BERKELEY CITY COUNCIL BUDGET & FINANCE COMMITTEE
SPECIAL MEETING

Thursday, May 15, 2025
10:00 AM

Cypress Room – 2180 Milvia Street, 1st Floor, Berkeley, CA 94704

Committee Members:

Mayor Adena Ishii, Councilmembers Rashi Kesarwani and Brent Blackaby
Alternate: Councilmember Igor Tregub

This meeting will be conducted in a hybrid model with both in-person attendance and virtual participation. All Committee meetings are recorded.

Use this URL https://cityofberkeley-info.zoomgov.com/j/1606748374 to access the meeting remotely. To request to speak, use the "raise hand" function in Zoom. To join by phone: Dial **1-669-254-5252 or 1-833-568-8864 (Toll Free)** and Enter **Meeting ID: 160 674 8374.** To provide public comment, press *9 and wait to be recognized by the Chair. To submit a written communication for the Committee's consideration and inclusion in the public record, email policycommittee@berkeleyca.gov.

This meeting will be conducted in accordance with the Brown Act, Government Code Section 54953. Any member of the public may attend this meeting, however, if you are feeling sick, please do not attend the meeting in person.

Pursuant to the City Council Rules of Procedure and State Law, the presiding officer may remove, or cause the removal of, an individual for disrupting the meeting. Prior to removing an individual, the presiding officer shall warn the individual that their behavior is disrupting the meeting and that their failure to cease their behavior may result in their removal. The presiding officer may then remove the individual if they do not promptly cease their disruptive behavior. "Disrupting" means engaging in behavior during a meeting of a legislative body that actually disrupts, disturbs, impedes, or renders infeasible the orderly conduct of the meeting and includes, but is not limited to, a failure to comply with reasonable and lawful regulations adopted by a legislative body, or engaging in behavior that constitutes use of force or a true threat of force.

California Government Code Section 84308 (Levine Act) Parties to a proceeding involving a license, permit, or other entitlement for use are required to disclose if they made contributions over $500 within the prior 12 months to any City employee or officer. Parties and participants with a financial interest are prohibited from making more than $500 in contributions to a decisionmaker for the 12 months after the final decision is rendered on the proceeding. The above contribution disclosures and restrictions do not apply when the proceeding is competitively bid, or involves a personnel or labor contract. For more information, see Government Code Section 84308.

AGENDA

Roll Call

Minutes for Approval

Draft minutes for the Committee's consideration and approval.

1. Minutes - April 24, 2025

Committee Action Items

The public may comment on each item listed on the agenda for action as the item is taken up. The Chair will determine the number of persons interested in speaking on each item. Up to ten (10) speakers may speak for two minutes. If there are more than ten persons interested in speaking, the Chair may limit the public comment for all speakers to one minute per speaker.

Following review and discussion of the items listed below, the Committee may continue an item to a future committee meeting, or refer the item to the City Council.

2. Fire Facility Revenue Measures *(Item contains supplemental material)*
From: Councilmember Terry Taplin (Author), Councilmember Blackaby (Co-sponsor), Councilmember Humbert (Co-sponsor), Mayor Ishii (Co-sponsor)
Referred: April 14, 2024
Due: September 22, 2025
Recommendation: Refer to the City Manager the assessment of potential 2026 revenue ballot measures to support capital improvements to fire department facilities and return recommendations for council adoption.
Financial Implications: See report
Contact: Terry Taplin, Councilmember, District 2, (510) 981-7120

3. Fiscal Year 2026 Mid-Biennial Budget Update *(Item contains supplemental material)*
From: City Manager
Recommendation: Receive a presentation on the preliminary FY 2026 Mid-Biennial Budget Update, including proposed balancing strategies, and provide recommendations.
Financial Implications: See report
Contact: Sharon Friedrichsen, City Manager's Office, (510) 981-7000,
Henry Oyekanmi, Finance, (510) 981-7300

4. Presentation: Marina Fund FY26 Updated Budget and Five-Year Forecast
From: City Manager
Recommendation: Receive an update on the FY25 Marina Fund.
Financial Implications: See report
Contact: Scott Ferris, Parks, Recreation and Waterfront, (510) 981-6700

Unscheduled Items

These items are not scheduled for discussion or action at this meeting. The Committee may schedule these items to the Action Calendar of a future Committee meeting.

5. **Remove pre-transfer eligibility restriction of the transfer tax rebate for wildfire hardening**
   From: Disaster and Fire Safety Commission
   Referred: May 5, 2025
   Due: October 12, 2025
   Recommendation: Adopt first reading of an ordinance removing the 1-year pre-transfer eligibility restriction of the transfer tax rebate for wildfire hardening from BMC 7.52.060, to encourage early mitigation efforts.
   Financial Implications: See report
   Contact: Keith May, Commission Secretary, (510) 981-3473

Items for Future Agendas

- **Requests by Committee Members to add items to the next agenda**

Adjournment

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Written communications submitted by mail or e-mail to the Budget & Finance Committee by 5:00 p.m. the Friday before the Committee meeting will be distributed to the members of the Committee in advance of the meeting and retained as part of the official record.

This meeting will be conducted in accordance with the Brown Act, Government Code Section 54953 and applicable Executive Orders as issued by the Governor that are currently in effect. Members of the City Council who are not members of the standing committee may attend a standing committee meeting even if it results in a quorum being present, provided that the non-members only act as observers and do not participate in the meeting. If only one member of the Council who is not a member of the committee is present for the meeting, the member may participate in the meeting because less than a quorum of the full Council is present. Any member of the public may attend this meeting. Questions regarding public participation may be addressed to the City Clerk Department (510) 981-6900.

COMMUNICATION ACCESS INFORMATION:
This meeting is being held in a wheelchair accessible location. To request a disability-related accommodation(s) to participate in the meeting, including auxiliary aids or services, please contact the Disability Services specialist at ada@berkeleyca.gov, (510) 981-6418 (V), or (510) 981-6347 (TDD) at least three business days before the meeting date. Attendees at public meetings are reminded that other attendees may be sensitive to various scents, whether natural or manufactured, in products and materials. Please help the City respect these needs.
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I hereby certify that the agenda for this meeting of the Standing Committee of the Berkeley City Council was posted at the display case located near the walkway in front of the Maudelle Shirek Building, 2134 Martin Luther King Jr. Way, as well as on the City's website, on May 8, 2025.

Mark Numainville, City Clerk

Communications

Communications submitted to City Council Policy Committees are on file in the City Clerk Department at 2180 Milvia Street, 1st Floor, Berkeley, CA, and are available upon request by contacting the City Clerk Department at (510) 981-6908 or policycommittee@berkeleyca.gov.
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01

BERKELEY CITY COUNCIL BUDGET & FINANCE COMMITTEE
REGULAR MEETING MINUTES

Thursday, April 24, 2025
10:00 AM

Cypress Room – 2180 Milvia Street, 1st Floor, Berkeley, CA 94704

Committee Members:

Mayor Adena Ishii, Councilmembers Rashi Kesarwani and Brent Blackaby
Alternate: Councilmember Igor Tregub

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MINUTES

Roll Call: 10:03 a.m.

Present: Kesarwani, Blackaby, Ishii

Absent: None

Public Comment on Non-Agenda Matters – 0 speakers

Minutes for Approval

Draft minutes for the Committee's consideration and approval.

1. Minutes - March 13, 2025
Action: M/S/C (Blackaby/Kesarwani) to approve the minutes of 3/13/2025.
Vote: All Ayes.

Committee Action Items

The public may comment on each item listed on the agenda for action as the item is taken up. The Chair will determine the number of persons interested in speaking on each item. Up to ten (10) speakers may speak for two minutes. If there are more than ten persons interested in speaking, the Chair may limit the public comment for all speakers to one minute per speaker.

Following review and discussion of the items listed below, the Committee may continue an item to a future committee meeting, or refer the item to the City Council.

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From: City Manager
Recommendation: Receive a presentation on the preliminary FY 2026 Mid-Biennial Budget Update, including proposed balancing strategies, and provide recommendations.
Financial Implications: See report
Contact: Sharon Friedrichsen, Budget Manager, (510) 981-7000, City Manager's Office, Henry Oyekanmi, Finance, (510) 981-7300
Action: 1 speaker. Presentation made and discussion held. Item continued to the next meeting.

3. Fire Facility Revenue Measures
From: Councilmember Terry Taplin (Author), Councilmember Blackaby (Co-sponsor), Councilmember Humbert (Co-sponsor), Mayor Ishii (Co-sponsor)
Referred Date: April 14, 2025
Due Date: September 22, 2025
Recommendation: Refer to the City Manager the assessment of potential 2026 revenue ballot measures to support capital improvements to fire department facilities and return recommendations for council adoption.
Financial Implications: See report
Contact: Terry Taplin, Councilmember, District 2, (510) 981-7120
Action: Item continued to the next meeting.

Unscheduled Items

These items are not scheduled for discussion or action at this meeting. The Committee may schedule these items to the Action Calendar of a future Committee meeting.

- None

Items for Future Agendas

- None

Adjournment

Action: M/S/C (Ishii/Kesarwani) to adjourn the meeting.
Vote: All Ayes.

Adjourned at 12:08 p.m.

I hereby certify that the foregoing is a true and correct record of the Budget & Finance Committee meeting held on April 24, 2025.

_____
Neetu Salwan, Assistant City Clerk

Communications

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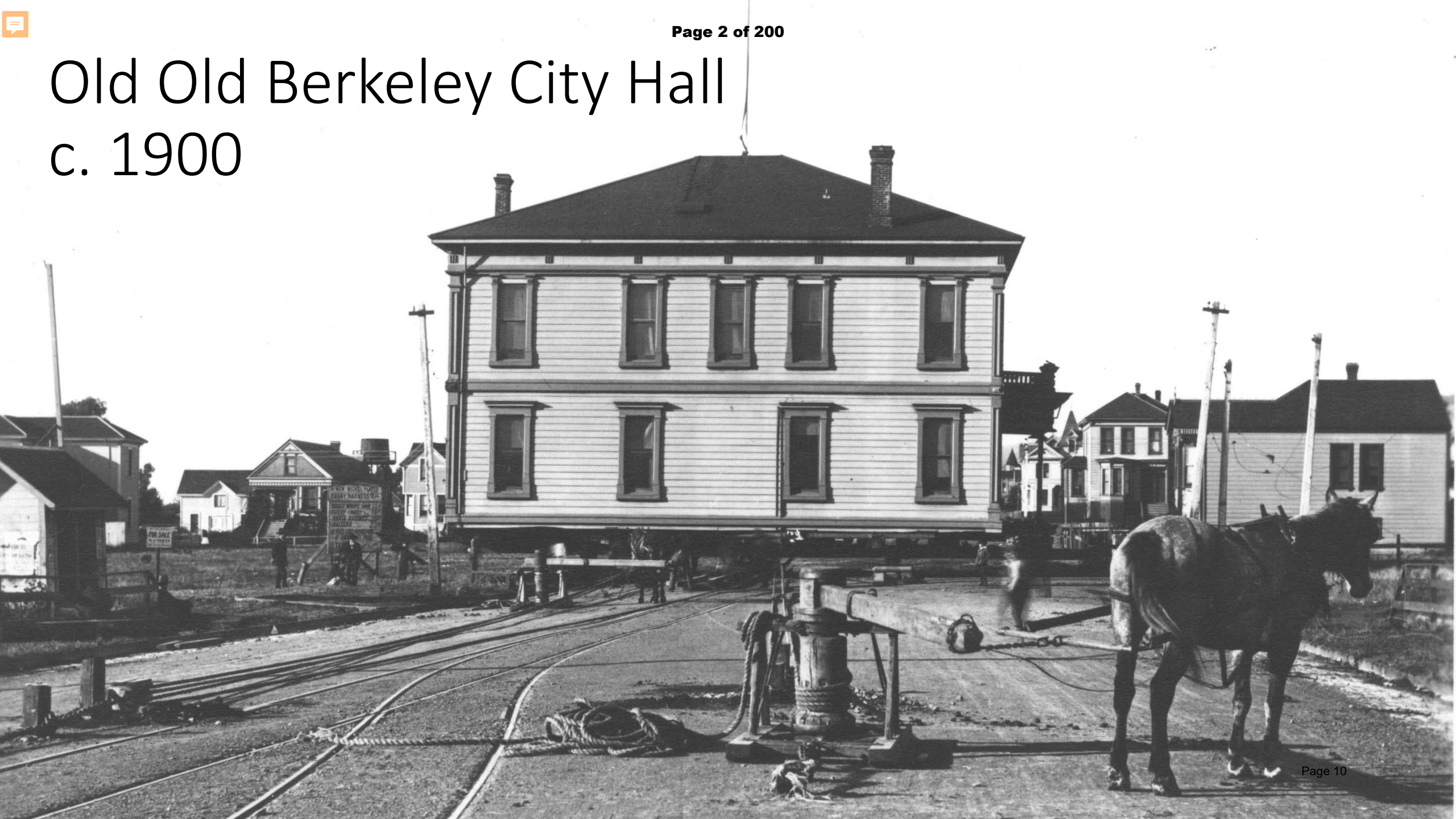
02

Item 3. Fire Facility Revenue Measures

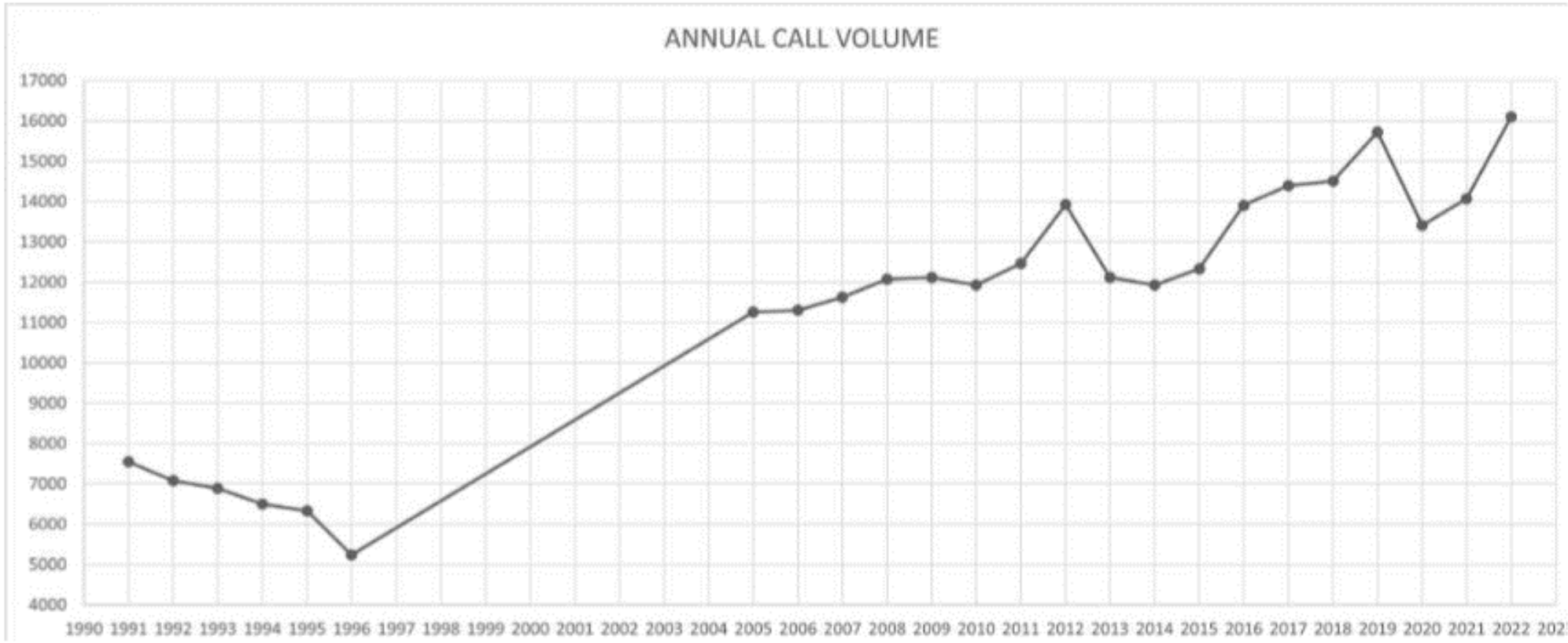
From: Councilmember Terry Taplin (Author), Councilmember Blackaby (Co-sponsor), Councilmember Humbert (Co-sponsor), Mayor Ishii (Co-sponsor)

Old Old Berkeley City Hall
c. 1900



Expanding Responsibilities

Expanding Demand



Berkeley's Local Hazard Mitigation Plan

Hazard	Likelihood	Severity of Impact
Earthquake	Likely	Catastrophic
Wildland-Urban Interface Fire	Likely	Catastrophic
Extreme Heat	Likely	Moderate to Catastrophic
Rainfall-Triggered Landslide	Likely	Minor to Catastrophic
Sea Level Rise	Likely	Minor to Major
Hazardous Materials Release	Likely	Minor to Catastrophic
Infectious Disease	Likely	Minor to Catastrophic

Current Fire Facilities and Upgrades Required

Station 1
Relocation and expansion of Fire Station 1 to a more commercial site in the same response area.

Station 2
Replace the station on the existing site with a new 3-story Building.

Station 3
Renovation and expansion of existing fire station.

Station 4
Replacement of existing building on an expanded site.

Station 5
Replacement of existing station with a new 2-story building.

Station 6
Renovation and expansion of the existing fire station.

Station 7
Renovation and expansion of existing fire station.

Warehouse
Renovation and Expansion of existing space.

Headquarters
Relocation of headquarters to a city owned building.

Training Facility
Relocation of the training facility in partnership with other local Municipalities.

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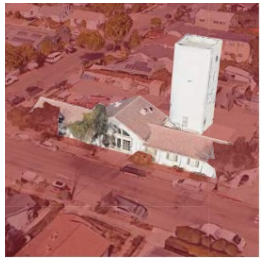


Training Facility
Relocation of the training facility in partnership with other local Municipalities.

Upgrade Costs

Station Number	Upgrades that need to be made	Rationale	Low end ($Mil)	High end ($Mil)
1	Relocation, New site on or near San Pablo Ave	The station is surrounded by residential lots. Expansion would require purchasing the land and removal of an enormous amount of housing units.	42	47
2	Replacement	Fire Station No. 2 is the Fire Department's most populated and busiest station with multiple cross staff units. It does not allow the staging of all apparatus for response. The replacement of the station includes a parking deck which allows this station to meet all current and projected needs.	51	56
3	Renovation and Expansion	The renovation will focus on improving the health, safety and privacy aspects of the fire station.	12	16
4	Replacement	This area has been identified as an area that should plan for an additional ambulance. The existing fire station can not be expanded for this new unit due to its unique configuration. The recommendation for this station is to replace it at the existing site and expand the site into the adjacent road right of ways.	36	41
5	Replacement	The Department's second most populated and busiest station. Houses multiple support units. The station has been renovated multiple times and is past its useful life. The site area is very compact and does not currently allow adequate space for site operations. The recommended option replaces the station onsite and adds subterranean parking for staff and the supporting units.	53	58
6	Renovation and Expansion	Renovation and expansion of the existing fire station to provide a dedicated fitness room, turnout storage, private offices and private sleeping room. The entire station will be renovated to allow modernize the kitchen, dining and dayroom.	12	15
7	Renovation and Expansion	Station 7 is the Department's newest station; however, it is lacking some of the basic spaces required to provide a safe work environment. Primarily the missing space is a dedicated turnout room with decontamination equipment. In addition, additional sleeping rooms are necessary to accommodate the move up staffing during fire season.	10	13
Headquarters	New Headquarters	Current location cannot accommodate the growing staff or the ambulance deployment center.	22	36
Training Center	Renovation	The current location is undersized and located in a residential neighborhood which impacts what training can occur there. The region is missing a large training facility for emergency responders	81	90

Total Upgrade Costs

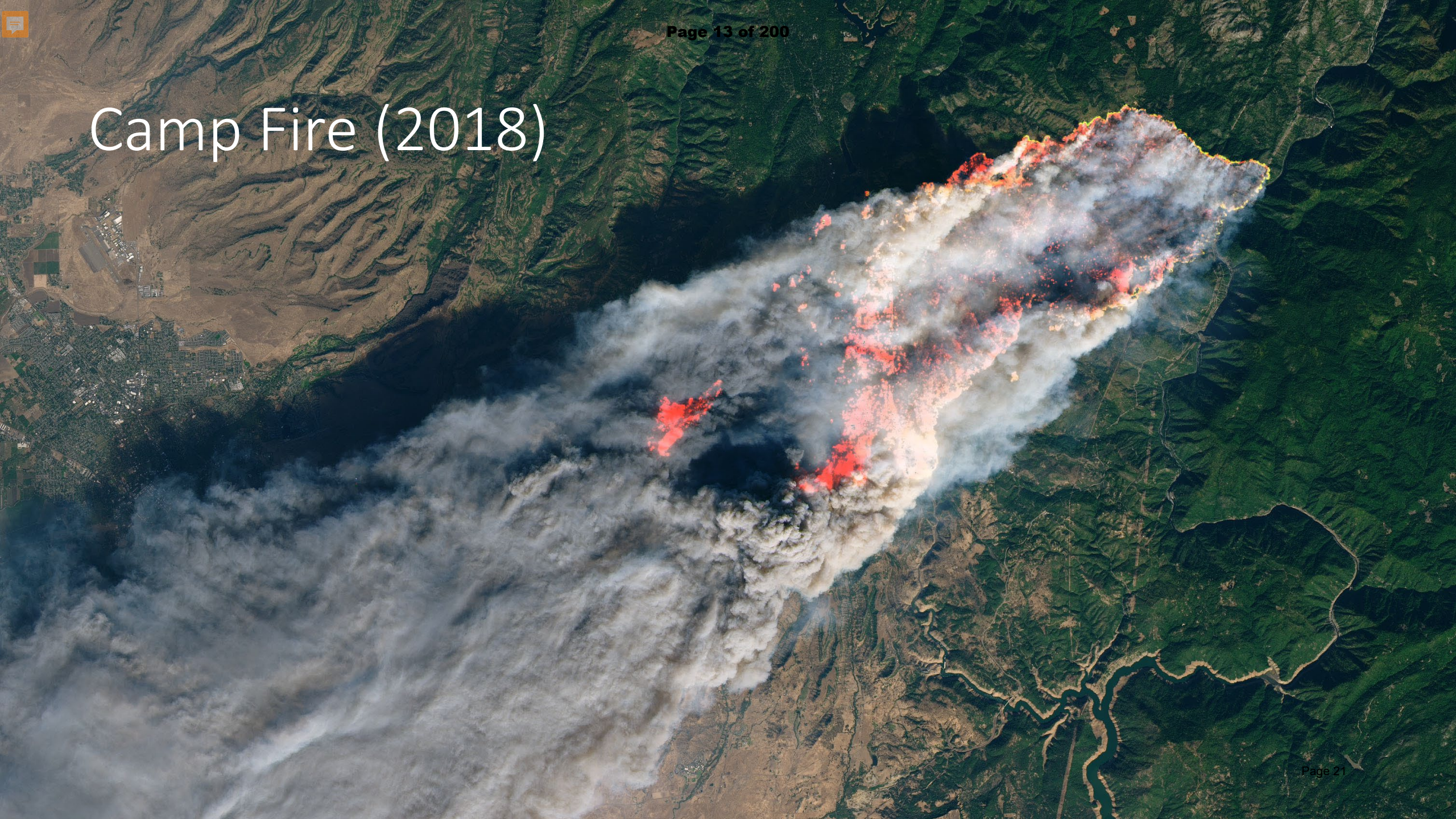
$321-374 Million

Tunnel Fire (1991)

Rim Fire (2013)

Tubbs Fire (2017)

Camp Fire (2018)



Caldor Fire (2021)

Eaton and Palisades Fires (2025)

Advancing The City of Berkeley Strategic Plan

“Create a resilient, safe, connected and prepared city”

“Provide state-of-the-art-well-maintained infrastructure, amenities, and facilities”

Recommendation

Refer to the City Manager the assessment of potential 2026 revenue ballot measures to support capital improvements to fire department facilities and return recommendations for council adoption.

SUPPLEMENTAL AGENDA MATERIAL

for Supplemental Packet 1

Meeting Date: April 24th 2025

Item Number: 3

Item Description: Fire Facility Revenue Measures

Submitted by: Councilmember Terry Taplin

Updating the Rationale section to include language regarding financing capital improvements in regard to the Fire Department Master Plan.

CONSENT CALENDAR
4/29/2025

To: Honorable Mayor and Members of the City Council
From: Councilmember Terry Taplin

Subject: Fire Facility Revenue Measures

RECOMMENDATION

Refer to the City Manager the assessment of potential 2026 revenue ballot measures to support capital improvements to fire department facilities and return recommendations for council adoption.

FINANCIAL IMPLICATIONS

Community polling to help set priorities for a bond initiative that will exclusively pay for remodeling or replacement of fire facilities is expected to cost between $20,000 and $50,000.

CURRENT SITUATION AND ITS EFFECTS

The Berkeley Fire Department Facilities Master Plan (FMP) establishes a ten-year timeline to implement critical remodels and replacements of fire facility capital improvements necessary to keep pace with the department's evolving and expanding mission, meet the growing demand for service in the city, and comply with modern building codes and industry standards, and align with best practices. Needed improvements include renovation and expansion (Fire Stations 3, 6, and 7), on-site replacement (Fire Stations 2, 4, and 5), relocation (Fire Station 1, Fire Administration, Fire Training Center), and remodeling (Fire Warehouse).

The 2023 Standards of Coverage and Community Risk Assessment (SOC) indicate that the city has an appropriate number of stations, which need to be maintained to retain this status. Furthermore, the SOC recommends strategic staffing in the downtown core and additional staffing during wildfire weather, both of which are beyond the current capacity of existing stations.

The budgets below represent an "Order of Magnitude Cost Plan," intended to estimate costs within a broad range rather than the lowest possible amount. These figures are for planning purposes and exclude escalation beyond 2024, property acquisition, and program management costs. They do include construction, equipment, furnishings, design, environmental review, permitting, and related fees. The proposed phasing prioritizes projects with the highest call volumes and staffing needs. Station 1 is slated to begin first as a relocation; once complete, the original facility can serve as temporary housing for future replacements.

SEQUENCED PROJECTS

Design Start		Rough Order of Magnitude Costs LOW x $ Million	HIGH x $ Million
2024	**Fire Station 1** Relocation New site on/near San Pablo Ave	$42	$47
2026	**Fire Station 2** Replacement Temporary Location - Station 1, 4, 5	$51	$56
2028	**Fire Station 5** Replacement Temporary Location - Station 1, 4, 2	$53	$58
2030	**Fire Station 4** Replacement Temporary Location - Station 2, 6	$36	$41

INDEPENDENT PROJECTS

Design Start		Rough Order of Magnitude Costs LOW x $ Million	HIGH x $ Million
2023	**New Headquarters** Site TBD	$33	$36
2023	**Training Center** Phase 1 Renovation Phase 2 Replacement Regional Site TBD	$81	$90
2026	**Fire Station 3** Renovation + Expansion Temporary Location - Station 2, 5	$12.0	$16
2028	**Fire Station 6** Renovation + Expansion Temporary Location - Trailer on site	$11.6	$15
2030	**Fire Station 7** Renovation + Expansion Temporary Location - TBD	$10.0	$13
	TOTAL Rough Order of Magnitude Project Cost	$330	$372

BACKGROUND

The history of Berkeley's fire service begins in 1877 with the first volunteer hose-and-bucket brigade founded by residents of West Berkeley. Following Berkeley's incorporation, the Board of Town Trustees recognized Beacon #1 Fire Company as the Volunteer Fire Department. The Town Trustees established the Paid Fire Department on October 1, 1904, and appointed James Keney as Berkeley's first fire chief. Over the last one hundred and twenty-one years, the Berkeley Fire Department has provided dedicated exemplary service to the community 24 hours a day responding to medical emergencies, fires, hazardous material events, technical rescues, utility emergencies, water rescues, disaster response, active shooter incidents, vehicle extrications, and other critical and life-threatening events. The cities growing population, increasing density, increasing physical height of structures along with advances in technology have driven an expansion and evolution of the Department's mission which require modern facilities with a footprint of adequate size to sustain operations.

Since 1995, the volume of local calls for service for emergencies has grown from 6,300 to 17,500 calls annually in 2024. There are now spikes of over 300% in the daily average call volume during extreme weather events that necessitate additional surge staffing. Space for these additional employees and emergency response vehicles is required in the city's firehouses. As these extreme weather events increase in frequency, the Department is planning for how to integrate these modifications into its long-term infrastructure plans.

In order to fulfill the modern mission of the fire department and in order to be prepared and to address hazards while adhering to emission standards, apparatus have grown in size including wildland engines, ambulances, off-road vehicles and boats, and other equipment.

Research spanning decades, continents, and more than 80,000 firefighters validates the connection between firefighting and occupational cancer. Cancer is the most dangerous threat to firefighter health and safety today. Firefighters have a 9 percent higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population, according to research by the CDC/National Institute for Occupational Health and Safety (NIOSH). This has driven ire station best practices have evolved to update spatial layouts to include dedicated turnout and decontamination rooms, dedicated fitness rooms, airlock separation between apparatus bays and living quarters, and reorganized circulation, to minimize exposure to carcinogens.

In order to fulfill commitments to reduce carbon emissions and promote the health of firefighters and the community at large, the City of Berkeley and the Berkeley Fire Department are moving to electrify stations and apparatus. The process of electrifying fire stations is expensive, and staff has determined that the investment that would be required should be deferred until the fire stations undergo needed remodels, rebuilds or relocation. To invest in these upgrades prior to these known and impending actions was not seen as fiscally responsible when the analysis was completed.

To accommodate the needs of our existing diverse and inclusive workforce, and to create spaces that welcome higher percentages of under-represented groups, the Department calls for increased privacy and accessibility in stations via gender-neutral restrooms, single occupancy bedrooms, and dedicated offices for supervisors.

The majority of the city’s fire stations were built in the 1960s, receiving seismic upgrades in the 1990s while the Training Facility was built in 1996, the Public Safety Building in 2000, and Station 7 in 2006. Despite having undergone some degree of modification since construction, most fire stations currently lack the specifications to properly house modern apparatus, equipment, and cannot absorb additional units and new staff, to meet current policy, codes, and health, safety, and inclusion standards. Many stations also contain outdated features, hinder alignment with best practices for health and the environment.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS

There are no immediate impacts from conducting polling, however, if a tax measure was successful and this work occurred it would allow for electrification of the Department’s fleet in alignment with the City’s long-term goals outlined in the Municipal Fleet Electrification Plan.

According to current policy, any new construction in Berkeley is required to be all electric. Going all-electric for buildings and the fleet will require significant revisions to the site power supply including:

- Changing the type of power entering the building (from single to three-phase in most instances)
- Increasing the electrical service to 800 or 1200 amps
- Installing solar arrays and energy storage systems

This move improves health and safety at stations and addresses environmental considerations by:

- Improving indoor air quality by eliminating natural gas (for heating and cooking) in the buildings
- Decreasing fossil fuel reliance and carbon pollution by providing electric charging stations for fire department vehicles and apparatus, and staff's personal electric vehicles
- Employing clean energy sources while the power grid is up and during emergencies when it is down.

RATIONALE FOR RECOMMENDATION

Renovation, replacement, and relocation of stations and facilities are required to align the Department with best practices, address modern needs, and keep up with operational demands. Furthermore, the city's Local Hazard Mitigation Plan indicates that the city is vulnerable to earthquake, wildland-urban interface fire, extreme heat, events, and assesses the likelihood of each to be high and the impacts of each risk to be severe. Additionally, daily calls for service and the response-needs of the city continue to grow.

Financing capital improvements to city facilities pursuant to the Fire Department Master Plan, both furthers the modernization of Berkeley's Fire service and progress towards addressing the city's unfunded liabilities related to deterred infrastructure maintenance thus advancing City of Berkeley Strategic Plan goes to *create a resilient, safe, connected and prepared city,* and *provide state-of-the-art-well-maintained infrastructure, amenities, and facilities.*

ALTERNATIVE ACTIONS CONSIDERED

Waiting to pursue revenue measures in subsequent cycles, seeking to use General Fund dollars, and inaction were all considered but the current recommendation was ultimately decided.

CONTACT PERSON

Councilmember Taplin
Council District 2
510-981-7120

Attachments:

1. Fire Department Master Plan
2. Standards of Coverage

BERKELEY CITY COUNCILMEMBER
TERRY TAPLIN
DISTRICT 2

SUPPLEMENTAL AGENDA MATERIAL

for Supplemental Packet 1

Meeting Date: April 24th 2025

Item Number: 3

Item Description: Fire Facility Revenue Measures

Submitted by: Councilmember Terry Taplin

Updating the Rationale section to include language regarding financing capital improvements in regard to the Fire Department Master Plan.

BERKELEY CITY COUNCILMEMBER
TERRY TAPLIN
DISTRICT 2

CONSENT CALENDAR
4/29/2025

To: Honorable Mayor and Members of the City Council
From: Councilmember Terry Taplin

Subject: Fire Facility Revenue Measures

RECOMMENDATION
Refer to the City Manager the assessment of potential 2026 revenue ballot measures to support capital improvements to fire department facilities and return recommendations for council adoption.

FINANCIAL IMPLICATIONS
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CURRENT SITUATION AND ITS EFFECTS
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The 2023 Standards of Coverage and Community Risk Assessment (SOC) indicate that the city has an appropriate number of stations, which need to be maintained to retain this status. Furthermore, the SOC recommends strategic staffing in the downtown core and additional staffing during wildfire weather, both of which are beyond the current capacity of existing stations.

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volumes and staffing needs. Station 1 is slated to begin first as a relocation; once complete, the original facility can serve as temporary housing for future replacements.

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The history of Berkeley's fire service begins in 1877 with the first volunteer hose-and-bucket brigade founded by residents of West Berkeley. Following Berkeley's incorporation, the Board of Town Trustees recognized Beacon #1 Fire Company as the Volunteer Fire Department. The Town Trustees established the Paid Fire Department on October 1, 1904, and appointed James Keney as Berkeley's first fire chief. Over the last one hundred and twenty-one years, the Berkeley Fire Department has provided dedicated exemplary service to the community 24 hours a day responding to medical emergencies, fires, hazardous material events, technical rescues, utility emergencies, water rescues, disaster response, active shooter incidents, vehicle extrications, and other critical and life-threatening events. The cities growing population, increasing density, increasing physical height of structures along with advances in technology have driven an expansion and evolution of the Department's mission which require modern facilities with a footprint of adequate size to sustain operations.

Since 1995, the volume of local calls for service for emergencies has grown from 6,300 to 17,500 calls annually in 2024. There are now spikes of over 300% in the daily average call volume during extreme weather events that necessitate additional surge staffing. Space for these

additional employees and emergency response vehicles is required in the city's firehouses. As these extreme weather events increase in frequency, the Department is planning for how to integrate these modifications into its long-term infrastructure plans.

In order to fulfill the modern mission of the fire department and in order to be prepared and to address hazards while adhering to emission standards, apparatus have grown in size including wildland engines, ambulances, off-road vehicles and boats, and other equipment.

Research spanning decades, continents, and more than 80,000 firefighters validates the connection between firefighting and occupational cancer. Cancer is the most dangerous threat to firefighter health and safety today. Firefighters have a 9 percent higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population, according to research by the CDC/National Institute for Occupational Health and Safety (NIOSH). This has driven ire station best practices have evolved to update spatial layouts to include dedicated turnout and decontamination rooms, dedicated fitness rooms, airlock separation between apparatus bays and living quarters, and reorganized circulation, to minimize exposure to carcinogens.

In order to fulfill commitments to reduce carbon emissions and promote the health of firefighters and the community at large, the City of Berkeley and the Berkeley Fire Department are moving to electrify stations and apparatus. The process of electrifying fire stations is expensive, and staff has determined that the investment that would be required should be deferred until the fire stations undergo needed remodels, rebuilds or relocation. To invest in these upgrades prior to these known and impending actions was not seen as fiscally responsible when the analysis was completed.

To accommodate the needs of our existing diverse and inclusive workforce, and to create spaces that welcome higher percentages of under-represented groups, the Department calls for increased privacy and accessibility in stations via gender-neutral restrooms, single occupancy bedrooms, and dedicated offices for supervisors.

The majority of the city’s fire stations were built in the 1960s, receiving seismic upgrades in the 1990s while the Training Facility was built in 1996, the Public Safety Building in 2000, and Station 7 in 2006. Despite having undergone some degree of modification since construction, most fire stations currently lack the specifications to properly house modern apparatus, equipment, and cannot absorb additional units and new staff, to meet current policy, codes, and

health, safety, and inclusion standards. Many stations also contain outdated features, hinder alignment with best practices for health and the environment.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS

There are no immediate impacts from conducting polling, however, if a tax measure was successful and this work occurred it would allow for electrification of the Department's fleet in alignment with the City's long-term goals outlined in the Municipal Fleet Electrification Plan. According to current policy, any new construction in Berkeley is required to be all electric. Going all-electric for buildings and the fleet will require significant revisions to the site power supply including:

- Changing the type of power entering the building (from single to three-phase in most instances)
- Increasing the electrical service to 800 or 1200 amps
- Installing solar arrays and energy storage systems

This move improves health and safety at stations and addresses environmental considerations by:

- Improving indoor air quality by eliminating natural gas (for heating and cooking) in the buildings
- Decreasing fossil fuel reliance and carbon pollution by providing electric charging stations for fire department vehicles and apparatus, and staff's personal electric vehicles
- Employing clean energy sources while the power grid is up and during emergencies when it is down.

RATIONALE FOR RECOMMENDATION

Renovation, replacement, and relocation of stations and facilities are required to align the Department with best practices, address modern needs, and keep up with operational demands. Furthermore, the city's Local Hazard Mitigation Plan indicates that the city is vulnerable to earthquake, wildland-urban interface fire, extreme heat, events, and assesses the likelihood of each to be high and the impacts of each risk to be severe. Additionally, daily calls for service and the response-needs of the city continue to grow.

Financing capital improvements to city facilities pursuant to the Fire Department Master Plan, both furthers the modernization of Berkeley's Fire service and progress towards addressing the city's unfunded liabilities related to deterred infrastructure maintenance thus advancing City of

BERKELEY CITY COUNCILMEMBER
TERRY TAPLIN
DISTRICT 2

Berkeley Strategic Plan goes to *create a resilient, safe, connected and prepared city,* and *provide state-of-the-art-well-maintained infrastructure, amenities, and facilities.*

ALTERNATIVE ACTIONS CONSIDERED

Waiting to pursue revenue measures in subsequent cycles, seeking to use General Fund dollars, and inaction were all considered but the current recommendation was ultimately decided.

CONTACT PERSON

Councilmember Taplin
Council District 2
510-981-7120

Attachments:

1. Fire Department Master Plan
2. Standards of Coverage

BERKELEY CITY COUNCILMEMBER
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DISTRICT 2

CONSENT CALENDAR
4/29/2025

To: Honorable Mayor and Members of the City Council
From: Councilmember Terry Taplin (Author), Councilmember Blackaby (Co-sponsor), Councilmember Humbert (Co-sponsor), Mayor Ishii (Co-sponsor)

Subject: Fire Facility Revenue Measures

RECOMMENDATION

Refer to the City Manager the assessment of potential 2026 revenue ballot measures to support capital improvements to fire department facilities and return recommendations for council adoption.

FINANCIAL IMPLICATIONS

Community polling to help set priorities for a bond initiative that will exclusively pay for remodeling or replacement of fire facilities is expected to cost between $20,000 and $50,000.

CURRENT SITUATION AND ITS EFFECTS

The Berkeley Fire Department Facilities Master Plan (FMP) establishes a ten-year timeline to implement critical remodels and replacements of fire facility capital improvements necessary to keep pace with the department's evolving and expanding mission, meet the growing demand for service in the city, and comply with modern building codes and industry standards, and align with best practices. Needed improvements include renovation and expansion (Fire Stations 3, 6, and 7), on-site replacement (Fire Stations 2, 4, and 5), relocation (Fire Station 1, Fire Administration, Fire Training Center), and remodeling (Fire Warehouse).

The 2023 Standards of Coverage and Community Risk Assessment (SOC) indicate that the city has an appropriate number of stations, which need to be maintained to retain this status. Furthermore, the SOC recommends strategic staffing in the downtown core and additional staffing during wildfire weather, both of which are beyond the current capacity of existing stations.

The budgets below represent an "Order of Magnitude Cost Plan," intended to estimate costs within a broad range rather than the lowest possible amount. These figures are for planning purposes and exclude escalation beyond 2024, property acquisition, and program management costs. They do include construction, equipment, furnishings, design, environmental review, permitting, and related fees. The proposed phasing prioritizes projects with the highest call

volumes and staffing needs. Station 1 is slated to begin first as a relocation; once complete, the original facility can serve as temporary housing for future replacements.

SEQUENCED PROJECTS

Design Start		Rough Order of Magnitude Costs LOW x $ Million	HIGH x $ Million
2024	**Fire Station 1** Relocation New site on/near San Pablo Ave	$42	$47
2026	**Fire Station 2** Replacement Temporary Location - Station 1, 4, 5	$51	$56
2028	**Fire Station 5** Replacement Temporary Location - Station 1, 4, 2	$53	$58
2030	**Fire Station 4** Replacement Temporary Location - Station 2, 6	$36	$41

INDEPENDENT PROJECTS

Design Start		Rough Order of Magnitude Costs LOW x $ Million	HIGH x $ Million
2023	**New Headquarters** Site TBD	$33	$36
2023	**Training Center** Phase 1 Renovation Phase 2 Replacement Regional Site TBD	$81	$90
2026	**Fire Station 3** Renovation + Expansion Temporary Location - Station 2, 5	$12.0	$16
2028	**Fire Station 6** Renovation + Expansion Temporary Location - Trailer on site	$11.6	$15
2030	**Fire Station 7** Renovation + Expansion Temporary Location - TBD	$10.0	$13
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EXECUTIVE SUMMARY

The City of Berkeley (City) Fire Department (Department) retained Citygate Associates, LLC (Citygate) to conduct the City's first Standards of Cover (SOC) Study and Community Risk Assessment to define appropriate levels of service based on a comprehensive analysis of historical performance; expectations; and existing and projected community risk factors, hazards, population growth and aging, topography, and the density and vertical growth of the build environment. Deployment strategies will then be proposed as indicated by the analysis. The study will assist the City in determining whether the current levels of service are appropriate for the risks to be protected in the City, and that the methods to ensure suitable service levels are consistent with generally accepted national standards and benchmarks.

This report is presented in two volumes. The Technical Report (**Volume 1**) includes: this Executive Summary, which contains a summary of our analysis and suggested next steps; Sections 1 and 2, which contain the deployment and SOC portions of the study; and a comprehensive Community Risk Assessment provided as **Appendix A**. A Map Atlas of deployment coverage measures is provided in **Volume 2**.

Throughout this report, Citygate makes key findings and, where appropriate, specific action item recommendations. Overall, there are 17 key findings and 10 specific action item recommendations. This summary cannot discuss every single issue in depth, but all are important and would not have been included in the Final Report otherwise.

POLICY CHOICES FRAMEWORK

While there are no mandatory federal or state regulations directing the level of fire service response times and outcomes, there are guidelines and best practices from the National Fire Protection Association (NFPA), the Insurance Services Office (ISO), the Commission on Fire Accreditation International (CFAI), and the California Occupational Safety and Health Administration (Cal/OSHA). The level of service provided, and any resultant costs, is the choice of local communities in the United States. The body of regulations related to fire services suggests that if fire services are provided, they must be provided with the safety of the firefighters and the publicpubic in mind. Thus, there is often a constructive tension between the desired level of service and the level that can be funded, and many communities may not have the level of service they desire. The City's investments in fire services over the past decades serve as its baseline commitment today.

This study identifies that the community has a high expectation for service delivery and, in order to meet that expectation, additional investment in fire services is necessary. The fundamental policy choices that drive a city's investment in fire services are derived from two key questions:

1. **What outcomes are desired for the emergencies to which the Department responds?** Is the desire to keep a building fire to the room, building, or block of origin, and to provide emergency medical care in time to lessen the possibility of preventable death and severe disability?

2. **Should equitable response time coverage be provided to all neighborhoods with similar risks (building types and population density) to protect?** Once desired outcomes are determined, fire and emergency medical services (EMS) first responder and ambulance deployment can then be designed to cover the most geography in the fewest minutes to meet stated outcome goals. In a large city with multiple neighborhoods such as Berkeley, it must be determined whether similarly populated areas should receive similar response time performance from both fire and ambulance services units.

RESPONSE PERFORMANCE SUMMARY

Citygate finds that the Department is organized only to accomplish "yesterday's mission" and is struggling to meet current demand, much less the future growth of the City and university. The Department is working to adopt best practices, become proactive, and pursue understanding and service provision that is data driven. Citygate found a caring, committed workforce that is *strongly dedicated* to the City and agency, using best practices where possible to anticipate and meet the risks to be protected in the City. In conducting this study, Citygate received outstanding cooperation from Department and City executives. However, the Department is challenged by EMS call volume growth, which significantly exceeds crew workload limits. The growth in population and medical incident demand which has occurred in the City over the past two decades, and which is projected to continue, will increasingly strain the Department's response times, which are already substantially slower than best practice recommendations. There are solutions to these issues that will take more than one fiscal year to correct. City leadership can use this study as a master plan to drive policy choices over the next several years.

The Department serves a diversity of populations, from residents to business employees and students. These populations, across a varied zoning pattern combined with topography and road design constraints, place significant restrictions on best practice-based fire and EMS response times. Population drives service demand, and development brings population. Of the top 50 largest cities in California, Berkeley is already the second most densely populated city per square mile—second only to San Francisco—*without* factoring in the daily influx of students, Citywide employment, tourism, and cars on the freeways. The City needs an ***urban*** level of fire, EMS, and specialty rescue services.

The Department protects large tourism and non-resident population densities. As different areas continue to infill develop with resultant increases in population density, the Department's firefighting and ambulance services will need adjustment just to *recover* timely response capacity, much less *improve* response times equitably across all neighborhoods—more so when simultaneous incidents occur at peak hours of the day.

Fire service deployment, simply summarized, is about the *speed* and *weight* of response. *Speed* refers to initial (first-due) response of all-risk intervention resources (e.g., engines, ladder trucks, and ambulances) strategically deployed across a jurisdiction for response to emergencies within a travel time interval sufficient to control routine-to-moderate emergencies without the incident escalating to greater size or severity. *Weight* refers to multiple-unit (Effective Response Force, or ERF) responses for more serious emergencies such as building fires, multiple-patient medical emergencies, vehicle collisions with extrication required, or technical rescue incidents. In these situations, enough firefighters must be assembled within a time interval to safely control the emergency and prevent it from escalating into an even more serious event.

Throughout the City, while the substantial growth in EMS incidents over the past two decades seems all-consuming, for the foreseeable future there will always be the need for both a first-due unit and multiple-unit response consistent with current best practices to limit the risk of fire damage to only part of an affected building and keep wildland fires small within the initial response force's capabilities. Stated this way, *all neighborhoods need a standby and readily available firefighting force* that can respond when fires break out, regardless of peak-hour EMS workload. As demonstrated by current extreme weather emergencies, there is also a need for a strong Fire Department during natural disasters, as the vulnerable members of the City's population will need help from first responders.

INTEGRATED CHALLENGES – RESPONSE TIME, INCIDENT VOLUME, AND GROWTH

The following table summarizes Citygate's benchmarking the Department's operational response performance for reporting year (RY) 2020/21 relative to national recognized best practices. These best practices were used as the City/Department do not yet have adopted performance measures.

Table 1—Response Performance Summary – RY 20/21

Response Component	Best Practice		90th Percentile Performance	Performance Versus Best Practice and Current Goal
	Time	Reference		

Response	Best Practice		90th Percentile	Performance Versus Best
Call Processing / Dispatch	1:30	NFPA	**2:29**	**+ 0:59**
Crew Turnout	2:00	Citygate	**2:05**	**+ 0:05**
First-Unit Travel	4:00	NFPA	**5:53**	**+ 1:53**
First-Unit Call to Arrival	7:30	Citygate	**9:32**	**+ 2:02**
ERF Call to Arrival	11:30	Citygate	**18:50**	**+ 7:20**

As the table shows, call processing is taking longer than best practice. Crew turnout performance is nearly meeting recognized best practice goals. First-unit travel performance is 1:53 minutes *slower* than the 4:00-minute best practice goal due to several factors: station location, open spaces, terrain, and traffic congestion. Overall, first-unit call-to-arrival and ERF call-to-arrival performance, which is a fire agency's true customer service measure, are both significantly *slower* than their respective 7:30-minute and 11:30-minute best practice goals.

To set a travel time goal and a resultant total response time goal for Berkeley, Citygate assessed the results by the *fifth* minute of travel, which we find to be acceptable in *urban* areas. In the City, the fifth *travel* minute coverage per fire station area ranges from 53.5 percent to 90.5 percent. The three most populated and highest incident volume station areas are stations 1, 2, and 5, whose grouping is the "triangle" of stations at the City's core. By the fifth minute of travel, performance across all three stations averages 86.9 percent, with stations 2 and 5 both hitting 90 percent. Thus, the largest population, risk, and incident densities are reached by the fifth minute of travel.

Based on fifth-minute coverage in the core of the City, and due to the fact that the waterfront and upper hills areas cannot be covered as quickly due to road design and topography, Citygate recommends the City adopt a 5:00-minute *travel* time goal which, when added to an improved, best practice dispatch time of 1:30 minutes and a turnout goal of 2:00 minutes, yields a total response time goal of 8:30 minutes. This will deliver first responder paramedics to the highest-risk areas in an acceptable amount of time.

The City is also evolving to improve its housing shortages by approving mid- and high-rise residential buildings. UC Berkeley is completing its new master plan to add students, faculty, on-campus buildings and housing off-campus.

The ongoing intensification of land uses, building heights, and population density will make several sections of the City very urban—typical of the largest metropolitan cities for building fire and rescue/EMS challenges. The cumulative effect of these projects around the City necessitates a shift in staffing and response models as well as an increase in the flexibility of emergency medical resources. The City's fire and ambulance programs must evolve to those suitable for a major urban fire department in staffing, unit types, and facility locations. Citygate acknowledges this will not only be costly but also very difficult to find new locations for responders.

While state fire code requires fire sprinklers in residential dwellings, it will be many more decades before enough residential units are replaced or remodeled with automatic fire sprinklers. If desired outcomes include limiting building fire damage to only part of the inside of an affected building and minimizing permanent impairment resulting from a medical emergency, then the City will need coverage in all neighborhoods that is consistent with Citygate's response performance recommendation for Berkeley. Based on Citygate's study, this response performance recommendation entails *no more than* 8:30 minutes for the arrival of a single first responder, and 11:30 minutes for a multiple-unit arrival to more serious incidents, from the time of 9-1-1 notification at the Berkeley Police Communications Center—all at 90 percent or better reliability.

Dispatch, turnout, and travel times all need to be reduced. Dispatch time must decrease by 0:59 seconds to meet a 1:30-minutes call-processing goal, turnout time by :05 seconds to meet a 2:00-minute goal, and travel time by 0:53 seconds to meet a proposed goal of no more than 5:00 minutes for first-due units in *congested urban* areas. Collectively, Citygate's recommended first-unit total response time goal is 8:30 minutes (1:30 + 2:00 + 5:00).

Stated this way, *"Berkeley must get its fire department back"* to offer availability for serious, life-threatening fires and EMS events and to field enough firefighters to serious building or wildland fires quickly.

~~The City is facing three choices regarding emergency unit response times:~~

~~1. Do nothing and accept sluggish response times that are likely to continue to degrade with infill development and ongoing traffic calming measures and/or streets restricted to bicycles and pedestrians.~~

~~2. Implement Department improvements and strictly limit traffic calming on primary and secondary arterials to improve response times.~~

~~3.~~1. ~~If the changes in #2 do not improve response times, add infill fire/ambulance stations between existing sites to lower travel distances.~~

OVERALL SUMMARY OF CITY FIRE SERVICE DEPLOYMENT

Recovering response time and unit capacity goals will require multiple changes over the next three years to first improve and then maintain response times as growth occurs:

1. Increasing the number of ambulances from four to six.
2. Shifting responsibility for non-acute EMS calls from the 9-1-1 Fire/Ambulance program to a Mobile Integrated Health program like the City's pilot Mobile Integrated Paramedic (MIP) program.
3. Improving dispatch staffing and systems to allow for EMS clinical call triage. W
4. Work collaboratively with Public Works staff and traffic safety advocates to engineer methods to lessen disproportionate impacts on emergency response times as the City redesigns streets and crossings to achieve Vision Zero.
5. Increasing staffing to four personnel each on key engines and ladder trucks.
6. Adding a second field operations Battalion Chief 24/7 for improved crew supervision and to add an immediate scene safety officer to support the Battalion Chief / Incident Commander for serious emergency incidents.

If these six strategies do not improve acute emergency response times *and lower unit-hour utilization (UHU) workload to no more than 30 percent,* the City should construct infill fire or ambulance-only stations between the current busiest station pairs of 2 and 5 and 1 and 6. These areas are also where much of the infill development, high-rise building, and UC Berkeley campus growth will occur.

Citygate finds the Department's response apparatus types to be appropriate to protect against the hazards likely to impact the City. However, *fire crew staffing of three per unit is insufficient* to provide the necessary "weight" of response to serious fires—especially so in mid- and high-rise buildings and for severe wildland fires that start in the hills. Currently, the Department's service capacity for fire and non-fire risk consists of 37 personnel on duty daily, including one Battalion Chief, one mobile Paramedic Supervisor, and 27 firefighters staffing seven engines and two aerial ladder trucks. An additional eight firefighters currently staff four ambulances and operate from the Department's seven fire stations. However, engines are very busy providing EMS response, and the firefighters staffing ambulances are not consistently available for firefighting at present. Over the next several years, three firefighters per day will be moved to an engine and both ladders, thus raising three of the nine firefighting units to four-firefighter staffing consistent with NFPA Standard 1710 and Citygate best practices for high-density urban core areas. These firefighters will be replaced by non-firefighter EMS personnel on the ambulances, thus aligning the classification with the work and creating a more efficient system. However, only three units with

four-firefighter staffing will not be enough. At a minimum, four-firefighter staffing should be provided:

- On four engines: 1, 2, 5, and 6
- On trucks 2 and 5
- Occasionally (on high-fire danger wildland fire days) on engines 3, 4, and 7.

When increasing firefighting units to four crew members each, one additional firefighter per day will have to be newly funded, which amounts to a total of three added firefighting personnel *per crew* (plus the overtime to cover their leave absences) on a three-platoon fire crew rotation system. The wildfire threat days which increase staffing to four each can be handled via overtime during daylight hours or when winds are most severe. When the engine and ladder units identified are staffed with four personnel each, the daily staffing for units other than ambulances increases from 27 to 33 per day—much more consistent with the risks to be protected in a thriving, growing urban area with internationally known assets and a tragic history of wildland fires.

FINDINGS AND RECOMMENDATIONS

Following are all findings and recommendations presented throughout this report.

Findings

Finding #1: The Department's physical response unit *types* are appropriate to protect against the hazards likely to impact the City.

Finding #2: The Department's minimum daily Citywide staffing of 27 firefighting unit response personnel assigned to engine and truck companies is only sufficient for a modest single-family house fire or small commercial building fire at the ground floor.

Finding #3: The Department has not established response performance goals consistent with best practice recommendations as published by the Commission on Fire Accreditation International. The current City Council budget goal measures do not reflect policy resolution or a specific General Plan policy.

Finding #4: The Department has a standard response plan that considers risk and establishes an appropriate initial response for each incident type; each type of call for service receives the combination of engines, trucks, ambulances, specialty units, and command officers customarily needed to effectively control that type of incident based on Department experience.

Finding #5: The mapping evaluation of coverage demonstrates that the City has an adequate number of fire stations. However, as incident statistics demonstrate, best practice travel times are not being delivered due to multiple factors.

Finding #6: As shown in this study's GIS models, traffic congestion decreases first-unit road mile coverage by only 3.6 percent, which, in Citygate's experience, is not severe. However, overall traffic congestion does still contribute to the Department's slower real-world, non-GIS-modeled travel times. There is a more significant impact on multiple-unit ERF responses, eroding road mile coverage by 26 percent.

Finding #7: At least two simultaneous incidents are occurring nearly 47 percent of the time. This primarily impacts station areas 5, 2, and 1.

Finding #8: While the annual number of simultaneous incidents has decreased slightly, the response time coverage provided by the busiest companies to their own and to adjacent station areas remains diminished, shifting workload to other companies.

Finding #9: The City's ambulance system must provide an increased number of full- and part-time ambulances.

Finding #10: The City's call processing / dispatch performance is *not* meeting Citygate's recommended best-practice goal of 1:30 minutes at 90 percent or better reliability.

Finding #11: At 2:05 minutes averaged over 24 hours, the Department is just over meeting Citygate's recommended 2:00-minute crew turnout performance goal. As sleeping hours increase turnout time, consider adopting a turnout measure of 1:30 minutes during daytime hours to provide greater clarity and reflect Department performance more accurately.

Finding #12: At 5:53 minutes, 90th percentile first-unit travel time is *significantly* higher than the 5:00-minute best practice goal for urban areas.

Finding #13: At 9:32 minutes in RY 20/21, 90th percentile first-unit call-to-arrival performance is 2:02 minutes *slower* than an optimum best practice goal of 7:30 minutes for urban areas.

Finding #14: At 18:50 minutes across the three years of data, 90th percentile ERF (First Alarm) call-to-arrival performance *is 7:20 minutes slower than* the 11:30-minute Citygate-recommended best practice goal for urban areas.

Finding #15: Improve procedures by which the Fire Department, Public Works staff, and traffic safety advocates work collaboratively to identify ways to implement traffic safety improvements without unnecessary impacts on emergency response. ~~Berkeley Planning, Traffic Engineering, and the Fire Department do not have an effective set of integrated policies and traffic-calming methods to partially mitigate the impacts of walkable street designs on fire and ambulance response times~~.

Finding #16: The City's planned expansion of ambulance service is consistent with best practices and will provide needed improvement, but upgrades in dispatcher skills for clinical evaluation to recognize and separate low-acuity incidents will not be fully realized for at least three more years, and likely longer. Given the ongoing strain on ambulances staffed with only firefighter/paramedics, the process of conversion and expansion of ambulances is too slow to meet current (and growing) EMS service demands.

Finding #17: Based on the most recent year's quantity of mental health transport patients being held for evaluation in the City, for the Department to be tasked with management of these patients would require the addition of one 24-hour unit and one 12-hour peak unit—both operating seven days a week. At present, the Department does not have the units or personnel to administer this workload.

Recommendations

Recommendation #1: Proceed with the planned conversion to staffing the four current ambulances with non-firefighter paramedics and EMTs.

Recommendation #2: The Department needs to add two additional ambulances, requiring 16 additional non-firefighter Paramedics and/or EMT FTE personnel.

Recommendation #3: The City needs to upgrade its dispatch staffing, training, and software to allow for clinical call triage to send Basic Life Support (BLS) ambulances or alternative care units to low-acuity EMS requests, as outlined in the analysis from Federal Engineering Communications consulting.

Recommendation #4: Design and focus on new strategies to provide for a balance of emergency response times in concert with necessary safety improvements with Vision Zero's goals. ~~traffic calming and pedestrian safety while not significantly worsening emergency response times or community evacuation times.~~

Recommendation #5: Increase the staffing on six of the nine firefighting units (four engines, two aerial trucks) from three to four personnel per day.

Recommendation #6: Provide the overtime staffing increase from three to four firefighters for engines 3, 4, and 7, which are closest to the eastern hills during high-hazard wildfire threat periods.

Recommendation #7: If ambulance and dispatch improvements do not improve acute emergency response times and lower unit-hour utilization (UHU) workload to no more than 30 percent for long, contiguous hours of the day, the City should construct infill fire or ambulance-only stations between the current busiest station pairs of 2 and 5 and 1 and 6.

Recommendation #8: Adopt updated deployment policies: City Council should consider adopting complete performance measures that begin with a 9-1-1 call being answered and end with the Fire Department and/or an ambulance arriving at the emergency incident. The measures of time should be designed to save patients and keep small but serious fires from becoming more complex or damaging. With this is mind, Citygate recommends the following outcome-based measures for the major emergency types:

8.1: **Geographic Distribution of Fire Stations:** To treat medical patients and control small fires, the first-due unit should arrive within 8:30 minutes, 90 percent of the time, from receipt of the 9-1-1 call in the fire dispatch center. This equates to a 90-second dispatch time, a maximum 2:00-minute nighttime company turnout time, and a 5:00-minute travel time, which is realistic for Berkeley as a more urban area.

8.2: **Multiple-Unit Effective Response Force for Serious Emergencies:** To confine fires near the room of origin and treat up to five medical patients at once, a multiple-unit response of a minimum of four engines, two ladder trucks, one ambulance, one Medic Supervisor, and one Battalion Chief—totaling a minimum of 22 personnel—should arrive within 11:30 minutes from the time of 9-1-1 call receipt in fire dispatch, 90 percent of the time. This equates to a 90-second dispatch time, a 2:00-minute company turnout time, and an 8:00-minute travel time.

8.3: **Hazardous Materials Response:** The Department needs to maintain its hazardous materials response as designed to protect the community from hazards associated with uncontrolled release of hazardous and toxic materials. The first-due unit should arrive to investigate a hazmat release at the operations level within 8:30 minutes, 90 percent of the time. This equates to a 90-second dispatch time, a 2:00-minute company turnout time, and a 5:00-minute travel time in urban population areas. After assessment and scene evaluation is completed, a determination can be made whether to request additional resources.

8.4: **Technical Rescue:** To respond to technical rescue emergencies as efficiently and effectively as possible with enough trained personnel to facilitate a successful rescue, the first-due company to arrive for assessment of the rescue should achieve a 5:00-minute travel time in urban to suburban areas, 90 percent of the time. Additional resources capable of initiating a rescue should be assembled within a total response time of 11:30 minutes, 90 percent of the time, with the result being a safe and complete rescue/extrication to ensure delivery of patients to a definitive care facility.

Recommendation #9: Adopt a split turnout time measure consisting of 2:00 minutes or less, 90 percent of the time, averaged over a 24-hour period, and within that, a daytime measure of 1:30 minutes or less, 90 percent of the time, from 0700–2200 hours.

Recommendation #10: The City should add a second field operations Battalion Chief 24/7 as soon as fiscally possible.

NEXT STEPS

Near Term

- Review and absorb the content, findings, and recommendations of this report.
- Adopt, as a City Council, revised response performance goals.
- ~~Refocus on balancing traffic safety and emergency response ability.~~
- As soon as possible, increase the pace of the conversion program for Department ambulances to add non-firefighter ambulance crews, add two more ambulances, increase fire unit staffing, and upgrade dispatch EMS capabilities.

- Start long-term planning for infill fire and EMS stations if response times cannot be improved per the recommendations in this study. Consider working now with large block redevelopment applicants to provide street-level small spaces for a single emergency response unit/crew.

SECTION 1—INTRODUCTION AND BACKGROUND

The City of Berkeley (City) Fire Department (Department) retained Citygate Associates, LLC (Citygate) to conduct a Standards of Cover (SOC) Study and Community Risk Assessment to define appropriate levels of service based on a comprehensive analysis of historical performance; expectations; and existing and projected community risk factors, hazards, population growth and aging, topography, and the density and vertical growth of the build environment. Deployment strategies will then be proposed as indicated by the analysis. The study will assist the Department in determining whether the current levels of service are appropriate for the risks to be protected in the City, and that the methods to ensure suitable service levels are consistent with generally accepted national standards and benchmarks.

Citygate's scope of work conforms with the methodology outlined in *Standards of Response Coverage* (fifth and sixth editions) as published by the Commission on Fire Accreditation International (CFAI) and addresses all elements of the City's requested scope of work. The study also incorporates guidelines and best practices in the field of deployment and risk analysis from the National Fire Protection Association (NFPA), the Insurance Services Office (ISO), the CFAI, the California Occupational Safety and Health Administration (Cal/OSHA), relevant federal and state laws and regulations, and other recognized industry best practices.

1.1 REPORT ORGANIZATION

This report is organized into the following sections. **Volume 2—Map Atlas** is separately bound.

Executive Summary Summarizes fire service policy choices and all findings and recommendations that can be used to strategically guide the City's and Department's efforts.

Section 1 **Introduction and Background**: Describes Citygate's project approach, methodology, and scope of work and provides an overview of the City and Department.

Section 2 **Standards of Cover Analysis**: Describes Citygate's updated service demand and response performance analysis in detail, as well as our findings and recommendations for each Standards of Cover element.

Appendix A **Community Risk Assessment**: Provides a comprehensive analysis of the fire and non-fire hazards likely to impact the City.

1.1.1 Goals of Report

Citygate cites findings and makes recommendations as appropriate related to each finding. Findings and recommendations throughout this report are sequentially numbered. A complete list of the same findings and recommendations is provided in the Executive Summary.

This document provides technical information about how fire services are provided and legally regulated and the way the Department currently operates. This information is presented in the form of recommendations and policy choices for consideration by the Department and City.

The result is a strong technical foundation upon which to understand the advantages and disadvantages of the choices facing Department and City leadership regarding the best way to provide fire services and, more specifically, at what level of desired outcome and expense.

1.1.2 Limitations of Report

In the United States, there are no federal or state regulations requiring a specific minimum level of fire services. Each community, through the public policy process, is expected to understand the local fire and non-fire risks and its ability to pay and then choose its level of fire services. *If* fire services are provided at all, federal and state regulations specify how to safely provide them for the public and for the personnel providing the services.

While this report and technical explanation can provide a framework for the discussion of Department services, neither this report nor the Citygate team can make the final decisions, nor can they cost out every possible alternative in detail. Once final strategic choices receive policy approval, City staff can conduct any final costing and fiscal analyses as typically completed in its normal operating and capital budget preparation cycle.

1.2 Project Approach and Scope of Work

1.2.1 Project Approach and Methodology

At the start of this study, Citygate reviewed relevant background data and information to better understand current service levels, costs, and the history of service level decisions, including prior studies.

Citygate subsequently reviewed demographic information about the City and the potential for future growth and development. Citygate also obtained map and response data from which to model current and projected fire service deployment, with the goal to identify the location(s) of stations and crew quantities required to best serve the City as it currently exists and to facilitate future deployment planning.

Once Citygate gained an understanding of the Department's service area and its fire and non-fire risks, the Citygate team then developed a deployment model that was tested against the travel time mapping and prior response data to ensure an appropriate fit. Citygate also evaluated future City growth as well as UC Berkeley's proposed on- and off-campus expansion to model service demand by risk type and evaluate potential alternative emergency service delivery models. This resulted in Citygate proposing an approach to address current and long-range needs with effective and efficient use of existing resources. The result is a framework for enhancing Department services while meeting reasonable community expectations and fiscal realities.

1.2.2 Scope of Work

Citygate's approach to this study included:

- Reviewing relevant information data and information provided by the Department and City.
- Interviewing internal City and Department study team members and stakeholders.
- Receiving a general summary of the City and services provided by the Fire Department.
- Using best practice study guidelines as needed from the CFAI, the NFPA, the International Code Council, the ISO, Cal/OSHA, federal and state laws, and recognized industry best practices.
- Obtaining the Department's historical incident data.
- Understanding and forecasting the Department's ambulance delivery system needs.
- Conducting a comprehensive Community Risk Assessment.
- Preparing a comprehensive report that includes analysis-based findings and recommendations, including an executive summary presentation of the written report for City stakeholders.

1.3 CITY OVERVIEW[1]

The City of Berkeley is in Alameda County on the east side of the San Francisco Bay approximately ten miles east of San Francisco. The City encompasses 10.43 square miles of land and 7.22 square miles of water for a total area of 17.66 square miles, and has an estimated *resident*

[1] City of Berkeley Comprehensive Annual Financial Report FY 2021, pages 9 and 10.

population of 124,563,[2] making it the second most densely populated of the 51 most populated Cities in California, second only to San Francisco.

The City is among the oldest cities in California. Founded in 1864, it was incorporated as a town in 1878 and as a city in 1909. The original City Charter was adopted in 1895. As the geographic midpoint of the Greater Bay Area, Berkeley is 20 minutes from San Francisco and close to population centers in Contra Costa County and the Silicon Valley.

The City is governed by a City Council composed of members elected from eight districts to serve four-year terms, and a Mayor who serves as the president of the City Council, elected Citywide to a four-year term. The City's fiscal year (FY) 2021 adopted budget included $447,702,457 of expenditures and reserves, of which $194,718,710 was allocated to the General Fund of the City and $252,983,747 to all other funds. The City employs approximately 1,579 full-time equivalent (FTE) employees. The City provides a full range of services exceeding that of most similarly sized cities in California.

To a large degree, the City is defined both culturally and economically by the presence of the University of California campus located on the eastern side of the City. The City has a diversified economy led by UC Berkeley, Lawrence Berkely National Laboratory, tourism, technology, and commercial/industrial businesses. The City provides a full range of urban community services, including police, fire, marina, water, refuse and recycling, street, parking, planning, building, engineering, parks, economic development, library, recreation, cultural, and educational services.

With 45,057 students and approximately 20,129[3] employees of all types, the UC Berkeley institution provides a high degree of economic stability for the City and has spurred growth in the high technology and biotechnology sectors. The Federal Government Lawrence Berkeley Laboratory also has 4,200 employees, and the Alta Bates Medical Center has approximately 3,100 employees. The City's current economic base consists of approximately 12,100 active licensed businesses operating in the City. These businesses include private manufacturing, technology research, retail and service businesses, educational services, healthcare and social assistance, cannabis clubs, consulting, arts and entertainment, and hospitality services, along with several state, federal, and non-profit institutions.[4]

[2] State of California Department of Finance E-1 Report, May 2022.
[3] Cal Online facts, student and staff counts.
[4] Ibid #1.

1.3.1 Future Growth and Development

The previous Association of Bay Area Governments (ABAG) 2040 Plan projected that Berkeley's population would grow by 17.8 percent to 140,935 by 2040.[5] That plan is now obsolete, however, and the new 2050 One Bay Area Plan does not make specific projections for local communities, focusing instead on regional growth. As the following table shows, historical population data from the State Department of Finance cites Berkeley's prior population growth rate at 8.9 percent *when accounting solely for residents.*

Table 2—Population Change in State, County, and Neighboring Cities (2000–2020)

Jurisdiction	2000	2010	2020	% Change 2000-2010	% Change 2010-2020
California	33,871,648	37,253,956	39,782,870	10.0%	6.8%
Alameda County	1,443,741	1,510,271	1,670,834	4.6%	10.6%
Berkeley	102,743	112,580	122,580	9.6%	8.9%
Oakland	399,484	390,724	433,697	-2.2%	11.0%
Fremont	203,413	214,089	234,220	5.2%	9.4%
San Francisco	776,733	805,235	897,806	3.7%	11.5%
San Leandro	79,452	84,950	87,930	6.9%	3.5%
Hayward	140,030	144,186	160,311	3.0%	11.2%
Richmond	99,216	103,701	111,217	4.5%	7.2%

Sources: Decennial Census, 2000, 2010; California Department of Finance, E-5 series, 2020.

However, for the purposes of this fire and EMS services assessment, prior growth rates should not be used. The City recently updated single-family zoning and accessory dwelling unit (ADU) allowances along with processing multiple mid- and high-rise residential building plans. As of late 2021, the City has 61 residential units of all types approved or under construction totaling 3,560 units. Another 11 projects were in design that would contain several hundred more residential units. All but two of these projects ranged in height from three to six stories. The City has moved in many areas to increased density development and redevelopment over that of single-family zoning. For example, 5,000 more dwelling units with an average of 2.44 people[6] per unit could

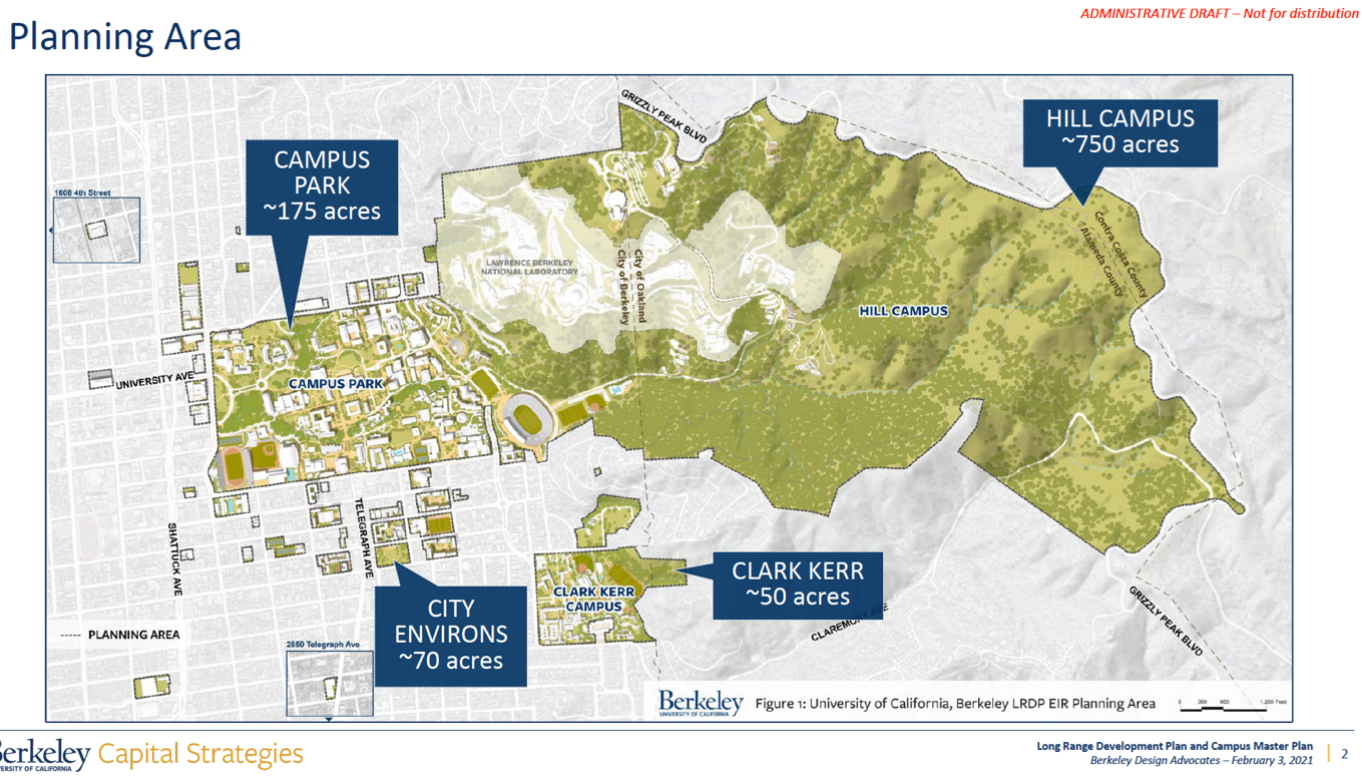
[5] Source: Plan Bay Area 2040, Plan Bay Area Projections 2040.
[6] City of Berkeley Draft Housing Element Update, November 2022.

add 12,200 more residents in three to seven years, which—in addition to the current population of 124,563—would be an increase of 9.8 percent, which is likely a low estimate.

UC Berkeley Growth

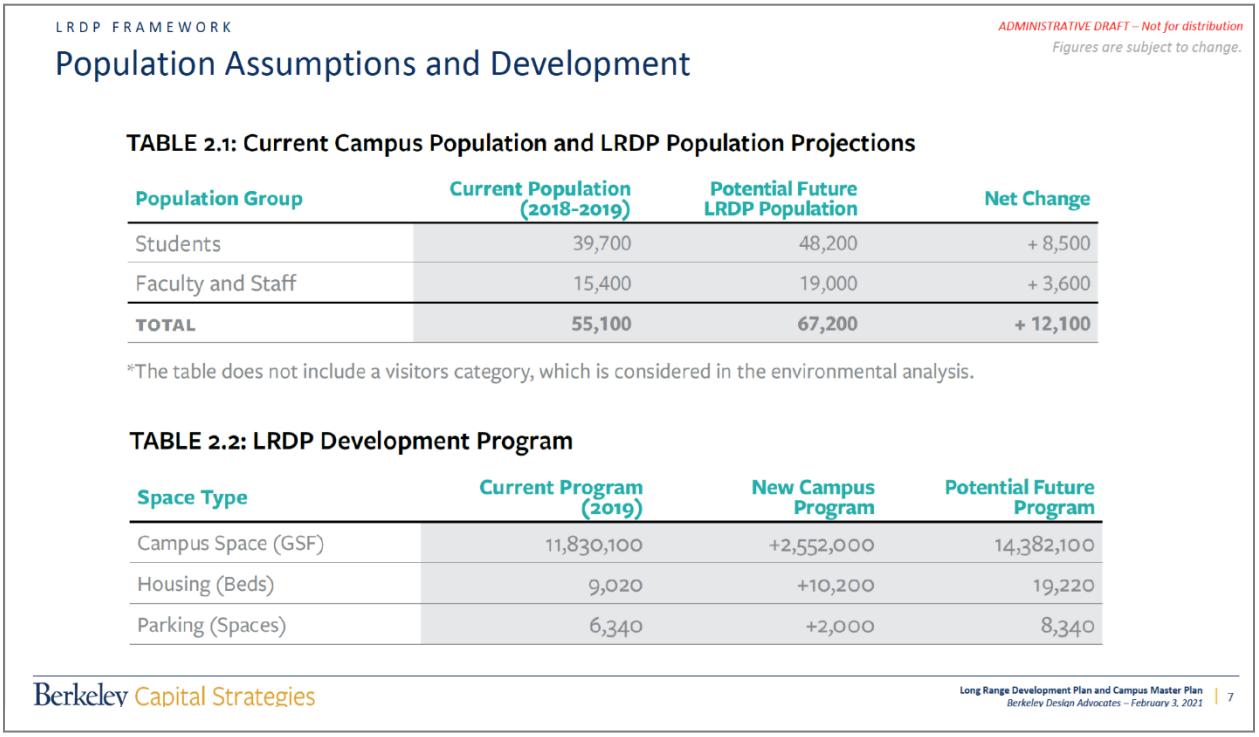
Since late 2020, UC Berkeley has been doing advance planning for its future needs in cooperation with the City. Two planning projects are processing together—the 2021 Long Range Development Plan (LRDP) and the Campus Master Plan. The LRDP is the regulatory framework to drive high-level population projections and a subsequent EIR. The Campus Master Plan is an aspirational planning document. The LRDP was completed mid-2021 and focuses on the planning areas shown in the following figure.

Figure 1—Long-Range Development Planning Areas



To date, the planning projects have generated these campus community population projections. The potential student and faculty residential developments are at all sides of core campus and at the Clark Kerr campus. All development areas are at the perimeter or just inside the City, and thus are protected by the Department.

Figure 2—Population Assumptions and Development



LRDP FRAMEWORK

ADMINISTRATIVE DRAFT – Not for distribution
Figures are subject to change.

Population Assumptions and Development

TABLE 2.1: Current Campus Population and LRDP Population Projections

Population Group	Current Population (2018-2019)	Potential Future LRDP Population	Net Change
Students	39,700	48,200	+ 8,500
Faculty and Staff	15,400	19,000	+ 3,600
TOTAL	**55,100**	**67,200**	**+ 12,100**

*The table does not include a visitors category, which is considered in the environmental analysis.

TABLE 2.2: LRDP Development Program

Space Type	Current Program (2019)	New Campus Program	Potential Future Program
Campus Space (GSF)	11,830,100	+2,552,000	14,382,100
Housing (Beds)	9,020	+10,200	19,220
Parking (Spaces)	6,340	+2,000	8,340

Berkeley Capital Strategies

Long Range Development Plan and Campus Master Plan
Berkeley Design Advocates – February 3, 2021 | 7

If all campus population and facility square footage growth projected in the previous figure is eventually realized, the result will be significant, measurable impacts to the Department, as will be discussed elsewhere in this study.

Service Demand of Population by Age

Population drives demand for EMS services. However, it is not easy to account for multiple variables by age group, such as basic access to health care, being fully insured, access to preventive care, cultural and language barriers etc. One recent estimate put forth 40 percent of California's population as eligible for MediCal (Medicaid); however, this does not mean that percentage of the population is enrolled. Further, MediCal has not historically covered more than a token payment against the true, full cost of an ambulance transport.

Utilizing EMS incident data for the City, generally 40 percent of patients are over age 65, which represents only 13.7 percent of the total population according to census data. Patients between 18 and 23 years of age account for approximately 10 percent of patients. Patients between the ages of 18 and 23, and those 65 or older, account for roughly half of all the documented patients in Berkeley. According to the same data, the number of documented patients over 65 has steadily risen since 2013. It is commonly understood that America is "graying," but this generality does

not mean that every senior is dependent on EMS for primary health care access. The houseless represent many age groups and most have no routine health care. What can be said is that until there is fundamental health care reform economically in America, the issues that have dramatically increased ambulance demand over the last two decades show no signs of slowing.

1.4 Fire Department Overview

1.4.1 Organization

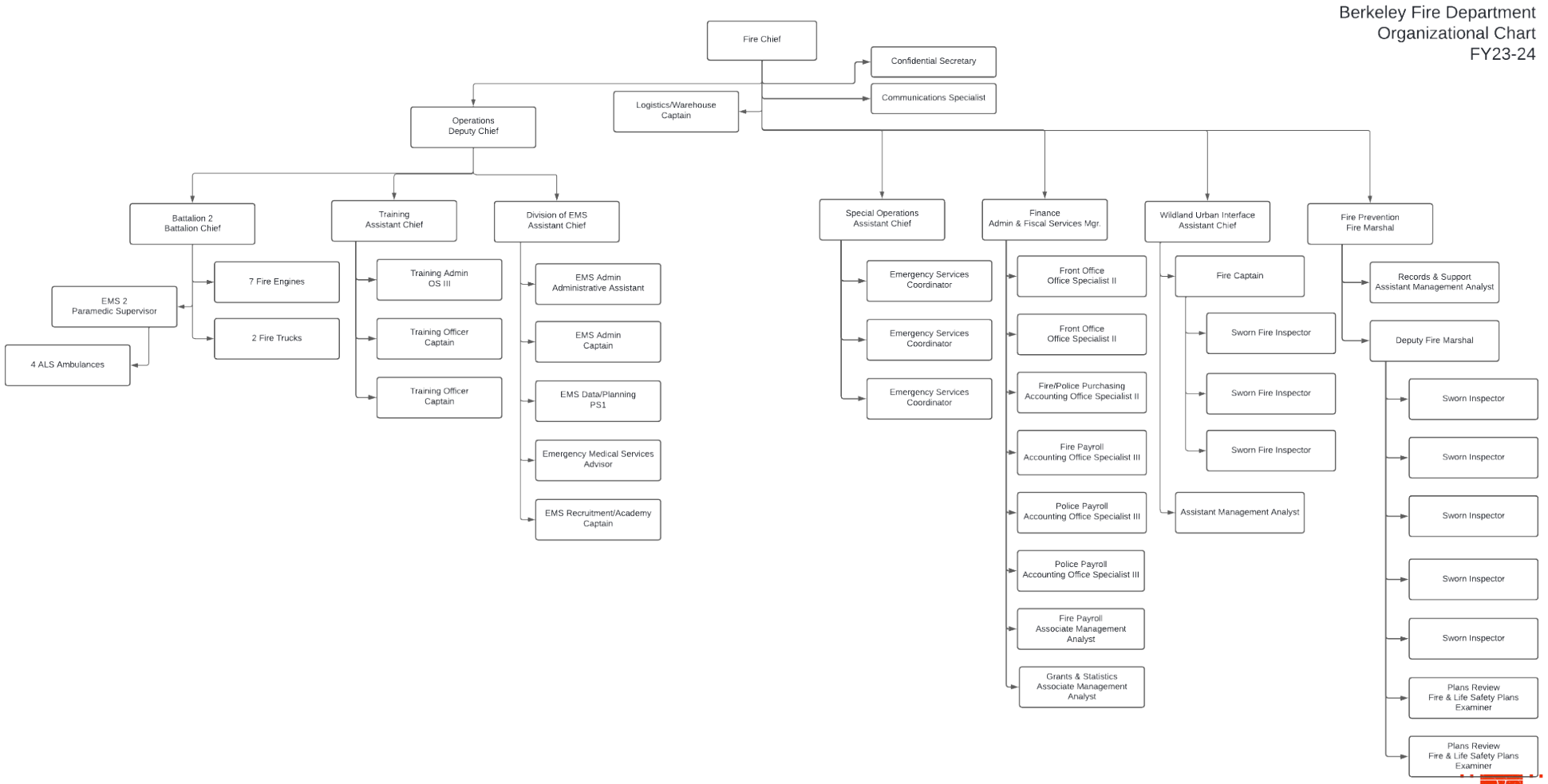
The Department provides fire suppression, Advanced Life Support (ALS) ground ambulance transportation, ALS pre-hospital emergency medical, water rescue, hazardous material release, fire prevention, wildland-urban interface, office of emergency services, community outreach, and related fire and life safety services with a staff of 154 personnel organized into five divisions, as summarized in the following table and figure.

Table 3—Budgeted FTE – Fire Department

Division	Budgeted FTE[1]
Office of the Fire Chief	3
Administrative and Fiscal Services	10
Fire/EMS Operations	122
Office of Emergency Services (OES)	4
Wildland-Urban Interface	5
Fire Prevention	10
Total	**154**

[1] FTE = Full-Time Equivalent
Source: City of Berkeley Fiscal Year 2022-23 Adopted Budget

Figure 3—Fire Department Organization



1.4.2 Facilities and Resources

The Department provides services from seven fire stations and Fire Administration located in the Public Safety building with the Police Department and 9-1-1 Dispatch.

Table 4—Fire Department Facilities, Resources, and Daily Response Staffing – 2022 (Prior to the Expansion of the Ambulance Program)

Station Number	Address	Unit Staffing (Minimum/Maximum)
1	2442 Eighth St.	Engine 1 Ambulance Medic 1 Confidence (boat – cross-staffed by E1/M1) RWC 1 (jet ski – cross-staffed by E1/M1)
2	2029 Berkeley Way	Engine 2 Truck 2 Ambulance Medic 2 Battalion 2 HM2 (Hazmat – cross-staffed by E2/T2) E602 (Type VI – cross-staffed by T2)
3	2710 Russell St.	Engine 3 Ambulance Medic 3
4	1900 Marin Ave.	Engine 4
5	2680 Shattuck Ave.	Engine 5 Truck 5 Ambulance Medic 5 E305 (Type III cross-staffed by T5)
6	999 Cedar St.	Engine 6
7	3000 Shasta Rd.	Engine 7 QRV7 (Polaris cross-staffed) OES Type VI (cross-staffed)

All front-line engine, ladder, and ambulance units are staffed with firefighter/EMTs and firefighter/paramedics as appropriate.

1.4.3 Service Capacity

Service capacity refers to the Department's available response force; the size, types, and condition of its response fleet and any specialized equipment; core and specialized performance capabilities

and competencies; resource distribution and concentration; availability of automatic or mutual aid; and any other agency-specific factors influencing its ability to meet current and prospective future service demand relative to the risks to be protected.

The Department's service capacity for fire and non-fire risk consists of 37 personnel on duty daily—including one mobile Paramedic Supervisor and one Battalion Chief—staffing seven engines, two aerial ladder trucks, and four ambulances, and operating from the Department's seven fire stations. The Department also has one Type-3 wildland engine, two Type-6 wildland engines, one hazardous materials apparatus, one fireboat, one rescue watercraft, and two all-terrain vehicles (ATVs) that can be cross-staffed by on-duty personnel as needed.

All response personnel are trained to either the Emergency Medical Technician (EMT) level, capable of providing Basic Life Support (BLS) pre-hospital emergency medical care, or EMT-Paramedic (Paramedic) level, capable of providing Advanced Life Support (ALS) pre-hospital emergency medical care. All engines are staffed with a minimum of one EMT-Paramedic, and ambulances are staffed with two paramedics. The Department also provides ground ambulance services; air ambulance services, when needed, are provided by CALSTAR/REACH from Concord, Stanford Life Flight from Palo Alto, East Bay Regional Parks Police Department, or the California Highway Patrol. Emergency room services are available at Alameda Hospital (Alameda), Alan Bates Summit Medical Centers and Highland Hospital (Oakland), Kaiser Oakland (Oakland), and UCSF Benioff Children's Hospital (Oakland). Highland Hospital and UCSF Benioff Children's Hospital are also Level 1 Trauma Centers, and Eden Medical Center is a Level 2 Trauma Center.

Response personnel are also trained to the U.S. Department of Transportation Hazardous Material First Responder Operational level to provide initial hazardous material incident assessment, hazard isolation, and support for a hazardous material response team. When needed, technical hazardous materials response is provided by Station 2 personnel trained to the Hazardous Materials Specialist level cross-staffing a hazardous material apparatus. For significant spills and releases, the Department responds via the Alameda County Fire Department Hazardous Materials Team.

All response personnel are further trained to the Confined Space Awareness level, with technical rescue capability available as needed from the City of Oakland. The Department has obtained a Cal OES Type-2 Urban Search and Rescue trailer and is designing a technical rescue program.

Marine response capacity includes up to 24 personnel certified to the State Fire Training Open Water Rescuer and/or Open Water Rescue Boat Operator level. In addition, the Department cross-staffs a 27-foot Type IV fireboat and a trailered rescue watercraft—moored at the Berkeley Marina and staffed with on-duty Station 1 and Station 6 personnel as needed.

The Department has automatic and mutual aid agreements with all the directly adjoining departments in both Alameda and Contra Costa counties, along with being a signatory to the Alameda County Fire Mutual Aid Plan and California Master Mutual Aid Agreement.

Finding #1:	The Department's physical response unit *types* are appropriate to protect against the hazards likely to impact the City.
Finding #2:	The Department's minimum daily Citywide staffing of 27 firefighting unit response personnel assigned to engine and truck companies is only sufficient for a modest single-family house fire or small commercial building fire at the ground floor.

SECTION 2—STANDARDS OF COVER ANALYSIS

This section provides a detailed analysis of the Department's current ability to deploy and mitigate hazards within its service area. The response analysis uses prior response statistics and geographic mapping to help the Department and the community to visualize what the current response system can and cannot deliver.

2.1 STANDARDS OF COVER PROCESS OVERVIEW

The core methodology used by Citygate in the scope of its deployment analysis work is *Standards of Response Coverage* (fifth and sixth editions), which is a systems-based approach to fire department deployment published by the CFAI. This approach uses local risks and demographics to determine the level of protection best fitting a community's needs.

The SOC method evaluates deployment as part of a fire agency's self-assessment process. This approach uses risk and community expectations regarding outcomes to help elected officials make informed decisions regarding fire and emergency medical services deployment levels. Citygate has adopted this multiple-part systems approach as a comprehensive tool to evaluate fire station locations. Depending on the needs of the study, the depth of the components may vary.

In contrast to a one-size-fits-all prescriptive formula, such a systems approach to deployment allows for local determination. In this comprehensive approach, each agency can match local needs (risks and expectations) with the costs of various levels of service. In an informed public policy debate, a governing board "purchases" the fire and emergency medical service levels the community needs and can afford.

While working with multiple components to conduct a deployment analysis is admittedly more work, it yields a much better result than using only a singular component. For instance, if only travel time is considered and the frequency of multiple calls is not, the analysis could miss overworked companies. If a risk assessment for deployment is not considered and deployment is based only on travel time, a community could under-deploy to incidents.

The following table describes the eight elements of the SOC process.

Table 5—Standards of Coverage Process Elements

SOC Element		Description
1	**Existing Deployment System**	Overview of the community served, authority to provide services, and current deployment model and performance metrics
2	**Community Outcome Expectations**	Review of the community's expectations relative to response services provided by the agency
3	**Community Risk Assessment**	Description of the values to be protected within the service area, and analysis of the fire and non-fire risks likely to impact the service area
4	**Critical Task Analysis**	Review of the essential tasks that must be performed and the personnel required to deliver a stated outcome for an Effective Response Force (ERF)
5	**Distribution Analysis**	Review of the spacing of initial response (first-due) resources (typically engines) to control routine emergencies to achieve desired outcomes
6	**Concentration Analysis**	Review of the spacing of fire stations so that larger or more complex emergencies receive sufficient resources in a timely manner (ERF) to achieve desired outcomes
7	**Reliability and Historical Response Effectiveness Analysis**	Using recent prior response statistics, determining the percentage of conformance to established response performance goals the existing deployment system delivers
8	**Overall Evaluation**	Proposing Standards of Coverage statements by risk type as appropriate

Source: CFAI, *Standards of Cover*, fifth edition

Fire service deployment, simply summarized, is about the *speed* and *weight* of response. *Speed* refers to initial (first-due) response of all-risk intervention resources (e.g., engines, ladder trucks, and ambulances) strategically deployed across a jurisdiction for response to emergencies within a travel time interval sufficient to control routine-to-moderate emergencies without the incident escalating to greater size or severity. *Weight* refers to multiple-unit ERF responses for more serious emergencies such as building fires, multiple-patient medical emergencies, vehicle collisions with extrication required, or technical rescue incidents. In these situations, enough firefighters must be assembled within a time interval to safely control the emergency and prevent it from escalating into an even more serious event.

The following table illustrates this deployment paradigm.

Table 6—Fire Service Deployment Paradigm

Element	Description	Purpose
***Speed** of Response*	Response time of initial all-risk intervention units strategically located across a jurisdiction	Controlling routine to moderate emergencies without the incident escalating in size or complexity
***Weight** of Response*	Number of firefighters in a multiple-unit response for serious emergencies	Assembling enough firefighters within a reasonable time frame to safely control a more complex emergency without escalation

Thus, smaller fires and less complex emergencies require a single- or two-unit response (engine or specialty resource such as an ambulance) within a relatively short response time. Larger or more complex incidents require more units and personnel to control. In either case, if crews arrive too late or the total number of personnel is too few for the emergency, they are drawn into an escalating and more dangerous situation. The science of fire crew deployment is to spread crews out across a community or jurisdiction for quick response to keep emergencies small with positive outcomes without spreading resources so far apart they cannot assemble quickly enough to effectively control more serious emergencies.

2.2 CURRENT DEPLOYMENT

SOC ELEMENT 1 OF 8
EXISTING DEPLOYMENT POLICIES

Nationally recognized standards and best practices suggest using several incremental measurements to define response time. Ideally, the clock start time is when the 9-1-1 dispatcher receives the emergency call. In some cases, the call must then be transferred to a separate fire dispatch center. In this setting, the response time clock starts when the fire center receives the 9-1-1 call into its computer-aided dispatch (CAD) system. Response time increments include dispatch center call processing, crew alerting and response unit boarding (commonly called turnout time), and actual driving (travel) time.

The following table summarizes the Department's current response performance goals;[7] however, City Council has not, by separate Council policy, adopted performance goals. The General Plan does not contain specific response measures, but rather strategies reflecting the need to protect the community from fire. In the annual City Fire Department budget measure page, the Department does report the following response time measure. While the entire budget is adopted by the

[7] Source: City of Berkeley 2022 Proposed Budget, page 208.

Council, it would be a stronger best practice to adopt, by Council resolution, performance measures by which to govern fire and emergency medical services. Otherwise, at any given budget cycle, a council could choose to deviate from the Department's reported measures without a specific vote on changing the response time goals.

Table 7—Current City Budget Response Performance Goals

Response Component	Current Performance Goal	Percentage Reliability Goal
Call Processing / Dispatch	None	90%
Crew Turnout (*internal FD policy*)	60–90 sec	90%
First-Due Travel	None	90%
First-Due Call-to Arrival (Distribution)	None	90%
Fire Crew Notification to First-Unit Arrival	5:15 average 4:46 median	None
Multiple-Unit ERF Call to Arrival (Concentration)	None	90%
Ambulance Call to Arrival	None	90%

The Department's current response performance goals *do not* mirror industry-recognized best practices for first-unit responses, including all three response elements and reliability percentages.[8] NFPA Standard 1710, a recommended deployment standard for career fire departments in urban/suburban areas, recommends initial (first-due) intervention units arrive within a travel time of 4:00 minutes, and all resources comprising a multiple-unit First Alarm arrive within a travel time of 8:00 minutes, all at 90 percent or better reliability.

The most recently published NFPA best practices have decreased recommended dispatch / call processing time to 1:00 minute for events with an imminent threat to life or significant property damage and 1:30 minutes for hazardous materials or technical rescue incidents, for joint response with law enforcement involving weapons, or for incidents involving language barriers.[9] Further, for crew turnout time, 60 to 80 seconds is recommended. However, the prior edition of NFPA Standard 1221—and Citygate's experience across many systems—finds 90 seconds for dispatch, and a turnout time of 2:00 minutes across a 24-hour-per-day average, to be effective and safe goals. During high demand daylight hours, the turnout goal should be closer to 1:30 minutes.

[8] NFPA 1710 – Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition).

[9] NFPA 1221 – Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems (2019 Edition).

If the travel time measures recommended by the NFPA and Citygate are added to dispatch processing and crew turnout times recommended by Citygate and NFPA best practices, then a realistic 90 percent first-due unit response performance goal is now 7:30 minutes (or 8:30 minutes if a 5:00-minute *travel* time is used) from the time of the Berkeley Police 9-1-1 dispatch center receiving the call. This includes 1:30 minutes for call processing / dispatch, 2:00 minutes for crew turnout, and 4:00–5:00 minutes for travel time.

Finding #3:	The Department has not established response performance goals consistent with best practice recommendations as published by the Commission on Fire Accreditation International. The current City Council budget goal measures do not reflect policy resolution or a specific General Plan policy.

2.2.1 Current Deployment Model

Resources and Staffing

The Department's current deployment model meets the minimum staffing standards for building fires as recommended by NFPA 1710, providing sufficient personnel for serious fire incidents or other emergencies requiring a multiple-unit response to effectively resolve, along with providing additional response capacity for one to two simultaneous incidents.

At present, the Department's EMS Division provides paramedic ambulance transport services with four ambulances, supplemented by a paramedic on each fire crew. The ambulance program has grown in volume and was being expanded concurrently with Citygate's study. This expansion will be reviewed in more detail in the deployment recommendations section.

Response Plan

The Department is an all-risk fire agency providing the population it protects with services that include fire suppression; pre-hospital paramedic (ALS) emergency medical services; ambulance transport; hazardous material and technical rescue response; open water safety/response; and other non-emergency services, including fire prevention, wildland-urban interface, office of emergency services, community outreach, and other related services.

Given these risks, the Department utilizes a tiered response plan calling for different types and numbers of resources depending on incident/risk type. The City's 9-1-1 dispatch CAD system selects and dispatches the closest and most appropriate resource(s) pursuant to the Department's response plan, as summarized in the following table.

Table 8—Response Plan by Type of Emergency

Incident Type	Response	Total Personnel
Medical Emergency	1 Engine or Truck, 1 Ambulance	**5**
Building Fire	4 Engines, 2 Trucks, 1 Ambulance, 1 Medic Supervisor, 1 Battalion Chief	**22**
Vehicle Fire	1 Engine	**3**
Traffic Collision	1 Engine or 1 Truck, 1 Ambulance	**5**
Hazardous Material Incident	2 Engines, 1 Hazmat Unit, 1 Ambulance, 1 Medic Supervisor, 1 Battalion Chief	**13**
Technical Rescue	2 Engines, 1 Truck, 1 Ambulance, 1 Medic Supervisor, 1 Battalion Chief	**12**

Source: City Dispatch Unit Assignments List

Finding #4: The Department has a standard response plan that considers risk and establishes an appropriate initial response for each incident type; each type of call for service receives the combination of engines, trucks, ambulances, specialty units, and command officers customarily needed to effectively control that type of incident based on Department experience.

2.3 Outcome Expectations

SOC Element 2 of 8
Community Outcome Expectations

The SOC process begins by reviewing existing emergency services outcome expectations. This includes determining for what purpose the response system exists and whether the governing body has adopted any response performance measures. If it has, the time measures used must be understood and good data must be available.

Current national best practice is to measure percent completion of a goal (e.g., 90 percent of responses) instead of an average measure. Mathematically, this is called a fractile measure.[10] This is because measuring the average only identifies the central or middle point of response time

[10] A *fractile* is that point below which a stated fraction of the values lies. The fraction is often given in percent; the term percentile may then be used.

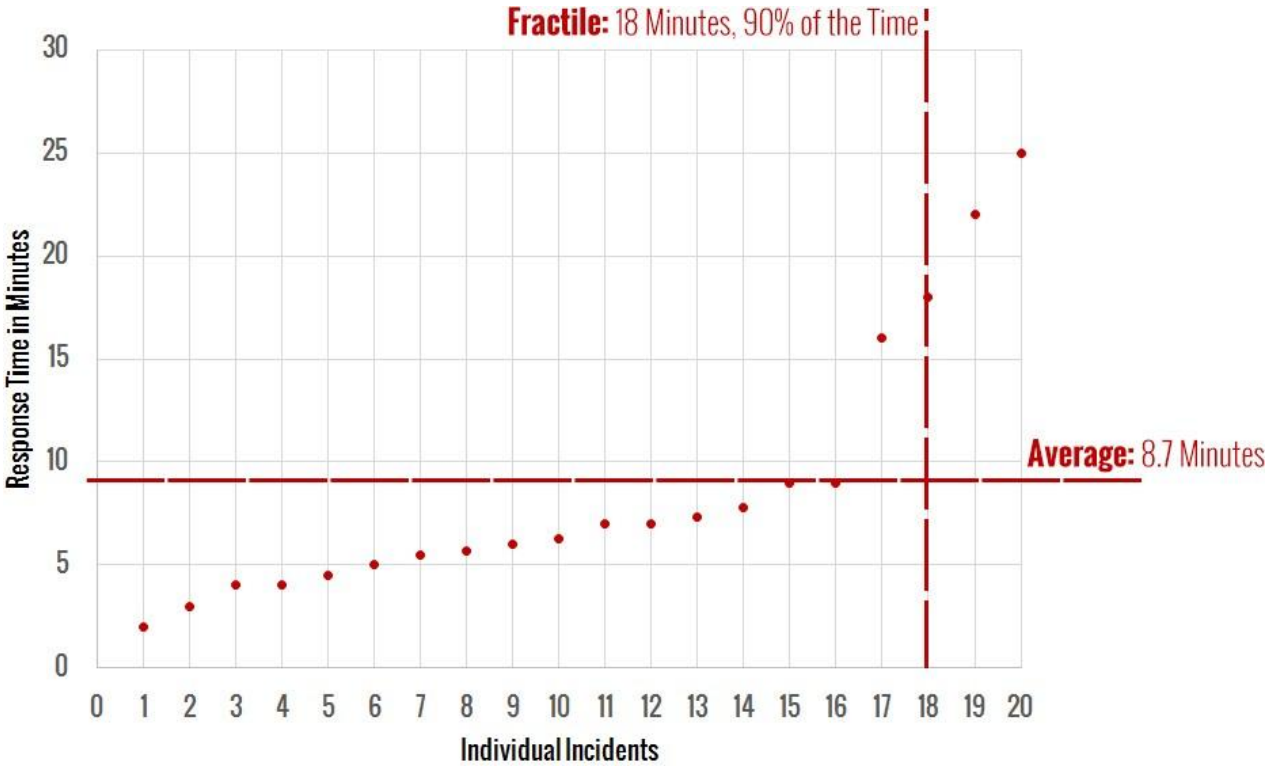
performance for all calls for service in the data set. Using an average makes it impossible to know how many incidents had response times that were far above the average or just above.

For example, the following figure shows response times for a hypothetical small fire department that receives 20 calls for service each month. Each response time has been plotted on the graph from shortest response time to longest response time.

The following figure shows that the average response time is 8.7 minutes. However, the average response time fails to properly account for four calls for service with response times far exceeding a threshold in which positive outcomes could be expected. In fact, it is evident in the figure that 20 percent of responses are far too slow, and that this hypothetical jurisdiction has a potential life-threatening service delivery problem. Average response time as a fire service delivery measurement is simply not sufficient. This is a significant issue in larger cities if hundreds or thousands of calls are answered far beyond the average point.

By using the fractile measurement with 90 percent of all responses, this small jurisdiction has a response time of 18:00 minutes, 90 percent of the time. Stated another way, 90 percent of all responses are 18:00 minutes or less. This fractile measurement is far more accurate in reflecting the service delivery situation of this small agency.

Figure 4—Fractile versus Average Response Time Measurements



More importantly, within the SOC process, positive outcomes are the goal. From that, crew size and response time can be calculated to provide appropriate fire station spacing (distribution and concentration) to achieve the desired goal. Emergency medical incidents include situations with the most severe time constraints. The brain can only survive 4:00 to 6:00 minutes without oxygen. Cardiac arrest and other events can cause oxygen deprivation to the brain. Cardiac arrests make up a small percentage, with drowning, choking, trauma constrictions, or other similar events having the same effect. In a building fire, a small incipient fire can grow to involve the entire room in a 3:00- to 5:00-minute time frame. If fire service response is to achieve positive outcomes in severe emergency medical situations and incipient fire situations, *all* responding crews must arrive, assess the situation, and deploy effective measures before brain death occurs or the fire spreads beyond the room of origin.

Thus, from the time of 9-1-1 receiving the call, an effective deployment system is *beginning* to manage the problem within a 7:00- to 8:00-minute total response time. This is right at the point that brain death is becoming irreversible, and the fire has grown to the point of leaving the room of origin and becoming very serious. Thus, the City needs a first-due response goal that is within a range to give the situation hope for a positive outcome. It is important to note that fire or medical emergency events continue to deteriorate from the time of inception, not from the time the fire engine or ambulance starts to drive the response route. Ideally, the emergency is noticed immediately, and the 9-1-1 system is activated promptly. This step of awareness—calling 9-1-1 and giving the dispatcher accurate information—takes, in the best of circumstances, 1:00 minute. Then crew notification and travel time take additional minutes. Upon arrival, the crew must approach the patient or emergency, assess the situation, and appropriately deploy its skills and tools. Even in easy-to-access situations, this step can take 2:00 minutes or more. This time frame may be increased considerably due to long driveways, apartment buildings with limited access, multiple-story buildings, or enclosed shopping centers.

Unfortunately, there are times when the emergency has become too severe, even before the 9-1-1 notification or fire department response, for the responding crew to reverse; however, when an appropriate response time policy is combined with a well-designed deployment system, then only anomalies like bad weather, poor traffic conditions, or multiple emergencies slow down the response system. Consequently, a properly designed system will give citizens the hope of a positive outcome for their tax dollar expenditure.

For this report, total response time is the sum of the Berkeley Police 9-1-1 center call processing/dispatch, fire crew turnout, and road travel time intervals, which is consistent with CFAI and NFPA best practice recommendations.

2.4 COMMUNITY RISK ASSESSMENT

SOC ELEMENT 3 OF 8
COMMUNITY RISK ASSESSMENT

The third element of the SOC process is a community risk assessment. Within the context of an SOC study, the objectives of a community risk assessment are to:

- Identify the values at risk to be protected within the community or service area.
- Identify the specific hazards with the potential to adversely impact the community or service area.
- Quantify the overall risk associated with each hazard.
- Establish a foundation for current/future deployment decisions and risk-reduction/hazard-mitigation planning and evaluation.

A hazard is broadly defined as a situation or condition that can cause or contribute to harm. Examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. Risk is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity of resultant impacts* to people, property, and the community.

2.4.1 Risk Assessment Methodology

The methodology employed by Citygate to assess community risks as an integral element of an SOC study incorporates the following elements:

- Identification of geographic planning sub-zones (risk zones) appropriate to the community or jurisdiction.
- Identification and quantification, to the extent data is available, of the specific values at risk to various hazards within the community or service area.
- Identification of the fire and non-fire hazards likely to impact the community or service area relative to services provided by the fire agency.
- Determination of the probability of occurrence for each hazard.
- Determination of the *likely* impact severity for each hazard by planning zone.
- Determination of overall risk by hazard considering probability of occurrence and likely impact severity according to the following template.

Table 9—Overall Risk Template

Probability of Occurrence	Impact Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	*Low*	*Low*	*Low*	*Moderate*	*High*
Unlikely	*Low*	*Low*	*Low*	*Moderate*	*High*
Possible	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Probable	*Low*	*Low*	*Moderate*	*High*	*Extreme*
Frequent	*Low*	*Moderate*	*High*	*Extreme*	*Extreme*

2.4.2 Values to Be Protected

Broadly defined, *values* are those tangibles of significant importance or value to the community or jurisdiction that are potentially at risk of harm or damage from a hazard occurrence. Values at risk typically include people, buildings, critical facilities/infrastructure, and key economic, cultural, historic, and natural resources.

People

Residents, employees, visitors, and travelers in a community or jurisdiction are vulnerable to harm from a hazard occurrence. Particularly vulnerable are specific at-risk populations, including those unable to care for themselves or self-evacuate in the event of an emergency. At-risk populations typically include children younger than 10 years, the elderly, and people housed in institutional settings. Key demographic data for the City includes the following:[11]

- The Department serves a diverse urban population with densities ranging from less than 5,000 to more than 40,000 people per square mile over a varied land use pattern.
- The City's population is projected to increase by nearly 18 percent by 2040 for an average annualized increase of slightly less than one percent.
- The City has a large inventory of residential and non-residential buildings to protect as identified in this assessment.
- The City also has significant economic and other resource values to be protected as identified in this assessment.

[11] Source: Esri Community Profile (2021).

- The City and Alameda County have a mass emergency notification system to effectively communicate crucial information to the public in a timely manner.
- The City's overall risk for six hazards related to emergency services provided by the Department range from **Low** to **Extreme,** as will be summarized in Table 9.

Buildings

The City has more than 51,000 housing units and nearly 7,000 businesses, including offices, professional services, retail sales, restaurants/bars, motels, churches, schools, government facilities, healthcare facilities, and other business types as described in **Appendix A**.[12]

Critical Infrastructure / Key Resources

The City has identified 81 critical facilities. A hazard occurrence with significant impact severity affecting one or more of these facilities would likely adversely impact critical public or community services.

Cultural, Economic, Historic, and Natural Resources

Of the nearly 7,000 businesses employing more than 98,000 people in Berkeley, top industries include services and retail sales, followed by manufacturing and construction, as identified in **Appendix A** of this report.[13] Top employers with more than 500 employees include:[14]

- University of California Berkeley
- Lawrence Berkeley National Laboratory
- Sutter East Bay Medical Foundation
- City of Berkeley
- Bayer Corporation
- Berkeley Unified School District
- Kaiser Permanente Medical Group
- Siemens Corporation / Healthcare Diagnostics, Inc.
- Berkeley Bowl Produce

[12] Source: Esri Community Analyst Business Summary (2021).

[13] Source: Esri Community Business Summary (2021).

[14] Source: City of Berkeley Fiscal Year 2020/2021 Annual Comprehensive Financial Report

Natural Resources

Key natural resources to be protected within the City include:

- San Francisco Bay
- Aquatic Park
- Shorebird Park Nature Center
- McLaughlin East Shore State Seashore

Cultural/Historic Resources

Key cultural/historic resources within Berkeley include:

- Berkeley Art Museum and Pacific Film Archive
- Berkeley History Center
- Berkeley Public Library
- Berkeley Repertory Theater
- Hearst Greek Theater
- Judah Magnes Museum

Special/Unique Resources

Following are special/unique resources to be protected within the City of Berkeley:

- University of California Berkeley
- Lawrence Berkeley National Laboratory
  - The laboratory, in some very controlled settings, does use extremely toxic hazardous materials for research and development. Quantities are typically low, and the lab employs fire and hazardous materials safety personnel to ensure best practice mechanical controls are used to prevent a sustained, dangerous release. However, a catastrophic accident could occur that could spread downwind beyond a parking lot buffer and into other lab buildings, the UC campus, or the City itself. The lab and its fire department contractor, along with the Berkeley Fire Department, are trained and have plans for such a rare occurrence.

2.4.3 Hazard Identification

Citygate utilized prior risk studies where available, fire and non-fire hazards as identified by the CFAI, and agency- and jurisdiction-specific data and information to identify the hazards to be evaluated for this study.

The 2019 City of Berkeley Local Hazard Mitigation Plan (LHMP) identifies the following seven hazards with potential to impact the City:

1. Earthquake
2. Wildland-Urban Interface Fire
3. Rainfall-Triggered Landslide
4. Floods
5. Tsunami
6. Climate Change
7. Extreme Heat

Although the Department has no legal authority or responsibility to mitigate any of these hazards other than wildland-urban interface fires, it does provide services related to all hazards, including fire suppression, emergency medical services, technical rescue, and hazardous materials response.

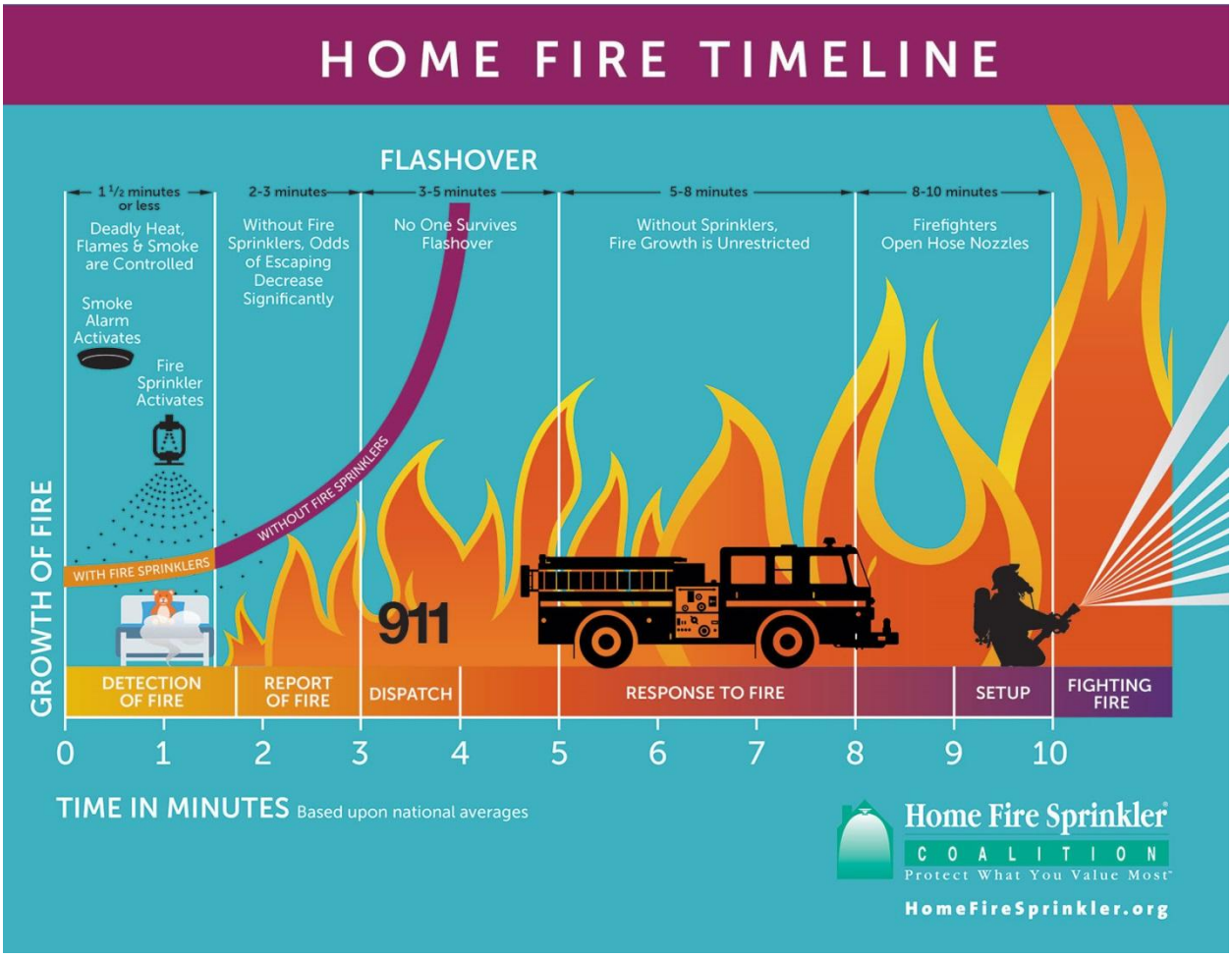
The following is a brief overview of building fire and medical emergency risk. **Appendix A** contains the full risk assessment for all six hazards.

Building Fire Risk

One of the primary hazards in any community is building fire. Building fire risk factors include building size, age, construction type, density, and occupancy; number of stories above ground level; required fire flow; proximity to other buildings; built-in fire protection/alarm systems; available fire suppression water supply; building fire service capacity; and fire suppression resource deployment (distribution/concentration), staffing, and response time.

The following figure illustrates the building fire progression timeline and shows that flashover, which is the point at which the entire room erupts into fire after all the combustible objects in that room reach their ignition temperature, can occur as early as three to five minutes from the initial ignition. Human survival in a room after flashover is extremely improbable.

Figure 5—Building Fire Progression Timeline

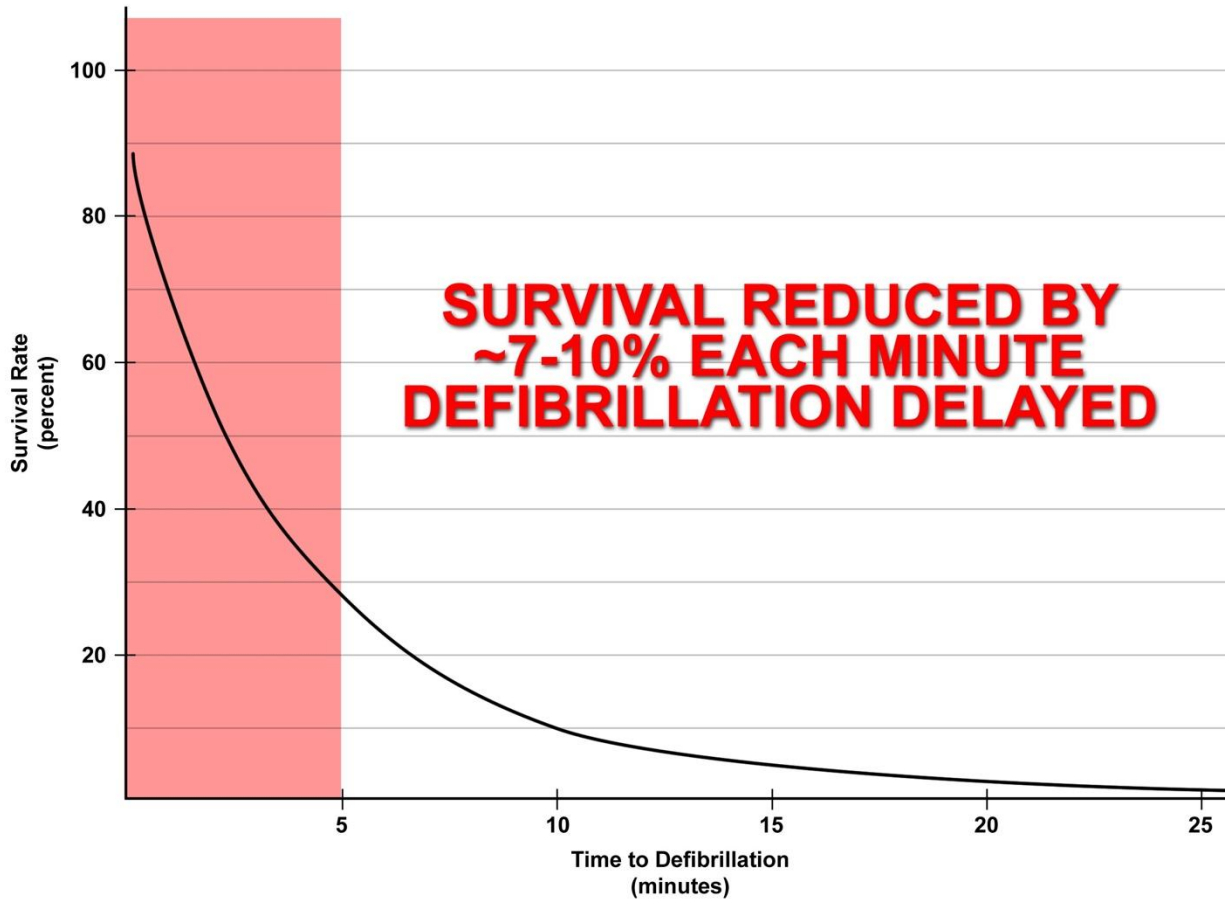


Source: http://www.firesprinklerassoc.org.

Medical Emergency Risk

Fire agency service demand in most jurisdictions is predominantly for medical emergencies. The following figure illustrates the reduced survivability of a cardiac arrest victim as time to defibrillation increases.

Figure 6—Survival Rate versus Time of Defibrillation



The Department currently provides BLS and ALS pre-hospital ambulance emergency medical services, with operational personnel trained to the EMT or EMT-Paramedic level.

2.4.4 Risk Assessment Summary

Citygate's evaluation of the values at risk and hazards likely to impact the City yields the following:

- The City has a large inventory of residential and non-residential buildings to protect, as identified in this assessment.
- The City also has significant economic and other resource values to be protected, as identified in this assessment.
- The City utilizes multiple methods to effectively communicate emergency notifications and information to the public in a timely manner.

- The City's overall risk for six hazards related to emergency services provided by the Fire Department range from **Low** to **Extreme**, as summarized in the following table.

Table 10—Overall Risk by Hazard

Hazard		Risk Planning Zone						
		Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
1	Building Fire	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*
2	Vegetation/Wildland Fire	*Low*	*Extreme*	*Extreme*	*Extreme*	*Moderate*	*Low*	*Extreme*
3	Medical Emergency	*High*	*High*	*High*	*High*	*High*	*High*	*High*
4	Hazardous Materials	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*
5	Technical Rescue	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Low*
6	Marine Incident	*Moderate*	*Low*	*Low*	*Low*	*Low*	*Moderate*	*Low*

2.5 Critical Task Time Measures—What Must Be Done over What Time Frame to Achieve the Stated Outcome Expectation?

SOC Element 4 of 8
Critical Task Time Study

SOC studies use critical task information to determine the number of firefighters needed within a time frame to achieve desired objectives on fire and emergency medical incidents. The following tables illustrate critical tasks typical of building fire and medical emergency incidents, including the minimum number of personnel required to complete each task. These tables are composites from Citygate clients in urban/suburban departments like Berkeley, with units staffed with three personnel per engine or ladder truck. It is important to understand the following relative to these tables:

- It can take considerable time after a task is ordered by command to complete the task and achieve the desired outcome.
- Task completion time is usually a function of the number of personnel that are *simultaneously* available. The fewer firefighters available, the longer some tasks will take to complete. Conversely, with more firefighters available, some tasks are completed concurrently.
- Some tasks must be conducted by a minimum of two firefighters to comply with safety regulations. For example, two firefighters are required to search a smoke-filled room for a victim.

2.5.1 Critical Firefighting Tasks

The following table illustrates the critical tasks required to control a typical single-family dwelling fire with nine response units for a total ERF of 22 personnel (four engines, two ladder trucks, one ambulance, one Medic Supervisor, and one Battalion Chief). These tasks are taken from typical fire departments' operational procedures, which are consistent with the customary findings of other agencies using the SOC process. No conditions exist to override the Occupational Safety and Health Administration (OSHA) two-in/two-out safety policy, which requires that firefighters enter atmospheres that are immediately dangerous to life and health, such as building fires, in teams of two while two more firefighters are outside and immediately ready to rescue them should trouble arise.

Scenario: *Simulated approximately 2,000-square-foot, two-story, residential fire with unknown rescue situation. Responding companies receive dispatch information typical for a witnessed fire. Upon arrival, they find approximately 50 percent of the second floor involved in fire.*

Table 11—First Alarm Residential Fire Critical Tasks – 22 Personnel

	Critical Task Description	Personnel Required
First-Due Engine (3 Personnel)		
1	Conditions report	**1**
2	Establish supply line to hydrant	**2**
3	Deploy initial fire attack line to point of building access	**1–2**
4	Operate pump and charge attack line	**1**
5	Or skip the above and establish incident command	**1**
6	Or conduct primary search within OSHA regulations	**2**
Second-Due Engine (3 Personnel)		
1	If necessary, establish supply line to hydrant	**1–2**
2	Deploy an attack or backup attack line	**1–2**
3	Or establish Initial Rapid Intervention Team (IRIT)	**2**
First Due Truck (3 Personnel)		
1	Conduct initial search and rescue, if not already completed	**2**
2	Deploy ground ladders to roof	**1–2**
3	Establish horizontal or vertical building ventilation	**1–2**
4	Open concealed spaces as required	**2**
First Chief Officer		
1	Transfer of incident command from first- or second-in Captain	**1**
2	Establish exterior command and scene safety	
Third- and Fourth-Due Engines (6 Personnel)		
1	Establish full Rapid Intervention Crew	**4**
2	Secure utilities	**1**
3	Or deploy second attack line(s) as needed	**2**
Ambulance Unit		
1	Establish incident rehab	**2**

Grouped together, the duties in the previous table form an ERF, or First Alarm Assignment. These distinct tasks must be performed to effectively achieve the desired outcome; arriving on scene does not stop the emergency from escalating. While firefighters accomplish these tasks, the incident progression clock continues to run.

Fire in a building can double in size during its free-burn period before fire suppression is initiated. Many studies have shown that a small fire can spread to engulf an entire room in less than 3:00 to

5:00 minutes after free burning has started. Once the room is completely superheated and involved in fire (known as flashover), the fire will spread quickly throughout the structure and into the attic and walls. For this reason, it is imperative that fire suppression and search/rescue operations commence before the flashover point occurs *if* the outcome goal is to keep the fire damage in or near the room of origin. In addition, flashover presents a life-threatening situation to both firefighters and any building occupants.

2.5.2 Critical Medical Emergency Tasks

The Department responds to approximately 7,800 EMS incidents annually, including vehicle accidents, strokes, heart attacks, difficulty breathing, falls, childbirths, and other medical emergencies. For comparison, the following table summarizes the critical tasks required for a cardiac arrest patient.

Table 12—Cardiac Arrest Critical Tasks – Three Engine or Truck Personnel + ALS Ambulance

Critical Task		Personnel Required	Critical Task Description
1	Chest compressions	**1–2**	Compression of chest to circulate blood
2	Ventilate/oxygenate	**1–2**	Mouth-to-mouth, bag-valve-mask, apply O_2
3	Airway control	**1–2**	Manual techniques/intubation/cricothyroidotomy
4	Defibrillate	**1–2**	Electrical defibrillation of dysrhythmia
5	Establish I.V.	**1–2**	Peripheral or central intravenous access
6	Control hemorrhage	**1–2**	Direct pressure, pressure bandage, tourniquet
7	Splint fractures	**2–3**	Manual, board splint, HARE traction, spine
8	Interpret ECG	**2**	Identify type and treat dysrhythmia
9	Administer drugs	**2**	Administer appropriate pharmacological agents
10	Spinal immobilization	**2–3**	Prevent or limit paralysis to extremities
11	Extricate patient	**3–4**	Remove patient from vehicle, entrapment
12	Patient charting	**1–2**	Record vitals, treatments administered, etc.
13	Hospital communication	**1–2**	Receive treatment orders from physician
14	Treat en route to hospital	**2–3**	Continue to treat/monitor/transport patient

2.5.3 Critical Task Analysis and Effective Response Force Size

The time required to complete the critical tasks necessary to stop the escalation of an emergency (as shown in Table 11 and Table 12) must be compared to outcomes. As shown in nationally

published fire service time-versus-temperature tables, a building fire will escalate to the point of flashover after approximately 4:00 to 5:00 minutes of free burning in an enclosed room. At this point, the entire room is engulfed in fire, the fire extends rapidly both horizontally and vertically, and human survival near or in the room of fire origin becomes impossible. Additionally, brain death begins to occur within 4:00 to 6:00 minutes of the heart stopping. Thus, the ERF must arrive in time to prevent these emergency events from becoming worse.

The Department's daily staffing provides an ERF of 22 personnel to a building fire—if they can arrive in time, which the statistical analysis of this report will discuss in depth. Mitigating an emergency event is a team effort once the units have arrived. This refers to the *weight* of response analogy; if too few personnel arrive too slowly, then the emergency will escalate instead of improving. The outcome times, of course, will be longer and yield less-desirable results if the arriving force is smaller or arrives later.

The quantity of staffing and the arrival time frame can be critical in a serious fire. Fires in older or multiple-story buildings could require the initial firefighters to rescue trapped or immobile occupants. If the ERF is too small, rescue and firefighting operations *cannot* be conducted simultaneously.

Fires and complex medical incidents require that additional units arrive in time to complete an effective intervention. Time is one factor that comes from *proper station placement*. Good performance also comes from *adequate staffing* and training. However, where fire stations are spaced too far apart, and one unit must cover another unit's area or multiple units are needed, these units can be too far away, and the emergency will escalate or result in a less-than-desirable outcome.

Previous critical task studies conducted by Citygate, the National Institute of Standards and Technology (NIST), and NFPA Standard 1710 find that all units need to arrive with 15 or more firefighters within 11:30 minutes (from the time of 9-1-1 call) at a building fire to be able to *perform the tasks of rescue, fire suppression, and ventilation simultaneously and effectively*.

A question one might ask is, "If fewer firefighters arrive, *what* from the list of tasks mentioned would not be completed?" Most likely, the search team would be delayed, as would ventilation. The attack lines would only consist of two firefighters, which does not allow for rapid movement of the hose line above the first floor in a multiple-story building. Rescue is conducted with at least two-person teams; thus, when rescue is essential, other tasks are not completed in a simultaneous, timely manner. Effective deployment is about the **speed** *(travel time)* and the **weight** *(number of firefighters)* of the response.

An initial response of 22 personnel can handle a moderate-risk confined building fire; however, even this ERF will be seriously slowed if the fire is above the first floor in a low-rise apartment

building or commercial/industrial building. This is where the capability to add additional personnel and resources to the standard response becomes critical.

Given that the Department's ERF plan delivers 22 City personnel to a building fire, it reflects a goal to confine serious building fires to or near the room of origin and to prevent the spread of fire to adjoining buildings. This is a typical desired outcome in urban/suburban areas and requires more firefighters more quickly than the typical rural outcome of keeping the fire contained to the building, not room, of origin.

The Department's current physical response to building fires is, in effect, its de-facto deployment measure—*if those areas are within a reasonable travel time from a fire station*. Thus, this becomes the baseline policy for the deployment of firefighters.

2.6 Distribution and Concentration Studies—How the Location of First-Due and First Alarm Resources Affects Emergency Incident Outcomes

SOC Element 5 of 8
Distribution Study

SOC Element 6 of 8
Concentration Study

The City is served today by seven fire stations deploying the resources and staffing identified in Table 4. It is appropriate to understand, using geographic mapping tools, what the existing stations do and do not cover within specified travel time goals, if there are any coverage gaps needing one or more stations, and what, if anything, to do about them.

In brief, there are two geographic perspectives to fire station deployment:

- **Distribution** – the spacing of first-due fire units to control routine emergencies before they escalate and require additional resources.
- **Concentration** – the spacing of fire stations sufficiently close to each other so that more complex emergency incidents can quickly receive sufficient resources from multiple fire stations. As indicated, this is known as the **Effective Response Force** (ERF), or, more commonly, the First Alarm Assignment—the collection of a sufficient number of firefighters on scene, delivered within the concentration time goal to stop the escalation of the problem.

To analyze first-due fire unit travel time coverage, Citygate used a geographic mapping tool that can measure theoretical travel time over a street network. For this calculation, Citygate used the base map and street travel speeds calibrated to actual fire apparatus travel times from previous responses to simulate real-world travel time coverage. A second model of traffic congestion

limitations is used to show realistic negative impacts on travel times. Using these tools, Citygate ran several deployment tests and measured their impact on various parts of the City. A 4:00-minute first-due and 8:00-minute ERF *travel* time were used consistent with national best practice response performance goals for positive outcomes in urban areas.

2.6.1 Deployment Baselines

All maps referenced can be found in **Volume 2—Map Atlas**.

Map #1 – General Geography, Station Locations, and Response Resource Types

Map #1 shows the City boundary and fire station locations. This is a reference map for other maps that follow. Station symbols denote the type of staffed fire apparatus at each station. All engines and trucks are staffed with a minimum of three personnel each, and there are four ambulance units that are staffed with two firefighter/paramedics each.

Map #2 – Risk Assessment: Population Density

Map #2a shows population densities in the City. EMS incidents are principally driven by population density. In the City's case, with rental housing for students and others, it is apparent the highest density areas are adjacent to the UC Berkeley campus.

Map #2a – Risk Assessment: High Wildfire Hazard Zones

This map displays the locations of the City's identified high fire hazard areas as required by state law to adopt or use the CAL FIRE maps generated statewide. Even without knowing the history of the Hills Fires in 1991 and 1923, due to the hilly terrain and natural vegetation types, the areas pose a dangerous threat of wildfire to populations and buildings.

Map #3 – Distribution: 4:00-Minute First-Due Travel Time Coverage

Map #3 shows in green the City's public road miles that should be expected to be reached within 4:00 minutes of travel time from the City's seven fire station locations *without traffic congestion*, assuming the responding resource is in-station.

The purpose of response time modeling is to determine response time coverage across a jurisdiction's geography and station locations. This geo-mapping design is then validated against actual response data to reflect actual travel times. There should be some overlap between station areas so that a second-due unit can have a chance of an acceptable response time when it responds to a call in a different station's first-due response area.

Map #3a – Distribution: 4:00-Minute First-Due Travel Time Coverage With Automatic Aid

This map factors in the coverage provided by partner agencies under automatic aid agreements from Kensington Fire District and the Alameda County Fire Department which serves Emeryville. There is small added coverage into the hills north of Station 4 and almost no added coverage from Emeryville. While this helps when Berkeley units are busy with other incidents, automatic aid coverage is not large enough to replace that of a Berkeley fire station.

Map #3b – Distribution: 4:00-Minute First-Due Travel Time Coverage with Traffic Congestion

This map shows reduced traffic congestion coverage in red color over that of the green 4:00-minute travel time reach. While densely populated in non-hills areas, coverage loss due to traffic congestion is minimal as it is being mitigated by the City's well-spaced fire stations.

Map #4 – Insurance Services Office 1.5-Mile Coverage

Map #4 displays the ISO recommendation that urban stations cover a 1.5-mile *distance* response area. Depending on a jurisdiction's road network, the 1.5-mile measure usually equates to a 3:30- to 4:00-minute travel time. However, a 1.5-mile measure is a reasonable indicator of station spacing and overlap. As can be seen, the 1.5-mile ISO coverage is good except in small pockets at the eastern central Hills area, and the Marina on the Bay. This coverage shows the value of the seven fire station locations.

Map #5 – Concentration: 8:00-Minute Effective Response Force (ERF) Travel Time Coverage

This map shows, in green, the City's public road miles that *should* be reachable within 8:00 minutes of travel time for a minimum initial ERF of four engines, two ladder trucks, one ambulance, one Medic Supervisor, and one Battalion Chief *without traffic congestion*. This quantity of units is a challenging number to deliver to the entire City within a *travel* time of 8:00 minutes, and there are coverage gaps in three corners of the City, mostly in the hills.

Map #5a – Concentration: 8:00-Minute ERF Travel Time Coverage with Traffic Congestion

This map shows the significant *reduction* in 8:00-minute ERF travel time coverage *with traffic congestion*, primarily impacting all but the center core of the City.

Map #6 – Concentration: 8:00-Minute ERF Travel Time Coverage – Ladder Trucks

Map #6 shows the ERF coverage from the City's two ladder trucks. As can be seen the two units are properly located to cover the entire City.

Map #7 – 8:00-Minute Battalion Chief Travel Time Coverage

This map displays 8:00-minute travel time coverage for a Battalion Chief from Station 1 without traffic congestion. It is apparent that the single Battalion Chief travel time coverage includes nearly all the City except for the extreme southeast corner.

Map #8 – All Incident Locations

This map shows the location of all incident responses from July 1, 2018, through June 30, 2021, which occurred on almost every street segment in the City. Incidents plotted outside the city are due to the City's mutual aid supporting other agencies.

Map #9 – Emergency Medical Services and Rescue Incident Locations

Map #9 illustrates only the emergency medical and rescue incident locations for the three reporting years of data being analyzed. With most of the calls for service being medical emergencies, virtually all areas of the City need pre-hospital emergency medical services.

Map #10 – All Fire Locations

This map displays the location of all fires within the City in the three reporting years being studied, which includes any type of fire call, from vehicle, to dumpster, to building. There are obviously fewer fires than medical or rescue calls. Even given this fact, it is evident that fires occur in all fire station areas and clustered along major arterials and the more densely populated areas on two sides of the UC Berkeley campus.

Map #11 – Building Fire Locations

Map #11 shows the locations of all building fire incidents in the three reporting years being studied. While the number of building fires is a smaller subset of total fires, in Citygate's experience this is consistent with other, similar cities in the western United States. As with the prior map showing all types of fires, there are more building fires in the more densely populated and older building stock areas close to the UC Berkeley campus.

Map #12 – Emergency Medical Services and Rescue Incident Location Densities

This map displays, by mathematical density, where clusters of EMS and rescue incident activity occurred during the three reporting years of data analyzed by Citygate. In this set, the darker density color plots the highest concentration of EMS and rescue incidents. This type of map makes the location of frequent workload more meaningful than simply mapping the locations of all EMS and rescue incidents, as was shown in Map #9.

This perspective is important because the deployment system needs an overlap of units to ensure the delivery of multiple units when needed for more serious incidents or to handle simultaneous

calls for service, as is evident for the higher population density areas of the City. There is a particular incident density west and southwest of the UC Berkeley campus, close to Station 2 and Station 5.

Map #13 – Fire Incident Location Densities

Map #13 shows the hot spots for all types of fire incidents (shown in Map #10).

Map #14 – Building Fire Incident Location Densities

This map shows the hot spots for building fire incidents (shown in Map #11). The density of structure fire incidents is most pronounced around the UC Berkeley campus and in the western region of the City near the Marina.

2.6.2 Travel Time Road Mile Coverage Measures

In addition to the visual displays of coverage that maps provide, the following table summarizes non-congested coverage versus the impacts of traffic congestion, both with the current station location and with stations 5 and 8 being relocated.

Table 13—First-Due and ERF Road Mile Coverage of 327 Miles – Congested Versus Non-Congested Traffic

Map	Travel Time Measure	Road Miles Covered	Percentage of Miles Covered
3	**4:00-Minute First-Due**	285.27	**87%**
3b	**4:00-Minute First-Due – Congested**	273.61	**84%**
5	**8:00-Minute ERF** (4 Engines, 1 Truck, 1 Battalion Chief, 1 Medic)	257.35	**79%**
5a	**8:00-Minute ERF** (4 Engines, 1 Truck, 1 Battalion Chief, 1 Medic) – **Congested**	172.42	**53%**

As the table shows, 4:00-minute first-due unit coverage is reduced by 3.6 percent with traffic congestion. With 4:00 minutes as a desirable first-due travel time goal, and data in Table 23 showing the Department's 90th percentile first-due travel time performance is 5:40 minutes, traffic congestion is, at least in part, impacting the additional 1:40 minutes of travel time. The 8:00-minute ERF travel time coverage without traffic congestion is adequate at 79 percent of total road miles, but congestion significantly erodes it by 26 percent.

Finding #5:	The mapping evaluation of coverage demonstrates that the City has an adequate number of fire stations. However, as incident statistics demonstrate, best practice travel times are not being delivered due to multiple factors.
Finding #6:	As shown in this study's GIS models, traffic congestion decreases first-unit road mile coverage by only 3.6 percent, which, in Citygate's experience, is not severe. However, overall traffic congestion does still contribute to the Department's slower real-world, non-GIS-modeled travel times. There is a more significant impact on multiple-unit ERF responses, eroding road mile coverage by 26 percent.

2.7 STATISTICAL ANALYSIS

SOC ELEMENT 7 OF 8
RELIABILITY & HISTORICAL RESPONSE EFFECTIVENESS STUDIES

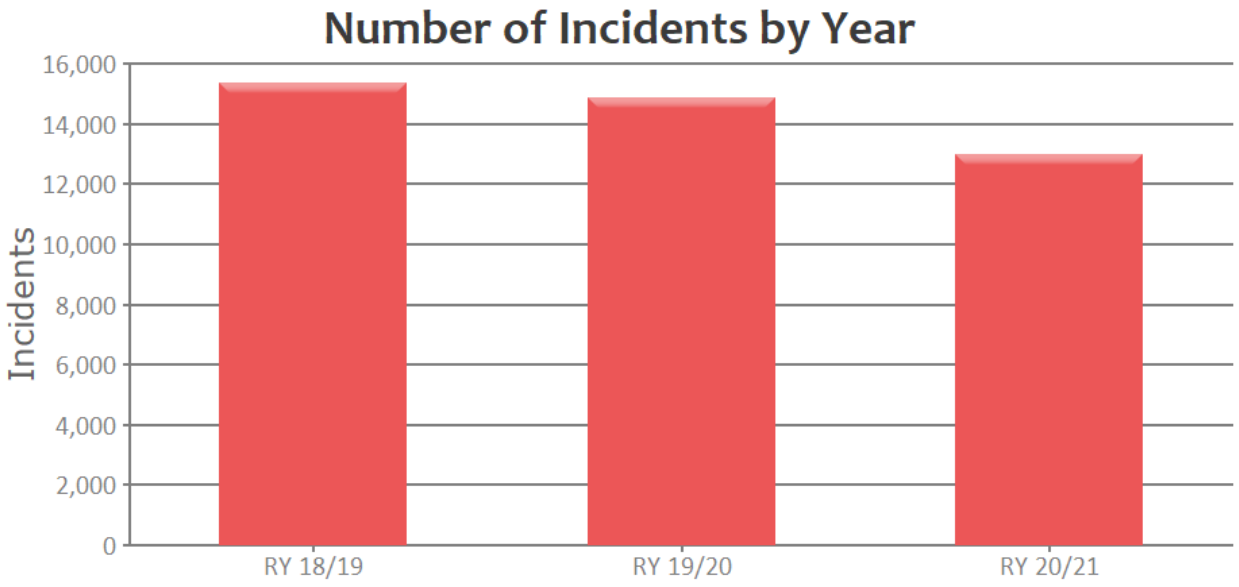
The maps described in **Section 2.6** and presented in **Volume 2—Map Atlas** show the ideal situation for response times and response effectiveness given no competing calls, units out of place, or simultaneous calls for service. Examination of the response time data provides a picture of actual response performance with simultaneous calls, rush hour traffic congestion, units out of position, and delayed travel time for events such as periods of severe weather.

The following subsections provide summary statistical information regarding the Department and its services.

2.7.1 Demand for Service

The Department provided both NFIRS 5 incident and records management system apparatus response data from July 1, 2018, through June 30, 2021. These two data sets were merged, providing 43,260 incidents and 87,805 apparatus response records across the three reporting years being analyzed. The Department experienced a decrease in incident activity in the last reporting year, most likely due to the ongoing COVID-19 pandemic.

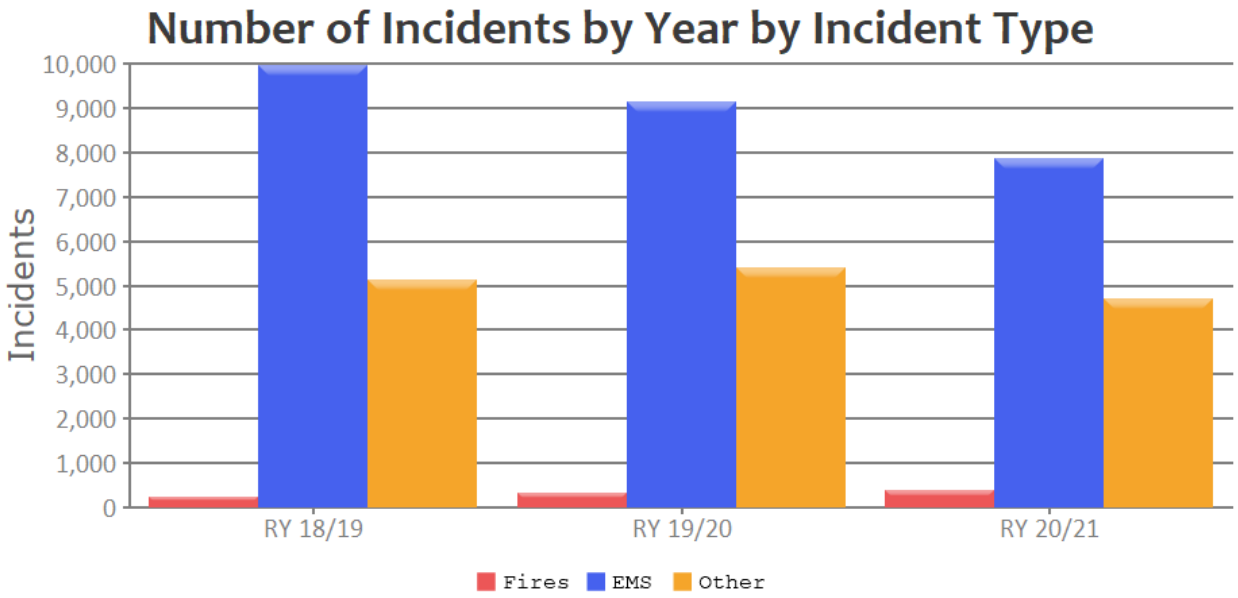
Figure 7—Total Service Demand by Year



In RY 20/21, the Department responded to 13,003 incidents. During the year, the City had a daily demand of 35.62 incidents, of which 3.15 percent were fire incidents, 60.53 percent were EMS incidents, and 36.32 percent were other incident types. During this same period there were 27,402 total apparatus responses, which means there was an average of 2.11 apparatus responses per incident (typically a fire truck and an ambulance).

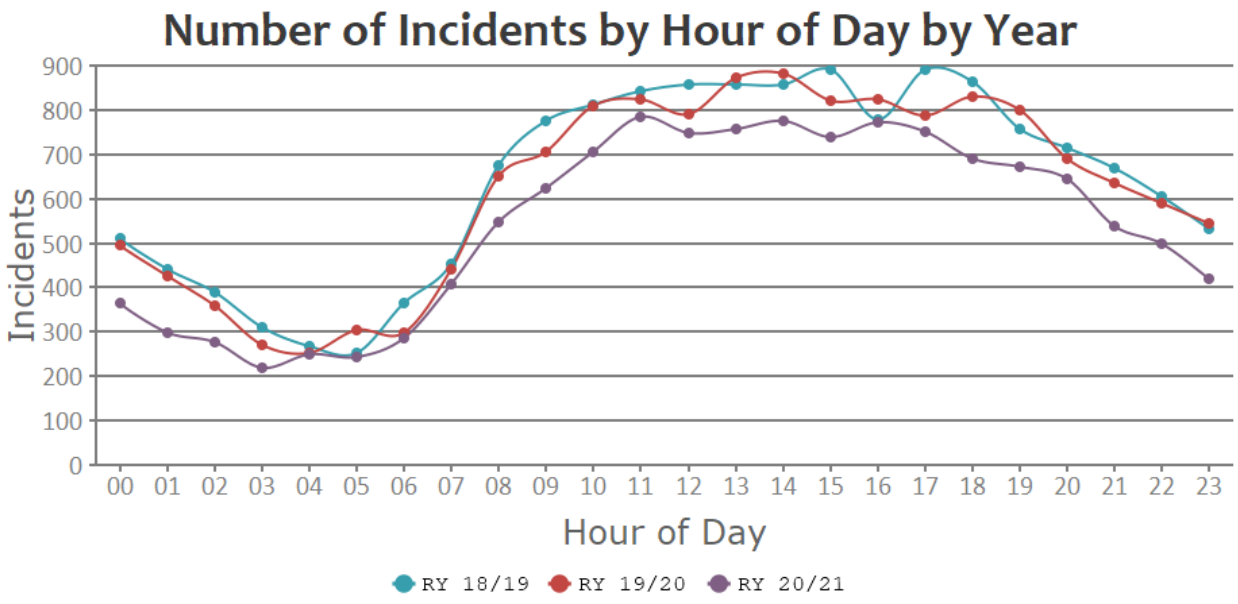
The following figure illustrates the number of incidents by incident type by reporting year. The number of EMS incidents appears to have declined by about 1,000 per year over the three reporting years assessed for this study. However, given the disruptions and changes brought about by COVID-19, it likely not a permanent trend.

Figure 8—Annual Service Demand by Incident Type



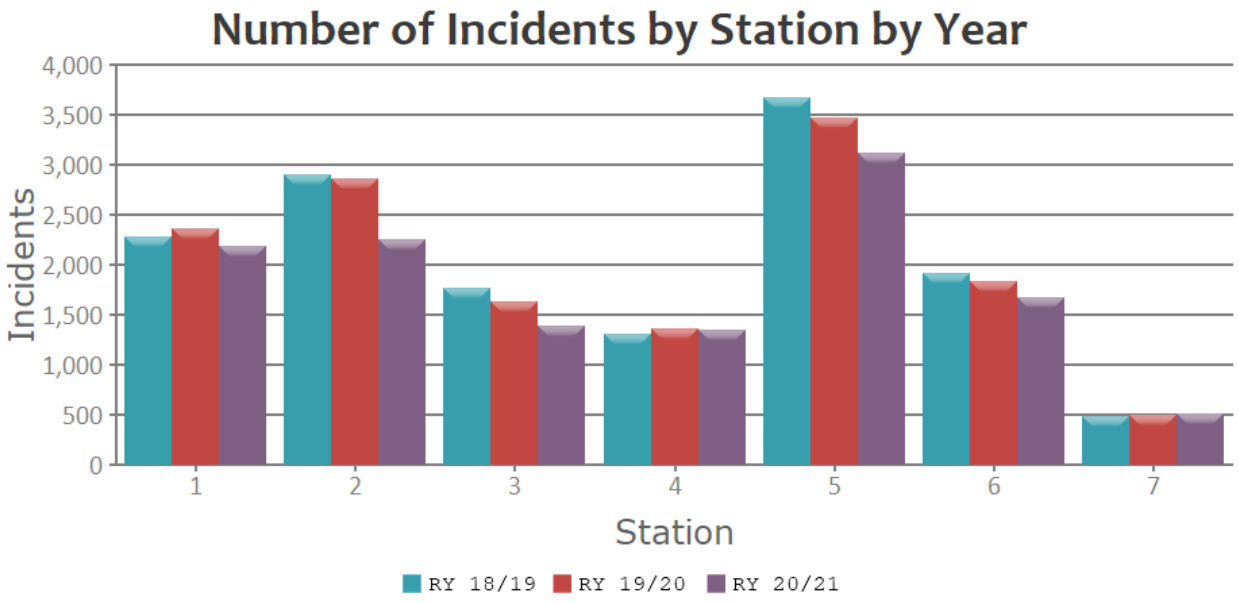
The following figure breaks down incidents by hour of the day by reporting year. There was a slight decline in incident activity in RY 20/21 throughout the late morning and early afternoon hours, and then again from the early evening hours through the early morning hours.

Figure 9—Service Demand by Hour of Day and Year



The following figure is a breakdown of the number of incidents by station area by reporting year. Activity in all but Station 4 and Station 7 seems to have declined, but this may be due to COVID-19.

Figure 10—Service Demand by Station Area by Year



The following table shows the activity rankings of incidents by incident type by reporting year. There was a strong ranking for EMS incidents. Cancelled en route incidents also ranked high on the list. Only incident types with more than **30** calls for service over five years are shown. Also, responding units were cancelled prior to arrival on 4.6 percent of all incidents.

Table 14—Service Demand by Incident Type – RY 20/21

Incident Type	RY 20/21
321 EMS call, excluding vehicle accident with injury	5,552
320 Emergency Medical Service, other	1,215
611 Dispatched and canceled en route	604
745 Alarm system sounded, no fire – unintentional	525
300 Rescue, emergency medical call (EMS) call, other	473
700 False alarm or false call, other	414
554 Assist invalid	383
622 No incident found on arrival of incident address	299

Incident Type	RY 20/21
400 Hazardous conditions, other	224
743 Smoke detector activation, no fire – unintentional	223
651 Smoke scare, odor of smoke	216
600 Good intent call, other	192
311 Medical assist, assist EMS crew	181
324 Motor vehicle accident no injuries	168
322 Vehicle accident with injuries	146
740 Unintentional transmission of alarm, other	127
500 Service Call, other	115
510 Person in distress, other	112
151 Outside rubbish, trash, or waste fire	109
150 Outside rubbish fire, other	107
744 Detector activation, no fire – unintentional	101
550 Public service assistance, other	99
412 Gas leak (natural gas or LPG)	93
444 Power line down	75
522 Water or steam leak	70
440 Electrical wiring/equipment problem, other	64
710 Malicious, mischievous false call, other	61
323 Motor vehicle/pedestrian accident (MV Ped)	59
520 Water problem, other	57
746 Carbon monoxide detector activation, no CO	48
531 Smoke or odor removal	47
733 Smoke detector activation due to malfunction	42
424 Carbon monoxide incident	41
730 System malfunction, other	40
736 CO detector activation due to malfunction	39
353 Removal of victim(s) from stalled elevator	38
131 Passenger vehicle fire	34
551 Assist police or another governmental agency	33
553 Public service	33
100 Fire, other	33

Incident Type	RY 20/21
711 Municipal alarm system, malicious false alarm	32
900 Special type of incident, other	31
111 Building fire	**30**

The following table ranks incidents by property use where occurrences were greater than **100**. The highest rankings for incidents by property use were residential dwellings.

Table 15—Service Demand by Property Use – RY 20/21

Property Use	RY 20/21
419 One- or two-family dwelling	3,120
429 Multifamily dwellings	2,258
963 Street or road in commercial area	1,059
400 Residential, other	917
900 Outside or special property, other	744
960 Street, other	590
962 Residential street, road, or residential driveway	441
311 24-hour care Nursing homes, four or more persons	321
961 Highway or divided highway	267
331 Hospital - medical or psychiatric	221
340 Clinics, Doctors' offices, hemodialysis centers	212
965 Vehicle parking area	140
462 Sorority house, fraternity house	128
449 Hotel/motel, commercial	127

Property Use	RY 20/21
460 Dormitory type residence, other	117
241 Adult education center, college classroom	114
500 Mercantile, business, other	105
519 Food and beverage sales, grocery store	101
931 Open land or field	100

2.7.2 Simultaneous Incident Activity

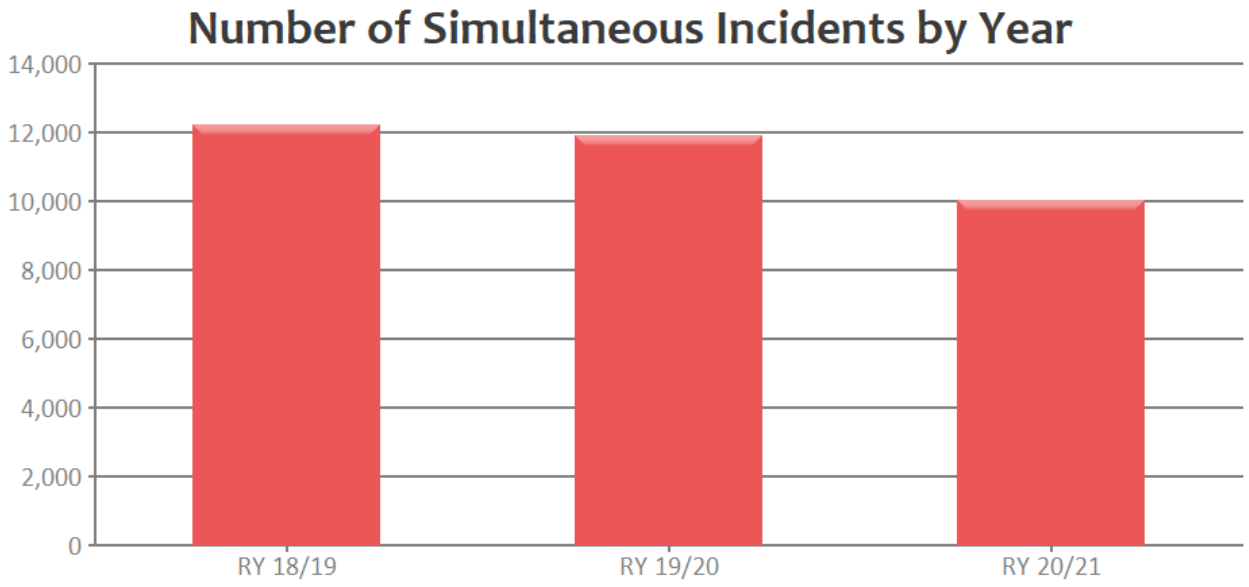
Simultaneous incidents occur when other incidents are underway at the time a new incident begins. During RY 20/21, 77.31 percent of the City's incidents occurred while one or more other incidents were underway.

Table 16—Simultaneous Incident Activity – RY 20/21

Number of Simultaneous Incidents	Percentage
1 or more	77.31%
2 or more	47.18%
3 or more	23.49%
4 or more	9.67%
5 or more	3.36%
6 or more	.97%

This following figure shows the number of simultaneous incidents by year. As with incident volume, there was a decrease in the number of simultaneous incidents in RY 20/21, which may be due to COVID-19.

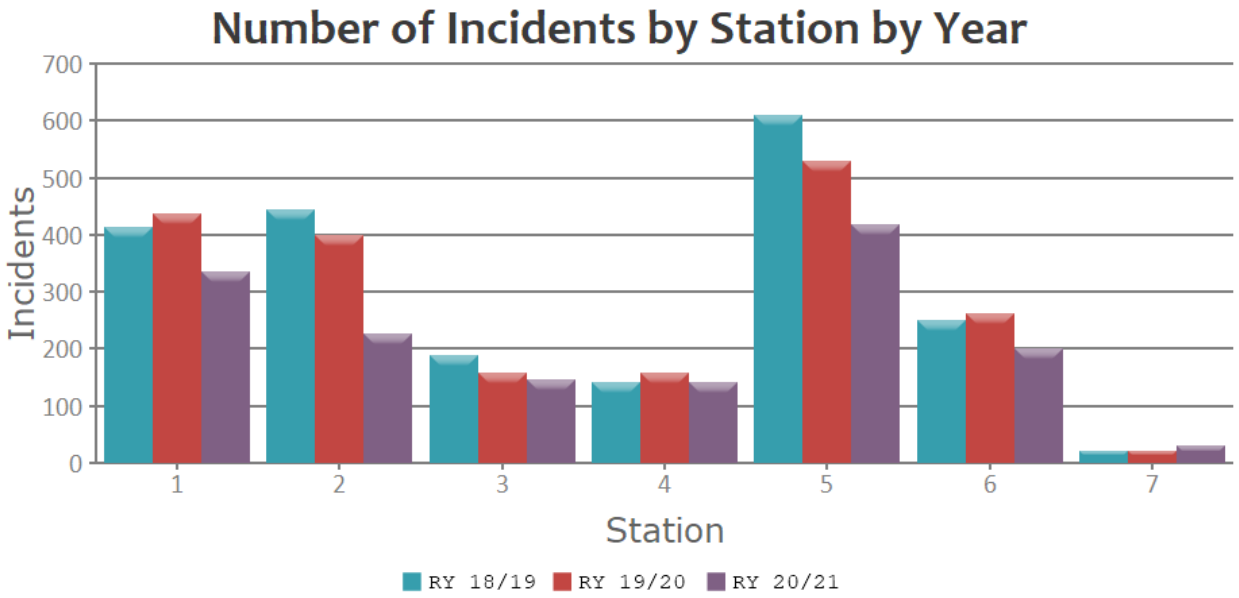
Figure 11—Number of Simultaneous Incidents by Year



In a larger city, simultaneous incidents in different station areas have very little operational consequence. However, when simultaneous incidents occur within a single station area, there can be significant delays in response times.

The following figure illustrates the number of single-station simultaneous incidents by station area by reporting year. Station 5 had the greatest number of single-station simultaneous incidents over the three reporting years. Station 7 had the lowest.

Figure 12—Number of Single-Station Simultaneous Incidents by Station by Year



Finding #7:	At least two simultaneous incidents are occurring nearly 47 percent of the time. This primarily impacts station areas 5, 2, and 1.
Finding #8:	While the annual number of simultaneous incidents has decreased slightly, the response time coverage provided by the busiest companies to their own and to adjacent station areas remains diminished, shifting workload to other companies.

2.7.3 Apparatus Deployment – Simultaneous Incident Impact

The following table shows 90 percent travel time performance in minutes and seconds. This table illustrates that Station 1's area has a 7:38 minute travel time for Station 1 units. However, when resources respond from Station 1 (column 1, row 6) they take 9:17 minutes (time to 90 percent compliance) to arrive in Station 6's territory.

Table 17—Apparatus: 90 Percent Performance Minutes – Assigned Station by Station Area

Station Area	Assigned Station of the First-Arriving Apparatus						
	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Station 1	07:38 (2,001)	10:21 (203)	12:00 (84)	06:08 (5)	09:22 (263)	08:06 (122)	13:30 (3)
Station 2	10:50 (82)	06:00 (2,133)	09:14 (98)	06:09 (25)	07:49 (232)	08:20 (14)	10:18 (5)
Station 3	13:42 (12)	08:59 (36)	06:21 (1,208)	06:39 (2)	07:52 (95)	02:54 (1)	09:27 (1)
Station 4	11:10 (36)	09:19 (523)	13:56 (42)	06:43 (683)	12:39 (115)	08:25 (25)	07:38 (15)
Station 5	08:11 (177)	07:32 (175)	07:26 (344)	09:53 (8)	05:55 (3,259)	07:08 (11)	08:03 (1)
Station 6	09:17 (706)	09:57 (267)	12:28 (32)	10:48 (19)	10:15 (75)	06:22 (937)	-
Station 7	16:50 (3)	12:26 (165)	14:19 (20)	12:34 (12)	14:54 (41)	06:32 (1)	07:53 (239)

2.7.4 Unit-Hour Utilization

The unit-hour utilization percentage is calculated using the number of responses and duration of the responses to show the percentage of time that a response resource is committed to an active incident during a given hour of the day. **In Citygate's experience, a unit-hour utilization of 30 percent or higher over *multiple* consecutive hours becomes the point at which other responsibilities, such as training, do not get completed.** The following table shows a unit-hour utilization summary for the City's engine companies. The busiest engines are listed first. Engine 5 has two hours over 50 percent utilization and 11 consecutive hours over 30 percent utilization.

Table 18—Unit-Hour Utilization – Engines (20/21)

Hour	Engine 5	Engine 1	Engine 2	Engine 6	Engine 4	Engine 3	Engine 7
00:00	23.23%	15.11%	17.16%	9.62%	10.14%	11.33%	0.58%
01:00	25.88%	10.21%	15.51%	11.19%	6.41%	9.09%	3.37%
02:00	18.81%	12.81%	10.79%	11.12%	9.66%	7.74%	3.56%
03:00	13.47%	6.63%	12.40%	6.71%	7.76%	4.40%	2.06%
04:00	11.55%	13.59%	10.26%	10.62%	7.61%	7.62%	1.69%
05:00	15.01%	6.44%	7.62%	3.69%	9.87%	4.93%	2.59%
06:00	11.08%	19.01%	10.05%	9.78%	13.02%	5.63%	3.00%
07:00	25.01%	21.97%	20.84%	18.37%	13.97%	8.97%	6.10%
08:00	30.47%	31.19%	22.80%	20.58%	20.92%	13.10%	5.44%
09:00	38.00%	31.75%	22.75%	28.75%	21.67%	14.57%	5.65%
10:00	41.58%	42.32%	28.32%	23.47%	25.77%	19.88%	11.49%
11:00	52.86%	31.20%	35.07%	41.62%	28.02%	23.70%	7.28%
12:00	49.05%	28.41%	31.70%	34.37%	20.78%	18.56%	9.29%
13:00	53.48%	43.37%	30.66%	31.32%	31.70%	29.91%	7.95%
14:00	45.24%	43.90%	39.12%	34.42%	36.53%	25.40%	15.68%
15:00	38.09%	38.93%	32.49%	31.93%	20.30%	18.31%	7.38%
16:00	47.27%	34.35%	34.50%	28.96%	22.18%	20.99%	12.14%
17:00	44.46%	33.94%	34.26%	22.25%	22.90%	20.69%	8.62%
18:00	32.84%	31.45%	30.75%	22.85%	23.40%	20.74%	11.46%
19:00	29.80%	30.92%	25.06%	29.59%	21.39%	18.51%	10.09%
20:00	25.59%	32.76%	23.66%	24.96%	20.72%	15.76%	9.20%
21:00	29.23%	20.37%	20.49%	18.23%	12.64%	12.76%	6.77%
22:00	26.99%	21.79%	16.67%	12.63%	9.51%	12.90%	4.69%
23:00	19.81%	24.27%	15.45%	21.47%	16.11%	8.64%	3.85%

The following table shows unit-hour utilization for the two truck companies for RY 20/21.

Table 19—Unit-Hour Utilization – Trucks (20/21)

Hour	Truck 5	Truck 2
00:00	6.87%	5.07%
01:00	4.84%	4.42%
02:00	4.63%	3.45%
03:00	1.68%	1.41%
04:00	3.10%	3.53%
05:00	1.95%	2.76%
06:00	4.25%	6.36%
07:00	3.96%	7.08%
08:00	7.73%	11.87%
09:00	20.38%	14.38%
10:00	24.35%	18.19%
11:00	26.10%	15.98%
12:00	14.58%	13.39%
13:00	23.15%	20.47%
14:00	20.43%	13.91%
15:00	16.57%	12.32%
16:00	22.90%	13.25%
17:00	24.16%	12.88%
18:00	14.36%	13.44%
19:00	11.24%	8.43%
20:00	9.11%	11.14%
21:00	6.00%	6.70%
22:00	6.74%	7.34%
23:00	4.05%	8.37%

The following table illustrates a unit-hour utilization summary for the City's EMS apparatus. M5, M2, and M1 each have several hours of 50 percent utilization and Medic 5 and Medic 2 each have one hour over 60 percent utilization and at least 13 consecutive hours at or above 30 percent utilization.

Table 20—Unit-Hour Utilization – EMS Units (20/21)

Hour	M5	M2	M1	M3
00:00	22.87%	17.48%	12.56%	9.32%
01:00	22.85%	15.75%	19.46%	9.27%
02:00	17.34%	16.40%	17.53%	7.35%
03:00	13.61%	16.98%	10.92%	4.04%
04:00	8.71%	14.86%	18.86%	6.86%
05:00	13.06%	14.24%	8.26%	3.46%
06:00	8.95%	13.17%	16.14%	2.94%
07:00	25.50%	34.83%	33.70%	12.56%
08:00	48.33%	29.77%	33.16%	15.43%
09:00	44.71%	39.61%	38.97%	27.70%
10:00	48.82%	45.75%	42.94%	33.54%
11:00	51.40%	60.08%	41.92%	34.01%
12:00	49.60%	55.48%	42.34%	27.61%
13:00	51.46%	44.70%	54.43%	42.82%
14:00	65.37%	47.39%	56.38%	36.85%
15:00	45.36%	37.26%	52.01%	28.99%
16:00	52.28%	54.10%	44.79%	36.74%
17:00	41.93%	46.57%	42.89%	27.86%
18:00	48.24%	46.87%	35.45%	25.95%
19:00	31.61%	34.82%	42.09%	19.44%
20:00	30.19%	34.40%	38.01%	15.91%
21:00	22.49%	30.65%	26.78%	17.02%
22:00	26.16%	22.41%	23.65%	11.37%
23:00	21.09%	26.63%	25.70%	6.88%

Three of the ambulance units exceeded a 30 percent threshold for long periods of time during consecutive daylight hours in RY 20/21.

Finding #9: The City's ambulance system must provide an increased number of full- and part-time ambulances.

2.7.5 Operational Performance

Measurements for the performance of the first response apparatus to arrive at emergency incidents are the number of minutes and seconds necessary for 90 percent completion of the following response components:

- Call processing / dispatch
- Crew turnout
- Travel
- Call to arrival

Call Processing / Dispatch

Call processing measures the time from the first incident timestamp until completion of the dispatch notification. Call processing performance depends on what is being measured. If the first incident timestamp takes place at the time the public-safety answering point (PSAP) physically answers a 9-1-1 call (at times, calls can be briefly held in queue), then call processing begins at *PSAP Time*. In Berkeley this is the Police Department, which also dispatches for the Fire Department.

In addition, not all requests for assistance are received via landline 9-1-1. Generally, there are numerous ways that requests for assistance are received, including landline telephone, cellular telephone, SMS text message, fire or police officer-initiated requests, TTY/TDD operator, etc., that each have a separate timestamp at a different point in the processing operation. This is not as much of a factor if most requests are received via 9-1-1 PSAP.

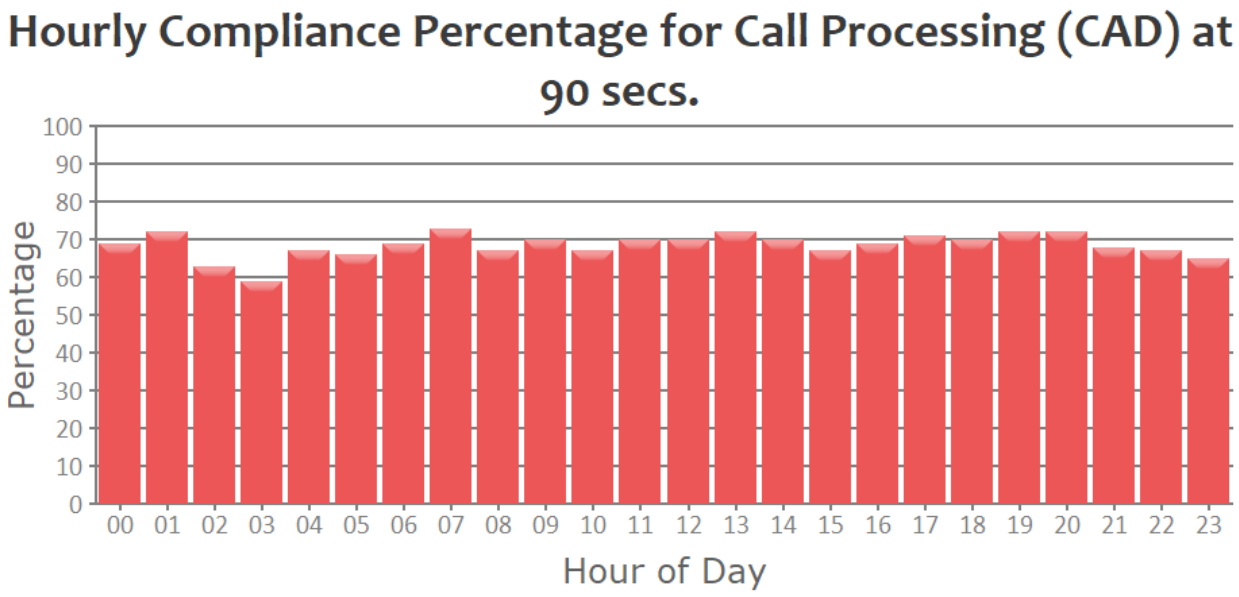
The following table shows call processing / dispatch performance from time of call receipt at the Police Department. This performance does not meet a 1:30-minute Citygate best practice goal, nor a more aggressive NFPA Standard 1710 recommendation of 65 seconds. Also noteworthy is the consistency of performance across all three reporting years. Stated this way, COVID-19 only slightly lengthened dispatch processing time by approximately five seconds.

Table 21—90th Percentile Call Processing / Dispatch Performance

Station	Overall	RY 18/19	RY 19/20	RY 20/21
Department-Wide	2:27	2:24	2:29	2:29

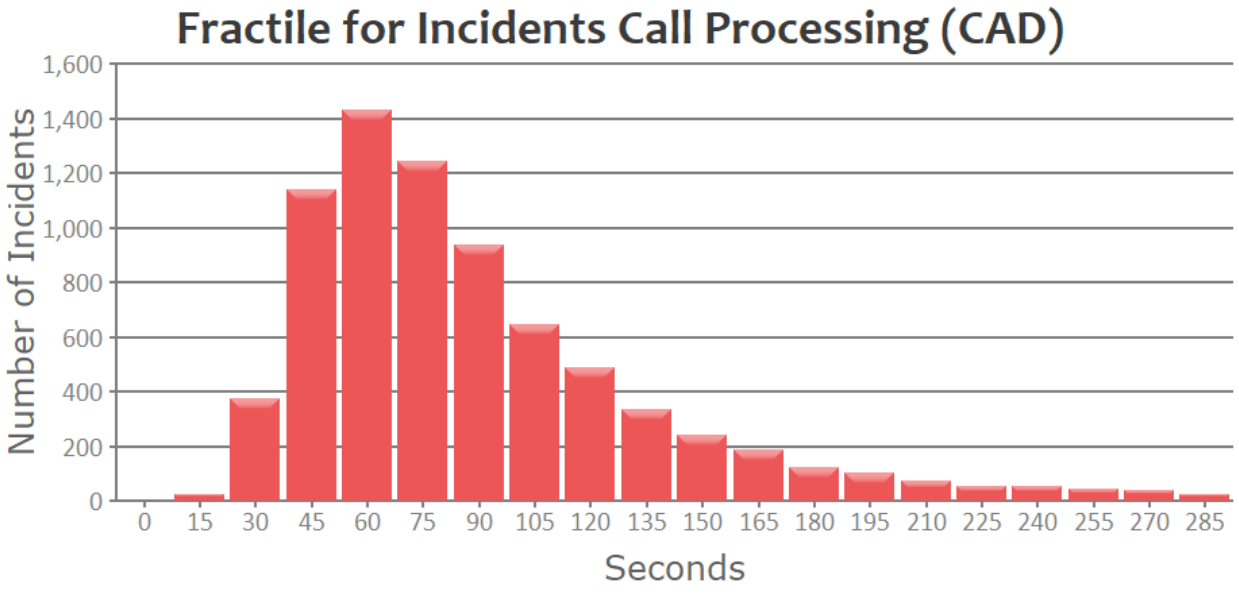
The following is an hourly **compliance** figure revealing call processing compliance between 60 percent and 70 percent nearly every hour of the day.

Figure 13— Hourly Compliance Percentage for Call Processing (CAD) – 2020



The following figure illustrates that most requests are being processed within 90 seconds, with a peak at 60 seconds.

Figure 14—Fractile for Incidents Call Processing (CAD)



Finding #10: The City's call processing / dispatch performance is *not* meeting Citygate's recommended best-practice goal of 1:30 minutes at 90 percent or better reliability.

Crew Turnout

Crew turnout performance measures the time interval from completion of the dispatch notification until the start of apparatus travel to the incident. While the most recent NFPA recommendation for crew turnout performance is 1:00 minute at 90 percent reliability for EMS incidents and 1:20 minutes at 90 percent reliability for fire incidents, Citygate has found over hundreds of fire department studies that few, if any, departments are able to achieve this level of performance when measured across a 24-hour shift.[15] Thus, for many years, Citygate has recommended a 2:00-minute best practice goal for crew turnout at 90 percent or better reliability.

The following table summarizes the City's crew turnout performance for the three reporting years, which very nearly meets Citygate's recommendation of 2:00 minutes. Continued focus on this important measure will be needed to maintain this positive effort.

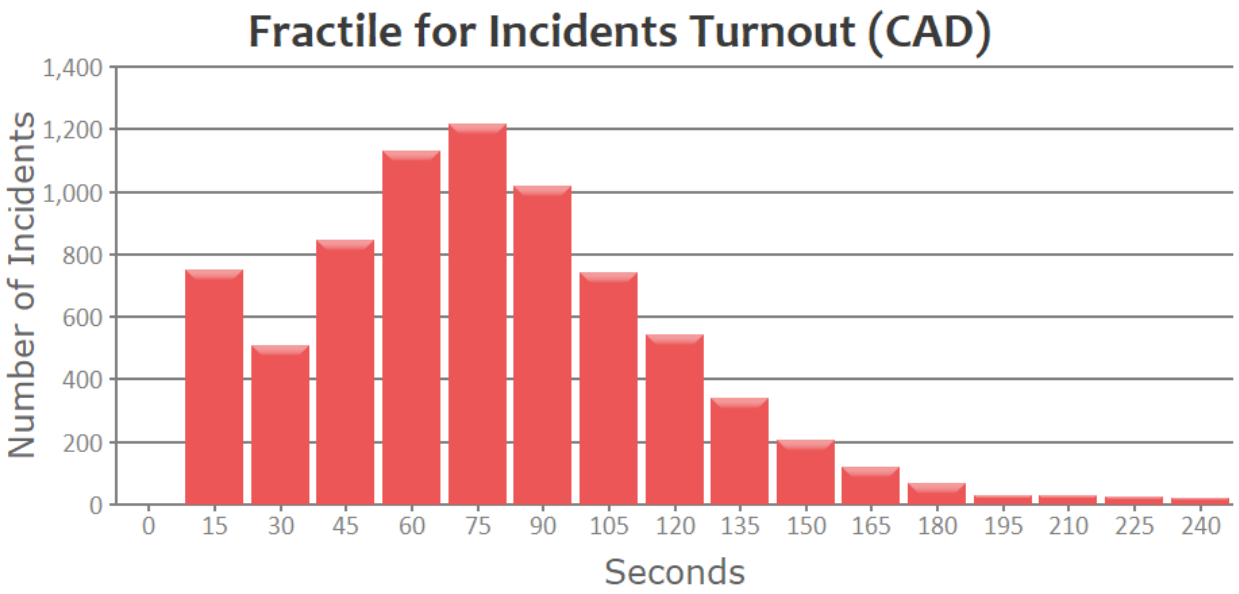
Table 22—90th Percentile Crew Turnout Performance

Station	Overall	RY 18/19	RY 19/20	RY 20/21
Department-Wide	2:03	2:03	2:02	2:05

The following figure illustrates turnout performance by number of seconds. Most turnout occurs in 120 seconds or less, but there are turnouts for emergency incidents that take longer.

[15] NFPA 1710 – Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments (2020 Edition).

Figure 15—Fractile Crew Turnout Performance (2020)



Finding #11: At 2:05 minutes averaged over 24 hours, the Department is just over meeting Citygate's recommended 2:00-minute crew turnout performance goal. As sleeping hours increase turnout time, consider adopting a turnout measure of 1:30 minutes during daytime hours to provide greater clarity and reflect Department performance more accurately.

Fire Station Distribution: First-Unit Travel

Travel performance measures the interval from start of first-due apparatus movement to arrival at the emergency incident. For most urban/suburban jurisdictions, a 4:00-minute first-due unit travel time 90 percent of the time would be considered highly desirable.

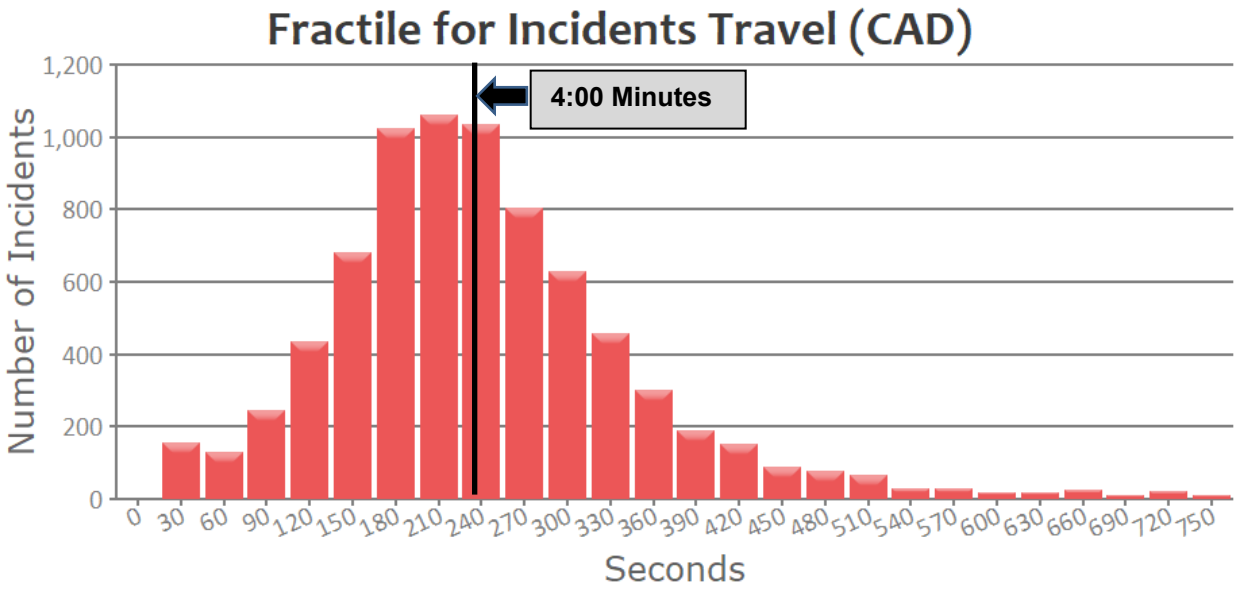
As the following table illustrates, the Department's 90th percentile first-due unit travel time performance over the past three reporting years is 5:40 minutes, which is *30 percent slower* than a best practice-based 4:00-minute goal for highly urban areas. In addition, stations 4 and 7 have overall travel times *both less than and greater than 7:00 minutes*.

Table 23—90th Percentile First-Unit Travel Time Performance

Station	Overall	RY 18/19	RY 19/20	RY 20/21
Department-Wide	**05:40**	**05:25**	**05:42**	**05:53**
Station 1	06:00	05:31	05:57	06:19
Station 2	04:57	04:40	04:57	05:13
Station 3	05:16	05:12	05:15	05:23
Station 4	06:58	06:49	07:20	06:51
Station 5	04:56	04:49	04:52	05:09
Station 6	06:04	05:46	06:10	06:18
Station 7	08:14	08:12	08:30	08:05

The following figure illustrates fractile travel time performance. The peak segment for travel performance is 210 seconds, or 3:30 minutes, with a slow drop-off in volume after the 240-second mark, indicating that 68 percent of incidents are reached within the first 4:00 minutes, though a significant number of incidents require much longer travel time.

Figure 16—Fractile for First-Due Travel Performance (CAD)



Finding #12: At 5:53 minutes, 90th percentile first-unit travel time is *significantly higher* than the 4:00-minute best practice goal for urban areas.

Fire Station Distribution: Call to First-Unit Arrival

Call to first-unit arrival performance measures the time interval from receipt of the 9-1-1 call in the Berkeley Police dispatch center until first-unit arrival at the emergency incident. This measure is a fire agency's primary customer service metric. For urban population areas, Citygate typically recommends a 7:30- to 8:30-minute first-unit call-to-arrival goal at 90 percent compliance.[16] As the following table shows, the Department's overall 90th percentile call-to-arrival performance across three reporting years is 9:23 minutes, or 1:53 minutes *slower* than an optimum 7:30-minute goal.

Across all reporting years, and in each station area, the weak performance is consistent:

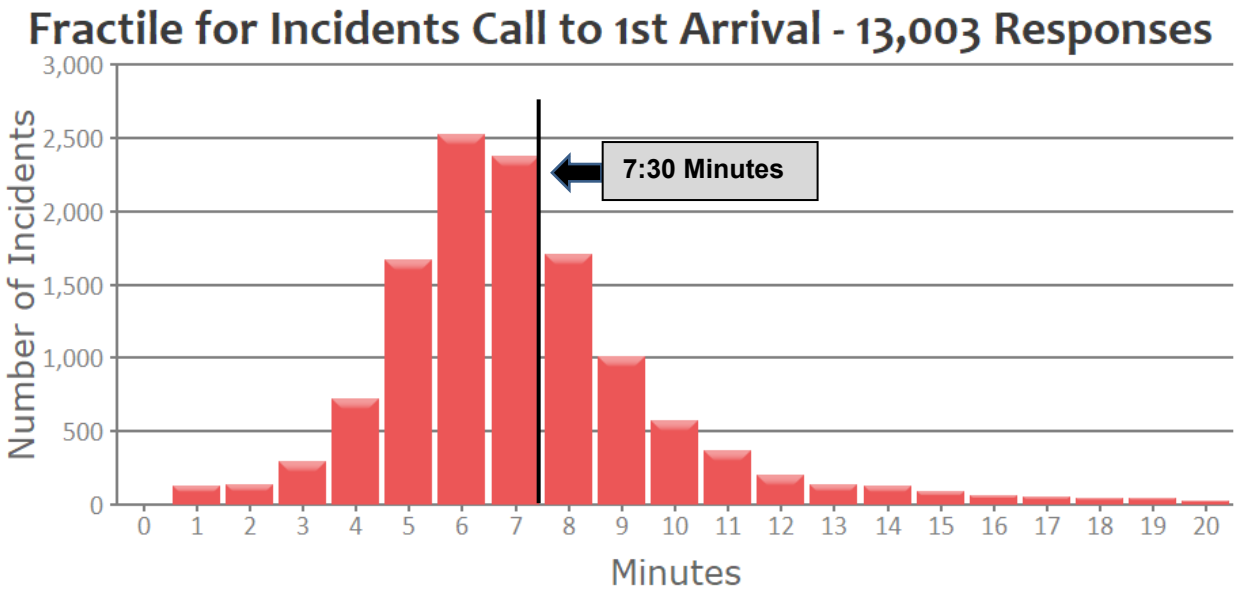
Table 24—90th Percentile First-Unit Call-to-Arrival Performance

Station	Overall	RY 18/19	RY 19/20	RY 20/21
Department-Wide	**09:23 (25,366)**	**09:00 (9,161)**	**09:32 (8,552)**	**09:32 (7,653)**
Station 1	09:51 (4,269)	09:35 (1,482)	09:52 (1,425)	09:59 (1,362)
Station 2	08:38 (5,154)	08:26 (1,914)	08:35 (1,846)	08:56 (1,394)
Station 3	09:05 (2,450)	08:56 (918)	09:07 (817)	09:07 (715)
Station 4	09:55 (2,290)	09:50 (745)	10:27 (771)	09:36 (774)
Station 5	08:16 (6,977)	08:03 (2,601)	08:17 (2,290)	08:26 (2,086)
Station 6	10:10 (3,471)	09:21 (1,289)	10:39 (1,141)	10:37 (1,041)
Station 7	12:11 (755)	11:49 (212)	12:30 (262)	12:11 (281)

The following figure shows peak call to first-unit arrival occurring at 6:00 minutes (360 seconds), and the right-shifted graph indicates the number of incidents with longer call to arrival time.

[16] The 7:30-minute call to first-unit arrival goal in urban areas includes 1:30 minutes for call processing / dispatch time, 2:00 minutes for crew turnout time, and 4:00 minutes for travel time.

Figure 17—Fractile Call to First-Unit Arrival Performance – RY 20/21



Finding #13: At 9:32 minutes in RY 20/21, 90th percentile first-unit call-to-arrival performance is 1:53 minutes *slower* than an optimum best practice goal of 7:30 minutes for urban areas.

Fire Station Concentration: ERF (First Alarm) Call to Arrival

The Department's ERF for building fires includes four engines, two ladder trucks, one ambulance, one Medic Supervisor, and one Battalion Chief for a total of 22 personnel. Over the period of three reporting years that were studied, there were 24 incidents for which the entire ERF arrived, with a 90th percentile call-to-arrival performance of 18:50 minutes, which is 7:20 minutes *slower* than Citygate's recommended 11:30-minute goal for urban areas. Most of this slower response is due to the longer travel times, when several units must cross most of the City to reach the incident.

Table 25—90th Percentile ERF Call-to-Arrival Performance

Station	Overall	RY 18/19	RY 19/20	RY 20/21
Department-Wide	18:50 (25)	11:50 (6)	16:29 (9)	18:50 (10)
Station 1	18:50 (2)	-	-	18:50 (2)
Station 2	13:18 (8)	11:50 (3)	13:18 (2)	25:28 (3)
Station 3	15:20 (4)	-	11:17 (2)	15:20 (2)
Station 4	20:59 (2)	-	20:59 (2)	-
Station 5	10:16 (6)	09:45 (2)	16:29 (2)	08:29 (2)
Station 6	17:28 (3)	17:28 (1)	07:40 (1)	08:47 (1)
Station 7	-	-	-	-

Finding #14: At 18:50 minutes across the three years of data, 90th percentile ERF (First Alarm) call-to-arrival performance *is 7:20 minutes slower than* the 11:30-minute Citygate-recommended best practice goal for urban areas.

Response Performance Summary

The following table summarizes the Department's operational response performance over the three-reporting-year period of data studied relative to recognized best practices. As the table illustrates, response performance for RYs 18/19, 19/20, and 20/21 was *slower* than Citygate's best practice recommendation to ensure positive outcomes for serious emergencies.

Table 26—Response Performance Summary

Response Component	Best Practice		90th Percentile Performance	Performance Versus Best Practice and Current Goal
	Time	Reference		

Response	Best Practice		90th Percentile	Performance Versus Best
Call Processing / Dispatch	1:30	NFPA	**2:29**	**+ 0:59**
Crew Turnout	2:00	Citygate	**2:05**	**+ 0:05**
First-Unit Travel	4:00	NFPA	**5:53**	**+ 1:53**
First-Unit Call to Arrival	7:30	Citygate	**9:32**	**+ 2:02**
ERF Call to Arrival	11:30	Citygate	**18:50**	**+ 7:20**

2.8 ~~Special Challenges to Deployment – Traffic Congestion and Street Designs~~Traffic Congestion, Street Safety Improvements and Emergency Response

This study has noted how emergency incident travel times are 1:53 minutes slower than recommended best practice travel times to serious events. This measure is consistent across the City and by fire station district. Even in 2020, with many shutdowns related to the onset of the COVID-19 pandemic, travel time remained sluggish.

The GIS data measured only a small, 3.6 percent reduction in first-due road mile coverage resulting from traffic congestion. In Citygate's experience with many other Bay Area cities, this is the most minimal impact between peak and off-peak hours we have witnessed. Some area cities see peak-hour impacts which decrease the road miles covered by approximately 15–25 percent.

Residing in Alameda County, and having visited Berkeley multiple times, Citygate's lead consultant on this project took note of the City's street designs, the hills, street parking, buildings at corners and trees affecting sight lines—plus the large volume of traffic during most hours of the day, with the exception of very late evening to pre-morning rush hour. All these factors combine to negatively impact travel times for emergency vehicles in general. Traffic congestion specifically plays only a minor part in delaying first-due units; however, traffic congestion does severely impact multiple-unit ERF travel times—even with traffic signal preemption control, as there is nowhere cars and trucks can move to make space for emergency vehicles.

To protect pedestrians and automobile passengers, the City has long used various traffic-calming measures, including barriers on some residential streets, to stop "cut-through" traffic. The street closure barriers were built to allow the passage of fire trucks—*but only slowly*. Emergency response units cannot drive over these barriers at the speed limit. Many of these devices completely restrict ambulance passage as ambulances sit lower to the ground than fire trucks.

Throughout the country over the last 20 plus years, traffic engineers have deployed approximately 20 street design elements to slow through traffic. A few examples of such elements are speed humps, lumps, split lumps, intersection bulb-outs, traffic circles, and raised intersections. Most communities have a formal process to consider these tools during development or upon neighborhood request. The more common devices that slow traffic—such as lumps or traffic circles—slow a fire unit by 9–10 seconds *per device encountered.* Thus, if a unit had to encounter and navigate three devices en route to an incident, 27–30 seconds would be lost across the total response time.

Currently the City has adopted Vision Zero~~s~~ as a set of strategies to significantly improve pedestrian and bicycle safety. Fire departments are typically involved in the approval process for traffic-calming elements to understand the impacts to response time. One strategy to lessen impacts on fire and ambulance response times is to have the fire department identify "priority response routes" that are the prime arterials and or main boulevards leaving a fire station, and which allow units to quickly travel across half of a fire station district to the actual residential streets in need of service. Priority response routes should be identified based on specific criteria, and could~~would~~ employ fewer, or perhaps differently designed~~, if any~~, traffic-calming methods.

There is a constructive tension between preserving public safety travel times and pedestrian and automobile safety. The City is to be commended on also working to shift with incentives the burden of traffic congestion from high automobile use to non-vehicular modes of transit. Doing so now is important work, as~~Worsening the current, congested City response times as measured in this study,~~ if left unmitigated the use of more automobiles with ~~urban planning is adding more street design restrictions to lower traffic volumes, decrease vehicle speeds, and encourage "walkable communities." Additionally, there is the~~ an increase in development density for mid-rise residential dwelling buildings and ADU units on single-family lots~~. Even with some limits as to the parking of cars and the use of rideshare services, and despite the city's best efforts to incentivize residents to reduce vehicle trips and get around using sustainable modes such as on foot or bike or public transit, the total growth envisioned for the City and UC campus means it is quite likely that~~ will likely increase ~~*will increase*~~ *street traffic* ~~*will increase*~~ even more.

Further, "vertical" high-rise populations mean the time to emergency response is even longer. After a unit reaches an address, it must then ascend several stories to where the patient or fire is. While dense, high-rise housing plays an important role in meeting the city's housing goals, it is creating an increasingly complicated landscape for first responders and emergency response times. The three following proposed projects are in the active development process and are representative of infill growth changes. All three projects are to the western side of the UC Berkeley Campus, not spread throughout the City:

- iHub Berkeley – 26 stories at Oxford and Center streets. 485 apartments and a 4,000-square-foot restaurant as part of 13,500 square feet of commercial use space.
- 26 stories at 1974 Shattuck Avenue. 297 units plus commercial space at street level.
- 25 stories at 2190 Shattuck Avenue, to contain 326 units and other uses.

All of these factors indicate that traditional measures to mitigate the impacts of traffic congestion and safe streets calming on fire/EMS travel times will not materially lower response times to that of a decade ago and will probably barely mitigate the impacts of new growth in traffic. However, it is not Citygate's suggestion that the Department should give up. The Department must be more involved in traffic design approvals, setting forth priority response routes and requesting funding for technology control of traffic signals—more so the use of "smart corridor" controls to sync several traffic signals at once along a fire unit route.

~~The City is facing three choices regarding emergency unit response times:~~

~~1. Do nothing and accept sluggish response times that are likely to continue to degrade with infill development and ongoing traffic calming measures and/or streets restricted to bicycles and pedestrians.~~

~~4. Implement Department improvements and strictly limit traffic calming on primary and secondary arterials to improve response times.~~

~~5. If the changes in #2 do not improve response times,~~ It may be necessary to add infill fire/ambulance stations between existing sites to lower travel distances. This

2. ~~Option 3~~ is essentially the way downtown urban cores such as Manhattan, Chicago, and Los Angeles must provide coverage. In these agencies, fire/EMS stations are almost in sight of each other due to traffic congestion and high-rise building populations.

Finding #15: Berkeley Planning, Traffic Engineering, and the Fire Department do not have an effective set of integrated policies and traffic-calming methods to partially mitigate the impacts of walkable street designs on fire and ambulance response times.

2.9 PLANNED AMBULANCE SYSTEM IMPROVEMENTS

This study has identified how overcommitted the Department's four paramedic ambulance units are for most of the daytime to mid-evening hours. This is due to the City not adding a sufficient number of new ambulances over the years, a dispatch center that is not capable of triaging and

diverting non-urgent calls for service, increases in population, and—given the state of health care and housing in America—the increase in non-medically insured populations, both housed and houseless.

In parallel with beginning this study, the Department understood the issues associated with the workload per ambulance per hour and gained City support for a plan to grow and change the deployment of Department ambulances. Over the next three years, the Department will make the transition from ambulances staffed with only firefighter/paramedics to ambulances staffed with non-firefighter/paramedics and EMTs. During this transition to staffing ambulances with full-time medical personnel only, some existing firefighter/paramedics will be reduced through attrition, and some will be reassigned to ladder units to increase first responder staffing to emergencies that firefighters are trained for.

Initially, the program will alter staffing for the existing four ambulances, which will **not reduce** unit workload. As a second step, the Department will add BLS ambulances to handle low-acuity patients who do not require ALS paramedic care, but this change will also require upgrades to dispatcher training and technology to sort 9-1-1 callers into clinical categories.

Over time, ambulance staffing changes will reduce the cost associated with each ambulance staff member by approximately 20 percent for non-firefighter paramedics and 50 percent for non-firefighter EMTs. These cost savings will allow the Department to strategically increase some fire apparatus staffing from three to four crew members and deploy additional ambulances at a lower cost.

This conversation will also allow the Department to build a recruitment pathway from local vocational schools to provide entry-level EMT positions that pay well and provide good benefits. An employee is then inside the Department and can be further mentored and developed to take on a variety of career paths valuable to the City—all of which are high skill, high pay, and in need of qualified applicants.

In early 2023, the Department will begin transitioning staffing for ALS ambulances to non-firefighter paramedics. This will require at least four paramedic recruitments over three years. The anticipated sequence of ambulance conversion will be Medic 2, Medic 1, Medic 3, and Medic 5.

The Department will also work to deploy BLS ambulances staffed with EMTs. These positions will be entry-level, with limited-term contracts, that will provide the primary recruitment tool for the organization. Employment contracts will last for three years but may be extended to five if the employee enrolls in a fire academy or paramedic program.

The Department would like to hire as many as 28 EMTs (with current funding for 10). The soonest that EMT ambulance positions can be added would be 2024. Thus, it is all but impossible for the Department to add a fifth or sixth ambulance of any type before early 2024.

> **Finding #16:** The City's planned expansion of ambulance service is consistent with best practices and will provide needed improvement, but upgrades in dispatcher skills for clinical evaluation to recognize and separate low-acuity incidents will not be fully realized for at least three more years, and likely longer. Given the ongoing strain on ambulances staffed with only firefighter/paramedics, the process of conversion and expansion of ambulances is too slow to meet current (and growing) EMS service demands.

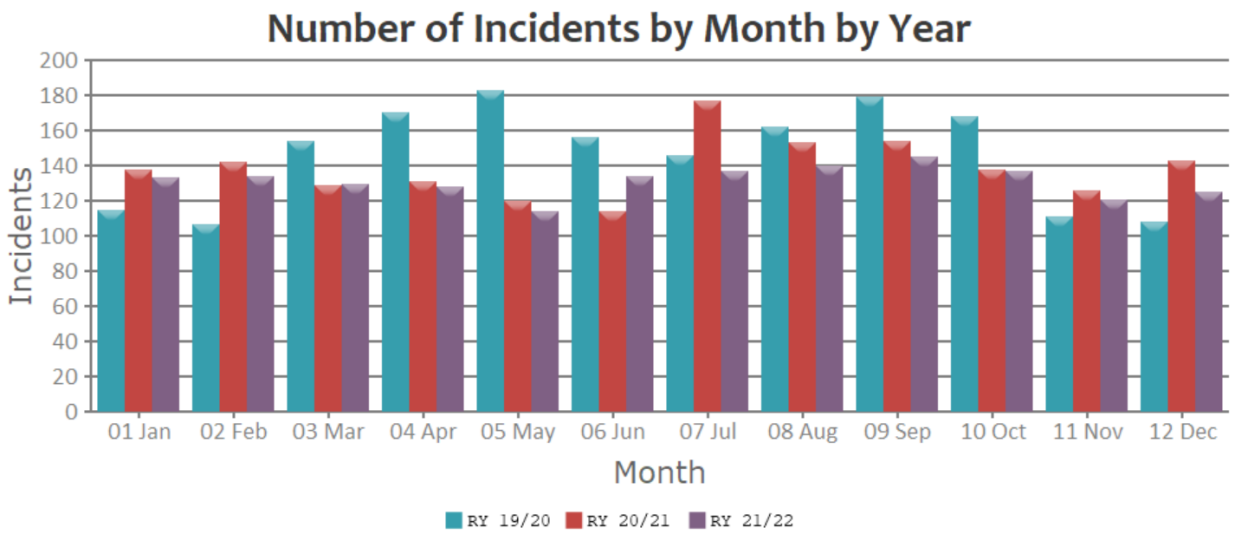
2.10 Mental Health Patient Transport

Another type of EMS patient care is when a patient is experiencing a mental health crisis so severe that a police officer can require the person be placed on 72-hour hold for in-patient mental health evaluation. To date in Alameda County, these patients are transported by the County's ambulance provider to several facilities. In addition to police, Department first responders and ambulances also respond at times given uncertainty as to the medical situation when 9-1-1 is first called. The short form name for these incidents comes from the California Government Code for the mental health holds—Section 5150. These 5150 incidents are separately counted in the Berkeley Police and Fire incident records and as such are not included in the EMS incident counts elsewhere in this study.

Citygate was provided 5150 incident data for three reporting years between 7/1/2019 and 6/30/2022. During this period, there were 5,002 mental health incidents and 15,534 apparatus response records—demonstrating that, for many incidents, the initial response is three units: police, fire first responder, and fire ambulance. In the last reporting year, there were 1,578 total incidents and 3.1 apparatus responses per incident. The number of incidents per day was 4.32.

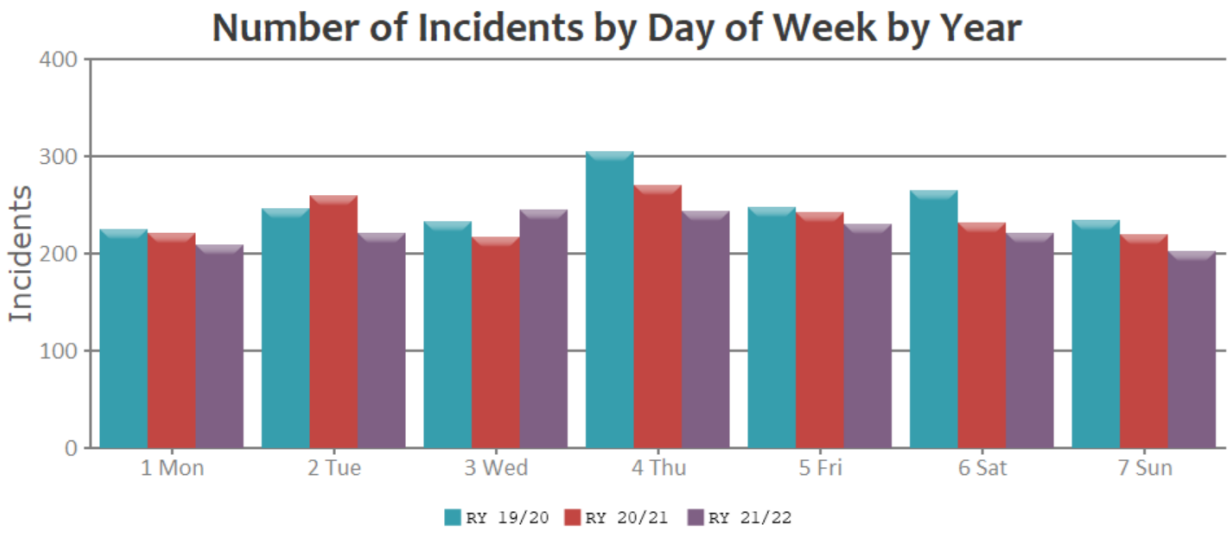
The following figure illustrates the number of incidents by month by year. There is more activity during summer months, with activity decreasing during winter months.

Figure 18—Number of 5150 Incidents by Month by Year



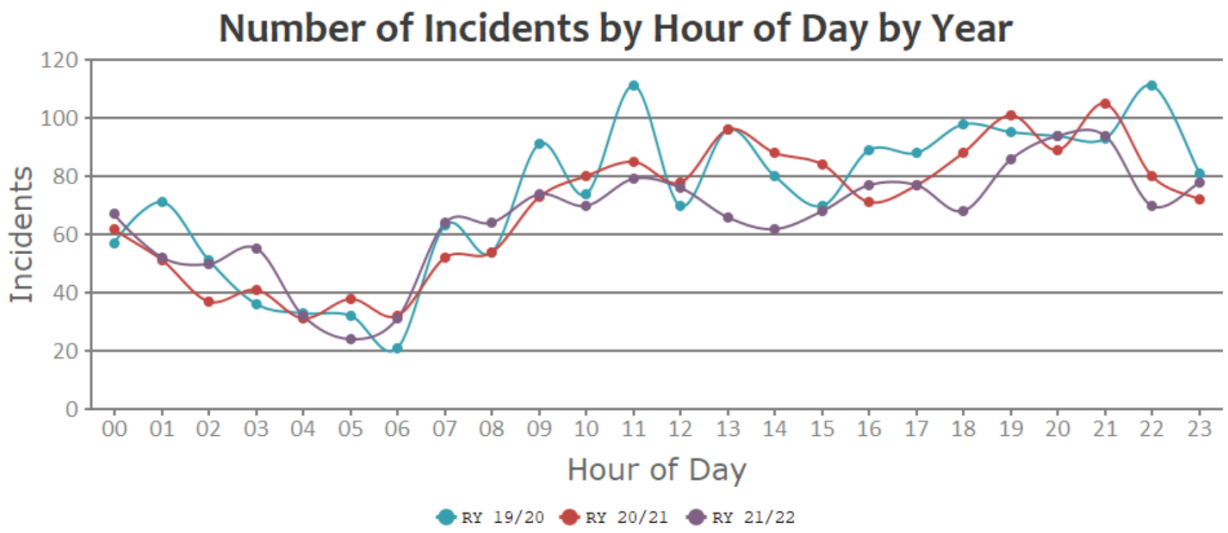
The following figure shows that peak activity occurs on Thursday, with minimal activity on Sunday and Monday.

Figure 19—Number of 5150 Incidents by Day of Week by Year



The following figure illustrates the breakdown of incidents by hour of day by year.

Figure 20—Number of 5150 Incidents by Hour of Day by Year



The following table illustrates the total number of hours spent for 5150 incidents by department.

Table 27—5150 Incidents – Total Duration Hours by Year by Department

Department	RY 19/20	RY 20/21	RY 21/22	Total
Berkeley Fire Department	15.4	14.3	18.8	**48.5**
Berkeley Police Department	696.2	696.1	738.4	**2130.7**
County Ambulance System Transport	1835.9	1755.6	1821.0	**5412.5**
Total	**2547.6**	**2466.0**	**2578.2**	**7591.8**

The following table illustrates 5150 incidents by destination hospital by year.

Table 28—5150 Incident Count – Year by Destination Hospital

Hospital	RY 19/20	RY 20/21	RY 21/22	Total
-Blank-	786	525	462	**1,773**
Alameda County Fairmont Hospital			1	**1**
Alameda County Medical Center, Highland	8	15	10	**33**
Alta Bates Summit Medical Center, Alta Bates Campus	472	654	536	**1,662**
Alta Bates Summit Medical Center, Herrick Campus	5	4	10	**19**
Alta Bates Summit Medical Center, Summit Campus	25	33	46	**104**
Children's Hospital & Research Center Oakland	9	10	4	**23**
Eden Medical Center	4	3	2	**9**
John George Psychiatric Pavilion	372	374	434	**1,180**
Kaiser Permanente, Oakland Medical Center	43	36	56	**135**
Kaiser Permanente, San Leandro Medical Center		1	2	**3**
San Leandro Hospital	11	4	12	**27**
Willow Rock Center	22	6	3	**31**
Total	**1,759**	**1,665**	**1,578**	**5,002**

The following table illustrates hours and minutes to 90 percent duration performance for 5150 incidents by destination hospital by year. Given the number of mental health crisis patients in the north county, take note of the time it takes the ambulance to transfer care of the patient at the County's John George facility and Alta Bates Summit Center:

Table 29—90 Percent Performance Minutes for 5150 Incidents – Year per Hospital

Hospital	RY 19/20	RY 20/21	RY 21/22
-Blank-	02:35 (786)	02:32 (525)	02:23 (462)
Alameda County Fairmont Hospital			03:22 (1)
Alameda County Medical Center, Highland	02:07 (8)	03:25 (15)	04:02 (10)
Alta Bates Summit Medical Center, Alta Bates Campus	**02:29 (472)**	**02:37 (654)**	**02:38 (536)**
Alta Bates Summit Medical Center, Herrick Campus	01:48 (5)	01:11 (4)	02:44 (10)
Alta Bates Summit Medical Center, Summit Campus	01:56 (25)	04:22 (33)	03:07 (46)
Children's Hospital & Research Center Oakland	01:33 (9)	02:32 (10)	05:08 (4)
Eden Medical Center	02:44 (4)	04:16 (3)	03:32 (2)
John George Psychiatric Pavilion	**02:53 (372)**	**02:52 (374)**	**03:32 (434)**
Kaiser Permanente, Oakland Medical Center	02:09 (43)	02:27 (36)	02:43 (56)
Kaiser Permanente, San Leandro Medical Center		01:41 (1)	03:31 (2)
San Leandro Hospital	02:54 (11)	02:41 (4)	04:34 (12)
Willow Rock Center	02:50 (22)	03:08 (6)	03:23 (3)

It is not uncommon for more than one of these incidents to occur at the same time in the City.

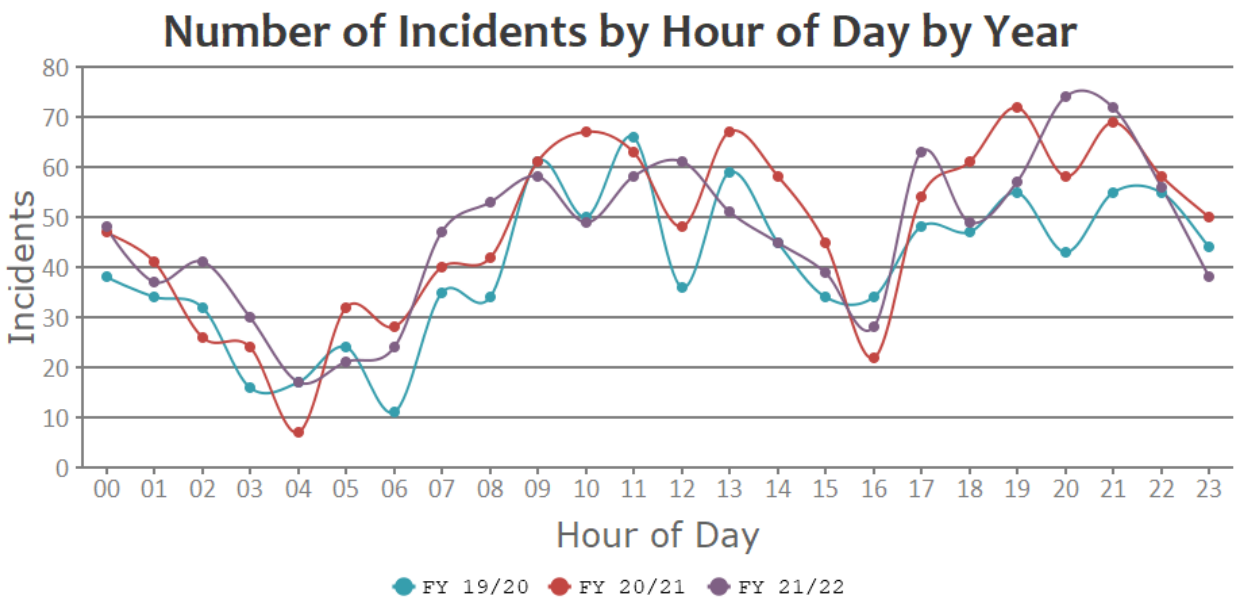
The following table shows simultaneous 5150 incidents by hour of day and day of week.

Table 30—Simultaneous 5150 Incidents (Two or More at the Same Time)

Hour	1 Mon	2 Tue	3 Wed	4 Thu	5 Fri	6 Sat	7 Sun	Total
00:00	11	17	7	11	15	12	9	**82**
01:00	10	7	4	12	11	5	10	**59**
02:00	5	10	10	13	6	9	4	**57**
03:00	8	9	7	8	8	5	5	**50**
04:00	5	2	9	7	2	5	4	**34**
05:00	2	7	2	4	4	7	8	**34**
06:00	9	4	7	6	3	4	3	**36**
07:00	5	6	9	15	14	12	11	**72**
08:00	7	7	16	16	14	7	4	**71**
09:00	17	19	11	22	17	13	9	**108**
10:00	11	15	17	21	16	14	6	**100**
11:00	20	21	8	13	18	16	18	**114**
12:00	18	16	10	16	8	9	18	**95**
13:00	24	23	16	18	16	12	14	**123**
14:00	17	17	12	14	15	10	14	**99**
15:00	14	18	13	22	5	18	10	**100**
16:00	17	13	16	22	14	15	2	**99**
17:00	12	5	17	23	13	23	7	**100**
18:00	10	10	19	16	12	17	16	**100**
19:00	16	11	13	25	23	16	27	**131**
20:00	10	19	9	24	17	17	17	**113**
21:00	14	19	23	20	27	11	12	**126**
22:00	10	13	21	14	18	15	19	**110**
23:00	13	15	15	10	19	15	14	**101**
Total	**285**	**303**	**291**	**372**	**315**	**287**	**261**	**2,114**

The following figure illustrates the breakdown of transport incidents by hour of the day by year.

Figure 21—Number of 5150 Transport Incidents by Hour of Day by Year



The number and frequency of mental health evaluation holds and resultant transports to an appropriate care facility are a significant daily event in the City.

Finding #17: Based on the most recent year's quantity of mental health transport patients being held for evaluation in the City, for the Department to be tasked with management of these patients would require the addition of one 24-hour unit and one 12-hour peak unit—both operating seven days a week. At present, the Department does not have the units or personnel to administer this workload.

2.11 Overall Deployment Evaluation

The Department serves a diverse urban population with a mixed residential and non-residential land-use pattern typical of an East San Francisco Bay area city. Due to the City's bayfront location, the University of California campus and the Lawrence Berkeley National Laboratory, the Department protects large tourism and non-resident population densities. The City also is evolving to improve its housing shortages by approving mid- and high-rise residential buildings. UC

SOC Element 8 of 8
Overall Evaluation

Berkeley is completing its new master plan to add students, faculty, on-campus buildings and housing off-campus.

The intensification of land uses and populations will make several sections of Berkeley very "urban" to a degree typical of the largest metropolitan cities for population densities and traffic. This will require the City's fire and ambulance programs to evolve beyond those of a "suburban" agency to those suitable for a major urban fire department in staffing, unit types, and facility locations. Citygate acknowledges this will not only be costly but also difficult to find new locations for responders in an already built-up City.

For comparison, the following table displays population density per square mile. Of the top 50 largest cities in California, Berkeley is already the second most densely populated city per square mile—even *without students, citywide employment, tourism, and cars on the freeways.* The City needs an ***urban*** level of fire, EMS, and specialty rescue services.

Table 31—California Cities: Population Density per Square Mile

Rank by Population	Rank by Density	City	Population	Size (Square Miles)	Population per Square Mile
4	1	San Francisco	873,965	46.91	18,630.68
51	**2**	**Berkeley**	**124,321**	**10.43**	**11,919.56**
13	3	Santa Ana	310,227	27.34	11,347.00
31	4	Garden Grove	171,949	17.96	9,574.00
7	5	Long Beach	466,742	50.71	9,204.14
1	6	Los Angeles	3,898,747	469.49	8,304.22
8	7	Oakland	440,646	55.93	7,878.53
22	8	Oxnard	202,063	26.53	7,616.40
23	9	Huntington Beach	198,711	27	7,359.67
46	10	Santa Clara	127,151	18.28	6,955.74
33	11	Salinas	163,542	23.52	6,953.32
36	12	Sunnyvale	155,805	22.08	7,056.39
40	13	Torrance	147,067	20.52	7,167.01
10	14	Anaheim	346,824	50.27	6,899.22
37	15	Pomona	151,713	22.99	6,599.09
41	16	Fullerton	143,617	22.42	6,405.75
24	17	Glendale	196,543	30.48	6,448.26
44	18	Pasadena	138,699	22.96	6,040.90

Rank by Population	Rank by Density	City	Population	Size (Square Miles)	Population per Square Mile
19	19	Modesto	218,464	43.05	5,074.66
3	20	San Jose	1,013,240	178.26	5,684.06
43	21	Orange	139,911	25.67	5,450.37
15	22	Chula Vista	275,487	49.64	5,549.70
6	23	Sacramento	524,943	98.61	5,323.43
11	24	Stockton	320,804	62.21	5,156.79
21	25	Fontana	208,393	43.07	4,838.47
5	26	Fresno	542,107	115.18	4,706.61
14	27	Irvine	307,670	65.61	4,689.38
25	28	Santa Rosa	178,127	42.53	4,188.27
28	29	Rancho Cucamonga	174,453	40.11	4,349.36
17	30	Santa Clarita	228,673	70.75	3,232.13
2	31	San Diego	1,386,932	325.88	4,255.96
29	32	Oceanside	174,068	41.27	4,217.79
26	33	Elk Grove	176,124	41.99	4,194.43
38	34	Escondido	151,038	37.35	4,043.86
20	35	Moreno Valley	208,634	51.33	4,064.56
50	36	Concord	125,410	30.55	4,105.07
35	37	Corona	157,136	39.94	3,934.30
39	38	Roseville	147,773	44.08	3,352.38
49	39	Vallejo	126,090	30.42	4,144.97
42	40	Visalia	141,384	37.94	3,726.52
12	41	Riverside	314,998	81.23	3,877.85
18	42	San Bernardino	222,101	62.13	3,574.78
34	43	Hayward	162,954	45.82	3,556.39
27	44	Ontario	175,265	49.97	3,507.40
48	45	Simi Valley	126,356	41.55	3,041.06
16	46	Fremont	230,504	78.31	2,943.48
9	47	Bakersfield	403,455	149.78	2,693.65
47	48	Thousand Oaks	126,966	55.26	2,297.61
30	49	Lancaster	173,516	94.27	1,840.63
45	50	Victorville	134,810	73.71	1,828.92
32	51	Palmdale	169,450	106.06	1,597.68

While state fire code requires fire sprinklers in residential dwellings, it will be many more decades before enough residential units are replaced or remodeled with automatic fire sprinklers. If desired outcomes include limiting building fire damage to only part of the inside of an affected building and minimizing permanent impairment resulting from a medical emergency, then the City will need coverage in all neighborhoods that is consistent with Citygate's response performance recommendation for Berkeley. Based on Citygate's study, this response performance recommendation entails *no more than* 8:30 minutes for the arrival of a single first responder, and 11:30 minutes for a multiple-unit arrival to more serious incidents, from the time of 9-1-1 notification at the Berkeley Police Communications Center—all at 90 percent or better reliability.

Dispatch, turnout, and travel times all need to be reduced. Dispatch time must decrease by 0:59 seconds to meet a 1:30-minutes call-processing goal, turnout time by :05 seconds to meet a 2:00-minute goal, and travel time by 0:53 seconds to meet a proposed goal of no more than 5:00 minutes for first-due units in *congested urban* areas. Collectively, Citygate's recommended first-unit total response time goal is 8:30 minutes (1:30 + 2:00 + 5:00).

Stated this way, *"Berkeley must get its fire department back"* to offer availability for serious, life-threatening fires and EMS events and to field enough firefighters to serious building or wildland fires quickly.

Accomplishing this goal means multiple changes over the next three years to first improve and then maintain response times as growth occurs:

1. Increasing the number of ambulances from four to six.
2. Shifting responsibility for non-acute EMS calls from the 9-1-1 Fire/Ambulance program to a Mobile Integrated Health program like the City pilot Mobile Integrated Paramedic (MIP) program.
3. Improving dispatch staffing and systems to allow for EMS clinical call triage.
4. Engineering traffic systems to give priority access to first responders in addition to providing pedestrian safety.
5. Increasing staffing to four personnel each on key engines and ladder trucks.
6. Adding a second field operations Battalion Chief 24/7 for improved crew supervision and to add an immediate scene safety officer to support the Battalion Chief / Incident Commander for serious emergency incidents.

If these six strategies do not improve acute emergency response times *and lower unit-hour utilization (UHU) workload to no more than 30 percent,* the City should construct infill fire or ambulance-only stations between the current busiest station pairs of 2 and 5 and 1 and 6. These

areas are also where much of the infill development, high-rise building, and UC Berkeley campus growth will occur.

One solution employed by some fire departments that struggle with UHU and response time is to deploy a smaller, two-firefighter staffed squad unit to handle low-risk / low-acuity calls. In the City, ambulances—at both ALS and BLS levels of care—are non-firefighting, two-person units. Proposed alternative response units like the Mobile Integrated Paramedic (MIP) or similar model could also employ two-person staffing. Given the large building, wildland fire, technical rescue, and hazardous materials risks, City firefighter units require a fully staffed crew to arrive quickly and concurrently with all the needed tools to provide rapid mitigation of the problem. Adding personnel to existing units will result in the appropriate number of firefighters arriving in a shorter amount of time. Given these dynamics, Citygate is not recommending the use of firefighting squads in the City.

Given our analysis, Citygate finds the Department's response apparatus types to be appropriate to protect against the hazards likely to impact the City. However, *fire crew staffing of three per unit is insufficient* to provide the necessary "weight" of response to serious fires—especially so in mid- and high-rise buildings and for severe wildland fires that start in the hills. Currently, the Department's service capacity for fire and non-fire risk consists of 37 personnel on duty daily, including one Battalion Chief, one mobile Paramedic Supervisor, and 27 firefighters staffing seven engines and two aerial ladder trucks. An additional eight firefighters currently staff four ambulances and operate from the Department's seven fire stations. However, engines are very busy providing EMS response, and the firefighters staffing ambulances are not consistently available for firefighting at present. Over the next several years, three firefighters per day will be moved to an engine and both ladders, thus raising three of the nine firefighting units to four-firefighter staffing consistent with NFPA Standard 1710 and Citygate best practices for high-density urban core areas. These firefighters will be replaced by non-firefighter EMS personnel on the ambulances, thus aligning the classification with the work and creating a more efficient system. However, only three units with four-firefighter staffing will not be enough. At a minimum, four-firefighter staffing should be provided:

- On four engines: 1, 2, 5, and 6
- On trucks 2 and 5
- Occasionally (on high-fire danger wildland fire days) on engines 3, 4, and 7.

When increasing firefighting units to four crew members each, one additional firefighter per day will have to be newly funded, which amounts to a total of three added firefighting personnel *per crew* (plus the overtime to cover their leave absences) on a three-platoon fire crew rotation system. The wildfire threat days which increase staffing to four each can be handled via overtime during

daylight hours or when winds are most severe. When the engine and ladder units identified are staffed with four personnel each, the daily staffing for units other than ambulances increases from 27 to 33 per day—much more consistent with the risks to be protected in a thriving, growing urban area with internationally known assets and a tragic history of wildland fires.

There is also a need to add a second field operations Battalion Chief 24 hours per day for improved crew supervision and to add an immediate scene safety officer to support the Battalion Chief / Incident Commander for serious emergency incidents.

The Department's on-duty operations staff has grown to 10 direct reports to a single on-duty Battalion Chief. This is beyond an effective span of control of 5–7 subordinates per supervisor. A 10:1 span of control provides no time for mentoring and training subordinates, which contributes to long-term challenges relating to succession planning. Further, this 10:1 ratio does not factor in any future expansion of the organization to meet the changing needs of the community.

Performing competent emergency incident command is very challenging, especially in the initial minutes of an incident when rapid decisions have to be made that influence the preservation of life, property, and the environment. Industry best practice is to have two chief officers on the scene of significant emergencies. As defined by National Institute of Occupational Safety and Health (NIOSH),[17] four of the top five contributing factors to firefighter fatalities on an emergency scene are the responsibility of the Incident Commander:

1. Improper or Inadequate Risk Assessment
2. Lack of Incident Command
3. Lack of Accountability
4. Inadequate or Poor Communications
5. Lack of SOPs or failure to follow established SOPs.

A novel forensic study of over 12,000 firefighter incident emergencies called Project Mayday[18] provides useful data to help fire department incident commanders predict and prevent firefighter injuries and deaths. Surprisingly, there have been at least 10 firefighter maydays called by City Firefighters since 2001—incidents where firefighters were in life-threatening situations and required immediate assistance from crews and complex coordination from the sole Incident Commander on scene.

[17] https://www.cdc.gov/niosh/fire/default.html

[18] http://projectmayday.net/

1. Two crew members caught and burned in a rapid fire progression during a warehouse fire.
2. One crew member becomes disoriented, lost, and jumps out a window during the search of a residential structure on fire.
3. Two crew members trapped under a roof collapse during a structure fire on Milvia St.
4. Two crew members caught in a rapid fire event while fighting a residential structure fire on Fulton St.
5. One crew member separated from other team members and caught in rapid fire progression, rescued from a window during a church fire.
6. Two crew members lost and become trapped during a search of a residential structure fire on Milvia St.
7. One crew member becomes disoriented and lost during the search of a commercial structure on fire on Ninth St.
8. One crew member falls into a swimming pool that was covered with foam and not visible.
9. Multiple crews escape electrocution when high-tension PG&E lines are burned through and drop during a warehouse fire on Fourth St.
10. Two crew members fall through a floor collapse at a fire on College Ave.

The Department has implemented a temporary second Duty Chief program where 40-hour staff chief officers rotate on-duty as second chief officers. Project Mayday tells us that 85 percent of firefighter emergencies occur during non-business hours, when a department's second Duty Chief system has personnel traveling from home often with a response time of 45:00 minutes or more. Project Mayday data reveals that 40 percent of firefighter emergencies occur within the first 25 minutes of operations. Thus, a response time of 45:00 minutes or more for additional chief-level support must be improved.

According to Dr. Richard Gasaway,[19] "[Task] Saturation results when the brain takes in the maximum amount of stimulation it can handle—it's working at full capacity—yet more and more information is coming in. When the brain gets completely saturated with task demands, it simply cannot process any more information." With only one chief officer on the scene of critical

[19] https://www.samatters.com/task-saturation-impacts-situational-awareness/

incidents, even seasoned incident commanders become task saturated as they are attempting to simultaneously:

- Manage communications on multiple radio channels
- Absorb face-to-face communication from civilians and firefighters
- Maintain incident accountability and resource tracking (on paper)
- Perform ongoing risk analysis
- Monitor strategy and tactics to ensure they are in alignment with the problem and standard operating guidelines
- Order and coordinate mutual aid resources to provide coverage to Berkeley fire stations for other 9-1-1 calls that will continue to occur
- Initiate emergency call back of off-duty staff if needed such as the PIO and Fire Investigator
- Identify and initiate an evacuation plan using Zonehaven (if necessary)
- Develop and deploy emergency messaging to the community
- Perform the role of Safety Officer for the scene
- Make phone calls to dispatch and other members of command staff to coordinate and provide critical updates.

Partially due to task saturation and the resulting auditory exclusion, Project Mayday informs us that when a firefighter initiates an emergency and makes a critical "mayday" radio transmission to the incident commander, informing them of the situation and the urgent need for help—*which is sometimes the first and last transmission a seriously injured firefighter is able to make*—the incident commander misses these transmissions 36 percent of the time.

2.11.1 Overall Deployment Recommendations

Based on the technical analysis and findings contained in this SOC study, Citygate offers the following overall deployment recommendations:

Recommendation #1:	Proceed with the planned conversion to staffing the four current ambulances with non-firefighter paramedics and EMTs.

Recommendation #2:	The Department needs to add two additional ambulances, requiring 16 additional non-firefighter Paramedics and/or EMT FTE personnel.
Recommendation #3:	The City needs to upgrade its dispatch staffing, training, and software to allow for clinical call triage to send Basic Life Support (BLS) ambulances or alternative care units to low-acuity EMS requests, as outlined in the analysis from Federal Engineering Communications consulting.
Recommendation #4:	Design and focus on new strategies to provide for traffic calming and pedestrian safety while not significantly worsening emergency response times or community evacuation times.

Recommendation #5:	Increase the staffing on six of the nine firefighting units (four engines, two aerial trucks) from three to four personnel per day.
Recommendation #6:	Provide the overtime staffing increase from three to four firefighters for engines 3, 4, and 7, which are closest to the eastern hills during high-hazard wildfire threat periods.
Recommendation #7:	If ambulance and dispatch improvements do not improve acute emergency response times and lower unit-hour utilization (UHU) workload to no more than 30 percent for long, contiguous hours of the day, the City should construct infill fire or ambulance-only stations between the current busiest station pairs of 2 and 5 and 1 and 6.

Recommendation #8: Adopt updated deployment policies: City Council should consider adopting complete performance measures that begin with a 9-1-1 call being answered and end with the Fire Department and/or an ambulance arriving at the emergency incident. The measures of time should be designed to save patients and keep small but serious fires from becoming more complex or damaging. With this is mind, Citygate recommends the following outcome-based measures for the major emergency types:

8.1: **Geographic Distribution of Fire Stations:** To treat medical patients and control small fires, the first-due unit should arrive within 8:30 minutes, 90 percent of the time, from receipt of the 9-1-1 call in the fire dispatch center. This equates to a 90-second dispatch time, a maximum 2:00-minute nighttime company turnout time, and a 5:00-minute travel time, which is realistic for Berkeley as a more urban area.

8.2: **Multiple-Unit Effective Response Force for Serious Emergencies:** To confine fires near the room of origin and treat up to five medical patients at once, a multiple-unit response of a minimum of four engines, two ladder trucks, one ambulance, one Medic Supervisor, and one Battalion Chief—totaling a minimum of 22 personnel—should arrive within 11:30 minutes from the time of 9-1-1 call receipt in fire dispatch, 90 percent of the time. This equates to a 90-second dispatch time, a 2:00-minute company turnout time, and an 8:00-minute travel time.

8.3: **Hazardous Materials Response:** The Department needs to maintain its hazardous materials response as designed to protect the community from hazards associated with uncontrolled release of hazardous and toxic materials. The first-due unit should arrive to investigate a hazmat release at the operations level within 8:30 minutes, 90 percent of the time. This equates to a 90-second dispatch time, a 2:00-minute company turnout time, and a 5:00-minute travel time in urban population areas. After assessment and scene evaluation is completed, a determination can be made whether to request additional resources.

8.4: **Technical Rescue:** To respond to technical rescue emergencies as efficiently and effectively as possible with enough trained personnel to facilitate a successful rescue, the first-due company to arrive for assessment of the rescue should achieve a 5:00-minute travel time in urban to suburban areas, 90 percent of the time. Additional resources capable of initiating a rescue should be assembled within a total response time of 11:30 minutes, 90 percent of the time, with the result being a safe and complete rescue/extrication to ensure delivery of patients to a definitive care facility.

Recommendation #9: Adopt a split turnout time measure consisting of 2:00 minutes or less, 90 percent of the time, averaged over a 24-hour period, and within that, a daytime measure of 1:30 minutes or less, 90 percent of the time, from 0700–2200 hours.

Recommendation #10: The City should add a second field operations Battalion Chief 24/7 as soon as fiscally possible.

APPENDIX A—RISK ASSESSMENT

A.1 COMMUNITY RISK ASSESSMENT

SOC ELEMENT 3 OF 8
COMMUNITY RISK ASSESSMENT

The third element of the Standards of Coverage (SOC) process is a community risk assessment. Within the context of an SOC study, the objectives of a community risk assessment are to:

- Identify the values at risk to be protected within the community or service area.
- Identify the hazards with potential to adversely impact the community or service area.
- Quantify the overall risk associated with each hazard.
- Establish a foundation for current and future deployment decisions and risk-reduction / hazard-mitigation planning and evaluation.

A hazard is broadly defined as a situation or condition that can cause or contribute to harm. Examples include fire, medical emergency, vehicle collision, earthquake, flood, etc. Risk is broadly defined as the *probability of hazard occurrence* in combination with the *likely severity of resultant impacts* to people, property, and the broader community.

A.1.1 Risk Assessment Methodology

The methodology employed by Citygate to assess community risks as an integral element of an SOC study incorporates the following elements:

- Identification of geographic planning sub-zones (risk zones) appropriate to the community or jurisdiction.
- Identification and quantification, to the extent data is available, of the specific values at risk to various hazards within the community or service area.
- Identification of the fire and non-fire hazards to be evaluated.
- Determination of the probability of occurrence for each hazard.
- Evaluation of *probable* impact severity for each hazard by planning zone using agency/jurisdiction-specific data and information.
- Determination of overall risk by hazard using the following template.

Table 32—Overall Risk Template

Probability of Occurrence	Probable Impact Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
Rare	Low	Low	Low	Moderate	High
Unlikely	Low	Low	Low	Moderate	High
Possible	Low	Low	Moderate	High	Extreme
Probable	Low	Low	Moderate	High	Extreme
Frequent	Low	Moderate	High	Extreme	Extreme

Citygate used the following data sources for this study to understand the hazards and values to be protected in the City:

- Esri and U.S. Census Bureau population and demographic data
- City and County geographical information systems data
- City General Plan and Zoning information
- City of Berkeley Local Hazard Mitigation Plan
- Fire Department data and information

A.1.2 Risk Assessment Summary

Citygate's evaluation of the values at risk and hazards likely to impact the City of Berkeley yields the following:

- The Department serves a diverse urban population with densities ranging from less than 5,000 to more than 40,000 people per square mile over a varied land use pattern.
- The City's population is projected to increase by nearly 18 percent by 2040 for an average annualized increase of slightly less than one percent.
- The City has a large inventory of residential and non-residential buildings to protect as identified in this assessment.
- The City also has significant economic and other resource values to be protected as identified in this assessment.

- The City and Alameda County have a mass emergency notification system to effectively communicate emergency notifications and information to the public in a timely manner.
- Berkeley's overall risk for six hazards related to emergency services provided by the Fire Department range from **Low** to **Extreme** as summarized in the following table.

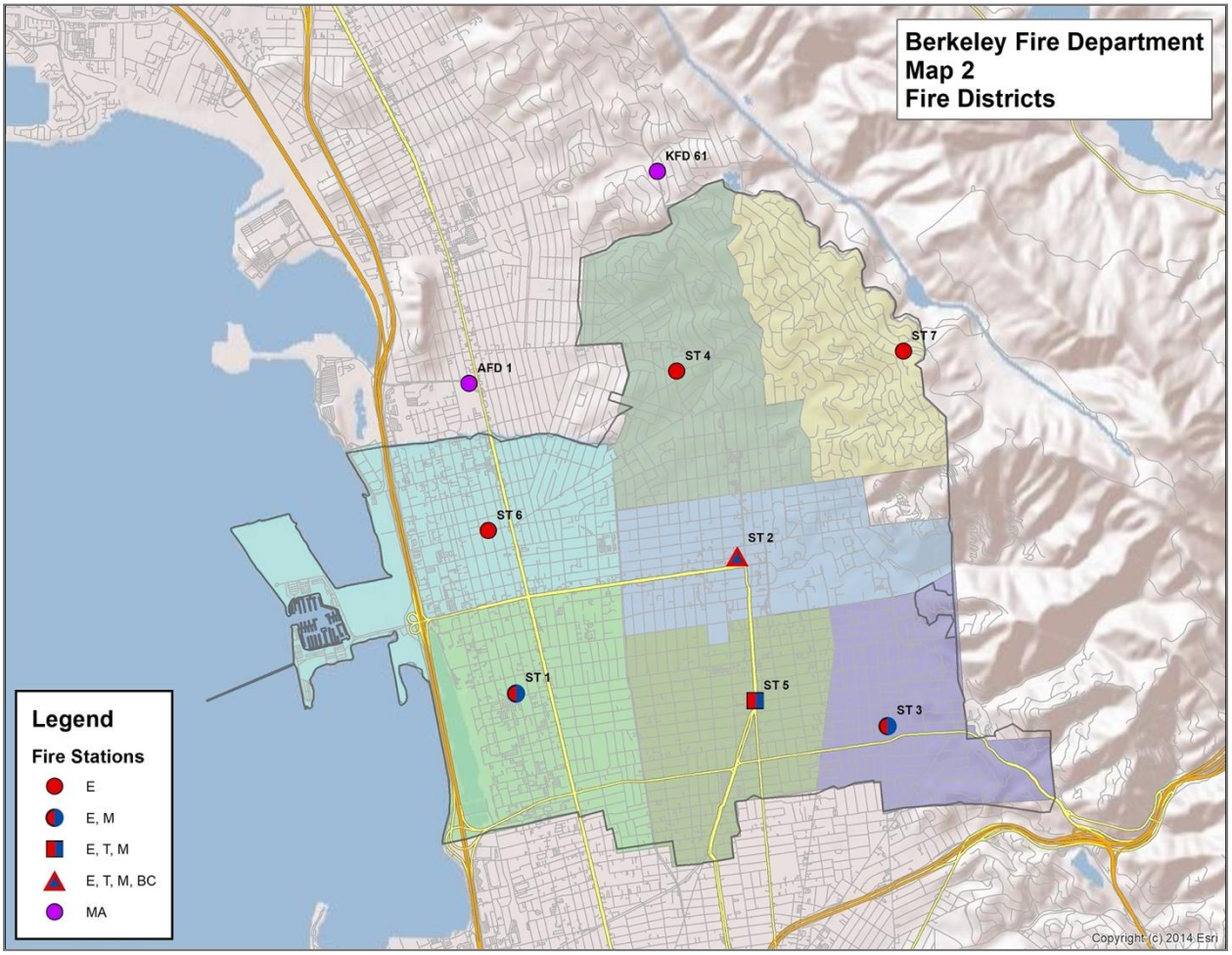
Table 33—Overall Risk by Hazard

Hazard		Risk Planning Zone						
		Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
1	Building Fire	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*
2	Vegetation/Wildland Fire	*Low*	*Extreme*	*Extreme*	*Extreme*	*Moderate*	*Low*	*Extreme*
3	Medical Emergency	*High*	*High*	*High*	*High*	*High*	*High*	*High*
4	Hazardous Materials	*Moderate*	*Moderate*	*High*	*Moderate*	*Moderate*	*Moderate*	*High*
5	Technical Rescue	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Low*
6	Marine Incident	*Moderate*	*Low*	*Low*	*Low*	*Low*	*Moderate*	*Low*

A.1.3 Risk Planning Zones

The Commission on Fire Accreditation International (CFAI) recommends jurisdictions establish geographic planning zones to better understand risk at a sub-jurisdictional level. For example, portions of a jurisdiction may contain predominantly moderate risk building occupancies, such as detached single-family residences, while other areas may contain high- or maximum-risk occupancies, such as commercial and industrial buildings with a high hazard fire load. If risk were to be evaluated on a jurisdiction-wide basis, the predominant moderate risk could outweigh the high or maximum risk and may not be a significant factor in an overall assessment of risk. If, however, high- or maximum-risk occupancies are a larger percentage of the risk in a smaller planning zone, they become a more significant risk factor. Another consideration in establishing planning zones is that the jurisdiction's record management system must also track the specific zone for each incident to appropriately evaluate service demand and response performance relative to each zone. As shown in the following map, Citygate utilized seven planning zones corresponding with the Department's current first-due response areas for this assessment.

Figure 22—Risk Planning Zones



A.1.4 Values at Risk to Be Protected

Values at risk, broadly defined, are tangibles of significant importance or value to the community or jurisdiction potentially at risk of harm or damage from a hazard occurrence. Values at risk typically include people, critical facilities/infrastructure, buildings, and key economic, cultural, historic, and natural resources.

People

Residents, employees, visitors, and travelers in a community or jurisdiction are vulnerable to harm from a hazard occurrence. Particularly vulnerable are specific at-risk populations, including those unable to care for themselves or self-evacuate in the event of an emergency. At-risk populations typically include children under the age of 10, the elderly, and people housed in institutional settings. The following tables summarizes key demographic data for the City.

Table 34—Key Demographic Data – Berkeley

Demographic	2021
Population	**119,619**
Under 10 years	6.30%
10–14 years	3.40%
15–64 years	74.40%
65–74 years	9.30%
75 years and older	6.60%
Median age	32.8
Daytime population	144,863
Housing Units	**51,470**
Owner-Occupied	37.60%
Renter-Occupied	57.00%
Vacant	5.30%
Average Household Size	2.19
Median Home Value	$1,203,262
Race/Ethnicity	
White	53.90%
Asian	28.70%
Black / African American	7.60%
Other / Two or More Races	9.80%
Hispanic/Latino	11.20%
Diversity Index	72.3
Education (population over 24 years of age)	**75,144**
High School Graduate	96.80%
Undergraduate Degree	75.20%
Graduate/Professional Degree	40.50%
Employment (population over 15 years of age)	**65,514**
In Labor Force	92.60%
Unemployed	7.40%
Median Household Income	$92,345
Population Below Poverty Level	18.70%
Population without Health Insurance Coverage	2.60%

Source: Esri Community Analyst (2021) and U.S. Census Bureau

Of note from the table:

- Slightly more than 22 percent of the population is under 10 years or 65 years of age and older.
- The City's daytime population is 21 percent more than its resident population.
- The City's population is predominantly White (54 percent), followed by Asian (29 percent), Black / African American (8 percent), and Other (10 percent), with those of Hispanic/Latino ethnicity representing 11 percent of the population.
- Of the population over 24 years of age, nearly 97 percent have a high school or equivalent level of education.
- More than 75 percent of the population over 24 years of age has an undergraduate, graduate, or professional degree.
- Of the population older than 15 years of age, nearly 93 percent are in the workforce.
- The median household income is slightly more than $92,000.
- The population below the federal poverty level is 18.7 percent.
- The population without health insurance coverage is 2.6 percent.

The Association of Bay Area Governments (ABAG) projects that Berkeley's population will grow by 17.8 percent to 140,935 by 2040.[20]

Buildings

Berkeley has more than 51,000 housing units and nearly 7,000 businesses, including offices, professional services, retail sales, restaurants/bars, motels, churches, schools, government facilities, healthcare facilities, and other business types.[21]

Building Occupancy Risk Categories

The CFAI identifies the following four risk categories that relate to building occupancy:

Low Risk – includes detached garages, storage sheds, outbuildings, and similar building occupancies that pose a relatively low risk of harm to humans or the community if damaged or destroyed by fire.

[20] Source: Plan Bay Area 2040, Plan Bay Area Projections 2040
[21] Source: Esri Community Analyst Business Summary (2021).

Moderate Risk – includes detached single-family or two-family dwellings; mobile homes; commercial and industrial buildings fewer than 10,000 square feet without a high hazard fire load; aircraft; railroad facilities; and similar building occupancies where loss of life or property damage is limited to the single building.

High Risk – includes apartment/condominium buildings; commercial and industrial buildings more than 10,000 square feet without a high hazard fire load; low-occupant load buildings with high fuel loading or hazardous materials; and similar occupancies with potential for substantial loss of life or unusual property damage or financial impact.

Maximum Risk – includes buildings or facilities with unusually high risk requiring an Effective Response Force (ERF) involving a significant augmentation of resources and personnel and where a fire would pose the potential for a catastrophic event involving large loss of life or significant economic impact to the community.

Evaluation of the City's building inventory identified 3,971 high/maximum-risk building uses as they relate to the CFAI building fire risk categories, as summarized in the following table.

Table 35—High-Risk Building Occupancies

Occupancy Classification		Number[1]	Risk Category[2]
A-1	Assembly	**15**	***Maximum***
H	Hazardous	**17**	***Maximum***
I	Institutional	**25**	***High***
R-1	Hotel/Motel	**22**	***High***
R-2	Multi-Family Residential	**3,892**	***High***
	Total	**3,971**	

[1] Source: City of Berkeley
[2] CFAI *Standards of Cover* (Fifth Edition)

Critical Facilities

The U.S. Department of Homeland Security defines critical infrastructure and key resources as those physical assets essential to the public health and safety, economic vitality, and resilience of a community, such as lifeline utilities infrastructure, telecommunications infrastructure, essential government services facilities, public safety facilities, schools, hospitals, airports, etc. The City has identified 81 critical facilities as summarized in the following table. A hazard occurrence with

significant impact severity affecting one or more of these facilities would likely adversely impact critical public or community services.

Table 36—Critical Facilities

Critical Facility Category	Number
Communications	1
Community Services	7
Education	18
Government Services	11
Healthcare	7
Public Safety	21
Transportation	3
Utility	13
Total	**81**

Source: City of Berkeley

Economic Resources

Of the nearly 7,000 businesses employing more than 98,000 people in the City, top industries include services and retail sales, followed by manufacturing and construction.[22] Top employers with more than 500 employees include:[23]

- University of California Berkeley
- Lawrence Berkeley National Laboratory
- Sutter East Bay Medical Foundation
- City of Berkeley
- Bayer Corporation
- Berkeley Unified School District
- Kaiser Permanente Medical Group

[22] Source: Esri Community Business Summary (2021).
[23] Source: City of Berkeley Fiscal Year 2020/2021 Annual Comprehensive Financial Report.

- Siemens Corporation/Healthcare Diagnostics, Inc.
- Berkeley Bowl Produce

Natural Resources

Key natural resources to be protected within the City include:

- San Francisco Bay
- Aquatic Park
- Shorebird Park Nature Center
- McLaughlin Eastshore State Seashore

Cultural/Historic Resources

Key cultural/historic resources within Berkeley include:

- Berkeley Art Museum and Pacific Film Archive
- Berkeley History Center
- Berkeley Public Library
- Berkeley Repertory Theater
- Hearst Greek Theater
- Judah Magnes Museum

Special/Unique Resources

Following are special/unique resources to be protected within the City of Berkeley:

- University of California Berkeley
- Lawrence Berkeley National Laboratory

A.1.5 Hazard Identification

Citygate utilized prior risk studies where available, fire and non-fire hazards as identified by the CFAI, and agency/jurisdiction-specific data and information to identify the hazards to be evaluated for this study. The 2019 City of Berkeley Local Hazard Mitigation Plan (LHMP) identifies the following seven hazards with potential to impact the City.

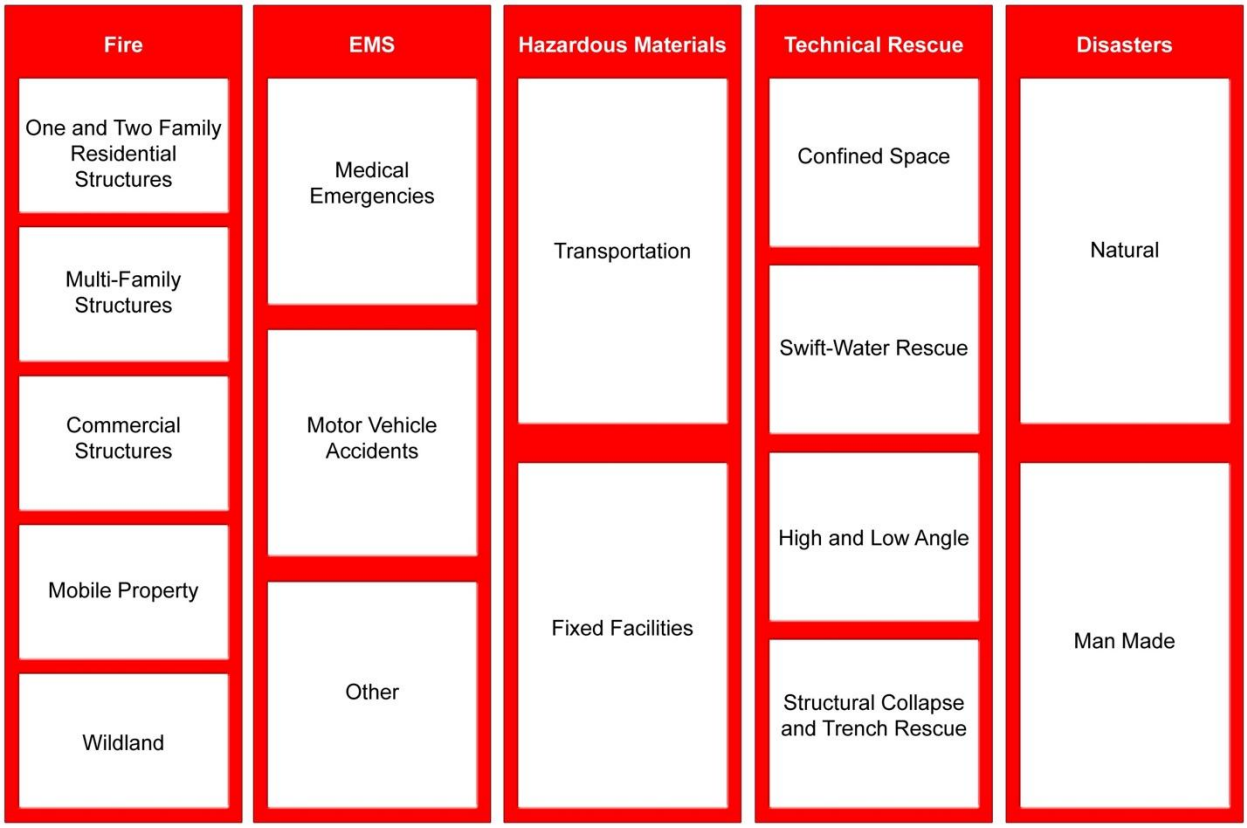
1. Earthquake

8. Wildland Urban Interface Fire
9. Rainfall-Triggered Landslide
10. Floods
11. Tsunami
12. Climate Change
13. Extreme Heat

Although the Department has no legal authority or responsibility to mitigate any of these hazards other than wildland-urban interface fires, it does provide services related to all hazards, including fire suppression, emergency medical services, technical rescue, and hazardous materials response.

The CFAI groups hazards into fire and non-fire categories, as shown in the following table. Identification, qualification, and quantification of the various fire and non-fire hazards are important factors in evaluating how resources are or can be deployed to mitigate those risks.

Figure 23—Commission on Fire Accreditation International Hazard Categories



Source: CFAI *Standards of Cover* (Fifth Edition)

Following review and evaluation of the hazards identified in the City of Berkeley LHMP and the fire and non-fire hazards as identified by the CFAI as they relate to services provided by the Department, Citygate evaluated the following six hazards for this risk assessment:

1. Building fire
14. Vegetation/wildland fire
15. Medical emergency
16. Hazardous material release/spill
17. Technical rescue
18. Marine Incident

A.1.6 Service Capacity

Service capacity refers to the Department's available response force; the size, types, and condition of its response fleet and any specialized equipment; core and specialized performance capabilities and competencies; resource distribution and concentration; availability of automatic or mutual aid; and any other agency-specific factors influencing its ability to meet current and prospective future service demand relative to the risks to be protected.

The Department's service capacity for fire and non-fire risk consists of 37 personnel on duty daily—including one mobile Paramedic Supervisor and one Battalion Chief—staffing seven engines, two aerial ladder trucks, and four ambulances, and operating from the Department's seven fire stations. The Department also has one Type-3 wildland engine, two Type-6 wildland engines, one hazardous materials apparatus, one fireboat, one rescue watercraft, and two ATVs that can be cross-staffed by on-duty personnel as needed.

All response personnel are trained to either the Emergency Medical Technician (EMT) level, capable of providing Basic Life Support (BLS) pre-hospital emergency medical care, or EMT-Paramedic (Paramedic) level, capable of providing Advanced Life Support (ALS) pre-hospital emergency medical care. All engines are staffed with a minimum of one EMT-Paramedic, and ambulances are staffed with two paramedics. The Department also provides ground ambulance services; air ambulance services, when needed, are provided by CALSTAR/REACH from Concord, Stanford Life Flight from Palo Alto, East Bay Regional Parks Police Department, or the California Highway Patrol. Emergency room services are available at Alameda Hospital (Alameda), Alan Bates Summit Medical Centers and Highland Hospital (Oakland), Kaiser Oakland (Oakland), and UCSF Benioff Children's Hospital (Oakland). Highland Hospital and UCSF Benioff Children's Hospital are also Level 1 Trauma Centers, and Eden Medical Center is a Level 2 Trauma Center.

Response personnel are also trained to the U.S. Department of Transportation Hazardous Material First Responder Operational level to provide initial hazardous material incident assessment, hazard isolation, and support for a hazardous material response team. When needed, technical hazardous materials response is provided by Station 2 personnel trained to the Hazardous Materials Specialist level cross-staffing a hazardous material apparatus. For significant spills and releases, the Department responds via the Alameda County Fire Department Hazardous Materials Team.

All response personnel are further trained to the Confined Space Awareness level, with technical rescue capability available as needed from the City of Oakland. The Department is in the process of obtaining a Cal OES Type-2 Urban Search and Rescue trailer.

Marine response capacity includes up to 24 personnel certified to the State Fire Training Open Water Rescuer and/or Open Water Rescue Boat Operator level. In addition, the Department cross-staffs a 27-foot Type IV fireboat and a trailered rescue watercraft—moored at the Berkeley Marina and staffed with on-duty Station 1 and Station 6 personnel as needed.

A.1.7 Probability of Occurrence

Probability of occurrence refers to the probability of a future hazard occurrence during a specific period. Because the CFAI agency accreditation process requires annual review of an agency's risk assessment and baseline performance measures, Citygate recommends using the 12 months following completion of an SOC study as an appropriate period for the probability of occurrence evaluation. The following table describes the five probability of occurrence categories and related characteristics used for this analysis.

Table 37—Probability of Occurrence Categories

Probability	General Characteristics	Expected Frequency of Occurrence
Rare	• Hazard ***may occur*** rarely under unusual conditions.	> 10 years
Unlikely	• Hazard ***could occur*** infrequently. • No recorded or anecdotal evidence of occurrence. • Little opportunity, reason, or means for hazard to occur.	2–10 years
Possible	• Hazard ***should occur*** occasionally. • Infrequent, random recorded or anecdotal evidence of occurrence. • Some opportunity, reason, or means for hazard to occur.	1–23 months
Probable	• Hazard will ***probably occur*** regularly. • Regular recorded or strong anecdotal evidence of occurrence. • Considerable opportunity, reason, or means for hazard to occur.	1–4 weeks
Frequent	• Hazard is ***expected to occur*** frequently. • High level of recorded or anecdotal evidence of regular occurrence.	Daily to weekly

	• Strong opportunity, reason, or means for hazard to occur. • Frequent hazard recurrence.	

Citygate's SOC assessments use recent multiple-year incident response data to project the probability of hazard occurrence for the ensuing 12-month period.

A.1.8 Impact Severity

Impact severity refers to the *probable* extent a hazard occurrence impacts people, buildings, lifeline services, the environment, and the broader community. The following table summarizes the five impact severity categories and related general criteria used for this assessment.

Table 38—Impact Severity Categories

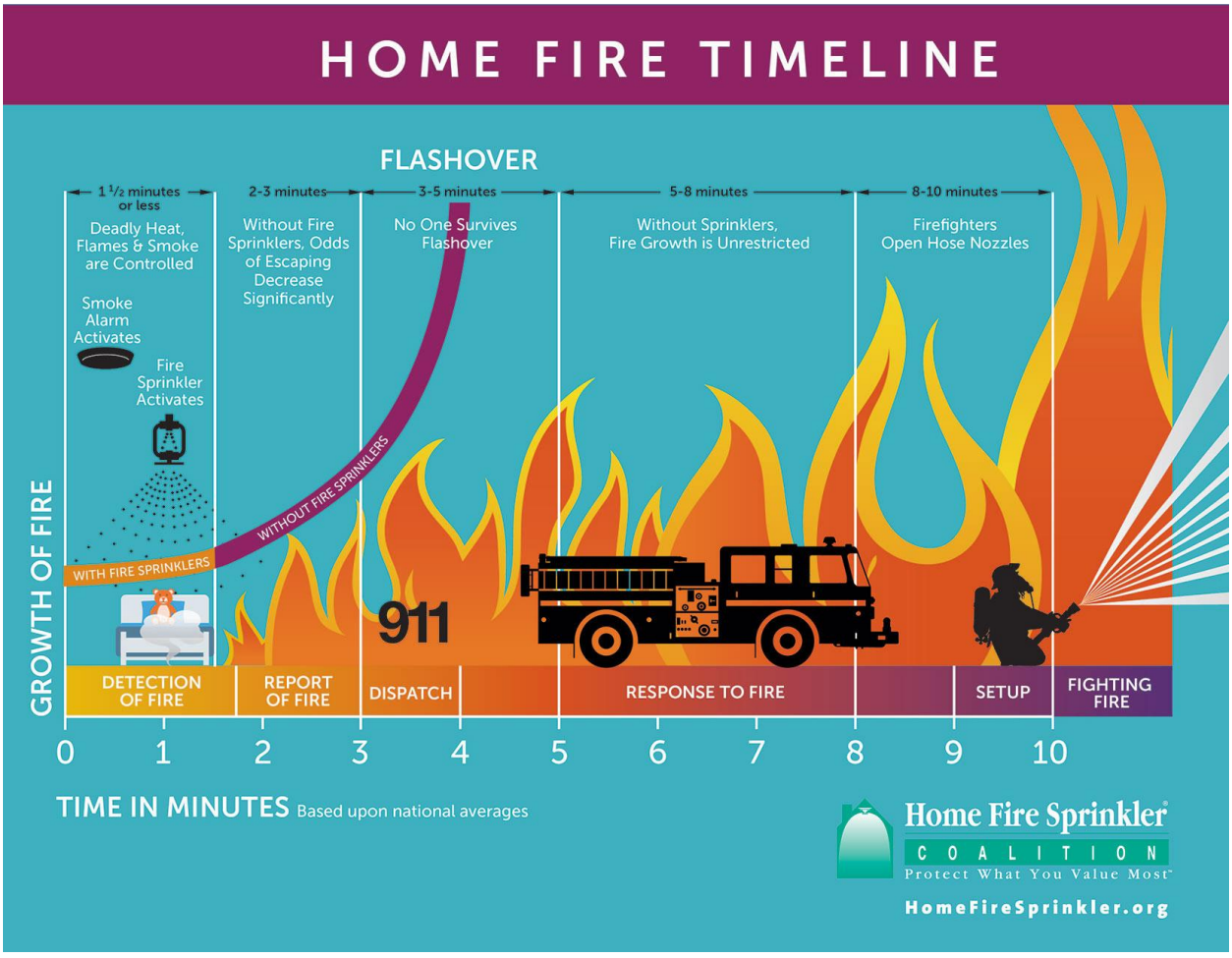
Impact Severity Category	Characteristics
Insignificant	• No injuries or fatalities • None to few persons displaced for short duration • Little or no personal support required • None to inconsequential damage • None to minimal community disruption • No measurable environmental impacts • None to minimal financial loss • No wildland Fire Hazard Severity Zones (FHSZs)
Minor	• Few injuries; no fatalities; minor medical treatment only • Some displacement of persons for less than 24 hours • Some personal support required • Some minor damage • Minor community disruption of short duration • Small environmental impacts with no lasting effects • Minor financial loss • No wildland FHSZs
Moderate	• Medical treatment required; some hospitalizations; few fatalities • Localized displacement of persons for fewer than 24 hours • Personal support satisfied with local resources • Localized damage • Normal community functioning with some inconvenience • No measurable environmental impacts with no long-term effects, or small impacts with long-term effect • Moderate financial loss • Less than 25% of area in *Moderate* or *High* wildland FHSZs
Major	• Extensive injuries; significant hospitalizations; many fatalities • Large number of persons displaced for more than 24 hours • External resources required for personal support • Significant damage • Significant community disruption; some services not available • Some impact to environment with long-term effects • Major financial loss with some financial assistance required • More than 25% of area in *Moderate* or *High* wildland FHSZs; less than 25% in *Very High* wildland FHSZs
Catastrophic	• Large number of severe injuries requiring hospitalization; significant fatalities • General displacement for extended duration • Extensive personal support required • Extensive damage • Community unable to function without significant external support • Significant impact to environment and/or permanent damage • Catastrophic financial loss; unable to function without significant support • More than 50% of area in *High* wildland FHSZs; more than 25% of area in *Very High* wildland FHSZs

A.1.9 Building Fire Risk

One of the primary hazards in any community is building fire. Building fire risk factors include building size, age, construction type, density, occupancy, number of stories above ground level, required fire flow, proximity to other buildings, built-in fire protection/alarm systems, available fire suppression water supply, building fire service capacity, fire suppression resource deployment (distribution/concentration), staffing, and response time. Citygate used available data from the Department and the U.S. Census Bureau to assist in determining the City's building fire risk.

The following figure illustrates the building fire progression timeline and shows that flashover, which is the point at which the entire room erupts into fire after all the combustible objects in that room reach their ignition temperature, can occur as early as three to five minutes from the initial ignition. Human survival in a room after flashover is extremely improbable.

Figure 24—Building Fire Progression Timeline



Source: http://www.firesprinklerassoc.org

Population Density

The population density in the City ranges from less than 5,000 to more than 40,000 people per square mile as shown in Map #2 (**Volume 2—Map Atlas**). Although risk analysis across a wide spectrum of other Citygate clients shows no direct correlation between population density and building fire *occurrence*, it is reasonable to conclude that building fire *risk* relative to potential impact on human life is greater as population density increases, particularly in areas with high-density, multiple-story buildings.

Water Supply

A reliable public water system providing adequate volume, pressure, and flow duration near all buildings is a critical factor in mitigating the potential impact severity of a community's building fire risk. Potable water for the City is provided by the East Bay Municipal Utility District. According to City staff, fire flow, pressure, and hydrant spacing are adequate throughout the City except for in areas west of I-80 and some of the higher elevation areas in the eastern/northeastern Berkeley Hills.

Building Fire Service Demand

For the three-year study period from July 1, 2018, through June 30, 2021, the Department responded to 193 building fire incidents comprising 0.45 percent of total annual service demand over the same period, as summarized in the following table.

Table 39—Building Fire Service Demand

Hazard	Year	Risk Planning Zone								Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	Other		
Building Fire	RY 18/19	8	13	7	0	13	10	1	1	**53**	0.35%
	RY 19/20	8	19	10	8	23	11	2	3	**84**	0.56%
	RY 20/21	16	8	2	7	15	6	0	2	**56**	0.43%
Total		**32**	**40**	**19**	**15**	**51**	**27**	**3**	**6**	**193**	**0.45%**
Percent Total Station Demand		0.47%	0.50%	0.40%	0.37%	0.50%	0.50%	0.20%	0.26%		

As the table shows, building fire service demand was consistent over the three-year study period, with the greatest demand in Station 5's response area, and the least demand in Station 7's response area. **Overall, building fire service demand is like that of other California jurisdictions of similar size and demographics.**

Building Fire Risk Assessment

The following table summarizes Citygate's assessment of the City's building fire risk by planning zone.

Table 40—Building Fire Risk Assessment

Building Fire Risk	Planning Zone						
	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7
Probability of Occurrence	*Possible*	*Probable*	*Possible*	*Possible*	*Probable*	*Possible*	*Possible*
Probable Impact Severity	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*
Overall Risk	***Moderate***	***Moderate***	***Moderate***	***Moderate***	***Moderate***	***Moderate***	***Moderate***

A.1.10 Vegetation/Wildland Fire Risk

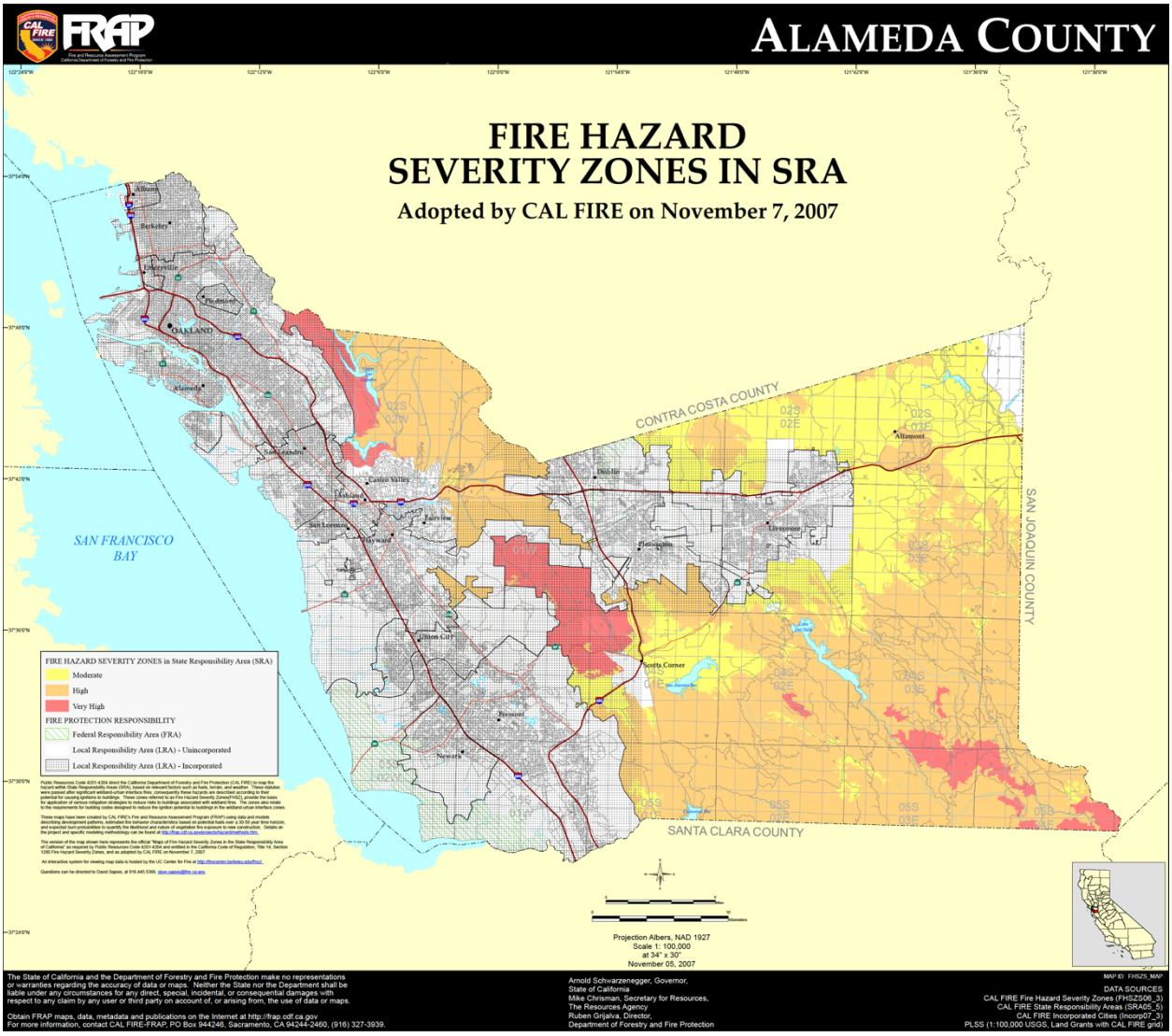
Many areas within and adjacent to the City are susceptible to a vegetation/wildland fire, particularly a wind-driven fire along the City's eastern Berkeley Hills border. The fire risk facing people and properties in the eastern hills is compounded by the area's mountainous topography, limited water supply, and limited access/egress routes. The City's flatlands are also exposed to a fire that spreads west from the hills. The flatlands are densely covered with old wooden buildings housing low-income and vulnerable populations, including isolated seniors, people with disabilities, and students.

Vegetation/wildland fire risk factors include vegetative fuel types and configuration, weather, topography, prior fires, water supply, mitigation measures, and vegetation fire service capacity.

Wildland Fire Hazard Severity Zones

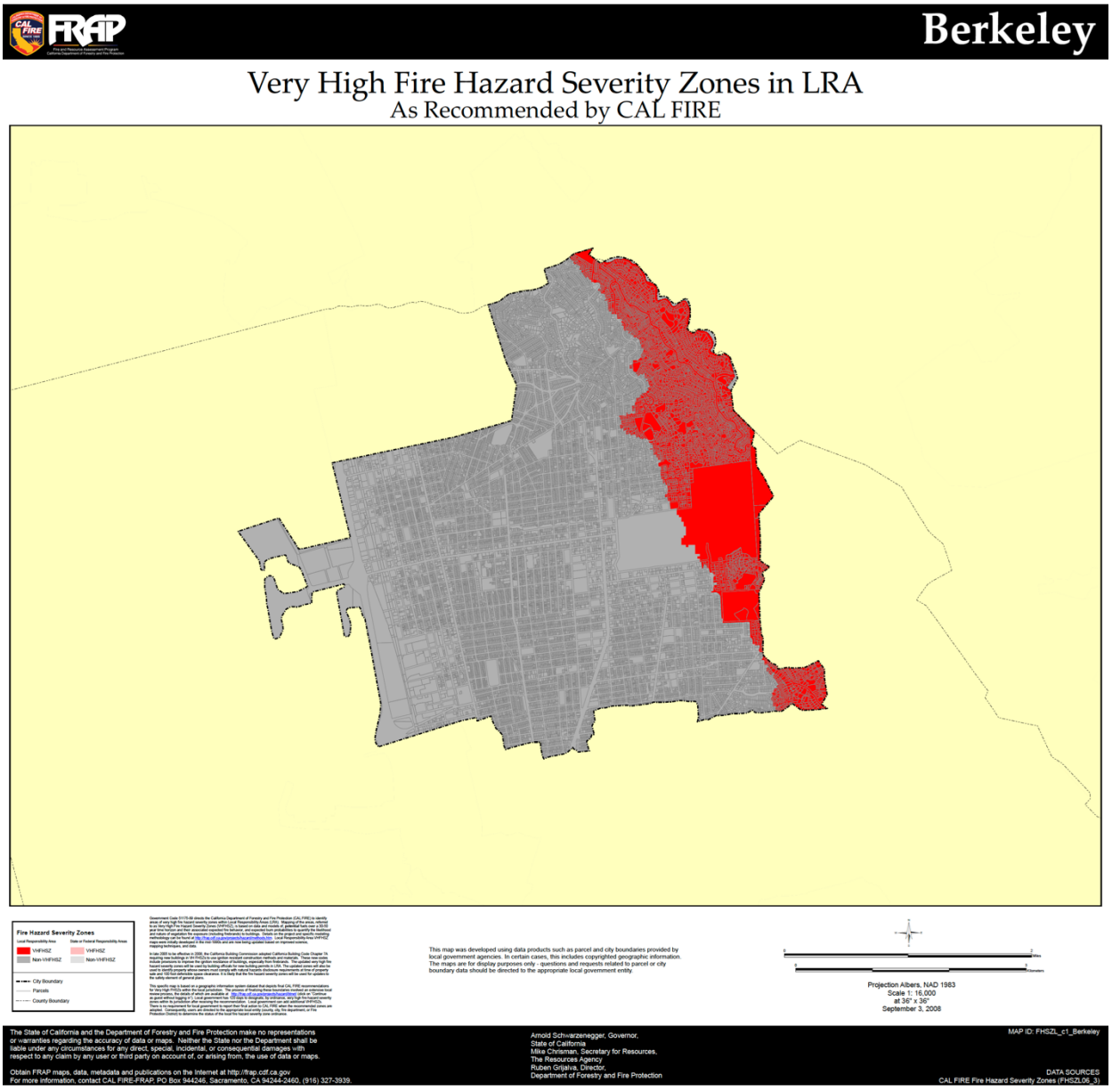
The California Department of Forestry and Fire Protection (CAL FIRE) designates wildland Fire Hazard Severity Zones (FHSZ) throughout the state based on analysis of multiple wildland fire hazard factors and modeling of potential wildland fire behavior. For State Responsibility Areas (SRAs) where CAL FIRE has fiscal responsibility for wildland fire protection, CAL FIRE designates ***Moderate***, ***High***, and ***Very High*** FHSZs by county, as shown in yellow, orange, and red, respectively, in the following map for Alameda County. Although not shown on this map, the entire western edge of Contra Costa County east of the City is a ***Very High*** FHSZ.

Figure 25—SRA Wildland Fire Hazard Severity Zones – Alameda County



CAL FIRE also identifies recommended ***Very High*** FHSZs for Local Responsibility Areas (LRAs) where the local jurisdiction is responsible for wildland fire protection, including incorporated cities, as shown in red in the following map for the City.

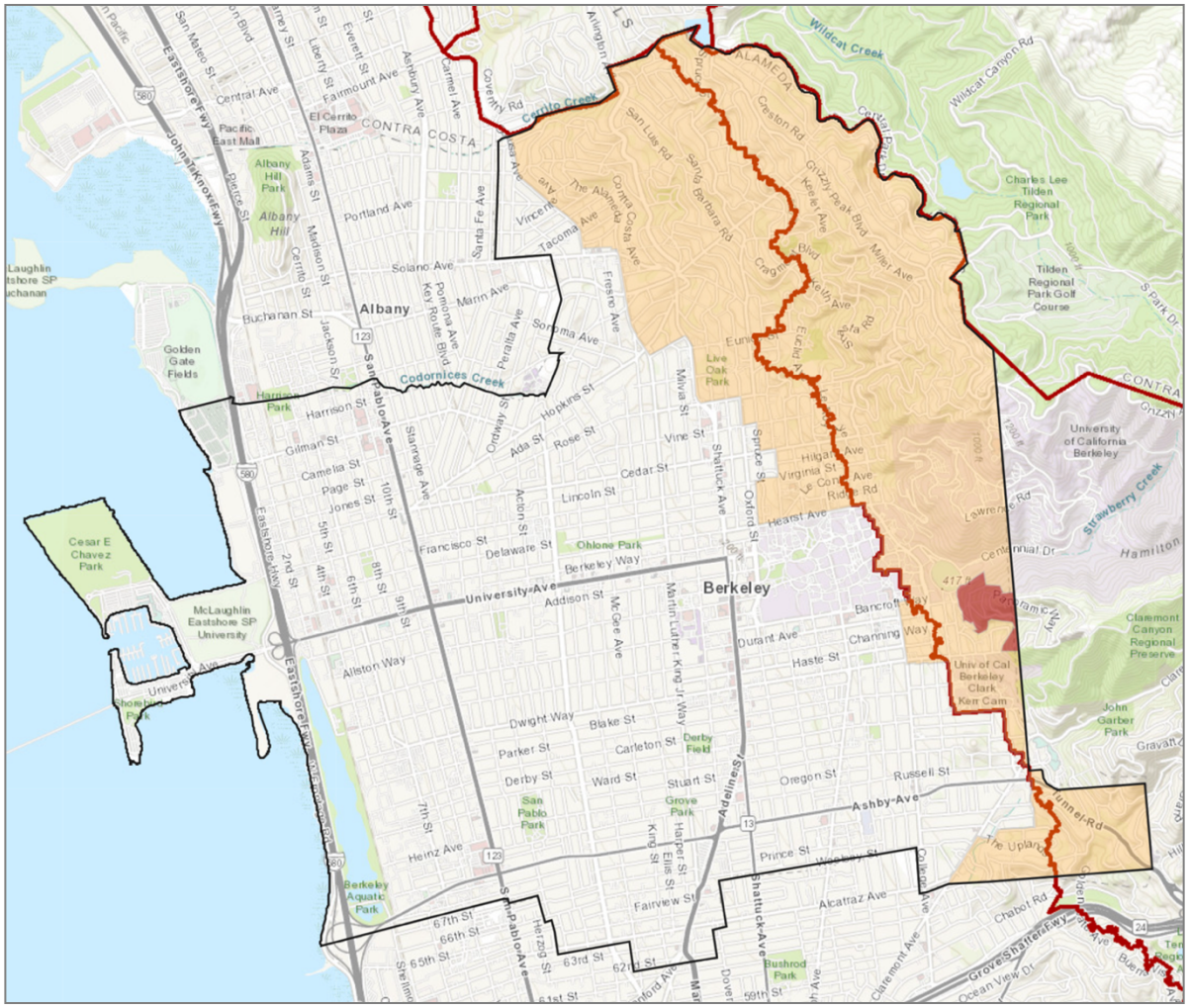
Figure 26—Berkeley Recommended Very High Wildland Fire Hazard Severity Zones in LRA



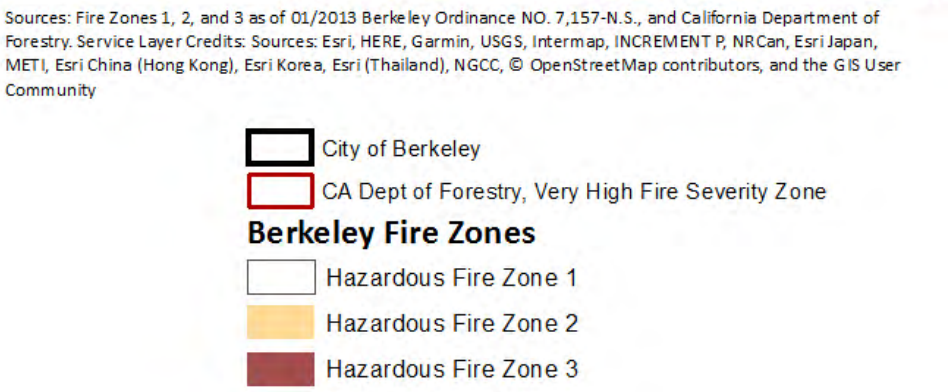
On December 6, 2023, via Ordinance #7845 adopting its Fire Code, the City of Berkeley adopted a more locally tailored VHFHSZ expanding CAL FIRE's recommended area shown in the previous figure. Instead, and as shown in the following figure, the City adopted all of the orange- and red-shaded areas as Berkeley's VHFHSZ.

In addition, the City has divided Berkeley into three separate Hazardous Fire zones, as also shown in the following figure. Fire Zone 3 is the Panoramic area, shaded in red. Fire Zone 2 is the remainder of the Berkeley Hills (and VHFHSZ) area, shaded in orange. The Berkeley flats are not shaded, and represent Fire Zone 1.[24]

Figure 27—Very High Fire Hazard Severity Zone and Hazardous Fire Zones – Berkeley



[24] Source: City of Berkeley 2019 Local Hazard Mitigation Plan, Map 16.



Vegetative Fuels

Vegetative fuel factors influencing fire intensity and spread include fuel type (vegetation species), height, arrangement, density, and moisture. In addition to decorative landscape species, vegetative fuels within the City consist of a mix of annual grasses and weeds, manzanita/knob cone, chaparral, deciduous, eucalyptus, and mixed conifer tree species. Once ignited, vegetation fires can burn intensely and contribute to rapid fire spread under the right fuel, weather, and topographic conditions.

Weather

Weather elements, including temperature, relative humidity, wind, and lightning, also affect vegetation/wildland fire potential and behavior. High temperatures and low relative humidity dry out vegetative fuels, creating a situation where fuels will more readily ignite and burn more intensely. Wind is the most significant weather factor influencing vegetation/wildland fire behavior, with higher wind speeds increasing fire spread and intensity. The City has a Mediterranean climate with warm, dry summers and cool, wet winters. Summers are cooler than a typical Mediterranean climate due to foggy nights and mornings. Average summer high temperatures are in the mid-70s, with an average of less than three days per year over 90 degrees Fahrenheit. Strong offshore winds develop in late spring and early fall producing higher temperatures and lower humidity. Average annual rainfall is 25 inches. Fuel and weather conditions conducive to vegetation/wildland fires primarily occur during the summer and fall months.

Topography

Vegetation/wildland fires tend to burn more intensely and spread faster when burning uphill and up-canyon, except for a wind-driven downhill or down-canyon fire. The City's topography transitions from being flat / sea level along San Francisco Bay in the west to steeper, sloped terrain

approaching 1,000 feet in elevation in the Berkeley Hills along the City's eastern edge. The eastern Berkeley Hills area of the City can influence vegetation/wildland fire behavior and spread.

Water Supply

Another significant vegetation fire impact severity factor is the water supply immediately available for fire suppression. According to Fire Department staff, available fire flow, pressure, and hydrant spacing is adequate except west of I-80 and some areas in the Berkeley Hills sections of the City with wharf type hydrants with low flow and pressure.

Wildland Fire History

The risk of a wildland-urban interface (WUI) fire in the City was clearly demonstrated in the 1991 Tunnel Fire, which resulted in 25 deaths and 62 homes destroyed in Berkeley and more than 3,000 in Oakland. Accounts of major wildfires in the City date back to at least 1905 when a fire burned through Strawberry Canyon and threatened the University campus and the small Panoramic Hill subdivision. Other major fires occurred in the 1970s and 1980s.

Vegetation/Wildland Fire Hazard Mitigation

Hazard mitigation refers to specific actions or measures taken to prevent a hazard from occurring or to minimize the severity of impacts resulting from a hazard occurrence. While none of the hazards subject to this study can be entirely prevented, measures *can* be taken to minimize the impacts when those hazards do occur.

The City employs a comprehensive strategy to reduce both the occurrence and severity of its vegetation/wildland fires, including strict building and fire code provisions with more restrictive local amendments, annual inspection, and enforcement of vegetation fire hazard clearances in high-risk areas, improvement of access/egress routes, and infrastructure maintenance. Fire Department staff inspect more than 1,400 properties in Fire Hazard Zones 2 and 3 each year, and other properties throughout the City on a complaint basis. The City also has several other ongoing fuel management/reduction programs to reduce vegetative fuel loading in higher fire hazard areas.

Vegetation/Wildland Fire Service Demand

The Department responded to 59 vegetation fires over the three-year study period, comprising 0.14 percent of total service demand over the same period, as summarized in the following table.

Table 41—Vegetation/Wildland Fire Service Demand

Hazard	Year	Risk Planning Zone								Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	Other		

Vegetation / Wildland Fire	**RY 18/19**	5	1	1	2	1	4	1	1	**16**	0.10%
	RY 19/20	3	0	2	1	2	3	2	2	**15**	0.10%
	RY 20/21	5	7	0	1	0	8	2	5	**28**	0.22%
Total		**13**	**8**	**3**	**4**	**3**	**15**	**5**	**8**	**59**	**0.14%**
Percent Total Station Demand		0.19%	0.10%	0.06%	0.10%	0.03%	0.28%	0.33%	0.34%		

Vegetation/Wildland Fire Risk Assessment

The following table summarizes Citygate's assessment of the City's vegetation/wildland fire risk by planning zone.

Table 42—Vegetation/Wildland Fire Risk Assessment

Vegetation/Wildland Fire Risk	Risk Planning Zone						
	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7
Probability of Occurrence	*Possible*	*Possible*	*Possible*	*Possible*	*Possible*	*Possible*	*Possible*
Probable Impact Severity	*Minor*	*Catastrophic*	*Catastrophic*	*Catastrophic*	*Moderate*	*Minor*	*Catastrophic*
Overall Risk	***Low***	***Extreme***	***Extreme***	***Extreme***	***Moderate***	***Low***	***Extreme***

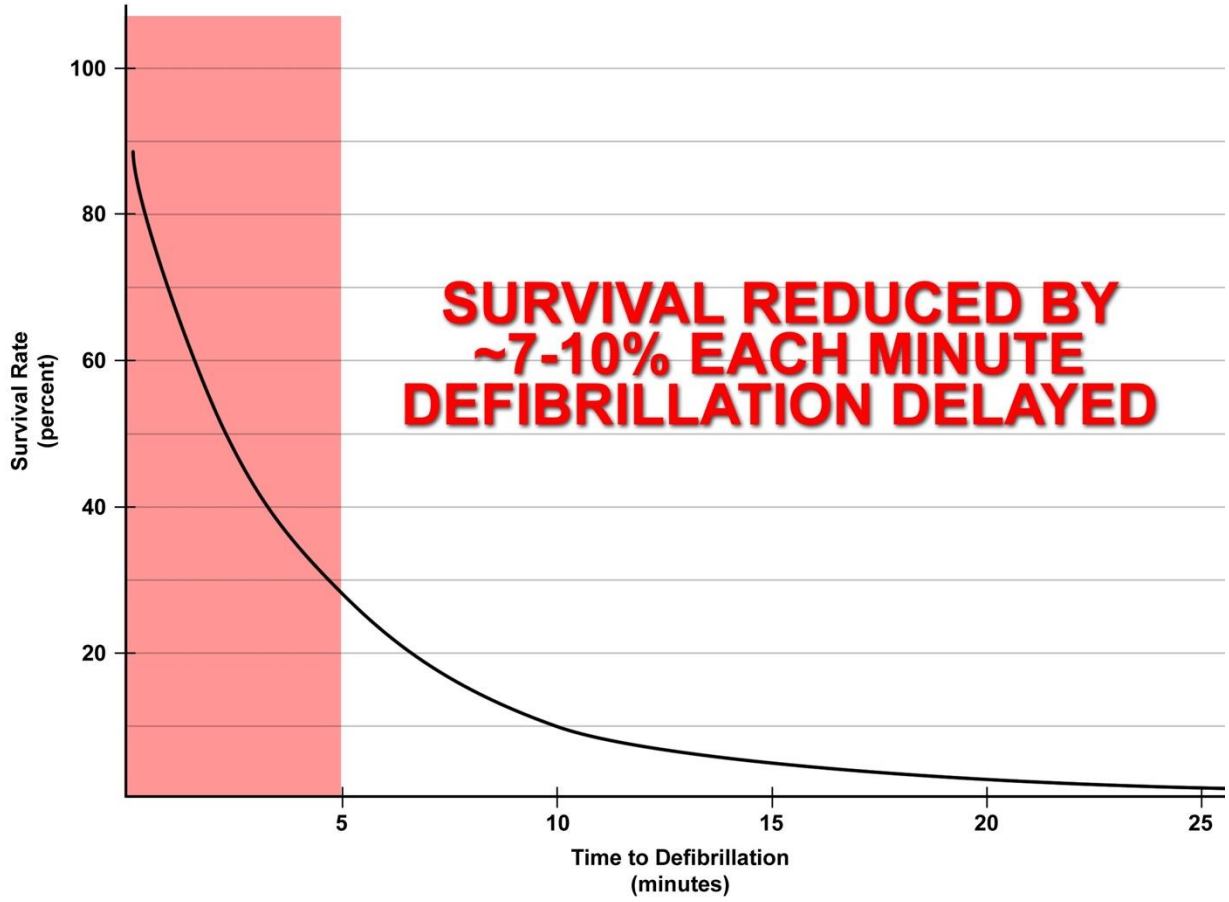
A.1.11 Medical Emergency Risk

Medical emergency risk in most communities is predominantly a function of population density, demographics, violence, health insurance coverage, and vehicle traffic.

Medical emergency risk can also be categorized as either a medical emergency resulting from a traumatic injury or from a health-related condition or event. Cardiac arrest is one serious medical emergency among many where there is an interruption or blockage of oxygen to the brain.

The following figure illustrates the reduced survivability of a cardiac arrest victim as time to defibrillation increases. While early defibrillation is one factor in cardiac arrest survivability, other factors can influence survivability as well, such as early CPR and pre-hospital advanced life support interventions.

Figure 28—Survival Rate Versus Time to Defibrillation



Population Density

Population density in the City ranges from less than 5,000 to more than 40,000 people per square mile, as shown in Map #2 (**Volume 2—Map Atlas**). Risk analysis across a wide spectrum of other Citygate clients shows a direct correlation between population density and the *occurrence* of medical emergencies, particularly in high urban population density zones.

Demographics

Medical emergency risk tends to be higher among older, poorer, less educated, and uninsured populations. As shown in Table 32, nearly 16 percent of the population is 65 and older, only slightly more than 3 percent of the population over 24 years of age has less than a high school

education or equivalent, nearly 19 percent of the population is at or below poverty level, and 2.6 percent of the population does not have health insurance coverage.[25]

Vehicle Traffic

Medical emergency risk tends to be higher in areas of a community with high daily vehicle traffic volume, particularly areas with high traffic volume traveling at high speeds. The City's transportation network includes State Routes 13 and 123, and Interstate 80 carrying an aggregate annual average daily traffic volume of more than 278,000 vehicles, with a peak-hour load of more than 20,000 vehicles.[26]

Medical Emergency Service Demand

Medical emergency service demand over the three-year study period includes more than 23,000 calls for service comprising 53.2 percent of total service demand over the same period, as summarized in the following table.

Table 43—Medical Emergency Service Demand

Hazard	Year	Risk Planning Zone								Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	Other		
Medical Emergency	RY 18/19	1,358	1,871	863	681	2,055	1,223	213	542	**8,806**	57.33%
	RY 19/20	1,341	1,711	666	572	1,614	1,042	252	438	**7,636**	51.26%
	RY 20/21	1,261	1,330	460	639	1,551	889	271	183	**6,584**	50.63%
Total		**3,960**	**4,912**	**1,989**	**1,892**	**5,220**	**3,154**	**736**	**1,163**	**23,026**	**53.23%**
Percent Total Station Demand		57.78%	61.25%	41.39%	47.03%	50.81%	58.10%	48.87%	49.49%		

As the previous table shows, medical emergency service demand varies significantly by planning zone and *decreased* more than 25 percent over the three-year study period. Overall, medical emergency service demand is typical of other jurisdictions with similar demographics.

Medical Emergency Risk Assessment

The following table summarizes Citygate's assessment of medical emergency risk by planning zone.

[25] Source: Esri Community Analyst Community Profile (2021) and U. S. Census Bureau.
[26] Source: California Department of Transportation (2020).

Table 44—Medical Emergency Risk Assessment

Medical Emergency Risk	Risk Planning Zone						
	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7
Probability of Occurrence	*Frequent*	*Frequent*	*Frequent*	*Frequent*	*Frequent*	*Frequent*	*Frequent*
Probable Impact Severity	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*
Overall Risk	***High***	***High***	***High***	***High***	***High***	***High***	***High***

A.1.12 Hazardous Material Risk

Hazardous material risk factors include fixed facilities that store, use, or produce hazardous chemicals or waste; underground pipelines conveying hazardous materials; aviation, railroad, maritime, and vehicle transportation of hazardous commodities into or through a jurisdiction; vulnerable populations; emergency evacuation planning and related training; and specialized hazardous material service capacity.

Fixed Hazardous Materials Facilities

City staff identified six facilities within Berkeley that require a state or local Certified Unified Program Agency (CUPA) operating permit, and an additional 294 facilities that generate hazardous waste. There are also PG&E natural gas transmission pipelines running generally north/south along Seventh Street, and east/west along Allston Way and Russell Streets.

There are 15 different locations on the UC Berkeley Campus where regulated quantities of hazardous materials are used. Many materials are in small quantities for research and teaching purposes. All use locations are inspected by City Fire and or City Toxics Management staff amounting to approximately six inspections per year as part of a three-year cycle. The Campus safety staffs also provide oversight to these locations. The regulations, reporting and oversight inspections are the same as any other commercial site in the City. Further, the Fire Department's Hazardous Material incident response capability is prepared for these types of materials and will respond appropriately should an accidental release occur.

The Lawrence Berkeley National Laboratory (LBNL) is a 202-acre facility in the Berkeley Hills above the UC Berkeley campus supported by the U.S. Department of Energy (DOE) Office of Science and managed by the University of California. Employing approximately 5,200 scientists, engineers, and support staff to conduct unclassified research across a wide range of scientific disciplines. The lab hosts an average of 19,000 visitors annually, including U.S. citizens and foreign nationals. Additional on-site contractors, visiting researchers, students, and other guests frequent the LBNL campus in part to use or support the five National User Facilities: the Advanced

Light Source, Energy Sciences Network, Joint Genome Institute, Molecular Foundry, and National Energy Research Scientific Computing Center in addition to the other on-site and off-site user facilities. The main campus consists of approximately 226 facilities and structures, of which approximately 82 are occupied by LBNL staff, researchers, or visitors.

The laboratory, in some very controlled settings, does use extremely toxic hazardous materials for research and development. Quantities are typically low, and the lab employs fire and hazardous materials safety personnel to ensure best practice mechanical controls are used to prevent a sustained, dangerous release. However, a catastrophic accident could occur that could spread downwind beyond a parking lot buffer and into other lab buildings, the UC campus, or the City itself. The lab and its fire department contractor, along with the Berkeley Fire Department, are trained and have plans for such a rare occurrence.

In addition to having on-site emergency assessment and response teams, LBNL contracts with the Alameda County Fire Department (ACFD) for on-site fire and EMS services, including a full ACFD hazardous materials response team that coordinates closely with facility staff and the Department's Hazardous Materials Response Team. All hazardous materials and processes are regularly screened for quantity, toxicity, and dispersibility, and comprehensive emergency plans developed to largely mitigate risks to the interior of an affected building in conformance with federal Emergency Management Program requirements, however a worst-case scenario could potentially affect eastern Berkeley including the UC campus.

Transportation-Related Hazardous Materials

The City also has transportation-related hazardous material risk because of its road transportation network, including State Routes 13 and 123, and Interstate 80, with heavy daily truck traffic volume, many carrying hazardous commodities, as summarized in the following table.

Table 45—Average Annual Daily Truck Traffic

Highway	Crossing	AADT[1]	Truck AADT by Axles				Percentage of Truck AADT by Axles			
			2	3	4	5+	2	3	4	5+
SR 13	SR 123	758	522	123	26	86	68.87%	16.23%	3.43%	11.35%
I-80	SR 13	10,438	3,655	1,041	416	5,327	35.02%	9.97%	3.99%	51.03%
SR 123	SR 13	431	338	53	8	32	78.42%	12.30%	1.86%	7.42%
	Total	**11,627**	**4,515**	**1,217**	**450**	**5,445**	**38.83%**	**10.47%**	**3.87%**	**46.83%**

[1] Average Annual Daily Trips
Source: California Department of Transportation (2020)

There is also a Union Pacific railroad line running generally north/south between Interstate 80 and State Route 123, and it is reasonable to assume that some railcars are transporting hazardous commodities.

Population Density

Because hazardous material emergencies have the potential to adversely impact human health, it is logical that the higher the population density, the greater the potential population exposed to a hazardous material release or spill. As shown in Map #2 Population Density by Block Group (**Volume 2—Map Atlas**), the population density within the City ranges from less than 5,000 to more than 40,000 people per square mile.

Vulnerable Populations

Persons vulnerable to a hazardous material release/spill include individuals or groups unable to self-evacuate, generally including children under the age of 10, the elderly, and persons confined to an institution or other setting where they are unable to leave voluntarily. As shown in Table 33, slightly more than 22 percent of the population is under age 10 or is 65 years of age and older.

Emergency Evacuation Planning, Training, Implementation, and Effectiveness

Another significant hazardous material impact severity factor is a jurisdiction's shelter-in-place / emergency evacuation planning and training. In the event of a hazardous material release or spill, time can be a critical factor in notifying potentially affected persons, particularly at-risk populations, to either shelter-in-place or evacuate to a safe location. Essential to this process is an effective emergency plan that incorporates one or more mass emergency notification capabilities, as well as pre-established evacuation procedures. It is also essential to conduct regular, periodic exercises involving these two emergency plan elements to evaluate readiness and to identify and remediate any planning or training gaps to ensure ongoing emergency incident readiness and effectiveness.

Through Berkeley Ready, the Department's Office of Emergency Services (OES) coordinates a suite of programs to build and maintain community disaster resilience. For example, OES maintains real-time online evacuation maps that are accessible to the public and provide incident location(s), evacuation route(s), and temporary evacuation shelter locations.[27]

In addition, the City participates in AC Alert, a free subscription and reverse 9-1-1-based mass emergency notification system that can provide emergency alerts, notifications, and other emergency information to email accounts, cell phones, smartphones, tablets, and landline telephones. The City also utilizes social media, Wireless Emergency Alerts (WEA), local AM and

[27] https://community.zonehaven.com

FM radio stations, and local television outlets to provide timely emergency information and alerts. OES has established 78 pre-designated geographic evacuation zones within the City, and AC Alert emergency notification messages can be issued by numerous designated OES, City Manager's Office, and Fire and Police Department personnel down to the supervisor level. OES also conducts ongoing Emergency Operations Center training as needed and strives to conduct a full EOC exercise at least annually.

Hazardous Material Service Demand

The Department responded to 565 hazardous material incidents over the study period of three reporting years, comprising 1.31 percent of total service demand over the same period, as summarized in the following table.

Table 46—Hazardous Material Service Demand

Hazard	Year	Risk Planning Zone								Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	Other		
Hazardous Material	RY 18/19	33	33	20	26	41	19	7	9	**188**	1.22%
	RY 19/20	32	35	19	18	43	42	10	5	**204**	1.37%
	RY 20/21	20	33	20	17	38	29	9	7	**173**	1.33%
Total		**85**	**101**	**59**	**61**	**122**	**90**	**26**	**21**	**565**	**1.31%**
Percent Total Station Demand		1.24%	1.26%	1.23%	1.52%	1.19%	1.66%	1.73%	0.89%		

As the table shows, hazardous material service demand varies significantly by planning zone and was generally consistent over the three reporting years analyzed within this study.

Hazardous Materials Risk Assessment

The following table summarizes Citygate's assessment of the City's hazardous materials risk by planning zone.

Table 47—Hazardous Materials Risk Assessment

Hazardous Materials Risk	Risk Planning Zone						
	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7
Probability of Occurrence	*Probable*	*Probable*	*Probable*	*Probable*	*Probable*	*Probable*	*Possible*
Probable Impact Severity	*Moderate*	*Moderate*	*Major*	*Moderate*	*Moderate*	*Moderate*	*Major*
Overall Risk	***Moderate***	***Moderate***	***High***	***Moderate***	***Moderate***	***Moderate***	***High***

A.1.13 Technical Rescue Risk

Technical rescue risk factors include active construction projects; structural collapse potential; confined spaces, such as tanks and underground vaults; bodies of water, including rivers and streams; industrial machinery use; transportation volume; and earthquake, flood, and landslide potential.

Construction Activity

There is ongoing residential, commercial, industrial, and infrastructure construction activity occurring within the City.

Confined Spaces

There are multiple confined spaces within the City, including tanks, vaults, and open trenches.

Bodies of Water

Bodies of water within the City include San Francisco Bay and smaller ponds, creeks, and seasonal waterways.

Transportation Volume

Another technical rescue risk factor is transportation-related incidents requiring technical rescue. This risk factor is primarily a function of vehicle, railway, maritime, and aviation traffic. Vehicle traffic volume is the greatest of these factors within the service area, with State Routes 13 and 123 and Interstate 80 carrying an aggregate annual average daily traffic volume of more than 278,000 vehicles, with a peak-hour load of more than 20,000 vehicles.

Earthquake Risk[28]

A significant earthquake event is one of the hazards of greatest concern to the City, with a high probability of occurrence and the potential for widespread damage. There are several known and potentially undiscovered faults in Alameda County, including the Hayward Fault with three fault segments, the San Andreas Fault with ten fault segments, and the Northern Calaveras and Greenville Faults.

Numerous destructive earthquakes have occurred historically in the greater San Francisco Bay Area region, and the U.S. Geological Service (USGS) predicts a 72 percent probability of one or more Magnitude 6.7 or greater earthquakes over the next 21 years.

[28] Source: 2019 City of Berkeley Hazard Mitigation Plan, Section B.5.

Flood Risk[29]

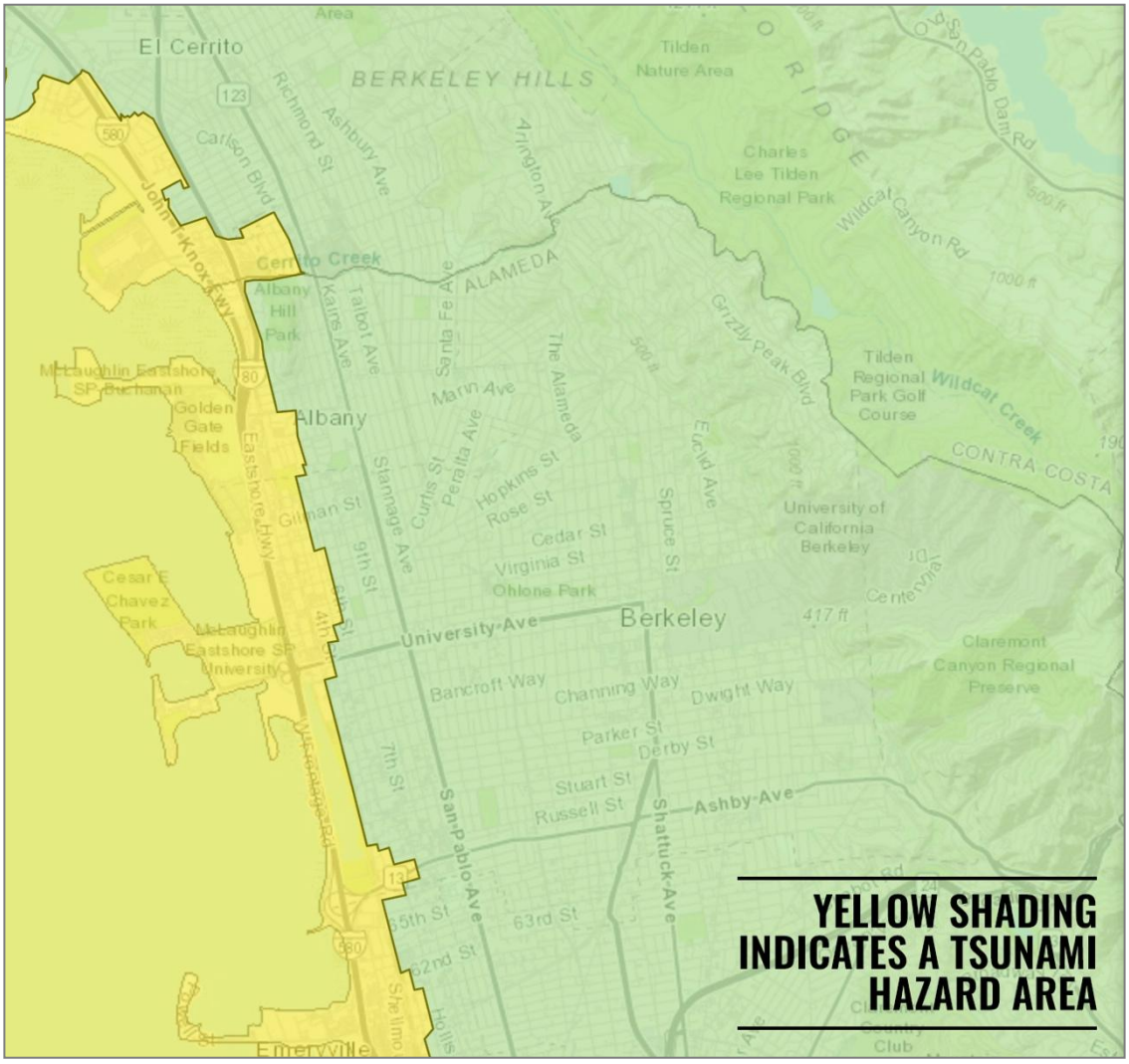
Some areas of the City are subject to minor flooding hazard, primarily from local creek flooding and storm drain overflow along the western edge of the City adjacent to San Francisco Bay, the low-lying areas between Harrison Street and Dartmouth Street, and some areas of the UC Berkeley campus.

Tsunami Risk[30]

Tsunamis affecting the Bay Area can result from offshore earthquakes within the Bay Area, or from more distant events. While it is most common for tsunamis impacting the Bay Area to be generated by faults in Washington and Alaska, local tsunamis can be generated from local underwater faults. While tsunamis entering San Francisco Bay are rare, a March 2011 tsunami event resulted in a half-meter-tall surge and $158,000 damage to boats and docks in the Berkeley Marina. The following map shows the areas of the City potentially subject to inundation from a tsunami event.

[29] Source: 2019 City of Berkeley Hazard Mitigation Plan, Section B.8.
[30] Source: 2019 City of Berkeley Hazard Mitigation Plan, Section B.9.

Figure 29—Tsunami Inundation Zones



Source: California Department of Conservation Tsunami Maps (Updated 2022)

Technical Rescue Service Demand

Over the three-year study period, there were 224 technical rescue incidents in the City comprising 0.52 percent of total service demand, as summarized in the following table.

Table 48—Technical Rescue Service Demand

Hazard	Year	Risk Planning Zone								Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	Other		

Technical Rescue	**RY 18/19**	10	14	14	6	18	11	2	9	**84**	0.55%
	RY 19/20	8	19	13	3	19	8	0	3	**73**	0.49%
	RY 20/21	16	12	4	4	15	14	0	2	**67**	0.52%
Total		**34**	**45**	**31**	**13**	**52**	**33**	**2**	**14**	**224**	**0.52%**
Percent Total Station Demand		0.50%	0.56%	0.65%	0.32%	0.51%	0.61%	0.13%	0.60%		

Technical Rescue Risk Assessment

The following table summarizes Citygate's assessment of technical rescue risk by planning zone.

Table 49—Technical Rescue Risk Assessment

Technical Rescue Risk	Risk Planning Zone						
	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7
Probability of Occurrence	*Possible*	*Probable*	*Possible*	*Possible*	*Probable*	*Possible*	*Unlikely*
Probable Impact Severity	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*	*Moderate*
Overall Risk	***Moderate***	***Moderate***	***Moderate***	***Moderate***	***Moderate***	***Moderate***	***Low***

A.1.14 Marine Incident Risk

Marine incident risk factors include water and near-shore recreational activity, and watercraft storage and use in or on City waterways. Marine incidents include watercraft fires, searches for person(s) in water, and water and watercraft rescues.

Waterways

The primary bodies of water in the City are San Francisco Bay and Aquatic Park.

Berkeley Marina

The Berkeley Marina, located on the western side of the City adjacent to San Francisco Bay, has approximately 925 slips accommodating boats up to 80+ feet in length.

Recreational Activity

The Berkeley waterfront / San Francisco Bay is a popular destination for near-shore and open water recreational activities, including boating, swimming, snorkeling, diving, fishing, etc.

Marine Incident Service Capacity

The Department's marine incident service capacity includes up to 24 personnel certified by State Fire Training as Open Water Rescue swimmers, a 27-foot aluminum fire boat, and one rescue watercraft.

Marine Incident Service Demand

Over the three-year study period, the Department responded to 40 marine incidents comprising 0.09 percent of total service demand over the same period as shown in the following table.

Table 50—Marine Incident Service Demand

Hazard	Year	Risk Planning Zone								Total	Percent Total Annual Demand
		Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7	Other		
Marine Incident	RY 18/19	0	0	0	0	0	10	0	2	**12**	0.08%
	RY 19/20	4	0	0	1	0	8	0	0	**13**	0.09%
	RY 20/21	3	0	0	0	0	10	0	2	**15**	0.12%
Total		**7**	**0**	**0**	**1**	**0**	**28**	**0**	**4**	**40**	**0.09%**
Percent Total Station Demand		0.10%	0.00%	0.00%	0.02%	0.00%	0.52%	0.00%	0.17%		

Marine Incident Risk Assessment

The following table summarizes Citygate's assessment of the City's marine incident risk by planning zone.

Table 51—Marine Incident Risk Assessment

Marine Incident Risk	Risk Planning Zone						
	Sta. 1	Sta. 2	Sta. 3	Sta. 4	Sta. 5	Sta. 6	Sta. 7
Probability of Occurrence	*Possible*	*Rare*	*Rare*	*Unlikely*	*Rare*	*Possible*	*Possible*
Probable Impact Severity	*Moderate*	*Minor*	*Minor*	*Minor*	*Minor*	*Moderate*	*Minor*
Overall Risk	***Moderate***	***Low***	***Low***	***Low***	***Low***	***Moderate***	***Low***

CITY OF BERKELEY

BERKELEY FIRE DEPARTMENT MASTER PLAN

VOLUME I

DRAFT MAY 08, 2023

SIEGEL & STRAIN Architects

MARY MCGRATH | ARCHITECTS

The Berkeley Fire Department protects life, property, and the environment through emergency response, prevention, and community preparedness.

In 1877, the year before Berkeley incorporated as a town, several West Berkeley residents banded together to form a volunteer hose-and-bucket brigade. On August 21, 1882, the Berkeley Board of Town Trustees officially recognized Beacon #1 Fire Company as the Volunteer Fire Department. A 1,000-pound bell was installed in the nearby Church of the Good Shepherd tower to serve as both a church bell and fire alarm. The Town Trustees established the Paid Fire Department on October 1, 1904. James Kenney was appointed the first fire chief. Ironically, Town Hall burned down on October 22, just a few weeks later, after attic wires sparked a blaze.

For over 100 years the Berkeley Fire Department organization has built an unmatched legacy of trust in the community. The core of the Department's strength comes from its members' fundamental commitment to excellent customer service, high professional standards and their commitment to one another.

Today, the Department provides 24-hour response to emergencies including fires, medical emergencies, hazardous materials events, technical rescue, utility emergencies, water rescue, disaster response, active shooter, vehicle extrication, and other life-threatening situations.

I. MASTER PLAN REPORT (VOLUME I)

II. DETAILED FACILITY STUDY (VOLUME II)

III. APPENDIX


BER
E-2

A. EXECUTIVE SUMMARY

THE PURPOSE OF THE BERKELEY FIRE DEPARTMENT MASTER PLAN (FDMP) is to provide City leaders with a ten-year strategic approach for addressing the City's aging, undersized, and outdated essential facilities to meet today's needs and anticipated demands on Berkeley's fire and emergency services. The Berkeley Fire Department Master Plan recommends a series of facility improvements necessary to support its mission, comply with building codes and industry standards, and align with best practices in ways that are fiscally responsible in fulfilling the forward-looking mission of the Berkeley Fire Department.

THE EVOLVING AND EXPANDING MISSION of the Berkeley Fire Department has led to many changes within the Department's response and delivery since its founding in 1904. The range of operational factors facing the larger firefighting community and the world, and within BFD has increased significantly over time. These operational changes include:

- Increased local call volume from 6,300 annual calls in 1995 for structural fires and medical emergencies to 16,000 annual calls in 2022 for a broad range of emergencies. The volume of daily calls in one 24-hour period in March 2023 due to an extreme weather event was 292 calls, compared to an average of 44 daily calls in 2022.
- Apparatus have grown in size in order to accommodate firefighters and the equipment necessary to accomplish the modern all-hazards mission of the fire service. The type and number of specialty units, such as those for wildland engines, ambulances, off-road vehicles and boats, has also increased.
- Best practices for fire stations have evolved to include space layouts that limit firefighters' exposure to carcinogens. This includes dedicated turnout and decontamination rooms, dedicated fitness rooms, airlock separation between apparatus bays and living quarters, and reorganized circulation.
- The City of Berkeley and the BFD are dedicated to moving towards an all-electric infrastructure. Electrification of both the stations and the apparatus is a future goal of the Department to support the health of firefighters and the larger community, and to reduce carbon emissions.
- The diverse and inclusive workforce of the Department calls for increased privacy and accessibility within the stations. Gender neutral restrooms, single occupancy bedrooms, and dedicated offices for supervisors are needed. Americans with Disability Act (ADA) and other local laws also dictate that the stations be accessible for both the community and the firefighters.

These internal and external changes can no longer be accommodated within the existing fire stations and support facilities. Volume II of this Master Plan outlines specific station needs and proposes modifications necessary to bring each of the stations into alignment with codes, industry standards, and the Berkeley Fire Department mission and culture.

FACILITIES EXISTING CONDITIONS: Most of Berkeley's fire stations were built in the 1960's and received seismic upgrades in the 1990's. The Training Facility was built in 1996, the Public Safety Building in 2000, and Station 7 in 2006. Based on existing conditions assessments, the FDMP team found that since their original construction, most BFD facilities have undergone some modifications but not to the extent necessary to properly house modern apparatus, equipment, additional units and new staff, nor to meet current policy, codes and health, safety and inclusion standards. Additionally, many of the stations house outdated features (such as hose drying towers) and hinder healthy environmental practices (such as physical training in apparatus bays). Without further renovation, replacement or relocation, the stations will continue to fall short of addressing the present-day needs and expanding and changing operational demands.

BFD is approaching an acute situation of not being able to meet the expressed needs of the community due to a lack of adequate facility space.

MASTER PLAN SITES: The FDMP scope includes ten (10) properties used by the Berkeley Fire Department:

> Seven (7) fire stations
> Division of Training
> Headquarters
> Warehouse on Folger/Heinz

APPROACH AND RECOMMENDATIONS: The FDMP team walked all ten properties used by the Fire Department and reviewed provided documentation relevant to the structures and programmatic needs. With each facility, the FDMP team first sought the most fiscally conservative renovation approach to accommodate the evolving mission, changes to staffing and adoption of best practices at each site. When these planning priorities could not be met through renovation, the FDMP team looked at accommodating operational needs with a new structure on either existing or expanded sites. In instances where renovation or new construction on existing or expanded sites was not feasible, the team recommended relocation to a new site.

Fire Stations 3, 6, and 7 - RENOVATION AND EXPANSION
These stations and their sites are of a size and configuration that can be expanded and operationally upgraded in their current locations, substantially reducing project costs compared to new construction.

Fire Stations 2, 4, and 5 - REPLACEMENT ON SITE
These fire stations are too small for current and projected needs and require replacement to accommodate the expanded mission, increased staffing, larger and more apparatus, and safe operating conditions. The existing sites of Station 2 and 5 are of ample size to accommodate new larger stations. The proposal at Station 4 includes an expansion into the adjacent roadway, yielding substantial cost savings over what would otherwise be incurred with relocation.

Fire Station 1 - RELOCATION
The current Station 1 building and site are too small to accommodate the increase in staffing and the new units needed within this response area. The existing and expanded Fire Station 1 units and operations are proposed to be relocated to a new site (yet to be identified) within the response area.

Fire Administration - RELOCATION
The administration functions including recently expanded staffing across most divisions, the newly established Wildland Urban Interface (WUI) Division, and the needed ambulance deployment center do not fit in the currently designated spaces within the Public Safety Building at 2100 Martin Luther King Jr. Way. This Master Plan includes a preliminary spatial program for a BFD Headquarters in a larger location.

Fire Training Center - RELOCATION
The existing Training Center on Cedar Street no longer supports the training needs of a modern fire department. The site is undersized and located in a residential neighborhood, which has created an untenable situation for neighbors and unrealistic limitations on the type of training events that can be conducted, the hours that training can occur, and the parking needs for trainers and trainees. BFD is currently collaborating with Albany, El Cerrito, and Richmond Fire Departments to identify appropriately sized and zoned sites that could be shared by the jurisdictions. A portion of the current training site at Cedar Street will be used for the expansion of Station 6. The remaining training building could be modified for use as a meeting hall and for staff accommodations during unplanned fluctuations in service demand due to emergencies such as wildfire urban interface fire events, extreme climate events, and seismic events.

Fire Warehouse - REMODEL
The existing Warehouse located at 1011 Folger, although small, remains useful as a central supply depot and overflow storage for reserve and specialty apparatus. A project is currently underway to add office space inside the warehouse to make the facility more usable.


PROBATIONARY
E2
BERKELEY

B. BFD MASTER PLAN BACKGROUND

In 2021, the Berkeley Fire Chief and the Public Works Director, both new to their positions, realized that there was not a long-term plan that evaluated the current state of Fire Department facilities or provided a roadmap for known or projected renovation or replacement. They identified the need to create a Fire Department Master Plan (FDMP). This plan is one of five foundational studies that the Berkeley Fire Department (BFD) has undertaken over the last few years which collectively aim to provide a clear set of priorities that the City can use over the next years to guide improvements. The other foundational efforts are:

Berkeley's Community Wildfire Protection Plan (CWPP), initiated in 2022, will organize a community's efforts to protect itself from wildfire, and empower citizens to move in a cohesive, common direction. This includes goals for improving wildfire response, community preparedness, fuel management, infrastructure, ignition reduction, home hardening, and more. The CWPP draft plan is currently under review with a final plan to be adopted in spring of 2023.

Standards of Coverage and Community Risk Assessment Study (SOC), conducted in 2022-2023 defined appropriate levels of service based on a comprehensive analysis of a number of factors: historical performance; expectations; existing and projected community risk factors, hazards, population growth and aging, topography, the density and vertical growth of the build environment; and performance as compared to national standards and best practices. The report outlines five strategies to improve acute emergency response time, four of which have spatial implications for the fire stations that have been addressed by the FDMP. These include: increase in the number of ambulances; creation of a Mobile Integrated Paramedic (MIP) program; increase of staffing on key engines; and addition of a second Battalion Chief.

Internal Berkeley Fire Department Reorganization, which started in 2015, is a comprehensive re-organization of the Department designed to result in a more efficient response system, strengthen the existing culture that is community and employee centric, create pathways from the community to career positions, and build an organization that is better able to respond to the changing needs and risk of our community. These priorities are accounted for in the FDMP by proposing reconfigurations to stations to better serve both the community and the BFD.

Dispatch Needs Analysis (DNA), in December of 2021 the Department contracted with Federal Engineering Inc. to conduct a comprehensive needs assessment of the Berkeley Communications Center in response to City Council's request to enhance operations to meet the community's growing needs under the omnibus reimagining package. The project will examine existing dispatch capabilities and the City's goals to develop a path forward on how to triage calls, divert non-emergency calls—including mental health calls—to appropriate resources, and implement the delivery of emergency medical instructions to callers. Federal Engineering Consultants' work will result in a wide-ranging plan that recommends adjustments to staffing, hardware and software, implementation of pre-arrival and emergency medical dispatch systems, diversion of sub-acute calls to the most appropriate resource, training for dispatchers, and dispatch center facilities.

Kitchell Facilities Condition Assessment, completed in August of 2021, documents the existing conditions of the ten BFD facilities owned by The City of Berkeley. The object of the assessment was to understand the deficiencies of the buildings, proposed maintenance and corrections, and create budgets for the work at each facility. The assessment report also includes a facility condition needs index that is accounted for in the FDMP.

Each of these four studies articulate goals and aspects that impact BFD facilities and, as such, have influenced the Berkeley Fire Department Facilities Master Plan and its planning process.

C. FACILITIES MASTER PLAN PURPOSE & GOALS

THE PURPOSE of this Fire Department Master Plan (FDMP) is to provide the City of Berkeley leaders and policy makers with a multi-year strategic approach for addressing the City's aging, undersized, and outdated essential facilities to meet today's needs and anticipated demands on Berkeley's fire and emergency services.

The FDMP recommends a series of renovations and replacement of the Fire Department's critical facilities needed to support its mission, comply with building codes and industry standards, and align with best practices in ways that are fiscally responsible and fulfill the forward-looking mission of the Berkeley Fire Department.

As a planning tool, this document is meant to help prioritize and inform capital improvement decisions necessary for the City to develop a funding and implementation plan.

SPECIFIC PLANNING GOALS for Fire Department Master Plan focus on:

1. Improving, expanding and/or replacing each of the City's fire stations so that they support current fire operations and have flex capacity as the mission of the fire service evolves both in day-to-day call volume and in the event of major disasters.

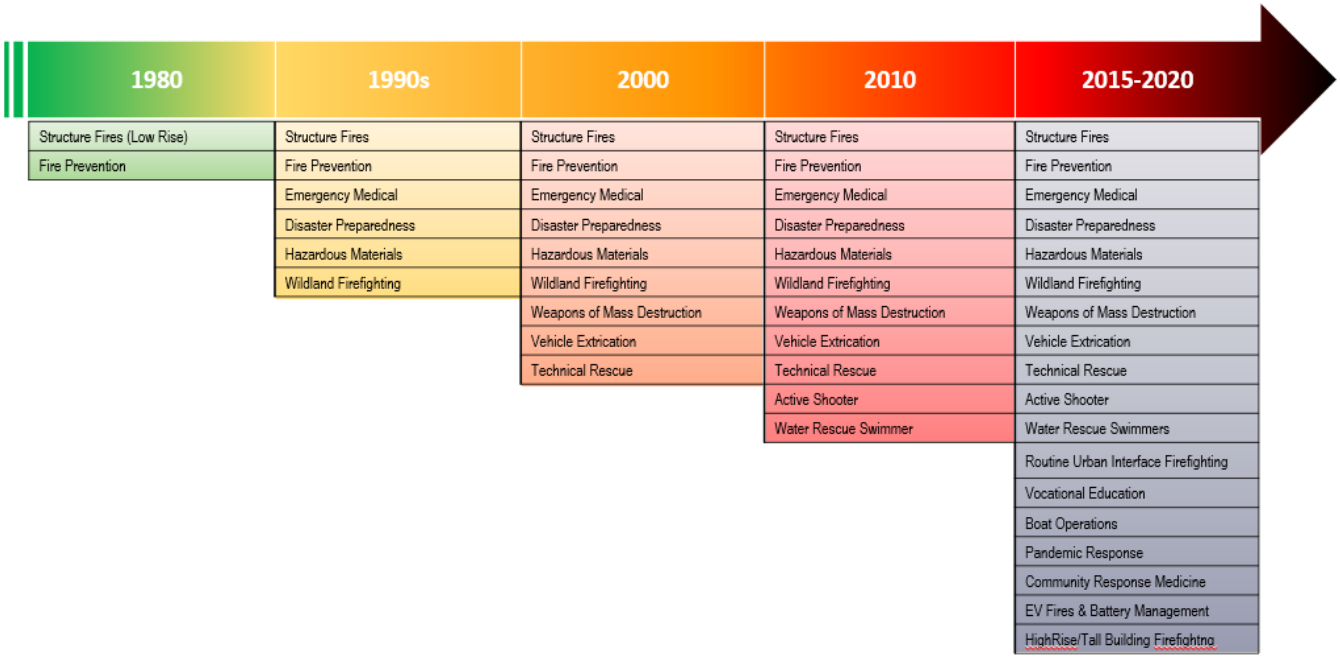
2. Integrating improved health, safety and personnel needs of the first responders, including reduced exposure to carcinogens, into the design and operations of Fire Department facilities.

3. Relocating current and expanding Fire Department Headquarters functions to a facility that can accommodate growing needs including: a fully functional office setting for fire department support; an Emergency Operations Center (EOC) which can be used as a conference room or classroom outside of emergency conditions; and a deployment center for additional ambulances.

4. Identifying a suitable location for the delivery of future proposed integrated community health programs which provide resources for the under-insured and other high-volume system users that require services other than ambulance trips and emergency room visits.

5. Developing facilities improvement proposals that are adequate and appropriate in meeting and not exceeding established needs through renovation where feasible, or relocation or replacement where renovation is not feasible. The development improvements must demonstrate the trust the Fire Department has established with the community and be respectful of the public funds.

EVOLVING BERKELEY FIRE DEPARTMENT MISSION



The Berkeley Fire Departments mission and responsibilities have evolved and expanded over the last 50 years.

D. OPERATIONAL CHANGES

BFD is approaching an acute situation of not being able to meet the expressed needs of the community due to a lack of adequate facility space required to accommodate a number of operational changes. Only few of these needs have been properly considered or addressed in the Department's budget or space allocations. This Master Plan chapter documents the drivers behind the space needs, and Volume II documents high-level space plans that address these needs.

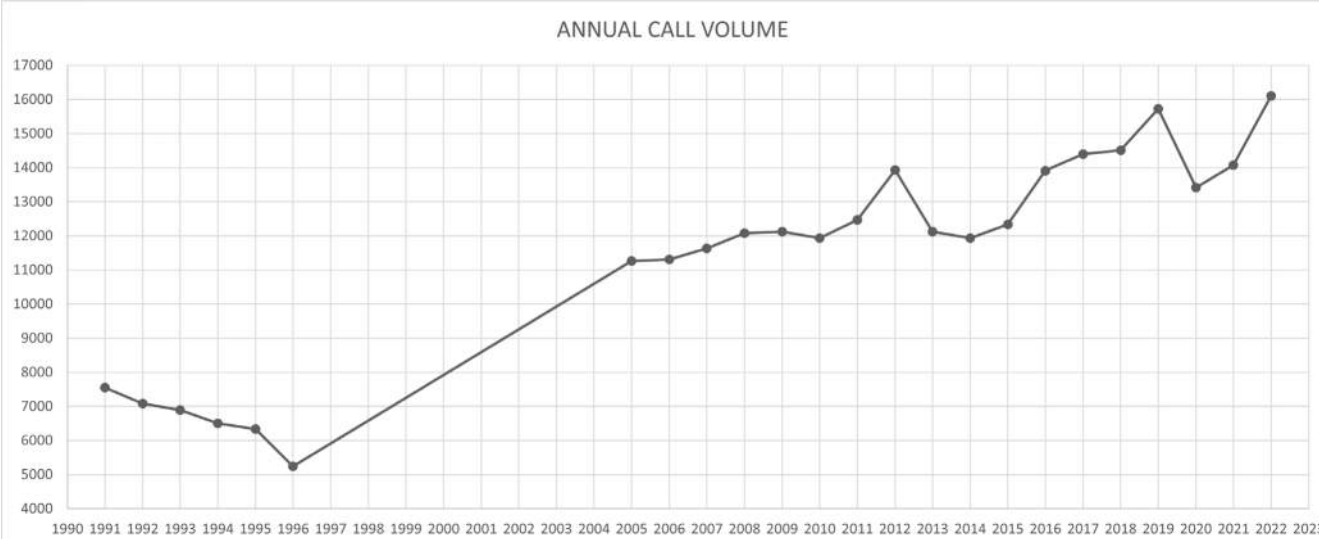
EVOLVING MISSION: The work of fire departments is constantly evolving and expanding. In most fire departments today, putting out fires is just a small part of a day's work. External and internal factors alike have influenced the arc of BFD's evolving mission.

Over the years well-intentioned fire administrators and firefighters alike have seen a natural logic in tasking themselves with response capabilities motivated by the instinct to be ready to mitigate anything life throws at the Berkeley community. In the 1970s doctors home from the war in Vietnam introduced emergency medicine into firefighting. Hazardous materials response emerged in the 1990s. BFD's water rescue unit emerged from the bottom up in the early 2000's when firefighters jumped in the Bay in their underwear to rescue a drowning civilian. The number of specialty disciplines that BFD has taken on since with little to no training or infrastructure support is simultaneously impressive and staggering. While firefighters are now properly cross-trained, the stations do not have adequate space or support functions to accommodate these specialty first responder units and the added apparatus, equipment, personnel, and training requirements that come with.

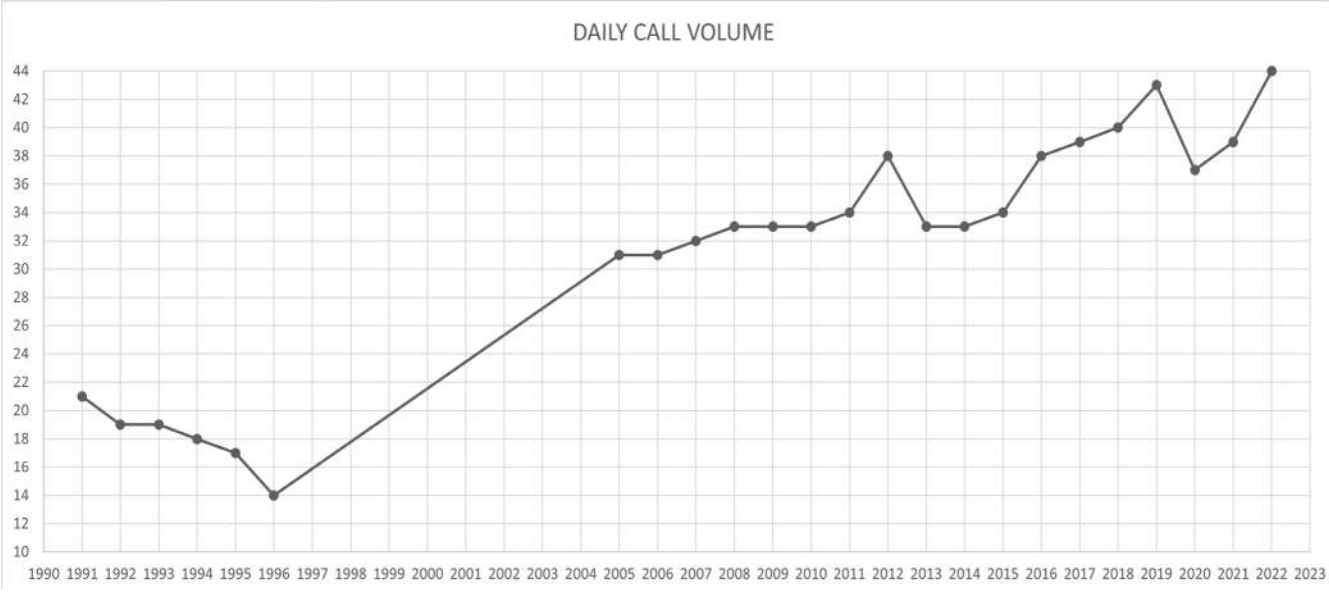
This ever-expanding mission increase can be problematic, stretching resources thin and diluting firefighters' ability to be proficient at any discipline. Nonetheless, adding these disciplines to the Fire Department's scope makes sense from a service model and fiscal perspective. The alternative would likely require establishing a new department or division, adding even more staffing and infrastructure needs.

The ripple effect this evolution of BFD's mission has had on all aspects of the organization is substantial: an increase in specialized types of apparatus and equipment; more equipment on apparatus and a reciprocal increase in apparatus size; more on-duty staff to dispatch and respond to emergencies; more support staff to conduct plan checks and to educate residents in prevention, disaster preparedness and enhanced wildfire safety; and expanded training to cover more area-specific hazard types. All of these mission-critical aspects have space implications.

CALL VOLUME: Since its establishment in 1904, the Berkeley Fire Department (BFD) has evolved to respond to all manner of emergencies and hazards. Using call volume as a key metric for assessing fire department needs, in 1995 the BFD responded to 6,300 annual calls-for-service, mostly structure fires and medical emergencies. In 2022 the annual call volume was over 16,000 calls – or an average of 44 calls a day – for a much broader range of emergencies compared to prior years.



Daily call volume, which also drives the staffing required in the firehouses, has also recently experienced dramatic fluctuations due to extreme weather conditions and climate change, which is an emerging risk. BFD recently set two daily records: on January 4, 2023, the Department received 80 calls, nearly double the daily average; and less than three months later the Department received a dramatic 292 calls for service spanning a 24-hour period between March 21 to 22, demonstrating that demand for BFD services is ever-evolving and consistently trending higher.



EXTREME WEATHER EVENTS: According to a 2023 United Nations climate change report, human-caused climate change is already affecting weather and climate extremes in every region across the globe. These extreme events are leading to the increased demand for fire department services. The two weather events which are major contributors to increased call volumes for the BFD are wildfires and atmospheric rivers. Climate change projections predict that atmospheric rivers will become the main source of precipitation in western North America. This will lead to an even more pronounced "flood or drought" climate in California. The prevalence of major wildfires in drought years and the prevalence of ground saturation and flooding in wet years will impact the fire department.

The record breaking call volume days of January 4th, 2023 and March 21-22, 2023 were both during an atmospheric river event. Moving forward the BFD will need space to provide emergency accommodations for additional staff during these surges in demand.

RESPONSE AND DELIVERY CHANGES: The City has changed substantially over the last 20 years, transitioning from a suburban, mostly single-story, single-family residential community to a dense, urban, vertically-oriented community. Berkeley is now the second most dense city of the top 51st most populated cities in California, behind San Francisco.

The Standards of Coverage (SOC) analysis prepared by Citygate observed "… *that the Department is organized only to accomplish 'yesterday's mission' and is struggling to meet current demand, much less the future growth of the City and University."* Relative to the FDMP, the SOC goes on to explain that *"The ongoing intensification of land uses, building heights, and population density will make several sections of the City very urban—typical of the largest metropolitan cities for building fire and rescue/EMS challenges. The cumulative effect of these projects around the City necessitates a shift in staffing and response models as well as an increase in the flexibility of emergency medical resources. The City's fire and ambulance programs must evolve to those suitable for a major urban fire department in staffing, unit types, and facility locations. Citygate acknowledges this will not only be costly but also very difficult to find new locations for responders*."

Changes in local policies have also driven increases in density and vertical orientation of the City and committed the City to providing services to the unhoused and to those with psychiatric emergencies. However, there have not been correlating modifications to the Fire Department facilities or staffing over that same period of time to address these changes. As a result the City, including the Fire Department, is now faced with a large, acute gap between community need and service expectation, and what the Department's infrastructure can accommodate.

RECOMMENDATIONS FROM RECENT EFFORTS: The Standards of Coverage study, the re-shaping of the organization following the passage of Measure FF, the implementation of the department reorganization, and the Dispatch Needs Analysis have spatial repercussions on stations and administration headquarters, the most significant being:

- Adding ambulances to recover and maintain Unit Hour utilization and response times.
- Adding a Mobile Integrated Health program similar to the Department's pilot Mobile Integrated Paramedic (MIP) program.
- Deploying the Wildfire Urban Interface (WUI) Division.
- Adding staff to support the modern mission of the Divisions of Training, Emergency Medical Services (EMS) and Fire Prevention.
- Increasing the size of the dispatch center for triaging increased call volume, appropriately handling calls for psychiatric emergencies, and delivering pre-arrival instructions.
- Adding a future Battalion Chief.

> Increasing full-time staff on six of nine fire companies from three to four personnel (and the remaining three companies from three to four personnel during high-fire danger days) to address changing risk and demand arising from new development in Berkeley and the implications of climate change on our natural environment.

APPARATUS AND SPECIALTY UNITS: To support the evolving mission and modern safety regulations, BFD apparatus have grown in size. In the past, fire department personnel rode on the rear tailboard of an engine, uncovered and unprotected, causing hundreds of firefighter injuries and deaths across the country. In addition to firefighters moving inside the cabs, apparatus have also grown in size to accommodate all the equipment necessary to accomplish the modern all-hazards mission of the fire service. Other specialty apparatus acquired to accommodate BFD's mission includes wildland engines, ambulances, off-road vehicles and boats, all of which need proper storage and maintenance facilities.

ELECTRIFICATION: The Department is actively researching electrification of its fleet to meet the City's long-term goals outlined in the Municipal Fleet Electrification Plan. According to current policy, any new construction in Berkeley is required to be all-electric. Going all-electric for buildings and the fleet will require significant revisions to the site power supply including:

> Changing the type of power entering the building (from single to three-phase in most instances)
> Increasing the electrical service to 800 or 1200 amps
> Installing solar arrays and energy storage systems

This move towards electrification improves health and safety at stations and addresses environmental considerations by:

> Improving indoor air quality by eliminating natural gas (for space and water heating, and cooking) in the buildings
> Decreasing fossil fuel reliance and carbon pollution by providing electric charging stations for fire department vehicles and apparatus, and staff's personal electric vehicles
> Employing clean energy sources while the power grid is up and during emergencies when it is down

City Council will need to provide direction to BFD as to whether fire stations should be electrified prior to a full remodel or replacement. Costs associated with both electrification and the purchase of these types of apparatus will be significant. The cost to electrify the stations will be approximately $400,000 each. Electrical apparatus are currently double the cost of a typical apparatus.

DECONTAMINATION: Significant health and safety concerns related to carcinogens from turnout gear and equipment, and the overall air quality at fire stations have long been identified as unsafe. Research spanning decades, continents, and more than 80,000 firefighters validates the connection between fire fighting and occupational cancer. Cancer is the most dangerous threat to firefighter health and safety today. The Department currently has five members with active cancer cases and five recent retirees with active cancer cases. These are only the reported cases and there are likely more which have not been reported.

- Cancer caused 66 percent of the career firefighter line-of-duty deaths from 2002 to 2019, according to data from the International Association of Firefighters (IAFF). Heart disease caused 18 percent of career LODDs for the same period.
- Cancer caused 70 percent of the line-of-duty deaths for career firefighters in 2016 (Smith, Cardiovascular Strain of Fire fighting and the Risk of, 2016).
- Firefighters have a 9 percent higher risk of being diagnosed with cancer and a 14 percent higher risk of dying from cancer than the general U.S. population, according to research by the CDC/National Institute for Occupational Health and Safety (NIOSH).

Firefighters' risks are significantly higher for some types of cancer than the general population, including:

- Testicular cancer – 2.02 times the risk (100% = double = 2 times)
- Mesothelioma – 2.0 times greater risk
- Multiple myeloma -1.53 times greater risk
- Non-Hodgkin's lymphoma – 1.51 times greater risk
- Skin cancer – 1.39 times greater risk
- Malignant melanoma – 1.31 times greater risk
- Brain cancer -1.31 times greater risk
- Prostate cancer – 1.28 times greater risk
- Colon cancer -1.21 times great risk and
- Leukemia – 1.14 times greater risk

Industry standards call for each structure/vehicle fire to be treated like a hazardous materials incident, including recommendations for firefighters to literally wash each other with special soap to remove carcinogens and to be placed out of service for additional decontamination measures following the incident. Personal Protective Equipment (PPE) needs to be properly bagged and decontaminated, and stations need facilities to keep PPE isolated from physical fitness and living areas as this equipment continues to off gas carcinogens and other toxins.

To reduce the prevalence of cancer in the workforce, best practice recommendations that the City must begin to implement are:

> Dedicated turnout rooms with personnel decontamination and turnout cleaning facilities
> Reorganized path of travel to and from the apparatus bay for decontamination between each call, setting up what is referred to as the "Hot, Warm and Cool" zone organization.
> Hands-free medical cleanup facilities
> Dedicated physical fitness rooms not in apparatus bays
> Airlock air separation between apparatus bay and the stations' living and office quarters
> Direct capture or similar vehicle exhaust systems in apparatus bays, an effort that was implemented in 2001

INCLUSION & PRIVACY CONSIDERATIONS: The fire service is a community-based organization and as such it is critical that the BFD staff reflects the makeup of the community it serves. This commitment to inclusion drives changes to the work environment and the facilities necessary in creating a safe workplace for a diverse workforce by increasing privacy and accessibility in living and office environments. Specific improvements include:

> Gender neutral restrooms
> Single occupancy bedrooms
> Dedicated Captains' offices
> Accessible accommodations

E. EXISTING FACILITIES

ORIGINAL CONSTRUCTION: Most of the Berkeley Fire Stations were built in the 1960's. The Training Facility was built in 1996, the Public Safety Building in 2000, and Station 7 in 2006.

The stations built in the 1960's were designed for a single engine and three personnel per shift. Additionally, at the time of original construction, each station design and site layout offered very little room for expansion or to accommodate future needs and an evolving mission.

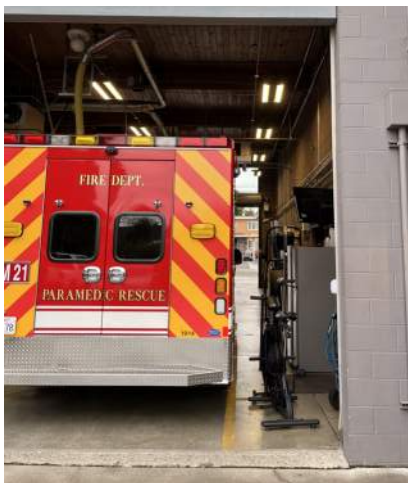
FACILITIES MODIFICATIONS: While the stations have not been significantly modified since they were built, they have been stretched to perform beyond their original design by simply squeezing in additional needs and services. Since their original construction in the 1960s, the older stations have been renovated to accommodate:

- Three ambulances when the service was established in 1977
- Two reserve ambulances and additional equipment when paramedic services were established in 1986
- Improved building seismic performance in the 1990s, following the 1986 Loma Prieta Earthquake
- Hazardous Materials Response apparatus and equipment in the 1990s
- A fourth ambulance and additional reserve ambulances in 2008 to partially meet increased call volume
- Water rescue apparatus and equipment in 2010
- Specialty wildfire apparatus and equipment over the past thirty years
- Disaster response supplies and equipment in the 1990s and 2000's
- A mobile emergency medical supervisor vehicle and staff in 2023

While the stations have undergone minor improvements and ongoing maintenance including, for example, lighting, kitchen and restroom upgrades, they have not been modified to the extent necessary to properly house modern apparatus and equipment, additional units and new staff. These expanded services have been accommodated by simply pushing the stations beyond their spatial capacity at the expense of properly addressing safety, health, and privacy (related to inclusion and diversity) protocols.

OUTDATED FACILITIES: As a result, the BFD stations are packed, outdated and potentially unsafe.

- Apparatus are parked inches away from roll up doors, creating narrow spaces for personnel to circulate.
- Towers, once necessary for drying cotton hoses, are now obsolete due to updated hose material technology.
- Exercise equipment is typically set up in apparatus bays adjacent to apparatus and personal protective equipment (or PPE) that off-gas diesel fumes and known carcinogens.



In 2021 the Berkeley Public Works Department, which is responsible for Berkeley public facilities maintenance, authorized Kitchell to prepare Facility Condition Assessments of each of the Stations and the Public Safety Building. The report found that in the short-term Fire Stations 1, 4, and 7 are in good condition, Fire Stations 2, 3, and 5 are in fair condition, and Fire Station 6 is in poor condition. In the longer-term Fire Station 1 will be in fair condition, Fire Station 7 will remain in good condition, and the rest will be in poor condition, meaning that in 15 years the bulk of the fire stations will be in poor condition.

Given the limited expansion space in stations and the fact that most Berkeley fire stations do not meet health and safety protocols or industry standards, many of the facilities are in need of major overhauls. Based on existing conditions and needs assessments, most BFD facilities are currently at or beyond capacity. Without significant expansion and modifications, they cannot be made hazards-ready nor can they support the evolving inclusive culture of the Berkeley Fire Department. Renovation or replacement or relocation is necessary to accommodate identified staffing and operational needs. Volume II of this Master Plan outlines specific station needs and proposes modifications necessary to bring each of the stations into alignment with codes, industry standards, and the Berkeley Fire Department mission and culture.

Turnouts, exercise equipment, and apparatus all in the same space do not meet current best practices.

F. METHODOLOGY

MASTER PLANNING TEAM: The Fire Department Master Plan (FDMP) effort has relied on a close working relationship with the Fire Chief, members of the command team and members of IAFF Local 1227. The consultant team includes:

- Architects with expertise in fire department facilities planning and design
- Economic planner who investigated mixed use facilities combining fire stations with residential uses
- Design specialists on the programing and conceptual design development of a regionally shared training facility

MASTER PLANNING SCOPE: The FDMP effort began in began in earnest in Feb 2022 and included the following tasks:

- Collecting and reviewing the provided existing construction documents for each station
- Visiting each site
- Conducting a kick-off meeting with Fire Department representatives
- Documenting the fire department's spatial program needs
- Developing alternative layouts for each station, with the goal of reusing, renovating and/or adding to existing buildings and sites. Where renovation and reuse options did not achieve the requisite goals of improved health, safety, and service, the planning team studied replacement options.
- Preparing high-level construction cost estimates
- Exploring implementation and phasing scenarios to determining how improvements might roll out

KEY TAKEAWAYS:
Primary findings thus far are that all uses fundamental to fire fighting, emergency medical service, training, rescue and prevention can be accommodated at the planned stations (including specialty units at a few specific stations), headquarters, and training center.

Given space constraints at the station sites, all new ambulances and integrated mobile health programs (MIP or similar) could not be accommodated at the stations without significant expansion which would substantially increase costs at each facility. Therefore, the FDMP team proposes that this service be part of a new BFD Headquarters.

Reserve apparatus are currently proposed by this master plan as stored outdoors at some of the fire stations which is not optimal. Ideally these apparatus would be stored indoors at a centrally located warehouse, which would free up more space at the fire stations and allow for more efficient maintenance regiment.

Adequate onsite parking for first responders' private vehicles during shift changes was a major design driver in the site plans and station design options. Adequate onsite parking for first responders' private vehicles is necessary at each site because most employees commute from outside the Bay Area from locations that lack mass-transit options. Once at work, often responders are required to move from one station to another with a hundred pounds of safety equipment in tow.

VOLUME II of this report outlines in greater detail the implications of these findings at each station, BFD Headquarters and the Training Center.


6

G. APPROACHES TO IMPROVEMENTS

RENOVATION APPROACH: For each station, the FDMP team first sought a renovation approach to accommodate the evolving mission, changes to staffing, and the adoption of best practice environmental controls by providing:

- Private sleeping rooms for all on-duty staff
- Gender-neutral restrooms
- Dedicated turnout storage and decontamination spaces
- Dedicated Fitness Room apart from the apparatus bay and vehicle exhaust
- Office space for on-duty supervisor(s)
- Increased size of common spaces – kitchen, dining and day rooms – to accommodate added staff
- Clear and safe paths of travel throughout stations
- Additional apparatus bays for future units at Stations 1 and 4
- Sufficient parking for staff
- Appropriate facilities for electrification of the fleet (solar, charging, storage, transformers, etc)

REPLACEMENT APPROACH – NEW CONSTRUCTION: When the aforementioned priorities could not be accommodated through renovation, the team then looked at accommodating all the operational needs in new structures on either existing, expanded or new sites.

MIXED USE CASE STUDY: The Fire Department leadership team had hoped that with the City's goals of increasing density and affordable housing, fire stations could be rebuilt along with residential units to maximize city property that is centrally located and close to transit hubs. To research this concept, economics planner Strategic Economics researched three mixed-use projects which combined housing and fire stations on a single site. The case study sites are:

Fire Station 13, San Francisco, CA

Potomac Yard, Alexandria, VA

Lincoln Towers, Wilmington, DE

Mixed Use Case Studies Findings: The major takeaway from these mixed-use case studies is that combining housing and fire services on the same property is not a common development approach and for good reason. California's seismic building codes are extremely stringent for public safety buildings making them difficult to pair with other uses. Given the costs associated with the seismic safety requirements for fire stations and other public uses, pairing affordable housing with a fire station is not cost-effective in Berkeley.

Where this was attempted locally in San Francisco for Station 13 located at 530 Sansome Street, the residential component is a luxury hotel plus commercial uses. These non-fire station uses were designed to be separated and independently structured from the fire station by cantilevering the building that housed them over the station. This solution is only financially viable due to its location in San Francisco's financial district where the private development will generate enough value to pay for extra construction costs without impacting the rates of return. The land value in Berkeley is not comparable to the land value in San Francisco and thus this approach would not be attractive to a developer.

The projects in Virginia and Delaware were made possible because of the massive tracts of land available to the developers. This allowed for large-scale development which offset the costs of the fire stations. This is also not possible in Berkeley due to the small amount of city owned land. Another takeaway from the case studies is that each project studied benefitted from having other funding sources in place prior to design and construction to offset costs.

The complete case study report prepared by Strategic Economics is included in this Master Plan's appendix.

H. DEVELOPMENT SCENARIO RECOMMENDATION

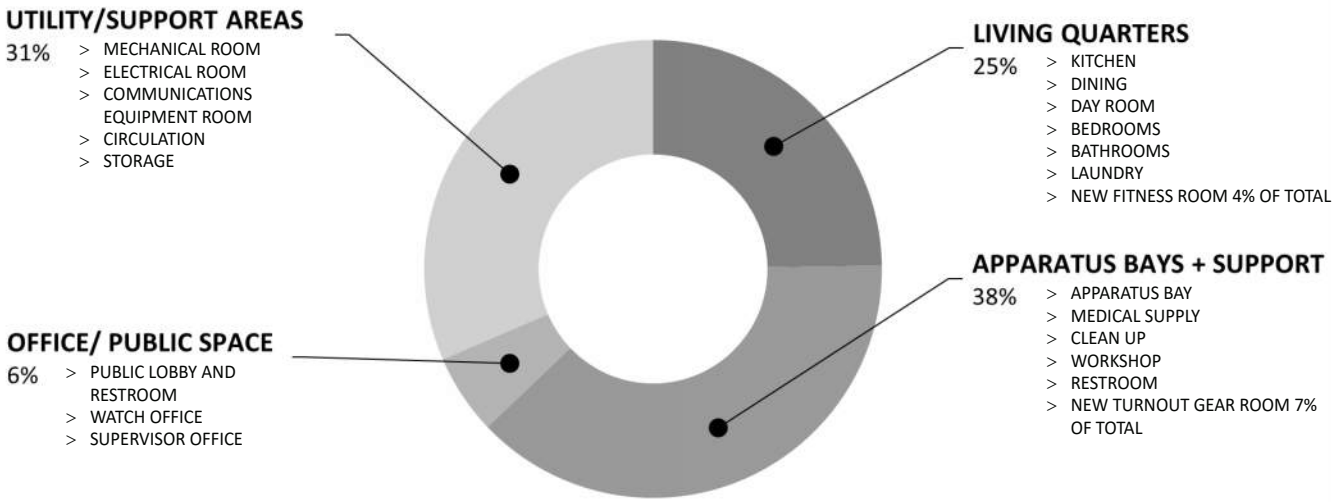
GUIDING PRINCIPLES: The following principles were established to inform the development of the Fire Department Master Plan.

1. All key operational efficiency and safety issues must be addressed.
2. In the station renovations, the addition of sleeping, dedicated turnout and fitness rooms are prioritized.
3. The plan prioritizes the replacement or renovation of the busiest stations first.
4. All additional ambulances or alternate response type programs (staff & vehicles) will be housed outside of the fire houses.
5. The project delivery schedule must allows funds to be maximized through the use of existing facilities as temporary unit locations during construction phases.
6. Utilize city owned property, if possible, to maximize funds for the new headquarters facility
7. Plan and build a regional training center in collaboration with other jurisdictions to the north in Alameda and Contra Costa.

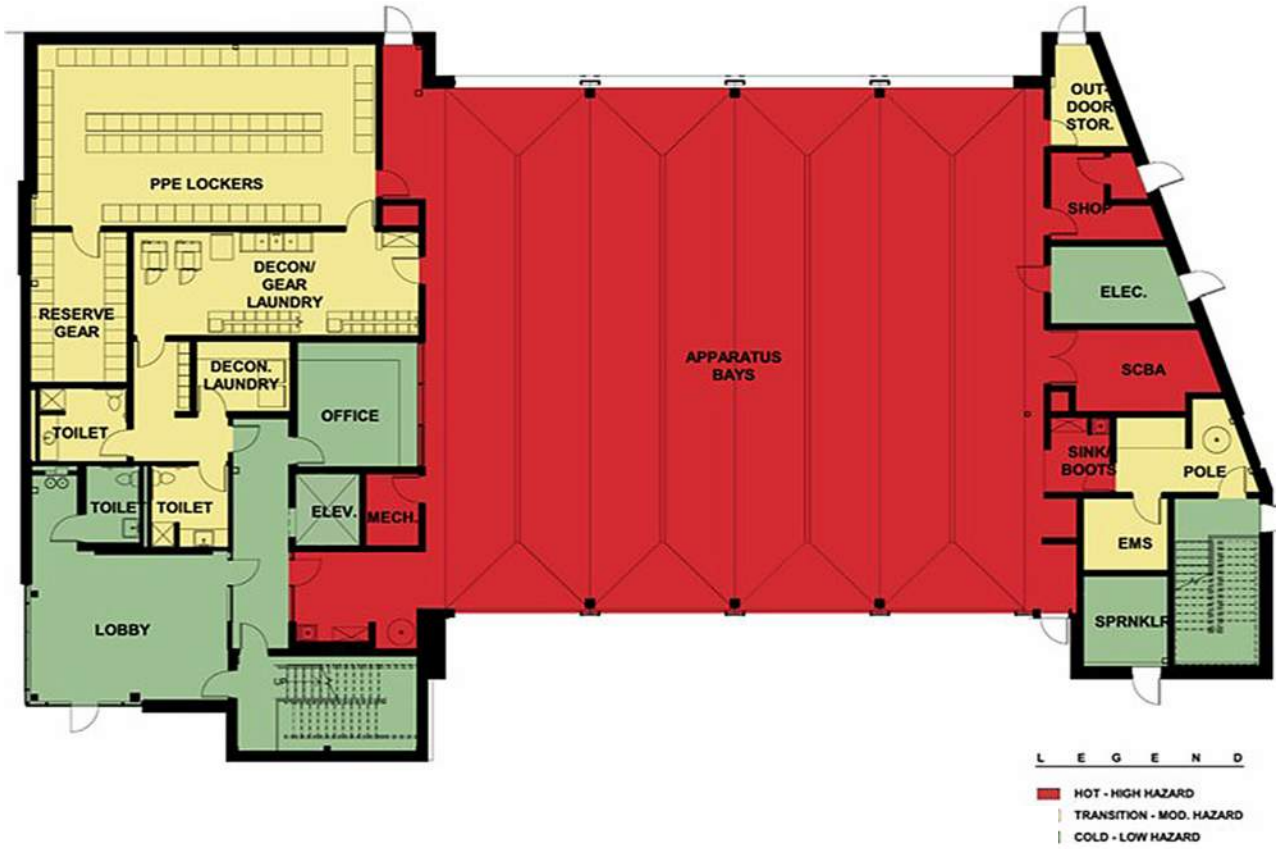
USES IN A TYPICAL STATION: Fire stations in and of themselves are a complex mixed-use building, combining residential, business and quasi-industrial uses under one roof. There are four major space need categories:

> The greatest single use space in a station – roughly 38% – is taken up by apparatus, fire fighting equipment and gear, including Turnouts
> Living quarters take up a quarter of a station and include shared and private spaces and fitness rooms which have typically been shoehorned into apparatus bays
> A comparatively smaller area – 6% of a station – goes to administrative uses, entry and public restrooms.
> The rest of the space – nearly a third of the stations – supports circulation and operations, such as: Storage, Mechanical, Electrical, and communication equipment rooms

TYPICAL STATION AREA BREAKDOWN



HOT WARM COOL ZONE DIAGRAM



The separation of the hazardous areas of the station with the living and office quarters is paramount to increased safety in a fire station. The diagram above indicates the areas of the station that are considered hazardous (Hot Zones), moderately hazardous (Warm Zones) and the balance of the areas , low hazard living quarters and office facilities are considered (Cool Zones).

RECOMMENDED SCENARIO: The development phasing scenario recommended by this FDMP maximizes operational improvements by focusing first on the busiest and largest stations. The team tested a variety of ways to meet the guiding principles, a process which ultimately helped shape the principles themselves. For instance, the original goal was to add all the new ambulance and alternative response units to the existing stations. This proved to be impossible without expanding almost every station and purchasing adjacent residential parcels at each location. The recommended development scenario described bellow made the best use of the existing sites. A summary of the key points of each project follows.

SCENARIO DESCRIPTION: Most station projects can be implemented on city-owned property except for Station 1. This scenario successfully addresses increased staffing needs and key operational efficiencies.

The budgets reflected below are "Rough Order of Magnitude Cost Plans." As a perspective, an order of magnitude cost model has the objective of identifying costs within an order of magnitude. The budget is not meant to be the lowest possible, but rather, to identify the order of magnitude of costs in considering next steps. A range of costs was used for planning purposes. The ranges below do not include escalation beyond 2024, property acquisition costs or program management costs. They include all construction, equipment and furnishings costs, plus fees for design, environmental review, permits, etc., associated with project delivery. In the recommended development phasing scenario, the initial focus is on the projects with highest call load and largest staffing numbers. Station 1 was proposed to be implemented first because it is a relocation project. Once a new Station 1 is complete and online, the existing original Station 1 can be used as temporary housing for the future replacement projects.

SEQUENCED PROJECTS

Design Start		*Rough Order of Magnitude Costs LOW x $ Million*	*HIGH x $ Million*
2024	**Fire Station 1** Relocation New site on/near San Pablo Ave	**$42**	**$47**
2026	**Fire Station 2** Replacement Temporary Location - Station 1, 4, 5	**$51**	**$56**
2028	**Fire Station 5** Replacement Temporary Location - Station 1, 4, 2	**$53**	**$58**
2030	**Fire Station 4** Replacement Temporary Location - Station 2, 6	**$36**	**$41**

INDEPENDENT PROJECTS

Design Start		*Rough Order of Magnitude Costs LOW x $ Million*	*HIGH x $ Million*
2023	**New Headquarters** Site TBD	**$33**	**$36**
2023	**Training Center** Phase 1 Renovation Phase 2 Replacement Regional Site TBD	**$81**	**$90**
2026	**Fire Station 3** Renovation + Expansion Temporary Location - Station 2, 5	**$12**	**$16**
2028	**Fire Station 6** Renovation + Expansion Temporary Location - Trailer on site	**$12**	**$15**
2030	**Fire Station 7** Renovation + Expansion Temporary Location - TBD	**$10**	**$13**

TOTAL Rough Order of Magnitude Project Cost	**$330**	**$372**

H. DEVELOPMENT SCENARIO RECOMMENDATION

THE PROPOSED PROJECTS IN ORDER OF DEVELOPMENT ARE OUTLINED BELOW:

Fire Station No. 1 - Relocation and Replacement on a new site (to be identified)

Key Attributes: Relocation and expansion of Fire Station 1 to a more commercial site in the same response area. Current station can then be used as a temporary station as others are renovated.

Rationale: The existing site is located in a residential neighborhood. The adjacent properties would need to be purchased to accommodate an expansion or replacement on site. These properties contain apartment buildings. Dozens of house units would need to be removed to accommodate the operational needs at this location. Therefore, it is recommended to relocate this facility to a site in a commercial area.

Order of Magnitude Budget Range: $42-47M

Schedule: Recommended design start 2024

Fire Station No. 2 – Replacement at existing site (2029 Berkeley Way)

Key Attributes: Replace the station on the existing site with a new 3-story building that includes all required parking.

Rationale: Fire Station No. 2 is the Fire Department's most populated and busiest station with multiple cross staff units. The current configuration does not allow the staging of all apparatus for response. In addition, there is not adequate on-site staff or visitor parking. The replacement of the station includes a parking deck which allows this station to meet all current and projected needs.

Order of Magnitude Budget Range: $51-56M

Schedule: After completion of Fire Station 1

Fire Station No. 5 - Replacement at existing site (2680 Shattuck Avenue)

Key Attributes: Replacement of existing station with a new 2-story building plus basement parking in order to fully meet all programmatic and parking needs on site.

Rationale: Station No. 5 is the Department's second most populated and busiest station. It also houses multiple support units. The station has been renovated multiple times and is past its useful life. The site area is very compact and does not currently allow adequate space for site operations. The recommended option replaces the station onsite and adds subterranean parking for staff and the supporting units.

Order of Magnitude Budget Range: $53-58M

Schedule: After completion of Fire Station 2

Fire Station No. 4 – Replace at existing expanded existing site (1900 Marin Avenue)

Key Attributes: Replacement of existing building on an expanded site to meet programmatic and parking requirements.

Rationale: This response area of the City has been identified as an area that should plan for an additional ambulance. The existing fire station can not be expanded to add the apparatus bay necessary for this new unit due to its unique configuration. The recommendation for this station is to replace it at the existing site and expand the site into the adjacent road right of ways.

Order of Magnitude Budget Range: $36-41M

Schedule: Design start 2030

Fire Station No. 3 – Renovation and addition at existing site (2710 Russell Street)

Key Attributes: Renovation and expansion of existing fire station to provide a dedicated fitness room, turnout storage, private office and private sleeping rooms.

Rationale: This station is not recommended to add new units. The renovation will focus on improving the health, safety and privacy aspects of the fire station.

Order of Magnitude Budget Range: $12-16M

Schedule: Design start 2026

Fire Station No. 6 – Renovation and addition at existing site at existing site (999 Cedar Street)

Key Attributes: Renovation and expansion of the existing fire station to provide a dedicated fitness room, turnout storage, private offices and private sleeping room. The entire station will be renovated to allow modernize the kitchen, dining and dayroom.

Rationale: This station is not recommended to add new units although the increases in staffing on existing units are driving the need to modernize the living quarters. In addition, the station will be expanded to improve the health, safety and privacy aspects of the station.

Order of Magnitude Budget Range: $11.6-14.6M

Schedule: Design start 2028

Fire Station No. 7– Renovation and addition at existing site (3000 Shasta Road)

Key Attributes: Renovation and expansion of existing fire station to provide a dedicated fitness room, turnout storage and private sleeping quarters for the additional staffing staged at this location during high fire season.

Rationale: Station 7 is the Department's newest station, however, it is lacking some of the basic spaces required to provide a safe work environment. Primarily the missing space is a dedicated turnout room with decontamination equipment. In addition, additional sleeping rooms are necessary to accommodate the move up staffing during fire season.

Order of Magnitude Budget Range: $10-13M

Schedule: Design start 2030

Headquarters – Relocation to new site.

Key Attributes: Relocation of headquarters to a city owned building. Location to be big enough to Administrative offices, training classrooms, and the ambulance deployment center.

Rationale: Current location cannot accommodate the growing staff or the ambulance deployment center.

Order of Magnitude Budget Range: $33-36M

Schedule: Design start 2023

Training Facility – New construction and renovation at site to be determined

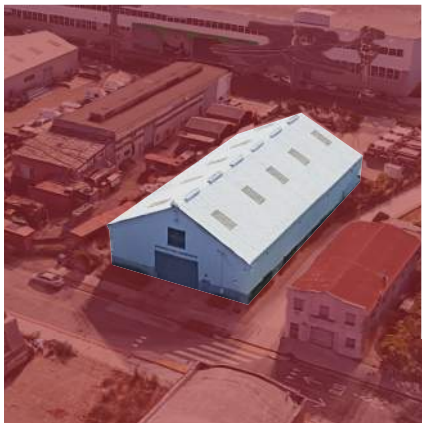
Key Attributes: Relocation of the training facility in partnership with other local municipalities.

Rationale: The current location is undersized and located in a residential neighborhood which impacts what training can occur there. The region is missing a large training facility for emergency responders

Order of Magnitude Budget Range: $81-90M

Schedule: Phase 1 design Start 2023

Warehouse – Renovation at site in progress



Key Attributes: Renovation of this building is currently in the design phase and will provide a small office and meeting location.

Rationale: The current location has staff assigned but they work from a desk in the warehouse space, exposed to noise and exhaust, and without climate controls.

Order of Magnitude Budget Range: $800-1.5m

Schedule: Design underway

I. REFERENCES

FACILITY & DECONTAMINATION:
NFPA 1584: Standard on the Rehabilitation Process for Members during Emergency Operations and Training Exercises, Section 7.4.2

NFPA 1700: Guide for Structural Fire Fighting, Section 11

NFPA 1500: Standard on Fire Department Occupational Safety, Health, and Wellness Program, Section 7, 10, 14, Annex C, Annex F

Occupational Safety and Health Act (OSHA), Occupational Safety and Health Standards (1910), Toxic and Hazardous Substances (subpart Z), Air Contaminants (§ 1910.1000)

Occupational Safety and Health Act (OSHA), Permissible Exposure Limits (PELs), OSHA Annotated Tables Z-1, Z-2, Z-3

California Occupational Safety and Health Act (Cal/OSHA), Subchapter 7, Group 16, Article 109 Hazardous Substances and Processes

California Occupational Safety and Health Act (Cal/OSHA), Subchapter 7, Group 16, Article 107 Dusts, Fumes, Mists, Vapors and Gases

California Occupational Safety and Health Act (Cal/OSHA), Table AC 1 - Permissible Exposure Limits (PELs)

Firefighter Cancer Registry Act; https://www.congress.gov/bill/115th-congress/house-bill/931

The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), https://oehha.ca.gov/proposition-65/about-proposition-65

Lavender Ribbon Report, Best Practicews for Preventing Firefighter Cancer, International Association of Fire Chiefs & National Volunteer Fire Council, 2018

CANCER IN THE FIRE SERVICE:
Occupational & Environmental Medicine, Mortality and cancer incidence in a pooled cohort of US firefighters from San Francisco, Chicago and Philadelphia (1950– 2009), Daniels, at al 2013

Exposure–response relationships for select cancer and non-cancer health outcomes in a cohort of US firefighters from San Francisco, Chicago and Philadelphia (1950–2009), Daniels, at al

Environmental Health, Prostate cancer in firefighting and police, Sritharan, et al 2017

Am J Ind Med., Risk of Cancer Among Firefighters in California, 1988–2007, Tsai, et al 2016

Fent, K.W., Toennis, C., Sammons, D. et al. Firefighters' absorption of PAHs and VOCs during controlled residential fires by job assignment and fire attack tactic. J Expo Sci Environ Epidemiol 30, 338–349 (2020). https://www.nature.com/articles/s41370-019-0145-2

NIOSH [2013]. Health hazard evaluation report: evaluation of dermal exposure to polycyclic aromatic hydrocarbons in firefighters. By Fent KW, Eisenberg J, Evans D, et al. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, NIOSH HETA Report No. 2010-0156-3196. https://www.cdc.gov/niosh/hhe/reports/pdfs/2010-0156-3196.pdf.

Kenneth W. Fent, Barbara Alexander, Jennifer Roberts, Shirley Robertson, Christine Toennis, Deborah Sammons, Stephen Bertke, Steve Kerber, Denise Smith & Gavin Horn (2017) Contamination of firefighter personal protective equipment and skin and the effectiveness of decontamination procedures, Journal of Occupational and Environmental Hygiene, 14:10, 801-814, DOI: 10.1080/15459624.2017.1334904

Laroche E, L'Espérance S. Cancer Incidence and Mortality among Firefighters: An Overview of Epidemiologic Systematic Reviews. International Journal of Environmental Research and Public Health. March 3, 2021. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7967542/.

LeMasters GK, Genaidy AM, Succop P, et al. Cancer risk among firefighters: a review and meta-analysis of 32 studies. Journal of Occupational and Environmental Medicine. 2006;48(11):1189-1202. doi:10.1097/01.jom.0000246229.68697.90

Memorial Sloan Kettering Cancer Center. Clonal Hematopoiesis (CH). https://www.mskcc.org/cancer-care/types/leukemias/risk-factors/clonal-hematopoiesis-ch.

National Institute for Occupational Safety and Health. Findings from a Study of Cancer among U.S. Fire Fighters. July 2016. https://www.cdc.gov/niosh/pgms/worknotify/pdfs/ff-cancer-factsheet-final-508.pdf.

Pukkala E, Martinsen JI, Weiderpass E, et al. Cancer incidence among firefighters: 45 years of follow-up in five Nordic countries. Journal of Occupational and Environmental Medicine. 2014 Jun;71(6):398-404. doi: 10.1136/oemed-2013-101803. Epub 2014 Feb 6. PubMed PMID: 24510539. https://www.ncbi.nlm.nih.gov/pubmed/24510539.

https://firefightercancersupport.org/resources/faq/

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03

FY26 Mid-Biennial Update
Preliminary Budget Status

Budget and Finance Policy Committee

24 April 2025

AGENDA

1. Situational Overview
2. Fiscal Challenges
3. Citywide All Funds Summary
4. General Fund Summary
5. Budget Balancing Options
6. Next Steps and Timeline
7. Discussion- **Seeking Preliminary Recommendations on Strategies**

SITUATIONAL OVERVIEW

Reliance on one-time resources / actions

- Vacancies (hiring freeze, salary savings)
- Project deferrals
- Use of fund balance and resources
- Federal resources deployed

Resource Constraints

- Available resources < Need

Federal and economic uncertainty

- Status of federal grants?
- Increased costs and supply and demand issues?
- Probability of a recession?

FISCAL CHALLENGES

Operating / Other Funds (not exhaustive)

- General Fund
- Grant Funds (Federal and State pass thru funds)
- Parking Funds
- Marina Fund
- Camps Fund
- Internal Service Funds (Building Maintenance and Vehicles)
  - **Special revenue and enterprise funds cannot assist General Fund however the General Fund is the backstop for struggling funds**

Deferred Maintenance

- Buildings
- Fleet
- Technology infrastructure
- Streets / Roads

FY26 PRELIMINARY UPDATE STATUS

	2026 Adopted	2026 Adopted Update	Variance	% Inc/Dec
All FUNDS Revenue	698,663,104	695,897,660	2,765,444	0.40%
All FUNDS Expense	783,017,117	835,650,081	52,632,964	6.72%
Delta	**(84,354,014)**	**(139,752,421)**	**(55,398,407)**	**65.67%**
GF Revenue	284,047,716	284,047,716	-	0.00%
GF Expense	296,120,769	316,030,859	19,910,090	6.72%
Delta	**(12,073,053)**	**(31,983,143)**	**(19,910,090)**	**164.91%**
All FUNDS Personnel	390,853,568	428,926,104	38,072,536	9.74%
All FUNDS Non-Personnel	392,163,549	406,723,978	14,560,429	3.71%
Total	**783,017,117**	**835,650,082**	**52,632,965**	**6.72%**
GF Personnel	192,772,863	216,454,592	23,681,729	12.28%
GF Non-Personnel	103,347,906	99,576,267	(3,771,639)	-3.65%
Total	**296,120,769**	**316,030,859**	**19,910,090**	**6.72%**

- As in prior fiscal years, revenues are not keeping up with expenditures citywide.
- Options include increasing revenue, using depleting fund balance/reserves and/or reducing expenses.

FY26 PRELIMINARY UPDATE BY DEPARTMENT

Summary of Expenditures by Department – All Funds

	FY 2022 Actual	FY 2023 Actual	FY 2024 Actual	FY 2025 Adopted	FY 2026 Adopted	FY 2026 Update
Mayor and Council	3,334,706	3,943,449	4,203,792	5,929,940	5,975,686	7,779,383
City Auditor	2,691,656	2,711,752	3,157,444	3,759,532	3,838,168	3,867,644
Rent Stabilization Board	5,803,126	6,784,836	7,028,903	8,489,208	8,597,595	9,222,949
Police Accountability (a)	808,594	909,307	1,210,483	1,484,847	1,524,120	1,497,263
City Manager's Office	18,417,010	19,826,926	22,096,549	18,116,987	18,383,457	19,748,967
Berkeley Public Library	18,476,578	19,951,914	24,026,043	29,196,378	29,606,293	34,097,618
City Attorney	6,200,456	7,880,612	9,112,692	9,290,707	9,425,305	9,853,253
City Clerk	2,398,903	2,876,230	2,823,822	3,518,483	3,576,397	3,805,489
Finance	8,738,585	8,872,348	8,938,144	11,823,352	11,963,574	12,365,438
Human Resources	3,574,288	4,588,216	5,551,340	5,993,013	6,198,864	6,868,420
Information Technology	16,446,318	15,454,602	15,298,230	23,471,574	23,651,297	24,133,340
Health, HSG & Community Svc	91,780,017	102,059,650	108,295,302	137,886,421	138,029,239	101,941,477
Parks, Recreation & Waterfront	63,534,473	45,578,024	48,266,958	47,477,378	47,713,333	51,220,137
Planning & Development	22,433,636	24,148,382	26,533,191	33,307,721	33,268,672	34,955,135
Public Works	140,757,034	133,012,197	149,296,617	196,515,790	181,881,632	238,729,999
Police	82,753,749	89,672,154	90,716,174	91,311,450	94,797,598	107,694,500
Fire & Emergency Services	58,014,195	62,872,373	68,731,246	71,480,646	73,060,880	79,070,418
Non-Departmental (b)	126,738,115	119,779,636	133,946,419	94,266,290	91,525,011	88,798,652
Total All Funds	**672,901,439**	**670,922,608**	**729,233,350**	**793,319,717**	**783,017,121**	**835,650,081**

* FY 2025 & FY 2026 General Fund numbers do include adopted Tier 1 funding recommendations

(a) Police Review Commission has become the Office of the Director of Police Accountability in FY 23

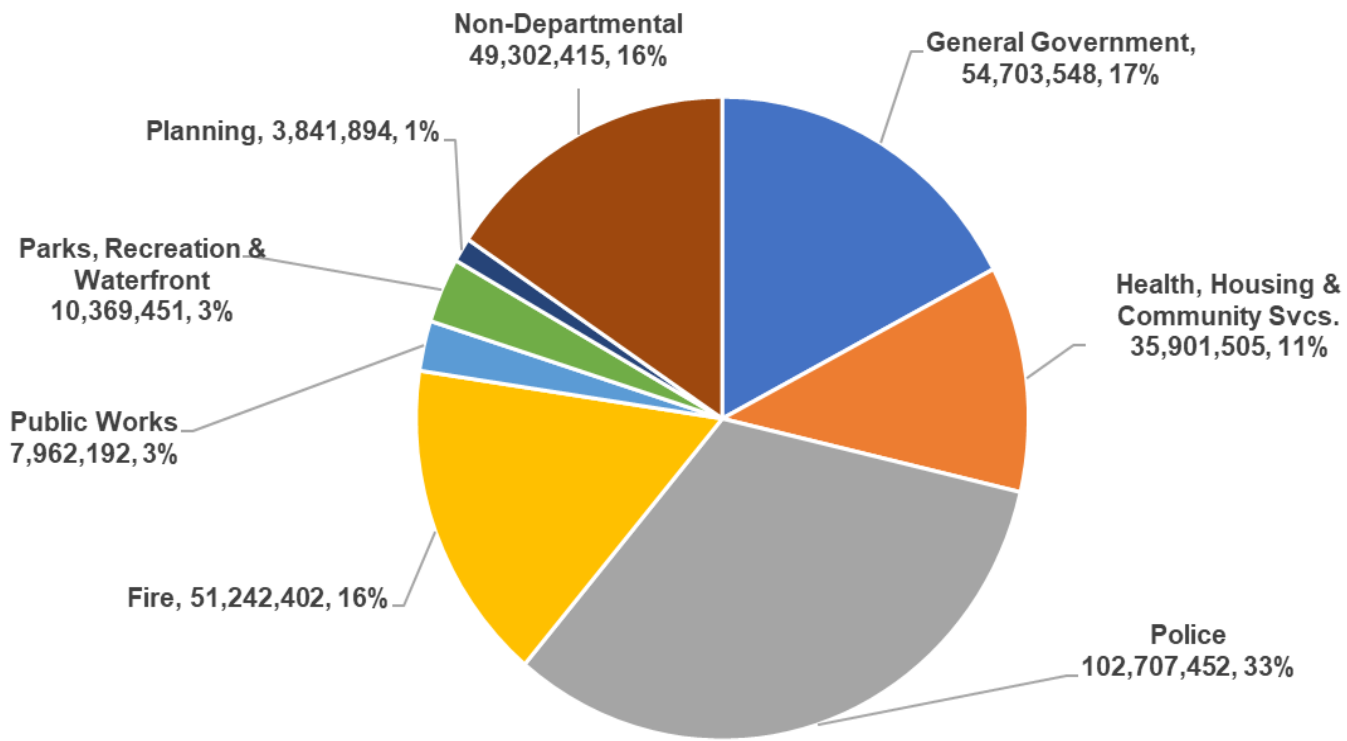
(b) Non-Departmental consists of operational overhead costs such as Property Insurance and School Board Salaries, General Fund allocation for Community Based Organizations, Workers' Compensation costs, Debt Service, and Interfund Transfers.

FY26 PRELIMINARY UPDATE BY DEPARTMENT

Summary of Expenditures by Department – General Fund

	FY 2022 Actual	FY 2023 Actual	FY 2024 Actual	FY 2025 Adopted	FY 2026 Adopted	FY 2026 Update
Mayor and Council	3,334,706	3,939,049	4,203,792	5,929,940	5,975,686	7,779,383
City Auditor	2,627,178	2,633,227	3,078,425	3,657,880	3,734,615	3,823,689
Rent Stabilization Board (a)	-	568,412	554,214	-	-	-
Police Accountability	808,594	909,307	1,210,483	1,484,847	1,524,120	1,497,263
City Manager's Office	12,034,751	13,385,432	15,438,698	14,352,200	14,591,829	16,182,796
City Attorney	2,648,008	3,701,943	5,332,589	5,612,249	5,662,267	6,093,156
City Clerk	2,231,818	2,550,697	2,114,865	2,867,551	2,918,529	3,139,455
Finance	6,827,434	7,075,971	7,188,353	9,302,267	9,415,265	9,865,324
Human Resources	2,052,893	2,971,640	3,819,103	3,928,242	4,073,809	4,741,723
Information Technology	1,446,933	882,432	1,077,796	1,580,760	1,580,760	1,580,760
Health, HSG & Community Svc	32,619,369	28,154,030	36,867,755	31,950,903	33,283,018	35,901,505
Parks, Recreation & Waterfront	8,757,651	9,693,628	12,640,006	9,625,120	9,719,820	10,369,451
Planning & Development	2,629,757	2,924,671	3,153,666	3,745,098	3,802,944	3,841,894
Public Works	6,859,822	7,066,623	7,100,535	7,046,369	7,209,627	7,962,192
Police	77,916,629	84,895,063	85,926,952	86,427,222	89,849,214	102,707,452
Fire & Emergency Services	43,406,934	40,874,529	48,392,171	47,108,481	48,628,122	51,242,402
Non-Departmental	43,112,577	52,800,630	69,050,828	50,930,926	54,151,147	49,302,415
Total	**249,315,054**	**265,027,284**	**307,150,230**	**285,550,055**	**296,120,772**	**316,030,859**

FY26 PRELIMINARY UPDATE BY DEPARTMENT

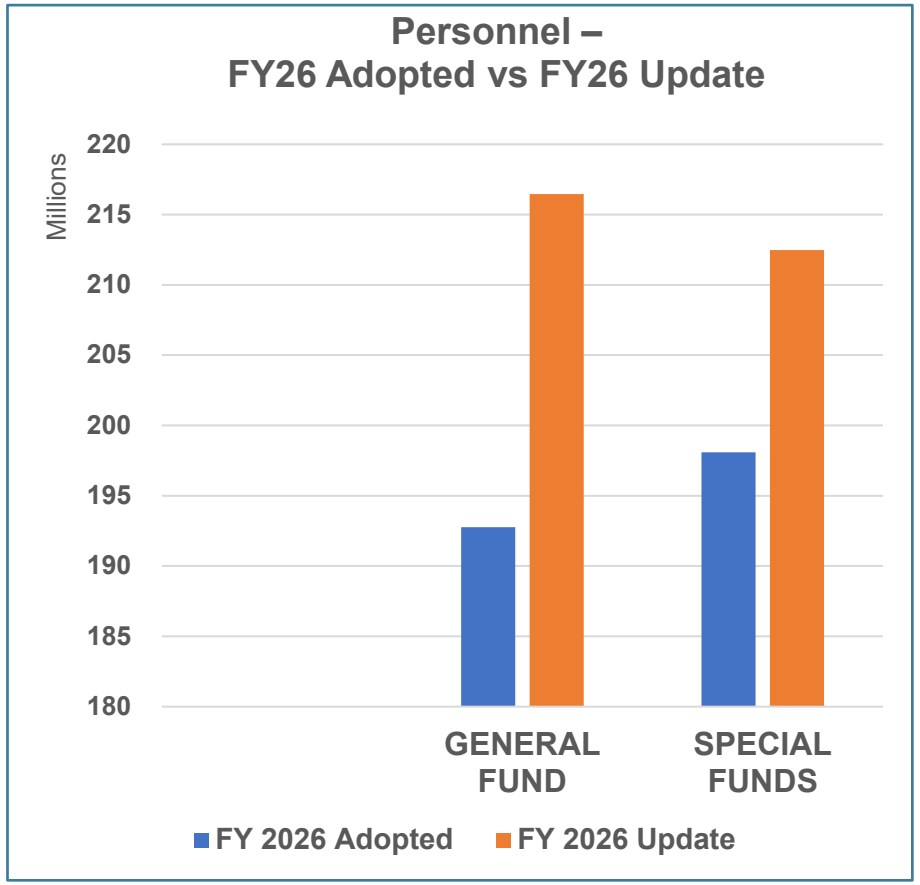


- Public safety ~50% of budget
- General Government is 17%
- Non-department of 16% includes
  - $14M community agencies
  - $10M transfer for streets
- HHCS is 11%
- Planning, PRW and Public Works together total 7%

COST DRIVER: SALARIES

Personnel - GF	FY 2026 Adopted	FY 2026 Update	Increase Amount	%
POLICE	82,456,475	95,316,213	12,859,737	16%
FIRE	40,242,447	43,104,262	2,861,815	7%
OTHER DEPARTMENTS	70,073,940	78,034,117	7,960,177	11%
Total	**192,772,863**	**216,454,592**	**23,681,729**	**12%**
*includes GFTarget Savings: FY26 Adopted-6% Average; FY26 Update-3%				

Personnel	FY 2026 Adopted	FY 2026 Update	Increase Amount	%
GENERAL FUND	192,772,863	216,454,592	23,681,729	12%
SPECIAL FUNDS	198,080,706	212,471,512	14,390,806	7%
Total	**390,853,568**	**428,926,104**	**38,072,535**	**10%**
*includes GFTarget Savings: FY26 Adopted-6% Average; FY26 Update-3%				



- Update reflects increased wages with implementation of adopted labor MOUS
- Updated Budget includes vacant positions budgeted at step 1
- Salary savings target revised from an average of 6% ($15M) to 3% ($7M) for the General Fund.
- Includes $10M in overtime (~$7M Police and $3M Fire), may need to increase based on prior years.

COST DRIVER: PENSION

- The City contributes a percentage of payroll to CalPERS for the retirement plans of current employees (normal cost)
- The percentage has decreased slightly, but base payroll is up
- CalPERS updated the projected cost of the Unfunded Actuarial Liability (UAL), which is the cost for prior employees' retirement
- Total pension costs are $4.6M, or 9%, more than FY26 Adopted

Pension Plan	FY 2026 Adopted	FY 2026 Update	Increase Amount	Increase %
FIRE	9,875,261	11,141,002	1,265,741	13%
POLICE	24,697,530	28,799,988	4,102,458	17%
MISCELLEANOUS	19,635,266	18,900,457	(734,809)	-4%
Total	**54,208,057**	**58,841,447**	**4,633,390**	**9%**

CONTEXT ON GENERAL FUND BUDGET

- The General Fund has been struggling with a structural deficit.
- FY 20-21 Budget: $40M ➡ Hiring freeze, no capital and $11M reserves
- FY 22 Budget: $27M ➡ $23M in ARPA, $4M reductions
- FY23-24: $22M/$12M ➡ Increase salary savings, use of fund balance
- FY25-26: $12M/FY ➡ Salary savings, fund balance and Trust, work comp holiday
- One-time solutions are largely gone and our costs are up significantly

FY26 GENERAL FUND BUDGET OVERVIEW

	FY26 Adopted	FY26 Projected Update
Revenue	$284,047,716	$284,047,716
General Fund Balance	3,762,210	
Total Uses	**287,809,926**	**286,382,796**
Adopted Expenditures	296,120,772	316,030,859
Expenditure reductions (pension refinement, cost shifts)		(3,532,018)
Worker Compensation Holiday	(4,854,558)	(5,429,505)
Section 115 Pension Trust	(3,000,000)	(3,000,000)
Completed Old City Hall & Veterans Building Leak Repair	(68,141)	(68,141)
PW Engineer charged to streets budget	(388,147)	
Revised Expenditures	**287,809,926**	**304,001,195**
Projected Surplus/(Deficit)		**(19,953,479)**

- General Fund (no U1) projected $20M deficit from increased personnel expenses and revised salary savings.
- While revenue projections are updated by Finance, strategies to balance the budget are needed.
- The environment has changed since last June and some of the prior balancing options may not be as feasible.
- FY26 Mid-Biennial Update will close the deficit with one-time options. However, FY27-28 will work on long-term fiscally sustainable approaches to address the ongoing structural deficit.

BUDGET BALANCING OPTION: WORKER COMPENSATION HOLIDAY

- **FY26 includes holiday of $5.5M GF ($10.7M All Funds)**
- Used to balance and fund other needs (TI construction costs, Marina Dock project) for the past 2 years
- Assets have gone from $56M to $35M (6/30/25 projected)
- Assets / Liabilities have gone from 100% to 68%, and another year of “holiday” could reduce this to 55%
- Actuarial recommend an asset balance of $51.3M at 6/30/25 to have 80% confidence that our total liability is covered.
- Short-term costs of payment of salaries while on leave and overtime to backfill in public safety as well as long term liability depending on length and cost of settlement

BUDGET BALANCING OPTION: SECTION 115 TRUST

- Pension cost increase of $4.6M or 9% over FY26 Adopted
- **FY26 Budget includes $3M. Increase by $3M for $6M total.**
- Trust balance of $26.4M as of 6/30/2024
- Use of Trust in the short-term balanced with future needs
- Long-term liability is of paramount concern

PLAN Citywide costs	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Fire	$7,958,918	$8,768,612	$9,415,000	$9,945,000	$11,093,000	$11,370,000
Police	16,420,813	17,867,757	18,906,000	19,796,000	21,479,000	21,988,000
Miscellaneous	30,126,063	31,865,338	34,561,000	36,579,000	40,959,000	42,012,000

Source: CalPERS actuarial valuation as of 6/30/23. Assumes 6.80% rate of return.

BUDGET BALANCING OPTION: VACANCIES

- FY26 Update included vacant positions as of January 2025
- Departments provided update on filled and newly vacant positions
- Snapshot as of 4/1/25. Positions may have been filled as hiring freeze not in place yet
- Currently 134 positions totally $26.2M included within budget
- Use hiring freeze memo criteria to evaluate
- Determine which positions will not be budgeted thereby reducing costs
- Exploring one-time or longer cost shifting between funds for filled positions

BUDGET BALANCING OPTION: U1

- FY26 includes $2.5M allocation for Small Sites program
- FY26 includes $1M to organizations for capacity building and anti-displacement
- FY26 includes ERF-2 required match as Measure P is overcommitted
- FY26 using $2.3M of fund balance
- Projected to be negative in FY28 due to support of 2 required matches for ERF grants

BUDGET BALANCING OPTION: EXPENDITURE REDUCTION/ COST SHIFT

- Partial holiday on contribution to IT
- Evaluated savings from Specialized Care Unit
- Assessing community agency funding and performance
- Reviewing baseline for funding to outside agencies
- Reviewing FY26 Adopted Tier 1 Items
- Reviewing Measure P planned programmatic expenditures

NEXT STEPS

- Next Budget Committee meeting on May 15, 2025:
  - FY26 Revenue Projection Update
  - Vacancy review: impact of keeping positions vacant, City Manager recommendations
  - Measure P Forecast Update
  - FY26 Council budget referrals

- Council Budget meeting on May 20, 2025

GOING FORWARD

FY 25/26

- Implementing one-time measures
- Hiring freeze
- Maintaining vacant positions

Biennial FY 27 – FY 28: Addressing the City's Structural Deficit

- Cost structure
- Revenue opportunities
- Efficiencies

DISCUSSION

- Questions and Comments
- Other strategies to consider

FY26 Budget Balancing Options			
Revenues	$	284,047,716	Adopted revenue. Waiting for update
	$	*1,661,452*	*projected ambulance revenue increase*
Expenditures	$	316,030,859	Includes vacant positions. Does not include new funding requests and Council budget referrals
Cost refinement reduction	$	(3,532,018)	
Projected Surplus/(Deficit)	***$***	***(26,789,673)***	
Options			
Unfund vacant positions			Will need to recalculate the salary savings target included within the FY26 Update projection as it based on payroll
Section 115 Trust for Pension	$	(6,000,000)	Reduce GF contribution to PERS UAL with Trust paying a portion of the payment instead
Worker Compensation Holiday	$	(5,428,152)	GF portion. Would also apply holiday to other citywide funds.
IT Cost Allocation holiday (50%)	$	(6,164,889)	Reduce GF allocation to IT services
Measure U1 Reallocation	$	(2,500,000)	Reallocate small sites funding
Community agency reduction			Reviewing quarterly reports and contracts to assess feasibility for savings
Projected Surplus/(Deficit)	**$**	**(6,696,632)**	

General Fund Vacant Positions as of 04.01.2025						
Department Name	**PCN#**	**Position Description**	**Budgeted Amount**	**% GF Funded**	**How long has the position been vacant?**	**Notes**
City Attorney	N/A	RISK MANAGER	$ 258,967.80	1.00	1+ years	
City Attorney	991	SENIOR LEGAL SECRETARY - CA - OFFICE OF THE CITY ATTY	$ 142,630	1.00	1+ years	
City Attorney Total			**$ 401,598**	**2.00**		
City Auditor	783	ACCOUNTING TECHNICIAN - AUDITOR - PAYROLL DIVISON	$ 161,902	1.00	1 to 3 months	
City Auditor	1746	AUDITOR I - AUDITOR - PERFORMANCE DIVISION	$ 169,155	1.00	1 to 3 months	
City Auditor	2908	SENIOR AUDITOR - AUDITOR - PAYROLL DIVISON	$ 211,461	1.00		
City Auditor Total			**$ 542,518**	**3.00**		
City Clerk	1271	OFFICE SPECIALIST III - CC - OFFICE OF THE CITY CLERK	$ 137,101	1.00	1+ years	
City Clerk Total			**$ 137,101**	**1.00**		
City Manager	3952	ADMIN ASSISTANT UNREP - CMO - OFFICE OF THE CITY MANAG	$ 137,584	1.00	4 to 6 months	
City Manager	1898	DEPUTY CITY MANAGER	$ 508,852	1.00	4 to 6 months	
City Manager	1416	DIGITAL COMNCATNS COORD - CMO - COMMUNICATIONS	$ 212,996	1.00	1 to 3 months	
City Manager	1628	OFFICE SPECIALIST II - CMO - OFFICE OF THE CITY MANAG	$ 121,403	1.00	1+ years	
City Manager	2588	PROGRAM MANAGER I	$ 190,170	1.00	4 to 6 months	
City Manager Total			**$ 1,171,005**	**5.00**		
Finance	3578	ACCT OFF SPEC II MC - FIN - REV COLLECTION - LICENSING	$ 121,754	1.00	4 to 6 months	
Finance	1430	ACCT OFF SPEC II MC - FIN - TREASURY - DIVISI	$ 121,754	1.00	4 to 6 months	
Finance	3866	ACCT OFF SPEC III MC - FIN - TREASURY - DIVISION	$ 137,947	1.00	4 to 6 months	
Finance	565	ADMIN SECRETARY - FINANCE - OFFICE OF THE DIR	$ 183,749	1.00	1 to 3 months	
Finance	221	ASSOC MGMT ANALYST CSU - FIN - REV COLLECTION - LICENSING	$ 86,328	0.50	1+ years	
Finance	1220	CUSTOMER SVC SPEC II - FIN - REV COLLECTION - CUST SVC	$ 124,196	1.00	7 to 12 months	
Finance	2477	CUSTOMER SVC SPEC II - FIN - REV COLLECTION - CUST SVC	$ 124,196	1.00	7 to 12 months	
Finance	1282	GENERAL SERVICES MANAGER - FIN - GENERAL SERVICES - DIVISON	$ 211,973	1.00	4 to 6 months	
Finance	2597	REVENUE DEVELOPMENT SPEC I - FIN - TREASURY - REV DEVELOPMENT	$ 142,340	1.00	1+ years	
Finance	3310	REVENUE DEVELOPMENT SPEC I - FIN - TREASURY - REV DEVELOPMENT	$ 142,340	1.00	1+ years	
Finance	2461	REVENUE DEVELOPMENT SUP - FIN - TREASURY - REV DEVELOPMENT	$ 185,934	1.00	1+ years	
Finance	1289	SENIOR SYSTEMS ANALYST - FIN - ANALYTICAL SYS DIV	$ 206,393	1.00	7 to 12 months	
Finance Total			**$ 1,788,904**	**11.50**		
Fire	4451	FIRE CAPTAIN II - FD - OPERAT - FIRE SUPPRESSION	$ 281,161	1.00	1+ years	
Fire	2772	FIREFIGHTER - FD - OPER - EMERGENCY MED SVCS	$ 217,468	1.00	1 to 3 months	
Fire	3891	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3892	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3893	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3894	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3895	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3896	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3897	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3898	LIMITED TERM EMT	$ 92,693	1.00	1+ years	

General Fund Vacant Positions as of 04.01.2025						
Department Name	**PCN#**	**Position Description**	**Budgeted Amount**	**% GF Funded**	**How long has the position been vacant?**	**Notes**
Fire	3899	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	3900	LIMITED TERM EMT	$ 92,693	1.00	1+ years	
Fire	2894	MECHANIC - FIRE DEPARTMENT	$ 139,076	1.00	7 to 12 months	
Fire	1924	OFFICE SPECIALIST II - FD - CHIEF ADMIN & FISCAL SRV	$ 119,781	1.00	1 to 3 months	
Fire	2773	FIREFIGHTER - FD - OPER - EMERGENCY MED SVCS	$ 256,015	1.00	1 to 3 months	
Fire	1409	FIREFIGHTER - FD - OPER - EMERGENCY MED SVCS	$ 241,540	1.00	1 to 3 months	
Fire	2748	FIREFIGHTER - FD - OPER - EMERGENCY MED SVCS	$ 248,613	1.00	1 to 3 months	
Fire	1049	FIREFIGHTER - FD - OPER - EMERGENCY MED SVCS	$ 244,214	1.00	1 to 3 months	
Fire	3609	PARAMEDIC - FIRE	$ 138,249	1.00	1 to 3 months	
Fire	3930	PARAMEDIC (R) - FD OPER EMERGENCY MED SVCS S-P	$ 142,130	1.00	1 to 3 months	
Fire	3932	PARAMEDIC (R) - FD OPER EMERGENCY MED SVCS S-P	$ 142,130	1.00	1 to 3 months	
Fire	4608	PARAMEDIC (R) - FD OPER EMERGENCY MED SVCS S-P	$ 142,130	1.00	1 to 3 months	
Fire Total			**$ 3,239,437**	**22.00**		
HHCS	3589	(T) COM SERVICE SPEC II - HHCS-HCS - HOMELESS SERVICES	$ 172,665	1.00		
HHCS	2535	BEHAVIORAL HLTH CLIN II - HHCS-AGING - SOCIAL SERVICES	$ 96,468	0.44	1 to 3 months	
HHCS	2404	BEHAVIORAL HLTH CLIN II - HHCS-MH - CRISIS SERVICES	$ 164,261	1.00	1+ years	
HHCS	2630	COM DEVELOPMENT PROJ COOR - HHCS-HCS - COMMUNITY SVCS	$ 188,182	1.00	1+ years	
HHCS	2517	CUSTOMER SERVICE SPECIALIST II - HHCS - PHOU - VITAL STATISTICS	$ 116,739	0.94	4 to 6 months	
HHCS	1594	HEALTH OFFICER (CERT) - HHCS-PHOU UNIT	$ 449,062	1.00	1 to 3 months	
HHCS	568	HEALTH SERVICES PROGRAM SPEC - HHCS-PH - FAMILY WELL - WBFWC	$ 118,527	0.72	4 to 6 months	
HHCS	1206	HEALTH SERVICES PROGRAM SPEC - HHCS-PH - PREPAREDNESS	$ 37,845	0.23	1 to 3 months	
HHCS	1057	HEALTH SERVICES SUPERVISOR- HHCS - PH - ADMINISTRATION	$ 104,453	0.50	1 to 3 months	
HHCS	1638	MEALSITE COORDINATOR - HHCS-AGING - STH BERK SR CNTR	$ 16,591	0.16	1 to 3 months	
HHCS	3335	MENTAL HEALTH CLINICAL SUPV - HHCS-MH - CRISIS SERVICES	$ 164,224	0.90	1+ years	
HHCS	826	OFFICE SPECIALIST II - HHCS-AGING - STH BERK SR CNTR	$ 119,598	1.00	1+ years	
HHCS	204	OFFICE SPECIALIST II - HHCS-EH - ADMINISTRATION	$ 74,123	0.60	1 to 3 months	
HHCS	653	SENIOR COMM DEVLP PROJ COORD - HHCS-HCS - HOUSING	$ 208,100	1.00	4 to 6 months	
HHCS	792	SENIOR HEALTH SERV PROG SPEC - HHCS-PH - FAMILY WELL - WBFWC	$ 227,927	1.00	1 to 3 months	
HHCS	3394	SENIOR HEALTH SERV PROG SPEC - HHCS-PH - PREPAREDNESS	$ 105,770	0.50	1 to 3 months	
HHCS	1429	SOCIAL SERVICES SPECIALIST - HHCS-AGING - SOCIAL SERVICES	$ 92,038	0.50	1 to 3 months	
HHCS	851	SUPERVISING PUBLIC HLTH NURSE - HHCS-PHOU - COMMUNICABLE DIS	$ 120,172	0.51	4 to 6 months	
HHCS	1960	SUPERVISING PUBLIC HLTH NURSE - HHCS-PHOU - COMMUNICABLE DIS	$ 235,649	1.00	4 to 6 months	
HHCS	1056	VECTOR CONTROL TECHNICIAN - HHCS-EH - DIVISION	$ 108,326	0.78	1+ years	
HHCS Total			**$ 2,920,720**	**14.78**		
HR	1597	DIR OF HUMAN RESOURCES - HR - OFFICE OF HR DIRECTOR	$ 380,079	0.90	1 to 3 months	
HR Total			**$ 380,079**	**0.90**		
Mayor and Council	3234	LEGISLATIVE AIDE - MAYOR'S OFFICE	$ 142,454	1.00	7 to 12 months	
Mayor and Council Total			**$ 142,454**	**1.00**		

General Fund Vacant Positions as of 04.01.2025						
Department Name	**PCN#**	**Position Description**	**Budgeted Amount**	**% GF Funded**	**How long has the position been vacant?**	**Notes**
ODPA	171	ASSOCIATE MANAGEMENT ANALYST - MAYOR'S OFFICE - OFFICE OF DIR. POLICE AC	$ 172,848	1.00	4 to 6 months	
ODPA	3777	POLICE ACCOUNTABILITY INVESTIGATOR - MAYOR'S OFFICE - OFFICE OF DIR.	$ 203,444	1.00	1 to 3 months	
ODPA Total			**$ 376,292**	**2.00**		
Planning	1417	COMMUNITY SERVICE SPEC I - PLAN - ENERGY AND SUSTAINABILITY	$ 113,866	0.80	1 to 3 months	
Planning	1506	OFFICE SPECIALIST II - PLAN - LAND USE - DIVISION	$ 59,332	0.50	1+ years	
Planning	3349	PLANNING TECHNICIAN - PLAN - LAND USE - DIVISION	$ 66,077	0.50	1 to 3 months	
Planning Total			**$ 239,275**	**1.80**		
Police	2283	COMMUNITY SERVICE OFFICER- PD - SUP SRVS - JAIL	$ 140,490	1.00	1 to 3 months	
Police	3918	COMMUNITY SERVICE OFFC SUP - PD -SUP SRV - RECORDS/SUBPOENA	$ 134,038	1.00	7 to 12 months	
Police	3917	COMMUNITY SERVICE OFFICER - PD - INVES DETECT/CRIME ANLYST	$ 134,038	1.00	7 to 12 months	
Police	3912	COMMUNITY SERVICE OFFICER- PD -INVES DETECT/CRIME ANLYST	$ 134,038	1.00	7 to 12 months	
Police	3915	COMMUNITY SERVICE OFFICER- PD -INVES DETECT/CRIME ANLYST	$ 134,038	1.00	7 to 12 months	
Police	3916	COMMUNITY SERVICE OFFICER- PD -INVES DETECT/CRIME ANLYST	$ 134,038	1.00	7 to 12 months	
Police	3318	CRIME ANALYST - PD -INVES DETECT/CRIME ANLYST	$ 173,950	1.00	4 to 6 months	
Police	1567	OFFICE SPECIALIST III M&C PD -SUP SRV - RECORDS/SUBPOENA	$ 145,740	1.00	1 to 3 months	
Police	380	OFFICE SPECIALIST III PD -PRO STAND - PERSON & TRAIN	$ 165,609	1.00	1 to 3 months	
Police	3167	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 286,877	1.00	1+ years	
Police	956	POLICE OFFICER - PD - INVES DETECT/CRIME ANLYST	$ 278,679	1.00	1+ years	
Police	302	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	335	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	467	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,518	1.00	1+ years	
Police	474	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	579	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	650	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	679	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	750	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	1110	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	1166	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	1177	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	1450	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	1880	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	2499	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	4367	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	4368	POLICE OFFICER - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	447	POLICE OFFICER - PD -INVES DETECT/CRIME ANLYST	$ 278,679	1.00	1+ years	
Police	894	POLICE OFFICER - PD -INVES DETECT/CRIME ANLYST	$ 278,679	1.00	1+ years	
Police	1081	POLICE OFFICER - PD -OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	932	POLICE OFFICER 12.5 - PD - OPERATION - PATROL	$ 278,679	1.00	1+ years	

General Fund Vacant Positions as of 04.01.2025						
Department Name	**PCN#**	**Position Description**	**Budgeted Amount**	**% GF Funded**	**How long has the position been vacant?**	**Notes**
Police	2814	POLICE OFFICER 12.5 - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	2827	POLICE OFFICER 12.5 - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	2828	POLICE OFFICER 12.5 - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	2831	POLICE OFFICER 12.5 - PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	2959	POLICE OFFICER 12.5 - PD - OPERATIONS - PATROL	$ 294,665	1.00	1+ years	
Police	2963	POLICE OFFICER 12.5 - PD - OPERATIONS - PATROL	$ 290,181	1.00	1+ years	
Police	498	POLICE OFFICER- PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	570	POLICE OFFICER- PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	590	POLICE OFFICER- PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	892	POLICE OFFICER- PD - OPERATIONS - PATROL	$ 278,679	1.00	1+ years	
Police	774	POLICE OFFICER- PD -INVES DETECT/CRIME ANLYST	$ 278,679	1.00	1+ years	
Police	4452	POLICE SERGEANT - PD - OPERATIONS - PATROL	$ 376,054	1.00	7 to 12 months	
Police	473	POLICE SERGEANT- PD - OPERATIONS - PATROL	$ 376,054	1.00	1+ years	
Police	271	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	344	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	346	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	1+ years	
Police	581	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	924	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	1059	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	3316	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	3375	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	3905	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	3906	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	3907	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	3908	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	3909	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 122,891	1.00	7 to 12 months	
Police	4453	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 130,231	1.00	1 to 3 months	
Police	341	PUBLIC SAFETY DISPATCHER I/II - PD - SUP SRV - COMMUNICAT CNTR	$ 157,316	1.00	1 to 3 months	
Police	275	PUBLIC SAFETY DISPATCHER II- PD - SUP SRV - COMMUNICAT CNTR	$ 162,936	1.00	7 to 12 months	
Police	767	PUBLIC SAFETY DISPATCHER II- PD - SUP SRV - COMMUNICAT CNTR	$ 162,936	1.00	7 to 12 months	
Police	1148	PUBLIC SAFETY DISPATCHER II- PD - SUP SRV - COMMUNICAT CNTR	$ 162,936	1.00	7 to 12 months	
Police	3317	PUBLIC SAFETY DISPATCHER II- PD - SUP SRV - COMMUNICAT CNTR	$ 162,936	1.00	7 to 12 months	
Police	3911	SUPERVISING PUBLIC SFTY DISP - PD - SUP SRV - COMMUNICAT CNTR	$ 184,028	1.00	7 to 12 months	
Police Total			**$ 14,000,921**	**64.00**		
PRW	2527	AQUATICS FACILITIES SUP - PRW - REC - W CAMPUS SWIM CTR	$ 112,970	1.00	1+ years	
PRW Total			**$ 112,970**	**1.00**		
Public Works	3880	(PB) ASSOC PLANNER - PW - TRANSPORTATION - PLANNING	$ 168,678	1.00	4 to 6 months	
Public Works	162	ACCOUNTING OFFICE SPEC III MC - PW DIRECTOR - CUSTOMER SVCS	$ 6,070	0.04	1 to 3 months	

General Fund Vacant Positions as of 04.01.2025						
Department Name	**PCN#**	**Position Description**	**Budgeted Amount**	**% GF Funded**	**How long has the position been vacant?**	**Notes**
Public Works	3879	ASST CIVIL ENG (REG) - PW - GEN ENG - FACILITIES/BLDGS	$ 196,569	1.00	1+ years	
Public Works	3881	PUBLIC WORKS SUPERVISOR - PW - STREETS - STREET MAINT	$ 167,726	1.00	1+ years	
Public Works	569	SUPERVISING TRANSPORTATION ENGINEER - PW - TRANS - TRAFFIC ENG	$ 193,730	0.80	1+ years	
Public Works Total			**$ 732,773**	**3.84**		
Grand Total			**$ 26,186,047**	**133.82**		

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
City Attorney		Risk Manager	129,484	258,968	On-Going	The City Attorney's Office serves as the Risk Manager for the City, but does not currently employ dedicated staff person to oversee risk management. This position is presently unclassified.	City Attorney
City Attorney		Outside Legal Counsel	500,000	500,000	One-Time	The City requires specialized legal expertise to meet the needs on Aging Infrastructure, Environmental Law, and Police Oversight	City Attorney
City Attorney		Deputy City Attorney I (2.0 FTEs / Step 3)	137,295	366,122	On-Going	Entry-level attorneys to provide additional capacity to respond to innovative policy initiatives originated by the City Council.	City Attorney
City Attorney		Affirmative Litigation	200,000	200,000	One-Time	Establishment of an Affirmative Litigation account (Public Liability Fund) using existing settlement revenues	City Attorney
City Attorney		Deferred Maintenance of Office Facilities	76,663	38,198	One-Time	Increase in non-personnel baseline adjusted for inflation and for facility maintenance and renovation	City Attorney
City Attorney		Increase in non-personnel Baseline (Public Liability Fund) - inflation adjustment	214,182	298,762	On-Going	Increase in non-personnel Baseline (Public Liability Fund)	City Attorney
City Auditor		Auditor II	201,898	213,675	On-Going	Convert a 2-year temporary position to permanent based on ongoing and increased workload.	City Auditor
City Auditor		Increase Payroll Division's overtime budget	50,000	50,000	One-Time	Reflects time needed for payroll activities	City Auditor
City Auditor		24/7 hotline service and case management software for Whistleblower Program	20,000	20,000	On-Going	Annual cost for 24/7 hotline service and case management software for Whistleblower Program	City Auditor
City Auditor		Staff Training	30,000	30,000	On-Going	Required trainings to maintain compliance with professional standards in Payroll and Performance audit.	City Auditor
City Auditor		Payroll Audit Succession Planning	50,000	-	One-Time	Funds to onboard new leadership with overlap of exiting leadership to ensure stability of City's payroll functions.	City Auditor

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
City Manager		Costs for design of new HVAC at Animal Shelter	118,000	-	One-Time	The Shelter's existing system is at the end of its useful life and frequently fails, creating safety issues for animals and staff, particularly during surgeries and in efforts to manage parasite outbreaks. The complexity of the system requires extensive design consultation. (Neighborhood Services)	Public Works
City Manager		Violence Prevention and Youth Services	210,000	210,000	One-Time	Voices Against Violence ($50,000) & BYA Counseling Center ($125,000 & $35,000). (Reimagining Public Safety)	Health, Housing, & Community Services
City Manager		Solano Stroll waste management services	12,000	12,000	One-Time	Manage waste removal from the Solano Stroll (Green Mary). (Neighborhood Services)	City Manager
City Manager		Solano Stroll vehicle barricade rental	50,000	50,000	One-Time	Rentals for Meridian barriers for the annual Solano Stroll. (Neighborhood Services)	City Manager
City Manager		Solano Stroll and special event street closure supplies and rentals	6,000	6,000	One-Time	Cost for Transportation Division street closure supplies (Neighborhood Services)	City Manager
City Manager		Solano Stroll Zero waste fees	1,500	1,500	One-Time	Cost for Zero Waste refuse bins (Neighborhood Services)	City Manager
City Manager		Restore Community Festival Grants	-	-	One-Time	Restore budget to $200k. Restored in FY 23&24 by savings from Mayor's Office	City Manager
Finance		Reclassification AOSIII - Treasury to align with operations	20,732	20,732	On-Going	Part of Employer of Choice initiative to retain employees. Critical to maintaining the Treasury function of receipt recordation, deposits, and investments.	Finance
Finance		Reclassification to Revenue Counter Customer Service to support revenue collection	15,306	15,306	On-Going	Part of Employer of Choice initiative to retain employees. Critical to maintaining revenue collections	Finance
Fire		Overtime	1,500,000	1,500,000	On-Going	Increase overtime budget to reflect department need and prior years' actuals.	Fire
Fire		1227 BFFA - MOU item	55,000	55,000	On-Going	Needed to fully fund 1227's Wellness and Education Fund	Fire
Fire		PPE Replacement	77,781	223,831	On-Going	Replacement of personal protective equipment	Fire

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
Fire		Recruitment Funding	70,000	70,000	One-Time	Recruiting, Advertising, and Marketing firm specializing in public safety	Fire
Fire		Debt service payments for fire apparatuses	128,022	678,030	On-Going	Cost to finance the purchase of fire engines and aerial trucks. Financing is financial preferred as purchase price is over $7M.	Fire
Fire		Program Manager II (temporary)	-	-	One-Time	Temporary position for four years that would support the public safety reimagining goals and advance programs, projects, and policies that would meet the City's Complete Streets and Vision Zero goals. (FY25 - UC funds, FY26 - Measure FF, FY27 & FY28 - General Fund) FY25/26 cost of $283,270.	Fire
Health, Housing, & Community Services		Senior Community Development Project Coordinator	175,405	233,873	On-Going	This position will oversee the City's Labor Standards and Workforce Development Unit (a 4-person team) including the newly adopted Fair Work Week and Hard Hats ordinance.	Health, Housing, & Community Services
Health, Housing, & Community Services		Program Manager II	-	258,079	On-Going	For FY26 - Proposed as part of Phase III of the HCS staffing study to oversee all housing units in HCS. (Funded by Measure U1)	Health, Housing, & Community Services
Health, Housing, & Community Services		Community Services Specialist I	-	153,514	On-Going	For FY26 - Proposed as part of Phase III of HCS' Staffing Study to support all of the affordable housing programming in HCS. (Funded by Measure U1)	Health, Housing, & Community Services

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
Health, Housing, & Community Services		Workforce and youth development programming for Youthworkers	20,000	-	One-Time	The YW budget currently only supports staff salaries, hourly costs for YW and the bare minimum for program implementation. Youth development and workforce development programming is essential to supporting professional and life skills for youth so that they achieve independence and autonomy when transitioning into adulthood. This new and ongoing funding will allow YW to expand on highly successful pilot programming supported by one-time grant funding that will end in FY24	Health, Housing, & Community Services
Human Resources		Labor Negotiations & Investigations	125,000	125,000	On-Going	Increased funding to support consultants assisting the City with labor negotiations, ongoing personnel-related matters and personnel investigations.	Human Resources
Human Resources		Recruitment Funding	125,000	125,000	One-Time	Continuation of Employer of Choice allocation for marketing agency and digital outreach	Human Resources
Mayor & Council		Legislative Aides (new job specification and salary range)	1,363,115	1,363,115	On-Going	New Specification and Salary range for Legislative Aide Classification (renamed from Legislative Assistants) per Res#71,311 dated 05/07/2024; two Legislative Aides at Step 14 with benefits.	Mayor & Council
Office of the Director of Police Accountability		Board Member Training	35,000	35,000	On-Going	Board member training	Office of the Director of Police Accountability
Office of the Director of Police Accountability		Staff Training	36,000	36,000	One-Time	Staff training	Office of the Director of Police Accountability
Office of the Director of Police Accountability		Office location	100,022	103,297	On-Going	Rent for the new office	Office of the Director of Police Accountability

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
Parks, Recreation, & Waterfront		Fair Work Week - Hourly Labor Costs	63,500	67,175	On-Going	Estimated cost to implement Fair Work Week Ordinance, including predictability pay / right-to-rest pay	Parks, Recreation, & Waterfront
Parks, Recreation, & Waterfront		Utilities	11,173	273,499	On-Going	Utilities and janitorial have been underbudgeted, plus there have been steep increases in PG&E, EBMUD and Refuse.	Parks, Recreation, & Waterfront
Parks, Recreation, & Waterfront		Fair Work Week - Software	10,000	10,000	One-Time	Software needed to manage scheduling and retention requirements.	Parks, Recreation, & Waterfront
Parks, Recreation, & Waterfront		Camp Scholarships & DEI programs	355,811	230,000	One-Time	General fund support to Camps Fund to cover the costs of scholarships and DEI programs.	Parks, Recreation, & Waterfront
Parks, Recreation, & Waterfront		Summer Lunch Food Costs	39,323	39,323	On-Going	Support the Summer Lunch food program.	Parks, Recreation, & Waterfront
Parks, Recreation, & Waterfront		Cazadero Riverbed Erosion	300,000	-	One-Time	River wall eroding camp property. Assumes 50/50 share with Caz Perf Arts Camp, total cost is $600K.	Parks, Recreation, & Waterfront
Parks, Recreation, & Waterfront		South Cove Seawall-Planning Only	250,000	-	One-Time	Funding to retain a specialized marine structural engineering firm to begin the investigation on replacement methods and permitting needs for the Seawall. Planning process may help in seeking grants. Current estimated construction cost of $4-5 million.	Parks, Recreation, & Waterfront
Police		Fair Impartial Policing (FIP) Training	100,000	100,000	On-Going	FIP enhanced Training (RPS)	Police
Police		Wellness Fund	50,000	50,000	On-Going	Critical Incident Stress Contract, Peer Support Team, and emerging wellness needs.	Police
Police		Recruitment Funding	125,000	175,000	One-Time	Recruiting, Advertising, and Marketing firm specializing in public safety	Police
Police		Early Intervention System (EIS) subscription service	100,000	100,000	On-Going	Ongoing subscription service for EIS software	Police
Police		Community Service Officers	-	-	On-Going	Convert Limited Term to Permanent positions (6 CSO Officers and 1 CSO Supervisor)	Police

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
Public Works		Restrooms in Right of Way	105,000	105,000	On-Going	Maintenance for one restroom in the right of way.	Public Works
Public Works		ADA Transition Plan Implementation	-	250,000	On-Going	Requesting $1.0 M annual contribution towards citywide ADA spending for FY 25 and FY 26.	Public Works
Public Works		Citywide Bicycle and Pedestrian and Traffic Calming projects (and Bus Shelters/Benches) - Funded by Future TNC Tax Annual Revenues	120,000	120,000	On-Going	Maintenance of bus shelters/benches	Public Works
Kesarwani, Wengraf, Taplin, and Humbert	X	Publicly Accessible Permanent Bathroom at James Kenney Park	160,000	-	One-Time	Renovate an existing bathroom at the James Kenney Community Center to make it ADA compliant and permanently accessible to members of the general public who visit the park.	Parks, Recreation, & Waterfront
Mayor Arreguin	X	Supply Bank School Supply Distribution	35,000	35,000	One-Time	To support providing essential school supplies to Berkeley families.	Health, Housing, & Community Services
Mayor Arreguin	X	Cesar Chavez Solar Calendar Maintenance	10,000	-	One-Time	Fund Kala Art Institute, the fiscal sponsor for the Chavez/Huerta Tribute Site, for the continued purpose of employing grounds keepers and providing the resources needed for the maintenance of the Cesar Chavez/ Dolores Huerta Solar Calendar Site until May/June 2026.	City Manager's Office - Office of Economic Development
Hahn, and Wengraf	X	Co-Sponsorship and Budget Referral for the Solano Avenue Stroll	10,000	10,000	One-Time	Solano Avenue Stroll; to support the September 2024 and 2025 events.	City Manager's Office - Office of Economic Development
Taplin	X	Berkeley Junior Jackets Capacity-Building Grant	150,000	150,000	One-Time	To provide Young Lives Matter Foundation, Inc. with funding for two years of operating costs for the Berkeley Junior Jackets Football and Cheer youth sports program.	City Manager's Office Reimagining Public Safety

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
Taplin and Humbert	X	Vision Zero Rapid Response on Bicycle Boulevards	200,000	-	One-Time	Pilot implementation of Neighborhood Bikeway standards and Complete Streets interventions on Heinz Avenue and the intersection with Seventh Street, and prioritizing implementation on Bicycle Boulevards on High Injury Streets and/or the Equity Priority Area	Public Works
Taplin	X	Waterside Workshops Emergency Recovery Grant	82,000	-	One-Time	Support youth enrichment and climate resilience programs following revenue losses due to construction and street closures on Bolivar Drive.	City Manager's Office
Hahn and Taplin	X	Fund Small Sites Program to Acquire, Rehabilitate, and Protect Existing Small Scale Housing	5,000,000	5,000,000	One-Time	Housing Trust Fund (FY25 - $2,500,000 & FY26 - $2,500,000), and Measure U1 (FY25 - $2,500,000 & FY26 - $2,500,000).	Health, Housing, & Community Services
Hahn and Taplin	X	Fund Small Sites Program to Acquire, Rehabilitate, and Protect Existing Small Scale Housing	-	-	One-Time	$200,000 in FY25 and $150,000 in FY26 (total of $350,000 over two years) "Capacity Building" grants to the Bay Area Community Land Trust to support expanded participation in the City's Small Sites Program.	Health, Housing, & Community Services
Hahn	X	CARE Program for Berkeley Fire	110,000	40,000	One-Time	$40,000 per year for Pilot Project to Screen for Cancer; $70,000 in FY25 (Furniture, Fixtures, and Equipment) upgrades to all Fire Stations; consider other items as part of AAO1	Fire
Hahn	X	CARE Program for Berkeley Fire	103,000	206,000	On-Going	Fire Mechanic	Fire
Wengraf, Taplin, and Hahn	X	$70,000 to Evaluate Pedestrian Safety and Implement Solutions on Euclid Avenue between Eunice Street and Bay View Place	70,000	-	One-Time	Evaluate Pedestrian Safety and Implement solutions on the short stretch of Euclid Ave between Eunice Ave and Bay View Place, including the crossings at Eunice and between Codornices Park and the Jane Hammond Field and the Berkeley Rose Garden and west side of Euclid.	Public Works

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
Wengraf	X	Crossing Guard for Cragmont School	22,000	22,000	One-Time	Crossing Guard for Cragmont Elementary School at the intersection of Regal Rd. and Spruce Street.	Public Works
Wengraf, Humbert, and Taplin	X	City of Berkeley Annual Holocaust Remembrance Day	7,000	7,000	One-Time	City of Berkeley's Annual Holocaust Remembrance Day Program.	City Manager's Office - Office of Economic Development
Wengraf	X	Equipment for Hybrid Commission Meetings	110,000	-	One-Time	Infrastructure costs to conduct hybrid city commission meetings.	Information Technology / City Clerk
Wengraf	X	Civic Center Plan Phase III – Advancing Pre-Design & Construction Activities for Berkeley's Maudelle Shirek and Veterans Buildings	300,000	-	One-Time	Civic Center Plan Phase III.	Public Works
Kesarwani	X	RFP for Food Security Non-Profits	200,000	200,000	One-Time	RFP for Food Security Non-Profits	Health, Housing, & Community Services
Mayor Arreguin	X	UC Theater Concert and Careers Program	50,000	50,000	One-Time	Workforce training program for high school and college age youth to learn concert promotion, management and music industry. City has funded since 2017.	City Manager's Office - Office of Economic Development
Hahn and Humbert	X	Budget Referral and Technical Support for the Aurora Theatre Company	150,000	-	One-Time	One-time emergency grant of up to $150,000 to the Aurora Theatre Company, pending information from staff about the availability of existing and other resources to support the organization. Conditioned on Aurora developing and submitting to the City a viable fiscal recovery plan within 9 months.	City Manager's Office - Office of Economic Development
Humbert and Bartlett	X	Additional Security Cameras at Intersections Experiencing Increased Violent Crime	150,000		One-Time	To install additional security cameras in District 3 and 8	Public Works
Hahn, Wengraf, Taplin, and Humbert	X	Funding to Protect Pedestrian Safety on Upper Marin Avenue	-	-	One-Time	Study and implementation of traffic control measures on upper Marin Avenue to address urgent safety needs for pedestrians. Reallocate up to $200k from Hopkins project for this purpose.	Public Works

Fiscal Years 2025 and 2026 Adopted Budget
General Fund Supported Requests and Referrals by Department (Continued)

Requestor	Budget Referral	Expenditure Type/Description	FY 2025 Adopted Funding	FY 2026 Adopted Funding	Type of Request	Reason for Request	Lead Department
Community Agency		Rising Sun Center for Opportunity	50,000	50,000	One-Time	Construction apprenticeship readiness program that offers intensive hands-on training along with a full year of job placement support and comprehensive wraparound services.	Health, Housing, & Community Services
Community Agency		Toolworks Inc/Lifelong- Site Based Tenancy Sustaining Services	47,665	47,665	One-Time	Provide case management to residents at UA Homes (74 units) and Erna P. Harris (34 units)	Health, Housing, & Community Services
Community Agency		Berkeley Flea Market	72,000		One-Time	To support maintenance and operations of the Flea Market given financial deficit and to create opportunities for staffing and programming augmentation to achieve financial stabilization	Planning

Measure U1 Budget and Forecast

	FY 2024 Adopted	FY 2024 Actuals	FY 2025 Adopted	FY 2026 Adopted	FY 2027 Estimate	FY 2028 Estimate	FY 2029 Estimate
Revenues							
Beginning Fund Balance	**$24,772,756**	**$14,800,640**	**$7,399,686**	**$8,148,756**	**$5,813,676**	**$750,799**	**($1,959,589)**
ADD: U1 Fund Balance transferred from the General Fund							
ADD: Revenues	**5,900,000**	**6,844,565**	**6,500,000**	**6,200,000**	**6,200,000**	**6,200,000**	**6,200,000**
Total Revenues and Available Fund Balance	**30,672,756**	**21,645,205**	**13,899,686**	**14,348,756**	**$12,013,676**	**$6,950,799**	**4,240,411**
LESS: Total Expenses	**7,027,248**	**14,245,519**	**5,750,930**	**8,535,080**	**11,262,877**	**8,910,388**	**6,450,628**
Personnel Costs [2]	*1,706,383*	*811,199*	*2,350,930*	*2,438,624*	*2,560,555*	*2,701,548*	*2,850,628*
HHCS (Measure O/Housing Trust Fund)	474,600	485,979	1,149,985	1,172,592	1,231,222	1,292,783	1,357,422
HHCS Staffing Study Phase 2 [3]	453,242		411,593	432,173	453,781	476,470	500,294
HHCS Staffing Study Phase 3				411593	432,173	466,746	504,086
Empty Homes Tax Staffing Costs & Admin Costs [4]	372,000	94,650	372,000				
Finance (Rev Dev Position & Admin Costs)	406,541	230,570	417,352	422,266	443,379	465,548	488,826
Non-Personnel and Other Program Costs	5,320,865	13,434,320	3,400,000	6,096,456	8,702,322	6,208,840	3,600,000
Small Sites/Community Land Trusts							
1638 Stuart/Small Sites loan (BACLT) -Contract # 31900285		-	-	-	-	-	-
1638 Stuart/Small Sites loan (BACLT) -Contract # 31900285		-	-	-	-	-	-
2321-2323 10th St./Small Sites loan (NCLT) -disburse in escrow - Contract # 32100097			-	-	-	-	-
2321-2323 10th St. loan (NCLT) - Contract # 32100097			-	-	-	-	-
1685 Solano / Small Sites (BACLT) pending request		250,000					
Small Sites Program - unallocated		-	-	-	-	-	-
Blake Apartments							
Housing Trust Fund		-	-	-	-	-	-
2001 Ashby predev (RCD) - Contract # 32000049		-	-	-	-	-	-
2527 San Pablo Ave (SAHA) - Contract pending		-	-	-	-	-	-
2012 Berkeley Way reserves (BRIDGE/BFHP) - Contract #32000250		3,023,365	-	-	-	-	-
Housing Trust Fund Program [7]	4,870,865				2,500,000	2,500,000	2,500,000
HTF Small Sites			2,500,000	2,500,000			
Development of New Housing Programs							
Capacity Building for Emerging Developers	200,000		0	200,000	200,000	200,000	200,000
Berkeley Unified School District Planning Grant		-	-	-	-	-	-
New Housing Programs/Land Trust/Coops		48,455	-	-	-	-	-
Review and Develop a Social Housing policy (Councilmember Taplin, Mayor Arreguin, Councilmembers Harrison and Hahn)		-	-	-	-	-	-
Anti-Displacement							
Rent Board (EDC & EBCLC)		-	550,000	550,000	550,000	550,000	550,000
East Bay Community Law Center (EBCLC)		-					
Housing Retention Program (EBCLC)		-					

Measure U1 Budget and Forecast

	FY 2024 Adopted	FY 2024 Actuals	FY 2025 Adopted	FY 2026 Adopted	FY 2027 Estimate	FY 2028 Estimate	FY 2029 Estimate
Eviction Defense Center (EDC)	250,000	112,500	250,000	250,000	250,000	250,000	250,000
Housing Retention Program / Eviction Defense							
Flexible Housing Subsidy Pool (BACS)		-	100,000	100,000	100,000	100,000	100,000
Additional City Priorities							
Berkeley Relief Fund		-	-	-	-	-	-
Landlord Incentives for Section 8 Participation		-	-	-	-	-	-
1001, 1011 University Ave. acquisition		-	-	-	-	-	-
Project Homekey Reservation (Round 3)		8,500,000					
West Berkeley Shellmound/1900 Fourth Street acquisition		1,500,000					
Transfer to Housing Trust Fund per court order							
Encampment Resolution Fund 2 Grant Match- Insight Housing/Super 8 [5]				2,496,456	2,535,186		
Encampment Resolution Fund 3 Grant Match- Dorothy Day House/ Howard Johnson [6]				-	2,567,136	2,608,840	
Fiscal Year Surplus (Shortfall)	**(1,127,248)**	**(7,400,954)**	**749,070**	**(2,335,080)**	**(5,062,877)**	**(2,710,388)**	**(250,628)**
Ending Fund Balance	**23,645,508**	**7,399,686**	**8,148,756**	**5,813,676**	**750,799**	**(1,959,589)**	**(2,210,216)**

Notes:
(1) In FY 2021, a separate fund was created for Measure U1 with the General Fund revenues being transferred into the fund. Beginning negative fund balance due to split payroll charges to FY 2020.
(2) Personnel Costs from FY 2027 to FY 2029 assumes a 5% increase in salary and benefit costs.
(3) Consist of 1 Community Services Specialist I, 1 Program Manager II and $10,000 for staffing costs
(4) Consists of Accounting Office Specialist III (Finance) 0.25 FTE - $38,750; Rent Board costs for 1 FTE Associate Planner and 1 FTE Office Specialist II, Mailing Costs for Outreach and Noticing of $10,000; and 7.4% Overhead Costs for Counselors, General Counsel, and Office of Executive Director. Funding in FY 25 and beyond may be shifted to General Fund once revenues are realized.

There is no material for this item.

City Clerk Department
2180 Milvia Street
Berkeley, CA 94704
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The City of Berkeley Budget and Finance Policy Committee Webpage:

https://berkeleyca.gov/your-government/city-council/council-committees/policy-committee-budget-finance

05

CONSENT CALENDAR
May 20, 2025

To: Honorable Mayor and Members of the City Council

From: Disaster and Fire Safety Commission

Submitted by: Greg Murphy, Chairperson

Subject: Remove pre-transfer eligibility restriction of the transfer tax rebate for wildfire hardening

RECOMMENDATION

Adopt first reading of an ordinance removing the 1-year pre-transfer eligibility restriction of the transfer tax rebate for wildfire hardening from BMC 7.52.060, to encourage early mitigation efforts.

FISCAL IMPACTS OF RECOMMENDATION

Increased utilization of the transfer tax exemption will result in less revenue to the City. Reduced risk of significant costs due to wildfire disaster.

CURRENT SITUATION AND ITS EFFECTS

The City of Berkeley has responded to wildfire risk with a variety of mitigation measures to improve prevention. One type of mitigation measure to reduce risk is through home "hardening" which is the process of increasing resistance to wildfire by replacing combustible materials with ignition resistant and/or non-combustible materials and other scientifically proven actions including:

- Reducing the home's vulnerability to heat.
- Creating fire-resistant surfaces
- Blocking any potential points of ingress for embers and other flammable material.

Retrofitting our homes against seismic damage and destruction has proven to be good policy; hardening against wildfire will be as well.

On September 10, 2024, the council approved the first reading of the Ordinance amending BMC 7.52.060 to include "Wildfire Hardening" in the Real Property Transfer Tax Exceptions. While this encourages homeowners to implement wildfire hardening at the time of sale, the limitation of eligibility to projects undertaken within a year prior to the time of transfer discourages early action, and, to the extent that such measures could be required within Fire Zone 4 as part of EMBER or a future program, dampens the ability to require the recommended measures without imposing hardship. It appears that this was an unintended consequence of the original action.

Therefore, the Commission recommends that the City Council amend Berkeley Municipal Code 7.50.060.L.3 to strike the words “up to one-year” from the current ordinance. The Commission notes that the existing rebate program for seismic upgrades does not have a one-year restriction prior to sale. While the point of sale is often an important opportunity for home renovations, the recent adoption of this ordinance with a one year prior to sale restriction could have the unintended consequence of discouraging homeowners from making wildfire hardening improvements early. Project delivery and property transfer dates are also subject to delay, which contributes to uncertainty, thereby discouraging action without this correction. Possible concerns to address permanence and verification should be studied over the next few years to integrate appropriate documentation filing requirements and/or re-inspection.

The inherent wildfire risk Berkeley faces because of the natural topography and weather conditions is increasing due to climate change which is bringing more frequent and substantial draughts, and higher temperatures. The City of Berkeley has and will continue to implement strategies that reduce the wildfire risk to our community, and should a wildfire occur, improve the emergency response. However, the City is able to address only part of the wildfire risk that the community faces as much of the risk within the City proper lies on private property in the form of structures that pre-date modern fire resistive building codes. While some of the retrofit work that must occur is inexpensive, much of it is expensive and requires professionals. Thus, there is a significant challenge to getting this work completed, even for motivated residents. There is a need to be nimble and adapt our legislation to incentivize the work we know has to get done, work that will help slow an advancing fire so firefighters can protect the community. This amendment will provide an opportunity and mechanism for the City to incentivize homeowners in making these improvements.

Action: Motion to approve the Commission recommendation Katz. Second: Kinosian.

Votes: Ayes:	7	Katz, Wilson, Bradstreet, Herzer-Baptiste, Gordon, Murphy, Kinosian;
Noe’s:	0	
Abstain:	0	
Absent:	2	Dean, Darling

BACKGROUND

Maintaining our housing stock is essential to the health and welfare of our city. The impacts from a wildfire are not just seen in the structures; it has devastating consequences on mental health, individual sense of security, and our financial stability as a community. The Loma Prieta Earthquake took the Bay Area by surprise on October 17,1989. According to the California Department of Conservation, that 6.9 magnitude earthquake killed 63 people, injured close to 4,000 and displaced over 12,000 people. Less than two years later, June 25, 1991, Berkeley City Council voted for an exception on transfer property taxes to help homeowners pay for seismically upgrading their homes, and BMC 7.52.060, Sub-section K was established. In the last 10 years, the Finance Department processed approximately 1,200 seismic upgrade rebates for a total of $7.2M. Since the seismic retrofit exception was included in BMC 7.52.060 in 1991 no expanded safety exceptions have been added. The City of Berkeley is in one of the highest wildfire risk areas in the state. We have a long history of catastrophic wildfire here in Berkeley.

Most notably, in 1923, when a wildfire destroyed more than 600 homes, leaving more than 1,000 residents homeless. In 1991, the Berkeley/Oakland Tunnel Fire was responsible for 25 deaths and destroyed more than 3,000 homes. In 2024 valuation, that conflagration cost 4 billion dollars. Now is the time to improve and adapt policies, and help residents harden their homes against wildfire. Fire science studies are decisive. Wildfire hardening reduces the chances of a home catching fire.

ALTERNATIVE ACTIONS CONSIDERED

- The Commission previously evaluated requiring that some investment to harden against wildfire while making major renovations and / or additions to the property will comply owners to undertake these important upgrades and reduce our vulnerability to destruction and damage as a result of a wildfire. This approach was found to be difficult for the Building Department to implement in a broader area, indicating that incentive approaches are important until staff can develop more experience after implementation of these aspects of the EMBER program within Fire Zone 4.
- The Commission considered recommending that pre-transfer rebate value be indexed to inflation, so homeowners not planning to transfer property ownership in the near term retain the real value of the incentive. The Commission did not recommend this feature at this time based on the Council declining to adopt a similar, although higher inflation adjustment for the rebate of home energy efficiency deposits. This feature could be considered in the future after further review.

CITY MANAGER

The City Manager concurs with the content and recommendations of the Commission's report to the extent that it can incentivize Berkeley residents to perform work on the homes in an effort to reduce fire ignition and spread. The City Manager also acknowledges that increased use of the transfer tax exemption will result in reduced revenues to the City. However, given the limited number of homes that would likely take advantage of the exemption, the overall impact to the City is not anticipated to be significant.

CONTACT PERSON
Keith May, Commission Secretary, Deputy Fire Chief, (510) 510-981-5508.

Attachments:
1: Ordinance Amending Sections of 7.52.060 of the BMC

ORDINANCE NO. #### -N.S.

AMENDING SECTIONS 7.52.060 OF THE BERKELEY MUNICIPAL CODE
BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Berkeley Municipal Code 7.52.060, Real Property Transfer Tax Exceptions, Sub-section L, is amended to read as follows:

BMC 7.52.60 Sub-section L

L. 1. Up to one-third of the tax imposed by this chapter shall be rebated, on a dollar for dollar basis, for all expenses incurred on or after January 1, 2025 to "wildfire harden" either any structure which is used exclusively for residential purposes, or any mixed-use structure which contains two or more dwelling units. Multiple rebate applications may be submitted for a partial rebate of the tax paid. However, the total rebate for any combination of seismic retrofit and/or wildfire hardening shall not exceed the maximum of one-third (1/3) of the tax paid per property.

2. The term "wildfire harden" within the meaning of this chapter means work which is the process of increasing resistance to wildfire by replacing combustible materials with ignition resistant and/or non-combustible materials and other scientifically proven actions. The work must be permanent and not vegetation management or gardening adaptations that require continued maintenance. To be eligible for a rebate, the parcel level mitigations set forth in the California Department of Insurance “Safer from Wildfires” Framework REG-2020-00015 adopting California Code of Regulations Title 10, Chapter 5, Subchapter 4.8, Article 4, Section 2644.9 must be satisfactorily completed as determined by the Building Official (when a permit is required) and a Berkeley Fire Department Defensible Space Inspection. These include:

(a) All improvements must be permanent and comply with design, material and construction methods as described in the California Building Code, Chapter 7A. and BMC 19.28.030.

(b) Structures with a wood shake roof must be replaced with a Class A fire rated roof before qualifying for the transfer tax rebate.

(c) Clearing combustible materials including fences and gates, and all movable combustible objects, from the area within five (5) feet of the building being evaluated (Replace with only noncombustible materials.).

(d) At least six (6) inches of noncombustible vertical clearance at the bottom of the exterior surface of the building, measured from the ground up.
(e) Fire-Resistant Vents and Gutter Covers of 1/16 to 1/8 inch noncombustible, corrosion-resistant metal mesh or OSFM Category 8165 approved ember resistant vents.

(f) Multi-paned windows, including dual pane windows, or functional shutters, which when closed, cover the entire window and do not have openings. (g) Enclosed eaves.

(h) Remove combustible materials and debris from under decks and installation of non-combustible siding or ember resistant mesh of 1/8” or finer around deck perimeter.

(i) Removal or absence of combustible structures, including sheds and other outbuildings, from the area within thirty (30) feet of the building being evaluated or, in the event that the applicant does not control the entirety of the area extending thirty feet from the building being evaluated, removal of combustible structures from as much of such area as is under the control of the applicant.

(j) Block spaces between roof covering and sheathing with noncombustible materials (bird stops).

(k) The property upon which the building being evaluated is situated complies with Section 4291 of the Public Resources Code, when applicable, and any applicable local ordinances, governing defensible space.

(l) Any other work found by the Building Official or Fire Marshal (or their designee) to substantially increase the capability of those structures, specified in subsection L.1, to withstand destruction or damage in the event of a wildfire.

3. The work to wildfire harden as provided herein shall be completed either ~~up to one year~~ prior to the transfer of property or as provided in subsection L.5.

4. If the work to wildfire harden structures and property provided for herein is to be performed after the transfer of property which is subject to the tax imposed by this chapter, upon completion of such work and certification by the building official as to the amount of the expenses of such work the City Manager or their designee may refund such expenses not to exceed one-third of the tax imposed to the parties to the sale in accordance with the terms of such sale. Any remaining tax shall be retained by the City.

5. From the date of the recordation of the transfer document, the applicant shall have one year to complete all wildfire hardening work and submit a wildfire

hardening verification application to the Codes and Inspection Division of the City of Berkeley. If the work is not completed at the end of one year, that portion which has been completed may be credited as a rebate to the applicant upon submission of a Home Hardening verification application and substantiating documentation, as required by the codes and inspections division of the City of Berkeley, showing the dollar amount of work completed up to that date.

6. Within the one-year period established by paragraph 5, an applicant may request, and the City Manager may approve, an extension of up to one year. The City Manager or their designee may grant such an extension only for good cause. The decision of the City Manager or their designee shall be entirely within their discretion and shall be final.

(a) "Good cause" includes (i) the inability of the applicant, after a prompt and diligent search to find and retain the services of an architect, engineer, contractor or other service provider whose services are necessary for the Home Hardening work; (ii) unforeseen and unforeseeable circumstances such as a significant change in the scope of the Wildfire Hardening work due to circumstances in the field which could not reasonably have been known earlier; and (iii) serious illness or other extraordinary and unforeseeable circumstances that prevented the timely commencement or completion of the Wildfire Hardening work.

(b) "Good cause" does not include (i) ignorance of the applicable City ordinances or regulations concerning the Wildfire Hardening rebate provided in this chapter or state or local laws relating to the standards with which wildfire hardening work must comply; or (ii) any delays which were within the control or responsibility of the applicant.

Section 2. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of Council Chambers, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.