SUPPLEMENTAL COUNCIL AGENDA: 11/06/2007
ITEM: 4.5

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Darryl Von Raesfeld
Fire Chief

SUBJECT: **See Below**

DATE: November 1, 2007

Approved [signature] Date 11/2/07

COUNCIL DISTRICT: City-Wide
SNI AREA:

SUBJECT: Supplemental Memorandum to November 6, 2007, Council Item 4.5, Approval of an Ordinance amending the San Jose Fire Code.

REASON FOR SUPPLEMENTAL MEMO

To clarify that the recommendation for adoption of the 2007 California Fire Code with local amendments was intended to cover the re-adoption of all pre-existing local amendments to the State Code, including local amendments relating to breathing air replenishment systems and public radio coverage requirements for high rise buildings; and to respond to questions raised at the October 17, 2007 Rules Committee meeting concerning these requirements.

BACKGROUND

The October 15, 2007 staff memorandum recommends adoption of the 2007 California Fire Code with certain local amendments. In addition to the local amendments specifically listed in the October 15th memorandum, the Fire Department is recommending that all pre-existing local amendments to the State Code be re-adopted, including the amendments relating to breathing air replenishment systems and public radio coverage requirements for high rise buildings, which have been in effect since 2005. The rationale and need for these amendments is described in the Council memoranda that were distributed when the requirements were originally adopted (copies of January 11, 2005 and January 25, 2005 memoranda attached).

ANALYSIS

The breathing air replenishment systems and public radio coverage requirements for high rise buildings are contained in Section 17.12.630 of the Proposed Ordinance, entitled "Additional Safety Requirements for Multi-Story and Other Buildings Presenting Unique Firefighting Challenges." Including this section in the Proposed Ordinance does not represent a new requirement, but instead ensures that that the existing requirements remain in place.

The requirements specified in Section 17.12.445 were adopted through Ordinance 27341 by a unanimous vote of the City Council on February 8, 2005. That Ordinance was developed following a Council referral to the Fire Department in March 2004. All of the requirements in that Ordinance were included as construction features in City Hall.

In the course of developing the language now included in SJMC 17.12.445, Fire staff conducted research with Bay Area, California, and Western U.S. cities, relative to which jurisdictions had (or were adopting) similar requirements. A summary of the research and outreach conducted in 2004-05 is included in the attached 2005 Council Memoranda.

Since adoption of the Ordinance, several developers have raised questions about whether the ordinance has inadvertently and de facto resulted in a requirement to use a sole provider. Specifically, the question is whether the ordinance or specifications developed by the Fire Department requires use of a proprietary or patented design for installation of an air replenishment system. This question was brought to the Rules Committee on October 17, 2007.

Fire Department staff has conducted extensive research into the current state of air replenishment systems. While there is general acceptance of the value of air replenishment systems among fire departments surveyed, there is a level of concern in some jurisdictions regarding the lack of clarity on whether a system design may or may not infringe on an existing patent or proprietary design. Because of that, several jurisdictions that formerly had an ordinance have dropped or modified their requirements. For example, in 2005 the Fire Department referenced ten cities which had adopted some kind of air replenishment system requirement. Of those original ten, Phoenix, Sunnyvale, and Menlo Park still have the original language intact. San Francisco had proposed an elevator system as an alternate, but was denied through the political process. Sacramento still has an ordinance in place, but recently approved an alternate design. Berkeley, Fremont, Milpitas, and Redwood City are all either eliminating or amending their ordinances to allow more flexibility. Status of Daly City is unknown at this time.

The City Attorney's Office has advised that neither the existing Code nor Proposed Ordinance requires the use of a patented system. Based on our research, we believe that it is possible to construct alternate systems that would meet the ordinance requirements. During the course of our research, however, we found only two companies that have constructed such systems, Rescue Air Systems, Inc., the company that has constructed all of the systems now in place except one, and E. Kent Halvorson, Inc. which recently constructed a system in the Sacramento Marriott Hotel. The Fire Department also has the ability to review and accept submittals for an "alternate materials or methods of construction" (AMMC) proposal, if there are developers who would prefer to follow a different path in construction compliance.

FOR DARRYL VON RAESFELD
Fire Chief

For questions please contact David Schoonover, Deputy Fire Chief, at 408-535-7792.

COUNCIL AGENDA: 01-11-05
ITEM: 9.1

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO:	HONORABLE MAYOR AND CITY COUNCIL	FROM:	Jeffrey L. Clet Fire Chief
SUBJECT:	HIGH RISE AND UNIQUE BUILDINGS ORDINANCE	DATE:	January 7, 2005

Approved [signature] Date 1 · 06 · 05

COUNCIL DISTRICT: All

RECOMMENDATION

Approve an ordinance amending Part 4 of Chapter 17.12 or Title 17 of the San Jose Municipal Code, to add a new Section 17.12.445 to establish public safety radio coverage requirements for certain buildings exceeding fifty thousand square feet, basements exceeding ten thousand square feet, high rise buildings, buildings with two or more stories underground, tunnels over five hundred (500) feet in length and buildings and structure with remote fire apparatus access, and to require the installation of Firefighter breathing air systems in high rise buildings, buildings with two or more stories underground, tunnels over five hundred (500) feet in length, and buildings and structures with remote fire apparatus access.

BACKGROUND

The San Jose Fire Department has evaluated the operational effectiveness of a number of systems for fighting fires and handling other emergencies in high-rise buildings and other unique buildings such as tunnels and underground structures. This has been an on-going process, especially since the adoption of the Department's High Rise Firefighting Operational Plan in March 1996.

Through this process Fire personnel have identified two systems that can significantly enhance fire fighting capabilities in high-rise buildings and other unique building and structures. First, a piping system that can deliver rescue breathing air to the upper floors of a high-rise building for the refilling of self contained breathing apparatus (SCBA) bottles would alleviate the need for staffing a Stairwell Support Group, the primary purpose of which is to shuttle air bottles up and down stairwells to support emergency operations.

Second, the national attention that was drawn to the problems caused by failure of radio communications in the terrorist attack on the World Trade Center served to highlight the need for an enhanced ability to transmit and receive radio signals from inside certain buildings. Failure of

radio communications due to building and structural interference has been an historic problem in San Jose.

The Fire Department has researched the availability of rescue air and radio coverage enhancement systems and found that such system are not only widely available, but are either required, or under consideration, in many other jurisdictions. Local jurisdictions with some type radio coverage requirement include Sunnyvale and Gilroy. Jurisdictions that require a rescue breathing air system include Sacramento, San Francisco, Milpitas, Sunnyvale, Berkeley, Daly City, Fremont, Menlo Park, and Redwood City.

The Fire Department has also considered the adoption of an "electrical standpipe" requirement. An electrical standpipe would consist of electrical wiring permanently installed in a smoke-free stairwell, with outlets on every floor, which would allow the Fire Department to use a mobile electrical generator on the ground floor to provide power in the event of certain power outages. Fire Department staff was unable to verify that any California jurisdiction has such a requirement. Further, the Building Department has indicated that the next version of the Uniform Electrical Code will likely contain a number of changes to building system electrical requirements It is therefore recommended that further consideration of the electrical standpipe requirement be referred to PBCE for consideration as part of adoption of the new Uniform Electrical Code.

ANALYSIS

Although radio coverage and rescue air requirements have been adopted by a number of other jurisdictions, the requirements are not contained in the current Uniform Fire or Building Code. It is therefore recommended that the Council make findings of special circumstances, as required for adoption of building standards that are more stringent than the Uniform Codes. The recommended findings and their factual bases are as follows:

- **Unique Geographic/Topographic Conditions**- A fire service area of approximately 203 square miles which spreads out fire protection resources; areas with limited number of thoroughfares which are heavily congested during peak traffic hours, increasing fire hazard potential by impairing response capability; the City's location between two of the most active earthquake faults in the Bay Area, creating a potential for a high magnitude earthquake; and the potential of severe seismic action to create a large number of fire emergencies, reducing the number of resources available to respond to any single event.
- **Unique Climactic Conditions**- semi-arid climate, strong prevailing winds during dry weather.

Breathing Air Systems

San Jose currently benefits from an existing ordinance that requires sprinkler and standpipe systems in all high-rise buildings. . However, toxicity of smoke is the primary source of fire

fatalities, and in San Jose, even small fires that have been contained by fire sprinklers have filled several floors with smoke, requiring firefighters to wear full protection, including their SCBAs.

Also where a sprinkler system is ineffective or fails, a full working fire can result several floors above street level. Initiating and sustaining fire attack in a high rise requires a large number of personnel, all of whom need a continuous supply of breathable air. Current operational practices would require that a number of companies be assigned to move full SCBA air bottles up stairwells, and return the empties to the ground floor for refilling outside of the building. This is both labor and time intensive.

The advent of "breathable air systems" has provided a solution to that problem. Such systems consist of permanent piping installed in a smoke-free stairwell that would be filled from the Department's Air Unit (housing a compressor). Outlets every three floors would be used to fill bottles without having to carry them back downstairs. This system is currently being installed in the new City Hall.

This type system would also provide needed support in other structures that pose unique problems in firefighting situations. These include: any building with two or more stories underground (typically underground parking garages), and any tunnel more than 500 feet in length. The unique problem with these structures is that firefighters have to begin breathing from their SCBAs as soon as they go below ground level, since they are walking down into the smoke. That means that some of the available air is used just to get to the fire and to exit. The 1979 BART Tunnel fire is an example of this problem, killing two firefighters who ran out of air before they were able to exit the tunnel. The availability of a rated space to refill bottles would provide support to allow sustained firefighting operations.

The other unique situation that would require this system is a building where the nearest fire apparatus access point is located more than 150 feet from the nearest building entrance. The problem with a structure such as this is simply logistics – the amount of time and personnel necessary to move air bottles back and forth before getting inside of the building.

Public Safety Radio Coverage

The inability of fire companies and police officers inside the World Trade Center towers to communicate with their radios within the buildings and with personnel outside of the buildings highlighted a problem with which San Jose Fire and Police Departments are familiar.

Certain buildings, because of their construction, create interference with radio signals. San Jose has a number of buildings in which both the Fire and Police Departments' experience is that radio communications do not work, either within the building, or from inside to outside the building. The ability of public safety personnel to communicate is necessary for life safety, accountability, and effective emergency operations.

The recommended ordinance would establish performance-based standards for the types of building and structures in which radio coverage has proven problematic in the past.. Buildings and structures that do not meet the performance criteria would be required to provide equipment to boost the signal strength within the building, and provide for distribution through an internal antenna or radiating cable system. A system of this type is part of the bid for new City Hall.

COORDINATION

This memo has been coordinated with the Police and PBCE Departments and the City Attorney's Office.

PUBLIC OUTREACH

This was coordinated with the Chamber of Commerce.

COST IMPLICATIONS

There are no cost implications to the city.

CEQA

CEQA: Not a project.

JEFFREY L. CLET
Fire Chief

COUNCIL AGENDA: 01-25-05
ITEM: 9.1

SUPPLEMENTAL

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO:	HONORABLE MAYOR AND CITY COUNCIL	**FROM:**	Jeffrey L. Clet Fire Chief
SUBJECT:	HIGH RISE AND UNIQUE BUILDINGS ORDINANCE, SUPPLEMENTAL REPORT	**DATE:**	January 21, 2005

Approved [signature] Date 1·21·05

COUNCIL DISTRICT: All

REASON FOR SUPPLEMENTAL

The purpose of this Supplemental Staff Report is to provide more detail regarding answers to several questions that have been raised by the Mayor's Office and Council offices.

BACKGROUND

In response to Council direction, Fire staff conducted additional research and outreach, meeting with several developers/architects planning high-rise buildings in San Jose. Fire staff then re-met with members of the Chamber of Commerce development group. Staff also conducted further research relative to cost estimates as well as additional benchmarking with similar cities.

ANALYSIS

Comparable Cities

Fire staff conducted benchmarking research with the following cities: Seattle, Denver, Phoenix, Sacramento, San Francisco, and San Diego. City staff has previously used these cities for purpose of comparison. Attached to this memo as a matrix, are the results from this benchmarking.

It was concluded that the proposed ordinance differs very little from the four cities that have breathing air ordinances in place. Three of those cities include underground structures. Sacramento does not include underground structures, however, does require a helipad on top of high rises, and equipment storage rooms (with firefighting supplies) on multiple floors.

Some cities studied had ordinances requiring radio signal boosters, or have a pending ordinance. One city plans to survey buildings to see if there is a reception problem. However, all of the cities use radios that work on 800mHz range, which their staffs have identified as resolving most

of their reception problems. San Jose Fire radios are in VHF (150mHz bandwidth) and San Jose Police are in UHF (460mHz bandwidth).

San Diego has a pending ordinance that will apply to all existing buildings four or more stories in height. Phoenix is in the process of switching to 800mHz, and have informed their community that they will be testing buildings, with the plan of requiring radio boosters if reception is not adequate.

Costs

For Breathing Air Systems, the ordinance requires fill stations on every third floor, beginning with the third floor. A reliable "high" cost estimate is approximately $12,000 per fill station, which equates to about $4,000 per building floor. That estimate assumes utilizing a defined system common throughout the Bay Area. This ordinance is primarily performance-based, in that it doesn't specify the design of the fill stations, just the required components and capacity. The rationale for this approach is (a) to ensure the ordinance is generic rather than requiring specific equipment, and (b) to provide flexibility to the developers in how they provide the fill stations.

Fire staff contacted a consultant in Southern California with expertise in the evaluation for and the installation of radio booster/repeater systems for public safety. The consultant has done extensive analysis on installation costs, which he sets at approximately $25,000 for 150,000 square feet of coverage (about $0.17 per square foot). Those costs were for retrofit installations, so the cost of a new installation as part of construction could be expected to be lower. In addition, this ordinance will only require signal booster systems in those areas of the building that cannot meet the standard for radio reception, rather than being required in the entire structure.

Fire staff contacted Steve Turner (IT) who has been involved in the specifications for wireless communication systems in the new City Hall. He specifically said that we should not use the first quote received as any measuring stick. Fire also communicated to him our interest in ensuring that the next RFP would reflect the newer, performance-based language of this ordinance.

Tunnels

Since the ordinance would apply to any tunnels 500' or more in length, Fire staff interviewed representatives from VTA and BART. Fire has been working with BART for several years, in anticipation of planning for the San Jose extension. Fire staff regularly attends committee meetings on the project. Fire Operations staff have made several visits to both the BART stations and the BART Operations Center to fully understand the system and how public safety works in that environment. Fire staff continues to work with VTA in the design phase for Light Rail.

The City of San Jose has no regulatory authority over Transit Districts. However, our conversations with BART and VTA have been very positive and productive. We have a clear understanding that VTA is willing to continue working with Fire staff to ensure that our

operational needs are met. In specific conversations about breathing air systems and radio communications, it was clear that they were willing to design those elements into their tunnels, although the City will have to pick up some of the costs. As a side note, BART also uses 800mHz radios, and automatically installs radio boosters and repeaters in their tunnels that work on those frequencies.

Breathing Air Systems

The installation of breathing air systems has been happening nationally for about ten years. The most recent development is that the National Fire Protection Association has a committee working on a national standard for these systems.

Public Safety Radio Coverage

Through this process, we have learned that, as a general rule, older buildings have more radio coverage problems than newer buildings. The areas that have the greatest problems are basements and sub-basements, parking garages, and the first couple of floors of high rise buildings. Another issue that affects coverage is the number and placement of repeaters installed by a jurisdiction as part of their communication network.

PUBLIC OUTREACH

This was coordinated with the Chamber of Commerce and a group of developers likely to be affected by this ordinance. Both groups expressed their appreciation for our candid conversations, and said that they greatly appreciated our willingness to be flexible in some of the design elements for these systems. Fire provided early drafts of administrative regulations describing the installations for required systems, and will be evaluating feedback from those groups.

Additionally, the County Fire Chiefs and the County Fire Prevention Officers listened to presentations on the ordinance, and have indicated that they are waiting to see what San Jose is doing, with the idea of pursuing matching ordinances if this one is approved.

COST IMPLICATIONS

There are no cost implications to the city.

CEQA

CEQA: Not a project.

JEFFREY L. CLET
Fire Chief

City	Air System Ordinance	Comments	Radio Ordinance	Comments
Denver	No	ξ No current plans	Yes	ξ New Construction.
Phoenix	Yes	ξ High-Rise Buildings (UBC) ξ Underground structures two or more stories below grade with area greater than 10,000 square feet	No	ξ Converting to 800 Megahertz. ξ After conversion FD will perform survey of buildings
Sacramento	Yes	ξ High-Rise Buildings (UBC) ξ In addition to the Firefighter Air system the following is required: ξ Helicopter landing on roof ξ Fire Equipment rooms ξ Secondary water supply ξ FD Dedicated electrical outlets powered by emergency generator	Yes	ξ Currently 800 Megahertz ξ New Construction ξ Change of Use ξ Addition of 20% or more ξ **Exemptions**: Buildings less than 5000 sq. ft. & any R-3
San Diego	No	ξ Currently working on wildland fire safety ordinance. Tentative plans next to research Air system requirements	Pending	ξ Currently use 800 Megahertz ξ Developing ordinance requiring existing buildings four or more stories in height, and underground structures
San Francisco	Yes	ξ High-Rise Buildings (UBC) ξ Underground Pedestrian & Transportation tunnels greater than 150 feet in length	No	ξ Currently use 800 Megahertz
Seattle	Before Council	ξ High-Rise Buildings. (UBC) ξ Underground structures two or more stories below grade with area greater than 10,000 square feet.	No	ξ Currently use 800 Megahertz. (Seattle and other cities within county converted to 800 Megahertz in a joint effort)