CITY OF OAKLAND
AGENDA REPORT

TO: Office of the City Administrator
ATTN: Deborah Edgerly
FROM: Oakland Fire Department
DATE: February 27, 2007

RE: **A Report And Recommendations From The Chief Of Oakland Fire Department, Regarding Firefighting Capacity For High-Rise Buildings And The Impacts From Current/Proposed Large Scale Housing Developments On The Department's Future Staffing And Equipment Needs**

SUMMARY

This report outlines the Oakland Fire Department's high-rise firefighting capabilities and provides an assessment of the capacity requirements for the Oak Knoll Development Project, the Oakland Army Base, and the Oak to 9th Street Development Project. The report also makes recommendations to address potential risks and hazards as a result of future growth and development in the City of Oakland.

FISCAL IMPACT

This is an informational report, and there is no direct fiscal impact from this report.

BACKGROUND

The Oakland Fire Department (OFD) is an all-risk, all-hazard mitigation Fire Department which provides Fire Suppression, Emergency Medical Services (EMS), Fire Prevention and Inspection Services, Public Education, and Emergency Planning for the City of Oakland.

The OFD is comprised of 25 fire stations strategically located to cover 53.8 square miles throughout the City of Oakland. These stations house 25 engines and 7 trucks with an on duty staffing level of 137 firefighters on duty per day.

The staffing levels include 4 Fire personnel per engine. The seven (7) trucks are staffed with 4 firefighters and, while there is currently no national standard that recommends a certain number of trucks for a specific number of high-rise buildings in a jurisdiction, the three (3) trucks located downtown, which is considered a high-density area, are staffed with 5 personnel.

The OFD annually responds to approximately 58,000 emergencies of varying nature and severity. Incident response time to these emergencies is a critical factor to consider when responding to fire and EMS incidents. Studies have shown when applying the time temperature curve model, which states that in the first five (5) minutes of a fire, the temperature quickly rises to a temperature of approximately 850 degrees Fahrenheit; within 10 minutes the temperature increases to approximately 1700 degrees. The build up and intensity of the fire is directly attributed to the types of materials and/or the fire loading in a specific area/space within a structure. The average incident response time, which is measured from the receipt of a citizen's telephone call to the Fire Department Dispatch Center until the time a fire unit arrives on the scene, falls within the incident response standard of seven minutes or less 90% of the time.

This report will show that the foremost critical factor to be considered in future development projects is the importance of complying with the current incident response time standard. Since our ability to provide service to more densely developed areas becomes increasingly difficult given the current resources of personnel and equipment, this report will focus on the Oakland Fire Department's ability to adequately control high-rise fires and address future development in the City of Oakland.

KEY ISSUES AND IMPACTS

High-Rise Buildings

The California Fire Code defines a high-rise building as any building that has floors used for human occupancy located more than 75 feet above the lowest floor level with building access that is typically constructed of Type 1 Fire Resistive or Type 2 building materials. These materials are typically non-combustible construction. Currently, there are 109 buildings that meet the definition of a high-rise in the City of Oakland. Based on data of catastrophic high-rise fires over the last 20 years, it has been determined that a key factor and ability to control these fires is a direct result of automatic sprinkler systems having been rendered inoperable due to construction being performed to the building, such as, tenant improvements, major renovations, or new construction.

High-rise buildings on fire are considered environments that are Immediately Dangerous to Life and Health (IDLH). High-rise fire history shows that in the early 1970's the MGM Grand in Las Vegas had significant loss of life caused by the fire's rapid movement and smoke and toxic gasses traveling through heating, ventilation, and air conditioning (HVAC) ducts. This devastating fire precipitated the enhancement of sprinkler systems and other fire detection

system requirements in high-rise buildings. In 1998, the 1st Interstate Bank building in Los Angeles had a non-operable sprinkler system. The same situation held true in 1991 at the Meridian Plaza fire in Philadelphia where several firefighters were killed and many were injured. In each of these cases several hundred firefighters were necessary to conduct fire ground operations to control and extinguish those high-rise fires.

Structural integrity is also a major consideration when fighting high-rise fires. A breach in the flame proofing, a protection of up to 4 hours, of the steel members and uncontrolled burning may ultimately cause collapse, as evident in the World Trade Center catastrophe in 2001.

In Oakland, of the 109 high-rise buildings, approximately 48 were built prior to 1974 at which time sprinklers were not required. Of the 48 buildings, 11 are fully sprinklered, 19 are non-sprinklered, and 18 are partially sprinklered. The 37 non/partially-sprinklered buildings pose the greatest potential life safety risk/hazards to occupants and responding fire department personnel. Additionally, the property damage and business interruption caused by a fire will have negative economic impacts to the City of Oakland.

The Oakland Fire Department has an aggressive firefighting philosophy, which means heavy allocations of personnel are sent to commence interior fire attack operations. Current National Fire Protection Association, Standard 1710, (not adopted by the City of Oakland due to excessive costs and a recommendation that attempts to usurp local control of resource levels and allocations) recommends the number of firefighters that respond and the time for which they should arrive on scene of an incident. Additionally, OSHA 29, California Code of Regulations (CFR) 1910 and 1926 require that two (2) personnel maintain a position outside of a structure fire prior to interior fire attack operations commencing.

Moreover, high-rise buildings are considered a potential target for terrorist attacks, (example: World Trade Center), especially government facilities or buildings which would have significant economic impact on the local economy. Key potential targets in the City of Oakland include the Federal Building, the State Building, Alameda County Courthouse, and City of Oakland City Hall.

Due to the uniqueness of a high-rise fire response, strong consideration must be given to fire ground operations, access, communications, evacuation/rescue, equipment, water supply/extinguishment, air supply, training, and staffing. Each area has its own unique challenges for fire department responses. These challenges include:

Access: Fires cause falling debris, broken glass, traffic, common use between tenant and fire department personnel for department access and tenant egress. Elevators, if used, have no barriers between fire atmosphere and the occupants of the car; therefore, they are not used to access the fire floor. Equipment must be manually transported using the stairs to the fire area. Additionally, elevators are not used to access the fire floor(s) where fires penetrate the fire floor. The average time then to reach the fire floor is approximately 1 minute per floor, i.e., 20 stories would take at least 20 minutes, which far exceeds the time temperature curve model.

Communications: Heavy concrete, steel, glass, and subterranean basements have rendered portable radios ineffective because of the lack of consistency in transmission and reception. Additionally, stationary in-building fire phones don't provide necessary flexibility. From an operations standpoint it is imperative that the OFD Dispatch Center is adequately staffed to support high-rise fire operations which relates directly to firefighters' health and safety.

Evacuation/Rescue: Evacuation and Rescue efforts may cause a delay in fire attack operations thereby increasing the growth and severity of the fire. This equates to the fire growing and moving from floor to floor and increases concerns for structural integrity.

Equipment: A large quantity of heavy equipment is required to perform firefighting operations. This includes Self Contained Breathing Apparatus (SCBA), cylinders, hose, nozzles, forcible entry tools, power tools, medical equipment and portable communications equipment, all of which is indispensable in combating a high-rise fire.

Water Supply/Extinguishment: Although most buildings are equipped with standpipe systems, the supply of water necessary to extinguish a fire on upper floors may not be adequate enough for the fire intensity. In this case alternative strategy and tactics may be employed. To extinguish these fire types 1 ¾ and 2 ½ inch diameter fire hoses are necessary to provide large volumes of water to combat and extinguish high-rise fires.

Air Supply: Currently the Oakland Fire Department utilizes 30 minute and a limited number of 1-hour SCBA's. Due to the strenuous nature of - and fatigue caused by - ascending stairs, moving heavy, cumbersome, equipment, and attacking the fire, the SCBA cylinders, although rated for 30 minutes and 1 hour, only last 20 or 40 minutes, respectively.

Training: To effectively combat high-rise fires, it is imperative that fire department personnel constantly train and have an opportunity to train using simulated high-rise fire response scenarios. Additionally, staff must schedule opportunities to conduct pre-fire planning and develop specific strategies and tactics that address high-rise fires.

Staffing: High-rise response requires large numbers of personnel to effectively contain and extinguish fires, perform evacuation, rescue operations, and other necessary tasks to achieve extinguishment of these fire types. Below is the matrix of the Oakland Fire Department, which shows the number of personnel necessary to respond to a high-rise incident.

High-rise Response Matrix						
Alarm Level*	Engines	Trucks	Chiefs	Auxiliary	Call Back Personnel	Total Number of Personnel
1st	6	2	2	1		40
2nd	4	1		1	1	23
3rd	4		1		2	19
4th	3	1			2	18
5th	3					12
6th	4	1			1	21
Total	24	5	3	2	6	133

* Fires on 10th floor require a minimum of a 5th alarm for a total of 133 City of Oakland firefighter personnel to address Standard High-rise Operation Procedures as well as carry equipment aloft and address firefighters fatigue. Mutual Aid will be required to provide City of Oakland Fire Station cover and/or to assist with high-rise firefighting efforts.

Command Staff/ Overhead Management:

While it takes substantial numbers of Firefighters to combat high-rise fires and large scale incidents, there is a need to have adequate command staff and personnel as part of an emergency response operation. While we have an Office of Emergency Services to develop disaster plans and other important emergency management functions, there is also a need to have sworn staff with a specific background in managing high-rise and other large scale disasters to ensure that the procedures, policies and other important functions are reviewed as the City continues to be developed, redeveloped and as the population increases.

The Incident Command System (ICS) is utilized to manage Oakland high-rise fires and other large scale emergencies. This system must be used as a part of the National Incident Management System (NIMS). This compliance to NIMS places the City in the position to receive federal funding as a result of a disaster declaration, as well as to compete and receive possible grant funds. The span of control and key functions of the ICS are essential to the management of high-rise fire and other emergencies.

Today, the Oakland Fire Department does not have adequate numbers of Chief Officers to address the majority of the overhead and command staff functions of the ICS, as was noted in the post incident reports for the Loma Prieta earthquake, the Oakland Hills Fire storm, and the 1999 incident on Broadway in the late 1990's, which resulted in the death of Oakland Firefighter Tracy Toomey. The shortage of Chief Officers, in comparison to like-size agencies, places the department and the City at a deficit when having to address high-rise fires, other large scale incidents, and the full activation of the EOC. Staffing additional Chief Officers, at the Assistant Chief and Deputy Chief levels, will need to be examined as the City's development and redevelopment projects increase the population of Oakland.

Mutual Aid Available

The City of Oakland participates in the State Master Mutual Aid plan as well as the Alameda County Mutual Aid Plan. Both of these plans are designed to provide and/or receive mutual aid to/from neighboring jurisdictions in cases where the jurisdiction's own resources are inadequate to respond to major fires or emergency situations. In the case of the OFD, extensive high-rise fires may be beyond capabilities of City of Oakland resources.

In the case of Oakland Fire Department, extensive high-rise fires (on the 10th floor and/or above) will be beyond the capabilities of the City of Oakland Fire Department.

Future City Growth and Fire Department Capability

The Oakland Fire Department has adequate staffing for the City's current population and development. Based on future development and the current environmental impact reports for the Oak Knoll, Oak to 9th St, and Oakland Army Base developments the Fire Department anticipates the City growing by approximately 40,000 residents over the next 18 years (or by 2025). Based on these projections, there is a strong potential for a significant increase in fire and EMS responses, resulting in the necessity for additional staff and resources. Moreover, a mega-station concept may be necessary where more units are in service from one fire station to provide effective and efficient fire and EMS response services. This would require modification of current fire department facilities and/or reconstruction.

- **Oak Knoll Development**

  The Oak Knoll Development is a 172-acre Planned Unit Development (PUD) located at the former Oak Knoll Naval Base. The proposed development includes 960 residential units and 82,000 square feet of commercial space, of which 6,000 will be for restaurants. The development will further provide a mixture of units and will include senior housing and an extensive multi-use trail system.

- **Army Base Development**

  The Oakland Army Base Development is a proposed 170-acre development of commercial and entertainment facilities, i.e., movie theatres, etc. The development would bring significant population during day and evening; however the population would be minimal during late evening to early morning time frames.

➢ **Oak to 9th Street Development**

The project is a 64.2-acre site converting the maritime and industrial area into a mixed use residential, retail/commercial, open space, marina use community. With 44% of the community dedicated to parks and open space, the project would have approximately 3,100 housing units, and 200,000 square feet of ground level retail/commercial space with building heights ranging from 86 to 240 feet.

SUSTAINABLE OPPORTUNITIES

Economic: The increase in development will cause an increase in revenue to the City of Oakland and will attract businesses and consumers to the city of Oakland. Additionally it will increase the demands for service by all city departments and the developers can assist by offsetting costs.

Environmental: The major environmental impact to be considered is the traffic and population increases which may increase fire department response times.

Social Equity: Ensure all citizens of Oakland are provided with adequate fire protection, emergency medical services, and all risk mitigation.

DISABILITY AND SENIOR ACCESS

There are no ADA or senior access issues contained in this report. However, implementing the recommendations will provide equal access by the fire department to both the disabled and senior communities through providing adequate fire protection, emergency medical services, and all risk mitigation.

RECOMMENDATIONS AND RATIONALE

High-rise Buildings

- Fire Department equipment rooms in buildings 10 or more stories tall at every 5th floor.
- Approve an ordinance developed by Information Technology Division (ITD) to improve the 800 MHZ communications inside all high-rises.
- Dedicated elevators be installed for fire ground operations only capable of moving equipment and personnel.
- Air fill stations installed in high-rise buildings.
- Building access tunnels or underground access to reduce hazards of falling glass and debris.

- Adoption of new road standard to address City of Oakland streets (currently, Draft Road Standards).
- Require acquisition of apparatus, tools, EMS, and other equipment, by developers/builders to address increased emergency response needs.
- Ensure all Building and Fire Codes are enforced to ensure life-safety system and construction standards.
- Provide Heli-pads for roof access and rescue.
- Develop and implement a Retrofit Ordinance for all non-sprinklered buildings to be sprinklered over the next 10 years.
- Provide mandatory sprinklers in all newly developed buildings.
- Provide funding for additional 800 MHZ radios to address interoperability.
- Provide funding for simulator to be used for high-rise strategy and tactics training.

Oak Knoll Development

- Requirements for fire resistive vegetation
- 100% sprinkler requirements on all residential and commercial construction
- Implementation of Draft Road Standards
- Requirements for class "A" roofs
- Removal of eucalyptus groves
- Design and review for adequate water supply
- Funding for Type III/Type IV apparatus (Brush Rigs/Tank Wagons)
- Funding for training of Fire Department personnel on wildland firefighting operations
- Funding for wildland firefighter equipment/safety clothing

Oak to 9th Street

- Provide for Fire Department waterside access
- Funding for water rescue program to purchase small boats, safety clothing and training for Fire Department personnel due to development and increased water activity. Note: U.S. Coast Guard does not provide fire suppression nor rescue services on/in waterside.
- Re-opening of the City's Fire Boat to address waterside firefighting and provide mutual response to waterfront cities.
- Adoption of new road standard to address City of Oakland streets (currently, Draft Road Standards).
- Heli-pad on proposed high-rises
- Funding for the implementation of a community defibrillator program for community/first response to cardiac arrest.
- Provide funding for simulator used for high-rise strategy and tactics training

As outlined in this report it is apparent that the need to respond to high-rise buildings, new developments, and an increasing population, will severely impact the operations of the Fire Department in the future.

ACTION REQUESTED BY THE CITY

Staff recommends that the City Council approve in concept the recommendations of the Fire Chief with relevance to fire department capabilities when responding to high-rise incidents and future development in the City of Oakland. Additionally, the fire department recommends that a committee be established with the Community and Economic Development Agency (CEDA), Redevelopment Agency, the Building Department, and Public Works to ensure that there is a committed effort to improve the life safety requirements of the fire department and a united agreement to ensure developers contribute to the quality of life and safety of Oakland residents.

Respectfully submitted,

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APPROVED AND FORWARDED TO
THE PUBLIC SAFETY COMMITTEE

Office of the City Administrator

Item: _____
Public Safety Committee
February 27, 2007