Bellevue Fire Department Standards of Cover





Effective Date: May 1, 2021 Jerome "Jay" Hagen, Fire Chief

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Introduction

The following report serves as the Bellevue Fire Department Community Risk Assessment (CRA) and Standards of Cover (SOC). Its purpose is to identify, assess and document local needs and circumstances, risks, strengths, gaps, and response capabilities. This process will recognize changing risks, identify opportunities for improvement, help to justify current service levels, and illuminate needed enhancements to our programs.

The Bellevue Fire Department is dedicated to delivering a safe and effective response force to mitigate events requiring fire suppression, emergency medical and specialty technician-level response. This mitigation is best achieved by working with the community to provide, information, education, training, enforcement of codes and building engineering standards, economic incentives, and data-informed, focused outreach that prevents a situation from arising whenever possible. The department's accrediting body, The Commission of Fire Accreditation International (CFAI) defines the SOC as, "Those written policies and procedures that establish the distribution and concentration of fixed and mobile resources of an organization."

In conducting this CRA and creating this SOC, the department analyzed many factors: demographics, such as, population densities, Social Vulnerability Index (SVI), and community profiles; other factors like geography, climate, building design and structure, manmade hazards, fire-on-scene tasks, and both the type, quantity and distribution of emergency and nonemergency calls. This analysis both serves to quantify the risk to the community and better enables the department to evaluate changing risk. Therefore, establishing and managing performance standards which are data-informed and rooted in community expectations.

Additionally, by periodically performing this analysis, the department provides a more responsive outreach/mitigation strategy, tailored to the changing demographics and make-up of the community served. Performance reporting and program evaluation will demonstrate where the department is meeting its established standards, where shortfalls exist, and measure a programs efficacy in achieving its 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 or modification of response plans designed to mitigate the effects of those events and the prioritization of effective outreach strategies that prevent and mitigate behaviors contributing to risk.

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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 prevent incidents, preserve, and protect both life and property, and minimize risk by educating our community. Since its formation in 1965, the department has 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.

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 engaging, educating, and ensuring our community has the necessary information to minimize the most probable types of risk.

The most important section 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 changing risks and system resource reliability to illuminate areas within the jurisdiction where the placement of additional resources, changing response strategies or additional community risk reduction (CRR) efforts 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 <u>RCW 35.103</u>.

The Bellevue Fire Department exists as one of <u>16 separate departments</u> that provide municipal services through the City of Bellevue. Under the powers granted to cities and towns by <u>state law (RCW 35.22.280)</u>, and under the <u>state law (RCW 35.103.030 1a)</u> that requires that they must have a written statement establishing the existence of a fire department, the City of Bellevue passed <u>Ordinance No. 6410</u>, establishing the Bellevue Fire Department's existence as the provider of emergency fire service to the city of Bellevue.

Governance and Administration

Current <u>city code 3.35.010</u> creates and establishes a fire department which shall protect life and property from fire, inspect property for fire hazards and require their removal; enforce the ordinances for fire safety in places of public gathering; foster fire prevention, regulate the use of all combustible or explosive materials, regulate and restrain the use of fireworks, provide emergency medical services, and perform such other duties in the protection of life and property as directed 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 <u>duties</u> 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 city uses a "budgeting for outcomes" (also known as "priorities of government") process called "Budget One" to develop the city's budget. Budget One puts the emphasis on community expectations for government services, not how the city is organized (departments). The City Council approves and funds the budget 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. However, 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 Finance and Asset Management (FAM) department. The department, however, has continued to maintain oversight of all these functions.



Historical perspective

The Bellevue Fire Department (BEFD) 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 <u>expand by annexation</u>. The department also expanded through the contracting of services to neighboring jurisdictions. Some of the city's greatest growth during the 1970's came from the expansion of fire department services in the realm of prehospital care.

Prior to 1970, BEFD 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 <u>Medic</u> <u>One training program</u>, as it is now known, was then in its formative stages. Upon completion of training, BEFD placed its first Mobile Intensive Care Unit (MICU) into service in the fall of 1972.

The importance of expanding the fire departments 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 70% 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.

Table I - Incident 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 that this growth represented, the added importance of fire prevention and code enforcement became clear. The increasing complexity of commercial construction drove the City and Department to adopt modern building and fire 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 residential construction that exceeds 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 11^{th,} 2001, the COVID-19 pandemic and recent incidences of civil unrest demonstrated the value of effective emergency management. The Department and community recognized the need for better planning considering the threats surrounding civil unrest, terrorism, natural disasters, pandemics, and other 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 (OEM) (originally Emergency Preparedness Division) was established to create a Comprehensive Emergency Management Plan (CEMP) designed to provide continuity of government and coordinate both City departments and regional authorities during a disaster. In addition, OEM began partnering with the community to help citizens and businesses prepare for and respond to local disasters.

Funding



The City of Bellevue (COB) requires that departments submit budget proposals every two years through a "zerobased" budgeting process called "budgeting for outcomes", or internally called "Budget One." The Budget One process puts the emphasis on <u>City Council priorities</u>, not department programs. It involves a series of steps that create a government based on available funding, which is then connected to these priorities 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 "budget 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 council priorities. Other jurisdictions that follow similar budgeting process can be found in Fort Collins CO, Savannah GA, Redmond WA, and Mesa County CO.

<u>Administrative resources</u> 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 <u>mission</u>, <u>vision</u>, <u>goals</u> and objectives. There is some overlap within functions, 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.

Budget Program	Expenditure	Revenue	Balance
Fire Suppression and EMS	\$30,381,868	\$8,390,948	\$21,990,920
Advanced Life Support (ALS) Services	\$9,247,841	\$9,863,229	(\$615,388)
UASI & EMPG Grant	\$246,225	\$252,263	(\$6,038)
Fire Management and Support	\$1,478,663	\$0	\$1,478,663
Fire Prevention	\$1,078,484	\$142,634	\$935,850
Fire Training	\$769,777	\$0	\$769,777
City-Wide Emergency Management	\$482,235	\$85,413	\$396,822
Fire Facilities Operations & Maintenance	\$894,675	\$0	\$894,675
Small Grants and Donations	\$757,000	\$657,000	\$100,000
Community Risk Reduction	\$361,869	\$0	\$361,869
Public Safety Dispatch Services	\$4,671,624	\$198,771	\$4,472,853
East Metro Training Group	\$378,786	\$378,786	\$0
Bellevue Fire CARES Program	\$756,488	\$640,838	\$115,650
Fire and Life Safety Inspections	\$313,082	\$0	\$313,082

Table II - 2020 Amended Fire Budget



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Development Services Inspections	\$1,339,800	\$1,138,995	\$200,805
Total	\$53,158,417	\$21,748,877	\$31,409,540

Particularly significant in the 2020 BEFD budget [Table II] is the ratio of expenditures to revenue. While many jurisdictions would find it notable to have even 20 percent of expenditures from revenue, BEFD's current ratio is almost 41 percent. The most notable sources of revenue come from the contracting of fire services, the funding from the Medic One property tax levy, grant funding, Ground Emergency Medical Transport (GEMT) and Basic Life Support (BLS) transport fees.

Service Area and Jurisdictions served

The City of Bellevue has an established jurisdictional boundary and a <u>Comprehensive Plan</u> 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 <u>series of annexations</u>. 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.

BEFD directly serves the City of Bellevue and contractually provides services to six neighboring jurisdictions: Beaux Arts, 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 Council and the governing bodies of the other communities. Annual performance meetings are held with all contract communities.

BEFD is also <u>one of five ALS providers</u> in King County. The BEFD ALS service area covers approximately 350 square miles.

The department has current <u>automatic and mutual aid agreements</u>, 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 <u>state-wide</u> support.

Jurisdiction	2020 Population	Land Area Square miles	2020 Assessed Valuation
Bellevue	148,100	31.97	\$68,318,402,917
Beaux Arts	300	0.09	\$208,491,757
Clyde Hill	3,055	1.06	\$3,025,493,616
Hunts Point	420	0.29	\$1,242,616,557
Medina	3,300	1.44	\$4,714,784,383
Newcastle	12,870	4.45	\$3,694,577,615
Yarrow Point	1,030	0.36	\$1,477,785,215

Table III – City Data

			BELLEVUE FIRE DEPARTMENT STANDARDS OF COVER	
Total	169,075	39.66	\$ 82,682,152,060	

The City of Bellevue

The city of <u>Bellevue</u> is the 5th largest of 281 cities in the State of Washington with a 2020 estimated population of 148,100 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.

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 2018, the median home value in Bellevue reached \$924,500 – 46% higher than King County (\$635,200) and 22% higher than Seattle (\$758,200). This is also three times more than the US median home value (\$229,700).

Figure 1: Washington State



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 over 1,400 businesses with about 55,000 employees that are creating a premier regional economy. Over 145 of these businesses claim Bellevue as their headquarters. The <u>Central Business District (CBD</u>) is home to many well-known companies such as Symetra Financial, 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, Amazon and Boeing have a substantial presence in Bellevue as well.

With over 160,000 jobs within the city, Bellevue was the second largest city in terms of employment in Washington State in 2020. <u>Over the past five years, more than 17,500 new jobs were created in Bellevue - a gain of 14.2%</u>. Information Technology created nearly 5,000 jobs – accounting for more than a quarter of the new jobs in Bellevue. The industries with the next largest employment increases were Tourism (3,600 jobs); Health, Beauty & Fitness (2,600); Construction & Development (1,600); Retail (1,500); and Business Services (1,200). By 2035, the number of jobs in Bellevue is projected to exceed 200,000.

Bellevue is home to many well-educated residents, incredible K-12 schools, and two successful post-secondary educational institutions, Bellevue College, and the Global Innovation Exchange. With nearly 70% of adults holding a bachelor's degree or higher, Bellevue is the third best-educated city among the nation's 200 largest. Employers in Bellevue draw from a large, well-skilled labor pool that stretches across the Puget Sound. The strength of Bellevue



as an employment destination is seen in the magnitude of its labor draw—90% of individuals employed in Bellevue live outside the city.

Bellevue has gained national and regional attention. In 2020, Bellevue was ranked as the 10th best place to live in the United States by Liveability.com and as having the 2nd best public-school system in the country according to Niche.com.

Bellevue community demographics are changing rapidly. In 2018, Bellevue became a majority minority city. A majority minority city is a community where the majority of its residents identify as <u>"people of color"</u>. Over 37% of Bellevue residents were born outside the U.S., 42% of the Bellevue population speak a language other than English at home and there are over 99 languages spoken in the Bellevue School District.

The city has grown significantly over the past 25 years. Bellevue now has more than 35 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 and is announced plans to move over 25,000 jobs into Bellevue in the next three years. Much of this new development supports premier regional shopping complexes such as the <u>Bellevue Collection</u> and <u>The Bravern</u>.

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 2]. 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.

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 contracts with Bellevue for its fire protection **[figure 3]**. Beyond the south end of Newcastle lies the city of Renton.



Renton, Kirkland, Redmond, Mercer Island, and Issaquah have established Fire Departments that provide both suppression and EMS services to their citizens.

Beaux Arts Village

Incorporated in 1954, <u>Beaux Arts Village</u> 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

Figure 3 – Bellevue and Contract Cities

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.

The City of Clyde Hill

The <u>City of Clyde Hill</u> 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 2020 estimate, there are 1,100

regend Varrow Point Hunts Point Clyde Hill Medina Beaux Arts Newcastle Bellevue

households and 3,055 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.

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The Town of Hunts Point

The <u>Town of Hunts Point</u> 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 420 residents. Except for the community center and town hall, the rest of the community is zoned residential. A drive down the community's <u>main access road</u> 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

<u>Medina</u>, 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 3,300. Notable residents include Microsoft founder Bill Gates and former Amazon CEO Jeff Bezos.

The City of Newcastle

<u>Newcastle</u> 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 was affiliated with the Renton Fire Department.

The community is predominantly residential. However, unlike the other contract communities that BEFD serves, Newcastle has a growing commercial zone with multiple 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 <u>Golf Club at Newcastle</u>, a premier public golf course with stunning views of Bellevue, Seattle and the Olympic Mountain ranges.

The city has 3,150 housing units, 4,396 households and 2,215 families with a population of 12,870. Its total land area is 4.45 square miles.

The Town of Yarrow Point

The easternmost of "The Points communities", <u>Yarrow Point</u> 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 threequarters 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. 2020 census estimates reflect a population of 1,030 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 <u>Puget Sound</u>, along with the <u>Cascade</u> Range to the east and the <u>Olympic mountains</u> 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 <u>Cascadia subduction zone</u> 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 47° 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.

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

Table IV - Climate data for Bellevue Washington

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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 "<u>Spring</u> <u>District</u>" is home to two beverage bottling plants and a milk and ice cream plant. 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 the end of 2021 and the new Eastlink light rail line should begin operations in the first quarter of 2023. Additionally, a light rail <u>Operations and Maintenance Facility - Eastside</u> (OMFE) is being constructed on the edge of the "Spring District" adjacent to the former BNSF rail line. This facility is 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 new light rail alignment will briefly run next to this previous rail line, but much of this alignment has been converted into a bicycle/pedestrian corridor. The area's air transportation needs are served by two airports, Sea-Tac International a 20-minute drive to the south, and Paine Field a 30-minute drive north.

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, <u>construction in the CBD and elsewhere in the City</u> 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. It is unclear what effect the ongoing COVID-19 pandemic will have on future development at this time.

COB reached the limit of its growth boundaries with the <u>last annexations</u> 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 that 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 12 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. Currently, a number of <u>600 foot towers are in the development pipeline</u>.



Section 2 Description of Agency Programs and Services

The services provided by BEFD include:

- Fire Suppression
- Emergency Medical Services
 - Basic Life Support (BLS), first response and transport
 - Advanced Life Support (ALS), first response and transport
 - o <u>CARES</u> Citizen Advocates for Referral and Education Services
- Hazardous Materials "Technician Level" Response
- Technician-level Specialized Rescue: trench, confined space, rope, vehicle, structural collapse, and surface water
- Community Risk Reduction (CRR)
 - Public Education/Outreach
 - Fire Prevention Division (FPD)
 - New construction plans review
 - New construction inspection
 - Fire and Life Safety inspection
 - Fire Investigation
- City-wide Emergency Management

The basic organizational structure for these services can be found in our <u>departmental organizational chart.</u>

Population

The Department's service area is part of the <u>Seattle-Tacoma-Bellevue Metropolitan Statistical Area</u> and is classified as "urban". While the downtown core has achieved a population density placing it in the metropolitan classification, the total jurisdiction population remains under the 200,000-resident threshold needed for the higher rating. The CBD contains the two (2) U.S. Census Tracts located in our service area that exceed population densities of 12,500 individuals per square mile and have been designated "high density" for response time purposes.

The remainder of the service area averages population densities of 4,600 per square mile. Although there are areas in the Crossroads neighborhood with much greater population densities.

Apart from the CBD, population densities, the recurrence and location of incidents indicate a mostly uniform risk level throughout the remainder of the service area.

Locations of existing fire stations and companies

BEFD 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 <u>Fire Department coverage area</u>. The other two medic units operate east of the department's jurisdiction and serve the ALS needs of those communities. All on-duty staffing operates under one Battalion Chief (BC); however, medic resources operate under a shift supervisor (Medical Service Officer (MSO) within the battalion), that oversees their needs/activities.



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

The address and staffing of each station are listed in [Figure 4].

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 4 - Station addresses, apparatus, and staffing

Station Neighborhood	Location	Companies	Staffing
Station 1	766 Bellevue Way SE, 98004	Battalion 101	2
Enatai, Downtown		Engine 101	3
		Aid 101 (BLS)	2
Station 2	2802 148th Ave SE, 98007	Engine 102	3
Eastgate		Aid 102 (BLS)	2
		Medic 102 (ALS)	2
		MSO 105	1
		MCI One	cross/select
Station 3	16100 NE 8th St, 98008	Ladder 103	5
Crossroads		Aid 103	2
		Rescue 103	cross/select
Station 4	4216 Factoria Blvd. SE, 98006	Engine 104	3
Factoria/Somerset			
Station 5	9621 NE 24th St, 98004	Engine 105	3
Clyde Hill/Points			
Station 6	1850 132nd Ave NE, 98005	Engine 106	3
BelRed/Overlake		Aid 206	2 – OT PT
		HM 106	cross/select
Station 7	11900 SE 8th St, 98005	Ladder 107	5
Wilburton			
Station 8	5701 Lakemont Blvd. SE, 98006	Engine 108	3
Lakemont		Air Unit 108	cross/select
Station 9	12412 Newcastle Way, 98006	Engine 109	3
Newport/Newcastle			
Overlake Hospital	1035 116th Ave NE, 98004	Medic 101 (ALS)	2
Outside City Medic Units	5		
Issaquah		Medic 104	2
	1280 NE Park Dr., Issaquah 98029		
North Bend		Medic 103	2
	112 W Second St., North Bend 98045		
		Suppression	39
		Medic EMS	9

BLS/Suppression Area44Daily on-duty staffing48



Resource descriptions

Battalion Chief - A BC shift commander responsible for the supervision of all personnel in the battalion. Under the current Department resource configuration, there is a single BC 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 a 500-gallon water tank. Bellevue's fire engines are rated at a minimum of 1500 GPM.

Ladders/Trucks - The Department currently staffs two ladder/engine companies. Both ladders are tillered aerial trucks that respond as one unit with an engine. 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, rope, structural collapse, and vehicle rescue).

Aid/Medic Units – The Department currently provides BLS transport services through the deployment of three Type I/Type III ambulances. 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 - 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 used in specialty rescue situations. 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.

MSU/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

BEFD minimum daily staffing is 39 suppression personnel and 9 ALS (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 may fill an acting 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 departmental goal of succession planning by developing skills in firefighters prior to being promoted.



Compensated leave in the form of vacations, holidays and Kelly days are scheduled a year in advanced and are subject to rules 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 veteran 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. Ladder 103 and Ladder 107 are staffed with 5 personnel and the normal response is with two apparatus: a tillered aerial and an engine.

The BC, designated as Battalion 101, 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 <u>King County Medic One</u> program and are also nationally certified. Bellevue is <u>one of five ALS providers</u> in the county.

Automatic/Mutual Aid

BEFD and the 13 surrounding fire agencies dispatched by NORCOM operate under automatic/mutual aid agreements, use AVL and strive to ensure inter-operability. King County has designated geographic regions of the county as Zones, and Bellevue is in Zone One (1). Other Zone 1 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 continuous in Zone 1 on how to best ensure seamless response and interoperability across geographic boundaries, as all the agencies in the Zone recognize the need to minimize obstacles in emergency situations.

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.



Operations - Response

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

- Dispatch:
 - Call Answering: begins when a phone call is initiated into the 911 system and ends when the call is connected to and answered at a dispatch center. In 2020, NORCOM reported that 97% of calls were answered within 10 seconds.
 - **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 "problem/nature code". 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, a pre-determined response plan is selected by the CAD.
 - Unit assignment and Unit notification: This step is nearly 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 almost 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 precede the 800 MHz notification.
- **Turnout:** Upon notification, personnel proceed to apparatus and, if needed, don protective clothing 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.

Suppression response

Suppression calls are dispatched according to 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 and emergency incidents will take priority.

Emergency Medical Services (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. High-risk life-threatening emergencies such as cardiac events and trauma



with shock receive a higher response with both the nearest BLS suppression crew (either aid, engine, or ladder/truck) and 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.

These tiered-response plans meet several performance goals, primarily, the ALS responders will only respond on calls where their advanced skills are most needed, and lower risk-but-more-frequent calls are handled by BLS responders. A secondary benefit is that fewer paramedics are needed, and training costs are reduced.

Technical Rescue Response

Technical rescue responses are provided by ladder/truck personnel responding from Stations Three and Seven. These personnel are trained to the Technician level in, confined space, rope, structural collapse, trench, and vehicle rescue. The remainder of BEFD Operations personnel are trained to an Awareness level on technical rescue response.

Hazardous Materials Response

Hazardous materials response is accomplished through standard suppression program response plans for low and moderate risk incidents. High and special risk incidents receive technician response through a consortium of agencies comprising what is known as the <u>Eastside Hazardous Materials Group</u> (EHMG). BEFD has participated in EHMG for over thirty (30) 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 Technician-level Haz-Mat incidents. BEFD is the only member of EHMG that currently requires that a HazMat Technician be on-duty at all times. In order to assemble the number of technicians required to mitigate a High or Special risk incident, NORCOM will group tone EHMG member agencies, who will then respond with all available on-duty technicians. The remainder of BEFD Operations personnel are trained to an Awareness level on Haz-Mat response.

Aviation Rescue and Firefighting

There are no aviation facilities in the service area and BEFD has not experienced an aviation related incident in the last thirty plus years, therefore, this program is not addressed in this document or in our response plans.

Marine and Shipboard Rescue and Firefighting

There are no commercial marine facilities in the service area and BEFD 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 providing marine unit capabilities through, Mercer Island Fire, Seattle Police, Seattle Fire, and Renton Fire. Therefore, this program is not addressed in this document or in our response plans.

Wildland Fire Services

The jurisdiction has not experienced a significant wildland fire incident in its history. There are portions of the service area 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)

<u>FPD</u> operates under a civilian Fire Marshal and is responsible for both Fire Investigation and Fire Prevention activities. This division is staffed with 17 fulltime positions, 15 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 V – 2020 FPD Performance Metrics

Construction Inspection	Plan Review	Maintenance Inspections	Fire Investigations
5,360	2,828	3,493	24

Community Liaison/Risk Reduction

The department coordinates <u>CRR</u> activities by utilizing an operations Lieutenant as a Public Information Officer (PIO)/Community Liaison Officer (CLO) in a rotating administrative assignment that typically lasts two (2) to three (3) 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 VI – 2020 CLO/PIO Performance Metrics

Level 1: Number of residents who	Level 2: Number of community events	Level 3: Number of
received CRR education presentations	attended by on duty crews and/or	social media
(in person or virtual)	members of the CRR Group	engagements
748*	23*	154,153

* - COVID-19 pandemic severely curtailed in-person interactions

Office of Emergency Management (OEM)

<u>OEM</u> consists of one and one-half full-time positions funded through the City general fund and two-and one-halftime other 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 VII – 2020 OEM Performance Metrics

City Employees	Number of findings	Percentage of Strategic	Residents who agree that Bellevue
Meeting NIMS	after State Audit of	Plan action items	plans for and well prepared to
requirements	Grants	complete	respond to emergencies
96%	0	53%	95%

Citizens Advocates for Referral and Education Services (CARES)

<u>CARES</u> consists of a Program Manager and a Clinical Coordinator who supervise up to twenty-five (25) unpaid Master 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 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 VIII – 2019 CARES Performance Metrics

CARES	CARES 911 Call Reduction	CARES Clients with no new 911	CARES Client
Referrals	after case closure	calls after case closure	Satisfaction Index
613	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 <u>2020 survey</u> indicated that the services the fire department provides are both highly desired and give high satisfaction.

Of the seven highest-ranked city services in importance, "responding to fires" is number five, and "providing emergency medical services" is number three.¹ In addition, responding to fires and providing emergency medical services ranked first and second respectively in a standardized satisfaction rating.² "Police Assistance", and "Clean Streets" ranked fifth and third respectively.

Over the years, Bellevue has used different question formats to identify what should be the city's priorities for budgeting. In 2020, a new approach was used. Called partial ranking, respondents were asked three questions:

• Below is a list of eight broad budget areas. Please indicate which of these you feel should be prioritized in the city's budget.

Respondents checked all that they felt should be a priority.

- Of those you selected, which is the MOST important to you personally?
- Of those items you did not select, which do you feel is the LEAST important to you personally?

Residents clearly feel that keeping the community safe by preparing and responding to emergencies timely and effectively is the most important priority for the city's budget. This is followed by maintaining a well-balance mix of urban environment with natural neighborhoods and open spaces and improving transportation and related services.

¹ <u>2020 Budget Survey p. 25</u>

² Ibid p. 27



Community Loss and Save Data

Table IX – 5 Year Cardiac Arrest Survival

Year	Cardiac Arrest Survival Rate	Methodology
2015 - 2019 ³	56.2%	Utstein protocol - (Witnessed, presumed cardiac, presents with VF or VT) – 5 year rolling average as reported for Bellevue Fire by King County Emergency Medical Services (KCEMS). KCEMS follows patient to discharge from the hospital.

Table X – 5 Year Fire Loss

Year	Total Fire Loss
2020	\$5,699,648
2019	\$4,568,330
2018	\$2,884,235
2017	\$3,486,127
2016	\$6,255,687

Table XI – 5 Year Structure Fires Confined

Year	Confined to Room of Origin
2020	69.7%
2019	75.8%
2018	77.4%
2017	85.2%
2016	79.2%

³ 2020 cardiac arrest data is not available until June 2021.

Agency goals

The Bellevue Fire Department's agency goals are explained more in-depth in our <u>Strategic Plan</u>. 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.



- 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

BEFD maintains a Class 2 rating from the <u>Washington State Survey and Rating Bureau (WSRB</u>). 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 most of the United States.

A Class 2 rating places Bellevue in the top 1 percent of the <u>29,705</u> departments in the U.S. and among the top three departments in the state. As of March 2021, 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.

This rating was last conducted in September 2020, and the rating bureau will reevaluate the department again in 2025.

EIRE

Section 3 All-Hazard Risk Assessment of the Community

A comprehensive CRA is a critical aspect of creating a SOC 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 section, the

Figure 5 - Probability, consequence, and impact matrix

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.

This risk analysis will consider three (3) factors when evaluating risk. The probability or frequency of the risk occurring, the consequence of that risk to the community served, and the impact of each risk to the BEFD. This three-axis approach to evaluating risk is depicted in the probability/consequence/impact matrix. [Figure 5].

The general qualitative and quantitative measurements of each risk are listed within the graphically designed matrix. The matrix rates consequence to the community (RC) by placing (consequence = C) [Table XII] on the X axis ranging from insignificant to catastrophic. Event

likelihood (probability = P) **[Table XIII]** is rated on the Y axis, ranging from unlikely to frequent. The impact to the organization (impact = I) **[Table XIV]** is rated on the Z axis and ranges from insignificant to catastrophic. Operational imperatives were accounted for by using a (modifier = M) to reflect an increase or decrease in risk for various reasons beyond the three risk quantifiers, these modifiers include blocking on collision response, vertical response time, technician level requirements, smoke control, fire sprinklers, etc.

Total risk is calculated using a modified Heron's Formula [Figure 6].

Table XII - Consequence to Community Matrix

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



Risk	Descriptor	Impact	Description
Score		Categories	
2	Insignificant	Life Safety	1 or 2 people affected, minor injuries, minor property damage, and no environmental impact.
		Life Safety	Small number of people affected (<10), no fatalities, and small number of minor injuries with first aid treatment.
4	Minor	Economic and Infrastructure	Minor displacement of people for <6 hours and minor personal support required. Minor localized disruption to community services or
		Environmental	infrastructure <6 hours. Minor impact on environment with no lasting effects.
			Limited number of people affected (11 - 50), no fatalities, but some hospitalization and medical treatment required.
		Life Safety	Localized displacement of small number of people for 6 – 24 hours.
6	Moderate	Economic and Infrastructure	Personal support satisfied through local arrangements. Localized damage that is rectified by routine arrangements.
		Environmental	Normal community functioning with some inconvenience
			Some impact on environment with short-term effects or small impact on environment with long-term effects.
		Life Safety	Significant number of people (51-100) in affected area impacted with multiple fatalities, multiple serious or extensive injuries, and significant hospitalization.
8	Significant	Economic and Infrastructure	Large number of people displaced for 6 - 24 hours or possibly beyond. External resources required for personal support. Significant damage
		Environmental	that requires external resources. Community only partially functioning, some services unavailable. Significant impact on environment with
		Life Safety	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
10	Catastrophic	Economic and	support required. Extensive damage to properties in affected area
		Infrastructure	requiring major demolition. Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period.
		Environmental	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, or damage to apparatus or personnel.
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.

Table XV - Modifier Values

M Value	Operational Modifier Rationale
1.0	Not Applicable/No Modifier needed
1.2	Flank Ops/BC required
0.8	Presence of Smoke Control and Sprinklers
1.2	Internal Hallway MFR without Sprinklers
1.2	Blocking of street or freeway/FF Safety
2.0	All Technician Rescue resources required
1.5	50% of Tech Rescue resources required
1.2	Some Tech Rescue resources required
1.5	Vertical Response time/ FF safety

Risk Categorization process

This section contains an analysis of the various risks considered within the BEFD 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:

• Social Vulnerability Index (SVI)

Social Vulnerability Index (SVI) is a measure developed by the Centers for Disease Control (CDC) that primarily uses relevant demographic fields from the American Community Survey (ACS) to identify census tracts where the population is vulnerable to disasters. It is measured on a scale from 0 to 1 with 0 being the least vulnerable and 1 being the most vulnerable. A population that is more vulnerable is more greatly affected by catastrophic events, such as losing their home, and to have less capability and resources to recover from such events. The summary fields of the SVI present overall and thematic percentile rankings for census tracts across the U.S. So, for example, a tract whose summary overall ranking is 0.9 or higher is a tract whose combination of 15 underlying ACS variables places it in the top 10% most vulnerable tracts in the U.S. The overall SVI is composed of rankings from four sub-rankings formed by groupings of similar ACS variables:

- Socioeconomic, composed of the following: # of persons with income below poverty line in the past 12 months, # who are unemployed, # with no high school diploma, and per capita income.
- Household Composition, composed of the # of persons aged 65 or older, # who are 17 or younger, # who have a disability, and the # of households that are single parent
- Minority/Language, composed of # of racial minorities, defined by the SVI as 'Non-white', and the # of persons who speak English "Less than well." (the phrasing used on the ACS questionnaire)
- Housing and Transportation, composed of # of housing units that are part of a building composed of 10 or more units (high density housing), # of mobile homes, # of housing units where the number of residents is greater than the number of rooms, # of households with no vehicle, and # of persons in institutionalized group quarters (e.g. Nursing/Skilled nursing facilities or correctional facilities).

Other Demographic Factors considered:

• Population Density

Man-Made Hazards

- Olympic Pipeline
- Tier II Sites
- Eastlink Light Rail
- Civil unrest
- Natural Hazards
 - Pandemic
 - o Flood

- Earthquake
- o Liquefaction
- Severe Weather

• Structural/Building Risk

- Life Hazard (dwelling units)
- o Building Construction
- Square Footage
- Presence or absence of smoke control and/or fire sprinklers systems

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.

Risk Classification and Categories

Low Risk

- BLS EMS Medical/Trauma
- Automatic Alarm SFR
- Minor Flooding
- Service Call
- Vehicle Fire
- Dumpster Fire
- Trail rescue
- Carbon Monoxide alarm Investigation

Moderate Risk

- Working Fire SFR
- Automatic Alarm MFR/Comm
- ALS Medical/Trauma
- Motor Vehicle Collision (MVC)
- Vehicle Entrapment
- Low Angle Rescue
- Surface Water Rescue

High Risk

- Working Fire MFR/Commercial
- Working Fire Targeted Hazard
- Cardiac Arrest
- Confined Space Rescue
- Structural Collapse
- High Angle Rescue
- Trench Rescue

Special Risk

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



SULEV() FIRE

Geographical Planning Zones -

Bellevue's BLS/Suppression Service Area

Fire station first-due 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.



Fire Station One



Bellevue Fire Station 1 is located at 766 Bellevue Way SE. This 15,701 s.f. facility was constructed in 1975, remodeled in 1987 and seismically upgraded in 1996. Front-line apparatus includes, 1 engine, 1 BLS aid car, 1 BC and 1 boat on a trailer. Reserve apparatus include 1 aid car and 1 BC. Daily on-duty personnel staffing; engine company (3), BLS aid car (2) and BC (2) for a total of 7. City of Bellevue Neighborhoods protected include Enatai, Downtown and West Bellevue. Contract communities include Beaux Arts Village and the southerly portions of the City of Medina.

Neighborhood Characteristics and demographics - Overall SVI is low ranging from 0.1 – 0.6 in the service area. Only two census tracts exceed 0.5 SVI (0233.02 & 0236.04) and they combined for a total of four (4) calls in 2020. The response area includes portions of the Downtown and outlying single-family residential neighborhoods. The Downtown consists of a mix of commercial and residential High and mid-rise structures built within the last twenty years with older commercial properties. There are several mid and high-rise licensed care facilities at the north end of the response area. These facilities are the most significant generators of incident activity. The outlying residential neighborhoods are mostly single-family residential buildings ranging from 2,000 s.f. to 50,000 s.f. There are a small number of older multi-family residential complexes grouped around Lake Washington that are primarily elderly citizens from lower socio-economic cohorts.

Population density varies greatly depending on the census tract. Census tracts comprising the Downtown neighborhood (0238.03 & 0238.04) have population densities over 23,000/sq mile and high non-white demographic factors, and these values are expected to increase after the results of the 2020 census become available. These two census tracts account for over 70% of the service area call activity. The remainder of the census tracts in the station service area are much less dense and diverse then those that comprise the Downtown.



The new light-rail line will pass through the Downtown neighborhood, but crossings are elevated or underground in this service area

Metric	2020	2019
Incident Count	2,396	2,870
Suppression Incidents	353 (14.73%)	465 (16.2%)
EMS Incidents	2,009 (83.85%)	2,366 (82.44%)
Other Incidents	34 (1.42%)	39 (1.36%)
90% Turnout Time EMS	1:41	1:41
90% Turnout Time Non-EMS	2:01	2:04
90% Total Response Time EMS	7:54	7:49
90% Total Response Time Non-EMS	8:36	9:06



Fire Station Two



Bellevue Fire Station 2 is located at 2802 148th Ave SE. This 8,061 s.f. facility was originally constructed in 1955. In 2002 it was reconstructed and 3,198 s.f. were added. Front-line apparatus includes, 1 engine, 1 BLS aid car, 1 ALS medic unit and 1 Medical Services Officer (MSO). Reserve apparatus include 2 ALS medic units. Daily on-duty personnel staffing; engine company (3), BLS aid car (2), ALS medic (2) and MSO (1) for a total of 8. City of Bellevue Neighborhoods protected include Eastgate, Factoria, West Lake Sammamish and Lake Hills.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 – 0.8 in the service area. Of the two census tracts that exceed 0.5 SVI (0232.02 & 0236.04), 0232.02 had only six (6) calls in 2020. The response area includes Bellevue College, the Eastgate commercial sectors and outlying residential neighborhoods. The Eastgate commercial properties include car dealerships, strip malls and mid-rise office buildings. Incident activity is well distributed throughout the response area. The outlying residential neighborhoods are mostly single-family residential buildings ranging from 2,000 s.f. to 5,000 s.f. The single-family residential housing stock is generally older and less well-maintained then other areas of the community. There are a small number of older multi-family residential complexes grouped around Bellevue College. These complexes are primarily populated by young adults. Census tract population density is mostly uniform across the response area. Most census tracts in the station service area are less diverse then other areas of the community.



Metric	2020	2019	
Incident Count	1,766	2,004	
Suppression Incidents	204 (11.55%)	224 (11.18%)	
EMS Incidents	1,526 (86.41%)	1,757 (87.67%)	
Other Incidents	36 (2.04%)	23 (1.15%)	
90% Turnout Time EMS	1:51	1:43	
90% Turnout Time Non-EMS	1:52	2:01	
90% Total Response Time EMS	8:49	8:24	
90% Total Response Time Non-EMS	11:00	10:36	



Fire Station Three



Bellevue Fire Station 3 is located at 16100 NE 8th St. This 16,463 s.f. facility was constructed in 1983 and seismically upgraded in 1996. Front-line apparatus includes, 1 engine, 1 aerial ladder, 1 BLS aid car and 1 Rescue. Reserve apparatus include 1 aerial ladder. Daily on-duty personnel staffing; aerial ladder/engine company combined (5) and BLS aid car (2) for a total of 7. City of Bellevue Neighborhoods protected include Crossroads, NE Bellevue, BelRed and Lake Hills.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 – 0.8 in the service area. Only two census tracts exceed 0.5 SVI (0232.02 & 0236.04). The Crossroads neighborhood consists of a mix of older commercial and residential low-rise structures and newly constructed mid-rise "5 over 1" multi-family residential buildings. The older multi-family residential complexes grouped around Crossroads Mall are primarily populated by minorities and those that speak other languages than English in the home. Additionally, there are several mid-rise licensed care facilities at the north end of the response area. Crossroads Malls and these facilities are significant generators of incident activity. The outlying residential neighborhoods are mostly single-family residential buildings ranging from 2,000 s.f. to 5,000 s.f. Two of the eight census tracts comprising the Crossroads neighborhood account for 90% of incident activity. Census tract 0232.02 has the highest SVI (0.8), high population density (8,900/sg mile) and the most incidents, while Census tract 0232.01 has population densities over 10,800/sq mile and high non-white demographic factors. The other census tracts in the station service area are much less dense and are more reflective of average community density and demographics.



Metric	2020	2019
Incident Count	2,655	3,006
Suppression Incidents	496 (18.68%)	589 (19.5%)
EMS Incidents	2,126 (80.08%)	2,387 (79.41%)
Other Incidents	33 (1.24%)	30 (1.0%)
90% Turnout Time EMS	1:53	1:47
90% Turnout Time Non-EMS	1:56	1:58
90% Total Response Time EMS	8:36	8:36
90% Total Response Time Non-EMS	8:54	9:30



Fire Station Four



Bellevue Fire Station Four is located at 4216 Factoria Blvd SE. This 6,751 s.f. facility was constructed in 1965 and remodeled in 1997. This remodel added 2,053 s.f. to the facility. Front-line apparatus includes 1 engine. Reserve apparatus include 1 engine, 1 MCI unit (for mass causality situations), and 1 MSO unit. Daily on-duty personnel staffing; engine company (3) for total of 3. City of Bellevue Neighborhoods protected include Factoria, Newport, Eastgate and Somerset.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 - 0.6 in the service area. Only one census tract exceeds 0.5 SVI (0248.00). The Factoria neighborhood consists of a mix of older commercial and residential low-rise structures and newly constructed mid-rise "5 over 1" multi-family residential buildings. Three fully protected (3) High-rise office buildings are in Factoria. The older multi-family residential complexes grouped around Factoria Square Mall are primarily populated by minorities and those that speak other languages than English in the home. Additionally, there are several smaller licensed care facilities at the north end of the response area. The outlying residential neighborhoods are mostly single-family residential buildings ranging from 2,000 s.f. to 5,000 s.f. The Somerset neighborhood population is primarily elderly and access challenges during inclement weather has become an issue in recent years. Population densities are analogous across the station response zone census tracts with commercial activity being the primary generator of daytime incident volumes. Factoria Square Mall is a significant generator of incident activity.



Metric	2020	2019	
Incident Count	987	1,244	
Suppression Incidents	158 (16.01%)	182 (14.63%)	
EMS Incidents	818 (82.88%)	1,056 (84.89%)	
Other Incidents	11 (1.11%)	6 (0.48%)	
90% Turnout Time EMS	1:51	1:41	
90% Turnout Time Non-EMS	1:50	1:49	
90% Total Response Time EMS	9:06	9:12	
90% Total Response Time Non-EMS	9:54	11:42	



Fire Station Five



Bellevue Fire Station Five is located at 9615 NE 24th St., Clyde Hill, WA. It is the only station located outside the City of Bellevue jurisdictional boundaries. This 5,000 s.f. facility was constructed in 1967, remodeled in 1987, and seismically upgraded in 1997. Front-line apparatus includes 1 engine. Reserve apparatus include 1 ALS medic unit. Daily on-duty personnel staffing; engine company (3) for total of 3. City of Bellevue Neighborhoods protected include NW Bellevue and the northly portion of Downtown. Contract communities protected include, City of Clyde Hill, City of Medina, Town of Hunts Point and the Town of Yarrow Point.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 - 0.5 in the service area. The northly portion of Downtown consists of a mix of older commercial low-rise structures and newly constructed high-rise multi-family residential buildings. Three fully protected (3) High-rise licensed care facilities are located at the extreme south-eastern corner of the response area. A few older multi-family residential complexes near Bellevue Square Mall are populated by community members with a lower socio-economic standing, but these are being rapidly replaced with newly constructed, fully protected complexes. Bellevue Square Mall is a significant generator of incident activity and Station 5 is second-in for this location. The remainder of the station service area is comprised of mostly single-family residential buildings ranging from 2,000 s.f. to 50,000 s.f.

Medina, Clyde Hill, Hunts and Yarrow Point experience a low frequency of incidents, but residences can present complex access challenges depending on their location. Most larger residences have been constructed with fire sprinkler systems due to low fire flow and extended supply concerns. FS5 Population densities are some of the lowest in the BLS/Suppression service area with the exception of the census tract comprising the north portion of Downtown.



Metric	2020	2019	
Incident Count	940	1,013	
Suppression Incidents	251 (26.7%)	245 (24.19%)	
EMS Incidents	667 (70.96%)	759 (74.93%)	
Other Incidents	22 (2.34%)	9 (0.89%)	
90% Turnout Time EMS	1:46	1:41	
90% Turnout Time Non-EMS	1:58	1:49	
90% Total Response Time EMS	9:06	8:54	
90% Total Response Time Non-EMS	9:36	9:48	



Fire Station Six



Bellevue Fire Station Six is located at 1850 132nd Ave NE. This 5,000 s.f. facility was constructed in 1983 and seismically upgraded in 1997. Front-line apparatus includes 1 engine, 1 BLS aid car and 1 Hazardous Materials Unit. Daily on-duty personnel staffing; engine company (3) for total of 3. City of Bellevue Neighborhoods protected include BelRed, Bridle Trails, and portions of Wilburton, NE Bellevue, and Crossroads.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 – 0.8 in the service area. Only two census tracts exceed 0.5 SVI (0232.02 & 0236.04) and neither has significant call volume for this station. The majority of the service area is a mix of light industrial and commercial low-rise structures. The only significant hazardous material exposure in the city is in this area. This exposure consists of a bottling plant, milk and ice cream plants and similar facilities that use a significant quantity of anhydrous ammonia in their production processes. Most automobile repair and service facilities in the city are located in older unprotected strip malls within this service area. The light-rail line passes directly south of the station and ongoing transit-oriented development (TOD) of the area is creating an increasing residential presence. A new high-rise multi-family residential complex has just been constructed, though the majority of new residential will be low and mid-rise buildings. Currently, a few older multi-family residential complexes and an assisted living facility near the southwest corner of the service area are the primary generators of incident activity. The COB Bridle Trails neighborhood comprises most of the single-family residential structures in the area and is composed of horse properties with structures between 3,000 and 10,000 s.f. This neighborhood has some of the lowest population densities in the City.

Three (3) light-rail streel-level crossings will affect incident travel time when the light-rail begins service in 2023. Current estimates are that each train crossing will add between one (1) to two (2) minutes if the trains passes



Metric	2020	2019
Incident Count	1,230	1,407
Suppression Incidents	170 (13.82%)	222 (15.78%)
EMS Incidents	1,034 (84.07%)	1,172 (83.3%)
Other Incidents	26 (2.11%)	13 (0.92%)
90% Turnout Time EMS	1:50	1:38
90% Turnout Time Non-EMS	2:00	1:51
90% Total Response Time EMS	8:30	9:00
90% Total Response Time Non-EMS	10:36	10:54

during a response. Most of the current service activity is located south and west of the station and it is expected that between 1-2 incidents per day will be impacted by street-level train crossings.





Fire Station Seven



Bellevue Fire Station Seven is located at 11900 SE 8th St. This 5,000 s.f. facility was constructed in 1985 and seismically upgraded in 1998. Front-line apparatus includes 1 engine and 1 aerial ladder. Daily on-duty personnel staffing; aerial ladder/engine company combined (5) for a total of 5. City of Bellevue Neighborhoods protected include Wilburton, Woodridge, the west portion of Lake Hills, and east portions of Downtown.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 - 0.8 in the service area. Only two census tracts exceed 0.5 SVI (0232.02 & 0236.04) and neither has significant call volume for this station. The majority of the service area is a mix of commercial mid and high-rise structures. New high-rise fully protected multi-family residential complexes have been constructed in the downtown. A few older multi-family residential complexes and a Men's homeless shelter are the primary generators of medical incident activity. The COB Wilburton and Woodridge neighborhoods are primarily composed of single-family residential structures between 2,000 and 5,000 s.f. The new light-rail line will pass through the Wilburton neighborhood and the south-east portion of Downtown, but crossings are elevated or underground in this service area.

The Station 7 ladder/truck company responds to a higher percentage of non-EMS responses than any other unit. This is primarily due to it being the closest ladder/truck company to the Downtown and response plans that require a ladder/truck on Automatic Fire Alarms (AFA) in commercial and Multi-family structures.



Metric	2020	2019	
Incident Count	1,213	1,260	
Suppression Incidents	585 (48.23%)	595 (47.22%)	
EMS Incidents	614 (50.62%)	649 (51.51%)	
Other Incidents	14 (1.15%)	16 (1.27%)	
90% Turnout Time EMS	1:53	1:45	
90% Turnout Time Non-EMS	2:03	1:59	
90% Total Response Time EMS	8:54	9:24	
90% Total Response Time Non-EMS	8:12	8:54	



Fire Station Eight



Bellevue Fire Station Eight is located at 5701 Lakemont Blvd SE. This 9,128 s.f. facility was constructed in 1995. Front-line apparatus includes 1 engine, 1 Air Unit and 1 Rescue/ATV. Reserve apparatus includes 1 engine. Daily on-duty personnel staffing; engine company (3) for total of 3. City of Bellevue Neighborhoods protected include Cougar Ridge/Lakemont and West Lake Sammamish. Contract community protected is the northeast portion of the City of Newcastle.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 - 0.8 in the service area. Only two census tracts exceed 0.5 SVI (0232.02 & 0236.04) and neither has significant call volume for this station. The majority of the service area consists of single-family residential buildings ranging from 2,000 s.f. to 10,000 s.f. There are a few low-rise multi-family residential complexes and some minor commercial development in the Lakemont area. There is one assisted living facility located at the southeastern edge of the service area.

Population densities are lower than average for this station area, but there is an increasing risk of Wildland Urban Interface (WUI) fires in the east portion of the service area.



Metric	2020	2019
Incident Count	632	609
Suppression Incidents	164 (25.95%)	155 (25.45%)
EMS Incidents	456 (72.15%)	446 (72.23%)
Other Incidents	12 (1.9%)	8 (1.31%)
90% Turnout Time EMS	1:52	1:51
90% Turnout Time Non-EMS	2:03	2:07
90% Total Response Time EMS	10:24	10:06
90% Total Response Time Non-EMS	11:24	11:00



Fire Station Nine



Bellevue Fire Station Nine is located at 12412 Newcastle Way. This 7,838 s.f. facility was constructed in 1975, remodeled in 1987 and seismically upgraded in 1997. Front-line apparatus includes 1 engine and 1 Mobile Command Unit (MCU). Reserve apparatus is 1 engine and 1 aid car. Daily on-duty personnel staffing; engine company (3) for total of 3. City of Bellevue Neighborhoods protected include Newport and the south portion of Factoria. This station also protects the contract community of the City of Newcastle.

Neighborhood Characteristics and demographics - Overall SVI ranges from 0.1 - 0.5 in the service area. The highest SVI of the top five (5) census tracts by incident volume is 0.4. The majority of the service area consists of single-family residential buildings ranging from 2,000 s.f. to 10,000 s.f. There are low-rise multi-family residential complexes and some commercial development in the City of Newcastle. There are two assisted living facilities in the service area.

Population densities are about average for this station area, but there is an increasing risk of Wildland Urban Interface (WUI) fires in the southeast portion of the service area.



Metric	2020	2019
Incident Count	1,176	1,261
Suppression Incidents	186 (15.82%)	197 (15.62%)
EMS Incidents	977 (83.08%)	1,052 (83.43%)
Other Incidents	13 (1.11%)	12 (0.95%)
90% Turnout Time EMS	1:49	1:52
90% Turnout Time Non-EMS	1:56	1:51
90% Total Response Time EMS	8:00	8:12
90% Total Response Time Non-EMS	9:00	9:36



ALLE VICE

Fire Station Ten





Bohlin Cywinski Jackson

Fire Station 10 will be on the northwest corner of 112th Avenue Northeast and Northeast 12th Street, north of McCormick Park and will open in 2023. The City Council approved funds for the land acquisition for Fire Station 10 in the 2015-21 Capital Investment Program and has completed property acquisition for the site. A geographic area was selected for Fire Station 10 based on coverage gaps identified in the Fire Facilities Master Plan. The 112th Avenue site was selected because it best met the criteria used to evaluate potential sites. FS10 will contain the following front-line apparatus; 1 engine (new resource), 1 BLS aid car (moved from FS1), 1 ALS medic unit (moved from OHMC) and 1 BC (moved from FS1). On-duty staffing total staffing will be 9. The station design will accommodate up to 14 firefighters. This will allow for future growth and provide additional flexibility for future resource decisions.

Downtown has been Bellevue's fastest growing residential neighborhood for more than a decade, with the population expected to nearly triple from 7,147 in 2010 to 19,000 in 2030. Bellevue's employment base, with the highest concentration of workers downtown, is also projected to grow from 42,525 employees in 2010 to an estimated 70,300 by 2030. BelRed, northeast of downtown, is also growing, with transit-oriented development drawing people and businesses there. The areas of downtown and BelRed represent 70 percent of the projected population growth for Bellevue. From 2010 to 2015, emergency incidents downtown increased by 24 percent.

Other Factors considered in the CRA

The design of, type of construction materials, presence or absence of fire protection detection and suppression systems, occupancy use associated with, and the square footage of a structure greatly determine the relative risk to the building and its occupants.



Table XVI – Buildings by occupancy use – Single Family excluded

Building Risk methodology

Building risk will be used to adjust response plan assignments whenever a determination has been made that the data is sufficient to achieve a 95% confidence interval of the building risk score. The following factors will be considered in this determination.⁴

- The presence or absence of smoke control and fire sprinklers shall be the only fire protection and/or suppression system used in determining the risk presented by individual structures.
- Building construction will be determined using International Building Code (IBC) designations for fire resistive and non-fire resistive construction types.
- Number of floors (stories), number of dwelling units and square footage will determine life hazard exposure for the structure.

⁴ Development Services Major Building permits (BB folder types) were reviewed from an issue date of January 1, 2014 forward to create a base dataset.



Table XVII – Building Risk Score Factors

Total SF	Num Stories	Dwell Units	SC Present	Spkr Present	Construction
1 = <10000	1 = <3	1 = 0	-1 = Yes	-1 = Yes	1 = IA, IB, IIA, IIB
2 = 10001- 100000	2 = 3 - 7	2 = 1 - 10	1 = No	1 = No	2 = IIIB
3 => 100001	3 => 8	3 = > 10			3 = VA, VB

The maximum risk score for a structure is 14 and the minimum score for a fully protected, fire resistive, commercial structure under 3 stories with less than 10,000 s.f. is 2.

Risk score is classified as follows:

- 2 5 is **LOW** risk
- 6 10 is **MODERATE** risk
- 11 14 is **HIGH** risk

Low and moderate risk structures will be assigned the minimum response plan for the building type and problem nature code per existing mutually agreed upon protocols. Structures identified as high risk by this methodology will be included in the "Targeted Hazard" response plans as currently defined by SOP 400-23, Station Captain Responsibilities and SOP 900-08 CAD, Geofile and Premise Information.

When fire alarm system information has been ascertained to meet the 95% confidence level, this methodology will be expanded to include the existence of structure wide fire alarm systems.

Row Labels	Count of Address	Sum of Dwell Units	Sum of Total SF	Max of Risk Score
Commercial	60) 1032	8,831,168	9
A-2	2	1 C	309,262	9
A-3	2	1 C	49,837	3
В	٤	3 (2,322,755	6
E	e	5 C	578,018	6
I-1	2	2 105	143,687	8
М	2	2 0	210,992	4
R-1	2	2 488	222,504	7
R-2	2	2 173	185,473	7
S-1	٤	3 (693,055	4
S-2	14	1 C	3,282,949	6
U	2	2 0	15,500	3
(blank)	e	5 266	817,136	4
MF Residential	119	9 4914	6,887,928	11
A-2	2	L C	4,215	2
A-3	2	L C) 11,159	3
I-1	2	L 118	119,276	6

Table XVIII – 2020 Existing Building Risk Summary

Risk Score (All)

	LEV	
(*	۲	٣)
	FIRE	Ϊ

Grand Total	179	5946	15,719,096	11
(blank)	8	260	430,036	7
S-2	9	33	1,080,189	8
R-2	99	4503	5,243,053	11

Manmade Hazards

From protection of critical infrastructure like the Olympic Pipeline, to civil unrest, 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.

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.

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.

Windstorm/High Wind Event

Of all severe weather events, wind events are the most likely natural hazard to occur within the service area with most years experiencing at least one significant wind event. The 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.

Additional detailed information on these hazards and the plan on how best to respond to them can be found in the City of Bellevue's <u>Hazard Inventory and Risk Assessment (HIRA)</u>.

All Hazard Risk Visualization Tool

All pertinent risk data was then populated to the <u>All Hazards Community Risk Assessment Visualization tool</u>. This tool was used by the CRA/SOC Development Group to evaluate overall risk, response plans and outreach strategies to mitigate that risk. The CRA/SOC Development Group was comprised of representatives from OEM, FPD, EMS, Operations, CRR and Administration. 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/SOC Development 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 identify any other response plans that may require more complex analysis beyond the scope of the CRA group.

City of Bellevue Neighborhoods & Characteristics

These fourteen (14) COB planning zones will be used communicate and present to neighborhood groups. However, due to their exclusion of communities served by BEFD that are outside the COB jurisdictional boundaries, they will not be used to represent overall system workload or performance.

Neighborhood	Aggregate Assessed Land Value	Aggregate Assessed Improvement Value	Aggregate Total Assessed Value	Number of Parcels	Average Assessed Value per Parcel	Area (square feet)	Average Assessed Land Value per square foot	Average Assessed Value per Acre
Belred	\$1,472,508,000	\$783,950,400	\$2,256,458,400	536	\$4,209,810	33,394,654	\$44	\$2,943,325
Bridle Trails	\$1,624,887,398	\$1,753,068,600	\$3,377,955,998	1,893	\$1,784,446	77,723,467	\$21	\$1,893,170
Cougar Mountain / Lakemont	\$1,737,072,377	\$2,410,589,995	\$4,147,662,372	3,953	\$1,049,244	90,037,189	\$19	\$2,006,639
Crossroads	\$963,248,399	\$1,384,348,890	\$2,347,597,289	1,007	\$2,331,278	32,098,824	\$30	\$3,185,828
Downtown	\$3,977,027,700	\$8,458,570,477	\$12,435,598,177	343	\$36,255,388	14,381,772	\$277	\$37,665,364
Eastgate	\$1,502,906,383	\$1,996,126,200	\$3,499,032,583	2,606	\$1,342,683	59,244,407	\$25	\$2,572,696
Factoria	\$364,419,945	\$813,228,541	\$1,177,648,486	300	\$3,925,495	13,183,906	\$28	\$3,890,984
Lake Hills	\$2,183,814,899	\$1,915,913,000	\$4,099,727,899	4,825	\$849,685	81,673,917	\$27	\$2,186,551
Newport	\$1,589,215,196	\$1,536,091,100	\$3,125,306,296	3,489	\$895,760	62,564,302	\$25	\$2,175,975
Northeast Bellevue	\$1,852,438,599	\$1,273,807,500	\$3,126,246,099	4,087	\$764,924	49,798,010	\$37	\$2,734,633
Northwest Bellevue	\$2,588,172,200	\$2,321,043,340	\$4,909,215,540	2,442	\$2,010,326	43,395,030	\$60	\$4,927,878
Somerset	\$1,546,974,200	\$1,431,753,400	\$2,978,727,600	3,081	\$966,805	47,550,983	\$33	\$2,728,721
West Bellevue	\$2,519,153,925	\$2,073,265,625	\$4,592,419,550	2,352	\$1,952,559	59,528,068	\$42	\$3,360,529
West Lake Sammamish	\$1,079,629,400	\$1,101,978,050	\$2,181,607,450	2,165	\$1,007,671	43,669,754	\$25	\$2,176,124
Wilburton	\$996,250,200	\$720,548,400	\$1,716,798,600	939	\$1,828,327	41,009,469	\$24	\$1,823,573
Woodridge	\$691,871,242	\$619,740,600	\$1,311,611,842	1,231	\$1,065,485	23,414,755	\$30	\$2,440,077
					(. / . /			

Source: Calculated by City of Bellevue's Community Development Department from King County Assessor parcel data as of 8/24/2018.

Additional Demographic factors for Neighborhood focused Risk Reduction Planning

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

BEL-RED / BRIDLE TRAILS [BR/BT]

BEL REI	O / BRIDLE TRAILS	BELLEVUE	
POPULATION [p]			
Population	12,578	148,100	
Density [p/mi ²]	2,626	4,628	
	ОМЕ ГИНИ		
Median HHI	\$107.479	\$94 638	
		, , , , , , , , , , , , , , , , , , ,	
= ^{60%}			
atio 40%		_	
8			
0% <50	50-75	75+	
Bellevue	Income [thousands]	
Poverty Rate	4 86%	7 90%	
	4.0070	7.5070	
ETHNICITY			
White	51.05%	58.74%	
Black	3.45%	2.37%	
Asian	39.91%	31.29%	
Hispanic	5.48%	7.07%	
Other	0.12%	0.52%	
HOUSING - YEAR	BUILT		
2000 +	4.07%	15.60%	
1980 - 1999	40.26%	30.30%	
1960 - 1979	50.77%	39.30%	
1940 - 1959	4.25%	13.50%	
< 1940	.64%	1.30%	
HOUSING CHARA	CTERISTICS		
Housing Units	5,747	58,215	
Vacant	4.25%	6.90%	
TOP FOREIGN LANGUAGES ²			
Other Asian ³	20.98%	6.49%	
Chinese	20.62%	29.04%	
Russian	15.61%	6.37%	
Hindi	12.00%	4.09%	
Spanish	5.22%	16.86%	



HAZARDS

Approximately: 882 structures are within 450 feet of environmentally impacted areas⁴, 42 structures are within floodplain boundaries, and 147 structures are within a 150 foot radius of the Olympic Oil Pipeline.

	BEL RED /	
	BRIDLE TRAILS	BELLEVUE
Liquefaction	.17 mi²	1.9 mi ²
Floodplain	.05 mi²	.8 mi ²
Enviro. Hazards	214	692
Oil Pipeline	2.58 mi	17.3 mi
Liquefaction Floodplain Enviro. Hazards Pipeline View of the second sec		
1 I 350 Ft. 700 Ft.	ا 1,500 Ft.	3, 200Ft.

COUGAR MOUNTAIN / LAKEMONT [CM/LM]

	CM/LM	BELLEVUE		
POPULATION [p]	22 726	140,100		
Population Density [n/mia]	23,730	148,100		
Density [p/mi ²]	4,654	4,628		
HOUSEHOLD INCO	ОМЕ <i>[нні]</i>			
Median HHI	\$132,478	\$94,638		
Ho	usehold Income	9		
60%				
40%				
° 20%				
° 0%				
BR / BT	50-75 ncome [thousands]	/5+		
Bellevue	[]			
POVERTY ¹				
Poverty Rate	5.23%	7.90%		
ETHNICITY				
White	61.85%	58.74%		
Black	1.88%	2.37%		
Asian	29.65%	31.29%		
Hispanic	6.40%	7.07%		
Other	0.05%	11.70%		
HOUSING – YEAR	BUILT			
2000 +	24.75%	15.60%		
1980 - 1999	52.71%	30.30%		
1960 - 1979	18.33%	39.30%		
1940 - 1959	3.42%	13.50%		
< 1940	0.79%	1.30%		
HOUSING CHARA	CTERISTICS			
Housing Units	8.653	58.215		
Vacant	4.50%	6.90%		
Chinese	56 96%	29 0/%		
Korean	27.62%	10.65%		
Japanese	5.63%	3.88%		
Vietnamese	1.85%	3.79%		
Mon-Khmer	1.68%	1.57%		



HAZARDS

Approximately: 464 structures are within 550 feet of environmentally impacted areas³, no structures are within floodplain boundaries or a 150 foot radius of the Olympic Oil Pipeline.

	CM/LM	BELLEVUE
Liquefaction	.01 mi ²	1.9 mi ²
Floodplain	.01 mi ²	.8 mi ²
Enviro. Hazards	13	692
Oil Pipeline	.18 mi	17.3 mi



1. The US Census Bureau calculates poverty status by using estimates of the level of income needed to cover basic necessities (food, rent, utilities, etc.) Families who live below that threshold are considered to be in poverty.

2. Top foreign languages are determined by the amount of people who speak English "less than very well".

3. "Environmentally impacted areas" are defined by the Washington State Department of Ecology as locations that have active or potential impact to the environment through the storage of hazardous or toxic chemicals.

* Data was gathered from the US Census Bureau, the American Community Survey (2015), and InfoUSA (2016).

CROSSROADS

	CROSSROADS	BELLEVUE	
POPULATION [p]			
Population	17,425	148,100	
Density [p/mi ²]	8,890	4,628	
HOUSEHOLD INCO	ОМЕ (ннп		
Median HHI	\$70,691	\$94,638	
Но	usehold Income	e	
0% 0% < 50 < 50	50-75	75+	
Bellevue	ome [thousands]		
POVERTY¹			
Poverty Rate	13.39%	7.90%	
FTHNICITY			
White	15,19%	58,74%	
Black	31.69%	2.37%	
Asian	7.42%	31.29%	
Hispanic	28.52%	7.07%	
Other	0%	11.70%	
		•	
HOUSING – YEAR BUILT			
2000 +	7.08%	15.60%	
1980 - 1999	24.58%	30.30%	
1960 - 1979	57.38%	39.30%	
1940 - 1959	9.69%	13.50%	
< 1940	1.27%	1.30%	

HOUSING CHARACTERISTICS				
Housing Units 7,319 58,215				
Vacant	7.54%	6.90%		

TOP FOREIGN LANGUAGES ²				
Spanish	25.04%	16.86%		
Other Asian ³	16.79%	6.49%		
Chinese	16.16%	29.04%		
Hindi	9.27%	4.09%		
Russian	7.13%	6.37%		

AGE DISTRIBUTION [years]



HAZARDS

Approximately: 265 structures are within 300 feet of environmentally impacted areas⁴, 1 structure is within floodplain boundaries, and 20 structures are atop liquefiable soils.

	CROSSROADS	BELLEVUE
Liquefaction	.05 mi²	1.9 mi ²
Floodplain	.03 mi²	.8 mi²
Enviro. Hazards	44	692
Oil Pipeline	1.2 mi	17.3 mi

Liquefaction Pipeline Pipeline Floodplain C Enviro. Hazards



300 Ft.	600 Ft.	1,100 Ft.	2,600Ft

DOWNTOWN

	DOWNTOWN	BELLEVUE	
POPULATION [p]			
Population	11,197	148,100	
Density [p/mi ²]	16,227	4,628	
Modian HHI		\$94 638	
Hou	sehold income	,99 4 ,038	
= ^{70%} [senora meome		
latio			
ad 35%			
% %			
<50	50 - 75	75+	
BR / BT	ome [thousands]	-	
POVERTY ²	11 079/	7.00%	
Poverty Rate	11.97%	7.90%	
ETHNICITY			
White	57.95%	58.74%	
Black	2.21%	2.37%	
Asian	0%	31.29%	
Hispanic	3.47%	7.07%	
Other	0%	11.70%	
HOUSING - YEAR	BUIIT		
2000 +	68.59%	15.60%	
1980 - 1999	25.37%	30.30%	
1960 - 1979	5.83%	39.30%	
1940 - 1959	0.00%	13.50%	
< 1940	0.20%	1.30%	
HOUSING CHARA	CTERISTICS		
Housing Units	7,941	58,215	
Vacant	15.09%	6.90%	
TOP FOREIGN LANGUAGES ²			
Chinese	20.89%	16.86%	
Russian	12.40%	6.49%	
Hindi	11.92%	29.04%	
Japanese	11.85%	4.09%	
Korean	11.44%	6.37%	

AGE DISTRIBUTION [years] Age Distribution >5 6-19 Age 20-44 45-64 65+ 60% 30% 0% 30% 60% Male % Population Female

HAZARDS

Approximately: 265 structures are within 300 feet of environmentally impacted areas³, 1 structure is within floodplain boundaries, and 20 structures are atop liquefiable soils.

	DOWNTOWN	BELLEVUE
Liquefaction	0 mi	1.9 mi ²
Floodplain	0 mi²	.8 mi ²
Enviro. Hazards	78	692
Oil Pipeline	0 mi	17.3 mi

Liquefaction Enviro. Hazards



1. The US Census Bureau calculates poverty status by using estimates of the level of income needed to cover basic necessities (food, rent, utilities, etc.) Families who live below that threshold are considered to be in poverty.

2. Top foreign languages are determined by the amount of people who speak English "less than very well".

3. "Environmentally impacted areas" are defined by the Washington State Department of Ecology as locations that have active or potential impact to the environment through the storage of hazardous or toxic chemicals.

* Data was gathered from the US Census Bureau, the American Community Survey (2015), and InfoUSA (2016).

FACTORIA / EASTGATE

	FACTORIA /		
	EASIGATE	BELLEVUE	
Population	5,666	148 100	
Density [p/mi ²]	3.777	4.628	
) [[·) ····]	-,	.,	
HOUSEHOLD INCO	ОМЕ <i>[нні]</i>		
Median HHI	Ş68,042	\$94,638	
Ho	usehold Incom	e	
ation			
Indo			
× 25%			
0%	50 - 75	75+	
FT/EG Sellevue Inc	ome [thousands]	751	
	-		
POVERIN Poverty Bate	7 80%	7 90%	
	7.00%	7.5070	
ETHNICITY			
White	51.57%	58.74%	
Black	2.55%	2.37%	
Asian	23.28%	31.29%	
Othor	20.98%	11 70%	
Other	1.01%	11.70%	
HOUSING – YEAR	BUILT		
2000 +	6.70%	15.60%	
1980 - 1999	32.90%	30.30%	
1960 - 1979	26.70%	39.30%	
1940 - 1959	32.70%	13.50%	
< 1940	1.10%	1.30%	
		·	
Housing Units	2 201	59 215	
Vacant	2,304	6 90%	
vacant	10.3070	0.5070	
TOP FOREIGN LANGUAGES ²			
Spanish	48.66%	16.86%	
Chinese	20.67%	29.04%	
Korean	14.70%	10.65%	
Mon-Khmer	6.04%	1.57%	
French	2.84%	0.60%	

AGE DISTRIBUTION [years]



HAZARDS

Approximately: 287 structures are within 550 feet of environmentally impacted areas³, 5 structures are within floodplain boundaries, 48 structures are directly atop the Seattle Fault, 327 structures are atop liquefiable soils, and 125 structures are within a 150 foot radius of the Olympic Oil Pipeline.

	FACTORIA /	
	EASTGATE	BELLEVUE
Liquefaction	.19 mi₂	1.9 mi ²
Floodplain	.01 mi²	.8 mi²
Enviro. Hazards	44	692
Oil Pipeline	1.4 mi	17.3 mi
Fault Line	2.1 mi	7.2 mi



Env. Ha<mark>s</mark>s Fault Line



WEST LAKE HILLS

	WEST LAKE HILLS	BELLEVUE	
POPULATION [p]	-		
Population	9,791	148,100	
Density [p/mi ²]	3,795	4,628	
HOUSEHOLD INCO	DME <i>[нні]</i>		
Median HHI	\$71,826	\$94,638	
Hou	sehold Income		
Ilatio			
	_		
× 0%			
<50	50-75	75+	
Bellevue	ome [thousands]		
POVERTY ¹			
Poverty Rate	14.45%	7.90%	
FTUNIOITY			
White	48 60%	58 74%	
Black	4.00%	2.37%	
Asian	33.99%	31.29%	
Hispanic	11.97%	7.07%	
Other	1.3%	11.70%	
HOUSING - YEAR	BIIIIT		
2000 +	8.06%	15.60%	
1980 - 1999	40.21%	30.30%	
1960 - 1979	36.66%	39.30%	
1940 - 1959	14.29%	13.50%	
< 1940	.79%	1.30%	
HOUSING CHARA	4 292	E0 01E	
Vacant	4,283	6 90%	
	0.0070	0.0070	
TOP FOREIGN LANGUAGES ²			
Chinese	27.22%	29.04%	
Spanish	25.25%	16.86%	
Korean Other Indic*	11.40%	10.65%	
	/.85% / 0/%	2.11% 02%	
oruu	4.0470	.53%	

AGE DISTRIBUTION [years] Age Distribution 20-44 45-64 65+ 40% 20% 0% 20% 40% Male % Population Female

HAZARDS

Approximately: 360 structures are within 330 feet of environmentally impacted areas⁴, 19 structures are within floodplain boundaries, 31 structures are atop liquefiable soils, and 135 structures are within 150 feet of the Olympic Oil Pipeline.

	WEST	
	LAKE HILLS	BELLEVUE
Liquefaction	.11 mi²	1.9 mi ²
Enviro. Hazards	74	692
Floodplain	.06 mi²	.8 mi²
Oil Pipeline	4.3 mi	17.3 mi



NORTHEAST BELLEVUE

	NORTHEAST BELLEVILE	BELLEVILE		
	DELLEVOE	DELECVOL		
Population	7,918	148,100		
Density [p/mi ²]	2,817	4,628		
, ., .	1 -			
HOUSEHOLD INCO	ОМЕ <i>[нні]</i>			
Median HHI	\$68,042	\$94,638		
Ho	usehold Incom	e		
tion 75%				
end 250%				
a 25%				
< 50	E0 75	75.		
FT/EG		TC (
Bellevue In	come [thousands]			
POVERTY ¹				
Poverty Rate	3.62%	7.90%		
FTHNICITY				
White	73.06%	58.74%		
Black	2.33%	2.37%		
Asian	20.08%	31.29%		
Hispanic	4.25%	7.07%		
Other	.28%	11.70%		
HOUSING – YEAR		15 600/		
2000 +	3.70%	15.60%		
1980 - 1999	11.65%	30.30%		
1960 - 1979	71.15%	39.30%		
1940 - 1959	12.78%	13.50%		
< 1940	.72%	1.30%		
	CTEDICTICS			
Housing Units		50 215		
Vacant	2,919	6 90%		
vacant	3.23/0	0.50%		
TOP FOREIGN LANGUAGES ²				
Chinese	32.48%	29.04%		
Vietnamese	16.69%	3.79%		
Spanish	7.19%	16.86%		
Other Indic ³	6.29%	2.77%		
Croatian	6.16%	0.70%		



Approximately: 146 structures are within 350 feet of environmentally impacted areas⁴, 5 structures are within floodplain boundaries, 407 structures are directly atop the Seattle Fault, 7 structures are atop liquefiable soils, and 76 structures are within a 150 foot radius of the Olympic Oil Pipeline.

,	NORTHEAST	
	BELLEVUE	BELLEVUE
Liquefaction	.08 mi²	1.9 mi ²
Floodplain	0 mi²	.8 mi²
Enviro. Hazards	5	692
Oil Pipeline	0 mi	17.3 mi
Fault Line	0 mi	7.2 mi



NEWPORT HILLS

	NEWPORT HILLS	BELLEVUE		
POPULATION [p]		DEELEVOL		
Population	16,443	148,100		
Density [p/mi ²]	7,474	4,628		
HOUSEHOLD INCO		<u> 604 638</u>		
iviedian HHI	\$100,256	\$94,638		
нои = 80% г	senola income			
- %00 atio				
ad 40%				
² 20%				
0% - <50	50-75	75+		
FT/EG	come [thousands]	, , , ,		
	_			
POVERTY ¹	F 700/	7.00%		
Poverty Rate	5.79%	7.90%		
ETHNICITY				
White	67.66%	58.74%		
Black	3.18%	2.37%		
Asian	22.90%	31.29%		
Hispanic	5.50%	7.07%		
Other	.77 %	11.70%		
HOUSING - YFAR	BUIIT			
2000 +	10.28%	15.60%		
1980 - 1999	31.41%	30.30%		
1960 - 1979	47.46%	39 30%		
1040 1050	10.02%	12 50%		
1940 - 1959	10.02%	1.20%		
< 1940	.84%	1.30%		
HOUSING CHARACTERISTICS				
Housing Units	6,209	58,215		
Vacant	2.40%	6.90%		
Chinoso		20.04%		
Koroan	37.97%	29.04%		
Vietnamoso	13.34% Q /7%			
lananese	0.47% 7 72%	3.75%		
Snanish	6 37%	16 86%		
Shamen	0.3770	10.0070		

AGE DISTRIBUTION [years]



Approximately: 146 structures are within 350 feet of environmentally impacted areas³, 5 structures are within floodplain boundaries, 407 structures are directly atop the Seattle Fault, 7 structures are atop liquefiable soils, and 76 structures are within a 150 foot radius of the Olympic Oil Pipeline. NEWPORT

	HILLS	BELLEVUE
Liquefaction	.03 mi²	1.9 mi ²
Floodplain	.02 mi²	.8 mi²
Enviro. Hazards	23	692
Oil Pipeline	1.9 mi	17.3 mi
Fault Line	1.6 mi	7.2 mi


NORTHWEST BELLEVUE [NWB]

NORTHWEST		
	BELLEVUE	BELLEVUE
POPULATION [p]	7 880	1/18 100
Density [n/mi2]	7,880 4 147	4 628
	-,,	4,020
HOUSEHOLD INCO	ОМЕ <i>[нні]</i>	
Median HHI	\$107,479	\$94,638
Ηοι	usehold Income	!
5 75%		
50%		——————
å 25%		
× 0%		
< 50	50 - 75	75+
Bellevue 🗌 🛛 Inc	come [thousands]	
POVERTY ¹		
Poverty Rate	3.10%	7.90%
FTHNICITY		
White	66.60%	58.74%
Black	.41%	2.37%
Asian	28.79%	31.29%
Hispanic	3.63%	7.07%
Other	.58%	11.70%
	BUILT	
2000 +	12.90%	15.60%
1980 - 1999	27.50%	30.30%
1960 - 1979	27 60%	39 30%
1040 1050	29.20%	12 50%
1940 - 1959	28.30%	1 200/
< 1940	3.90%	1.30%
HOUSING CHARA	CTERISTICS	
Housing Units	3,660	58,215
Vacant	7.7%	6.90%
TOD EODEIGN LANGUAGES ²		
	35 8/1%	29 0/1%
Korean	23.61%	10.65%
Indo European ³	16.42%	1.85%
Spanish	6.87%	16.86%
Farsi	5.15%	2.02%



HAZARDS

Approximately: 287 structures are within 550 feet of environmentally impacted areas⁴, 5 structures are within floodplain boundaries, 48 structures are directly atop the Seattle Fault, 327 structures are atop liquefiable soils, and 125 structures are within a 150 foot radius of the Olympic Oil Pipeline.

	NORTHWEST	
	BELLEVUE	BELLEVUE
Liquefaction	.06 mi²	1.9 mi ²
Enviro. Hazards	12	692



Sammamish / East Lake

POPULATION [p]	SAMMAMISH / EAST LAKE	BELLEVUE
Population	14,511	148,100
Density [p/mi ²]	3,901	4,628
HOUSEHOLD INCO	DME <i>[нні]</i>	
Median HHI	\$87,390	\$94,638
Но	usehold Income	2
80% 60% 40% 20% 0%		
	some [thousands]	/5+
Poverty Rate	5.27%	7.90%
	71 70%	EQ 7/10/
Black	1.74%	2 37%
Asian	20.12%	31.29%
Hispanic	6.00%	7.07%
Other	.33%	11.70%
HOUSING - YEAR	BUIIT	
2000 +	4.13%	15.60%
1980 - 1999	18.25%	30.30%
1960 - 1979	46.44%	39.30%
1940 - 1959	28.87%	13.50%
< 1940	2.32%	1.30%
HOUSING CHARA	E 240	EQ 21E
Vacant	5,549 2.Δ1%	6 90%
vacant	2.71/0	0.5070
TOP FOREIGN LANGUAGES ²		
Chinese	28.65%	29.04%
Spanish	26.79%	16.86%
	/.82%	2.1/%
Vietnamese	5 85%	3 70%
victiaiiic3C	J.(J/0	5.7570

AGE DISTRIBUTION [years] Age Distribution \$5 6-19 20-44 45-64 65+ 40% 20% Male % Population

HAZARDS

Approximately: 760 structures are within 550 feet of environmentally impacted areas⁴, 27 structures are within floodplain boundaries, 860 structures are atop liquefiable soils, and 43 structures are atop the Seattle Fault.

	SAMMAMISH/	
	EAST LAKE	BELLEVUE
Liquefaction	.59 mi²	1.9 mi ²
Enviro. Hazards	12	692
Floodplain	.29 mi²	.8 mi²
Fault Line	.86 mi	7.2 mi



SOMERSET

	SOMERSET	BELLEVUE
POPULATION [p]		
Population	5,063	148,100
Density [p/mi ²]	4,116	4,628
HOUSEHOLD INCO	DME [нні]	
Median HHI	\$135 <i>,</i> 625	\$94,638
= 60% r	usehold Income	
latio		
ndo		
× 20%		
0%		
NWB <50	50-75	75+
Bellevue Inc	ome [thousands]	
POVERTY ¹		
Poverty Rate	3.90%	7.90%
ETHNICITY		
White	51.63%	58.74%
Black	1.18%	2.37%
Asian	44.78%	31.29%
Hispanic	1.57%	7.07%
Other	.81%	11.70%
HOUSING – YEAR	BUILT	
2000 +	3.80%	15.60%
1980 - 1999	17.10%	30.30%
1960 - 1979	74.10%	39.30%
1940 - 1959	4.50%	13.50%
< 1940	.50%	1.30%
HOUSING CHARACTERISTICS		
Housing Units	1,773	58,215
Vacant	1.60%	6.90%
TOP FOREIGN LANGUAGES ²		
Chinese	66.21%	29.04%
Korean	12.79%	10.65%
Japanese	7.46%	3.88%
Other Asian*	2.74%	6.49%
Tagalog	2.59%	1.64%

AGE DISTRIBUTION [years]



Approximately: 141 structures are within 530 feet of environmentally impacted areas⁴, 3 structures are within floodplain boundaries, 20 structures are atop liquefiable soils, and 156 structures are within a 150 foot radius of the Olympic Oil Pipeline.

	SOMERSET	BELLEVUE
Liquefaction	.8 mi²	1.9 mi ²
Enviro. Hazards	3	692
Floodplain	.01 mi²	.8 mi²
Oil Pipeline	2.1 mi	17.3 mi



WEST BELLEVUE

	WEST BELLEVUE	BELLEVUE
POPULATION [p]		
Population	9,245	148,100
Density [p/mi ²]	2,853	4,628
	ОМЕ ІННІІ	
Median HHI	\$107,491	\$94,638
Нои	sehold Income	
- ^{80%} [
- %00 ation		
a 40%		
20%		
0%		
NWB <50	50-75	75+
	ome [thousands]	
POVERTY ¹		
Poverty Rate	11.12%	7.90%
ETHNICITY		
White	77.04%	58.74%
Black	1.33%	2.37%
Asian	20.77%	31.29%
Hispanic	4.88%	7.07%
Other	.87%	11.70%
HOUSING – YEAR	BUILT	
2000 +	9.94%	15.60%
1980 - 1999	28.38%	30.30%
1960 - 1979	32.96%	39.30%
1940 - 1959	24.30%	13.50%
< 1940	4.42%	1.30%
	CTEDISTICS	
Housing Units	4.296	58 215
Vacant	8.33%	6.90%
TOP FOREIGN LANGUAGES ²		
Chinese	27.12%	29.04%
Spanish	19.05%	16.86%
Vietnamese	11.23%	3.79%
Russian	10.98%	6.37%
Korean	10.73%	10.65%

AGE DISTRIBUTION [years] Age Distribution >5 6-19 20-44 Age 45-64 65+ 40% 20% 0% 20% 40% Male % Population Female

HAZARDS

Approximately: 95 structures are within 150 feet of environmentally impacted areas³, 39 structures are within floodplain boundaries, 759 structures are atop liquefiable soils, and 49 structures are atop the Seattle Fault Line.

	WEST	
	BELLEVUE	BELLEVUE
Liquefaction	.4 mi ²	1.9 mi ²
Enviro. Hazards	44	692
Floodplain	.1 mi ²	.8 mi²
Fault	.9 mi	17.3 mi



WILBURTON

	WILBURTON	BELLEVUE
POPULATION [p]		
Population	3,854	148,100
Density [p/mi ²]	2,165	4,628
HOUSEHOLD INC	оме <i>[нні]</i>	
Median HHI	\$78,155	\$94,638
60% Hou 40% 20% 20% 0%	50-75	75+
NWB Bellevue Inc	come [thousands]	751
POVERTY¹		
Poverty Rate	11.40%	7.90%
ETHNICITY		

59.60%	58.74%
3.51%	2.37%
29.11%	31.29%
7.25%	7.07%
.53%	11.70%
	59.60% 3.51% 29.11% 7.25% .53%

HOUSING – YEAR BUILT		
2000 +	9.90%	15.60%
1980 - 1999	33.00%	30.30%
1960 - 1979	44.00%	39.30%
1940 - 1959	13.10%	13.50%
< 1940	0%	1.30%

HOUSING CHARACTERISTICS		
Housing Units	1,788	58,215
Vacant	4.60%	6.90%

TOP FOREIGN LANGUAGES ²										
Japanese	19.45%	3.88%								
Chinese	18.82%	29.04%								
Korean	11.79%	10.65%								
Russian	11.29%	6.37%								
Spanish	9.66%	16.86%								



% Population

Female HAZARDS

Male

Approximately: 261 structures are within 470 feet of environmentally impacted areas³, 20 structures are within floodplain boundaries, 42 structures are atop liquefiable soils, and 4 structures are within 150 feet of the Olympic Oil Pipeline.

	WILBURTON	BELLEVUE
Liquefaction	.19 mi²	1.9 mi ²
Enviro. Hazards	74	692
Floodplain	.18 mi ²	.8 mi²
Oil Pipeline	.65 mi	17.3 mi



WOODRIDGE

	WOODRIDGE	BELLEVUE									
POPULATION [p]											
Population	3,672	148,100									
Density [p/mi ²]	4,172	4,628									
HOUSEHOLD INCO	DME [нні]										
Median HHI	\$110,568	\$94,638									
Но	usehold Income	2									
tion 80%											
and 40%											
2 20%											
0%											
NWB <50	50-75	75+									
NWB <50 50-75 75+ Bellevue Income [thousands]											
POVERTY ¹											
Poverty Rate	7.30%	7.90%									
ETHNICITY											
White	66.92%	58.74%									
Black	2.02%	2.37%									
Asian	26.26%	31.29%									
Hispanic	4.80%	7.07%									
Other	0.00%	11.70%									
HOUSING - YEAR	BUIIT										
2000 +	10.40%	15.60%									
1980 - 1999	18.10%	30.30%									
1960 - 1979	43.90%	39 30%									
1940 - 1959	26 60%	13 50%									
1940 - 1959	1.00%	1 200/									
< 194U	1.00%	1.30%									
HOUSING CHARA	CTERISTICS										
Housing Units	1,546	58,215									
Vacant	8.30%	6.90%									
TOP FOREIGN LAN	IGUAGES ²										
Chinese	40.42%	29.04%									
Spanish	15.65%	16.86%									
Japanese	13.32%	3.88%									
Vietnamese	11.45%	3.79%									
Other Indic ³	5.61%	2.77%									



Approximately: 83 structures are within 260 feet of environmentally impacted areas⁴, and 33 structures are within 150 feet of the Olympic Oil Pipeline.

	WOODRIDGE	BELLEVUE
Liquefaction	.01 mi²	1.9 mi ²
Enviro. Hazards	4	692
Floodplain	.01 mi²	.8 mi²
Oil Pipeline	.55 mi	17.3 mi



Response strategies - human caused events

Emergency Medical Incidents⁵

- 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
- MVC & MVC 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 between 75 – 80 percent of all Bellevue Fire Department responses. EMS responses include all trauma, medical, and motor vehicle collisions that don't require patient extrication. BLS incidents mostly involve a single patient, are low risk and typically require a single fire department resource. Moderate risk incidents typically receive at least two-resource responses: one ALS and one BLS. Both high and special risk EMS incidents will require additional BLS and ALS resources.

Location and Extent

As expected, the greatest concentration of incidents is in the areas that have the highest population densities. The Central Business District (CBD) has the greatest concentration of calls for service. Other areas with significant concentrations are in the Crossroads neighborhood, the Overlake area, the Spring District, Factoria, and higher-density housing in the Coal Creek/Newcastle area, as expected, areas with high daytime population 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 Fire⁶

- Working Fire Single Family Residential Risk Score: 35.1 Moderate Risk
- Working Fire Multi-Family Residential/Commercial Risk Score: 49.64 High Risk
- Working Fire Targeted Hazard Risk Score: 54.60 High 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

⁵ Partial list of examples. For full list and determinations, see Appendix A.

⁶ Partial list of examples. For full list and determinations, see Appendix A.

normally live, work, or frequent and can include residences, businesses, assembly occupancies and even storage facilities.

	2020	2019	2018	2017	2016
Kitchen	64	51	54	67	58
Structure	88	140	141	125	138
Total Structure Fires	152	191	195	192	196
Structure Fires % of Total	0.81%	0.93%	0.98%	0.97%	1.04%
Total Incidents	18,696	20,549	19,840	19,822	18,764

Table XIX - 5 Year Structure Fires

History

Structure fire responses average less than 200 incidents per year are typically classified as moderate or high 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 fire responses, include safer home appliances, safer home construction, 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 fire responses is likely to continue as additional advancements in these areas are made. The next table **[Table XX]** represents the amount and occupancy use of buildings within the Bellevue service area. Columns represent the nine fire stations in Bellevue and the number of occupancies of each type within their first-due area.

	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

Table XX - Buildings by Occupancy



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 (FESSAM) 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 subsection.

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 greatly to the city's overall population growth.

Apart from two older high-rise buildings in the downtown core, all high-rises have been constructed with fixed fire sprinkler suppression and fire alarm detection systems. The two high-rises that were built prior to the code requirements for fire sprinklers are now entirely sprinklered and fire alarmed but are still absent other systems, such as smoke control, that reduce risk. The prevalence of fire protection and modern construction in the city is a major factor in the *Recurrence and Impacts* section to follow.

Prior to 2017, Bellevue's building code 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. Currently, 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 three projects under plan review for this new height restriction and multiple high-rise buildings <u>under construction</u>.

Location and Extent

The <u>COB Building Bellevue map</u> illustrates the locations of the new high-rise developments within the city. There are approximately 80 high-rise structures in the jurisdictional area.

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

Vegetation fires occur when grass, bushes, trees, or other types of plants combust. 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 the service area 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. Previous to 2020 this risk was considered "Low". In 2020, Washington State Department of Natural Resources (DNR) issued a new assessment that raised portions of both Station 8 and Station 9 first-due areas to "Very High" risk.

Figure 7 - WUI Map by Response Zone







In the past, the climate of the Puget Sound region has limited 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". BEFD 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 25 years.

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. Bark fires are particularly viable for an increased CRR effort that can serve to increase the publics' awareness and reduce the risk of these completely preventable 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. This changing risk is illustrated in WA DNR designation of WUI areas located in the south and east portions of the community protected.

Findings

An in-depth Wildland-Urban Interface analysis is recommended to assess the changes in exposure, review response strategies, strengthen requests for additional resources, and develop outreach/mitigation plans to ensure that the community is protected and prepared. The result of this analysis should be used to determine when or if it may become necessary to establish a Wildland program within the Operations Bureau or obtain additional vehicles and/or equipment specifically designed to combat these types of fire.

Civil Unrest

• Risk Score: 37.74 – Moderate Risk

Definition

Any incident that disrupts a community where intervention is required to maintain public safety is a civil disturbance. Examples are demonstrations, riots, strikes, public nuisances, and criminal activities. They may be caused by such political grievances and urban economic conflicts as racial tension, unemployment, unpopular political actions, and a decrease in the supply of essential goods and services. In general, civil disturbance most often arises from highly emotional social and economic issues.

History

Historically much of the civil unrest in the region has been limited to Seattle and Olympia. For example, there was the <u>World Trade Organization (WTO)</u> protest in Seattle in 1999. There has also been instances of riots and civil unrest during <u>May Day</u> demonstrations in Seattle and Olympia over the years.

However, while most instances of civil unrest are based in more urban areas, over the years Bellevue has experienced several instances of civil unrest. Though the majority of public demonstrations in Bellevue have been peaceful and well-intentioned, there have been events that required intervention.



In the spring of 2020, there were a series of demonstrations and protests in over 140 cities across the US that were driven by the <u>death of George Floyd</u> in Minneapolis. There was a relatively large demonstration in downtown Bellevue on May 30th, and the Mayor issued a <u>Civil Emergency Order</u> in response to "looters downtown damaging property and stealing merchandise". The unrest continued for several days and the Washington National Guard was brought in to provide support.

Location and extent

Civil unrest can potentially impact all areas of the City. Historically, these events have been most likely to occur in the Downtown Bellevue area, however the impacts (i.e. curfews) can be spread throughout a larger area.

Recurrence and Impacts

Instances of civil unrest are relatively rare in Bellevue. Most demonstrations are reasonably peaceful and do not require intervention (i.e. school reopening protests). However, the potential impacts of civil unrest can be significant, including:

- Road closures and traffic impacts
- Property damages
- Economic repercussions (due to temporary business closures)
- Injuries to demonstrators and public safety personnel

Additionally, curfews and other emergency measures may also be imposed in response to civil unrest which can impact residents' day-to-day lives.

While the Police Department takes the lead in response to civil unrest, a Unified Command (UC) may be formed to coordinate response efforts between Fire and Police. The Emergency Operations Center (EOC) may be activated to support citywide coordination if requested.

Response strategies - biologic, geologic, and meteorological hazards

Pandemic

• Risk Score: 40.79 – High Risk

Definition

Disease outbreaks can be characterized by the extent of spread of the disease. An outbreak is considered to be an epidemic if it's above normal disease levels within a defined geographical area. It is considered to be a pandemic if the disease spreads across several countries and affects a large number of people. New diseases can quickly lead to an epidemic or pandemic because there is often little or no immunity in the general population and there is limited information about disease prevention and treatments. New disease outbreaks can quickly overwhelm hospitals and other health care providers and decrease a jurisdiction's ability to provide essential services. Though some diseases may be more common in certain regions due to climate and other conditions, they can easily be spread globally if the appropriate preventative measures are not taken.

History

Historically there have been a number of pandemics that have impacted the Washington State. Some key examples are included below:



<u>1918 (Spanish Flu)</u>: This pandemic was considered to be the deadliest in the 20th century. The 1918 pandemic virus (also known as the "Spanish Flu") spread worldwide following the end of World War I. According to the CDC, approximately 500 million people (or one-third of the world's population) were infected with the virus and at least 50 million people died. This includes approximately 675,000 American deaths (6,571 were in Washington State).

<u>1957 (H2N2 virus)</u>: A new influenza A (H2N2) virus emerged in East Asia leading to a global pandemic. The virus was first reported in Singapore at the beginning of 1957. There were approximately 1.1 million deaths worldwide, including 116,000 in the US.

<u>2009 (H1N1 virus)</u>: In the spring of 2009, a novel influenza A (H1N1) virus emerged. It was first detected in the United States and quickly spread across the U.S. and the world. This flu pandemic was unusual because it primarily affected children and young and middle-aged adults. Nearly one-third of people over 60 years old had antibodies against the virus, likely due to exposure to an older H1N1 virus earlier in their lives. The CDC estimated that between 151,700 - 575,400 people died worldwide from the virus during the first year that it circulated. Since the 2009 H1N1 pandemic, this specific flu virus has continued to circulate seasonally in the U.S., causing significant illnesses, hospitalizations, and deaths.

<u>2020 (COVID-19)</u>: Coronaviruses are a large family of viruses that can cause illness in animals or humans. In humans there are several known coronaviruses that cause respiratory infections. COVID-19 was identified in Wuhan, China in December 2019. COVID-19 is caused by the virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), this is a new virus in humans that causes respiratory illnesses, which can be spread from person-to-person. Washington State had one of the first confirmed cases in the U.S. on January 21, 2020 from an individual who had traveled from Wuhan China. Since then the disease has spread and became a global pandemic.

As of April 2021, COVID-19 had spread to 233 countries. According to the World Health Organization (WHO), there were almost 120 million reported cases and 2.6 million confirmed deaths. This includes 84,031 cases and 1,437 deaths in King County. This pandemic is still ongoing at the time of publication, although mass vaccination efforts are currently underway.



Figure 8: Fire Department's <u>Mobile</u> <u>Vaccination Team</u> at work

In addition to these, there have also been a number of other pandemics (i.e. <u>Ebola</u>) that did not significantly impact Washington State, but did have had widespread global impacts.

Recurrence and Impacts

Though historically pandemics have been relatively rare, they are increasing in frequency globally. When pandemics do occur, they can be devastating to the impacted region (or world if it is a global pandemic). Impacts of pandemics can include, but are not limited to, the following:

- Loss of human life and health
- Overwhelmed hospital and health care systems
- Rise in number of people in poverty
- Increase in unemployment, evictions, and homelessness
- Scarcity of personal protective equipment (PPE)

- Disruption to supply chain (i.e., food supply)
- Widespread school closures (remote learning still available)
- Reduction of critical services and impact to continuity of government
- Increase in mental health issues
- Civil unrest



As Fire Department personnel are regularly in contact with members of the public (including transporting COVID-19 patients) it is critical that protective measures are taken to protect both staff and their family members. In response to COVID-19, decontamination, Scout/Recon, and other policies, procedures, and guidelines had to be developed and/or revised to address staff and patient safety.

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 can all produce frequent earthquakes. Earthquakes occur in Washington almost on a daily basis, and many of them go unnoticed. There are three types of earthquakes which may occur in our region: crustal (shallow), intraplate (deep) and megathrust.

Crustal faults are caused by the deformation within the <u>North American Plate</u> 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. Intense shaking occurs near the epicenter but usually diminishes quickly with distance relative to the other earthquake types. Several major population hubs are situated directly atop such faults, such as the <u>Seattle Fault</u> which runs directly beneath the Cities of Seattle and Bellevue. The most recent Seattle Fault earthquake occurred about 1,100 years ago and this fault has been active 3-4 times over the past 3,000 years.

The most frequent type of earthquake in Washington is <u>Intraplate</u>. 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, intraplate earthquakes occur every 10 to 30 years. The United States Geological Survey (USGS) estimates that there is an 84% chance of an intraplate earthquake of M6.5 or greater 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. The Nisqually quake did not cause any significant disruption to Bellevue or the surrounding communities.

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

The most likely earthquake to occur in the next twenty years is a Seattle fault event. Most scenarios model a M7.2 Seattle fault 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. This scenario is based on a past 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.

The <u>Washington State Geologic Information Portal</u> 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 SOP Article 700, Section 24, which details earthquake and disaster response protocols. Additionally, BEFD Forms FD150 through FD159 cover individual Station post-earthquake protocols and damage assessments. In summary, the plan is to move apparatus to safe areas, assess station damage, report assessments to the BC via a radio roll call, and then resources will perform a first-due area damage assessment prior to any emergency response. The on-duty BC will then form an area command that will prioritize the incidents and assign resources via a "resource emergency" plan designed to prioritize incidents and provide resources to those incidents where they have the most effect on the outcome.

The Emergency Manager (in coordination with COB leadership) will assess if an activation of the Emergency Operations Center (EOC) is required to support citywide response.

Despite the response capabilities of the department, a catastrophic earthquake will quickly deplete those resources and widespread damage is inevitable. The BEFD Office of Emergency Management (OEM), along with county and state agencies, encourages residents to <u>plan for these occurrences</u> 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 service jurisdiction. 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 the communities protected. 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 the jurisdiction has had many instances of severe weather. While not all have caused major longterm 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 service area. 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 hailstorms have not caused significant damage. A local weather condition known as the <u>Puget Sound</u> <u>Convergence Zone</u> 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. The 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, although it does happen occasionally such as the snow event in February of 2019 which lasted for approximately 13 days. However, it is also 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. Higher accumulations are more likely in areas of the jurisdiction with higher elevations. 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 can result in:

- A greater incidence of EMS calls due to the elderly and home-bound population's loss of home heating.
- An increase in EMS incidents as people that would normally drive themselves to the hospital turn to first responders to navigate snowy streets.
- Slightly higher risk of structure fires as people turn to alternate heating sources during power outages and cold spells.
- Slightly higher risk for CO Poisonings due to cooking and heating with outdoor equipment.

Additionally, snowstorms and corresponding low temperatures can be dangerous for homeless populations who are not able to find adequate shelter.

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. The Transportation Department has identified <u>priority and</u> <u>secondary</u> routes to be plowed in the event of a snowstorm.

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 the service area 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. BEFD can expect some wind-related problems on a near-annual basis; however, windstorms such as the 1962 <u>Columbus Day</u> <u>Storm</u>, 1993 <u>Inaugural Day Storm</u>, and the 2006 <u>Hanukkah Eve storm</u> 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

BEFD'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 the service areas 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 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 proparation.

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

BEFD 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, the service area could face up to \$10,162,000 in damages to buildings and property.

The City of 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.



The BEFD service area 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 <u>Wilkens Creek watershed</u> at 900 acres to the <u>Coal Creek</u> watershed at about 4,000 acres.

Recurrence and Impacts

Despite <u>12 instances of Federally-Declared flood disasters in King County since 1990</u>, those events had relatively minor effect on the service area. Significant flooding during those declarations took place in river basins outside of the jurisdiction. BEFD only has two properties in the jurisdiction that are susceptible to recurring flooding.

Figure 10 – Floodplain Boundaries





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 11], 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 BEFD 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 11 - 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 <u>Olympic Pipe Line Company (OPLC)</u> 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.



 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.

Figure 12 - Aerial photo of damage area from 1999 Bellingham Olympic Pipeline rupture and fire.



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.

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 <u>cascading series of failures</u> instead of one problem or event.⁷

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 are 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

⁷ The rupture occurred upstream to the right of the photo. Resulting fire extended several hundred feet on both sides of creek.



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.

Total Length (feet)		Fire	e Stations In				
Pipeline Size	Outside Area	2	4	6	7	9	Grand Total
16 INCHES	102,725	792,002	907,429	560,815	138,465	1,463,745	3,965,181
20 INCHES	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

Table XXI – Olympic Pipeline by Station area

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 BEFD 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, revised, and republished.

Energize Eastside

Puget Sound Energy (PSE) is the sole provider of electric service for the City of Bellevue and surrounding areas. PSE monitors its electric systems on a continual basis (24/7) and is alerted to anomalies in a number of ways including, automatic operation protective devices, public 911 calls, emergency dispatchers and responding PSE field personnel. In the event that adjacent non-PSE infrastructures, such as the Olympic Pipeline, are discovered to have possible impacts by an electric event, PSE will communicate with impacted infrastructures immediately upon learning of the impact. Further coordination and collaboration may be required between PSE and other responders in order to support safe response.

Energize Eastside is a Puget Sound Energy (PSE) project to increase electrical transmission capability across the region by replacing four (4) existing wooden transmission towers with two (2) new steel towers and a substation, using the existing pipeline right-of-way. Sixteen (16) miles of electrical transmission lines will be replaced, and a new substation constructed to manage the increased capacity. The existing right-of-way was chosen to minimize tree and property issues. PSE maintains that the Olympic Pipeline will not be affected by the construction activity. These two (2) new transmission towers will be between 70 and 100 feet in height, will be constructed out of steel and will replace four (4) wooden towers in approximately the same physical location.

In the event of an incident involving the release of material from the pipeline, these new towers will be more robust and less likely to suffer catastrophic failure. Incident Commanders (IC) should be familiar with these facts



and Community Communication Plans should proactively address this issue to allay public concerns in the unlikely event of an incident.

Figure 13 - 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 is scheduled to be completed in late 2021/early 2022 and ready for a yearlong test period. The East Link light rail is due to begin revenue service some time in 2023. The project includes building light rail infrastructure-at-grade, elevated, and tunnel. The BEFD has assigned a full time Administrative BC to liaison with the East Link project. This position currently reports to the Deputy Chief of Operations (DCO) and has the following duties and responsibilities related specifically to the East Link project:

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 wraps up and preparation for operations begins.
- 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 as the construction work activities concluding and the final electrical systems are being installed.

These duties exceed what is required under city permitting, plan reviews, and inspection. 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.

The total East Link segment is 14 miles in length with six of the ten stations located in the city of Bellevue:

- South Bellevue Station (parking)
- Wilburton Station

- East Main Station

- Spring District / 120th Station
- Bellevue Downtown Station
- BelRed / 130th Station (parking)

Count of Segment	Fire S	tations			
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

Table XXII – Light Rail segments by station area

Eastlink rail components

<u>*Tunnel*</u>: Construction began in April 2016 with the excavation of a 2,500-foot tunnel using the Sequential Excavation Method (SEM). The tunnel has two portals. The south portal, where excavation started, is at Main Street and 112^{th} Ave SE ($101 - 112^{th}$ Ave SE). The tunnel heads into the hillside, makes a right turn and heads



directly below 110th Ave NE. There is an eastbound track and a westbound track on opposite sides of a dividing wall. The north portal is at the NW corner of the Bellevue City Hall campus, NE 6th and 110th Ave NE which is the location of the Bellevue Transit Center Station. There continues to be high-angle, tunnel, and confined space components involved as the construction project is coming to a completion.

Elevated Guideways: The guideways vary but will carry trains full of passengers typically 30-50 feet above grade. There are 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 become the foundation. They are then 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 are constructed and installed over bent caps as the columns are completed. There are high angle and confined space components involved.

<u>At Grade</u>: Construction has involved utility relocations, land clearing, geology stabilization, and wet land protection. As the "systems" contract continues through 2021, the rail and electrical are being installed. There is the 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 BEFD 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. BEFD <u>does not</u> 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, BEFD firefighters 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 <u>light rail maintenance facility</u>. This facility has been 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 wrapping up and will be handed over to Sound Transit during the 1st Quarter of 2021.

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

<u>Orientation</u>: 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 (SFD) Battalion Unit is dispatched to the LCC for initial operations. A BEFD BC is expected to relieve the SFD member as soon as practical.

Examples of emergencies include:

- LRV fire
- LRV de-rail
- LRV vs. vehicle collisions
- 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 BEFD 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
- Collisions involving the switching locations
- Responding to EMS calls on the LRV

Eastlink incident response training

Following the completion of the current construction and prior to revenue service, BEFD will be actively engaged in training activities with Sound Transit representatives and other regional fire departments (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).

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 fire department should evaluate GIS and other available technology to leverage a more informed and efficient earthquake response plan. This may reveal critical infrastructure not otherwise observed using our current annual evaluation.

An inventory of CI that affects BEFD's ability to mitigate incidents has been compiled. This inventory will be evaluated by Program Managers when performing program appraisals; in order to identify gaps in capability, and develop policies and response strategies around CI, such as bridges, interchanges, highways, water mains, reservoirs, pumping stations, and communications facilities.

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

Table XXIII – Bridges by station area



		1		1		1		1	1	r	
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 XXIV – Communications Facilities by station area

Communications Facility		Fire Stations				
	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 XXV – Feet of Water main by station area

					Fire St	ation Are	ea					
Main Size (in)	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		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		10,92 7	31,67 2	30,43 2	13,69 6	21,12 8	10,88 1	5,429	37,42 3	3,717	653	165,958
6	1,525	55,94 0	141,0 33	234,4 67	76,79 3	122,4 14	62,37 0	52,45 6	22,95 0	41,42 7	1,39 8	812,771
8	10,077	116,6 31	212,1 00	195,4 83	176,8 51	224,0 60	280,2 99	74,73 1	282,8 32	115,3 95	7,09 9	1,695,56 0
10	8,525	4,275	18,48 8	19,75 9	10,80 9	6,099	21,69 0	67	3,721	1,130		94,563



Bellevue Fire Department STANDARDS OF COVER

		64.00		10.00						10 - 1		170.000
	5,784	61,32	60,34	43,62	53,31	46,70	78,66	38,91	56,84	10,51	3,84	459,886
12		9	9	4	4	1	1	8	5	9	3	
	1,857		3,158	1,179	581		1,686	7,062				15,524
14	,			,			,	,				
	146	2,535	20,27	3,368	2,171	17,06	18,30	7,866	3,758			75,485
16			7			4	1					
							2,812					2,812
18												
		178					1,906					2,084
20												
		4,007	8,055	1,448	32		571		1,757			15,870
24												
		201			96							297
30												
							24					24
36												
			272									272
48												
Grand Total	27,917	258,1	497,6	531,8	335,1	440,8	485,5	187,0	411,0	172,1	12,9	3,360,40
		88	66	37	58	53	71	16	19	90	93	7



Section 4 Current Deployment and Performance

On scene operations, critical tasking, and effective response force (ERF) determinations are the key elements of the department SOC. Ultimately those factors determine staffing levels, resource types, resource numbers, and expected duties performed to mitigate emergency incidents. The ability to rapidly place enough staff on-scene to perform duties or critical tasks has a direct influence on the outcome of a situation.

Consistent Provision of service

BEFD has established performance benchmarks to consistently provide the highest quality service to protect and preserve the lives, property, and environment of our community. In establishing its benchmarks, BEFD understands that applying a single benchmark standard to all service areas and planning zones of the community is in line with NFPA 1710. However, BEFD proposes to require a more stringent benchmark 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 both the increased population density and the "vertical" response component of the structures in these planning zones. To provide this level of consistency, the BEFD has developed a service provision methodology to measure its baseline performance against its established benchmarks in the following manner:

The two (2) census tracts that comprise the CBD (0238.03 & 0238.04) 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. Additionally, this 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. These census tracts and population densities will need to be reevaluated when the 2020 Census results are available.

Service Provision Methodology

In performing its CRA, the agency was able to assess, categorize, and classify its risk within its service area. This SOC 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.
- Measuring baseline performance for each service type.
- Establishing consistent benchmarks for each service type across the entire agency.
- Analyzing baseline performance against established benchmarks during program evaluation activity.
- Identifying opportunities to improve service and close the gap between baseline performance and benchmark goals in the Performance Improvement Plan (PIP).

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 firstarriving 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. Either no victims exist, or 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 first-arriving engine company on-scene may utilize 2in/1-out while performing imminent rescue. Rescue mode ends when the second engine 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 <u>time</u>, 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 14]**. 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 both the benchmark standards and baseline performance reporting.

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%

Figure 14 - The chain of survival

SULLE VG

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



Figure 15 - Time vs 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 critical 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 <u>Appendix A</u> 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."⁸

Resistance/Reliability

By definition resistance is a system's 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"⁹. In the case of emergency services, reliability looks at actual incident history data to measure historical performance in accordance with adopted performance benchmarks. 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 XXVI]**. The assumption is that out-of-service time results in simultaneous-call response time failure. For example, Bellevue strives to ensure that Unit Hour Utilization (UHU) remains below twenty percent (20%) for all BLS transport capable apparatus. Other jurisdictions might track the number of incidents 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 XXVI – 2019 Representative Sample of Apparatus Unit Hour Utilization¹⁰

Unit	% Utilization	Number of Responses

⁸ CPSE – Community Risk Assessment: Standards of Cover, 6th Edition

⁹ medium.com/elitecommandtraining 12-31-2016

¹⁰ Due to COVID-19 reductions in call volumes for 2020, data from 2019 was used to accurately reflect activity levels.



Bellevue Fire Department Standards of Cover

A103	18.4	2,320
A102	18.8	2,222
A101	18.7	2,849
M102	10.5	1,373
M101	10.1	1,421
E104	7.9	1,407
E106	8.9	2,133
L103	5.9	1,516
L107	6.4	1,768
B101	2.77	738

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 XXVII – 2019 Station Reliability¹¹

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

¹¹ Due to COVID-19 reductions in call volumes for 2020, data from 2019 was used to accurately reflect activity levels.


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.

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 magnitude¹².

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 BC 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 <u>Comprehensive Emergency Management Plan</u> (<u>CEMP</u>). 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. Though this plan is designed to guide the entirety of the City, many portions of the plan are relevant to Fire operations and administration.

¹² CPSE - Community Risk Assessment: Standards of Cover, 6th Edition



Section 5 Evaluation of Current Deployment and Performance

Overall jurisdiction performance

Alarm processing/dispatch – time 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 PSAP at Priority level P0 – P4.

Turnout – 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 priority EMS and Rescue incidents. Adopted benchmark standard is 1:20 for 90% of priority Suppression and Haz-Mat incidents.

First-due travel – 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.

Total Response Time (TRT) - time from PSAP activation to first arriving fire apparatus on priority responses, includes all the three components of

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 <u>meet</u> or beat the given time standard in at *least* nine responses out of ten.

response (alarm processing/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 begins when the first-arriving apparatus begins travel and concludes when the apparatus that establishes the required ERF arrives at scene. 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 19 firefighters are present. Adopted standard for ERF travel will be between 4:00 and 8:00, 90% of the time depending on the incident program area and risk level.

<u>ERF TRT</u> – The total time necessary to establish an "Effective Response Force". This time begins at PSAP activation and concludes when the apparatus that establishes the required ERF arrives at scene. This time will depend on the call/incident type; for low risk EMS calls the 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 25 firefighters are present. Adopted standard for ERF TRT will be between 6:00 and 20:00, 90% of the time depending on the incident program area and risk level.



2020 Departmental Performance

Program Area	Risk Category	Number of Incidents (N value)	Dispatch % (1:00 Standard)	Turnout % (1:00 Standard)	Turnout % (1:20 Standard)	TRT % (6:00 Standard)	TRT % (6:20 Standard)	ERF Travel (min) 90 % performance	ERF TRT (min) 90 % performance
EMS	Low	8,041	80.2%	46.5%	N/A	56.15%	N/A	6.7	9
EMS	Moderate	2,668	77.7%	47.9%	N/A	60.37%	N/A	18.5	20.5
EMS	High	218	78.0%	50.5%	N/A	65.37%	N/A	30	34.6
Suppression	Low	1,528	84.4%	N/A	72.0%	N/A	65.64%	6.1	8.1
Suppression	Moderate	196	40.3%	N/A	83.2%	N/A	50.08%	11.4	13.6
HazMat	Low	185	72.6%	N/A	38.3%	N/A	40.41%	7	9.9
HazMat	Moderate	22	59.1%	N/A	61.4%	N/A	48.57%	12.6	14.3
Rescue	Moderate	21	48.6%	44.0%	N/A	47.93%	N/A	26.7	28.8

Table XXVIII – BEFD 2020 Performance against standards¹³

Discussion of Current Performance

- Dispatch time is the best performing of all the response time components against the adopted benchmark dispatch time standard of 1:00, 90% of the time. Single apparatus Low risk response in EMS and Suppression both achieve over 80% baseline performance of emergency incidents. More complex non-EMS responses perform poorly against the adopted benchmark standard, and this is reflective of the larger resource assignment, extended interview time with the caller, and attempts to gather more descriptive information of the situation.
- Turnout time performance for EMS is consistent across all levels of risk and does not achieve the adopted benchmark standard of 1:00 greater than 51% of the time. Suppression and HazMat turnout does better against the adopted benchmark standard of 1:20, achieving between 72% 83% baseline compliance, even with the additional 20 seconds allocated to don bunker gear. Station design is the primary limiting factor in this performance.
- TRT baseline performance against the adopted EMS benchmark standard of 6:00 is between 56% 65%.
 TRT for Suppression and HazMat responses ranges from 40% 65% baseline against the 6:20 adopted benchmark standard for these calls. TRT is a sum of dispatch, turnout, and travel time combined and this performance is consistent with previous years. Historically, the department has never achieved better than 70% baseline performance against the adopted TRT benchmark standards.
- ERF Travel time on Low risk EMS and Suppression achieves the 90% at 6:42 and 6:06 respectively, against the 4:00 benchmark standard for these calls. As these call types are single apparatus response, this is reflective of first arriving travel times for all levels of risk in the community. Travel time is a function of the geographic placement of resources and the construction and staffing of FS10 in 2023 should improve this performance by providing the first new station for the department since 1995. Both EMS Moderate and High-risk ERF travel baseline performance is reflective of the tiered response model used by King County, as ALS resources are dispatched later in the incident timeline. Suppression Moderate risk responses achieve ERF travel 90% at 11:24, against the adopted benchmark standard of 8:00.

¹³ 2020 data only includes incidents dispatched at "Priority 0-4" by NORCOM. Non-emergency incidents are not accounted for in this table.



ERF TRT baselines range from 8:01 to 9:00 for Low risk Suppression and EMS calls to over 34:00 for High
risk EMS that requires an ALS Supervisor. This baseline performance is reflective of the tiered response
model used by King County, as ALS resources are dispatched later in the incident timeline. The Low risk
Suppression benchmark standard for this metric is 6:20 and Low risk EMS benchmark is 6:00. Moderate
risk Suppression responses requiring an ERF of 19 FF's on-scene achieve TRT 90% at 13:36 against the
adopted benchmark standard of 10:00.

Figure 16 - 2020 Incidents by Program





Bellevue Fire Department STANDARDS OF COVER







23:00 -	84	65	76	90	93	84	65	 ● 0 - 35 ● 35 - 70
22:00 -	78	99	72	97	100	104	103	• 70 - 105
21:00 -	92	108	125	106	128	144	103	105 - 14
20:00 -	126	107	115	122	177	119	99	175 - 21
19:00 –	117	142	144	145	150	146	124	210 - 24
18:00 -	150	138	154	150	173	146	138	• 245 - 28 • 280 - 31
17:00 -	177	158	160	170	152	156	130	• 315 - 35
16:00 -	174	161	181	174	157	143	133	
15:00 -	179	190	192	202	154	144	145	
14:00 -	175	272	195	222	162	137	113	
13:00 -	193	322	209	251	186	118	129	
12:00 -	233	249	234	280	181	140	129	
11:00 -	233	183	256	225	158	137	139	
10:00 -	184	152	233	175	178	145	96	
09:00 -	162	156	173	148	133	91	128	
08:00 -	122	138	113	138	118	96	101	
07:00 –	87	100	105	89	93	76	66	
06:00 -	71	77	85	63	83	56	60	
05:00 -	54	51	46	65	73	60	46	
04:00 -	49	45	45	41	51	45	55	
03:00 -	49	47	42	42	52	39	36	
02:00 -	49	48	58	58	54	66	79	
01:00 –	54	64	66	51	52	80	97	
00:00 -	72	70	64	50	53	76	65	
1	Monday	Tuesday	Wednesday	Thursday –	Friday -	Saturday	Sunday	1

Figure 20 – 2 Years of Incidents by Hour and Day

Like most communities with significant increase in daytime population, the service area call volumes are 200% – 300% greater during the work week and business hours. Call volumes peak between 1100 – 1400 on weekdays and 1100 – 1900 on weekends. Weekend peak call volumes are approximately 50% of peak weekday activity.





Figure 21 - 2 Year Incident Distribution

Incidents are distributed as expected with major population density reflecting greater incident activity. Incident groupings outside the Downtown and Crossroads neighborhoods reflect commercial and multi-family residential building concentrations properly addressed through current station and resource deployments.



Section 6 Plan for Maintaining and Improving Response Capabilities

Public safety continues to be a high priority for the BEFD service area residents. The expectations of the community are clearly stated in the 2020 COB Budget survey. The City of Bellevue's last six (6) 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 2010, 2012, 2014, 2018, 2020 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 one of the most important services and the function residents are most satisfied with for the last six (6) surveys. "Providing emergency medical services" ranked second in 2014 and third in 2018 and 2020. These survey results provide evidence that the services provided by BEFD are both valued by the community and meeting their expectations.

Ensuring Compliance/validation of Response Plans

Continuous improvement requires development of a methodology to ensure that planning occurs, problems 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.

Figure 22 - PDCA Cycle

In order to further develop this competency, a Program Appraisal (PA) has been developed. Formal PA's of the previous calendar year will be conducted by each of the following program managers, no later than February 14th of each year:

- Program 5A Community Risk Reduction/Fire Prevention – Fire Marshal or designee
- Program 5B Public Education Public Information/Community Liaison Officer and Community Risk Reduction Specialist
- Program 5C Fire investigation Assistant Fire Marshal Inspections/Investigations

Program 5D - Domestic

<text><complex-block><complex-block><complex-block>

PDCA

- Preparedness/Emergency Management Emergency Manager or designee
- Program 5E Suppression Deputy Chief Operations or designee
- Program 5F EMS Battalion Chief of EMS or designee
- Program 5G Technical Rescue Battalion Chief Special Operations
- Program 5H Hazardous Materials Battalion Chief Special Operations
- Program 5L CARES Battalion Chief EMS and CARES Program Manager



• Program 7G – Wellness/Fitness – Lead Personal Fitness Trainer

The PA shall ensure that each program is evaluated to determine the following:

- 1. Review the previous years' service demand by planning zone (Programs 5E, 5F, 5G & 5H only).
- 2. Validate the categorization of risk for each program area and class within each planning zone and document this validation (Programs 5E, 5F, 5G & 5H only).
- 3. Validate the critical infrastructure inventory and changes within each planning zone, discuss and document any changes.
- 4. Review any program areas that exceeded threshold levels established by policy document, determine if changes need to be made and document their discussion (Programs 5E, 5F, 5G & 5H only).
- 5. Assess adequacies, consistencies, reliabilities, and opportunities for improvement for the total response area relevant to the program and document their discussion.
- 6. Evaluate altering conditions, such as population growth, traffic, development and changing risk relevant to the program and document their discussion.
- 7. Evaluate community risk reduction, public education and outreach efforts and their effect on the programs goals and objectives and document their findings.
- 8. Discuss industry research findings that are relevant to each program area and document discussion.
- 9. Identify any shortfalls and gaps in the program and recommended actions to address those shortfalls.
- 10. Provide budget estimates of program needs for both the immediate future and the next 3 5 years.

Completed PA's are forwarded to the Fire Chief for review and consideration. The completed PA's are used by the Departmental Accreditation Manager (AM) to inform the Annual Compliance Report (ACR) to the accrediting body. As necessary, the AM will update the departmental <u>Performance Improvement Plan</u> (PIP) with any relevant findings, gaps, shortfalls and the action(s) recommended to address gaps identified from response program PA's.

These PA's, ACR, PIP and other tools will help the Department identify 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 Program Managers to ascertain performance for each response program area. Response programs are defined as:

- Suppression Program 5E
- Emergency Medical Services Program 5F
 - Basic Life Support (BLS)
 - Advanced Life Support (ALS)
- Technical Rescue Program 5G
- Hazardous Materials (Haz-Mat) Program 5H

Response data to be evaluated will include.

- Number of responses (*n value*)
- Dispatch time
- Turnout time
- Travel time



- Total response time (TRT)
- ERF travel time
- 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 total 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 *Standard Operating Policy* 100-9 – 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 <u>Confidence interval</u> of 95% or higher will be identified and highlighted for additional research and evaluation

Ongoing efforts to ensure performance

While the CRA 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 2023. 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 of incidents in yet unknown ways. The recognition of this need resulted in the creation of a new administrative BC of Special Operations in 2017. This position is tasked towards identifying mitigation strategies, partnering with developers and Sound Transit to anticipate issues and to constantly reevaluate our practices and response plans. This position is also tasked with overseeing both the Technical Rescue and Hazardous Materials Technician programs and ensuring that these programs are evaluated to departmental standards.

90th percentile Turnout time is reported for each apparatus quarterly by Station Captains. Platoon BC's are tasked with reviewing performance 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 BC's have the discretion to document performance-improvement efforts in this area.

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



Authority Having Jurisdiction (AHJ) Notification and Communication

The department provides an annual report to the city manager's office for review and publication on the city's website. Furthermore, as part of the Fire Chief's annual review a performance report is provided to the Deputy City Manager. Monthly supervisory tie-in meetings occur between the Fire Chief and the Deputy City Manager and ad-hoc meetings occur with the city manager's office whenever situations dictate.

Departmental performance metrics and outcomes are communicated through annual performance reporting to the City of Bellevue Covalent performance reporting system by the end of February for the previous calendar year.

Gaps in service delivery and shortfalls in existing programs are identified and brought forward through the budget process to be prioritized and evaluated. Changes to the biennial budget can be addressed in non-budget years through the "mid-bi" process to reallocate funding and prioritizations.

The totality of these interactions provides numerous means and methods to adequately notify the AHJ of any operational shortfalls, capacity gaps, and opportunities to improve the level of service.

Additionally, the department and/or City meets with or seeks feedback from external stakeholders and the community regularly. These meetings serve to discuss issues and gauge service level expectations and are conducted on the following schedule:

- City Council/City of Bellevue Budget process Biennially with mid-cycle update, the Department is an active participant in the City's biennial budget process which establishes service levels based on the expectations and surveys of the community.
- Contract Cities Annually, the department meets with its contracted cities (Beaux Arts Village, City of Clyde Hill, Town of Hunts Point, City of Medina, City of Newcastle and Town of Yarrow Point) to discuss the prior year's performance and any outstanding concerns or issues. Contract term is for ten (10) years and is next due for renegotiation in 2026.
- Community/Residents/Citizens surveyed by the City of Bellevue biennially
- Businesses/Developers surveyed by the City of Bellevue annually
- Bellevue Fire Department Strategic Plan development gathers extensive stakeholder and community input every five (5) years.

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.

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. This proposal was not funded. Budgetary constraints implemented due to the 2020 COVID-19 pandemic have postponed the resubmittal of this proposal to future budgets. However, the department continues to strengthen existing CRR efforts and wherever possible expand programs that can reflect data informed outcomes.



The long-term goal of the CRR plan, is to ensure that Fire Prevention, Office of Emergency Management, Emergency Medical Services, Community Liaison Office, Suppression staff and the Community Risk Reduction Specialist coordinate to deliver "community risk reduction" that is relevant, timely, well-coordinated and makes the best use of limited resources.

The CRRG has long recognized the need to expand the department's ability to connect with all residents through innovative community outreach. The first step in effective connection is fostering cultural competence among department members. Through this, we can expand our multicultural connections within the City, leveraging partnerships with community agencies who serve historically underrepresented residents.

Building on elements from the 2016 Strategic Plan, the following action items should continue as we move 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.

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.

A thorough analysis of response data over the years 2016-2020 clearly indicates that the CRRP needs to microfocus on two specific prevention program areas:

- 1) Fall prevention, with a particular emphasis on assisted living facilities and adult family homes; and
- 2) Motor-vehicle collisions.



The department is presently partnered with KCEMS to address fall prevention education to assisted living facilities, although there is room to expand this partnership, including internal advertising of the program already established.

Additionally, the department currently hosts Driving Under the Influence (DUI) drills at alternating high schools on an annual basis. The data strongly proves that the majority of teen-involved motor vehicle collisions are tied to distracted driving, not DUI. In order to make our DUI program more relevant and expand the audience to include teens that would typically be passengers, the department has partnered with Impact! Teen Driving to devise supplemental programming. Pre-COVID, the CRRG began meeting with the Bellevue School District (BSD) to discuss this change in programming focus. Focusing on motor-vehicle collision prevention is also directly tied to the City of Bellevue Vision Zero initiative, which aims to eliminate traffic deaths and serious injuries within the jurisdiction by 2030.

A third micro-focus, although not called-out specifically with data, but correlating to motor-vehicle collisions, is the establishment of a certified car-seat installation team. This is a self-identified need from the community that will empower residents and has immediate positive effect.

Programs - changing demographics and vulnerable populations

The regions diversity is increasing by any measure, including race, ethnicity, country of origin, and language spoken at home. In the BSD, more than 100 languages are spoken, 15.7% of the population qualifies for the English-Language-Learners Program, and 40.2% of the student population's first language is something other than English. While it enriches the fabric of the communities we serve, this diversity creates challenges for the department. More than half of the residents of some neighborhoods and over 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.

In January and February of 2018, community feedback was gathered through both phone contact and an online survey, and 481 service-area residents responded. This is an increase from the 339 respondents who responded to an identical survey in May of 2016.

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 <u>Bellevue Diversity Advantage Initiative</u>.

Planning for a changing community and mitigating risk

 <u>Comprehensive Emergency Management Plan (CEMP)</u> – Last updated in December of 2018 and scheduled to be updated again in 2023, this plan serves as the foundational framework for citywide prevention, mitigation, response, and recovery activities.



- <u>Community Risk Reduction Plan (CRRP)</u> 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.
 - 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.
- Leverage volunteers wherever it makes sense:
 - <u>BCS</u> 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.
 - <u>CERT</u> 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.
- 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 2020, CARES provided response on 860 non-emergency service incidents.



Figure 23 - 2020 CARES Incidents



Goals and objectives

The goal of creating the *SOC* is to provide BEFD with a rational, data-informed 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 *SOC*, 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 CRA 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 not have the ability to report in the Dispatch system 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. No validation of Technician certification by responding automatic/mutual aid unit exists to ensure ERF requirements are met. Currently, Zone One Shift Commanders communicate daily by conference call to ascertain the number of each specialty available in the Zone on any given shift. This call provides a minimum understanding of the resources available to mitigate an incident requiring technician level response. A technology solution that will assess unit response and certified personnel present on any given incident using a Computer Aided Dispatch (CAD) system should be pursued.
- 2. An in-depth Wildland-Urban Interface analysis is recommended to assess the changes in exposure, review response strategies, strengthen requests for additional resources, and develop outreach/mitigation plans to ensure that the community is protected and prepared. The result of this analysis should be used to determine when or if it may become necessary to formally establish a Wildland program within the Operations Bureau.
- **3.** The 2019 Snow Response After Action Report (AAR), CPSE site team strategic recommendation, ongoing WUI analysis and operational needs during inclement weather have all supported the purchase and deployment of a new type 6 or similar engine. This resource should be obtained as soon as possible.
- 4. Automatic fire alarms to Commercial/multi-family residential properties should be reduced to reflect critical tasks and ERF. This issue has been identified, evaluated and consensus within the organization has been obtained, yet response plans have not been modified. The Operations Tactics Group should be tasked with reviewing BEFD response plans periodically and at least biennially. These reviews should evaluate critical tasks, ERF, and resource deployment while considering any operational modifiers. This group should then determine any response plans to be modified and develop a process to ensure this occurs in a timely and consistent manner.
- 5. The challenges around obtaining data from the ESO Fire and ESO EHR medical records system limits the potential for analysis of patient treatment, trends, and limits data-informed outreach efforts. The department should ensure that all patient prognosis, treatment, and incident data is available to all divisions/groups that require this data.
- **6.** The department should create and periodically conduct formal training for Operations staff to ensure that accurate, timely data entry occurs for all aspects of response, inspection, and training.
- 7. The department should evaluate moving Low risk, single apparatus responses currently defined in the Technical Rescue and Hazardous Materials programs areas into the Suppression program. These calls can be mitigated with Awareness-level skills and do not require a Technician-level response.
- **8.** The department should work to better integrate critical infrastructure (CI) into response strategy formation and ensure that clear guidelines exist to define CI.
- **9.** GIS and other technology solutions should be considered as a replacement for the current method of documenting and evaluating earthquake routes.
- **10.** The department must continue to evaluate fire alarm system data, its impact on risk, and incorporate it into building risk methodology.
- 11. The department should increase and codify its efforts to raise the participation of community members and other city departments in outreach planning efforts. This will improve outreach by leveraging other programs/services/partnerships, address community concerns, increase the effectiveness of our efforts, expand the use of volunteers, and increase the level of trust between the department and the diverse communities we serve.



- **12.** The department should accelerate its transition of the DUI drill program to incorporate a "Distracted Driving" focus such as "Impact Teen Driving" that aligns with the COB "Vision Zero" initiative and more accurately reflects the current challenges faced by teen drivers.
- **13.** The department should evaluate its current organizational structure around Fire Prevention, CRR and CARES to determine the best use of available resources to create a cohesive CRR strategy moving forward.
- 14. The department administrative organizational command structure should be assessed for effectiveness, work responsibility alignment, and management scope to ensure that there is adequate capacity organizationally to address new and changing programs and needs.
- **15.** Discussions with the City of Bellevue to secure adequate funding for OEM should be prioritized. This funding should reduce reliance on grants and provide long-term, sustainable funding sources for the OEM program (including personnel and program costs).

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

Correlation Matrix

Performance	Performance Performance Indicator/Core Competency Text	
Competency		Page/Section/Area
1A.4	The governing body of the agency periodically reviews and approves services and programs.	<u>Page 11</u>
1A.7	The governing body or designated authority approves the organizational structure that carries out the agency mission.	<u>Page 11</u>
1A.9	A communication process is in place between the governing body and the administrative structure of the agency.	<u>Page 11 &</u> <u>Page 120</u>
18.2	Financial, equipment, and personnel resource allocation reflects the agency's mission, goals, and objectives.	Page 14
2A.1	Service area boundaries for the agency are identified, documented, and legally adopted by the authority having jurisdiction.	<u>Page 15</u>
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.	<u>Pages 15 - 19</u>
CC 2A.3	The agency has a documented and adopted methodology for organizing the response area into geographical planning zones.	Pages 41- 45
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.	<u>Page 41</u>
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.	<u>Pages 31 -32</u>
2A.6	The agency utilizes its adopted planning zone methodology to identify response area characteristics such as population,	Page 39



	transportation systems, area land use, topography, geography, geology, physiography, climate, hazards and risks, and service provisions capability demands.	
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.	<u>Pages 15 -19</u> & <u>Pages 43 - 47</u>
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.	<u>Page 28</u>
2A.9	The agency identifies critical infrastructure within the planning zones.	<u>Pages 73-74</u>
CC 2B.1	The agency's documented and adopted methodology for identifying, assessing, categorizing, and classifying risks throughout the community or areas of responsibility.	<u> Pages 39 - 41</u>
2B.2	The historical emergency and non-emergency service demand 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.	<u>Pages 41 - 60</u>
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.	<u>Pages 31 -32</u>
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 41- 45
2B.5	Fire protection and detection systems are incorporated into the risk analysis.	<u>Page 60</u>
2B.6	The agency assesses critical infrastructure within the planning zones for capabilities and capacities to meet the demands posed by the risks.	<u>Pages 73-74</u>
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.	<u>Page 103</u>



CC 2C.2	The agency has a documented and adopted methodology for monitoring its quality of emergency response performance for	<u>Page 103</u>
	each service type within each planning zone and total response area.	
2C.3	Fire protection systems and detection systems are identified and considered in the development of appropriate response strategies.	<u>Page 60</u>
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.	<u>Appendix A</u> & <u>Page 93</u>
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.	<u>Appendix B</u>
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.	<u>Appendix B</u>
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.	<u>Page 95</u> & <u>Appendix C</u>
2C.8	The agency's resiliency has been assessed through its deployment policies, procedures, and practices.	<u>Pages 79 - 81</u>
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.	<u>Pages 86 - 87</u>
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.	<u>Pages 93 -94</u>
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.	<u>Page 87</u>
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.	<u>Page 87</u>

FIRE

2D.5	Impacts of incident mitigation program efforts are considered and assessed in the monitoring process.	<u>Page 88</u>
CC 2D.6	Performance gaps for the total response area, such as inadequacies, inconsistencies, and negative trends, are determined at least annually.	<u>Page 87</u>
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.	<u>Appendix C</u>
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.	<u>Page 120</u>
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.	<u>Page 120</u>
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.	<u>Page 120</u>



Section 8 Appendices

Appendix A – Critical Tasks and ERF Determinations

Low Risk

Categ	Program Area	Type of Calls / Response Plan	Critical Tasks	Minimum Personnel	Dispatched Units	Staff
0.7	7.1.00					
Low Risk	EMS					
		EMS BLS Medical/Trauma	Command/Assess scene safety	1	BLS Unit (1) 2, 3 or 5
			Assess patient/provide treatment	1	Aid Car = (2 Engine = (3	2)
			Transport (if needed)		Lightforce = (5)	=
			Total ERF Required	2	Dispatched	l 2, 3 or 5
Low Risk	Suppress ion					
		AFA SFR/MFR/Comm	Command	1	Suppressio Unit (1)	n 3 or 5
		Service Call	Pump Operator/Alarm Panel	1	Engine = (3)
		Minor Flooding	Attack Line/Investigation	1	Lightforce = (5)	-
		Vehicle Fire				
		Dumpster Fire				
			Total ERF Required	3	Dispatched	l 3 or 5
Low Risk	HazMat					
		CO Call	Command/Size up	1	Suppressio Unit (1)	n 3 or 5



		Other Operational HazMat	Mitigation	2	Engine = (3)	
					Lightforce = (5)	
			Total ERF Required	3	Dispatched	3 or 5
Low Risk	Rescue					
		Trail Rescue (BLS)	Command/Safety	1	Suppression Unit (1)	3 or 5
			Search/Rescue	2	Engine = (3)	
					Lightforce = (5)	
			Total ERF Required	3	Dispatched	3 or 5

Moderate Risk

Category	Program Area	Type of Calls	Critical Tasks	Minimum Personnel	Dispatched Units	Staff
Moderate Risk	EMS					
		ALS Medical/ Trauma	Command/scene safety	1	BLS Unit (1)	2, 3 or 5
			ALS Meds/IV/Shock/Airwa y	2	ALS Unit (1)	2
			BLS Support/Transport	1		
			Total ERF Required	4	Dispatched	4, 5 or 7
Moderate Risk	EMS					
		MVC Street	Command/scene safety/Blocking	1	Suppression Unit (1)	3 or 5



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			Triage and assessment	2	BLS Transport Unit (1)	2
			BLS Support/Transport	2		
			Total ERF Required	5	Dispatched	5 or 7
Moderate Risk	Suppressi on					
		Working Fire - SFR	Command	2	Engine (4)	12
			Water supply/Pump operator	1	Ladder (2)	10
			Fire Attack / Backup line	5	Medic (1)	2
			Forcible entry/Search	2	BLS Transport (1)	2
			Ventilation	3	Battalion Chief (2)	3
			RIT	3	Medical Supervisor (1)	1
			Support/Utilities	2		
			Safety	1		
			Total ERF Required	19	Dispatched	30
Moderate Risk	Suppressi on					
		Brush Fire	Command/Scene safety	2	Battalion Chief (1)	2
			Water supply/Pump operator	2	Engine (2)	6
			Fire Attack - 2 lines	4		
			Total ERF Required	8	Dispatched	8



Moderate Risk	HazMat					
		Suspicious substance	Command/Size up	1	Engine (1)	3
			Air Monitoring/Investigati on	1	Ladder (1)	5
			Establish zones	1		
			Water Supply / Pump operator	1		
			Attack Line	1		
			Total ERF Required	5	Dispatched	8
Moderate Risk	Rescue					
		Vehicle Entrapment	Command	2	Battalion Chief (1)	2
		Low Angle	Safety	1	Engine (2)	6
		Surface Water Rescue	Triage	1	Ladder (1)	5
			Rescue Technicians	4	Medic (1)	2
			Rescue Supervisor	1	Medical Supervisor (1)	1
			EMS Treatment/Transport	2	BLS Transport (1)	2
			Total ERF Required	11	Dispatched	18

High Risk

Categ	Progra	Type of Calls	Critical Tasks	Minimum	Dispatched	Staff
ory	m Area			Personnel	Units	
High	EMS					
Risk						



		Cardiac Arrest	Command/Safety	1	Suppression (1)	3 or 5
			Med Control / Family Liaison	1	Medic (1)	2
			Triage/CPR Manpower	2	BLS (2)	4 or 5
			ALS Meds/IV/Shock/Airway /Transport	2	Medical Services Officer (1)	1
			BLS Support	2		
			Total ERF Required	8	Dispatched	10 or 13
High Risk	EMS					
		MVC - Freeway	Command/Blocking/ scene safety	1	Suppression (2)	6 or 8
		MVC - Freeway ALS	Water supply/ pump operator	1		
			Attack Line	2	Medic (1) or	2
			Triage and assessment	2	BLS Transport (1)	2
			ALS/BLS Support/Transport	2		
			Total ERF Required	8	Dispatched	8 or 10
High Risk	Suppres sion					
		Working Fire - Targeted Hazard	Command	2	Battalion Chief (2)	3
		Working Fire – Comm/MFR	Water supply/ Pump operator	2	Engine (4)	12
			Fire Attack - 4 lines	8	Ladder (2)	10



			Forcible entry/Search	2	Medic (1)	2
			Ventilation	3	BLS Transport (1)	2
			RIT	2	Medical Supervisor (1)	1
-			Fire Panel	1		
			Utilities	2		
			Lobby Support	2		
			Safety	1		
			Total ERF Required	25	Dispatched	30
High Risk	HazMat					
		Suspicious substance with injuries	Command/Size up	2	Battalion Chief (1)	2
		Industrial Leak	Safety (tech)	1	Engine (3)	9
			Haz Group Supervisor (tech)	1	Ladder (2)	10
			Entry Team (tech)	2	Medic (1)	2
			Backup Team (tech)	2	BLS Transport (1)	2
			Air Monitoring (ops)	2	Medical Service Officer (1)	1
			Research (tech)	1	HazMat 1 (tech)	1
			Logistics/Support (ops)	4	HazMat Group Tone (tech)	5
			Decontamination (ops)	6		
			Medical Treatment (ops)	4		
			Total ERF Required	25	Dispatched	32



High Risk	Rescue					
		Confined Space	Command	2	Battalion Chief (1)	2
		Structural Collapse	Safety	1	Engine (1)	3
		High Angle Rescue	ngle Rescue Pump operator 1		Ladder (2)	10
		Trench Rescue	Rescue Group Supr	1	Medic (1)	2
			Rescue Technicians	8	BLS Transport (1)	2
			Triage	2	Medical Service Officer (1)	1
			BLS treatment and transport	2		
			Medical Group Supr	1		
			Logistics/Support (ops)	2		
			Total ERF Required	20	Dispatched	20

Special Risk

Categor	Program	Type of Calls	Critical Tasks	Minimum	Dispatched Units	Sta
У	Area			Personnel		ff
Special Risk	EMS				Battalion Chief (2)	3
		ALS MCI >10	Command/safety	2	Engine (3)	9
		Active Shooter	EMS Operations	1	Ladder (2)	10
			Command Staff	1	Medic (2)	4
			ALS Meds/IV/Shock/ Airway	4	BLS Transport (2)	4
			Triage	2	Medical Services Officer (1)	1



			DI C	10	Mardian I Course and	4
			Support/treatment	10	Unit (1)	
					Private AMB (10)	0
			Total ERF Required	20	Dispatched	32
Special Risk	Suppress ion					
		Working Fire - High Rise	Command	2	Battalion Chief (2)	3
			Water supply/ Pump operator	2	Engine (5)	15
			Fire Attack - 2 lines	6	Ladder (3)	14
			Forcible entry/ Search	4	Medic (1)	2
			Ventilation	5	BLS Transport (1)	2
			RIT	4	Medical Supervisor (1)	1
			Fire Panel	1	Air Unit (1)	3
			Building evacuation	4		
			Lobby Support/ Control	2		
			Rehab	2		
			Medical Treatment	4		
			Safety	1		
			Total ERF Required	37	Dispatched	40
Special Risk	HazMat					
		Fire at Industrial Plant	Command/Size up	2	Battalion Chief (1)	2
		Explosion - Major	Safety	2	Engine (3)	9



			Water supply/Pump operator	2	Ladder (2)	10
			Fire Attack - 2 lines	4	Medic (1)	2
			Haz Group Supervisor (tech)	1	BLS Transport (1)	2
			Entry Team (tech)	2	Medical Service Officer (1)	1
			Backup Team (tech)	2	HazMat 1 (tech)	1
			Air Monitoring (ops)	2	HazMat Group Tone (tech)	5
			Research (tech)	1		
			Logistics/ Support (ops)	4		
			Decontamination (ops)	6		
			Medical Treatment (ops)	3		
			Total ERF Required	31	Dispatched	32
Special Risk	Rescue					
		Tunnel Rescue (light rail)	Command	2	Battalion Chief (2)	3
		Entire building collapse	Safety	1	Engine (4)	12
			Search/triage	8	Ladder (2)	9
			Rescue Group Supr	1	Medic (1)	2
			Rescue Technicians	8	BLS Transport (2)	2
			Recon	4	Medical Service Officer (1)	1
			Backup Team (tech)	4	Rescue (1)	3



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	ALS/BLS treatment and transport	4	Air Supply Unit	3
	Medical Group Supr	1	Admin Chief (2)	2
	Air Supply	2	Tunnel Captain (1)	1
	Air Monitoring (ops)	2		
	Total ERF Required	37	Dispatched	38



Appendix B – 90th Percentile Performance

Suppression

(Low Risk) St Times -	ERF = 3	Percentile ance	2016- 2020	2020	2019	2018	2017	2016
Alarm Handling	Pick-up to Dispatch	Urban	1:29	1:40	1:29	1:25	1:45	1:41
Turnout Time	Turnout Time 1st Unit	Urban	1:40	1:45	1:34	1:43	1:39	1:48
Travel Time	Travel Time 1st Unit Distribution	Urban	5:59	5:48	6:05	5:50	6:15	6:42
	Travel Time ERF Concentration	Urban	6:00	5:50	6:05	6:04	6:13	6:42
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	8:18	8:16	8:13	8:03	8:27	8:40
			n=792	n=112	n=148	n=186	n=186	n=160
	Total Response Time ERF Concentration	Urban	8:18	8:19	8:13	8:06	8:27	8:40
			n=792	n=112	n=148	n=186	n=183	n=160
(0.0		0.044	2016	2020	2010	2010	2017	2016
Percentile Times - Baseline Performance ERF = 19		2016- 2020	2020	2019	2018	2017	2016	
Alarm Handling	Pick-up to Dispatch	Urban	1:25	1:26	1:18	1:37	1:59	1:45



Bellevue	Fire	Def	PAR	TME	NT
Sta	NDA	RDS	OF	Cov	'ER

			1		1	1		1
Turnout Time	Turnout Time 1st Unit	Urban	1:52	2:08	2:00	1:39	1:53	1:56
Travel Time	Travel Time 1st Unit Distribution	Urban	5:50	6:14	5:57	5:32	6:31	5:32
	Travel Time ERF Concentration	Urban	15:59	13:19	16:14	17:27	17:17	14:55
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	8:26	9:01	7:59	7:52	9:47	8:54
			n=164	n=30	n=21	n=33	n=34	n=46
	Total Response Time ERF Concentration	Urban	18:42	15:58	18:07	19:20	19:13	18:27
			n=75	n=15	n=12	n=10	n=16	n=22
(High Ri Perce	isk) Suppression - ntile Times - Baseli	90th ine	2016- 2020	2020	2019	2018	2017	2016
reiter	Performance	ine	2020					
	ERF = 25							
Alarm Handling	Pick-up to Dispatch	Urban	1:45	2:03	1:45	1:48	2:20	1:36
Turnout Time	Turnout Time 1st Unit	Urban	1:48	1:53	1:45	1:49	2:01	1:46
Travel Time	Travel Time 1st Unit Distribution	Urban	5:02	5:13	5:26	5:31	4:58	5:02
	Travel Time ERF Concentration	Urban	27:58	25:38	29:03	21:46	19:25	28:30



Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	7:27	8:01	7:39	8:06	7:27	7:16
			n=436	n=75	n=94	n=83	n=101	n=83
	Total Response Time ERF Concentration	Urban	29:38	27:58	30:09	24:27	21:40	30:39
			n=60	n=8	n=13	n=9	n=15	n=15
(Special Risk) Suppression Response - 90th Percentile Times - Baseline Performance			2016- 2020	2020	2019	2018	2017	2016
	ERF = 37							
Alarm Handling	Pick-up to Dispatch	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Turnout Time	Turnout Time 1st Unit	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Travel Time	Travel Time 1st Unit Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			n=0	n=0	n=0	n=0	n=0	n=0
	Total Response Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			n=0	n=0	n=0	n=0	n=0	n=0

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Emergency Medical Services

(Low Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
ERF = 2								
Alarm Handling	Pick-up to Dispatch	Urban	1:13	1:26	1:21	1:21	1:17	1:18
Turnout Time	Turnout Time 1st Unit	Urban	1:41	1:47	1:43	1:47	1:46	1:49
Travel Time	Travel Time 1st Unit Distribution	Urban	5:44	5:57	6:14	6:13	5:59	5:54
	Travel Time ERF Concentration	Urban	5:46	5:59	6:19	6:16	6:00	5:56
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	7:52	8:20	8:22	8:23	8:08	8:07
			n=37,633	n=6,726	n=7,728	n=7,551	n=7,788	n=7,840
	Total Response Time ERF	Urban	7:54	8:21	8:26	8:26	8:10	8:09
	Concentration		n=37,633	n=6,726	n=7,728	n=7,551	n=7,788	n=7,840
ERF Travel and ERF TRT differences compared to First Arriving unit can be attributed to incidences where the first dispatched unit is replaced on the call due to system assigning based on AVL.								
(Moderate Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance ERF = 4, of which 2 are FF/PM		2016-2020	2020	2019	2018	2017	2016	
Alarm Handling	Pick-up to Dispatch	Urban	1:13	1:35	1:22	1:26	1:19	1:15


Turnout Time	Turnout Time 1st Unit	Urban	1:41	1:49	1:43	1:46	1:45	1:51
Travel Time	Travel Time 1st Unit Distribution	Urban	5:20	5:51	5:43	5:28	5:37	5:29
	Travel Time ERF Concentration	Urban	18:43	19:24	19:15	21:44	20:44	19:30
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	7:28	8:12	7:46	7:42	7:45	7:42
			n=11,458	n=1,999	n=2,318	n=2,335	n=2,435	n=2,371
	Total Response Time ERF	Urban	20:26	21:33	20:47	23:33	22:41	21:21
	concentration		n=11,458	n=1,999	n=2,318	n=2,335	n=2,435	n=2,371
(High Dick) E	morgonov Modios	Bosnonso	2016 2020	2020	2010	2019	2017	2016
(High Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance		aseline	2010-2020	2020	2013	2010	2017	2010
ERF = 8, of w	hich 2 are FF/PM	and 1 MSO						
Alarm Handling	Pick-up to Dispatch	Urban	1:25	1:47	1:21	1:54	1:38	1:36
Turnout Time	Turnout Time 1st Unit	Urban	1:43	2:03	1:56	1:50	1:46	1:45
Travel Time	Travel Time 1st Unit Distribution	Urban	5:10	6:20	5:45	5:56	5:48	5:09
	Travel Time ERF Concentration	Urban	21:04	15:19	21:37	24:21	21:59	24:11



Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	7:24	8:33	7:48	8:37	7:36	7:37
			n=766	n=182	n=145	n=140	n=154	n=145
	Total Response Time ERF	Urban	22:57	17:10	24:20	26:05	23:41	25:41
	Concentration		n=663	n=146	n=130	n=125	n=136	n=126
(Special Risk) Emergency Medical Response - 90th Percentile Times - Baseline Performance		2016-2020	2020	2019	2018	2017	2016	
ENF - 20	, oj which o ure i	FF/ FIVI						
Alarm Handling	Pick-up to Dispatch	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Turnout Time	Turnout Time 1st Unit	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Travel Time	Travel Time 1st Unit Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Total	Total	Urban	N/A	N/A	N/A	N/A	N/A	N/A
кesponse Time	Response Time 1st Unit on Scene Distribution		n=0	n=0	n=0	n=0	n=0	n=0
	Total	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	Time ERF		n=0	n=0	n=0	n=0	n=0	n=0



Technical Rescue

(Low Risk) Rescue Response - 90th Percentile Times - Baseline Performance		2016-2020	2020	2019	2018	2017	2016	
ERF = 3								
Alarm Handling	Pick-up to Dispatch	Urban	1:01	N/A	N/A	N/A	1:01	0:30
Turnout Time	Turnout Time 1st Unit	Urban	0:55	N/A	N/A	N/A	0:55	0:24
Travel Time	Travel Time 1st Unit Distribution	Urban	6:14	N/A	N/A	N/A	3:23	6:14
	Travel Time ERF Concentration	Urban	6:14	N/A	N/A	N/A	3:23	6:14
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	7:08	N/A	N/A	N/A	5:19	7:08
			n=2	n=0	n=0	n=0	n=1	n=1
	Total Response Time ERF Concentration	Urban	7:08	N/A	N/A	N/A	5:19	7:08
			n=2	n=0	n=0	n=0	n=1	n=1
(Madarata P	ick) Possue Pospons	o 00th	2016 2020	2020	2010	2019	2017	2016
(Moderate Risk) Rescue Response - 90th Percentile Times - Baseline Performance		rmance	2010-2020	2020	2019	2018	2017	2010
ERF = 11, of which 5 are Rescue Technicians								
Alarm Handling	Pick-up to Dispatch	Urban	2:07	2:45	2:21	2:32	2:12	1:57
Turnout Time	Turnout Time 1st Unit	Urban	1:43	1:46	1:46	1:49	1:40	1:45
Travel Time	Travel Time 1st Unit Distribution	Urban	6:05	5:45	6:19	6:08	6:18	6:07



	Travel Time ERF Concentration	Urban	20:33	20:30	21:08	24:18	18:00	20:27
Total Response Time	Total Response Time 1st Unit on Scene	Urban	8:50	8:48	9:15	9:12	9:01	8:53
	Distribution		n=1,997	n=235	n=404	n=387	n=439	n=532
	Total Response Time FRF	Urban	22:02	22:43	23:21	26:18	20:54	21:45
	Concentration		n=127	n=24	n=26	n=23	n=30	n=24
(High Risk) Rescue Response - 90th Percentile Times - Baseline Performance		2016-2020	2020	2019	2018	2017	2016	
ERF = 20	, of which 9 are Reso Technicians	cue						
Alarm Handling	Pick-up to Dispatch	Urban	2:05	N/A	N/A	N/A	N/A	2:05
Turnout Time	Turnout Time 1st Unit	Urban	2:09	N/A	N/A	N/A	N/A	2:09
Travel Time	Travel Time 1st Unit Distribution	Urban	4:24	N/A	N/A	N/A	N/A	4:24
	Travel Time ERF Concentration	Urban	9:12	N/A	N/A	N/A	N/A	9:12
Total Response Time	Total Response Time 1st Unit on Scene	Urban	6:06	N/A	N/A	N/A	N/A	6:06
	Distribution		n=3	n=0	n=0	n=0	n=0	n=3
	Total Response Time FRF	Urban	13:51	N/A	N/A	N/A	N/A	13:51
	Concentration		n=2	n=0	n=0	n=0	n=0	n=2
(Special Ris Percentile Tir	k) Rescue Response mes - Baseline Perfo	- 90th rmance	2016-2020	2020	2019	2018	2017	2016
ERF = 37, of which 13 are Rescue Technicians								



Alarm Handling	Pick-up to Dispatch	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Turnout Time	Turnout Time 1st Unit	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Travel Time	Travel Time 1st Unit Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Total Response Time	Total Response Time 1st Unit on Scene	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	Distribution		n=0	n=0	n=0	n=0	n=0	n=0
	Total Response Time ERF	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	Concentration		n=0	n=0	n=0	n=0	n=0	n=0



Hazardous Materials

(Low Risk) Hazardous Material Response - 90th Percentile Times - Baseline Performance		2016-2020	2020	2019	2018	2017	2016	
	ERF = 3							
Alarm Handling	Pick-up to Dispatch	Urban	1:11	1:25	1:14	1:07	1:06	1:32
Turnout Time	Turnout Time 1st Unit	Urban	1:58	2:17	1:59	2:01	2:25	2:10
Travel Time	Travel Time 1st Unit Distribution	Urban	6:01	6:43	5:49	6:26	6:06	6:18
	Travel Time ERF Concentration	Urban	6:07	6:43	5:57	6:26	6:06	6:26
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	8:06	8:52	8:01	8:21	8:16	9:12
			n=93	n=25	n=17	n=15	n=22	n=14
	Total Response Time ERF	Urban	8:09	8:52	8:08	8:21	8:16	9:14
	Concentration		n=93	n=17	n=17	n=15	n=22	n=14
ERF Travel ar	nd ERF TRT differenc dispatched unit	es compar t is replace	ed to First Arr d on the call c	iving unit car lue to system	n be attribute n assigning be	ed to incide ased on AV	nces where L.	e the first
(Moderate Response Bas	(Moderate Risk) Hazardous Material Response - 90th Percentile Times - Baseline Performance		2016-2020	2020	2019	2018	2017	2016
	ENF - 3							
Alarm Handling	Pick-up to Dispatch	Urban	1:21	1:41	1:26	2:04	1:14	1:29



Bellevue	Fire	Def	PAR	TME	NT
Sta	NDA	RDS	OF	Cov	/ER

Turnout Time	Turnout Time 1st Unit	Urban	1:47	1:35	1:43	2:07	1:55	1:48
Travel Time	Travel Time 1st Unit Distribution	Urban	5:29	6:29	6:07	7:52	5:35	5:45
	Travel Time ERF Concentration	Urban	8:55	8:52	8:45	17:52	14:05	8:34
Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	7:51	8:52	8:38	10:32	7:05	8:00
	Distribution		n=137	n=39	n=16	n=25	n=23	n=34
	Total Response Time ERF Concentration	Urban	11:04	11:18	10:33	20:23	16:06	11:26
			n=131	n=37	n=15	n=24	n=22	n=33
(High Risk) Hazardous Material Response - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
ERF = 25	, of which 1 are Haz Technicians	Mat						
Alarm Handling	Pick-up to Dispatch	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Turnout Time	Turnout Time 1st Unit	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Travel Time	Travel Time 1st Unit Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	Travel Time	Urban	N/A	N/A	N/A	N/A	N/A	N/A
	ERF Concentration							

Bellevue Fire Department

STANDARDS OF COVER

Total Response Time Scene pictribution Image n=0									
Total Response Time ERF Urban ERF N/A N	Total Response Time	Scene Distribution		n=0	n=0	n=0	n=0	n=0	n=0
Concentrationn=0n=0n=0n=0n=0n=0n=0n=0(Special Risk) HazMat Response90th2016-202020202019201820172016Percentile Times5 as a set in provide the set in term2016-202020202019201820172016ERF = 31. j which 1 are HazMat Response5 which 1 are HazMat Response0000000Alarm HandlingPick-up to DispatchUrban 1 st UnitN/AN/AN/AN/AN/AN/AN/AN/ATurnout Time 1 st Unit Distribution Time 1 st Unit Distribution Time 1 st Unit Distribution Time 1 st Unit Time 1 st Unit Time 1 st Unit DistributionN/A<		Total Response Time ERF	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Image: constraint of the series of the se		Concentration		n=0	n=0	n=0	n=0	n=0	n=0
(Special Risk) HazMat Response - 90th Percentile Times - Baseline Performance2016-202020202019201820172016ERF = 31. J which 1 are HazMat TechniciansVirbanN/AN/									
ERF = 31, of which 1 are Haz/Mat TechniciansImage: second	(Special Ris Percentile Ti	k) HazMat Response mes - Baseline Perfe	e - 90th ormance	2016-2020	2020	2019	2018	2017	2016
Alarm HandlingPick-up to DispatchUrbanN/AN/AN/AN/AN/AN/AN/ATurnout TimeTurnout Time 1st UnitUrbanN/AN/AN/AN/AN/AN/AN/ATravel Time 1st UnitUrbanN/AN/AN/AN/AN/AN/AN/ATravel Time 1st UnitUrbanN/AN/AN/AN/AN/AN/AN/ATravel Time ERF ConcentrationUrbanN/AN/AN/AN/AN/AN/ATotal Response 	ERF = 31	, of which 1 are Haz Technicians	Mat						
Turnout TimeTurnout Time 1st UnitUrban Ist 	Alarm Handling	Pick-up to Dispatch	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Travel Time 1st Unit DistributionUrban Image: N/AN/AN/AN/AN/AN/AN/ATravel Time ERF ConcentrationUrban Image: N/AN/AN/AN/AN/AN/AN/ATotal 	Turnout Time	Turnout Time 1st Unit	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Travel Time ERF ConcentrationUrban N/AN/AN/AN/AN/AN/AN/ATotal Response Time 1st Unit on Scene 	Travel Time	Travel Time 1st Unit Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Total Response Time 1st Unit on SceneUrbanN/AN/AN/AN/AN/AN/ADistributionScenen=0n=0n=0n=0n=0Distribution		Travel Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
$\left[\begin{array}{c c} \text{Distribution} \\ \text{Total Response} \\ \text{Time ERF} \\ \text{Concentration} \end{array} \right] \begin{array}{c c} \text{Urban} \\ Immediate in the image in the$	Total Response Time	Total Response Time 1st Unit on Scene Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
Total Response Time ERF ConcentrationUrbanN/AN/AN/AN/AN/AN/AN=0n=0n=0n=0n=0n=0n=0n=0		Distribution		n=0	n=0	n=0	n=0	n=0	n=0
n=0 n=0 n=0 n=0 n=0 n=0 n=0		Total Response Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
				n=0	n=0	n=0	n=0	n=0	n=0



Appendix C - Performance Improvement Plan (PIP)

Pursuant to Standard Operating Policy, Article 100, Section 13, the Program Manager's will perform annual Program Appraisals that 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 2016-2020 data, the agency has concluded that there are opportunities for improvement in the following areas:

Suppression Moderate risk:

- The agency's actual baseline performance for dispatch time was 1 minute and 25 seconds (1:25) for the five-year aggregate. *This performance presents an opportunity for improvement of 25 seconds*.
- The agency's actual baseline performance for turnout time was 1 minute and 52 seconds (1:52) for the five-year aggregate. This performance presents an opportunity for improvement of 32 seconds.
- The agency's actual baseline performance for travel time was 5 minutes and 50 seconds (5:50) for the five-year aggregate. This performance presents an opportunity for improvement of 1 minute and 50 seconds.
- The agency's actual baseline performance for total response time (TRT) was 8 minutes and 26 seconds (8:26) for the five-year aggregate. *This performance presents an opportunity for improvement of 2 minutes and 6 seconds.*
- The agency's actual baseline performance for ERF TRT was 18 minutes and 42 seconds (18:42) for the fiveyear aggregate. *This performance presents an opportunity for improvement of 8 minutes and 42 seconds*.

Emergency Medical Services Low Risk:

- The agency's actual baseline performance for turnout time is 1 minute and 41 seconds (1:41) for the fiveyear aggregate. *This performance presents an opportunity for improvement of 41 seconds.*
- The agency's actual baseline performance for travel time for is 5 minutes and 46 seconds (5:46) for the five-year aggregate. This performance presents an opportunity for improvement of 1 minute and 46 seconds (1:46).

Emergency Medical Services Moderate Risk:

• The agency's actual baseline performance for turnout time is 1 minute and 41 seconds (1:41) for the fiveyear aggregate. *This performance presents an opportunity for improvement of 41 seconds.*



• The agency's actual baseline performance for travel time for is 5 minutes and 20 seconds (5:20) for the five-year aggregate. This performance presents an opportunity for improvement of 1 minute and 20 seconds.

Emergency Medical Services High Risk:

- The agency's actual baseline performance for turnout time is 1 minute and 43 seconds (1:43) for the fiveyear aggregate. *This performance presents an opportunity for improvement of 43 seconds*.
- The agency's actual baseline performance for travel time is 5 minutes and 10 seconds (5:10) for the fiveyear aggregate. *This performance presents an opportunity for improvement of 1 minute and 10 seconds.*

Technical Rescue Moderate Risk:

- The agency's actual baseline performance for dispatch time performance was 2 minutes and 7 seconds (2:07) for the five-year aggregate. *This performance presents an opportunity for improvement of 1 minute and 7 seconds.*
- The agency's actual baseline performance for turnout time performance was 1 minutes and 43 seconds (1:43) for the five-year aggregate. *This performance presents an opportunity for improvement of 43 seconds.*
- The agency's actual baseline performance for travel time for the first arriving unit was 6 minutes and 5 seconds (6:05) for the five-year aggregate. *This performance presents an opportunity for improvement of 2 minutes and 5 seconds*.
- The agency's actual baseline performance TRT for the first arriving unit was 8 minutes and 50 seconds (8:50) for the five-year aggregate. *This performance presents an opportunity for improvement of 2 minutes and 50 seconds.*
- The agency's actual baseline performance for ERF TRT for 2019 was 22 minutes and 2 seconds (22:02) for the five-year aggregate. *This performance presents an opportunity for improvement of 12 minutes and 2 seconds.*

Hazardous Materials Moderate Risk:

- The agency's actual baseline performance for dispatch time performance was 1 minutes and 21 seconds (1:21) for the five-year aggregate. *This performance presents an opportunity for improvement of 21 seconds.*
- The agency's actual baseline performance for turnout time performance was 1 minutes and 47 seconds (1:47) for the five-year aggregate. *This performance presents an opportunity for improvement of 27 seconds.*
- The agency's actual baseline performance for travel time for the first arriving unit was 5 minutes and 29 seconds (5:29) for the five-year aggregate. *This performance presents an opportunity for improvement of 1 minute and 29 seconds.*
- The agency's actual baseline performance TRT for the first arriving unit was 7 minutes and 51 seconds (7:51) for the five-year aggregate. *This performance presents an opportunity for improvement of 1 minute and 51 seconds*.
- The agency's actual baseline performance for ERF TRT was 11 minutes and 4 seconds (11:04) for the fiveyear aggregate. *This performance presents an opportunity for improvement of 1 minute and 4 seconds*.

STEP 2 -

The agency identified that the following factors contributed to the identified opportunity for improvement of between 21 - 67 seconds for its dispatch time:

• Moderate risk Technical Rescue incidents 90% dispatch time of 67 seconds can be attributed to issues with resolving address of the incident. This are mostly Motor Vehicle Collisions (MVC) and ascertaining the correct location and direction of travel on freeway incidents requires additional time.

The agency identified that the following factors contributed to the identified opportunity for improvement of between 23 – 43 seconds for its turnout time:

- Mobile Data Computers (MDC) clock time was not synchronized to the NORCOM time server. Some apparatus MDCs were off by as much at 34 seconds, while others were within fractions of a second.
- Station officers could further emphasize turnout standards when working with crews.
- Existing 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 10 seconds to two minutes and 5 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.
- Moderate risk Technical Rescue incidents 90% travel time of 2 minutes and 5 seconds can be attributed to increased traffic volumes during freeway and street MVC's incidents.
- 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 regard to turnout time for low risk incidents, the agency implemented the following actions:

- In May of 2017, the department 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.
- In July 2017, the department created a Quarterly Performance Dashboard that requires each Station Captain to report turnout performance against the adopted standard. This data is reviewed by the Fire Chief quarterly.
- The department placed 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 regard to travel time 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 43 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.
- Redirect all apparatus MDC's to obtain the system clock time from the NORCOM dispatch time server.
- Have the COB IT Department ensure that all MDC's default to the NORCOM server.
- Institute weekly MDC clock time checks as part of the apparatus weekly check.

The agency proposes the additional actions to reduce the current gap of one minute and 10 seconds to two minutes and 5 seconds for its travel times:

- Construct a new downtown fire station.
- Implement a new fire suppression/BLS resource when the downtown fire station is complete.
- Complete the installation of Opticom GPS devices into all front-line response apparatus to ensure more effective and timelier signal pre-emption.
- Encourage the City of Bellevue Transportation Department to continue to equip traffic signals with Opticom GPS technology.

STEP 5 -

The agency's improvement plan for reducing the turnout gap of up to 43 seconds and the travel time gap of 2 minutes and 5 seconds 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.
 - Performing annual response Program Appraisal (PA) to ensure that Program Managers are aware of changes in baseline performance for their program area and performance against adopted benchmarks.
 - Pursuing a budget proposal to equip all fire stations with turnout timer capability.
 - Continue to analyze call volumes and response strategies to ensure new resources are optimally placed.
 - Identifying any operating and capital budget implications created by implementing components of this plan.
 - i. Pursuing 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

The department's benchmark service level objectives for the **Suppression** program are as follows:

For 90 percent of all priority fire suppression responses, the total response time (TRT) for the arrival of the first due unit, staffed with a minimum of 3 firefighters, shall be 6:20 minutes. The first-due unit shall be capable of: providing 500 gallons of water and 1,500 gallons per minute of pumping capacity; establishing Incident Command; completing an initial size-up; initiating a fire attack; addressing a water supply; and complying with 2-in-2 out unless circumstances of the incident indicate the need for other actions, such as immediate rescue. These operations shall be conducted in accordance with the policies and procedures as established by "*Best Practices for Offensive Fire Attack & Company Operations*" as published by the East Metro Training Group (EMTG).

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 6:20 minutes. The first-due unit shall be capable of: providing 500 gallons of water and 1,500 gallons per minute of pumping capacity; establishing Incident Command; completing an initial size-up; initiating a fire attack; addressing a water supply; and complying with 2-in-2 out unless circumstances of the incident indicate the need for other actions, such as immediate rescue. These operations shall be conducted in accordance with the policies and procedures as established by "*Best Practices for Offensive Fire Attack & Company Operations*" as published by the East Metro Training Group (EMTG).

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 providing a safety officer and rehab. These operations shall be conducted in accordance with the policies and procedures as established by "*Best Practices for Offensive Fire Attack & Company Operations*" as published by the East Metro Training Group (EMTG).

For 90 percent of all priority high risk fire suppression responses, the total response Time (TRT) for the arrival of the effective response force (ERF), staffed with a minimum of 25 firefighters, shall be 10:00 minutes. The ERF for high risk 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 providing a safety officer and rehab, and be capable of establishing a RIT. These operations shall be conducted in accordance with the policies and procedures as established in *"Best Practices for Offensive Fire Attack & Company Operations"* as published by EMTG.



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 multiple attack lines 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 lobby control and stairwell supervision; establishing a medical group; providing exposure protection; controlling utilities; and providing a safety officer and rehab, and be capable of establishing a RIT. These operations shall be conducted in accordance with the policies and procedures as established in "*Best Practices for Offensive Fire Attack & Company Operations"* as published by EMTG.

Emergency Medical Services

The department's benchmark service level objectives for the **EMS** program are as follows:

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 6:00 minutes. 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. These operations shall be done utilizing the policies, procedures and protocols as established by the department and King County Emergency Medical Services (KCEMS).

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 8:00 minutes. 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. These operations shall be done utilizing the policies, procedures and protocols as established by the department and King County Emergency Medical Services (KCEMS).

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 6:00 minutes. The ERF 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. These operations shall be done utilizing the policies, procedures and protocols as established by the department and King County Emergency Medical Services (KCEMS).

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. 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. These operations shall be done utilizing the



policies, procedures and protocols as established by the department and King County Emergency Medical Services (KCEMS).

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 and 1 a Medical Services Officer (MSO), shall be: 10:00 minutes. The ERF shall be capable of establishing command; assessing scene safety; conducting initial patient assessment; obtaining vitals and patient's medical history; providing medical support to include CPR, defibrillation, intravenous (IV) access, medication administration, intubation; and transporting the patient. These operations shall be done utilizing the policies, procedures and protocols as established by the department and King County Emergency Medical Services (KCEMS).

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: 12:00 minutes. The ERF shall be capable of establishing command; assessing scene safety; conducting triage/initial patient assessments; obtaining vitals and patient's medical history; providing medical support to include providing intravenous (IV) access, medication administration and control, intubation; and transporting the patients. These operations shall be done utilizing the policies, procedures and protocols as established by the department and King County Emergency Medical Services (KCEMS).

Technical Rescue

The department's benchmark service level objectives for the **Technical Rescue** program are as follows:

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 6:00 minutes. 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. These operations shall be conducted in accordance with the policies and procedures as established by the department to ensure personnel safety.

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 6:00 minutes. The ERF 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. These operations shall be conducted in accordance with the policies and procedures as established by the department to ensure personnel safety.

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 ERF shall be capable of establishing command; providing scene and technician safety; controlling the hazard; patient triage; patient extrication; and providing basic life support to any victim without endangering response personnel. These operations shall be



conducted in accordance with the policies and procedures as established by the department to ensure personnel safety.

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 12:00 minutes. The ERF shall be capable of establishing command; providing scene and technician safety; controlling the hazard; establishing medical supervision; providing patient triage; and administering basic life support to any victim without endangering response personnel. These operations shall be conducted in accordance with the policies and procedures as established by the department to ensure personnel safety.

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 20:00 minutes. The ERF shall be capable of establishing command; providing scene and technician safety; controlling the hazard; providing air monitoring; supporting rescue operations; establishing medical supervision; providing patient triage; and administering basic life support to any victim without endangering response personnel. These operations shall be conducted in accordance with the policies and procedures as established by the department to ensure personnel safety.

Hazardous Materials

The department's benchmark service level objectives for the **HazMat** program are as follows:

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 6:20 minutes. 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 conducted in accordance with safe operational procedures or the policies and procedures as established by the Eastside Hazardous Materials Consortium (EHMC).

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 6:20 minutes. The ERF 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 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; performing air monitoring and investigation; 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 and safety; designate an entry and backup team; perform air monitoring and investigation; establish hot, warm and cold zone as necessary; decontaminate; provide medical treatment; and provide the equipment, technical expertise, knowledge, skills and abilities to mitigate the incident. These operations shall be conducted in accordance with the policies and procedures as established by the Eastside Hazardous Materials Consortium (EHMC).

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 and safety; designate an entry and backup team; perform air monitoring and investigation; establish hot, warm and cold zone as necessary; decontaminate; provide medical treatment; and provide the equipment, technical expertise, knowledge, skills and abilities to mitigate the incident. These operations shall be conducted in accordance with the policies and procedures as established by the Eastside Hazardous Materials Consortium (EHMC).



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