CITY OF MOUNTAIN VIEW
MEMORANDUM

11.1

DATE: February 12, 2004

TO: City Council

FROM: Ron Geary, Deputy Community Development Director for Building and Safety

SUBJECT: FEBRUARY 24, 2004 STUDY SESSION—SOFT FIRST-STORY MULTI-FAMILY DWELLINGS AND IMPACTS ON CONDOMINIUM CONVERSIONS

On September 15, 2003, a staff memorandum was completed summarizing the findings of a report on soft-story buildings from the Santa Clara County Emergency Managers Association for the Santa Clara County Emergency Preparedness Council (SCC-EPC). The focus of this report, prepared by the San Jose State University Collaborative for Disaster Mitigation (SJSU-CDM), was to survey and inventory the soft-story multi-family buildings in Santa Clara County. The "Inventory of Soft First-Story Multi-Family Dwellings in Santa Clara County" report is provided as Attachment 1.

The main purpose of that memo was to summarize the findings of the SJSU-CDM report and identify potential actions that could be taken to address the structural deficiencies found in soft first-story buildings and postdisaster inspection and emergency response strategies, including managing the potential housing of large numbers of displaced residents.

Background on Soft First-Story Buildings

Soft first-story building construction is a term used to describe low-rise, multi-story (two to three stories), wood-frame apartment structures with a very flexible first story. This type of construction lacks the engineering systems provided by plywood shear walls, brace frames or concrete walls. This type of construction is very typical of the majority of apartments built in the late 1960s and early 1970s in which the parking garages at the first-floor level, often referred to as "tuck-under parking," support the upper stories of apartment units.

This type of construction met the adopted building codes and structural requirements at the time of construction but have proven to be extremely vulnerable to collapse and failure in earthquakes. It was the Northridge earthquake that focused the attention of the engineering community and building departments and fire-emergency response

services on the high level of damage that was caused because of the structural deficiencies created by soft first-story building design (Attachments 2 through 6). One of the primary lessons learned from Northridge was that because the majority of soft first-story buildings damaged or destroyed were high-density residential apartments, better identification of these buildings would have better prepared the first responders to inspect the properties, assist disaster victims and provide alternative shelter to displaced residents.

Mountain View Inventory and Seismic Policies

The SJSU-CDM report provided each jurisdiction in Santa Clara County with an inventory and map showing the location of the soft first-story buildings in its community. The survey identified 111 multi-family buildings in Mountain View that are soft first-story construction. These buildings represent 19 percent of the 584 multi-family buildings in Mountain View and contain 1,129 units with an estimated 2,823 occupants (calculated at 2.5 occupants/unit). Tables 1 and 2 in Attachment 1 show comparative data from other jurisdictions.

The survey also developed a map showing the distribution of these buildings in Mountain View (Attachment 7). The issues outlined in the SJSU-CDM report regarding the dangers to life safety created by soft first-story buildings in seismic events is very similar to the concerns that were identified in early 1984 for unreinforced masonry buildings (URM) in California. Due to the large number of these types of dangerous buildings throughout California, Senator Alquist in 1986 authored SB 547, a bill that directed the Seismic Safety Commission to prepare the California Earthquake Hazard Reduction Program.

SB 547 required all cities and counties in California to identify, inventory and notice the owners of URM buildings by January 1, 1990. The irony was that the mandated compliance date was three months after the Loma Prieta earthquake in which three people died from the collapse of brick buildings. The dangers from this type of construction, when not properly retrofitted to meet accepted engineering practices, was shown again when two people died in the December Paso Robles earthquake from the collapse of a historic URM building in the downtown.

The City met the original requirements of SB 547 in October 1989 with the identification of 25 URM buildings, all in the downtown area, and the notification of the building owners. After the Loma Prieta earthquake on October 17, 1989, the Council directed that a URM ordinance be drafted that would eventually require the upgrading of all URM buildings identified in the downtown. Working with the Downtown Revitalization Committee, business and property owners, an ordinance was adopted in October 1992. The key to the consensus support for this type of mandatory upgrade

ordinance, which ultimately would require that a building be demolished if it was not retrofitted within two years of an engineering analysis, was that it was based on triggers that would allow the building owners to integrate the upgrade into tenant improvements and building renovations. This allowed property owners to absorb the financial and construction impacts and loss of tenant rental into the process of improving and upgrading their property during a building upgrade. Today, all 25 URM building have been successfully upgraded, providing the community and businesses in the downtown a much safer environment and the URM Ordinance has been sunsetted.

Mountain View Soft First-Story Apartments—Next Steps

The purpose of this study session is to discuss with the Council the recommendations outlined in the September 15, 2003 memo. The potential next steps outlined in the memo were focused in three areas.

1. The Northridge earthquake highlighted the importance of improving the City's postdisaster preparedness for responding to the challenges of damage assessment and inspection, assisting disaster victims and providing alternative shelter for the potentially high number of displaced residents. Staff in Building Inspection, the Fire Department (EOC) and Police Departments will be moving forward to begin joint discussions and planning to develop strategies targeted for a focused disaster response to the identified areas that house multi-family soft first-story buildings (Attachment 6). Part of this planning will also include expanding the City's EOC plan to identify postdisaster shelters that would have the capacity for housing the large number of potentially displaced residents that occupy these types of buildings.

2. A second option available for improving the awareness of the dangers of these types of building for the owners are two publications written specifically for addressing this issue:

   - The Apartment Owner's Guide to Earthquake Safety.

   - Practical Solutions for Improving the Seismic Performance of Buildings with Tuck-Under Parking.

   These publications will be made available at the Building Inspection counter in the Development Services Center and through the Housing Inspection program.

Both of these options address the postevent consequences and heighten public awareness but do not address the primary issue of the lack of structural integrity of these

types of buildings due to their age and outdated engineering design components. Mitigating the significant life safety danger that these types of soft first-story buildings have exhibited in past seismic events would require that they be retrofitted with updated engineering systems to supplement the lack of rigid support required to absorb the lateral forces created by an earthquake. To date, there are no State or local (Santa Clara County) building code ordinances, such as SB 547, that require that owners evaluate and upgrade their buildings. The major barrier to owners proactively retrofitting their buildings is engineering and construction cost, compounded by the fact these complexes are primarily older apartment complexes that provide high-density affordable housing for, in many cases, lower-income populations. The SJSU-CDM report and the Rutherford & Chekene Consulting Engineers study, Seismic Rehabilitation of Three Model Buildings with Tuck-Under Parking: Engineering Assumptions and Cost Information, estimates the cost to retrofit these buildings to be between $16,000 and $20,500 per unit. This cost does not include loss of rent from displaced residents which, in most cases, could not be passed through to tenants in increased rent.

In exploring options for types of potential incentive programs that might motivate owners to retrofit their buildings, staff discussed circumstances which have presented the opportunity for encouraging or requiring these safety upgrades. Staff discusses below two approaches to upgrade these buildings: (1) requirement of retrofit soft-story construction as part of a condominium conversion; and (2) encourage the demolition and reconstruction of soft-story buildings by removing the current requirement to pay park in-lieu fees for the new units that replace demolished units in the soft-story building. One obvious opportunity is the upgrading of structures which occurs by law as part of the conversion of apartments to condominiums under the City Code and State law. City staff has been contacted by property owners who desire to convert soft first-story apartment buildings to condominiums. Application for this change in building ownership is at the discretion of the owner with the knowledge that the City will put conditions, which can include upgrades to the buildings and site, on the approval of the final subdivision. This could be an opportunity to require an engineering analysis and retrofit of the soft first-story construction as part of the condominium conversion and subdivision approval.

The cost of the retrofit would clearly be appropriate given the fact that condominium conversion will extend the life of the buildings 30 to 40 years, which may not be reasonable if the "old" structure is not upgraded. The new owners will be expecting many years of property life from their purchase of the new private units, including the assurance that their unit will be safe. Secondly, the insurance and risk exposure would be spread out to multiple owners of a damaged or destroyed building after a condominium conversion, versus a single owner (the original owner subdividing the property), increase the justification to require the retrofit and upgrading of the converted properties.

Property Redevelopment Option

The best case would be for developers to demolish these soft-story apartment buildings and replace them with newly constructed housing that meets contemporary earthquake standards.

Staff found that the requirement to pay park in-lieu fees on all new units built when redeveloping these types of properties was a major disincentive to owners and developers who otherwise might tear these 30- to 40-year-old buildings down and build new housing. The City's current subdivision ordinance requires developers to pay park dedication fees for both the number of units they are building that replace the demolished units and any additional units. Developers have told staff that this park fee for replacement units discourages the redevelopment of existing soft-story apartment buildings. It could be worth giving up some potential park dedication fees to encourage the replacement of soft-story buildings. This issue is discussed in more detail in a companion memorandum from the City Attorney on condo conversions and park in-lieu fees.

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884-02-24-04M-E^

Attachments:
1. Inventory of Soft First-Story, Multi-Family Dwellings in Santa Clara County
2. Soft First-Story Damage Photo
3. Soft First-Story Damage Photo
4. Soft First-Story Damage Photo
5. Soft First-Story Damage Photo
6. Soft First-Story Damage Photo
7. Mountain View Map
8. Newspaper Article—Soft First Stories

CITY OF MOUNTAIN VIEW
MEMORANDUM

DATE: September 15, 2003

TO: Kevin C. Duggan, City Manager

FROM: Ron Geary, Deputy Community Development Director for Building and Safety
Lynn Brown, OES Coordinator
Kevin S. Woodhouse, Senior Administrative Analyst

SUBJECT: Soft-Fist Story Multi-Family Dwellings

In June 2003 the San Jose State University Collaborative for Disaster Mitigation (SJSU-CDM), with support from the Santa Clara County Emergency Managers Association, completed a report and inventory of soft-fist story multi-family dwellings in Santa Clara County for the Santa Clara County Emergency Preparedness Council (SCC-EPC). The SCC-EPC is composed of elected officials from each jurisdiction in the County and serves as the funding authority for state and federal emergency management funds; City Council member Rosemary Stasek currently serves as Mountain View's representative. The "Inventory of Soft-First Story Multi-Family Dwellings in Santa Clara County" report is provided as Attachment 1.

Background on Earthquakes and Soft-First Story Buildings

Over the past 23 years there have been three significant earthquakes that have influenced the structural provisions in the building codes and the emergency response programs utilized to respond to post-disaster conditions -- the 1971 San Fernando (Sylmer) Earthquake, the 1989 Loma Prieta Earthquake, and the 1994 Northridge Earthquake. The loss of 14,600 dwelling units (of which 77% were apartments) in the Northridge Earthquake focused the attention of the engineering communities and local building and fire-emergency response services on the structural deficiencies of soft-first story buildings.

Soft-first story construction is a term used to describe low-rise, multi-story (2-3 stories), wood-framed apartment structures with a soft (very flexible) first story and an absence of plywood shear walls. These buildings typically have parking garages at the first-floor level, often referred to as "tuck-under parking," and often do not have enough bracing and strength to withstand earthquake forces. This lack of first-floor strength led to collapse of the first floor of many structures in the Northridge earthquake. However, this type of construction met the adopted building codes and structural requirements at the time of construction, which was between the mid and late 1970's to the 1980's. Figures 1 and 2 in Attachment 1 show a typical soft-first story apartment building and an example of soft-fist story failure.

In addition to evidence of the structural failure of soft-first story buildings, the Northridge Earthquake provided first responders, both the building inspectors performing damage assessment and the fire and medical services looking for disaster victims, with the lesson that

they were not prepared to address the large numbers of high-density residential apartments that were damaged or destroyed by the earthquake. The post disaster evaluation determined that if a better system of identifying these types of buildings had been in place, the cities would have been better prepared to inspect the properties, assist disaster victims, and provide alternative shelter for the displaced residents, many whom were out of their apartments for up to 6 months after the earthquake.

Santa Clara County and Mountain View

The SCC-EPC approved and funded the SJSU-CDM report as a step toward better identifying jurisdictions where soft-fist story buildings are located and the number of residents involved in order to reduce the risk to human life and property and prepare for adequate emergency response measures. As a result of the study, each jurisdiction in the County has been provided a copy of the inventory and a map showing the location of soft-fist story buildings in its jurisdiction. The study has identified 111 apartments in Mountain View that are soft-first story type construction. The 111 buildings represent 19% of the 584 multi-family buildings in Mountain View and contain 1,129 units with an estimated 2,823 occupants (calculated at 2.5 occupants/unit). Tables 1 and 2 in Attachment 1 show comparative data from other jurisdictions in the County. Attachment 2 is a map showing the distribution of these buildings in Mountain View.

In 1998, following the Northridge earthquake, the City of San Jose began an awareness program by producing a seismic safety guidance manual called "The Apartment Owner's Guide to Earthquake Safety," followed by a second manual in 2000 called "Practical Solutions for Improving the Seismic Performance of Buildings with Tuck-under Parking." These publications were made available to apartment owners in San Jose through the Tri-County Apartment Association. Prior to the distribution of these publications, the San Jose City Manager and City Attorney made the determination that identifying these properties as potentially dangerous could expose the City to an unacceptable level of liability and possible legal action. Consequently, they did not pursue further implementation of any actions related to soft-first story buildings at that time.

There are no formal programs (ordinances or building inspection requirements) in Santa Clara County that address the seismic safety of soft-first story buildings. In addition, to date there has been no response to a request by Building Officials in Santa Clara County that the California Seismic Safety Commission address this issue. Aside from the potential legal concerns expressed by San Jose, there are potential cost and resident displacement impacts that would occur from retrofitting these types of buildings, creating very little incentive for soft-first story building owners to undertake a retrofit. The SJSU-CDM report shows that these buildings are primarily older apartment complexes that provide high-density affordable housing for, in many cases, lower income populations. The "Practical Solutions for Improving the Seismic Performance of Buildings with Tuck-under Parking" report estimates the cost to retrofit these buildings to be between $16,000 and $20,500 per unit. That represents a cost, not including loss of rent from displaced residents, of approximately $205,000 to retrofit a 10-unit apartment building. It is likely that this cost would be passed through to tenants in increased rent.

Other cities in the County are currently evaluating the SJSU-CDM's report; staff does not know at this time what actions these cities are considering. The County Counsel's legal opinion of soft-first story legal issues related to this new report is agendized for discussion at the October 2nd meeting of the SCC-EPC.

Potential Next Steps in Mountain View

In response to the SJSU-CDM report, City staff has identified four actions that could be taken to address the structural deficiencies found in soft-first story buildings, post-disaster inspection and housing issues. The post-disaster and building code programs could include:

1. Identify the location of the 111 buildings in the City and map these buildings with the EOC, Fire, and Building Departments. This would allow a targeted response for both fire and building for emergency response and damage assessment.

2. Identify and plan for post-disaster shelters for the population of potentially displaced residents that occupy these types of buildings.

3. Distribute the "The Apartment Owner's Guide to Earthquake Safety" and "Practical Solutions for Improving the Seismic Performance of Buildings with Tuck-under Parking" to the property owners of the identified buildings through the Housing Inspection Program.

4. Amend the California Building Code to require that the identified soft-first story buildings be brought up to current seismic standards when a pre-defined set of conditions are met, such as remodeling the building in excess of either a dollar or square footage threshold or if the property is proposed for a condo conversion under the City's current ordinance.

SJSU-CDM's report is a significant step forward in raising the awareness of the dangers from soft-first story tuck-under parking buildings for City Councils, emergency responders, and fire and building departments. The next steps for Mountain View could include any of these four recommendations or possibly others that have yet to be developed. Specific next steps, review of legal issues, and potential staff workload impacts will be identified after receiving your input regarding the above four recommendations.

cc: ACM

Attachment 1

Inventory of Soft-First Story Multi-Family Dwellings in Santa Clara County

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Report prepared for:

Santa Clara County Emergency Preparedness Council

June 20, 2003

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Inventory of Soft-First Story Multi-Family Dwellings in Santa Clara County

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Introduction

Seismic events such as the Loma Prieta, Northridge, and Kobe (*Hanshin-Awaji Daishinsai*) earthquakes have shown that in addition to loss of human life and injuries, property damage can also be severe. Identifying and reinforcing buildings that lack adequate seismic resistance can reduce this risk to the community. Wood framed apartment buildings, particularly those with first-story tuck-under parking, have proven to be vulnerable to earthquake damage. A typical apartment building with a first-story tuck-under parking, in Santa Clara County, is shown in Figure 1. The failure of such a building during the Northridge Earthquake is shown in Figure 2. The Meadow Brook Apartment complex where a soft first story failed, resulting in 16 casualties, is shown in Figure 3. Due to the "clean" nature of the failure, responding agencies were not able to immediately identify this as a failure despite having driven past this apartment complex a few times during the first hour or so.

Emergency services officials in Santa Clara County have been concerned about these types of buildings for the following reasons:

- Santa Clara County is located in an active seismic region. It is vulnerable to ruptures on both the Southern Hayward Fault and the peninsula segment of the San Andreas Fault, among others.
- Apartment buildings constructed similarly to those that collapsed in recent earthquakes can be found in Santa Clara County. There were 2700 multi-family dwellings that were vacated or had significant structural damage due to the Northridge earthquake. Because of similarities in the housing stock, it is reasonable to expect similar damage in Santa Clara County.
- Most residents of these apartment buildings in Northridge had to be provided for in mass care shelters, with some remaining for as long as six months.

In order to reduce the risk to human life and property, and also be able to prepare adequate response measures, there is a need to better identify the localities where vulnerable buildings are located and the number of residents involved. To address this

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need, the Users' Group of The Collaborative for Disaster Mitigation (CDM) at San Jose State University proposed a survey of soft first-story multi-family structures in Santa Clara County. The Santa Clara County Emergency Managers Association fully supported this effort, and recommended to The Santa Clara County Emergency Preparedness Council that this survey be approved and funded.

Overview of the Survey

The survey was focused on developing an inventory of multi-family dwellings so that areas of cities that have potential soft-story buildings, and the density of these buildings in those areas, could be identified. The Users' Group and Santa Clara County EMA wanted the survey to contain data that would be compatible with, and suitable for input into, currently available risk assessment software programs, especially HAZUS.

There was considerable discussion regarding the format of the output. It was agreed at the outset that each city would be provided with the information pertaining to that particular city. Several individuals wanted detailed information on each building identified. However, there was concern that the provision of information of this nature could expose CDM and other bodies associated with the survey to legal liability. As a result of the discussions, it was decided that maps identifying areas where there were clusters of soft-first story buildings would be produced for each city in Santa Clara County. The clusters were to be identified as being high, medium and low. "High" would represent a cluster of more than 30 buildings, "medium" would represent a cluster of between 10 to 29 buildings, and "low" would represent a cluster of less than 10 buildings.

The main priority of the project was to identify all buildings in Santa Clara County that were thought to be vulnerable. All multi-family dwellings were inspected and those with soft-first stories identified. Visual details of each building were recorded, including photographing the buildings and their key features. Differences in "extent of vulnerability" among among the soft-first story buildings was not addressed. Such an effort requires more detailed engineering analysis and was beyond the scope of this project.

The survey was initiated by first identifying multi-family buildings with four or more units, that had two or more stories, and was built before 1990. This was done by using the software program Metroscan, a public data record taken from the County Assessor's office plus proprietary information that the County does not publish. This database does not have information such as number of parking spaces, number of occupants, ground floor use, dimensions of the buildings, number of masonry chimneys, structural properties, etc. This information was collected during the field survey. Home Profile, a software program designed for the real estate industry, was then used to obtain property information and to print parcel maps. The maps were used to pin point the lot where the buildings were located. An exact street address for each building was thus

obtained. Global Positioning System (GPS) units were used to obtain the latitude and longitude of each building.

Students were recruited from San Jose State University's College of Engineering, and trained by a licensed Civil Engineer before being sent to target areas for data collection. The first step in the data collection process was to determine if the particular building was a soft-first story structure or not. Data were collected only for those buildings that were found to have a soft-first story. These data were subsequently reduced into maps of individual cities showing the density of soft-story buildings. Survey work began in January 2002 and was completed in December 2002. The following sections describe the details of how the survey was implemented, and the salient features of the findings.

Development of the Survey Form

The survey form was developed by Steven Arnold, P.E., a practicing Civil Engineer in San Jose, and is shown in Fig. 4. Buildings were identified by street address, Assessor's Parcel Number (APN), an internal control number, and latitude and longitude from GPS readings.

The basic structural building material was recorded along with other potential seismic hazards such as the presence of masonry chimneys. A space for soil type information was included for possible future use. The ground floor use was also recorded; this can be useful in identifying soft-story structures and also possible existence of increased vulnerability. For example, a soft-story structure with first floor residential units is potentially more hazardous in terms of life safety than a soft-story structure with no living units on the first floor.

The building characteristics that were recorded included the year of construction, number of stories, and number of units. The year the building was constructed was found from Santa Clara County records. When possible, the building owner's name and address were also recorded. A space for value assessment of the building was included on the form for possible future economic analysis. It should be noted that the survey form was developed to include information that can be put into a HAZUS model and the form contains space for inclusion of relevant information, such as soil type, that may be used for future analysis.

In addition to the survey form shown in Fig. 4, each survey contained a sketch of the building plan and elevation, as shown in Figure 5, and the appropriate assessor's map, as shown in Figure 6. Several digital photos of the building were also taken and stored so that they can be utilized for future analysis.

Training of Student Surveyors

The engineering students recruited for this survey were first trained on campus, by Steve Arnold, by means of a workshop which included the following:

- Identification of basic structural building types;
- Characteristics of soft-story structures and how to identify them;
- How best to photograph each building;
- How to use the GPS system;
- Field trips to nearby known soft-first story structures; and
- List of multi-family dwellings for the area they were surveying.

The workshop ended with several example surveys being performed on buildings around the SJSU campus. (There are several good examples of soft-story buildings within walking distance of the SJSU campus.) The students were first required to fill out the survey forms on independently. These were then evaluated for accuracy and completeness by Steve Arnold. The process was repeated until the students were able to demonstrate competency before they were permitted to do the surveys on their own. The subsequent surveys done by the students were randomly sampled and checked for accuracy, throughout the entire duration of this project.

Conduct of the Survey

Before the student surveyors were sent out, CDM worked with each city's Emergency Services Officer, who alerted the appropriate local authorities in order to minimize public concern. This was particularly important since all of the surveys were performed after September 11, 2001. Each student surveyor was registered by SJSU's University Police Department as a Disaster Services Worker and issued an Official identification card which is shown in Figure 7. They also carried a letter from SJSU explaining the project and providing contact telephone numbers for Professor Guna Selvaduray of SJSU and Mr. Terry Gitlin, Executive Director, Santa Clara County Office of Emergency Services. The student surveyors asked permission to access each building owner's property in order to perform the survey. If the building owner could not be contacted, a curbside survey was performed. Student surveyors carried the following items:

- Survey forms;
- Digital camera;
- GPS system;
- Assessors and zoning maps;
- Official ID card and authorization letter.

As mentioned earlier, the student surveyors' completed work, was randomly sampled and subject to quality control checks by Steve Arnold. The information on the

survey forms was cross-checked with the digital photographs and also with trips to the actual locations of the buildings. He found that the surveyors had done a good job in all of the spot checks he performed.

Survey Findings

As a result of this survey, it was found that Santa Clara County has a significant number of soft-first story multi-family buildings (MFB). The results are summarized in Table 1.

Table 1: Soft-first Story Multi-family Buildings in Santa Clara County

City	Total number of MFB	Number of Soft-First Story MFB	Ratio (%)
Campbell	506	221	44%
Cupertino	166	53	32%
Gilroy	207	71	34%
Los Altos	43	19	44%
Los Gatos	235	96	41%
Milpitas	194	55	28%
Monte Sereno	0	0	0
Morgan Hill	138	37	27%
Mountain View	584	111	19%
Palo Alto	458	130	28%
San José	2,823	1,093	39%
San Martin	2	0	0
Santa Clara	1,021	320	31%
Saratoga	17	9	53%
Stanford	4	0	0
Sunnyvale	993	415	42%
Total	7,391	2,630	36%

A total of 7391 multi-family dwellings were identified in Santa Clara County. Of these, 2630 were found to be of the soft-first story construction type. This represents 36% of the total number of MFD buildings.

The City of San Jose is Santa Clara County's largest city, in addition to being the third largest city in California and the eleventh largest city in the U.S.A. As can be expected, The City of San Jose has the largest number of multi-family dwellings and the largest number of soft-first story multi-family dwellings – a total of 1093. This represents 39% of all MFDs. Approximately 40% of the multi-family dwellings in the cities surveyed were found to have soft-first stories.

Three cities were found to have no soft-first story multi-family dwellings. These were Monte Sereno, San Martin and Stanford. All three are relatively small cities which are also relatively affluent. Stanford is a "university-city". This finding is not surprising.

Approximately 90% of the buildings that were surveyed were 2-story buildings. The others were 3 and 4-story buildings. The age of the buildings varied anywhere from 15 to 45 years old; the majority were between 35 and 40 years old. An average size building had between 4 to 10 units. The larger complexes had up to 50 units.

The effort required for surveying each building varied, based on the size of the building. Some buildings took only 10 minutes to do the survey & data collection, while others took 30 minutes. An average size apartment building would take no more than 10 minutes, while larger complexes required more time (approx. 30 mins).

Table 2 contains data related to the number of units in soft-first story buildings, and the number of occupants, calculated at an average of 2.5 people per unit. As can be seen from Table 2, there are a total of 33,119 units in soft-first story buildings. This represents a total occupant population of close to 83,000. As can be expected, San Jose – the largest city in Santa Clara County – has the largest number of soft-first story apartment units and the largest population at risk. Other cities with relatively large numbers (greater than 1,000) of soft-first story apart units are Campbell, Cupertino, Los Gatos, Mountain View, Palo Alto, Santa Clara and Sunnyvale.

The overall average of the ratio of soft-first story apartment units to total number of apartment units was found to be 17% across all cities. However, if the three cities with no soft-first story apartment units are removed from consideration, then the ratio is 20%. This means that one out of every five apartment units is located in a soft-first story building.

The total time spent on this effort was close to 2600 hours. Of this total, close to 2200 hours were spent on the actual data collection, including travel time. Approximately 200 hours were spent on data entry and plotting of distribution maps, and another 160 hours were spent on project management and project coordination. The surveyors traveled a total of approximately 13,500 miles during the course of this survey.

Table 2: Soft-First Story Apartment Units in Santa Clara County

City	Total # of MFD Units	# of Soft-First Story Units	%	Occupants
Campbell	8,922	1,971	22%	4,928
Cupertino	7,670	2,597	34%	6,493
Gilroy	2,601	422	16%	1,055
Los Altos	837	222	27%	555
Los Gatos	8,404	2,967	35%	7,418
Milpitas	9,504	256	3%	640
Monte Sereno	0	0	-	0
Morgan Hill	4,368	371	8%	928
Mountain View	16,900	1,129	7%	2,823
Palo Alto	9,937	1,263	13%	3,158
San José	187,229	10,923	6%	27,308
San Martin	26	0	0%	0
Santa Clara	25,424	3,297	13%	8,243
Saratoga	600	262	44%	655
Stanford	185	0	0%	0
Sunnyvale	27,109	7,439	27%	18,598
Total	309,716	33,119	17%	82,798

Reduction of Data and Density Maps

All of the survey forms were submitted to the CDM office where they were recorded and the data analyzed so that they could be organized and presented in the form of city maps indicating regions where soft first-story multi-family dwellings are clustered. The GIS software program ArcView was used to construct each map using the survey data and a reference database containing all of the streets in Santa Clara County. The number of soft-story buildings are indicated on each map by the following three groups:

- High density (more that 30 soft-story units are present in the region indicated);
- Medium density (10 to 29 soft-story units are present in the region indicated);
- Low density (less than 10 soft-story units are present in the region indicated).

A typical map, in this case a map of the city of Sunnyvale, is shown in Fig. 8. It shows the major streets for orientation, a scale, the north arrow, and color coded areas indicating

the clusters of soft first-story buildings, according to density. All complete set of maps for the cities in Santa Clara County are included as an Appendix.

The data that were collected in this survey may be used by city officials in a number of ways such as:

- Identification of high-risk building stock within their jurisdictions
- Identification of locations where emergency mass care shelters might need to be established after an earthquake.

Conclusions and Further Work

This project represents only the beginning of the effort towards abating the seismic risk that is inherent to soft-first story structures. A number of steps still need to be taken if this issue is to be resolved to any extent.

Perhaps the most serious issue is the legal issue. Some City Managers and City Attorneys are apparently of the opinion that the exact location of soft-first story buildings cannot be publicly disclosed for fear of lawsuits. As such, there is very little scope for taking proactive steps.

The City of San Jose, in conjunction with San Jose State University, has developed an excellent risk assessment manual that apartment owners can use. The title of this document is "The Apartment Owners Guide to Earthquake Safety". It was authored by Professor Steven Vukazich and sponsored by The City of San Jose. A second document, also sponsored by The City of San Jose, was prepared by Rutherford and Chekene. This document is titled "Practical Solutions for Improving the Seismic Performance of Buildings with Tuck Under Parking". It provides retrofit guidelines.

Unfortunately, we are not able to send these documents directly to the owners of soft-first story apartment buildings. Further, there is no means of motivating or convincing the owners to undertake retrofitting of their buildings.

The "success story" that exists within California is the case of Unreinforced Masonry Buildings (URM). Initial legislation at the state level required local governments to survey and identify URMs within their jurisdictions. Subsequently, local governments passed ordinances that required retrofitting or abatement of the URMs. As a direct result of these actions, URMs today pose practically no threat to the residents. Similar steps are definitely required if the vulnerability inherent in soft-first story buildings are to be abated. This is an opportunity for Santa Clara County to take a leadership position.

This survey represents the advantages of a "town-gown" partnership. Useful data were collected in a timely and cost effective manner that benefited both the university and the local community. Engineering students were able to learn engineering concepts and see how engineers can play a role in public safety. In turn, city governments were

provided with valuable data that can be used to improve public safety and aid in disaster mitigation.

Future Efforts

Subject to the availability of funding, future efforts recommended include the following:

- More detailed evaluation of the vulnerability of the soft-first story buildings identified, taking into consideration more detailed engineering analysis and soil conditions.
- Investigation of the potential economic and societal impacts.
- Incorporation of the data into risk assessment software such as HAZUS.

Acknowledgements

The authors wish to thank several individuals and organizations for the encouragement and funding, without which this project would neither have been initiated nor carried through to completion.

- The Users' Group of The Collaborative for Disaster Mitigation, and The Santa Clara County Emergency Managers Association for articulating the critical need for the information that would become available from this survey.
- The Santa Clara County Emergency Preparedness Council for supporting this effort and for appropriating initial funding.
- The California Governor's Office of Emergency Services and FEMA for their support of this effort.
- Dr. Frances Edwards-Winslow and Mr. Paul Garrat, of The City of San Jose's Office of Emergency Services, and Mr. Terry Gitlin, Executive Director, County of Santa Clara, for their support of this effort throughout its entire duration.
- Dr. Thalia Anagnos who provided invaluable advice in making sure that the data collected could be of use for HAZUS.

Figure 1: Photograph of a typical soft-first story building with tuck-under parking.

Figure 2: Example of a soft-first story failure during the Northridge Earthquake

Figure 3: Photograph of the Meadowbrook Apartment Complex. Building on left hand side suffered soft-first story failure.

C D M

San José State University

SANTA CLARA COUNTY
SOFT-FIRST STORY BUILDING SURVEY

BUILDING ADDRESS

_____
street

_____
city

(Building No. _____, if appropriate)

APN: _____

Latitude: _____

Longitude: _____

STRUCTURAL PROPERTIES

Wood Frame _____

Steel Frame _____

Concrete Block _____

Concrete _____

Other Info:

Masonry Chimneys _____

Soil Type _____

Ground Floor Use: *(check all that apply)*

_____ Residential _____ Parking

_____ Commercial _____ Laundry

_____ Storage

BUILDING PROPERTIES

Year of Construction: _____

No. of Stories: _____

No. of Units: _____

Est. No. of Occupants: _____

No. of Parking Spaces: _____

Square Footage: _____

VALUATION:

Year Assessed: _____

Assessed Value: _____

Date of Last Sale: _____

Price of Last Sale: _____

Building Owner's Name & Address:

_____
owner

_____
street

_____
city state

_____

phone _____

PHOTO # _____

_____

_____

Surveyor: _____ Date:

Figure 4: Survey form

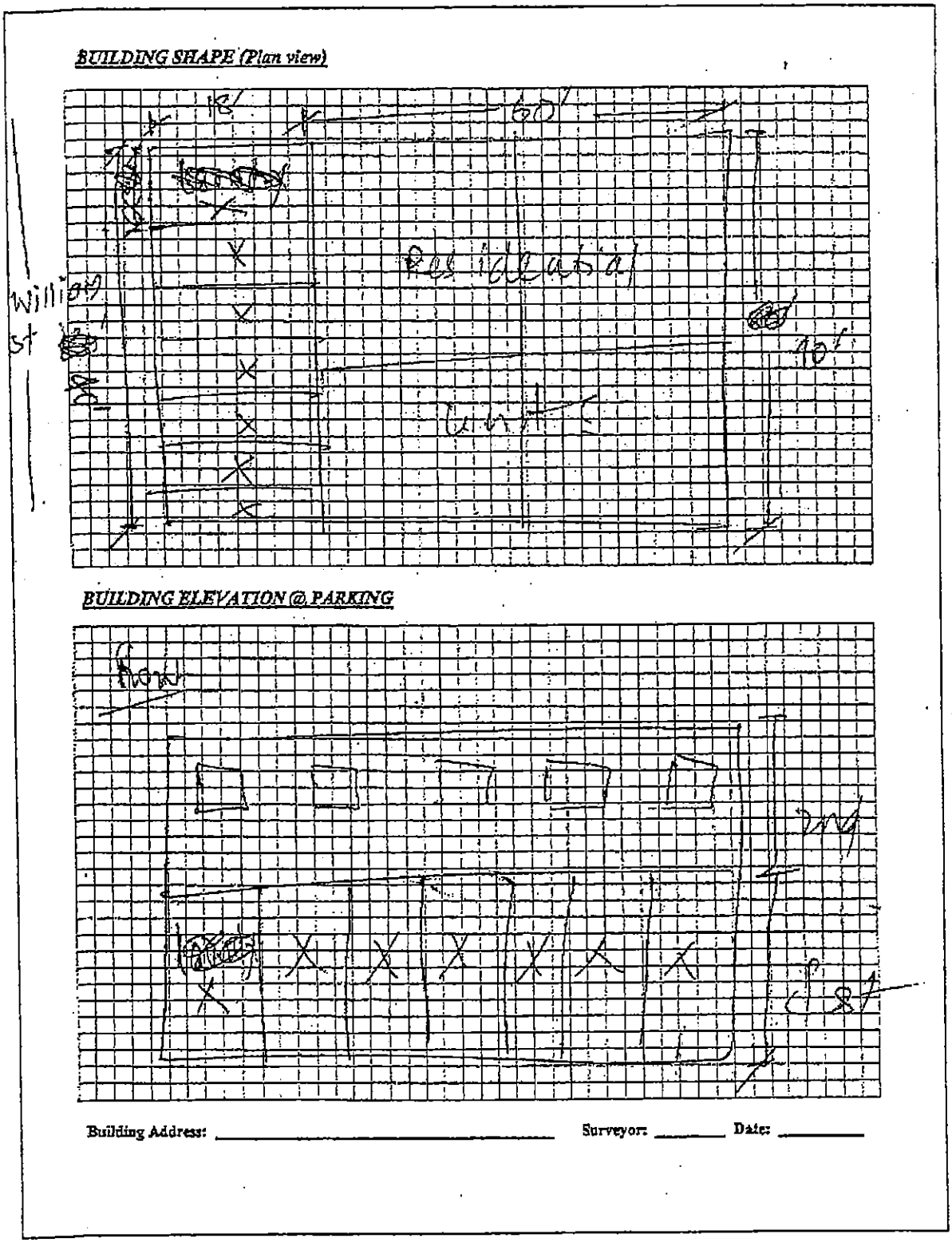


Figure 5: Sample of a Building Plan and Elevation Sketch

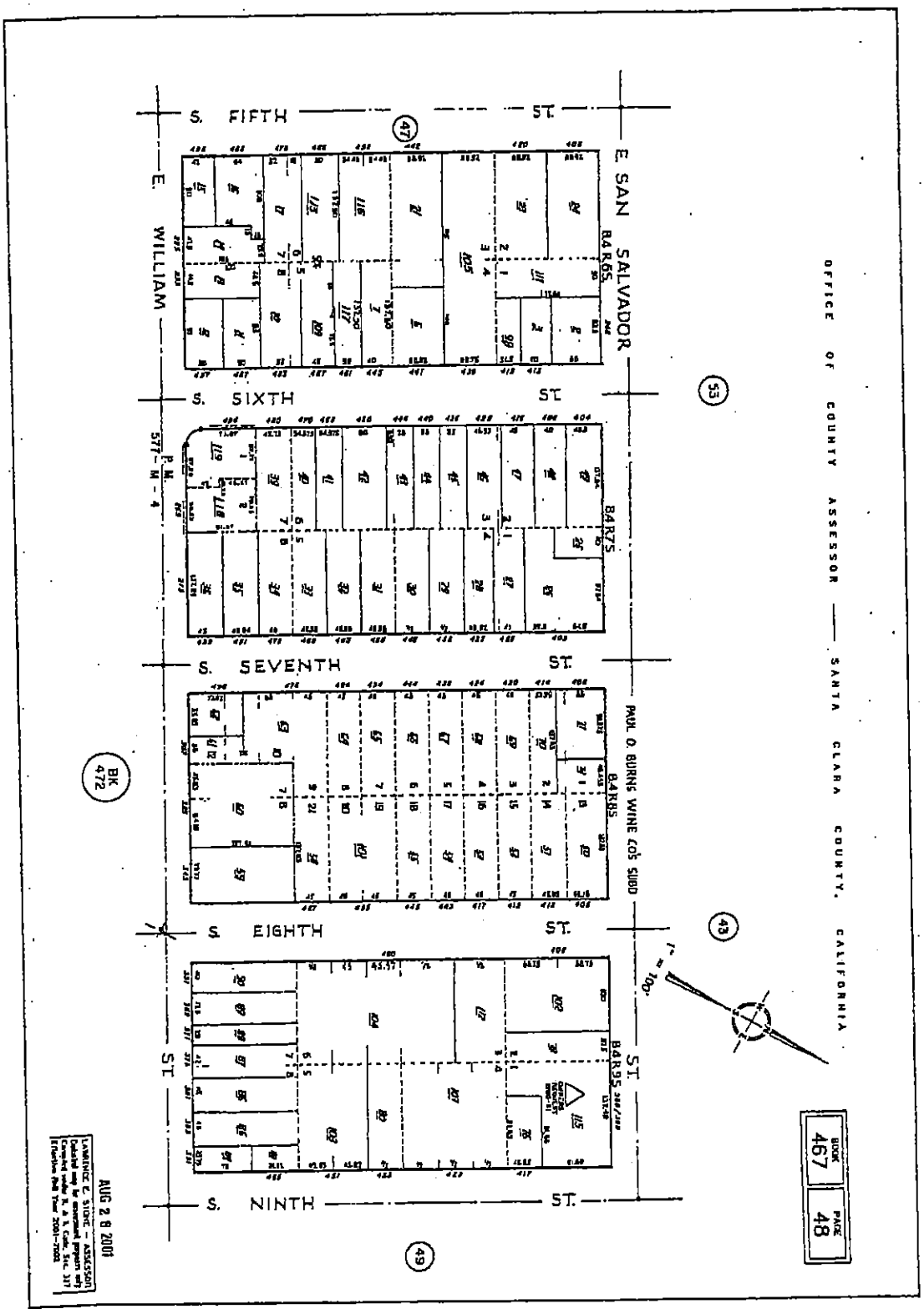


Figure 6: Sample of Assessor's Map

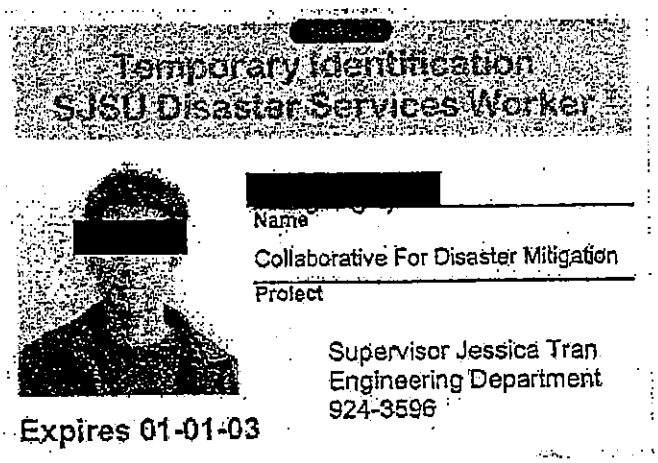


Figure 7: Student Surveyor's Identification Card

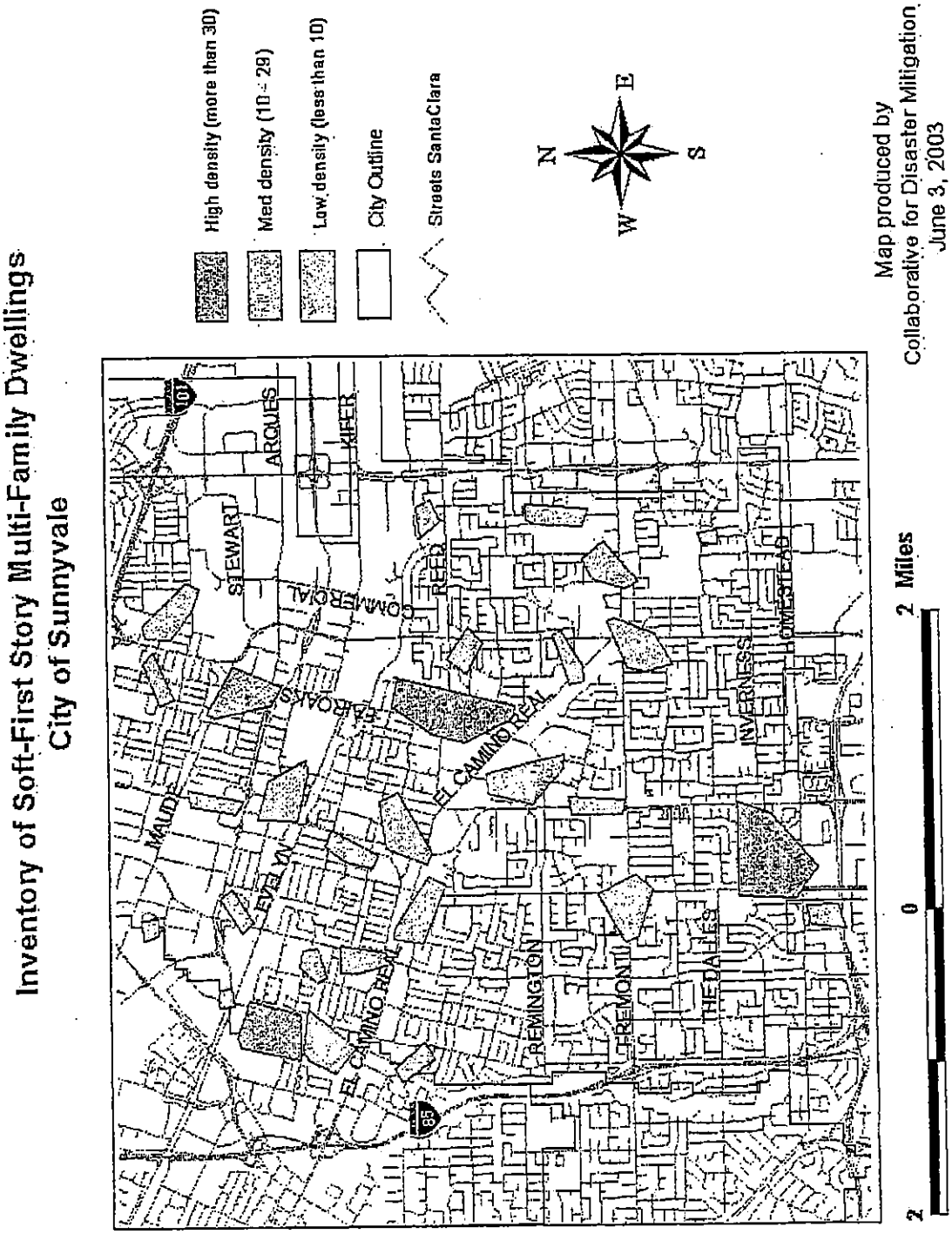
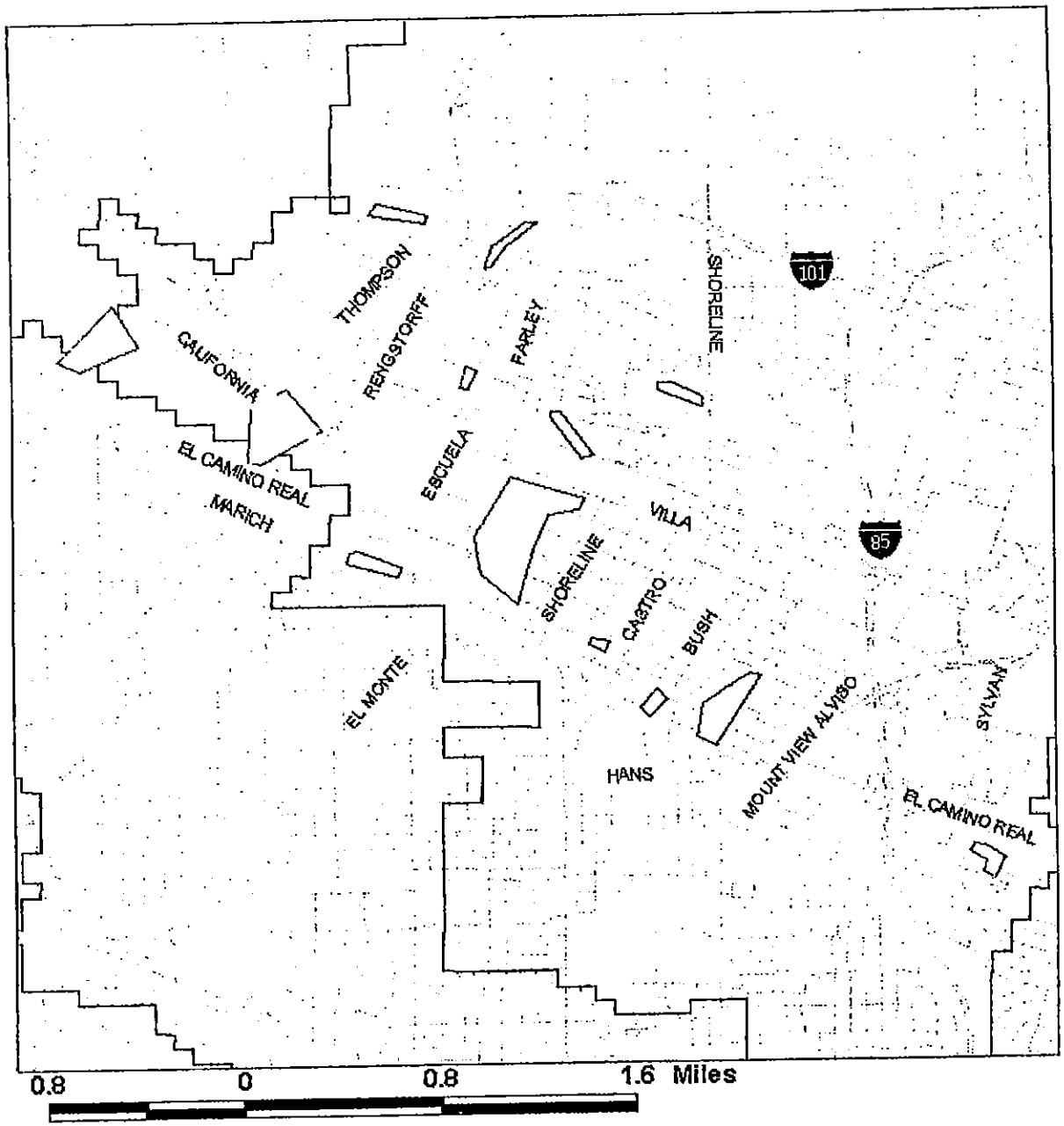


Figure 8: Soft First Story Density Distribution Map for The City of Sunnyvale

Inventory of Soft-First Story Multi-Family Dwellings
City of Mountain View



High density (more than 30)

Med density (10 - 29)

Low density (less than 10)

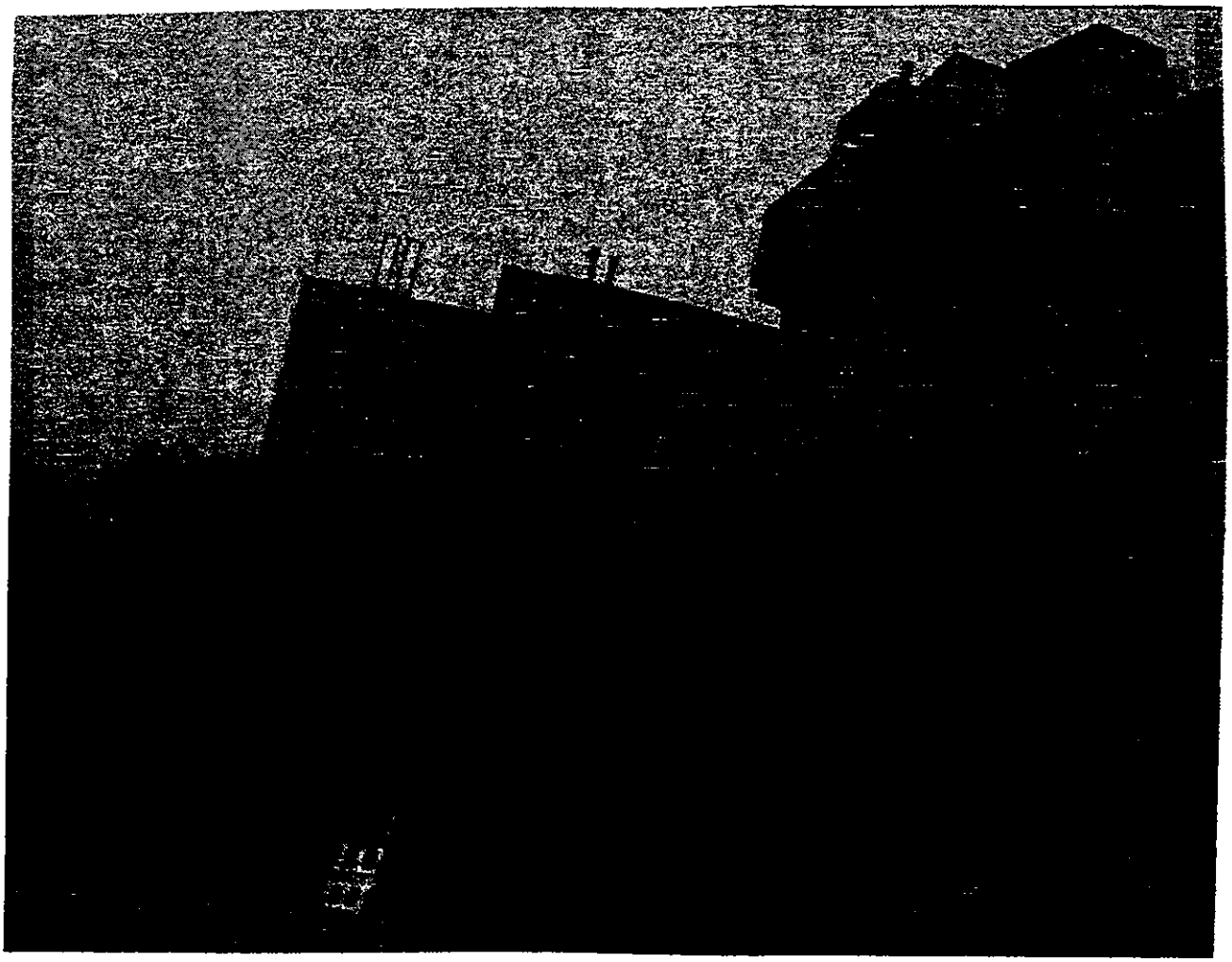
City Outline

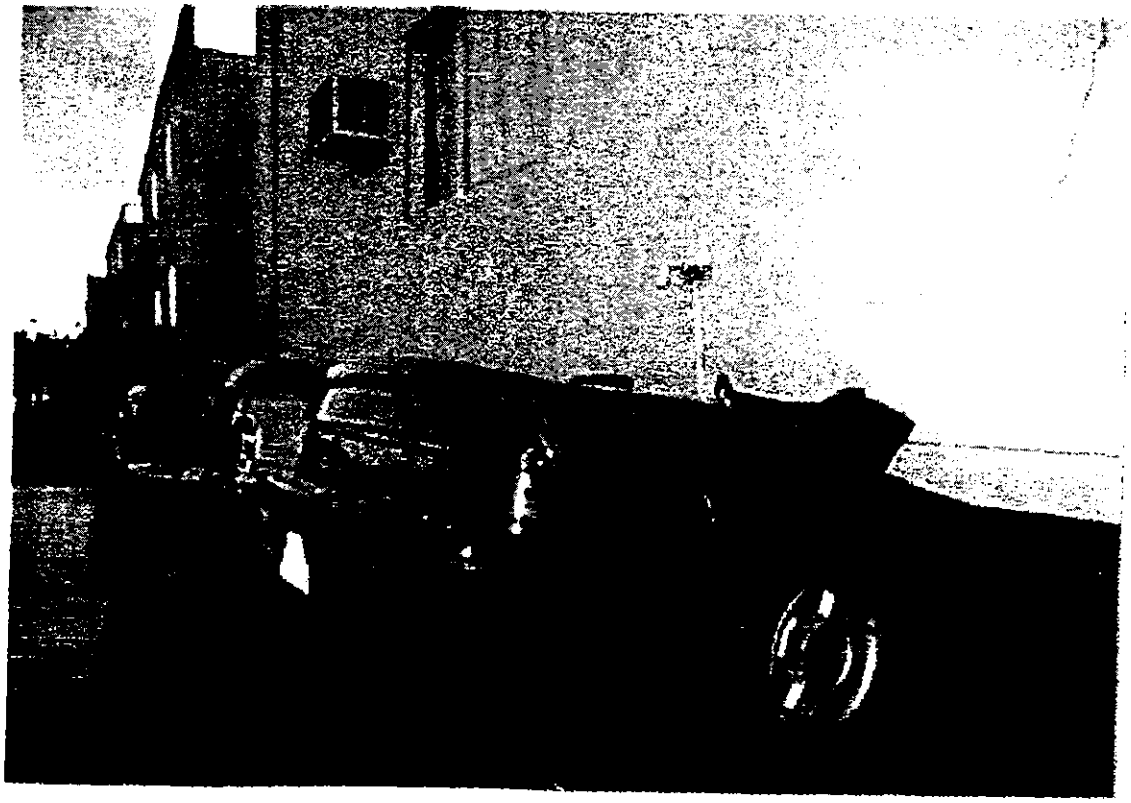
Streets Santa Clara

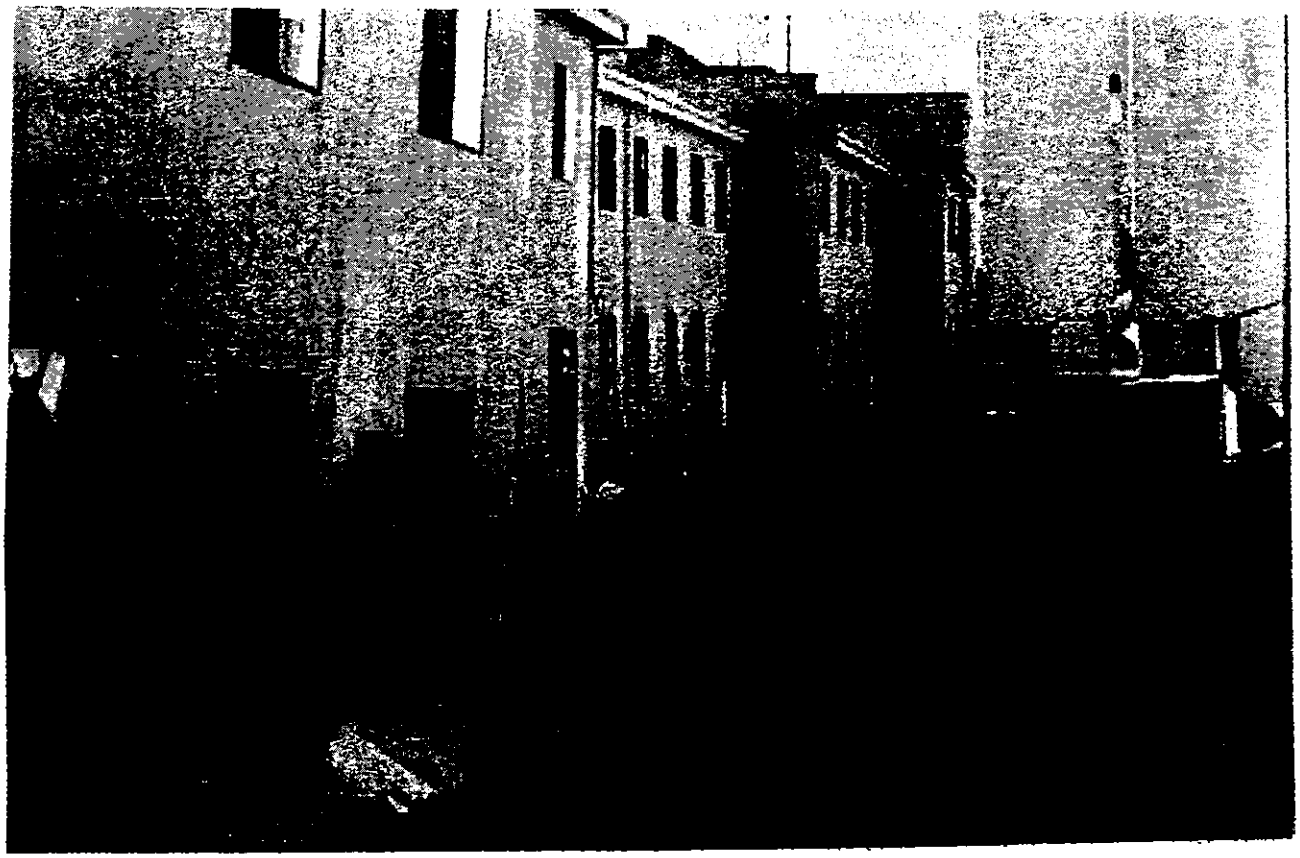
N
W E
S

Map produced by
Collaborative for Disaster Mitigation
June 3, 2003

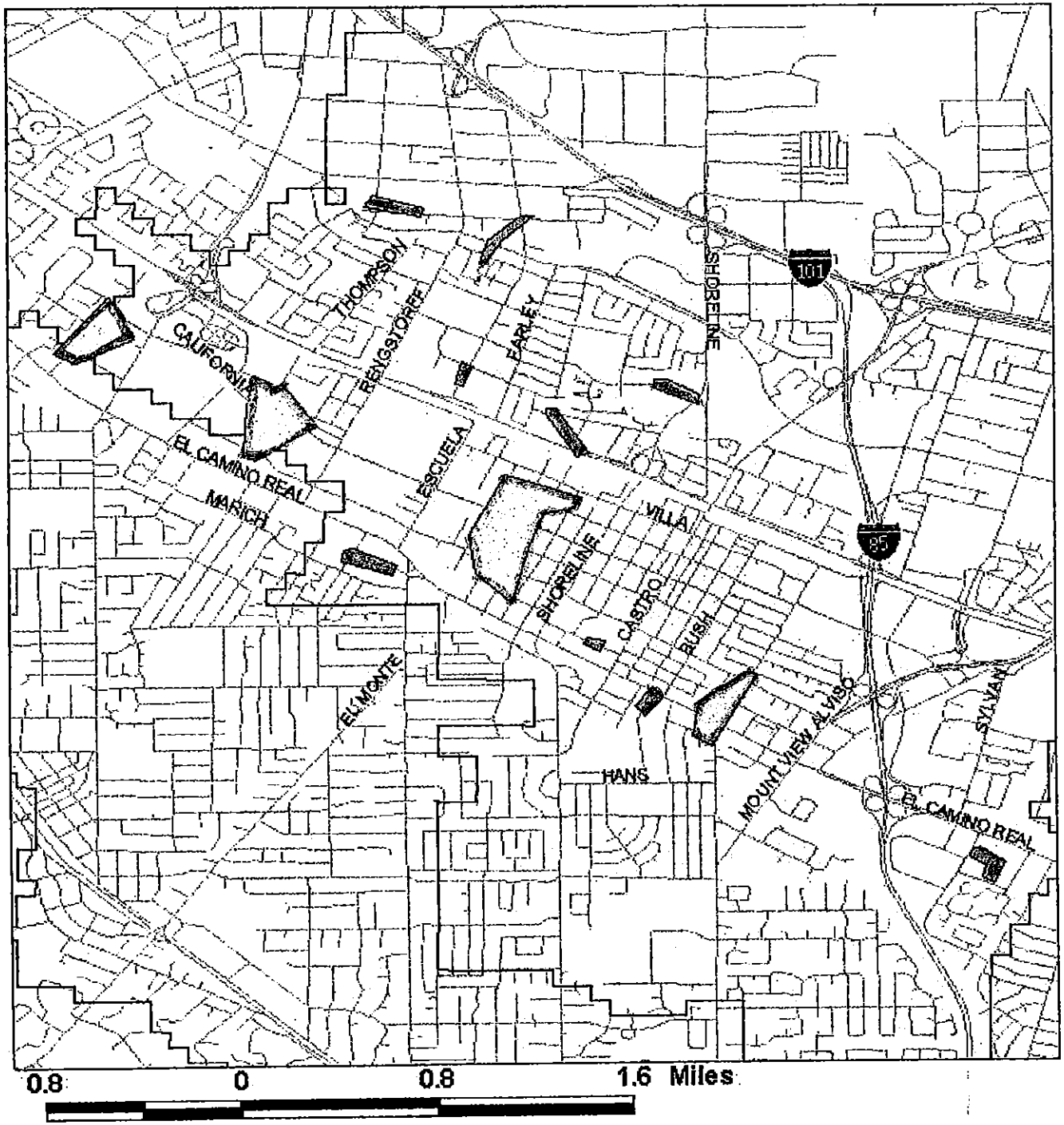
Attachment 2







Inventory of Soft-First S[illegible]ry Multi-Family Dwellings
City of Mountain View



High density (more than 30)

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City Outline

Streets Santa Clara

N

W E

S

Map produced by
Collaborative for Disaster Mitigation
June 3, 2003

attachment 7

BusinessExtra WWW.MERCURYNEWS.COM SAN JOSE ME

Apartment safety doubted

STRUCTURES OVER GARAGES, SHOPS AT ISSUE IN QUAKE

By Steve Johnson
Mercury News

Fearing many apartment buildings constructed over garages and shops could collapse in an earthquake, the Association of Bay Area Governments is trying to get city officials, landlords and tenants to be more aware of the problem.

Members of the group discussed the issue Thursday with Oakland's Emergency Management Board. They have created an Internet quiz for building owners and renters to help them assess the structural safety of their buildings.

Of particular concern are apartments built atop parking or commercial spaces, where the upper residential floors are supported by flimsy pillars or walls on the ground floor. Many of these buildings collapsed during the 1989 Loma Prieta earthquake and the 1994 Northridge quake in Southern California.

The Earthquake Engineering Research Institute, which helped give the Oakland briefing, estimates there are about 15,000 "soft-story" buildings in the nine-county Bay Area. A total of 2,630 such buildings — housing 90,000 people — are in Santa Clara County, according to the institute.

ASSOCIATION OF BAY AREA GOVERNMENTS

The Mid-Peninsula Apartment Complex was retrofitted during 2000-01, with minimal disruption to residents.

Despite efforts to get landlords to strengthen the ground-floor supports, few have done so, said Jeanne Perkins, an ABAG earthquake expert who spoke at the Oakland session.

"We did a study in 1999 that estimated that, at that point, less than 1 percent of these soft-story buildings had been retrofitted," she said. Based on interviews with city building officials and reviews of building permits, Perkins said her group has found little has changed since then.

"In the last four years, we're talking about less than 20 in the Bay Area" that have been retrofitted, she said.

Perkins wasn't sure why so few buildings have been strengthened. But she said it probably is because of the $3,000 to $9,000 cost per apartment unit to do the work, noting that city building codes do not require retrofits.

Kathy Thibodeaux, outgoing chief executive of the Tri-County Apartment Association in San Jose, agreed. Although newer apartments built over parking areas are structurally safe, she said, many older apartment complexes could prove expensive to fix.

"My hunch is that particularly in this market, the cost is prohibitive," Thibodeaux said.

IF YOU'RE INTERESTED

The building safety quiz along with facts about soft-story structures can be found online at quake.abag.ca.gov/fixit.

Contact Steve Johnson at sjohnson@mercurynews.com or (408) 920-5043.

attachment 8

CITY OF MOUNTAIN VIEW
MEMORANDUM

DATE: February 19, 2004

TO: City Council

FROM: Michael D. Martello, City Attorney

SUBJECT: FEBRUARY 24, 2004 STUDY SESSION—CODE CLEANUP ITEM: PARK LAND DEDICATION IN-LIEU FEES ON CONDOMINIUM CONVERSIONS

INTRODUCTION

Staff is seeking policy direction on whether to return to Council with an amendment to the Condominium Conversion Ordinance that does one or all of the following:

1. Amend the Condominium Conversion Ordinance to require seismic upgrading as part of any condominium conversion application.

2. Clarify that units reconstructed or "replaced" as part of a condominium conversion project will not require the payment of a park in-lieu fee.

3. Do not require park in-lieu fees for the conversion to condominiums of soft-story buildings and/or for the replacement of older apartments.

BACKGROUND

This issue first arose when the condo conversion for the Rock Street units had to come back before the Council because dry rot was found in most of the structural elements of the buildings, and a complete teardown was preferred rather than a piecemeal reconstruction. The teardown is considered reconstruction and not a "conversion."

Our current Condominium Conversion Ordinance, consistent with State law, exempts condo conversions from the payment of the park impact fee. Our ordinance imposes the fee on new units added to the project or if the project is reconstructed. To avoid placing the developer, the project and the lenders in a million-dollar "glitch" in the middle of construction, the Council approved the reconstruction of the units without payment of the fee. The Council also directed staff to clarify the existing Condominium Conversion Ordinance that new construction would be required to pay the fee, including any additional square footage which may be added.

On the way to making that change, the City Attorney's Office met with members of the Community Development Department, Public Works Department, Building Division and Community Services Department. Staff has also been contacted by a number of condo conversion developers who may wish to convert several complexes in town. Having considered the focal issue (park in-lieu fees for new construction in a conversion) in the context of the City approval which would allow the transfer of individual units in an older, often dilapidated structure to individual purchasers, staff has encountered a larger, more important question which requires policy direction from the Council.

The Larger Issue

In a nutshell, a condo conversion allows the transfer of a single-ownership unit (e.g., an apartment building) into individual ownership interests. The developer proposing the conversion must comply with minor Building Code updates and if they retain the original structure, they are exempt from paying the park in-lieu fee on the individual units. This, therefore, acts as an incentive to keep the "old."

To date, we have not seen any developer willing to knock down and reconstruct a building, and staff believes a large deterrent to this is the prospect of having to pay the condo conversion fee. The converter might also be faced with new setbacks or increased Building Code requirements, but we continually hear that one of the chief deterrents is the park fee.

Soft Stories

This park fee topic first arose during a discussion of soft-story buildings. There are 111 soft-story buildings in the City, and several of them have been suggested for conversion by condo converters. Staff initially considered an amendment to address just the soft-story issue in the condo conversion context. That change would have required seismic upgrading prior to conversion. The seismic upgrade would not necessarily alter other structural and mechanical systems (windows, plumbing, electrical, etc.).

Waiving or Adjusting the Fee

Since the City is almost completely built out, the loss of an opportunity to garner more revenue for park development may not appear attractive. Historically, however, it does not appear that we have received any fees and, probably into the future, will not receive any fees for condo conversions because, as a disincentive, the conversion will either not occur or will occur by just "shining and spinning" the existing structures.

Adjusting the Fee

An alternative to waiving the fee would be to provide a lower fee. For example, a condo converter would still pay the full fee on any new units and would be required to pay 25 percent of the fee on all reconstructed converted units, provided they do not increase the square footage more than, for example, 30 percent.

As a practical matter, zoning density/FAR and setback restrictions may reduce or eliminate the possibility of additional square footage. However, the possibility of additional square footage in return for the partial fee may give the developer the ability to provide a safer, more updated product.

CONCLUSION

This is clearly a policy call which needs to come from the Council. For a number of reasons which can be more fully developed as part of the study session, staff prefers not to see a 30-year-old or 40-year-old building passed on to individual purchasers. For instance, if an earthquake were to hit an old apartment structure, there would be one owner to remedy the situation and, probably, one insurance company and/or one lender. If that same older structure is owned by 25 new families pursuant to a condo plan, there will be 25 different owners, lenders and insurers to deal with. In addition, renovation may be more difficult because some units will be damaged while others will not, yet all may be assessed the cost of rebuilding the units, the parking and/or the utilities.

The counterpoint to all of this is that reconstruction is a "new" project, not a conversion, and the fee should be paid. We, therefore, could just prevent conversions in older and/or soft-story buildings to avoid the potential downstream harm to the purchaser. It is likely these buildings will remain, unless there is some mandatory upgrade requirement in place, similar to the approach taken in the unreinforced masonry context.

Prepared by:

Michael D. Martello
City Attorney

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