	1:17	1:08	1:04
Travel Time	Travel Time 1st Unit **Distribution**	Urban	3:16	2:49	3:32	3:28	3:29	3:07
		High Density	2:43	2:18	3:17	2:26	2:26	3:07

	Travel Time ERF **Concentration**	Urban	10:19	10:10	17:30	10:28	10:42	10:01
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	5:36	5:26	5:44	5:27	5:37	5:41
			n=161	n=26	N=28	n=37	n=33	n=38
	Total Response Time ERF **Concentration**	Urban	12:52	11:30	17:08	11:02	12:54	12:42
			n=161	n=26	N=28	n=37	n=33	n=38
(High Risk) Suppression - 90th Percentile Times - Baseline Performance **ERF = 25**			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	1:16	0:54	1:00	1:07	1:23	1:32
Turnout Time	Turnout Time 1st Unit	Urban	2:17	2:12	1:39	2:04	2:23	2:18
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:38	3:03	4:41	7:03	3:21	3:45
		High Density	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF **Concentration**	Urban	11:32	8:07	9:54	12:11	10:26	12:15
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:37	4:55	7:10	9:35	6:46	6:59
			n=28	n=5	n=2	n=5	N=7	n=9
	Total Response Time ERF **Concentration**	Urban	13:53	10:57	13:08	15:15	13:25	14:43
			n=28	n=5	n=2	n=5	N=7	n=9
(Low Risk) Hazardous Material Response - 90th Percentile Times - Baseline Performance			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**

ERF = 3								
Alarm Handling	Pick-up to Dispatch	Urban	1:12	1:14	1:07	1:03	1:14	1:25
Turnout Time	Turnout Time 1st Unit	Urban	1:33	1:31	1:31	1:30	1:34	1:42
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:15	5:13	5:54	4:53	4:43	5:59
		High Density	3:22	2:56	2:53	3:57	2:53	4:00
	Travel Time ERF **Concentration**	Urban	5:15	5:13	5:54	4:53	4:43	5:59
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:37	7:34	7:55	7:06	7:11	8:19
			n=644	n=114	N=125	n=144	n=125	n=136
	Total Response Time ERF **Concentration**	Urban	7:37	7:34	7:55	7:06	7:11	8:19
			n=644	n=114	N=125	n=144	n=125	n=136
(Moderate Risk) Hazardous Material Response - 90th Percentile Times - Baseline Performance **ERF = 5**			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	1:03	1:03	0:57	0:56	1:04	1:18
Turnout Time	Turnout Time 1st Unit	Urban	1:29	1:26	1:29	1:29	1:28	1:39
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:36	4:31	5:07	4:22	4:03	5:32
		High Density	2:50	2:46	2:25	3:14	2:49	3:48

	Travel Time ERF **Concentration**	Urban	10:20	10:24	9:10	10:08	12:17	9:09
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	6:59	6:36	7:22	6:42	6:22	7:45
			n=360	n=68	N=63	n=84	n=75	n=70
	Total Response Time ERF **Concentration**	Urban	14:03	12:51	14:12	13:28	19:01	11:26
			n=360	n=68	N=63	n=84	n=75	n=70
(High Risk) Hazardous Material Response - 90th Percentile Times - Baseline Performance **ERF = 25, of which 7 are HazMat Technicians**			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	1:20	1:24	1:01	1:13	1:12	N/A
Turnout Time	Turnout Time 1st Unit	Urban	2:07	2:10	1:54	1:42	1:47	N/A
Travel Time	Travel Time 1st Unit **Distribution**	Urban	3:48	3:37	3:15	3:24	3:40	N/A
		High Density	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF **Concentration**	Urban	12:48	11:02	7:42	10:45	18:39	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	6:21	6:28	6:04	5:38	6:04	N/A
			n=18	N=3	n=3	n=5	n=7	n=0
	Total Response Time ERF **Concentration**	Urban	16:03	14:55	10:49	13:23	20:28	N/A
			n=18	N=3	n=3	n=5	n=7	n=0

(Low Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance ERF = 2			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	1:05	1:02	1:02	1:02	1:11	1:10
Turnout Time	Turnout Time 1st Unit	Urban	1:42	1:41	1:40	1:40	1:46	1:41
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:38	5:31	5:36	5:36	5:40	5:44
		High Density	4:37	4:29	4:30	4:34	4:41	4:46
	Travel Time ERF **Concentration**	Urban	5:53	5:45	5:49	5:53	5:54	6:02
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:41	7:35	7:37	7:55	7:50	7:50
			n=41,744	n=8,040	n=8,301	n=8,388	n=8,579	n=8,436
	Total Response Time ERF **Concentration**	Urban	7:41	7:35	7:37	7:55	7:50	7:50
			n=41,744	n=8,040	n=8,301	n=8,388	n=8,579	n=8,436
(Moderate Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance ERF = 4, of which 2 are FF/PM			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	0:53	0:49	0:51	0:51	0:56	0:56
Turnout Time	Turnout Time 1st Unit	Urban	1:29	1:30	1:29	1:28	1:32	1:27
Travel Time		Urban	4:55	4:55	4:50	4:54	4:55	5:05

	Travel Time 1st Unit **Distribution**	High Density	4:00	3:48	3:56	4:07	4:12	3:59
	Travel Time ERF **Concentration**	Urban	5:25	5:21	5:17	5:26	5:26	5:31
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	6:51	6:49	6:41	6:42	6:58	6:59
			n=14,542	n=2,704	n=2,788	n=3,069	n=2,970	n=3,011
	Total Response Time ERF **Concentration**	Urban	7:09	7:07	6:57	7:03	7:15	7:17
			n=14,542	n=2,704	n=2,788	n=3,069	n=2,970	n=3,011
(High Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance **ERF = 8, of which 2 are FF/PM**			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	0:53	0:53	0:48	0:50	0:54	1:02
Turnout Time	Turnout Time 1st Unit	Urban	1:09	1:09	1:09	1:11	1:13	1:07
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:16	4:13	4:13	4:25	4:15	4:20
		High Density	3:31	3:28	3:36	3:29	3:33	3:22
	Travel Time ERF **Concentration**	Urban	5:10	5:04	4:50	5:24	5:10	5:24
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	6:15	6:12	6:14	6:15	6:16	6:22
			n=1,638	n=279	n=335	n=358	n=330	n=336
	Total Response Time ERF **Concentration**	Urban	6:53	6:45	6:31	7:08	6:58	6:59
			n=1,638	n=279	n=335	n=358	n=330	n=336

(Special Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance ERF = 20, of which 6 are FF/PM			2013 - 2017	2013	2014	2015	2016	2017
Alarm Handling	Pick-up to Dispatch	Urban	0:52	N/A	N/A	0:43	N/A	1:00
Turnout Time	Turnout Time 1st Unit	Urban	1:18	N/A	N/A	1:35	N/A	0:50
Travel Time	Travel Time 1st Unit **Distribution**	Urban	4:44	N/A	N/A	4:36	N/A	4:51
		High Density	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF **Concentration**	Urban	4:36	N/A	N/A	4:36	N/A	3:42
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	6:48	N/A	N/A	6:54	N/A	6:41
			n=4	n=0	n=0	n=2	n=0	n=2
	Total Response Time ERF **Concentration**	Urban	6:33	N/A	N/A	6:54	N/A	4:54
			n=4	n=0	n=0	n=2	n=0	n=2

(Low Risk) Rescue Response [9]- 90th Percentile Times - Baseline Performance ERF = 3			2013 - 2017	2013	2014	2015	2016	2017
Alarm Handling	Pick-up to Dispatch	Urban	0:54	3:13	4:08	N/A	0:35	1:41
Turnout Time	Turnout Time 1st Unit	Urban	1:07	1:44	0:39	N/A	1:16	0:57
Travel Time	Travel Time 1st Unit **Distribution**	Urban	5:10	7:44	6:15	N/A	4:09	6:23
		High Density	4:09	4:09	N/A	N/A	3:07	N/A
	Travel Time ERF **Concentration**	Urban	5:34	8:32	5:34	N/A	6:22	9:05
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:21	11:44	8:47	N/A	6:22	9:05
			n=22	n=5	N=3	n=0	n=8	n=6
	Total Response Time ERF **Concentration**	Urban	9:56	11:30	7:32	N/A	6:06	10:15
			n=22	n=5	N=3	n=0	n=8	n=6
(Moderate Risk) Rescue Response [10]- 90th Percentile Times - Baseline Performance ERF = 11, of which 5 are Rescue Technicians			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	1:57	N/A	1:03	N/A	1:20	2:00
Turnout Time	Turnout Time 1st Unit	Urban	1:36	N/A	1:34	N/A	1:33	0:51
		Urban	5:12	N/A	5:14	N/A	4:14	5:04

[9] NFIRS Incident Type = 35X, 36X, 37X, 38X, 3221, 3231
[10] NFIRS Incident Type = 35X, 36X, 37X, 38X, 3221, 3231

Travel Time	Travel Time 1st Unit **Distribution**	High Density	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF **Concentration**	Urban	11:19	N/A	8:42	N/A	6:38	7:51
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	7:53	N/A	15:08	N/A	6:38	7:51
			n=6	n=0	N=1	n=0	n=4	n=2
	Total Response Time ERF **Concentration**	Urban	18:28	N/A	15:08	N/A	20:15	9:32
			n=6	n=0	N=1	n=0	n=4	n=2
(High Risk) Rescue Response [11]- 90th Percentile Times - Baseline Performance **ERF = 20, of which 9 are Rescue Technicians**			**2013 - 2017**	**2013**	**2014**	**2015**	**2016**	**2017**
Alarm Handling	Pick-up to Dispatch	Urban	0:29	N/A	0:58	N/A	0:29	N/A
Turnout Time	Turnout Time 1st Unit	Urban	0:47	N/A	0:11	N/A	1:27	N/A
Travel Time	Travel Time 1st Unit **Distribution**	Urban	3:36	N/A	4:27	N/A	3:36	N/A
		High Density	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF **Concentration**	Urban	5:34	N/A	5:34	N/A	2:48	N/A
Total Response Time	Total Response Time 1st Unit on Scene **Distribution**	Urban	6:22	N/A	5:35	N/A	6:22	N/A
			n=4	n=0	N=1	n=0	n=3	n=0
	Total Response Time ERF **Concentration**	Urban	6:34	N/A	5:35	N/A	6:22	N/A
			n=4	n=0	N=1	n=0	n=3	n=0

[11] NFIRS Incident Type = 35X, 36X, 37X, 38X, 3221, 3231

Appendix C - Performance Improvement Plan (PIP)

Pursuant to Standard Operating Policy, Article 100, Section 13, the Annual Risk Assessment Performance Planning Evaluation Group (ARAPPEG) will identify ongoing trends in response. Planning Areas found to be deficient in meeting adopted performance standards will be identified and further evaluated by management staff to determine the reason for the shortfall. This evaluation will result in the creation of a Performance Improvement Plan or PIP which will document the issue, suggest improvements and list all actions taken, or not taken to improve results. Whether the deficiency can be addressed ultimately depends on the nature of the issue, the ability of the fire department to affect change, financial resource allocation and the political environment. Thus, not all issues will be correctable and the City of Bellevue has the final decision on whether resources are allocated to address the deficiency.

STEP 1 –

Please note that all data is reported at the 90th percentile fractile performance for each metric.

After reviewing 2017 data, the agency has concluded that there are opportunities for improvement in the following areas:

1. The agency's actual baseline performance for turnout time for low risk Suppression incidents is one minute and 48 seconds and its benchmark target is one minute and 20 seconds, which results in an opportunity for improvement of 2***8 seconds***.
2. The agency's actual baseline performance for turnout time for low risk EMS incidents is one minute and 41 seconds and its benchmark target is one minute, which results in an opportunity for improvement of ***41 seconds***.
3. The agency's actual baseline performance for turnout time for low risk HazMat incidents is one minute and 42 seconds and its benchmark target is one minute 20 seconds, which results in an opportunity for improvement of 22 ***seconds***.
4. The agency's actual baseline performance for travel time for low risk Suppression incidents in the urban response area is five minutes and 46 seconds and its benchmark target is four minutes, which results in an opportunity for improvement of ***one minute and 46 seconds***.
5. The agency's actual baseline performance for travel time for low risk EMS incidents is five minutes and 44 seconds and its benchmark target is four minutes, which results in an opportunity for improvement of ***one minute and 44 seconds*****.**
6. The agency's actual baseline performance for travel time for low risk EMS incidents in the High Density planning zones is four minutes and 46 seconds and its benchmark target is two minutes, which results in an opportunity for improvement of ***two minutes and 46 seconds***
7. The agency's actual baseline performance for travel time for low risk HazMat incidents in the urban response area is five minutes and 59 seconds and its benchmark target is four minutes, which results in an opportunity for improvement of ***one minute and 59 seconds***.
8. The agency's actual baseline performance for first arriving unit total response time for low risk Suppression incidents is 7 minutes and 53 seconds and its benchmark target is 6 minutes and 20 seconds, which results in an opportunity for improvement of **one minute and 33 seconds.**
9. The agency's actual baseline performance for an effective response force of 19 firefighters for moderate risk Suppression incidents is 12 minutes and 42 seconds and its benchmark target is 10 minutes, which results in an opportunity for improvement of **two minutes and 42 seconds**.

STEP 2 –

The agency identified that the following factors contributed to the identified opportunity for improvement of between 22 – 41 seconds for its turnout time:

- Station officers could further emphasize turnout standards when working with crews.
- Monthly turnout time reporting could provide more value if reviewed in a timelier manner, highlighted on the quarterly performance report and reviewed at each level of the chain of command.

The agency identified that the following factors contributed to the identified opportunity for improvement of one minute and 44 seconds to one minute and 59 seconds for its travel time to incidents occurring in the urban response area:

- Peak call volume occurs during business hours when traffic densities are at their worst.
- First-in units may be out of position due to other service demands.

The agency identified that the following factors contributed to the identified opportunity for improvement of two minutes and 46 seconds for its travel time for low risk EMS incidents occurring in the High Density planning zones:

- Current stations are located outside the high density planning zones.
- Peak call volume occurs during business hours when traffic densities are at their worst.
- First-in units may be out of position due to other service demands.

STEP 3 –

After identifying the causal factors that contributed to performance gaps in regards to turnout time for low risk incidents, the agency implemented the following actions:

- Created two FirstWatch turnout time triggers based on dispatch data to provide immediate notification to the on-duty Platoon Battalion Chief whenever emergency apparatus turnout exceeds 1:45 during 0600-2200 or 2:15 between 2200-0600.
- Created a Quarterly Performance Dashboard that requires each Station Captain to report turnout performance against the adopted standard. This data is then reviewed at the BC and DC level to promote accountability
- Increased emphasis on quick turnout times and expanded the review of these metrics to every level of the chain of command on a quarterly basis

After identifying the causal factors that contributed to performance gap in regards to travel time for low risk incidents in the urban response area, the agency implemented the following actions:

- Increased emphasis on responding as quickly as possible while maintaining safe travel speeds and 100% seatbelt use.

STEP 4 –

The agency proposes the additional actions to reduce the current gap of up to 41 seconds in its turnout time:

- Evaluate the Installation of turnout timers in the front of each station apparatus bay. This installation would provide a count-up clock at the initiation of dispatch and will provide immediate feedback to companies of their current performance.

The agency proposes the additional actions to reduce the current gap of two minutes and 46 seconds in its travel time to low risk EMS incidents occurring in the High Density planning zones:

- Construct a new downtown fire station.
- Implement a new fire suppression/BLS resource when the downtown fire station is complete.
- Equip front-line response apparatus with Opticom GPS devices to ensure more effective and timely signal pre-emption.

The agency proposes the additional actions to reduce the current gap of up to one minute and 59 seconds in its travel time to low risk incidents occurring in the urban response area:

- Construct a new downtown fire station.
- Implement a new fire suppression/BLS resource when downtown fire station is complete.
- Equip front-line response apparatus with Opticom GPS devices to ensure more effective and timely signal pre-emption.
- Work with the COB Transportation Department to equip all 227 traffic signal devices in the jurisdiction with Opticom GPS pre-emption devices.

STEP 5 –

The agency's improvement plan for reducing the turnout gap of up to 41 seconds, high density planning zone travel time gap of two minutes and 46 seconds for low risk EMS and the low risk incident travel time gap of one minute and 59 seconds for the remainder of the service area requires the involvement of the agency to address day-to-day operational issues and the City of Bellevue to address policy and financial implications of this improvement plan.

1. The agency will be responsible for:
    - Highlighting turnout performance and ensuring all suppression staff are aware of adopted standards.
    - Pursuing a budget proposal to equip all fire stations with turnout timer capability.
    - Analyzing call volumes and response strategies to ensure optimum new resource placement.
    - Identifying any operating and capital budget implications created by implementing components of this plan.
        i. Pursue a budget proposal to equip all front-line response apparatus with Opticom GPS signal pre-emption devices.
    - Evaluating the implementation of dynamic staffing. This staffing would consist of 'posting' a unit in the Urban Response Area during peak incident periods. This proposal would have to be fully discussed with the Firefighter's Union and then approved through the budget process.
2. The City of Bellevue will be responsible for:
    - Reviewing and approving necessary operating and capital budget adjustments, as appropriate.
    - Making any necessary adjustments to the level of service policies after implementation of the improvement plan.

Appendix D – Benchmark Service Level Objectives

Suppression

For 90 percent of all priority suppression responses, the total response time (TRT) for the arrival of the first due unit, staffed with a minimum of 3 firefighters, shall be 4:20 minutes in those areas designated "High Density[12]" and 6:20 minutes in the remainder of our urban response zone. The first-due unit shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating rescue. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority low risk suppression responses, the total response Time (TRT) for the arrival of the effective response force (ERF), staffed with a minimum of 3 firefighters, shall be 4:20 minutes in those areas designated "High Density" and 6:20 minutes in the remainder of our urban response zone**.** The ERF shall be capable of: establishing command; completing an initial size up; establishing water supply; and initiating rescue. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority moderate risk suppression responses, the total response Time (TRT) for the arrival of the effective response force (ERF), staffed with a minimum of 19 firefighters, shall be 10:00 minutes. The ERF shall be capable of: establishing command; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control; complying with the requirements of two in two out; completing forcible entry; searching and rescuing at-risk victims; supporting evacuation; ventilating the structure; providing exposure protection; controlling utilities; and performing salvage and overhaul. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority high risk suppression responses, the total response Time (TRT) for the arrival of the effective response force (ERF), staffed with a minimum of 25firefighters, shall be 10:00 minutes. The ERF shall be capable of: establishing command; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control; complying with the requirements of two in two out; completing forcible entry; searching and rescuing at-risk victims; supporting evacuation; ventilating the structure; providing exposure protection; controlling utilities; and performing salvage and overhaul. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority special risk suppression fire responses, the total response Time (TRT) for the arrival of the effective response force (ERF), staffed with a minimum of 37 firefighters, shall be 12:00 minutes. The ERF shall be capable of: establishing command; providing an uninterrupted water supply; advancing an attack line and a backup line for fire control; complying with the requirements of two in two out; completing forcible entry; searching and rescuing at-risk victims; supporting evacuation; ventilating the structure; providing exposure protection; controlling utilities; and performing salvage and overhaul. These operations shall be done utilizing safe operational procedures**.**

Hazardous Materials Response

For 90 percent all priority hazardous materials response incidents, the total response time for the arrival of the first-due unit, staffed with a minimum of 3 firefighters, shall be 4:20 minutes in those areas designated "High

[12] High Density – Defined as any Census Tract that exceeds population density of 12,499 per square mile as reported by the American Community Survey (ACS) of the United States Census Bureau.

Density" and 6:20 minutes in the remainder of our urban response zone. The first-due unit shall be capable of: establishing command; sizing up; assessing the situation to determine the presence of a potential hazardous material; determining the need for additional resources; estimating the potential harm without intervention; and begin establishing a hot, warm and cold zone. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority low risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), staffed with 3 firefighters, shall be 4:20 minutes in those areas designated "High Density" and 6:20 minutes in the remainder of our urban response zone. The ERF shall be capable of: establishing command, and providing the equipment, technical expertise, knowledge, skills and abilities to mitigate a hazardous materials incident. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority moderate risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), staffed with 5 firefighters, shall be 10:00 minutes. The ERF shall be capable of: establishing command, and providing the equipment, technical expertise, knowledge, skills and abilities to mitigate a hazardous materials incident. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority high risk hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), staffed with 25 firefighters and at least seven (7) Haz-Mat technicians, shall be 20:00 minutes. The ERF shall be capable of: establishing command; establishing a hot, warm and cold zone; and providing the equipment, technical expertise, knowledge, skills and abilities to mitigate a hazardous materials incident. These operations shall be done utilizing safe operational procedures.

For 90 percent of all priority special **risk** hazardous materials response incidents, the total response time for the arrival of the effective response force (ERF), staffed with 31 firefighters and at least seven (7) Haz-Mat technicians, shall be 20:00 minutes. The ERF shall be capable of: establishing command; establishing a hot, warm and cold zone; and providing the equipment, technical expertise, knowledge, skills and abilities to mitigate a hazardous materials incident. These operations shall be done utilizing safe operational procedures.

Emergency Medical Services

For 90 percent of all priority BLS medical incidents, the total response time for the arrival of the first-due unit, staffed with a minimum of 2 EMT-D's, shall be: 4:00 minutes in those areas designated "High Density" and 6:00 minutes in the remainder of our urban response zone. The first-due unit shall be capable of: establishing command; assessing scene safety; conducting initial patient assessment; obtaining vitals and patient's medical history; and initiating basic life support.

For 90 percent of all priority ALS medical incidents, the total response time for the arrival of the first-due unit, staffed with a minimum of 2 EMT-P's, shall be: 6:00 minutes in those areas designated "High Density" and 8:00 minutes in the remainder of our urban response zone. The first-due unit shall be capable of: establishing command; assessing scene safety; conducting initial patient assessment; obtaining vitals and patient's medical history; providing intravenous (IV) access, medication administration, intubation; and transporting the patient.

For 90 percent of all priority low risk EMS incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 2 EMT-D's, shall be: 4:00 minutes in those areas designated "High Density" and 6:00 minutes in the remainder of our urban response zone. The ERF shall be capable of: establishing command; assessing scene safety; conducting initial patient assessment; obtaining vitals and patient's medical history; initiating basic life support until a transport capable unit arrives.

For 90 percent of all priority moderate risk EMS incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 4, 2 of which shall be EMT-P's, shall be: 8:00 minutes in our urban response zone. The ERF shall be capable of: establishing command; assessing scene safety; conducting initial patient assessment; obtaining vitals and patient's medical history; providing intravenous (IV) access, medication administration, intubation; and transporting the patient.

For 90 percent of all priority high risk EMS incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 8, 2 of which shall be EMT-P's, shall be: 8:00 minutes in our urban response zone. The ERF shall be capable of: establishing command; assessing scene safety; conducting initial patient assessment; obtaining vitals and patient's medical history; providing intravenous (IV) access, medication administration, intubation; and transporting the patient.

For 90 percent of all priority special risk EMS incidents, the total response time for the arrival of the effective response force (ERF), with a minimum of 20, 6 of which shall be EMT-P's, shall be: 10:00 minutes in our urban response zone. The ERF shall be capable of: establishing command; assessing scene safety; conducting initial patient assessment; obtaining vitals and patient's medical history; providing intravenous (IV) access, medication administration, intubation; and transporting the patient.

Technical Rescue

For 90 percent of all priority technical rescue incidents, the total response time for the arrival of the first-due fire apparatus, staffed with 3 firefighters, shall be 4:00 minutes in those areas designated "High Density" and 6:00 minutes in the remainder of our urban response zone. The first-due fire apparatus shall be capable of: establishing command; sizing up to determine if a technical rescue response is required; requesting additional resources; controlling the hazard; and providing basic life support to any victim without endangering response personnel.

For 90 percent of all priority low risk rescue incidents, the total response time for the effective response force (ERF), staffed with 3 firefighters, shall be 4:00 minutes in those areas designated "High Density" and 6:00 minutes in the remainder of our urban response zone. The first-due fire apparatus shall be capable of: establishing command; sizing up to determine if a technical rescue response is required; requesting additional resources; controlling the hazard; and providing basic life support to any victim without endangering response personnel.

For 90 percent of all priority moderate risk technical rescue incidents, the total response time for the effective response force (ERF), consisting of at least five (5) rescue technicians, and a total of 11 firefighters and officers, shall be 10:00. The first-due fire apparatus shall be capable of: establishing command; sizing up to determine if a technical rescue response is required; requesting additional resources; controlling the hazard; and providing basic life support to any victim without endangering response personnel.

For 90 percent of all priority high risk technical rescue incidents, the total response time for the arrival of the effective response force (ERF), consisting of at least nine (9) rescue technicians, and a total of 20 firefighters and officers, shall be 10:00 minutes. The ERF shall be capable of: establishing command, establishing patient contact; providing the equipment; technical expertise, knowledge, skills and abilities to mitigate a technical rescue incident; and providing basic life support.

For 90 percent of all priority special risk technical rescue incidents, the total response time for the arrival of the effective response force (ERF), consisting of at least nine (9) rescue technicians, and a total of 37 firefighters and officers, shall be 12:00 minutes. The ERF shall be capable of: establishing command, establishing patient contact;

providing the equipment; technical expertise, knowledge, skills and abilities to mitigate a technical rescue incident; and providing basic life support.

This Page intentionally left blank