01
Special Meeting Item

Office of the City Manager

ACTION CALENDAR
January 28, 2020

To: Honorable Mayor and Members of the City Council

From: Dee Williams-Ridley, City Manager

Submitted by: Dave Brannigan, Fire Chief

Subject: Fire and Emergency Services Funding and System Design

RECOMMENDATION
Receive a presentation on fire and emergency services and various operational and system enhancements and provide direction on funding options including ballot measures, fees, and special studies.

SUMMARY
The Berkeley Fire Department provides fire suppression, emergency medical care and transport, and fire prevention services to the City and UC Berkeley. While the City and department call volume has grown dramatically since 1995, the staffing and response model has remained stagnant, adding only a single ambulance in 2017 and the resources to contract with a third-party to continue to provide 5150 transports. In addition, Berkeley historically experiences a significant wildfire every 30-40 years. Each time the City has rebuilt and added density to the already crowded hills fire zones. Wildfires in California have increased in severity and frequency in recent years and significant enhancements are needed to evacuation and fuel mitigation programs for the City. Finally, over the years, the Fire Department has become increasingly reliant on the General Fund to maintain service levels. Given all the demands being placed on the General Fund, this is not sustainable and the Department needs to diversify its funding streams.

In this report, the Fire Department is asking City Council to provide input and direction on the following:

- Options to address immediate funding needs of the Fire Department;
- Whether or not the City should implement Emergency Medical Dispatch services;
- Enhancing Emergency Medical Services through expanding the current deployment model or establishing a Transport Division that includes, among other things, 5150 transports, increased supervision, and options to improve recruitment and retention to achieve a more diverse workforce;

- Models to enhance fire suppression staffing and deployment;
- A comprehensive wildland urban interface inspection, fuel reduction, evacuation, utility undergrounding, public education, and emergency notification siren system;
- Long-term facility needs; and
- Funding for the City's Above Ground Water System.

Achieving the objectives outlined above will require additional resources. To this end, this staff report outlines what is needed to implement the options above.

STRATEGIC PLAN

Consideration of funding and design of efficient dispatch and emergency medical services, fire department staffing, wildland urban interface safety, and long term facility improvements align with the City's strategic plan, advancing our goals to:

- Provide state-of-the-art, well-maintained infrastructure, amenities, and facilities
- Create a resilient, safe, connected, and prepared city
- Provide an efficient and financially-health City government
- Attract and retain a talented and diverse City government workforce

CURRENT SITUATION AND ITS EFFECTS

Fire Department Overview

The Berkeley Fire Department (Department) protects life, property, and the environment through emergency response, prevention, and community preparedness. The Department consists of 153 full-time equivalent employees that are organized into five divisions:

- Administration and Fiscal Services;
- Professional Standards;
- Fire Prevention;
- Operations; and
- Special Operations, which includes the Office of Emergency Services.

The following is a breakdown – which is not all-inclusive – of services that the Fire Department provides:

- Structural Firefighting
- Wildland Firefighting
- Emergency Medical Response – Advanced Life Support (ALS/Paramedic) Level
- Wildland Urban Interface Inspections and Mitigation
- Hazardous Materials Response (First Responder and Technician Level)
- Water Rescue (Rescue Swimmers and Boat Operators)
- Vehicle Extrication
- Low and High-Angle Rope Rescue (Technical Search & Rescue)
- Confined Space Rescue/Emergencies
- Utility Emergencies (Electrical, Natural Gas, Flooding)
- Terrorism Response (Weapons of Mass Destruction)
- Mental Health Emergencies
- Fire Prevention Inspections, Code Enforcement, Plan Review
- Hydrant Inspections
- Community Emergency Response Training (CERT)
- Public Education – School Visits/Fire Station Visits

The Department occupies 10 facilities located throughout the City including seven (7) fire stations, the Division of Training and EMS, the Above Ground Water System warehouse, and the Fire Administration offices at the Public Safety Building.

In FY 20, the Department's total budget *including* resources allocated to provide 5150 transports is $45,579,144. The Department's budget is expected to increase to $47,834,206 in FY 21 due to a number of factors. The primary drivers are increases in personnel costs and the resources needed for 5150 transports.

Challenges
The following section outlines a number of challenges that threaten the Department's ability to maintain existing service levels.

Increasing reliance on the General Fund to maintain services
The following table provides an overview of the Department's budget, by fund, from FY 2017 through FY 21.

$'s in Thousands

	FY 17	FY 18	FY 19	FY 20 Projected	FY 21 Projected
General Fund (1)	$29,898	$31,494	$31,801	$37,219	$39,335
Paramedic Tax	3,198	3,561	3,673	3,853	3,955
CFD#1	62	84	111	176	180
Measure GG	4,756	4,666	4,016	4,250	4,281
Other Funds	1,211	524	408	81	83
Total	$39,125	$40,329	$40,008	$45,579	$47,834

1. For FY 20 and FY 21, the General Fund has been increased to account for Measure P resources allocated for 51510 transports. For FY 20, this includes $1.2 M and in FY 21, this includes $2.4 M.

As depicted in the table above, in FY 17 the General Fund accounted for approximately 76.4% of the total funding for the Department and in FY 21, it is estimated that the General Fund will account for approximately 81.3% of total funding for the Department. The addition of six (6) FTE in FY 18 to staff a fourth ambulance was absorbed entirely by the General Fund with no increase to the Paramedic Tax. In the long-term, given all the city-wide needs that must be funded by the General Fund, this is not sustainable.

Increasing Costs due to Alameda County Funding and Service Reductions
Additional pressure on the Fire Department budget have come from external sources. In FY 19, the Alameda County EMS Agency unilaterally eliminated First Responder Advanced Life Support (FRALS) funding (approximately $240,000) which helped pay for the City's FRALS program. Then in FY 20, the Alameda County EMS Agency again unilaterally eliminated a critical service it provided since 2002: 5150 patient transport for the City of Berkeley. The abdication of responsibility for mental health transport by the County forced Berkeley to take over that service at a cost of $2.4 million. The implications and alternatives that were considered by the City are outlined in Attachment 1, a memo dated March 16, 2019 from the City Manager to the City Council.

Paramedic Tax Fund Deficits are increasing
The Paramedic tax is not keeping pace with rising costs. As a result, the fund is generating deficits and increasingly relies on the General Fund. In FY 19, the General Fund transferred approximately $612,696 to the Paramedic Tax Fund. For the Paramedic Tax to cover the full cost of the ambulance transport program less the revenues from ambulance user fees, the Paramedic Tax would need to be increased.

Changes in the Built Environment

The type of construction and the built environment are rapidly changing from legacy and horizontal to modern and vertical. These changes present challenges to a fire department that is staffed and trained and experienced in fighting fires and responding to emergency medical calls primarily in single-family homes. The staffing and resource requirements necessary to combat and control a single room fire in a high-rise and to get to a patient, begin care, and transport are much different than the staffing, resources and training required to do the same work in a one- or two-story single-family home.

The City of Berkeley's Bike Plan and Vision Zero policy will also have impacts on fire and EMS response. While safer streets for bikes and pedestrians promise to reduce the number of injuries and therefore calls, the total number of transports annually from auto collisions with pedestrians and bicycles is a very small percentage of total calls for the Fire Department. As new street designs such as the Adeline Corridor plan, the Milvia bikeway, and Bancroft Way west of Telegraph become a reality, the lanes of traffic are reduced and narrowed and at the same time pushed further away from buildings. These designs make it slower for emergency vehicles to respond throughout the City and transport patients to the hospital. They also increase the complexity of responding to buildings along the corridors as it takes more equipment and time to reach nearby structures. Supporting new and creative street design means increasing and adapting fire department response capability throughout the City.

Recruitment and Retention

As the economy booms in California, the labor pool of well qualified, diverse paramedics has declined rapidly. Fire departments and private ambulance companies compete for new recruits. While the Fire Department has competitive wages and benefits, the ever increasing workload for paramedics has resulted in higher turnover and challenges in recruiting. Since October 2019, three (3) journey-level Firefighter/Paramedics and one probationary Firefighter/Paramedic have resigned to take lateral appointments with neighboring departments.

Alta Bates Emergency Department closure will increase transport times

When Alta Bates closes its emergency room, the City can expect a significant increase in transport times. In 2018, the Department delivered 4353 (62%) patients to Alta Bates. When the expected increase in round trip transport time (to Summit or Kaiser Oakland) is applied, the Department anticipates that transport times will increase by approximately 24 minutes round trip. Without additional resources, the Department is concerned that this will result in longer response times.

Increase in Total Call Volume

The Berkeley Fire Department has seen an increase in total calls of more than 130% since 1995. An analysis of the changing call volume and factors that impact it is found in Attachment 2.

Patients Experiencing Homelessness

Another consistent patient group are those experiencing homelessness. The number of homeless patients, if taken in total, account for approximately 14% of all documented patients since 2013. There has been an upswing to almost 18% during the past 16 months in medical calls for this patient group. In addition to responding to medical calls, fire related calls to encampments often pose significant risk due to the rapid burning nature of tents and makeshift construction materials, coupled with a high rate of propane and other fuels used in and around the encampments.

Emergency Medical Dispatch

According to the City of Berkeley Auditor's report on the 9-1-1 Communication Center, Berkeley's dispatchers are overworked, understaffed, and morale is low. The Fire Department is dispatched to every 9-1-1 medical call with advance life support staffed fire engine or truck and an ambulance, all driving code 3 or "lights and sirens". When a medical call is received, resources are dispatched and then the call is transferred to the Alameda County Regional Emergency Communications Center to give pre-arrival medical instructions to the caller. This transfer can result in delays and confusion for the caller, even though in the end they get potentially life-saving instructions from an emergency medical dispatcher. While Berkeley's communication center does not provide emergency medical dispatching, it is the standard in modern fire and EMS dispatching and the City is required by our contracts with Alameda County to explore providing such a service. Doing so would provide better instructions and medical care to 9-1-1 callers while also sorting and triaging 9-1-1 calls to make sure the appropriate resources are dispatched to the right calls, allowing for a more efficient expansion of existing Berkeley EMS resources.

Wildland Urban Interface

Berkeley is vulnerable to a wind-driven fire starting along the city's eastern border. The fire risk facing the people and properties in the eastern hills is compounded by the area's mountainous topography, limited water supply, minimal access and egress routes, and location, overlaid upon the Hayward Fault. Berkeley's flatlands are also exposed to a fire that spreads west from the hills. The flatlands, in addition to the hills, are densely-covered with old wooden buildings housing low-income and vulnerable populations, including isolated seniors, persons with disabilities and students.[1]

Without a consistent source of funding such as the fire safety district that existed briefly in the 1990s, the City is reliant on one-time funding for implementation of vegetation management, wildfire evacuation safety and public education, and the Safe Passages program.

[1] 1 2019 City of Berkeley Local Hazard Mitigation Plan

Facilities
The Fire Department occupies ten (10) facilities including seven (7) fire stations, the Division of Training and EMS, the Above Ground Water System warehouse, and the Fire Administration offices at the Public Safety Building. Most stations were built in the 1950s and 1960s and earthquake retrofitted in the 1990 except Station 7 which opened in 2007. The aging infrastructure is completely filled by our current deployment model and apparatus both in terms of number and size. Any addition of personnel, apparatus, or training grounds will require a long-term investment and construction.

Emergency Water Supply
The Community Facility District 1 – Procurement of Disaster Fire Equipment (CFD1) – Mello Roos (Measure Q) funded the purchase of an Above Ground Water System which provides a mobile system to pump water up to 6 miles when traditional water supplies are compromised. It also funded the land and construction of a warehouse in southwest Berkeley to house the system. This tax repays a 20-year bond and the final installment will be in FY 2022. The multi-vehicle system, its 6 miles of large diameter hose, the personnel and all the equipment necessary to support the maintenance and deployment of the system rely on the Community Facility District for funding. The Fire Department has projected another 4 to 5 years of operating budget before the fund balance reaches zero. Once the fund has been spent down over the projected five years, the annual cost to maintain this system, on-going training, and the warehouse is approximately $398,081 along with subsequent funds to cover increases in personnel costs for the one (1) employee assigned to oversee this program. There are components of this system that will reach the end of their lifecycle and will need to be replaced over a span of 10 to 25 years. The estimated cost to replace these components over 25 years is nearly $6 million. These funds would replace a security system, trucks, forklift, pumps, and hoses needed to combat a fire in an emergency. The future of the system and Berkeley's emergency water supply are at risk should another funding source not be identified.

BACKGROUND
In 1904, the population of Berkeley was nearly 15,000 and the need for a full-time professional fire department had become apparent. In September of 1904, the City Hall was destroyed by fire and in October, a paid department was created.

On September 1, 1923, Berkeley suffered its first catastrophic fire that swept into the north end of the city from what is now Tilden Park, destroying over 600 homes and businesses. The ignition source for this terrible fire, a small grass fire, started over three miles from the city limits. On that day, low humidity coupled with high winds and temperatures created conditions of extreme fire danger that rapidly pushed the fire over the ridge tops and into the homes north of the University of California.

By the mid-fifties, the Berkeley Fire Department had an all-time high of 179 sworn firefighters. Although reorganization in 1957 reduced the number of stations from ten to seven, personnel levels remained at this level well into the 1960's.

On September 22, 1970, a major fire occurred in the hills between Berkeley and Oakland. Although the fire was in Oakland, the Berkeley Fire Department was a critical contributor to the battle that eventually required 102 engine companies and resulted in the destruction of 37 homes.

In the early 1980's, engine company staffing was reduced from four firefighters to three, a cost cutting measure that put the department near its present staffing levels. The most significant fire of this decade occurred on December 10, 1980 when a dry northeast wind fanned a fire that destroyed five homes along Wildcat and Woodhaven and nearly crested the ridge at the top of Marin.

The 1990's were overshadowed by the 1991 firestorm, the worst conflagration in modern U.S. history. This fire left 25 people dead, and destroyed more than 3,400 dwellings in Oakland and 63 homes in Berkeley.

Emergency Medical Services and Fire Department Response Model

In 1977, the fire department took over the responsibility for ambulance service from the police department. In 1986, the Department was the first in Alameda County to upgrade to paramedic level transport services. Because the department has been providing dispatch and transport services since 1980 it maintains rights to "the exclusive operating area (EOA)" that is defined by the City's border, as long as the City continues to provide these services without interruption.

Residential Development and the High-rise in the City of Berkeley

In a 2015 presentation from the City's Economic Development Manager, described Berkeley as:

> *"Currently experiencing a construction boom that is unlike anything the City has seen before. In 2015, the number and total valuation of building permits spiked significantly. Whereas over the past decade the total valuation of building permits typically fell between $20 and $40 million per quarter, in the latest quarter that number has spiked to over $100 million. This is driven by major construction projects (e.g., 740 Heinz) as well as an increase in single-family home renovations.*
>
> *There are currently 22 multi-unit housing projects totaling 1,414 housing units that are entitled for development or under construction. An additional 5 multi-unit projects totaling 556 units are proposed and seeking entitlement. By comparison, a total of 858 units have been constructed since 2005. The majority of these development projects are clustered along University Ave, San Pablo Ave, and in the Downtown and Telegraph districts" (City of Berkeley, 2015).*

As the density increases through the construction of mid and high-rise buildings, the vertical arrangement of housing units will pose additional challenges for fire department

personnel. Mitigating a medical emergency or fighting even a small fire gets progressively more complex, and takes more personnel to mitigate, the higher the incident is from ground level.

While there is Fire Department review and comment on environmental impact reports for development projects, CEQA review is only for that individual project. And while, for example, a project that replaces a single-story commercial building such as a tire shop with a 5 story residence over commercial structure may not have an impact large enough to require additional fire resources or deployment changes, the cumulative effect of these projects around Berkeley necessitates a shift in staffing and response models as well as an increase and flexibility of emergency medical resources.

According to the (U.S. Fire Administration/Technical Report Series, 1996):

"Fires in highrise buildings generally require more complicated operational approaches than most structure fires. Tasks that are normally considered routine for most fire departments, such as locating and attacking the fire, evacuating occupants, and performing ventilation can become very difficult in highrises. Operations are affected by several specific challenges:

- *Access to floor levels that are beyond the reach of aerial apparatus is generally limited to the interior stairways. The use of elevators is usually restricted or prohibited because of safety concerns.*
- *Hundreds or even thousands of occupants may be exposed to the products of combustion [heat rises] while they are evacuating or unable to descend past a fire on a lower floor. Their exits may be limited to two narrow stairways, which are also the only access for firefighters coming up to assist with evacuation and to fight the fire.*
- *The ability to contain and control the fire is increasingly dependent on the construction of the building and the ability of sprinkler and/or standpipe systems to deliver water to the fire area.*
- *Ventilation can be much more complicated and critical in highrises than in other types of structures. Vertical ventilation is often limited to stairways or elevator shafts, both of which may also have to be used to evacuate occupants. Horizontal ventilation, by breaking out windows, presents the risk of falling glass to those outside the building. The stack effect (heat rises) causes smoke to rise rapidly through the vertical passages and accumulate on upper floors.*
- *Reflex time, or the amount of time it takes to react and take action, is usually much higher in highrise buildings than in non-highrise buildings. It often takes longer to travel from the ground floor to the fire floor than it*

takes to respond from the fire station to the building. Firefighters may have to climb dozens of floors before they can even reach the fire floor.

- *Communications, command, and control can be very difficult in a highrise fire. Radio transmissions through a building's concrete and steel infrastructure may be compromised. The size and complexity of these buildings require large forces of firefighters and well-coordinated operations in a very complex tactical environment. Effective coordination and control of strategy and tactics are essential."*

Existing Deployment (Fire Stations and Staffing)

Fire Department deployment, simply stated, is about the ***speed*** and ***weight*** of the attack. Speed calls for first-due, multi-hazard intervention units (engines, ladder trucks and specialty companies) strategically located across a City. These units are tasked with controlling everyday, average emergencies without the incident escalating to second alarm or greater size. Weight is about multiple-unit response for significant emergencies like a "room and contents structure fire," a multiple-patient incident, a vehicle accident where extrication is required, or a complex rescue or wildland fire incident. In these situations, departments must assemble enough firefighters in a reasonable period in order to control the emergency safely without it escalating to greater alarms.

While no one city (even a metropolitan one) can stand by itself and handle every type of incident without help, a desirable goal is to field enough of a response force to handle a community's day-to-day responses for primary single-unit response needs equitably to all neighborhoods, as well as be able to provide an effective initial response force to mitigate moderately serious building fires. Small fires and medical emergencies require a single, or two-unit response (engine and ambulance) with a quick response time. Larger incidents require more fire and EMS resources. In either case, if the companies arrive too late or the total personnel sent to the emergency are too few for the emergency type, they are drawn into a losing and more dangerous battle. The art of fire company deployment is to spread companies out across a community for quick response to keep emergencies small with positive outcomes, without spreading the stations so far apart that they cannot quickly amass enough companies to be effective in major emergencies.

Given the need for fire resources to be stationed throughout a community for prompt response instead of all companies responding from a central fire station, communities such as Berkeley are faced with neighborhood equity of response issues. When one or more areas grow (in population, and/or vertical growth) beyond the capacity of the nearest fire station, the choices available are limited: add more neighborhood fire stations, increase the number of apparatus and personnel at that station, or live with the reality of longer response times and greater consequences per incident.

State and Federal Law, National Recommendations[2]

In addition to restrictions on local government finance, there have been a number of newer state and federal laws, regulations, and court cases over the last decade that limit the flexibility of cities in determining their staffing levels, training, and methods of operation. These are given an abbreviated overview below:

- 1999 OSHA Staffing Policies ("2-in/2-out") - Federal OSHA applied the confined space safety regulations for work inside tanks and underground spaces to America's firefighters. This requires in atmospheres that are Immediately Dangerous to Life and Health (IDLH) that there be teams of two firefighters inside and two outside in constant communication, and with the outside pair equipped and ready to rescue the inside pair. This situation also occurs in building fires as fire and smoke conditions require the wearing of self-contained breathing apparatus (SCBA). This is commonly called the "2-in/2-out" policy.

- 2001 National Staffing Guidelines (NFPA 1710) - The National Fire Protection Association (NFPA) Standard on Career Fire Service Deployment was issued ten years ago. While advisory to local governments, as it starts to become locally adopted and used, it develops momentum, forcing adoption by neighboring communities. NFPA 1710 calls for four-person fire crew staffing, arriving on one or two apparatus as a company. The initial attack crew should arrive at the emergency within four minutes travel time, 90 percent of the time, and the total effective response force (first alarm assignment) shall arrive within eight minutes travel time, 90 percent of the time.

- CAL-OSHA Requirements - Among the elements required is a safety orientation for new employees, a hazard communications system for employees to communicate hazards to supervisors, the CAL-OSHA process for post-injury reviews, the required annual report of injuries, and a standard for safety work plans. Employers have many different responsibilities under the Occupational Safety and Health Act of 1970 and the Code of Federal Regulations (CFR). Initially OSHA focused its efforts on the private sector; more recently, it has turned its attention to the public sector and specifically the fire service. All of these raise (appropriately for safety) fire agency training and equipment costs.

- The Insurance Services Office (ISO) Fire Department Grading Schedule would like to see first- due fire engines stations spaced 1.5 miles apart and ladder trucks spaced 2.5 miles apart, which, given travel speeds on surface streets, is a 3- to 4-minute travel time for first-due engines and a 7- to 8-minute travel time for first-due ladder trucks.

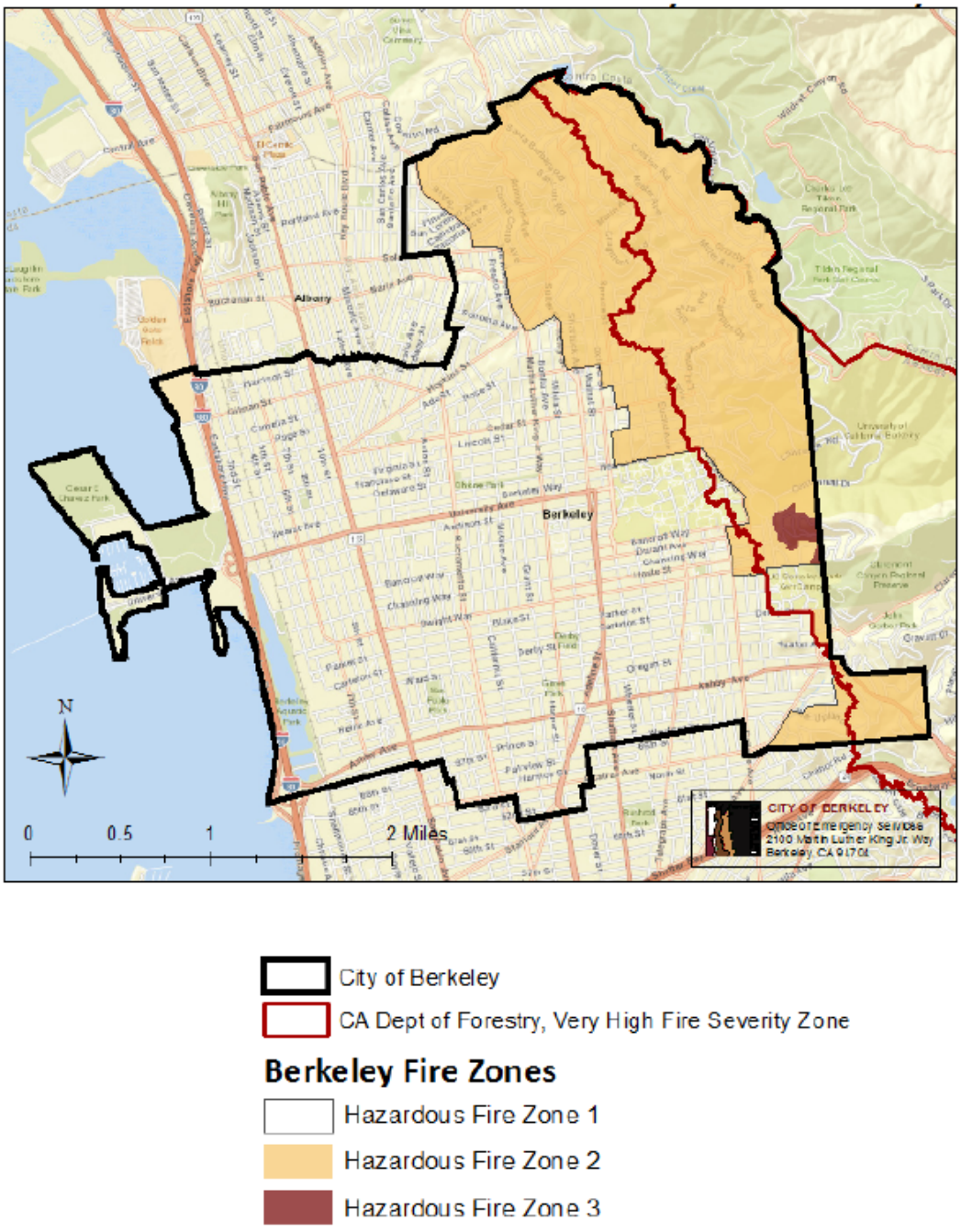
[2] CityGate Associates, Fire Service Standards of Response Coverage Deployment Study for the City of San Diego Fire-Rescue Department, 2011

The ISO grades community fire defenses on a 10-point scale, with Class 1 being the best. Historically, the City has been rated as a Class 3 department, but was upgraded to a Class 1 department in 2015. For many reasons, it is not necessary for an agency to only deploy to meet the ISO measures. The ISO criteria are designed to evaluate the fire protection system for the purposes of underwriting a department's ability to stop a building fire conflagration. The ISO system does not address small fires, auto fires, outdoor fires and emergency medical incidents.

Wildfire Evacuation and Fuel Reduction Programming

The City of Berkeley defines three Fire Zones designated in order of ascending fire risk. Fire Zone 3 is the Panoramic Hill area; Fire Zone 2 covers the remainder of the City's eastern hills; Fire Zone 1 covers the rest of the City west of the hills. Fire Zones 2 and 3 currently include approximately 8,300 properties and have the strictest fire prevention standards in the City regarding vegetation management and fire resistive construction. Additionally, Cal Fire designates Berkeley's "Very High Fire Hazard Severity Zone." The following map illustrates the boundaries of the Cal Fire VHFHSZ as well as Berkeley's Fire Zones.

Map 1: Hazardous Fire Zones in Berkeley



In 1923, a wildfire burned from the area of Lake Anza, down the northern hills of Berkeley, all the way to Shattuck Avenue. The 1991 Tunnel Fire in the Oakland and Berkeley hills destroyed 62 houses in Berkeley and more than 3,000 in Oakland. This led to an unprecedented increase in wildfire awareness.

A Fire Assessment District was created in 1992 (Berkeley City Ordinance 6129-N.S.) which funded fuel abatement and inspection programs in the Berkeley hills including three (3) full-time inspectors and a comprehensive fire fuel reduction program. The assessment district expired in 1997 following the passing of California Proposition 218 in 1996. With the primary funding source removed, dedicated Fire Prevention staffing was lost although some programming continues to this day in the form of the Fire Fuel Chipper and Debris Bin programs. On-duty firefighters now annually inspect a small proportion of properties in Berkeley's hills.

The 2017 fires in the North Bay and 2018 fires in Redding and Paradise were a stark reminder that wildland-urban interface fires move quickly through dry fuel with no regard to jurisdictional boundaries. These fires raised community awareness and concerns about existing fire prevention programs and triggered a need to review these programs at all levels of the City.

Three interrelated referrals that contained 82 distinct items were made to the City Manager and the "relevant commissions" on November 28, 2017, January 30, 2018 and February 28, 2018 addressing, in whole or in part, fire safety and community disaster preparedness measures. On July 10, 2018 the Berkeley City Council Referred the items to the Disaster and Fire Safety Commission and staff to come back and request funding as staff is able to meet the actual task. Of those items, 38 were directly related to Wildland Urban Interface fire safety and risk reduction

ENVIRONMENTAL SUSTAINABILITY

Uncontrolled wildfires result in enormous releases of carbon into the atmosphere. Systematic vegetation removal and management dramatically reduces the carbon emission potential created by uncontrolled fires. A comprehensive vegetation management plan will engage stakeholders on creating a plan that supports data-backed scientific management practices that improve the climate impact of the City such as maintaining a healthy tree canopy while removing harmful ladder fuels.

POSSIBLE FUTURE ACTION

Given the challenges outlined in this report, Staff is seeking input from City Council on various operational and system enhancements and requires City Council direction on funding options including ballot measures, fees, and special studies.

Option 1: Do nothing, maintain status quo.

This would result in a continued transfer from the General Fund to support the Paramedic Tax Fund and would not address the growing call volume, changing nature of the City, or the myriad challenges in emergency response outlined in this report.

Option 2: Provide direction on polling for possible ballot measures:

1) Increase in the existing Emergency Medical Services Tax (above FY 20 Estimated Revenue of $3.2M) could be used to fund one or more of the items listed in the table below:

	Est. Annual Cost	Est. Additional Tax Rate Per Square Foot (b)	Est. Total Tax Rate Per Square Foot (c)	Est. Annual Cost for a 1,900 sq ft residence
a. Address existing deficits	$900,000	$0.01105	$0.05035	$95.67
b. Implement Emergency Medical Dispatch	$3,200,000	$0.03930	$0.07860	$149.34
c. 5150 Transport				
i. 3rd-Party Contractor (existing service model)	$2,400,000	$0.02948	$0.06878	$130.68
ii. Establish Transport Division (Single Function / Basic Life Support)	$4,200,000	$0.05162	$0.09092	$172.75
d. Add Two (2) Additional Ambulances (Firefighter Paramedics / Advanced Life Support)	$5,500,000	$0.06755	$0.10685	$203.01

a) The existing Emergency Medical Services Tax is a parcel tax. The existing tax is $0.0393 per square foot of improvements. For a 1.900 square foot residence, the total annual Emergency Medical Services Tax is currently estimated at $74.67.
b) Represents the estimated parcel tax per square foot required to generate the revenue for the estimated annual cost.
c) Includes the existing Emergency Medical Services Tax rate *plus* the Additional Tax Rate per Square Foot.

2) Establish a new Fire and Emergency Services Tax
This new tax would be used to fund a re-design of the Fire Department including emergency medical dispatch capability, increasing staffing on suppression apparatus, and using a mix of staffing models on ambulances to meet the needs of mental health patients, emergency 9-1-1 medical patients, and the new height and dense nature of the built city. The total costs to achieve this vision are estimated at $8.0 million per year followed by facilities improvements based on a facility study.

3) Wildfire District Assessment
Funds would be used to address the ongoing Wildland Urban Interface fire safety needs of the community including a system of education, action, and enforcement.

	Estimated Annual Cost	Estimated One-Time Cost
a. Wildfire Fuel Mitigation Plan	$0	$500,000
b. Wildland Fire Inspectors (4 FTE)	700,000	0
c. Safe passages	200,000	0
d. Vegetation Management Crew	350,000	0
e. Evacuation Training and Exercise	100,000	0
f. Undergrounding	5,000,000	0
g. Outdoor Emergency Warning System	250,000	2,000,000
h. Weather Radio Distribution	200,000	1,000,000

4) Water Supply System
Over a 25-year timeframe, the City needs approximately $6,000,000 to staff and maintain then replace the fleet of vehicles, pumps, hose and facilities that make up the system. City Council could direct staff to extend the existing community facilities district (CFD 1) to generate the needed resources.

Option 3:
Direct staff to budget one-time funding for the followings studies:
1) Standards of Coverage Study $150,000
2) Comprehensive Facility Study $200,000

The Standards of Coverage Study will evaluate the service provided by the Fire Department. Specifically, the evaluation will report on the level of staffing needed compared to standards and best practices. This Staffing Needs Assessment will assist the Fire Department in future planning and provision of comprehensive emergency services to the City of Berkeley. Meanwhile, the Comprehensive Facility Study would document the condition of existing facilities and identify strategies to modernize existing facilities. The results of these studies would be presented to City Council to determine service levels and long-term funding needs.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

Possible future polling and ballot language development would incur legal and consulting fees as well as staff time to work with consultants. Any special elections for special districts or community facility districts would incur costs to conduct the elections.

CONTACT PERSON

Dave Brannigan, Fire Chief, Department of Fire and Emergency Services, (510) 981-3473

Attachments:
1: Berkeley Fire Department Emergency Medical Response Memo
2: Berkeley Fire Department Call Volume Analysis

Office of the City Manager

March 12, 2019

To: Honorable Mayor and Members of the City Council

From: Dee Williams-Ridley, City Manager

Re: Berkeley Fire Department Emergency Medical Response

The Berkeley Fire Department operates four, 24-hour, Advanced Life Support (ALS) ambulances. Whenever an ambulance is deployed it is staffed with two sworn firefighter paramedics. Additionally, the department has nine fire engines and trucks, staffed with a minimum of one firefighter paramedic. When responding to emergency medical incidents, a fire engine or truck is always dispatched along with an ambulance. In most cases the fire engine/truck arrives at the call faster than the ambulance and begins to provide life-saving emergency medical care at an ALS level.

A subset of emergency medical treatment and transport is for people experiencing psychiatric emergencies. These patients are always contacted by a Berkeley Police Officer and sometimes a member of Berkeley Mental Health's Mobile Crisis Team. Once they have made a determination that the patient requires further treatment and transport, the County's private ambulance provider, Paramedics Plus, is requested and responds. The Alameda County Emergency Medical Services Agency (LEMSA) reimburses Paramedics Plus for the costs related to the treatment and transport of these patients that they are unable to collect from the patient.

According to the California Code of Regulations (CCR), 5150(a) "When a person, as a result of a mental health disorder, is a danger to others, or to himself or herself, or gravely disabled, a peace officer, …designated members of a mobile crisis team, …may, upon probable cause, take, or cause to be taken, the person into custody for a period of up to 72 hours for assessment, evaluation, and crisis intervention, or placement for evaluation and treatment in a facility designated by the county for evaluation and treatment...".

<u>New City of Berkeley Transport Responsibilities</u>

In 2017, the Alameda County LEMSA conducted a Request for Proposal (No. EMS-901017 Emergency Ambulance Service, 911 Response, ALS Transport) to select a private ambulance transport provider that would provide emergency medical transport services to Alameda County except Berkeley, Alameda City, Albany and Piedmont. Berkeley is one of four exclusive operating areas (EOA) in Alameda County. The four EOAs correspond with the fire departments that started providing emergency ALS ambulance response and transport prior to 1980. When

the new contract for Alameda County, per their RFP, goes into effect on July 1, 2019, the City will have to assume responsibility for the transport and cost of transport for psychiatric patients in Berkeley.

Berkeley Psychiatric Emergency Transport Data

In 2018 the County's private transport provider transported 1090 psychiatric patients in Berkeley. As of July 1, 2019, these transports will become the responsibility of the City. In addition, during the same time, the Berkeley Fire Department (Department) transported 253 additional psychiatric patients. In total, there are nearly 1400 psychiatric transports that occur annually in the City.

Psychiatric patients that have no other medical symptoms or medical complaints are required to be transported to the specialized psychiatric facility, John George Psychiatric Pavilion, in San Leandro. Based on response records, the time an ambulance will be committed and unavailable for other calls will be approximately 185 minutes per psychiatric call. Approximately 50% of the psychiatric calls (based on current data) may be transported to a local emergency room to obtain medical clearance for another medical symptom before the patient can be transported to John George Psychiatric Pavilion Hospital. In these situations, the time a Department ambulance will be committed and unavailable for other calls is projected to be between 106 - 148 minutes, depending on the destination (Alta Bates, Kaiser, Summit Oakland, Children's Oakland or Highland). In these situations a Department ambulance would become available more quickly because the hospitals are closer to Berkeley and the time it takes to transfer care is shorter than at John George.

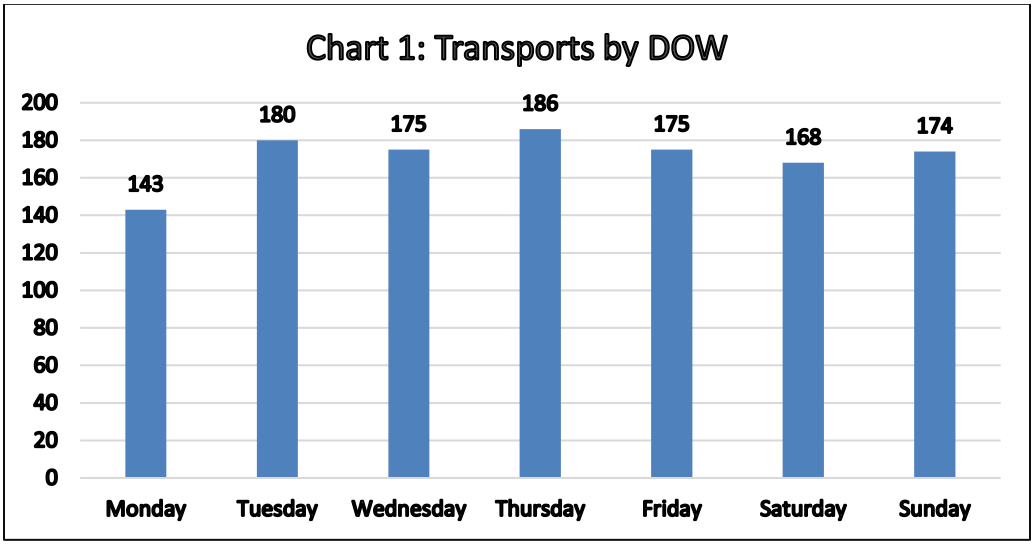
The Fire Department estimates the City of Berkeley will be required to transport 1,090 additional psychiatric patients per year, beginning July 1, 2019. Table 1 shows these estimates and the receiving facility to which patients will be transported.

Table 1

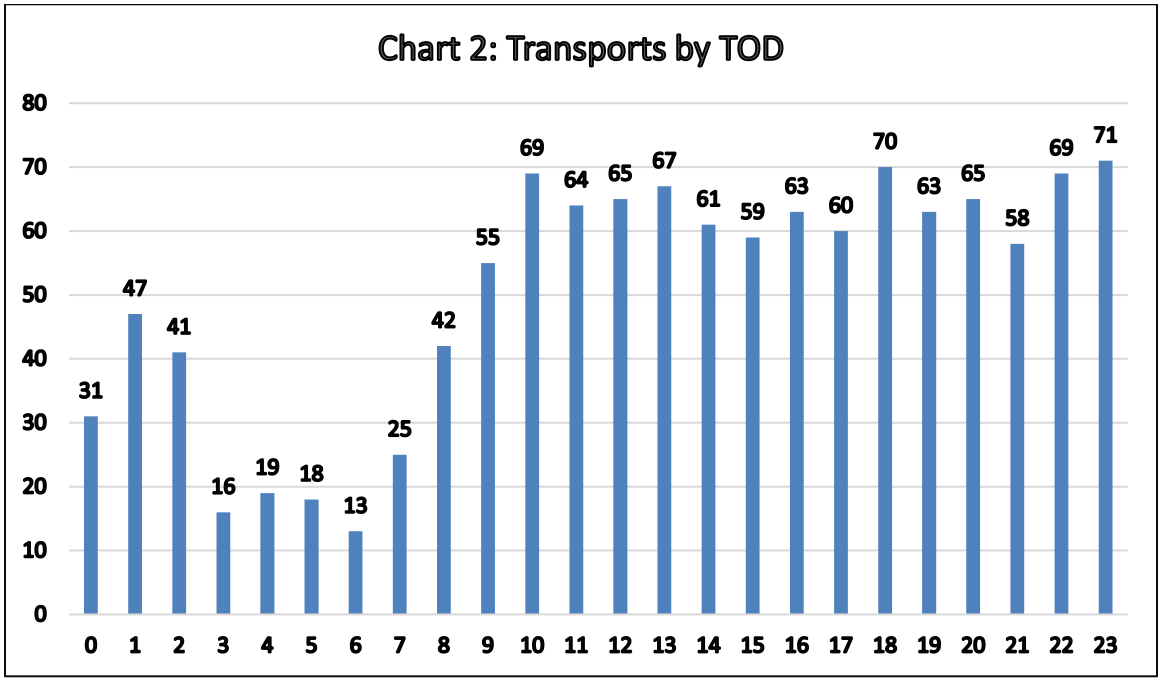
Type of Call	**Receiving Facility**	**Total Calls 2017**
Psychiatric	John George Psychiatric Pavilion	605
Psychiatric	Alta Bates	335
Psychiatric	Other	150
Total/Year:	**Receiving Facility**	1,090

Distribution of Calls

The distribution of psychiatric calls in the City by day of week (DOW) is shown in Chart 1.



The distribution of psychiatric calls in the City by time of day (TOD) is shown in Chart 2.



Transport Vehicle Use Time Calculation -- Unit Hour Utilization (UHU)

Unit Hour Utilization (UHU) is a calculation that measures the amount of time a transport unit is staffed, on duty, and assigned to providing response, triage, treatment and transport of patients in a given period of time. It also includes cleaning the ambulance and completing the required paperwork. During this time, the ambulance is unable to respond to other calls for service. UHU provides a standardized, shorthand way to measure workload levels in the system and to allow comparison to other systems.

The UHU calculation does not account for time necessary for employees to perform other duties that must occur each shift, including but not limited to: placing the unit in service at the beginning of the shift, taking it out of service at the end of shift, performing vehicle and equipment inspections and maintenance, training and continuing education, meal periods, public education, attending meetings, cleaning, rest and other functions including firefighting related responsibilities as assigned.

UHU is calculated by dividing the average time per call by the number of "unit hours." One-unit hour is defined as a fully equipped and staffed vehicle that is in-service and available for calls in the EMS system.

Accurately measuring UHU helps the Department demonstrate that its system is providing the community exceptional value and helps leaders determine when and what type of resources need to be added.

Table 2 shows the general scale used in the ambulance industry according to a paper written by Daniel R. Smiley who at the time was the Acting Director of the State of California Emergency Medical Services Authority, (Smiley, 2011).

Table 2

Unit Hour Utilization Range
.55 - .45 – High Utilization
.45 - .35 – Above Average Utilization
.35 - .25 – Average Utilization
.25 - .15 – Below Average Utilization
.15 - .01 – Low Utilization

Table 3 shows the total current UHU for the Department's four ambulances:

Table 3

Type	Calls/Yr	Hr/Call	Total Hours	Total Unit Hrs.	UHU
Medical calls	11,000	1.13	12,430	35,040	0.35

Table 4 shows the projected UHU for the current fleet of four ALS ambulances if they were to absorb the additional psychiatric patient transports:

Table 4

Type	Calls/Yr	Hr/Call	Total Hours	Total Unit Hrs.	UHU
Medical calls	11,000	1.13	12,430	35,040	
Psychiatric calls	1,400	3.08	4,312	35,040	
Total	**12,400**	**1.35 (weighted)**	**16,742**	**35,040**	**0.48**

Per ambulance industry standards, absorbing psychiatric transports by existing Fire Department ambulance resources would put Berkeley Fire into the highest category of utilization.

Managing New 5150 Transport Responsibilities

The most expeditious and reasonable way to assume the new transport responsibilities is to establish a one-year contract with an external Basic Life Support (BLS) private ambulance transport provider to temporarily handle the transport of Psychiatric patients beginning July 1, 2019. This will allow the service to continue, and give the Department time to collect and analyze response and transport data and prepare a recommendation for continuing the contract, absorbing the work internally or finding a creative alternative.

The payment structure for the selected private ambulance provider will mirror the current contract between Alameda County and Paramedics Plus, which currently provides emergency psychiatric transport for Berkeley. In this system, the selected vendor will bill the patient and/or their insurance company at a rate agreed upon with the City of Berkeley. After six months, the vendor will provide the City with evidence of the amount they collected and the City will reimburse the vendor the difference. This is necessary due to the variations in payment by private insurance, Medicare and Medi-Cal. The estimate for the potential cost to the City is based on the current 9-1-1 ambulance provider billing rate and assumes the City would have to reimburse the full cost of this rate. The actual cost to the City will likely be lower, but without knowing the agreed-upon rate or the ratio of collected revenue, the worst case scenario must be assumed.

The rate that the City could pay per transport is approximately $2300, which is the rate Alameda County EMS Agency currently pays Paramedics Plus. It is possible that a qualified lower cost vendor will respond to the RFP, in which case the costs to the City would be lower. Using the $2,300 figure and a collection estimate of 12% on the projected additional 1,090 transports, we estimate the likely scenario for City is that there would be a liability of $2.2 million.

Type	Calls/Yr	Cost/Call	Sub-Total	Est. Recovery (12%)	Est. Total
Psychiatric	1,090	$2300	$2.5 Mil	$300,840	$2.2 Mil

Alternatives Considered

1. *Creation of Basic Life Support (BLS) Ambulance Division:* This option appears to be the best solution for the long-term reorganization of the Fire Department, it would be impossible to implement by July 1, 2019. The milestones that would need to be implemented prior to upstaffing a BLS transport division are; creation of a new job classification, recruitment and hiring of at least 12 FTE, ambulance specification/design and purchase, and modifications to fire stations to accommodate additional personnel.

2. *Assumption of Psychiatric Calls by Current Deployment/Staffing:* This option would result in a UHU for the current ambulances categorized as "High Utilization" according to the industry standards defined by Dr. Smiley. Between emergency calls, firefighter training, EMS training, meetings and other related duties, our current fleet of ambulances and firefighter/paramedics are extremely busy.

   The real impacts to continuing with our current UHU or increasing it by absorbing Psychiatric transports would be less time for responding to other emergencies, and less training and development. Additionally, there would likely be increased employee fatigue (both chronic and acute), greater attrition of employees to other fire departments that do not transport and increased "burnout" and other associated mental health conditions (depression, PTSD, suicide, anger management, etc.).

3. *Transport by EMT and Berkeley Mental Health*: The legal authority to place a person on an involuntary psychiatric hold lies with the police, mental health professionals, and physicians. Berkeley Mental Health and Berkeley Police are the primary contacts with the patient population in question. An alternative to EMT ambulance transport is a hybrid where an EMT and a Mental Health Provider could team up and transport to John George. This adds significant cost due to the higher salaries of licensed mental health providers.

4. *Transport by Berkeley Police*: At times, police officers transport patients on a 5150 hold to John George Pavilion. This option would remove police officers from Berkeley for extended periods. This option also puts care and transport of psychiatric patients with law enforcement and not health care professionals.

Conclusion

The City has conducted research and explored numerous options to take over transporting mental and behavioral health patients beginning July 1, 2019. Considering the operational impacts, cost, and tight timeline, the most prudent option is to move forward with supplementing Berkeley Fire's existing transport capacity with a contracted ambulance service.

cc: Paul Buddenhagen, Deputy City Manager
David Brannigan, Fire Chief
Mark Numainville, City Clerk
Jenny Wong, City Auditor
Matthai Chakko, Assistant to the City Manager / Public Information Officer

Attachment 2

Department of Fire and Emergency Services
Office of the Fire Chief
David Brannigan, Fire Chief

Subject: Berkeley Fire Department Call Volume Analysis

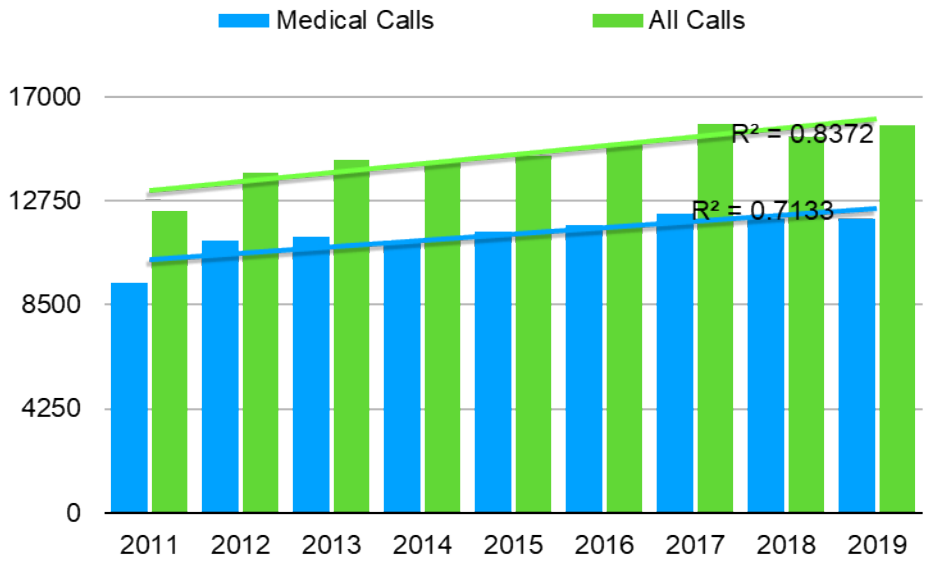
The Fire Department's call volume has significantly increased. In 1995, the Department responded to 6,300 calls-for-service, while in 2017, the Department responded to almost 16,000 calls-for-service. Over this timeframe, the only change in response capability and staffing was adding a fourth ambulance in FY2018.

Today, the increasing population density, demographic changes, increasing number of high-rise developments, UC Berkeley student population, the 5150 transport contract, as well as the imminent Alta Bates ED closure will significantly impact Berkeley public safety, its resources, and response capabilities. This confluence of factors point to an immediate need to enhance emergency medical services for the City, as well as transform and streamline EMS expansion in the future.

The Fire and EMS industry typically measure the workload of a system with a measurement know as Unit Hour Utilization (UHU) which is calculated by dividing the number of transports by the number of hours a unit is available for work. As UHU increases, response units are occupied for more of the day resulting in greater response times, increased reliance on mutual aid, and a decrease in training, maintenance, public education, and other important duties. Upcoming stresses to the EMS system will negatively impact UHU and therefore the speed and availability of response units.

Although there has been some small variation in total call volume year by year, over the past 9 years both medical and other service requests are consistently trending upward, especially in the area of medical call volume. There is no reason to expect this trend to change given the total population growth and ongoing development planned within the City.

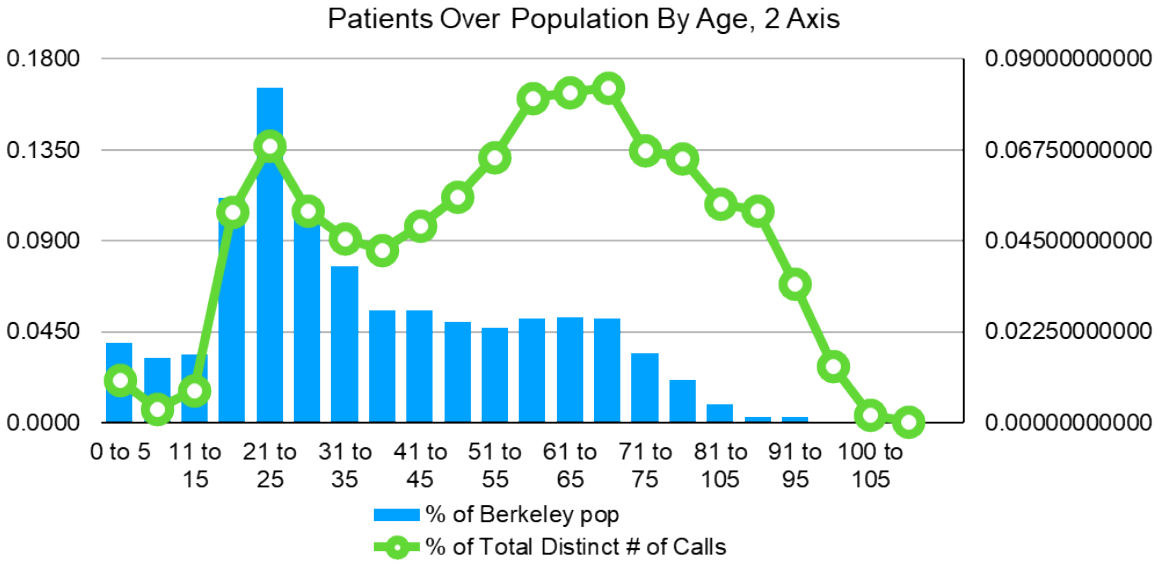
The increase in both medical and total call volume since 2011 was 22%. Considering total population growth for the same period as a rounded 7% or 8730 (according to census data), predictions for population and call volume growth can be made. By 2028 the City may have a population of 130,393, which may generate a call volume of 19,335 calls for service, at the historical rate of rise. Of those, we can estimate 15,274 will be medical calls, a number almost equal to our total call volume in 2019.



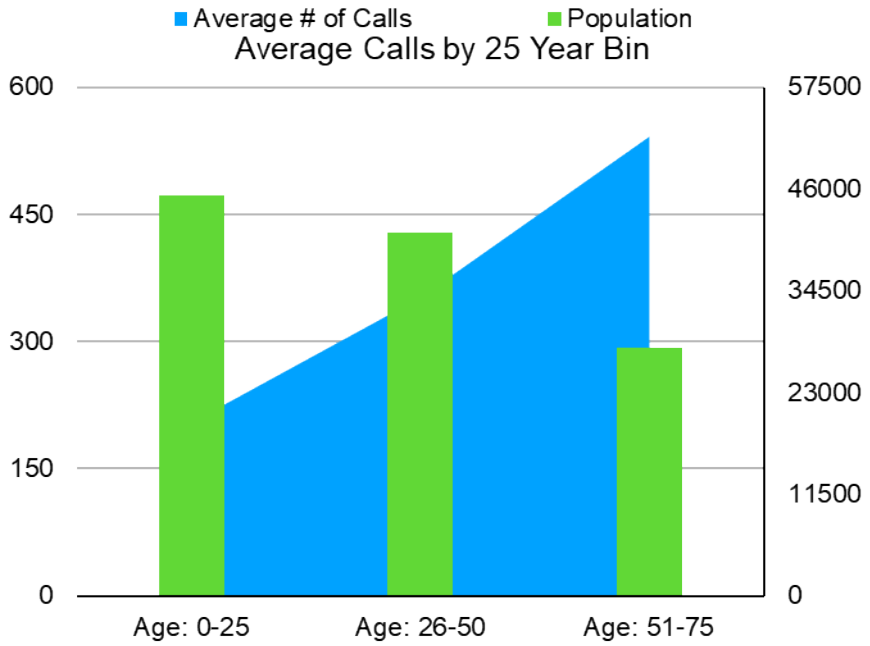
Berkeley is Aging and Expanding

The need for an efficient path toward expanding Emergency Medical services is highlighted by an analysis of Berkeley's population by age, there is a bimodal distribution of documented patients which is roughly inversely proportional to the actual population distribution. About 60% of the documented calls come from patients over 50, while 40% come from patients over 65—only 13.7% of the total population according to census data.

Patients between 18-23 years account for about 10% of patients. This group is only matched by similarly binned groups of elderly in this respect. For example, if we binned ages individually, in 2018 the 19 year old group (at 1.8%) is responsible for as many documented patients as the 61 year old group. They each account for more documented patients than any other single age group from 0-60 years old. The likely reason for the proportion of this group in both patients and population are the students. Also, given the constancy of this segment of patients historically, it is safe to assume that this is unlikely to change—i.e. these patients are not going away, and may even increase depending on the expansion of the student population.

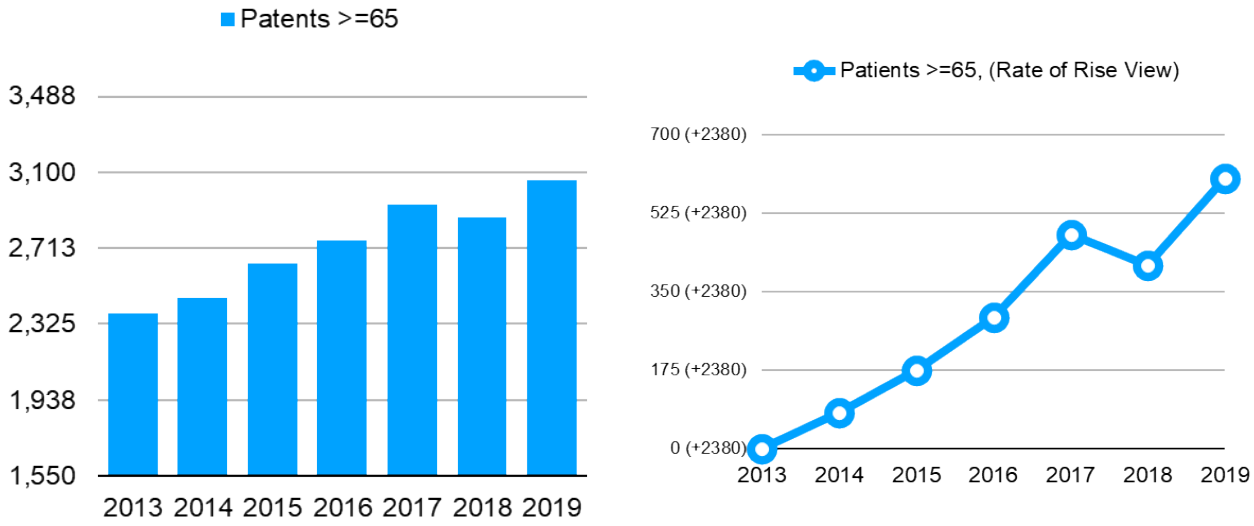


Patients between the ages of 18-23, and those 65 or older, account for roughly half of all the documented patients in Berkeley. If the patients over 50 are included, that increases to around 70%. Generally speaking, the older you are the more likely you are to use an ambulance. According to the same data, the number of documented patients over 65 has steadily risen since 2013 (even irrespective of call volume). The population of documented patients over 65 was at its highest in 2019.



Census data also shows a steady increase in the >/= 65 segment of the Berkeley population since 2000. The census increase was +1.5% for the decade ending in 2010, and +2% again by 2018. During the past 7 years, the number of documented patients from this patient group increased by about 10%. When adjusting for changes in call volume, the increase has been at least 1% per year, conservatively 7%. Like the 18-23 year old segment, this patient group is not likely to diminish in coming years. In fact, in the state of California the number of those over 65 will nearly double by 2030 (CA State Department of Finance). When examining the population distribution of Berkeley, there is a significant segment of the population between the ages of 51-65 (about 20%) that will move into the center of the highest demand-for-service group by 2030, give or take. Notably, the Berkeley Alta Bates/Summit Emergency Room is projected to be closed by the same year.

If there is no change in the current rate of growth for the >65 population, there could be more than a 7% increase in these patients by 2026, just following the historic norm. With an increase in this population segment by merely an additional percent, the number of documented patients in this group could increase by 3.5%. That sounds like a small enough increase, however, If we see a 2% increase in total rate of growth for this segment of the population (from 2% to 4%), it could account for more than a 14% increase in patients before the end of the decade. Even if the mortality average is fixed at 85 years of age (the approximate average mortality for men and women in Berkeley is 84.85), the City has more people aging into this group than aging out of it by more than 2%.



UHU and the 4th Ambulance

Unit Hour Utilization (UHU) is a calculation that measures the amount of time a transport unit is staffed, on duty, and assigned to incidents (response, on-scene, transport, and at hospital) in a given period of time. UHU provides a standardized, shorthand way to measure workload levels in the system and to allow comparison to other systems.

Other time that is not included in the UHU calculation includes time for training, maintenance, public education, meal periods, rest and other preparedness-related functions.

UHU itself is fairly straightforward. It's calculated by dividing the average time per transport (60 minutes) by the number of "unit hours," with one-unit hour defined as a fully equipped and staffed vehicle in the EMS system.

The higher the ratio, the more productive the system, in the sense that you're getting more transports using fewer ambulances.

The following factors influence UHU and are variable by system:

- **Geography:** Road condition and layout, traffic congestion, and other factors can affect the comparison value of UHU. Example: In Berkeley, transports originating from districts in the North and East of the City are much longer because ambulances must navigate narrow streets that are farther away from freeways and thoroughfares.
- **Time-On-Task:** This measurement, the time it takes to completely manage each incident, varies and has to be considered to have an accurate UHU. Example: Hospital wait times range from 15-90 minutes depending on bed availability and staffing of the Emergency Department. If crews cannot quickly offload patients at receiving hospitals, time-on-task increases.
- **Transport Times:** The location of hospitals in relation to the City has a significant impact on the UHU. Example: With the impending closure of Alta Bates Medical Center no later than 2030, the Department must anticipate adding approximately 20 minutes to each transport time to account for travel time to and from emergency departments outside the City.

Accurately measuring UHU helps the Department demonstrate that its system is providing the community exceptional value and helps leaders determine when and what type of resources need to be added.

The specific formula used to calculate UHU is:

$$\frac{\text{(Total Calls) x (Average Call Duration/Hrs)}}{\text{Total Unit Hours}}$$

The only significant staffing change for the Berkeley Fire Department since 1989 was the addition of the 4th full time ambulance in 2017. This addition, although impactful in reducing reliance on mutual aid, did not significantly reduce UHU for City ambulances (see below). Based on current data, UHU increased for medic units, comparing 4 ambulances in 2018 to 3 in 2014, as the time on task and response availability cuts into the increase in service capacity. There are two probable reasons for this:

1. Berkeley units are responding to calls that would have been handled by a mutual aid response from another municipality in the past, and
2. The calls are taking longer.

The data suggests both are true. Average time on task (time spent per call) has increased annually according to ePCR data (Tableau Reporting; Medic UHU Summary by Year), and in the year prior to the 4th ambulance being added, the Department requested mutual aid from an outside agency 642 times. In the year that followed, it requested it only 226 times (Tableau Reporting; Where Outcome is “Transferred Care to Another Agency”).

	Berkeley Fire Department UHU Based on ePCR Time Stamps				
Year	**Total Trsp.**	***Hrs Per Trsp.**	**Total Hours**	**Ttl Unit Hrs.**	**UHU**
2014	7192	.95	6,832.4	26,280	0.256
2018	6767	1.6	10,827.2	35,040	0.308

*Note: It should be noted that ePCR times under-report total Time On Task, as the completion time logged in ePCR documentation may not reflect the actual time the unit is available for dispatch. For consistency in analysis, we are using this reported time as it is the most conservative.

This trend is likely to continue, especially when considering the impending closure of the emergency department at Alta Bates and the reduction of thoroughfares and multi-lane roads to increase bicycle and pedestrian safety. Additional ambulances, a more efficient system in terms of resources and their allocation, or both, will be required to manage structural changes that large.