2018 – 2037

Capital Improvement Plan

Shoreline Fire Department

Capital Facilities & Equipment Plan

Attachment 7 - Shoreline Fire Department Capital Facilities & Equipment Plan

Shoreline Fire Department Capital Facilities & Equipment Plan

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This document reflects the need to prepare long-term capital project plans to appropriately identify future needs and the financial means to support those projects. The recession virtually eliminated any reserved capital funds and brings into sharp contrast the benefits of looking at the life cycles of all our needs and developing revenue sources for them. The likely solution is that not any one source will provided the funds necessary to sustain these projects, but rather that it will be a combination of sources. The original goal of this document was to establish a plan toward replacing the aged and dysfunctional Station 63 and then to look long-term at our needs of building a functional Station 62. This plan has been approved by the Board of Commissioners and will be evaluated on an annual basis. The following pages of this plan reflect a strategic, responsible, and cost conscious compromise reflective of current and future needs.

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1. Capital Facilities & Equipment Plan

1.1. Introduction & Purpose:

The purpose of this document is to identify the capital resources necessary for the Shoreline Fire Department (SFD), to appropriately address current and future service delivery model needs for our urban community. SFD's intent is to sustain adequate levels of service consistent with their adopted service standards and the Land Use elements of the Shoreline Comprehensive Plan. The goal of this plan is to forecast the next 20 years of capital facilities needs and establish an achievable six year funding plan that incrementally provides the resources necessary to maintain adequate service delivery prior to or concurrently with the impacts of development.

The Capital Facilities Plan for Shoreline Fire Department contains all elements required by Washington Law to comply with the Washington State Growth Management Act (GMA) as set forth in RCW 36.70A.070(3):

> *"(3) A capital facilities plan element consisting of: (a) An inventory of existing capital facilities owned by public entities, showing the locations and capacities of the capital facilities; (b) a forecast of the future needs for such capital facilities; (c) the proposed locations and capacities of expanded or new capital facilities; (d) at least a six-year plan that will finance such capital facilities within projected funding capacities and clearly identifies sources of public money for such purposes; and (e) a requirement to reassess the land use element if probable funding falls short of meeting existing needs and to ensure that the land use element, capital facilities plan element, and financing plan within the capital facilities plan element are coordinated and consistent."*

The underlying premise of this document is that as the community continues to grow, additional resources will be required to adequately meet the growing demand for services. It is assumed that a direct relationship exists between population and demand for services which directly links to a need for resources. This plan focuses on achieving the "Benchmark" goals of Shoreline Fire Department's 20 year planning documents by utilizing a "concurrency" philosophy to service delivery; meaning fire and emergency service capacity must grow concurrently with development. To determine future resource needs, this document utilizes the 20 year growth predictions found in the City of Shoreline, King County Comprehensive Plans, and the SFD Station Location Analysis conducted in 2016. For purposes of this plan, capital improvements are defined as real estate, structures or collective equipment purchases anticipated to have a cost over $20,000 and an expected useful life of at least five years.

1.2. Background & Organizational Overview:

1.2.1. Yesterday

Shoreline boasts a unique history and character derived from original settlements dating back to the late 1800s. The quality that drew early settlers to the area remains dominant to this day: location. The City of Shoreline offers classic Puget Sound beauty with the convenience of easy access to areas such as the City of Seattle.

As railroad fever gripped the Northwest in the 1880s, speculators planned towns in anticipation of the transcontinental railroad route. Among these was Richmond Beach, platted in 1890. The arrival of the Great Northern Railroad in Richmond Beach in 1891 spurred the growth of the small town and increased the pace of development in the wooded uplands.

Construction of the Seattle-Everett Interurban line through Shoreline in 1906, and the paving of the North Trunk Road with bricks in 1913, made travel to and from Shoreline easier, which increased suburban growth. People could live on a large lot, raise much of their own food and still be able to take the Interurban, train or, beginning in 1914, the bus, to work or high school in Seattle.

During the early twentieth century, Shoreline attracted large developments drawn by its rural yet accessible location. Car travel had broadened the settlement pattern considerably by the mid-1920s. Although large tracts of land had been divided into smaller lots in the 1910s in anticipation of future development, houses were still scattered.

The Great Depression and World War II slowed the pace of housing development. During the Depression, many Shoreline families eked out a living on land they had purchased in better times. By the late 1930s, commercial development concentrated along Aurora which saw steadily increasing use as part of the region's primary north-south travel route - U.S. Highway 99. Traffic on 99 swelled, particularly after the closing of the Interurban in 1939.

The late 1940s saw large housing developments spring up seemingly overnight. Schools ran on double shifts as families with young children moved into the new homes. In the late 1940s, business leaders and residents began to see Shoreline as a unified region rather than scattered settlements concentrated at Interurban stops and railroad accesses.

In 1944, the name "Shoreline" was used for the first time to describe the school district. Coined by a student at the Lake City Elementary School, it defined a community which went from city line to county line and from the shore of Puget Sound to the shore of Lake Washington.[1]

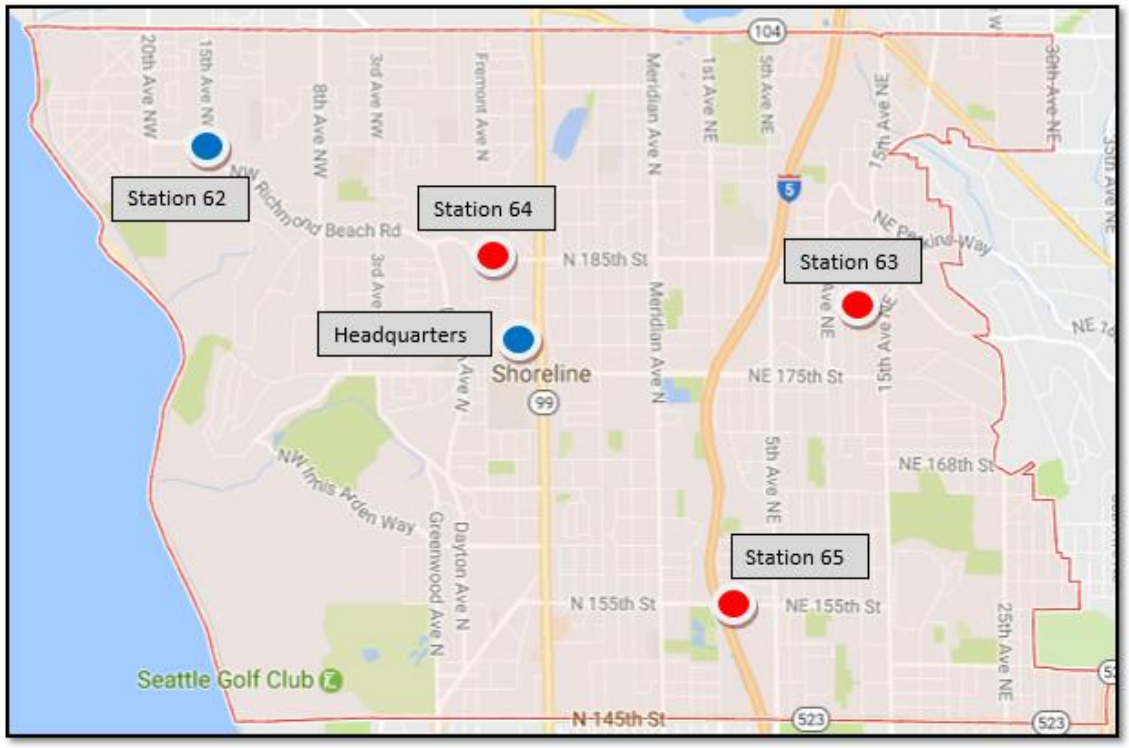
Originally formed as King County Fire District No. 4, Shoreline Fire Department has served the community since 1939. In 1995 Shoreline officially became a city being incorporated by King County and annexed into KCFD #4. The Department then changed its name officially to the Shoreline Fire Department in 1998.

1.2.2. Today

SFD is an independent special purpose district that provides fire and rescue services to the District's 13 square miles of predominantly urban areas. Services provided are delivered through a career type of fire service, meaning that only paid personnel are utilized to deliver services which include; fire protection, fire prevention and code enforcement, basic life support (BLS) emergency medical service (EMS), advanced life support (ALS) EMS in cooperation with King County EMS, public education in fire prevention and life safety, and technical rescue including high/low angle, confined space, and trench rescue. The urban boundary set in 1992 remains essentially the same in Shoreline. The current service area includes all of the City of Shoreline as well as the Town of Woodway and the Point Wells area, under service contracts. Furthermore, SFD provides ALS service to the Cities of Lake Forest Park, Kenmore, Bothell, and parts of Woodinville. Today with over 55,000 residents, Shoreline is Washington's 20th largest city.

[1] Information from City of Shoreline website http://www.shorelinewa.gov/community/about-shoreline/shoreline-history

Exhibit 1: Shoreline Fire Department Boundaries and Station Locations[2]



Red circles identify career station locations, blue circles represent other facilities.

1.2.3. Tomorrow's Growth

The City of Shoreline is already experiencing growth as the area emerges from the recession, which is expected to increase significantly in the near future. Generally, the entire King County region is seeing rapid development, but in Shoreline this will be augmented by the two light rail stations to be constructed over the next four years. As a result it is expected that there will be

[2] Internal SFD map

aggressive redevelopment of lower density properties to higher and better use. The result will be higher density commercial and multi-family residential development, which will include larger and taller structures that integrate mixed uses. These types of developments will require additional resources and specialized equipment for the delivery of adequate fire and rescue services. Due to the already built-out nature of Shoreline, the King County defined urban areas of today will likely remain much the same in the future, with growth occurring mainly within the city limits of Shoreline as described below.

1.2.3.1. City of Shoreline

The population of the City of Shoreline was fairly stable until about 2010 when growth started to increase at about one percent annually, with an estimated population in 2016 of 53,605.[3] The growth rate is expected to increase to a range of 1.5 to 2.5 percent in focused growth areas with over 5,000 additional housing units over the next 20 years.[4] This equates to an increase of 13,920 additional population at a rate of 2.4 people per household, bringing the total to an estimated 67,525 by 2035. Of course this could be dramatically influenced by regional demand and other factors.

Table 1: Future population of SFD

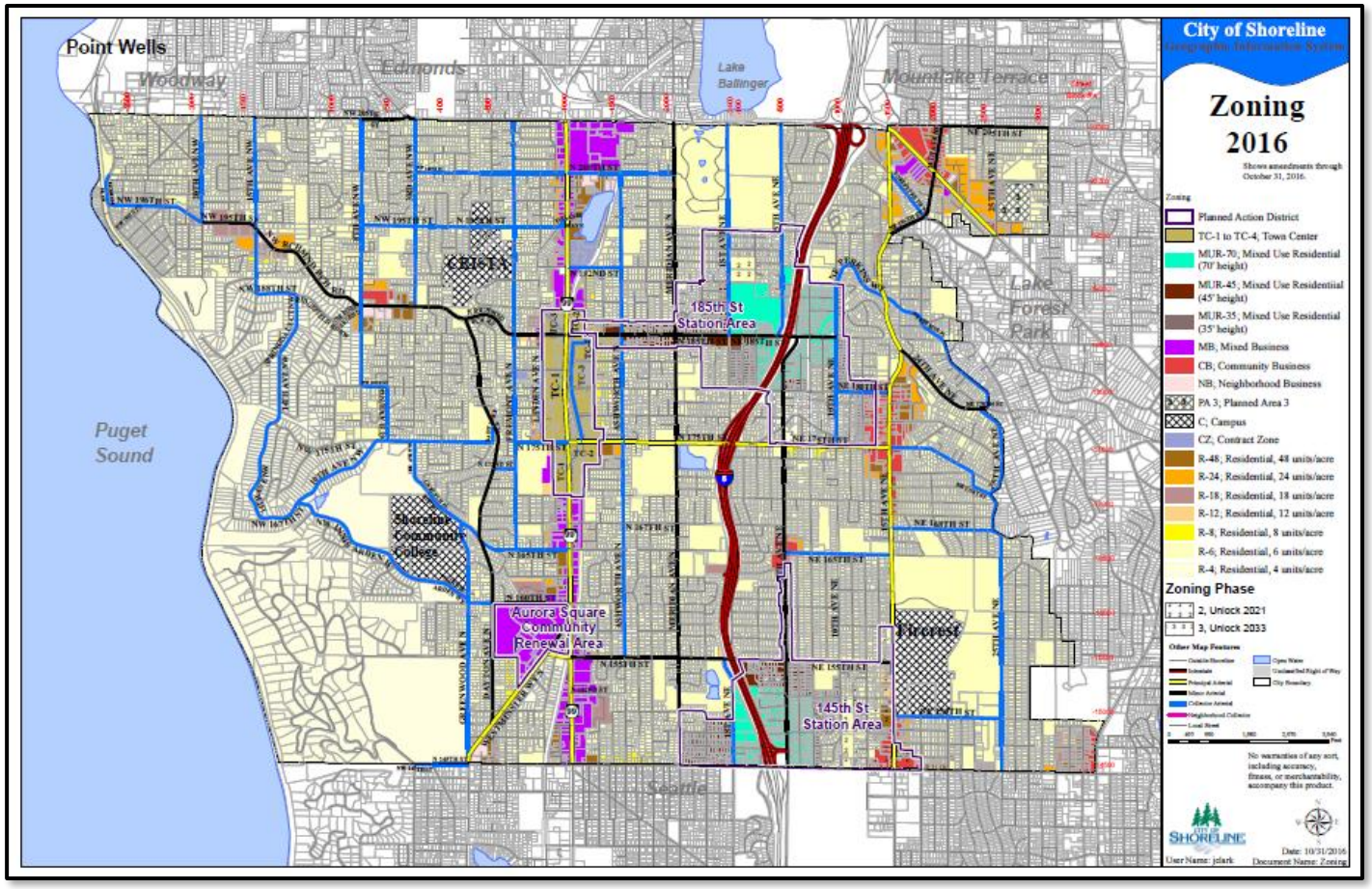
City of Shoreline	2010	2016	2035
Population	53,007[3]	53,605[3]	67,525
Population Growth Rate	flat (2000-2011)	1.14% (2011-2016)	1.5-2.5% (2016-2035)

The following map shows the zoning classifications around the City including the light rail station subareas.

[3] City of Shoreline Population Demographics http://www.cityofshoreline.com/home/showdocument?id=9737
[4] City of Shoreline Sub-Area and FEIS http://www.cityofshoreline.com/Home/ShowDocument?id=20061

The following map shows the zoning classifications around the City, including the light rail station subareas:

Exhibit 2: City of Shoreline Zoning Map[5]



[5] From City of Shoreline https://s3.amazonaws.com/CityMaps/Zoning.pdf

2. Inventory of Current Capital Assets

Capital resources for SFD consist of fire stations, fire apparatus (vehicles used for fire and rescue work), staff vehicles and the related equipment, tools, and associated personal protection equipment needed to safely and legally provide fire and rescue services. Current inventories of these resources are listed below.

2.1. Fire Stations

Emergency services are provided from three career fire stations located throughout the City of Shoreline, as identified in Table 2 and shown on the map in Exhibit 1. Two additional ALS units operate out of the neighboring Northshore and Bothell Fire Departments under regional service agreements. On average, the existing facilities in operation are nearly 34 years old, with Station 62 as the oldest at 69 years, and Headquarters as the newest at 16 years old.

Table 2: Existing Fire Station Descriptions

Facility	Location	Size	Built	Capacity	Condition	Dorm Rooms
Career Stations						
Station 63	1410 NE 180th St	7,310	1970	3 Bays *No Drive Thru*	Fair	7
Station 64	719 N 185th St	12,082	1999	3 Deep Bays *2 Drive Thru*	Good	8
Station 65	145 NE 155th St	11,441	1999	3 Deep Bays *1 Drive Thru*	Good	7
Sub-total		30,833		9 Bays		22
Other Facilities						
Headquarters	17525 Aurora Ave N (Includes Fleet Bays)	20,370	2001	2 Deep Bays *2 Drive Thru*	Good	0
Station 62	1851 NW 195th St (Future Career Station)	1,560	1948	2 Bays *No Drive Thru*	Poor	0
Sub-Total		21,930		4 Bays		0
Total		**52,763**		**13 Bays**		**22**

One critical factor in proper station location is ensuring an efficient response to all geographical areas of the Department, especially to areas of emergency incident concentrations. In the following two exhibits the response performance and incident concentrations are mapped with the City of Shoreline boundaries shown by a black line.

Exhibit 3: Map of Station Locations with Response Performance Rings for Stations 63, 64, and 65

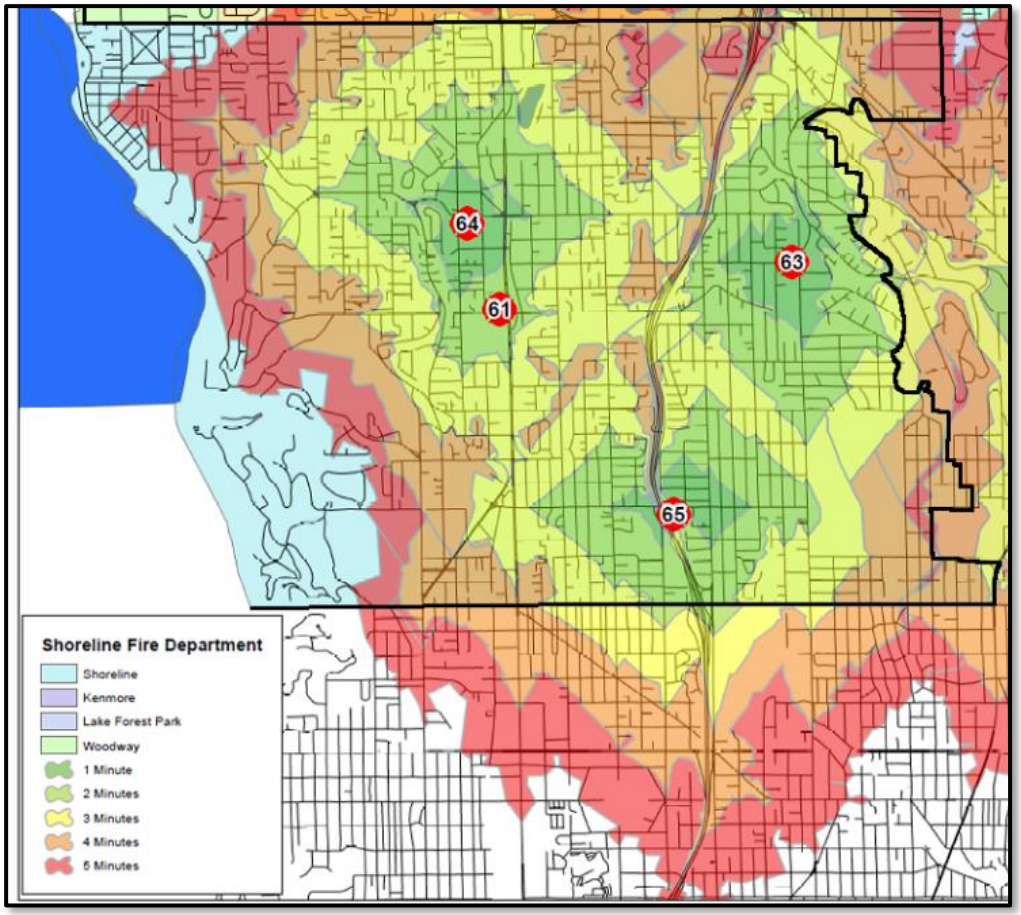
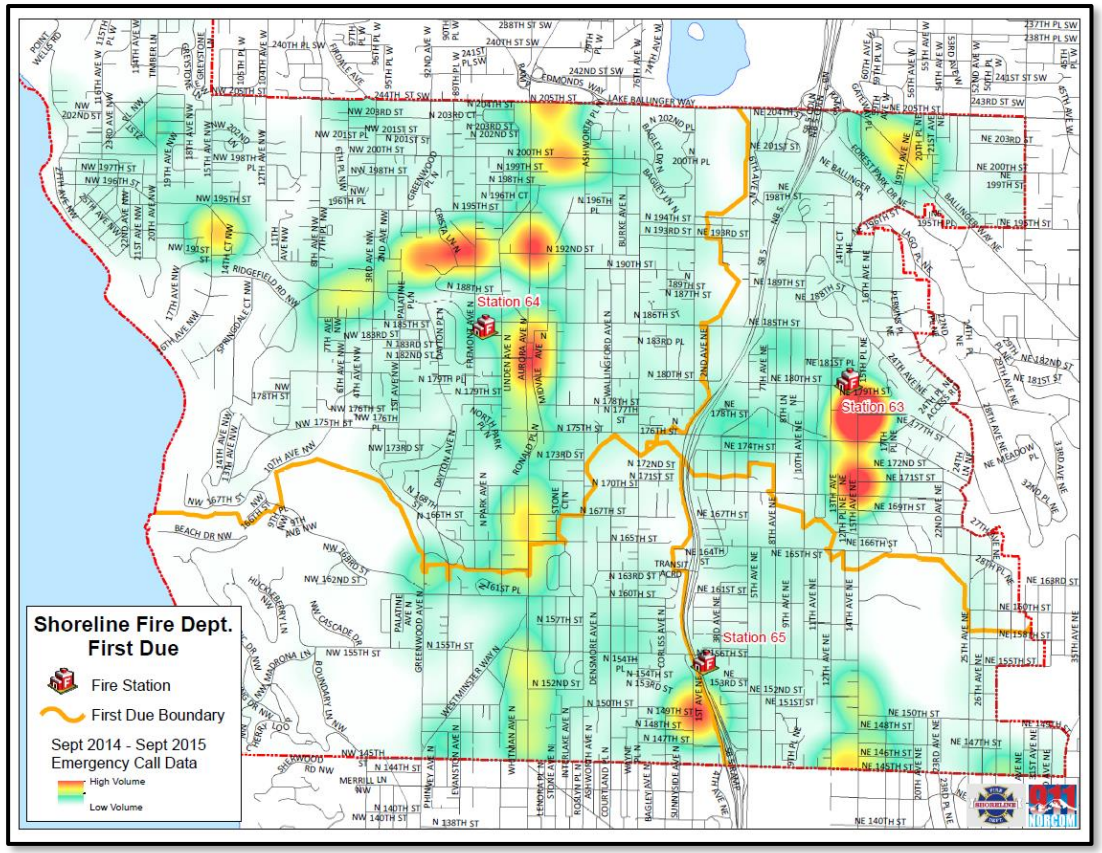


Exhibit 4: Map of Station Locations with Call Concentrations for Stations 63, 64, and 65



2.2. Apparatus

SFD's current fleet of emergency response vehicles is well maintained, but our ability to replace front line suppression apparatus has been restricted financially. For example, the ladder truck is currently 23 years old and should have been replaced at 15 years. Fortunately,

the Department was successful in passing a capital bond in 2015 to address some of the capital needs, but it will not be enough for all critical needs and only addresses the current rotation of apparatus. For example, the bond includes replacement of two of the aid cars, which was just recently completed. Another aid car was recently replaced due to an accident. SFD has designed a life cycle replacement of all response apparatus for front line service; aid cars (seven years), fire engines (ten years), and the ladder truck (fifteen years). After front line service they are rotated to reserve status for the same length of years, except for the ladder truck that is declared surplus. In the future, if there is space available, keeping a reserve ladder truck will be considered. In all of these examples and discussions, the ALS units are not discussed because they are supported financially by the KCEMS levy and therefore have a different funding mechanism. Table 3 provides a detailed listing of existing front line and reserve response apparatus, not including ALS units, staff vehicles, etc., at different locations with current age in years.

Table 3: Apparatus Inventory

Station	Aid Car	Fire Engine	Truck	Rescue	Command	Other
Station 63	A63(2)	E63(9)				
Station 64	A64(2)	E64(9),E62(18)			B61(4)	
Station 65	A65(1)	E65(9)	L61(23)	R61(18)		
Headquarters	A61(10)	E61(18)			B62(13)	
Station 62						ATV62(1)
Total (Avg Age)	4 Aid(9)	5 Engines(13)	1 Truck(23)	1 Resc(18)	2 BC(9)	1 ATV(1)

2.3. Equipment

A significant portion of fire station costs lie in the fixtures and equipment in the structure, such as vehicle exhaust systems. Some of these fixtures are integral to the structural integrity and intrinsic to the facility, such as the roof covering. Contrary to a single family residence these facilities also require more fixtures than similar structures, such as four refrigerators instead of one. The fixtures and equipment listed in Table 4 are not all inclusive, but includes the higher priced items.

Table 4: Existing Special Equipment Inventory

Station Fixtures and Equipment Inventory	
Fixture or Equipment	**Life Cycle**
HVAC Systems	25 Years
Vehicle Exhaust Systems	25
Emergency Generators	25
Above Ground Fuel Tanks	30
Roof Coverings	25
Refrigerators	10
Cooking Ranges/Ovens	15
Clothes Washers/Dryers	7
Dishwashers	7
Water Heaters	10
Bunker Gear Extractor	15
Oil Separators	15
Vehicle Hoists	25
Apparatus Bay Doors	20
Floor Coverings	15
LCD Projectors	10
Televisions	10
Fitness Equipment	5

A full complement of equipment is necessary for the delivery of fire and rescue services. This equipment is carried on aid cars, fire engines, the ladder truck, other apparatus, or at the station, allowing firefighters to safely and effectively deliver services. Table 5 provides a listing of operational capital equipment maintained by SFD.

Table 5: Existing Operational Equipment

Operational Equipment	
Equipment	**Life Cycle**
Fire Hose	10 Years
Fire Hose Nozzles	15
Water Appliances	20
Rescue Tools	15
SCBA	15
SCBA Air Compressor	15
IT & Office Equipment	variable
Mobile Radios	15
Portable Radios	7
Personal Protective Gear	10
Patient Gurneys	15
Defibrillators	10
Thermal Imaging Cameras	10
Positive Pressure Fans	20
Special Operations Equipment	10

3. Needed Resources

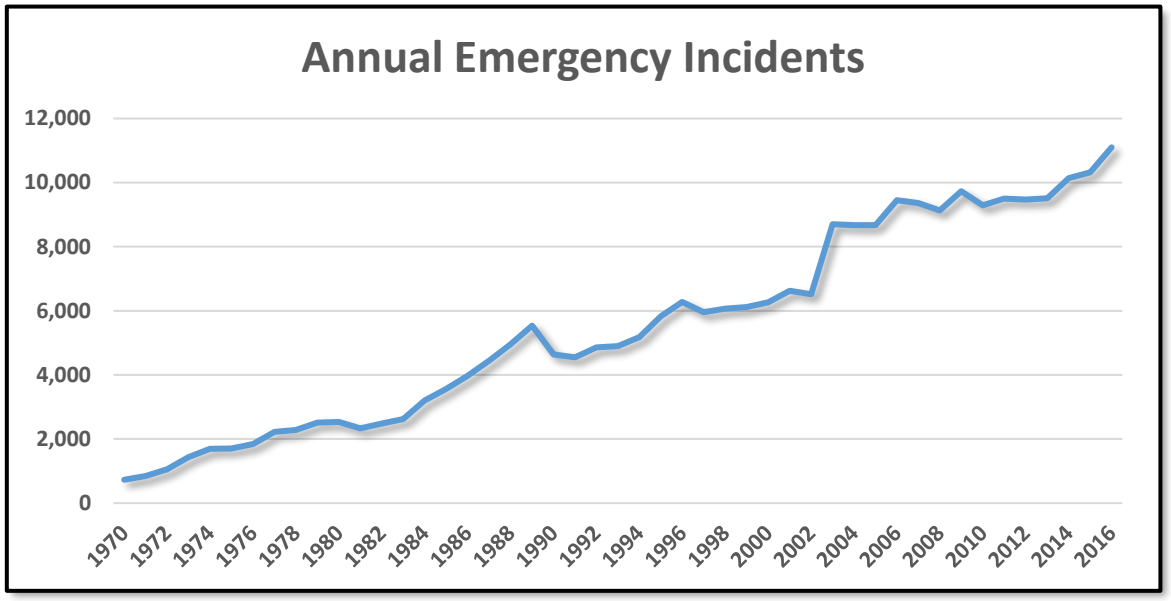
3.1. Impacts of the Growth Management Act

The Washington State Growth Management Act (GMA) was enacted to provide local oversight of community growth with the intent for local agencies such as counties, cities and towns, to monitor and mitigate the impacts of growth. Concurrency for transportation infrastructure is mandated by the Act and local agencies were given the authority to establish concurrency guidelines for other public needs such as water, sewer and fire services.

Fire districts such as SFD were originally created to provide rural fire protection. At the time the GMA was enacted in King County, more than 30 independent rural fire districts existed; all were independent municipal corporations without reporting requirements to the King County planners who were charged with developing Comprehensive Plans and implementing codes to comply with the GMA. As a result, fire officials for the most part were unaware of the looming impacts that the GMA (and its mandate to establish urban growth boundaries) would have on their ability to deliver services into the future.

The impacts of area growth spurred by the GMA over the past 27 years has significantly affected SFD's ability to deliver service. The service area population in 1990 was approximately 49,287 generating just over 4,637 emergency incidents. In 2016 the service area population has increased to 53,007 with 9,290 emergency incidents. This equates to a population increase of 7.5%, while incidents have increased by over 100%. An estimated 20% of this increase can be attributed to the expansion of the medic program service area, but that is still a significant increase in the need for emergency services. The following graph shows the increases in emergency incident call volumes since 1970:

Exhibit 5: Graph of Emergency Incident Call Volumes from 1970 to 2016



The rate of incidents, if averaged annually over the past 46 years is just over 6.5%. However, due to forecasted population growth the Shoreline area could also see even higher call volume increases in the near future.

Community growth and call volume increases generate the need for additional capital resources to support the greater demand for service. Current capital facilities are not capable of supporting adopted levels of service across the SFD service area.

3.2. Indicators of Future Capital Facility Needs

3.2.1. Level of Service Measures

3.2.1.1. Response Effectiveness

Response time is a critical component of any fire service system and is measured against two major benchmarks; time to brain death in a non-breathing patient and time to the occurrence of flashover[6] in a structure fire.

Response effectiveness is defined as the ability for a fire department to assemble enough equipment and personnel to prevent brain death, and control the fire prior to flashover. Brain death begins to occur at 4 to 6 minutes[7] in a non-breathing patient and flashover can occur anywhere from 3 to 20 minutes depending on the availability of oxygen and fuel in a fire. Most fire engineers and the National Fire Protection Association (NFPA) estimate flashover to occur most commonly between seven (7) to twelve (12) minutes.[8]

3.2.1.2. Level of Service Components and Measures

Washington State Law in Chapter 52.33 RCW requires career fire departments to adopt level of service standards and report performance of those standards annually. Time to the onset of brain death in a non-breathing patient and time to flashover in a structure fire are two required elements to be considered by the State when setting performance standards. The statute further recognizes the National Fire Protection Association (NFPA), the International Fire Chief's Association (IFCA) and International City/County Management Association (ICMA) for their work on establishing performance measures for fire and rescue services.

[6] Flashover refers to the point in a structure fire when everything in a room has heated to its ignition point, which causes everything within the room to instantaneously burst into flames. Survival is no longer possible in a room that has flashed-over. Flashover is a significant killer of firefighters even with all of their protective gear.

[7] The American Heart Association states; Brain death and permanent death start to occur in just four to six minutes after someone experiences cardiac arrest. Cardiac arrest is reversible in most victims if it's treated within a few minutes with an electric shock to the heart to restore a normal heartbeat. This process is called defibrillation. A victim's chances of survival are reduced by 7 to 10 percent with every minute that passes without CPR and defibrillation.

[8] Source: Time Verses Products of Combustion, NFPA handbook, 19 Edition

Chapter 52.33 RCW requires reporting of "fractile" performance at the 90th percentile. In simple terms, this would be the response performance of the 90th emergency response out of 100 if the response data of these incidents were stacked in order of response time from fastest to slowest. Response time performance of the 90th incident in the stack would be the agency's performance at the 90th fractile or percentile. To measure emergency response performance and identify system deficiencies, SFD has adopted response time standards based upon the concepts described in this section and performance is evaluated against the following four performance factors.

3.2.1.3. Turnout Time:

Turnout time refers to the elapsed time from when firefighters have received notification of an emergency until they are able to cease their current task, walk to the apparatus bay, don personal protective equipment, board the appropriate response vehicle, securely seatbelt themselves and begin driving away from their assigned fire station toward the dispatched emergency scene.

3.2.1.4. First Unit Travel Time:

First unit travel time refers to the drive time required for the first emergency response unit to travel from a fire station to the address of the emergency it was dispatched to. The fire industry often refers to first unit travel time as "Distribution Time," which references the best practice of distributing fire stations and adequate resources across a fire department's service area, so that all areas of the jurisdiction can be reached within the adopted time standard for the first unit to arrive on location of an emergency event. This time measure is sometimes referred to as the speed of attack or response.

The National Fire Protection Association establishes a four minute time standard for distribution or first unit travel time. This standard is to be performed 90% of the time in urban areas. The Center for Public Safety Excellence also establishes a first unit travel time of four minutes in urban areas to be performed 90% of the time.

3.2.1.5. Full First Alarm Travel Time:

Full first alarm travel time refers to the elapsed drive time required for the last of all emergency units dispatched to an emergency to arrive at the dispatched address. The fire industry often refers to full first alarm travel time as "Concentration Time," which references the best practice of concentrating enough resources within distributed fire stations so that an adequate number of firefighting personnel and resources can arrive in time to stop the escalation of property and life loss. Concentration differs by response type, for instance a structure fire requires more resources than a response to a sudden cardiac arrest. Concentration of resources is often referred to as the force of attack or response.

The National Fire Protection Association establishes a standard for concentration or full first alarm travel time of eight minutes to be performed 90% of the time in urban areas. The Center for Public Safety Excellence also establishes a full first alarm travel time in urban areas at 8 minutes to be performed 90% of the time.

3.2.1.6. Resource Reliability:

Reliability refers to the probability that the required amount of resources will be available when a fire or other emergency call is received. If all response resources are available at their assigned station every time an emergency call is received, they would have a reliability of 100%. If a fire station's emergency response unit is assigned to an emergency response when a second request for emergency response is received in that fire station's service area, a substitute response unit from a fire station farther away will need to respond causing longer response times than if the original unit were able to respond. These simultaneous emergency calls are tracked to measure the effectiveness or reliability of fire station resources; as the number of emergencies in a given fire station's service area increases, the probability of that station's emergency response unit(s) being available decreases. A decrease in unit availability or "Reliability" leads to increased response times, therefore it is imperative that response units remain available or reliable at least as often as they are expected to perform their defined level of service. To achieve 90% performance, response units must be available to respond 90% of the time.

3.2.1.7. Levels of Service by Community Type:

Turnout time, first unit travel time, full first alarm travel time and reliability are then applied to categories of community densities. The fire service defines community types by urban, suburban and rural. SFD uses the following community type definitions of the Center for Public Safety Excellence:

3.2.1.7.1. Urban Service Area:

A geographically defined land area having a population density greater than 2,000 or more people per square mile.

3.2.1.7.2. Suburban Service Area:

A geographically defined land area having a population density of 1,000 to 2,000 people per square mile.

3.2.1.7.3. Rural Service Area:

A geographically defined land area defined as having a population density of less than 1,000 per square mile.

3.3. Shoreline Fire Department Levels of Service

By definition SFD is an urban community and has established benchmark performance measures following the guidelines established by the Center for Public Safety Excellence (CPSE) published in their Commission on Fire Accreditation International (CFAI) Self-Assessment Manual. Benchmark performance represents industry best practices capable of limiting the loss of life and property. Performance below these standards can make an agency ineligible for accreditation by the CFAI and may contribute to unnecessary property and life loss.

Table 5: Turnout Time Performance Objectives

Benchmark Turnout Time Objectives		
Performance Type	Urban	Performance Factor
Daytime to all alarm types	2 min, 00 sec	90% of the time
Nighttime to all alarm types	2 min, 30 sec	90% of the time

Table 6: Travel Time Performance Objectives

Benchmark Travel Time Objectives		
Performance Type	Urban	Performance Factor
First in - “Distribution”- Benchmark	4 min, 00 sec	90% of the time
Effective Response Force - “Concentration” - Benchmark	8 min, 00 sec	90% of the time

Table 7: Reliability Objective

Minimum Reliability Objectives	
Performance Type	Urban
Minimum Peak Hour Unit Reliability	90%

3.5. Current Response Time Performance

Analysis of SFD's historical response data reveals sub-standard performance compared to benchmark expectations and are generally getting worse. Several factors contribute to this current sub-standard performance. First, performance cannot be met during peak hours where unit reliability is below the expected performance standard of 90%. Second, some areas of SFD simply cannot be reached within the adopted time standards because of the distance from a fire station and finally, some stations are within timely reach of substandard service areas but the lack of full time staffing on all apparatus at these stations impacts their unit reliability. Emergency response rates for the preceding three (3) years are identified in Table 8, Drive Time Performance Comparison to Benchmark and Baseline Standards. Historical performance is identified in a stop-light, (green, yellow, red) approach. Green indicates the standard was met, yellow indicates performance was within 10 seconds of the standard and red indicates performance was more than the standard. The information is separated into two tables. The first shows the drive time averages for the staffed apparatus and the second describes drive time averages by station. Data for this analysis was obtained from emergency response records of SFD.

Table 8: Drive Time Performance Comparison to Benchmark Standards 2015, 2015, and 2016[9]

Staff Dedicated Apparatus				
		2014	2015	2016
Unit	Urban	Drive Time	Drive Time	Drive Time
A64	4:00	**3:50**	**4:06**	**4:01**
E64	4:00	**3:58**	**4:21**	**4:15**
A65	4:00	**4:11**	**4:16**	**4:11**
E65/L61	4:00	**4:21**	**4:22**	**4:35**
E63/A63	4:00	**3:59**	**4:03**	**4:24**
If Unit is over 4:00 minutes then considered Red, between 3:50 and 4:00 then Yellow, if less than 3:50 then Green.				

[9] Performance is displayed in a stop-light approach, red equals failure, yellow is above failure but within 10 seconds of failure, green signifies that the performance expectation is being met.

Station				
		2014	2015	2016
Station	Urban	Drive Time	Drive Time	Drive Time
63	4:00	3:59	4:03	4:24
64	4:00	3:53	4:11	4:05
65	4:00	4:16	4:19	4:21
If Station is over 4:00 minutes then considered Red, between 3:50 and 4:00 then Yellow, if less than 3:50 then Green.				

The next three tables indicate the reliability of staffed apparatus for the preceding three years. These statistics identify the amount of time that a specific unit is available in their assigned station to respond on an emergency incident. If a unit is not available due to incident concurrency, then drive time and overall response performance is decreased. The "time on task" column in the tables refers to the minutes that the specific unit(s) are on an emergency incident annually. This time also includes incidents to which the unit is responding, but then cancelled prior to arriving on location. The total time is for responses only and not for other activities. The "reliability" column references the annual percentage of time that the apparatus is in the assigned station and available for a response.

Table 9: Current Response Reliability 2014, 2015, and 2016[10]

Staff Dedicated Apparatus (2014)				
Unit	Incidents	Time on Task	Reliability	Condition
A64	2958	111,076.67	78.87%	Red
E64	1655	32,500.68	93.82%	Yellow
A65	1476	58,482.83	88.87%	Red
E65/L61	1856	34,787.75	93.38%	Yellow
E63/A63	2002	59,875.85	88.61%	Red
If Unit is under 90% reliability then considered Red, between 90 and 95% then Yellow, if greater than 95% then Green.				

[10] Performance is displayed in a stop-light approach, red equals failure to the standard , yellow is above failure but within 5 percent of the standard and green signifies that the performance expectation is being met

Staff Dedicated Apparatus (2015)				
Unit	**Incidents**	**Time on Task**	**Reliability**	**Condition**
A64	2958	118,428.42	77.47%	**Red**
E64	1655	35,369.02	93.27%	**Yellow**
A65	1476	56,860.62	89.18%	**Red**
E65/L61	1856	35,871.70	93.18%	**Yellow**
E63/A63	2002	58,125.20	88.94%	**Red**
If Unit is under 90% reliability then considered Red, between 90 and 95% then Yellow, if greater than 95% then Green.				

Staff Dedicated Apparatus (2016)				
Unit	**Incidents**	**Time on Task**	**Reliability**	**Condition**
A64	3048	118,791.75	77.40%	**Red**
E64	1748	36,930.43	92.97%	**Yellow**
A65	1765	64,282.97	87.77%	**Red**
E65/L61	1057	33,482.12	93.63%	**Yellow**
E63/A63	1279	52,932.80	89.93%	**Red**
If Unit is under 90% reliability then considered Red, between 90 and 95% then Yellow, if greater than 95% then Green.				

3.5.1. Conclusion of Need for Capital Resources

SFD uses multiple indicators in determining the need for additional resources that will achieve and maintain their level of service standards. SFD conducted a fire station location analysis in 2016. This study and the Capital Facilities Plan have evaluated multiple variables of both SFD's service delivery model and their service area demographics to develop a rationale for the need of future resources. The variables considered regarding the SFD service area include:

- The nature of fire and life safety risks
- Types of incidents occurring (fire, rescue, emergency medical services, etc.)
- The magnitude of incident types and their need for resources
- Types and sizes of properties and their specific risks (existing and future)
- The ability of existing resources to match demand of incident types and property risks
- Historic and predicted population and geographic growth
- Historic and predicted land development
- Emergency call growth (historic and predicted)
- Travel times from fire stations to emergency scenes (historic and predicted)
- Availability of fire resources to demand for service (work load related, capacity of fire resources is limited)
- Responding unit types (career or volunteer staffing)
- Transportation networks (existing and future), and their influence on emergency response
- Geographic Information System (GIS) modeling of fire station coverage areas (provides for best placement of resources)
- Historic and predicted response times (current and future deployment)

3.4.1.1. Level of Service Adopted

In consideration of the numerous variables listed above the Board of Fire Commissioners for SFD have adopted the level of service standards and future fire station deployment model of this Plan. This Plan works toward implementing the level of service standards identified herein and the long-range four fire station model which has been adopted by the SFD Board.

3.6. Capital Projects and Purchases

Implementation of the adopted fire station deployment model is expected over the next 20 plus years to meet the demands of population growth identified in Table 1 on page 5 of this document. In total, SFD needs two new fire stations and several capital improvement projects to preserve current station capacity and prepare for future needs. In addition to station construction, all of the associated resources, special equipment and tools needed to deliver fire and rescue services from these sites are also required.

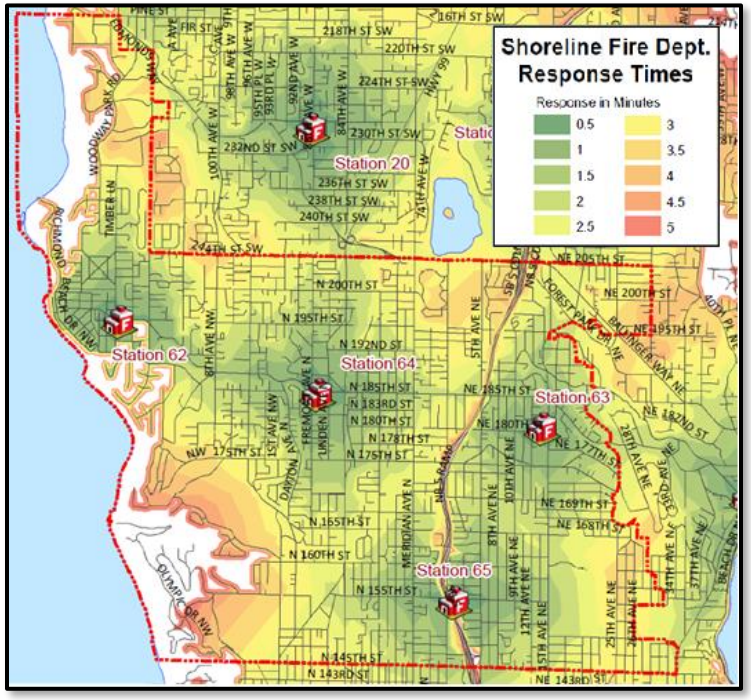
3.6.1. Revenue Limitations Effect Build Out of Fire Stations

Current funding limitations associated with the economic recession that began in 2008 will restrict SFD from implementing the full fire station model within the 20 year timeframe of this plan. The following description of capital projects and purchases reflects the current priorities for SFD over the next 20 years and includes implementing proposed stations "New Station 63" and "New Station 62," as shown in Exhibit 6 below.

3.6.2. Cost of New Fire Stations

The following costs are based on the General Services Administration's estimates for size requirements of fire stations capable of meeting the National Fire Protections Association and Washington State standards for safe and effective fire stations. Cost of construction is based upon recent costs of fire station construction. Land costs are based upon recent land acquisition experience in the Shoreline area. Current market trends for housing/land costs are increasing dramatically, so estimating future values and cost beyond the next two years is challenging. The map below illustrates the improved response time rings within the City, especially in the northwest corner.

Exhibit 6: Map of Response Rings from New Stations 62 and 63, and Stations 64 and 65



3.6.3. New Station 63

The current Station 63 shown in Exhibit 6 is located at 1410 NE 180th St, a location that can provides service to the North City area including the north east corner of the City. After reviewing over 20 different potential relocation sites and evaluating response time mapping, it was felt that the best option was to rebuild the station at the current location.

However, current and future operational needs coupled with new building and construction requirements have resulted in the new, two-story station growing significantly in size to an estimated 16,650 sq ft and requiring about 1½ acres of land. The larger station and the need to have drive through apparatus bays, forced SFD to buy adjacent properties to build the new station. SFD is currently working through a property acquisition process and it is anticipated that in late 2017 the needed properties will have been purchased. The Department is also in the process of designing the new station with a contracted architectural firm. Construction will likely begin in 2018 with final finishing and project acceptance scheduled for early 2019.

Table 10: Cost of New Station 63[11]

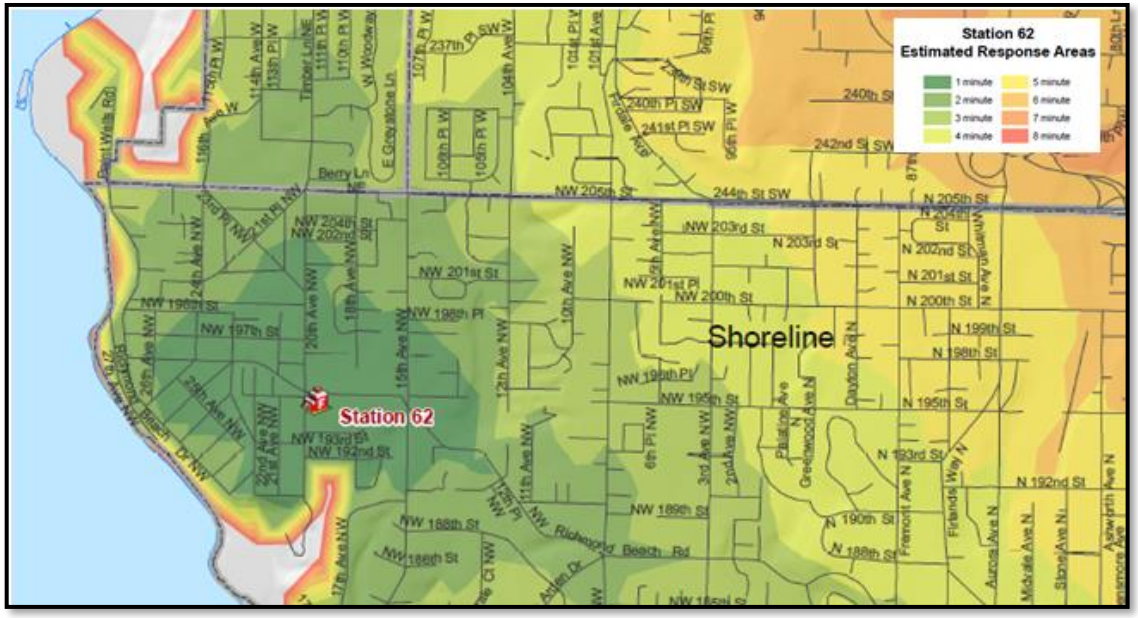
Land and Construction Costs	
Land (including legal fees)	$1,850,000
New Construction (includes site work, Phase 1 building and temporary quarters)	$9,000,323
Subtotal Land and Construction Costs	***$10,850,323***
Project Soft Costs	
Furnishing and Equipment	$215,941
Architect and Engineering Fees	$946,603
Permits/Fees/Inspections	$180,006
Printing/Reimbursables	$144,650
Contingency Funds	$315,011
Washington Sales Tax (some taxes built into phase 1)	$922,533
Subtotal Soft Costs	***$2,724,744***
Total New Station 63 Project Costs (2017 Dollars)	**$13,575,067**

[11] Cost estimates provided by The Robinson Company.

3.6.4. New Station 62

The current station 62, located at 1851 NW 195th St, is utilized as a children education center where tours and public education are held. The station was one of the original fire stations for Shoreline and was built in 1948. It has never had career staffing and it would be cost prohibitive to remodel the station. Again, similar to the location of the current station 63, the current station 62 is in a very good location to address response time challenges to that area. Below is a map showing a projected response time map if station 62 was staffed at the current location.

Exhibit 7: Map of Response Ring for Station



However, before land is purchased for this rebuild a more thorough analysis of multiple sites would need to be performed similar to the analysis for the new station 63.

The new station 62 would be constructed as what is considered a “satellite station”. This station would likely be constructed in a three, deep-bay configuration with, one or two drive-through bays, and space for five dorms. It is estimated that with this concept the size of this station would be approximately 11,000 sq ft.

The first step would be to determine a range of area that would support efficient operations, analyze possible locations within that area, purchase the land, and then design and construct the fire station. Due to financial constraints it is estimated that the purchasing of the land would not be possible until approximately 2028. Therefore, the costs of construction in the table below will change dramatically by the time this project is initiated.

Table 11: Cost of New Station 62

Land and Construction Costs	
Land (including legal fees)	$1,850,000
New Construction (includes site work)	$5,080,476
Subtotal Land and Construction Costs	***$6,930,476***
Project Soft Costs	
Furnishing and Equipment	$132,414
Architect and Engineering Fees	$409,599
Permits/Fees/Inspections	$106,413
Printing/Reimbursables	$75,743
Contingency funds	$153,093
Washington Sales Tax	$780,774
Subtotal Soft Costs	***$1,658,036***
Total New Station 62 Project Costs (2017 Dollars)	**$8,588,512**

3.6.5. Capital Improvement Necessary to Preserve Existing Assets, 2018 through 2037

While Shoreline Fire Department has adopted a four station future deployment plan, those existing stations that will be used as part of that model or those planned to be replaced in the future, must be preserved to maintain the existing assets until they can be

replaced. Table 12: Schedule of Asset Preservation Projects, identifies the larger cost asset preservation projects necessary to maintain these assets in a state of emergency response readiness.

Table 12: Schedule of Capital Preservation and Fixture Replacement Projects, 2018-2037

Asset Preservation and Fixture Replacement Projects in 2017 Dollars			
Station(s)	**Project Description**	**Project Year(s)**	**Total Cost**
61,64,65	HVAC System Overhaul or Replacement	2024, 2026	$1,150,000
61,64,65	Vehicle Exhaust System Replacement	2019, 2022	$220,000
61,64,65	Emergency Generator Replacement	2025, 2026	$130,000
61	Above Ground Fuel Tank and Controller Replacement	2018, 2031	$20,000
61,64,65	Roof Replacement	2024, 2026	$130,000
61,63,64,65	Appliances Replacement (refrigerators, ranges, dryers, washers, dishwashers, water heaters, bunker gear extractors)	2018-2037	$212,745
61	Oil Separator Replacement	2021	$36,000
61	Vehicle Hoists Replacement	2026	$70,000
61,62,64,65	Apparatus Bay Doors Replacement	2018, 2026	$235,000
61,62,63,64,65	Floor Covering Replacement	2016,2018,2031,2033	$219,000
61,63,64,65	LCD Projector and TV Replacements for Training Purposes	2018,2022,2023,2028,2034	$67,800
61,63,64,65	Physical Fitness Equipment	2018-2037	$160,000
Total Cost of Asset Preservation and Fixture Replacement			**$2,680,545**

3.6.6. Cost of Firefighting Equipment Required, 2018 through 2037

Table 13, Summary of Firefighting Equipment Costs, 2018 – 2037, identifies total revenue needed between 2018 and 2037 to fund SFD's equipment purchase and replacement plan.

Table 13: Summary of Equipment Costs, 2018 – 2037

Firefighting Equipment Cost in 2017 Dollars		
Description	**Cycles in Plan**	**Subtotal**
Fire Hoses	6	$206,000
Fire Nozzles and Appliances	2	$120,000
Rescue Tools	2	$80,000
Self-Contained Breathing Apparatus and Air Compressor	2	$1,170,000
IT/Office Equipment	20	$60,000
Mobile Radios	2	$78,000
Portable Radios	2	$456,000
Bunker Gear	2	$406,800
Gurneys	1	$120,000
Defibrillators and Batteries	8	$105,000
Thermal Imaging Cameras	2	$136,000
Positive Pressure Fans	2	$16,000
Maintenance Tools	4	$20,000
Special Operations Equipment	2	$136,000
TOTAL		**$3,109,800**

3.6.7. Apparatus Replacement

Table 14: Apparatus Replacement Summary, identifies the life cycle of apparatus and the total revenue needed between 2018 and 2037 to fund SFD's apparatus purchase and replacement plan.

Table 14: Apparatus Replacement Summary

Apparatus Replacement Schedule in 2017 Dollars									
Year	**Aid Car**	**Fire Engine**	**Ladder Truck**	**Rescue**	**BC**	**Fire Prev**	**Fleet/Maint**	**Staff**	**Estimated Cost**
2018									$0
2019		2			1				$1,359,000
2020									$0
2021						1			$38,000
2022	1								$225,000
2023									$0
2024	2								$450,000
2025					1	1	1	1	$179,000
2026		2		1					$1,500,000
2027									$0
2028								1	$40,000
2029	2					1			$488,000
2030									$0
2031		2			1			1	$1,399,000
2032	2		1						$1,650,000
2033						1	2		$118,000
2034								1	$40,000
2035									$0
2036	2	2							$1,750,000
2037					1	1		1	$97,000
Total 20 Year Apparatus Costs									**$9,377,000**

4. 20 Year Capital Cost Summary

The 20 year capital costs listed in Table 15: 20 Year Cost of Capital Resource Needed to Preserve LOS, 2018 – 2037, provide the first steps toward achieving the adopted station deployment model. The full station deployment model will be capable of providing the resources necessary to maintain concurrency with future development. Completion of this model could potentially be completed in the next 20 years, but depending on funding options may extend beyond the scope of this plan.

The cost of resources itemized in Table 15, are based upon an interim plan to achieve and maintain fire service concurrency over the next 20 years. Capital needs include the construction of two new fire stations, and all of the apparatus (fire engines, ladders etc.), and equipment required to deliver fire and life safety services.

Timing of fire station construction and other capital purchases is consistent with the capital projects detailed in section 3.5 found on pages 22 through 29 of this document. Fire station construction costs are typically spread out over four years for each new station project. Generally the three year plan follows a first year of land acquisition, and if needed, design and engineering. A second year of design approval, permitting, site infrastructure improvements and start of hard construction costs. The third year ends with the completion of construction, acceptance by SFD from the contractor and installation of final furnishings and firefighting equipment.

Phasing of construction and corresponding expenditures is equal to 30 percent of the projects estimated costs in the first year. Second year expenses are estimated at 60 percent of the overall project cost and 10 percent is budgeted in the third and final year of the construction process.

Table 15: 20 Year Cost of Capital Resource Needed to Preserve Level of Service, 2018 – 2037

20 Year Capital Needs																					
Costs in thousands based on 2017 dollars																					
Expense	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**Total**
Station Constr	$8,145	$5,430	$0	$0	$0	$0	$0	$0	$0	$0	$5,153	$2,577	$859	$0	$0	$0	$0	$0	$0	$0	**$22,164**
Preserv & Fixtures	$315	$170	$10	$60	$76	$27	$230	$80	$1,315	$12	$59	$8	$12	$36	$18	$190	$13	$10	$8	$10	**$2,659**
Equip	$746	$47	$108	$5	$48	$80	$40	$45	$431	$5	$68	$128	$113	$10	$48	$861	$74	$45	$208	$0	**$3,110**
Apparatus	$0	$1,359	$0	$38	$225	$0	$450	$179	$1,500	$0	$40	$488	$0	$1,399	$1,650	$118	$40	$0	$1,750	$97	**$9,377**
Annual Total	$9,167	$7,132	$133	$117	$420	$135	$930	$409	$4,466	$23	$3,129	$6,751	$1,165	$2,495	$3,086	$2,147	$249	$108	$4,141	$324	**$37,310**

5. Capital Resource Costs, 2018 – 2037

The following table breaks down the 20 year capital needs into the next six years.

Table 16: Six (6) Year Capital Needs

Six (6) Year Capital Needs							
All Costs in thousands based on 2017 dollars							
	2018	2019	2020	2021	2022	2023	6 Year Total
Station Construction	$8,145	$5,430	$0	$0	$0	$0	$13,575
Asset Preservation & Fixtures	$315	$170	$10	$60	$76	$27	$658
Equipment	$746	$47	$108	$5	$48	$80	$1,034
Apparatus	$0	$1,359	$0	$38	$225	$0	$1,622
Total	$9,206	$7,006	$118	$103	$349	$107	$16,889

6. Financing Plan

Table 17 includes four revenue sources; annual general funds, capital bonds, sale of surplus property, and impact/level of service fees. Full funding of this capital plan depends on maintenance of the SFD annual levy, fire benefit charge, use of existing bond capacity, impact and level of service fees, and an additional capital bond measure of $5 million in 2018 and a $10.65 million in 2028. Through annual operating funds and bonds, the tax payers of SFD will fund approximately 65% of the 20 year capital needs, with impact and level of service fees estimated to provide about 35 percent of the funding required. Impact and level of service fees to be assessed on new development have been estimated at $2,532 per single family residential structure and $5.540 per square foot of commercial space. All impact and level of service fees are designed to raise approximately $14.3 million of the $41.2 million required to fund the 20-year plan.

Table 17: 20 Year Cost/Funding Plan

20 Year Cost/Funding Sources for Capital Needs									
Costs in thousands based on 2017 dollars									
Cost/Funding Source	2018	2019	2020	2021	2022	2023	6 Year Total	2024 +	20 Year Total
Expense Sources									
Station Construction & Land Purchase	$8,145	$5,430	$0	$0	$0	$0	$13,575	$8,589	$22,164
Asset Preservation & Fixtures	$315	$170	$10	$60	$76	$27	$658	$2,001	$2,659
Equipment	$746	$47	$108	$5	$48	$80	$1,034	$2,096	$3,130
Apparatus	$0	$1,359	$0	$38	$225	$0	$1,622	$7,755	$9,377
Debt Interest	$97	$97	$97	$97	$97	$97	$582	$3,305	$3,887
Revenue Sources									
SFD-Annual Operational Revenue to Capital	$1,870	$500	$0	$0	$50	$0	$2,420	$1,350	$3,770
SFD-Taxpayer Bond Funds	$7,233	$6,303	$0	$0	$0	$0	$13,536	$10,411	$23,947
SFD-Sale of Surplus Property	$0	$0	$0	$0	$0	$0	$0	$1,000	$1,000
Developer-Impact/LOS Fees (residential)	$100	$150	$115	$100	$200	$104	$769	$6,400	$7,169
Developer-Impact/LOS Fees (commercial)	$100	$150	$100	$100	$196	$100	$746	$6,400	$7,146
Summary of Revenues less Expenses									
Expense	$9,303	$7,103	$215	$200	$446	$204	$17,471	$23,746	$41,217
Revenue	$9,303	$7,103	$215	$200	$446	$204	$17,471	$25,561	$43,032
Balance	$0	$0	$0	$0	$0	$0	$0	$1,815	$1,815
Ending Taxpayer Bond Fund Balance									
Taxpayer Bond fund balance	$6,303	$0	$0	$0	$0	$0	$0	$0	$0

6.1. Financial Feasibility of Capital Facilities Plan

The revenue resources identified in Table 17, "20 Year Cost/Funding Sources for Capital Needs, indicates that it is financially feasible to implement a portion of the four (4) station deployment model and long range plans adopted by SFD's Board of Commissioners. Final implementation of the station deployment model should be accomplished in the 20 year Capital Plan with the full station model likely to

be deployed by 2037. Key to the financial feasibility of this plan is the implementation of impact and level of service fees on new development. Within the financial plan, impact fees account for approximately $14.3 million in the 20 year funding plan.

6.2. GMA Policy

Washington's Growth Management Act in RCW 36.70A.070 (3) (e) contains a requirement to reassess the land use element of applicable Comprehensive Plans if probable funding falls short of meeting existing needs. This requirement applies to the City of Shoreline, not directly to SFD. The City of Shoreline has responsibility for Comprehensive Land Use Plans that apply to SFD's response area. Currently all of the urban growth area within SFD is contained within the corporate boundaries of the City of Shoreline. SFD's policy is to annually assess probable funding for consistency with this Plan. When funding is likely to fall short, SFD may make adjustments to; levels of service performance standards, timelines for implementation of the Plan, sources of revenue, mitigation measures, or a combination of the previous to achieve a balance between available revenue, needed capital facilities and adequate levels of service. In addition, SFD will provide annual updates to the City of Shoreline that address SFD's ability to fund this Plan. This policy constitutes SFD's response to RCW 36.70A.070 (3) (e).

Appendix A

Exhibit 8: Facility Replacement Schedules and Costs in 2017 Dollars

FACILITIES

Assumption that fire stations have a life cycle of 40 years and a 2017 construction cost of $700 (includes all costs such as site work, construction, soft costs, taxes, and contingencies) and remodel cost of $300 per square foot.

Building	Description	Sq Feet	Replacement Year (Age)	2017 Cost	Replacement Cost
Sta 61	Headquarters: Built in 2001, shop with 4 bays (currently 20,370 sq ft)	23,000	2041	$7,952,000	$16,164,779
Sta 61	Training Tower: Built in 1985???, (50 year life cycle, currently 4,000 sq ft)	6,000	2041	$1,200,000	$2,439,353
Sta 61	Carport: Built in 1999	800	2039	$60,000	$114,966
Sta 62	Built in 1948, 2 bays, no dorm rooms, (currently 1,560 sq ft)	11,000	2028	$8,588,512	$11,888,509
Sta 63	Built in 1970, remodelled in 2002, 3 bays, 7 dorms (currently 7,310 sq ft)	16,650	2018	$13,575,067	$13,575,067
Sta 64	Built in 1999, 3 bays double deep, 2 drive through, 8 dorms	12,286	2039	$3,685,800	$7,062,374
Sta 65	Built in 1999, 3 bays double deep, 1 drive through, 7 dorms	11,768	2039	$3,530,400	$6,764,611
Average cost annually for facilities replacement for the 40 year period is $1,450,241			**Total (modified)**	**$22,163,579**	

** The facilities replacement plan is averaged over a 40 year period due to longer life cycles.*

Attachment 7 - Shoreline Fire Department Capital Facilities & Equipment Plan

Facility Fixtures Purchases Plan

Assumption that items will have different life cycles.

Description		Life Cycle (years)	2017 Age	2017 Cost	1st Purchase Year	1st Purchase Cost	2nd Purchase Year	2nd Purchase Cost	3rd Purchase Year	3rd Purchase Cost	4th Purchase Year	4th Purchase Cost
HVAC System		25				$1,489,254		$0		$0		$0
Vehicle Exhaust System		25				$239,300		$0		$0		$0
Generators		25				$182,466		$0				$0
Above Ground Tank	2001	30	16	$10,000	2031	$15,126		$0		$0		$0
Fuel Pump Controller	1995	20	22	$10,000	2018	$10,300		$0		$0		$0
Roof		25				$164,378		$0		$0		$0
Refridgerator (oldest)		10				$30,418		$0		$0		$0
Range		15				$48,271		$28,082		$0		$0
Clothes Washer		7				$6,279		$7,722		$6,815		$0
Clothes Dryer (oldest)		7				$7,060		$8,682		$8,762		$0
Dishwasher (oldest)		7				$4,330		$5,325		$2,773		$1,702
Water Heater (oldest)		10				$26,754		$26,653		$12,668		$0
Bunker Gear Extractor		15				$21,988		$34,257		$0		$0
Oil Separator (61)	2001	20	16	$36,000	2021	$40,518		$0		$0		$0
Vehicle Hoists	2001	25	16	$70,000	2026	$91,334						
Apparatus Bay Doors		20				$232,447		$0		$0		$0
Floor Covering		15				$131,191		$160,471		$0		$0
LCD Proj 61 Classroom	2013	10	4	$15,000	2023	$17,911	2033	$24,071		$0		$0
TV		10				$43,050		$41,341		$0		$0
Fitness Equipment	5 year total	5	annually	$40,000	2022	$46,371	2027	$53,757	2032	$62,319	2037	$72,244
					Subtotal	$2,848,746	Subtotal	$390,361	Subtotal	$93,336	Subtotal	$73,947

Average cost per year for 20 year fixtures replacement is $170,320

Total $3,406,390

Of note that the construction of station 63 & 62 will reset fixtures to a purchase date of 2018 or 2028, which is reflected in the long-range financial plan.

If a cell is blank for the purchase year then it is beyond 2037, the limit of the plan starting in 2018.

Appendix B

Exhibit 9: Apparatus Replacement Schedule

APPARATUS: Aid Car Purchases Plan

Assumption that current aid cars have a projected life cycle of 7 years in front line position.
The 2017 replacement cost is estimated at $225,000

		1st Purchase		*2nd Purchase*		*3rd Purchase*	
Location	**Current Description**	**Year**	**Cost**	**Year**	**Cost**	**Year**	**Cost**
A63	1151: 2015 Ford	2022	$273,747	2029	$360,232	2036	$474,041
A64	1152: 2015 International	2024	$296,085	2029	$360,232	2036	$474,041
A65	1172: 2017 Ford	2024	$296,085	2032	$405,212		$0
A62	future staffed aid car			2032	$405,212		$0
A61	1101: 2010 Ford (reserve)	trickle down replacement					
EMS61	1083: 2008 Ford (training)	trickle down replacement					

Vehicles will be balanced to equalize mileage, wear and tear. Current style of aid car might be replaced with a heavier duty chassis, which may equate to a longer life cycle of 9 years. Grouping aid car purchases will allow greater economies of scale, but would limit flexibility in rotating aid cars to reserve status.

Average cost per year for aid car replacement over the 20 year period is $167,244

APPARATUS: Structural (Fire Engines, Ladder Truck, Rescue) Purchases Plan

Assumption that projected life cycles are 10, 15, and 20 years respectively in front line position.
Engine estimate $650,000 Ladder truck estimate $1,200,000 Rescue vehicle refurbish estimate $200,000

Location	Current Description	1st Purchase		2nd Purchase		3rd Purchase	
		Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost
E63	2081:2008 Fire Engine		$0	2031	$1,125,590	2036	$1,369,452
E64	2082:2008 Fire Engine	2019	$703,040	2026	$925,153		
E65	2083:2008 Fire Engine	2019	$703,040	2026	$925,153	2036	$1,369,452
E62	2991:1999 Fire Engine (reserve/future)		$0	2031	$1,125,590		
L61	2941:1994 LTI Ladder Truck		$0	2032	$2,161,132		
R61	2992:1999 H&W Pumper		$0	2026	$284,662		
E61	2993:1999 Fire Engine (reserve)	trickle down replacement					
L62	future reserve Ladder Truck	trickle down replacement					

Vehicles will be balanced to equalize mileage, wear and tear. Grouping purchases will allow greater economies of scale and will keep uniformity, but would limit flexibility in rotating vehicles to reserve status.

Avg cost per year for Fire Engine replacement over the 20 year period is $412,323

Avg cost per year for Truck replacement over the 20 year period is $108,057

Avg cost per year for Rescue replacement over the 20 year period is $14,233

APPARATUS: Battalion Chief Vehicle Purchase Plan

Staff vehicles have different life cycles and usage, but will be rotated out of front line use at around 6 years or 60,000 miles.

2017 Cost for a Suburban $59,000

Use	Type	Transition Plan	1st Purchase		2nd Purchase		3rd Purchase		4th Purchase	
			Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost
BC	Suburban	6 yrs/60k miles	2019	$63,814	2025	$80,746	2031	$102,169	2037	$129,276

Vehicles will be "trickled" down from primary use to secondary use.

Average cost per year for BC replacement over the 20 year period is $18,800

Attachment 7 - Shoreline Fire Department Capital Facilities & Equipment Plan

APPARATUS: Fire Prevention Vehicles Purchase Plan

Staff vehicles have different life cycles and usage, but will typically be sold around 150,000 miles.

2017 Cost for a 1/2 Ton Pickup $38,000

			1st Purchase		2nd Purchase		3rd Purchase		4th Purchase		5th Purchase	
Use	Type	Transition Plan	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost
FP Staff	Pickup 1/2 ton	150k miles	2021	$44,455	2025	$52,006	2029	$60,839	2033	$71,173	2037	$83,263

Vehicles will be "trickled" down from primary use to secondary use.

Average cost per year for FP replacement over the 20 year period is $15,587

APPARATUS: Fleet/Facilities Vehicles Purchase Plan

Staff vehicles have different life cycles and usage, but will typically be sold around 150,000 miles.

2017 Cost for a 3/4 Ton Pickup $42,000

			1st Purchase		2nd Purchase		3rd Purchase		4th Purchase		5th Purchase	
Use	Type	Transition Plan	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost
Fleet/Fac.	Pickup 3/4 ton	150k miles	2025	$57,480	2033	$78,665	2033	$78,665		$0		$0

Vehicles will be "trickled" down from primary use to secondary use.

Average cost per year for FF replacement over the 20 year period is $10,741

APPARATUS: General Staff Vehicles Purchase Plan

Staff vehicles have different life cycles and usage, but will typically be sold around 150,000 miles.

2017 Cost for a Medium SUV $40,000

			1st Purchase		2nd Purchase		3rd Purchase		4th Purchase		5th Purchase	
Use	Type	Transition Plan	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost	Year (Age)	Cost
Admin	Medium SUV	150k miles	2025	$54,743	2028	$64,657	2031	$72,730	2034	$81,812	2037	$92,027

Vehicles will be "trickled" down from primary use to secondary use.

Average cost per year for Staff replacement over the 20 year period is $18,298

Appendix C

Exhibit 10: 20 Year Equipment Costs & Replacement Schedule

Equipment Purchases Plan

Assumption that equipment will have different life cycles.

Description	Life Cycle (years)	2017 Age	2017 Cost	1st Purchase Year	1st Purchase Cost	2nd Purchase Year	2nd Purchase Cost	3rd Purchase Year	3rd Purchase Cost	4th Purchase Year	4th Purchase Cost	5th Purchase Year	5th Purchase Cost	6th Purchase Year	6th Purchase Cost	7th Purchase Year	7th Purchase Cost
Hose: 2 1/2"	10	2	$20,000		$0	2025	$27,371	2035	$40,516		$0		$0		$0		$0
1 3/4"	10	7	$35,000	2020	$39,370	2030	$58,278		$0		$0		$0		$0		$0
5" LDH	10	5	$48,000	2022	$58,399	2032	$86,445		$0		$0		$0		$0		$0
Nozzle	15	16	$37,500	2018	$39,000	2033	$70,237		$0		$0		$0		$0		$0
Water Appliances	20	21	$45,000	2018	$46,800		$0		$0		$0		$0		$0		$0
Rescue Tool	15	17	$40,000	2018	$41,600	2033	$74,919		$0		$0		$0		$0		$0
SCBA	15	14	$550,000	2018	$572,000	2033	$1,030,140		$0		$0		$0		$0		$0
SCBA Air Compressor	15	9	$70,000	2023	$88,572		$0		$0		$0		$0		$0		$0
Information Technology	10		$20,000	2025	$27,371	2035	$40,516		$0		$0		$0		$0		$0
Copier	8	11	$10,000	2023	$12,653	2031	$17,317		$0		$0		$0		$0		$0
Mobile Radio	15	10	$39,000	2019	$42,182	2034	$75,968		$0		$0		$0		$0		$0
Portable Radio	7	11	$228,000	2026	$324,515	2033	$427,040		$0		$0		$0		$0		$0
Bunker Gear	10	varies	$203,400	2026	$289,502	2036	$428,533		$0		$0		$0		$0		$0
Gurney	15	new	$120,000	2029	$192,124		$0		$0		$0		$0		$0		$0
Defibrillator	10	new	$35,000	2024	$46,058	2034	$68,177		$0		$0		$0		$0		$0
Defibrillator Battery	3	new	$5,000	2018	$5,200	2021	$5,849	2024	$6,580	2027	$7,401	2030	$8,325	2033	$9,365	2036	$10,534
Thermal Imaging Cam	10	9	$68,000	2018	$70,720	2028	$104,683		$0		$0		$0		$0		$0
Positive Pressure Fan	10	18	$8,000	2019	$8,653	2029	$12,808		$0		$0		$0		$0		$0
Maintenance Tool	5		$5,000	2020	$5,624	2025	$6,843	2030	$8,325	2035	$10,129		$0		$0		$0
Spec Ops Equipment	10	8	$68,000	2020	$76,491	2030	$113,225		$0		$0		$0		$0		$0
Average cost per year for equipment replacement over the 20 year period is					$236,818												