City of Novato

&

Novato Sanitary District

Multi-Jurisdiction All-Hazard Mitigation Plan

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Section 1 - Introduction

Executive Summary

To summarize, this document contains:

- The City of Novato /Novato Sanitary District Hazard Vulnerability Analysis;
- Prioritization of City of Novato / Novato Sanitary District Hazards for mitigation activities;
- Hazard Mitigation Strategy Goals and Objectives;
- City-wide Hazard Mitigation efforts and plan input;
- City Hazard Mitigation Best Practices;
- Record of local interest groups and citizens;
- Proposed strategies and actions to reduce short and long term vulnerability to the identified hazards; as recommended by the City of Novato Hazard Mitigation Planning Committee, its sub-committees and the general public;
- Methods of implementing, monitoring, evaluating, and updating this DMA 2000 Hazard Mitigation Plan;
- Constraints to implementing Hazard Mitigation strategies and recommendations;
- The establishment of the City of Novato Hazard Mitigation Planning Committee to assist in the further development, prioritization and implementation of the recommended Hazard Mitigation strategies.

This document also provides a framework for the identification and coordination of Hazard Mitigation strategies developed by the City of Novato, Marin County and the Association of Bay Area Governments (ABAG) with other plans; especially those developed by City departments, agencies and organizations as well as those plans developed in order to file for Federal disaster assistance, as required by P.L. 106-390 (as amended) of the Disaster Mitigation Act of 2000.

Definition of Hazard Mitigation

Hazard Mitigation is any sustained action taken to eliminate or reduce long term risk to human life, property and the environment posed by a hazard.

Hazard Mitigation Planning is the process of developing a sustained course of action taken to reduce or eliminate long-term risk to people and property from both natural and technological hazards and their effects. The planning process includes establishing goals and recommendations for mitigation strategies.

Hazard Mitigation may occur during any phase of a threat, emergency or disaster. Mitigation can and may take place during the *preparedness* (before), *response* (during), and *recovery* (after) phases.

The process of hazard mitigation involves evaluating a hazard's impact and identifying and implementing actions to minimize or eliminate the impact.

Purpose of the Plan

The purpose of this plan is to integrate Hazard Mitigation strategies into the day-to-day activities and programs of the City of Novato, the Novato Sanitary District its citizens and its stakeholders.

This plan identifies and evaluates specific strategies to be considered by the City of Novato, the Novato Sanitary District and their agencies. It offers the Novato Sanitary District and a City-wide support document as well as a planning support tool for those strategies developed by the City's political subdivisions, agencies, departments, special districts and organizations.

The strategies presented are deemed appropriate and effective by recommendation of the City of Novato Hazard Mitigation Planning Committee and the City's agencies, departments and private groups and other identified stakeholders.

Upon acceptance by the California Governor's Office of Emergency Services (OES) and the Federal Emergency Management Agency (FEMA), selected strategies will be further developed for funding and implementation by the Sanitary District and City. This plan describes the potential sources of Hazard Mitigation Strategy funding. All strategies identified in this plan can only be implemented when both planning jurisdictions find it financially feasible to do so.

This plan is based upon the City of Novato Regional Hazard Vulnerability Analysis (HVA) that considers natural, technological, and human-caused risks to which the City and the Sanitary District are vulnerable. The plan describes strategies that government and private sector organizations may utilize to develop their capabilities to mitigate those hazards.

It is understood that the mitigation strategies adopted in this plan are recommendations only, and must be approved and funded by the City Council and the Sanitary District Board of Directors in order to be implemented as official Hazard Mitigation Strategies.

Mission Statement

The mission of the City of Novato Multi-jurisdiction, All-Hazard Mitigation Plan is to establish and promote a comprehensive mitigation policy and program to protect citizens, city and private property and facilities, the infrastructure and the environment from natural and man made hazards.

Plan Adoption

Process

The Hazard Mitigation Plan Draft will be reviewed, and approved by the City of Novato's Hazard Mitigation Planning Committee and forwarded to the City of Novato City Council and the Novato Sanitary District Board of Directors for approval, and then forwarded to the State of California Office of Emergency Services (OES) and the Federal Emergency Management Agency (FEMA) for review and a passing requirement status.

Ongoing Maintenance and Procedures

The City of Novato's Hazard Mitigation Planning Committee shall review and revise the plan every 12 months: That review will be initiated by the City of Novato's Assistant City Manager, and Novato Sanitary District's Staff Engineer.

The Assistant City Manager will be responsible for appointing and contacting the Committee members on an annual basis by written correspondence. The Plan will be distributed to the lead team members to review, comment, and submit changes in their respective departments, district, or jurisdiction. The Assistant City Manager will be the Chairperson for this review and will reconvene the committee after an agreed upon time to collaborate and adopt appropriate updates.

The Plan updates will include information on:

- The progress of mitigation programs/projects.
- New mitigation strategies to reduce loss or damage to facilities and potential loss of lives.
- Identify, if any, hazard vulnerability to the City of Novato and the Novato's Sanitary District, through data from expert sources. The Committee will reprioritize hazards if appropriate.
- Budgetary reports and grant opportunities, to identify funding constraints or funding opportunities.
- Reevaluate their Capability Assessment for technical, political, legal, or services abilities.
- Review and incorporate public involvement.

The City of Novato and the Novato Sanitary District will have the opportunity to implement recommended action items through existing programs and procedures that are deemed appropriate. Upon adoption of the Plan, the multi-jurisdictional participants can use the Plan as a baseline of information on the natural hazards that impact the region.

Every five years after initial approval, the Committee shall be reconvened to conduct a plan update after which the Plan shall be submitted through proper channels to FEMA for re-approval.

Continued Public Involvement

The City of Novato is dedicated to involving the public directly in review and updates of the Plan. The planning jurisdictions will continue to communicate hazard information to the public through handouts and the local government television station as appropriate and as resources are available. The City and Sanitary District will implement a public input questionnaire for additional public participation.

A representative from both planning jurisdictions will be responsible for monitoring, evaluating, and updating the Plan as described above. During all phases of Plan maintenance, the public will have the opportunity to provide feedback. A copy of the Plan will be publicized and available for review on the City of Novato's website. In addition, copies of the plan will be catalogued and kept at all of the appropriate participation places within the City as identified by the committee. The existence and location of these copies will be posted on the City of Novato website. The site will contain contact information for City of Novato and the Novato Sanitary District to which people can direct their comments and concerns.

All public feedback will be forwarded to the appropriate Hazard Mitigation Planning Committee for review and incorporation (if deemed appropriate).

A press release requesting public comments will be issued after each evaluation or when deemed necessary by the City of Novato Hazard Mitigation planning committee chairperson. The press release will direct people to the website or appropriate local agency location where the public can review proposed updated versions of the Plan. This will provide the public an outlet for which they can express their concerns, opinions, or ideas regarding an outlet through any updates/changes that are proposed to the Plan. The Hazard Mitigation Planning Committee members will assure the resources are available to publicize the press releases and maintain public involvement through public access channels, web pages, and newspapers as deemed appropriate.

- Document the progress on the implementation of hazard mitigation strategies
- Review and update changes as appropriate to the Plan.

The Plan will be re-submitted to the California Office of Emergency Services (OES) and FEMA every 5 years as required for review and approval.

Legal Authority

Federal Laws

Federal legislation has historically provided funding for disaster relief, recovery, and hazard mitigation projects and planning. The Disaster Mitigation Act of 2000 (DMA 2000) is legislation to improve this planning process (Public Law 106-390). The legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, the DMA 2000 legislation establishes a pre-disaster hazard mitigation program and requirements for the national post and pre-disaster Hazard Mitigation Grant Programs (HMGP).

Section 322 of DMA 2000 specifically addresses mitigation planning at the state and local levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive, enhanced mitigation plan prior to a disaster. States and communities must have an approved mitigation plan in place prior to receiving post-disaster HMGP funds. Local and tribal mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to and the capabilities of the individual communities.

FEMA prepared an Interim Final Rule, published in the Federal Register on February 26, 2002 (44 CFR Parts 201 and 206), which establishes planning and funding criteria for states and local communities. This Plan has been prepared to meet FEMA and State of California's Office of Emergency Service's (OES) requirements thus making the City of Novato and the Novato Sanitary District eligible for funding and technical assistance from state and federal hazard mitigation programs.

State Laws

California has many laws and programs relating to hazard mitigation, the most effective of which include:

- Cal OSHA
- California Earthquake Hazards Reduction Act of 1986
- Caldrons' Seismic Retrofit Program
- California Fire Alliance
- California Earthquake Authority's Seismic Retrofit Program

- FEMA National Flood Insurance Program (NFIP), administered by the DWR
- State Planning Law

The following are state laws and executive orders related to hazard mitigation:

- Executive Order W-18-19
- Executive Order W-9-91
- Health & Safety Code §19211
- Health & Safety Code §19181.
- Public Resources Code §2621, et seq. (the Alquist-Priolo Earthquake Fault Zoning Act)
- California Environmental Quality Act Law and Guidelines (CEQA)
- Government Code 65302(g) General Plan Safety Element

The California Environmental Quality Act requires a thorough analysis of potential environmental consequences resulting from a development project or from a plan that guides future development. CEQA provides a means by which City officials and the general public can identify the potential impacts a project will have on the community, and to allow for mitigation or avoidance of such impacts.

Local Codes & Ordinances

The City of Novato and the Novato Sanitary District have adopted the most recent State of California approved Uniform Building Code, Uniform Mechanical Code, Seismic Safety Code, and National Electrical Code which contain structural requirements for existing and new buildings. The codes are designed to insure structural integrity during seismic and other hazardous events and prevent personal injury, loss of life and substantial structural damage. To protect public safety, development in City of Novato will be subject to these codes. The City is prepared to adopt new codes and standards as passed by the State of California.

The Novato Sanitary District Ordinance # 70 regulates the use of public and private sewers and drains, the installation of sewer laterals and public sewer main extensions providing permits and fixing fees for the installation and connection of sanitary sewers, regulation the discharge of waters and wastes into the public sewer system and providing penalties for the violation of provisions thereof.

City of Novato Mitigation Constraints

The City of Novato and the Novato Sanitary District, are surrounded by large open areas and adjacent Marin County Jurisdictions and are not in a position to make regional decisions regarding major disaster plans beyond their borders, including regional evacuation, water supply, fire and emergency medical response.

The City receives its water from one dedicated supplier, and is served by one Sanitary District who is a planning jurisdiction and participant in this Plan. The staff available in both jurisdictions to assist in emergency, planning, preparedness and response is relatively small.

Section 2 –Planning Process

Hazard Mitigation Planning Participation

Planning Committee Members

Mary Neilan	Assistant City Manager
Nancy Andrews	Senior Management Analyst, Police Department
Scott Sibbald	Captain, Police Department
Steve Wallace	Director, Public Works
Richard Scott	GIS Coordinator, Public Works
Hans Grunt	Senior Planner, Community Development Department
Ron Averiette	Chief Building Official, Community Development Department
Bill Philbrick	Superintendent of Maintenance Public Works Department
Dan Weakley	Human Resources Manager
Rich Hill	Sergeant, Police Department
Forrest Craig	Division Chief, Novato Fire Protection District
Drew McIntyre	Chief Engineer, North Marin Water District
Carmela Chandrasekera	Assistant Engineer, North Marin Water District
Bill Northcroft	Staff Engineer, Novato Sanitary District
Deborah Smith	Citizen Representative
Janice Rogala	Consultant
Ursula E. Hanks	Assistant ES Coordinator, Marin County Office of Emergency Services

Hazard Mitigation Planning Committee By-laws

1. The CITY OF NOVATO and THE NOVATO SANITARY DISTRICT Hazard Mitigation Planning Committee was organized on January 11, 2005. The NOVATO SANITARY DISTRICT officially became a participating member in March of 2005.

2. Members of the CITY OF NOVATO and THE NOVATO SANITARY DISTRICT hereinafter referred to as Hazard Mitigation Planning Committee agreed to and elected a chair/co-chair.

3. Members of the Hazard Mitigation Planning Committee agree to meet bi-weekly or as needed to identify hazard priorities and review, identify and implement the hazard mitigation strategy recommendations as financially feasible.

4. The Hazard Mitigation Planning Committee agrees to make and pass policy recommendations by a vote of a simple majority of those members present at the scheduled meeting.

5. Any single Hazard Mitigation Planning Committee member may request, at a scheduled meeting of the Hazard Mitigation Planning Committee as a whole, an adoption of, or amendment to the plan or process.

6. The Hazard Mitigation Planning Committee may form subcommittees to review and develop those feasible hazard mitigation strategy recommendations identified that will be reviewed by the Hazard Mitigation Planning Committee as a whole.

7. The sub-committees or members will identify and bring forward hazard mitigation strategies from existing recommendations contained in plans and documents, and from the input of inter-city departments, committees, commissions, private citizens and organizations.

8. The Hazard Mitigation Planning Committee will identify constraints to mitigation strategies that affect ability, authority and responsibility to implement those strategies.

9. Public Input will be implemented in the following manner: Public Meetings, Public out reach through local governmental Television Program, invitations to the public to attend Planning Committee Meetings and a public questionnaire distributed by members departments and on the internet.

Hazard Mitigation Planning Tasks

1. Coordinate all-hazard mitigation planning tasks and activities with the Planning Jurisdictions administrative staff and departments to develop a multi-hazard disaster mitigation plan and support the Hazard Mitigation Planning Committee chair/co-chair's oversight of the planning process.

2. Assist in carrying out the goals and objectives of the Planning Jurisdictions Hazard Mitigation Plan in compliance with FEMA DMA 2000 Hazard Mitigation Act.

3. Prioritize risks for implementing mitigation strategies.

4. Select designated critical facilities owned by the planning jurisdictions and in proximity to their facilities, and develop a risk exposure analysis for those facilities.

5. Select highest priority and most-desired hazard mitigation strategy recommendations and develop those recommendations for further action by each member of the Hazard Mitigation Planning Committee.

6. Review mitigation planning drafts, recommendations and updates.

7. Develop and implement long and short-term goals for implementation of the Hazard Mitigation Plan and strategies.

8. Coordinate and reference the plan with the City of Novato's Multi-hazard Functional Plan, Flood Hazard Mitigation Plan and Safety Element to the General Plan.

9. Coordinate and reference the Plan with the Novato Sanitary District's internal plans and policies.

10. Provide for the implementation of Planning Committee recommendations.

11. Encourage development of, coordinate and implement a methodology for the implementation of public input.

12. Establish Hazard Mitigation Planning Committee responsibilities to include but not be limited to the following:

    - Determine implementation ability and constraints for proposed Hazard Mitigation planning steps and development of strategies
    - Bring forward community concerns through private and public input
    - Identify implementation resources
    - Identify lead departments, commissions and committees for implementation of strategies
    - Provide for the update of the Disaster Mitigation Plan on a regularly scheduled basis
    - Evaluate and carry out mitigation activities, as feasible.
    - Assist in implementation of funding identification and procurement

13. Coordinate planning efforts with Marin County and the Association of Bay Area Governments in order to participate in a multi-jurisdictional planning effort as feasible.

Hazard Mitigation Planning Goals

The goals and objectives were developed by considering the risk assessment findings, localized hazard identification and loss/exposure estimates, and an analysis of the planning jurisdictions current capabilities assessment. These preliminary goals, objectives and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities.

1. Support the priorities of the planning jurisdictions; their mandates, employees, citizens and the business community.

2. Promote economic development consistent with seismic, floodplain and risk management guidance as developed by the CITY OF NOVATO, the NOVATO SANITARY DISTRICT and their departments, committees and/or commissions.

3. Provide for an effective public awareness program for natural, human-caused and technological hazards present in the planning area

4. Encourage scientific study and the development of data to support mitigation strategies for those hazards that are a threat to the planning jurisdictions.

5. Promote the recognition of the value of hazard mitigation to public facilities, public safety and the welfare of all citizens of the planning jurisdictions.

6. Support the mitigation efforts of local governments, private citizens, non-profit organizations, community-based organizations and private businesses throughout the city.

Hazard Mitigation Planning Objectives

1. Identify mitigation actions to reduce loss of lives and property.

2. Implement mitigation actions that are feasible, to reduce loss of lives and property.

3. Identify mitigation strategies that will allow the planning jurisdictions to perform their primary mission and goals in both day to day activities and in times of emergency.

4. Identify mitigation opportunities for short- and long-range planning considerations.

5. Maintain safe building and zoning codes that support scientific findings of a known risk.

6. Identify lead CITY OF NOVATO and NOVATO SANITARY DISTRICT Departments, Commissions and Committees that have an interest in mitigation of specific hazards.

7. Develop a standard mitigation program utilizing authorities, policies and programs of each CITY OF NOVATO and THE NOVATO Departments, Commissions and/or Committees.

8. Organize, train and maintain an effective and ongoing Hazard Mitigation Planning Committee that will facilitate implementation of the planning jurisdictions All-Hazard Mitigation Plan.

9. Review and update other CITY OF NOVATO programs to identify current and future mitigation goals and objectives in compliance with appropriate city, county, state and Federal requirements.

10. Review and update other NOVATO SANITARY DISTRICT'S programs to identify current and future mitigation goals and objectives in compliance with appropriate city, county, state and Federal requirements.

11. Gain support of the CITY OF NOVATO and NOVATO SANITARY DISTRICT'S administration for the Multi-Hazard Mitigation Plan implementation.

12. Achieve the overall goal of developing a comprehensive mitigation program with Federal, state, county and city organizations and other appropriate jurisdictions and stakeholders.

13. Support and expand identified hazard mitigation strategies as set forth in the CITY OF NOVATO Safety Element to the CITY OF NOVATO General Plan, the Novato Flood Mitigation Plan and all other CITY OF NOVATO plans that contain Hazard Mitigation Strategies.

14. Support and expand identified hazard mitigation strategies identified in the NOVATO SANITARY DISTRICT'S operational plans and documents as appropriate.

Hazard Mitigation Planning Public Participation

The Planning Committee discussed the need to establish a methodology for public input, as community involvement in the planning process is mandatory. Suggestions included posting a questionnaire on the City Website, and/or distributing copies to government buildings, Chamber of Commerce, and other public buildings. The committee agreed to implement the following method of Public Input.

SAMPLE: Public Input Questionnaire Letter

Dear Resident:

City of Novato and the Novato Sanitary District is currently developing an All-Hazard Mitigation Plan as required in the Disaster Mitigation Act of 2000 (DMA-2000). This project addresses:

Safety of Life & Property by:

Implementing activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to losses from all hazards.

Reducing losses and repetitive damages for chronic hazard events.

Public Awareness by:

Developing and implementing education and outreach programs to increase public awareness of the risks associated with these hazards.

Providing information on tools; partnership opportunities, and funding resources to assist in implementing mitigation activities.

Natural Systems

Balancing natural resource management, and land use planning with natural hazard mitigation to protect life, property, and the environment.

Preserving, rehabilitating, and enhancing natural systems to serve natural hazard mitigation functions.

Foster Partnerships and Implementation by:

Strengthening communication and coordinate participation among and within public agencies, citizens, non-profit organizations, business, and industry to gain a vested interest in implementation.

Encouraging leadership within public and private sector organizations to prioritize and implement local and regional hazard mitigation activities.

Enhancing Emergency Services by:

Establishing policy to ensure mitigation projects for critical facilities, services, and infrastructure.

Strengthening emergency operations by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.

Coordinating and integrating hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

In accordance with that law, it is our intent to solicit input regarding hazards from the communities we serve. We have enclosed a short questionnaire designed to gather information vital to an effective Hazard Mitigation Planning Project. Please take a few minutes to fill out the questionnaire and return it, no later than _____ to:
City of Novato Police Department- Attention: Nancy Andrews
909 Machin Avenue
Novato, California 94945
Thank you for supporting our commitment to making City of Novato a safe place to live.

Public Input Questionnaire

City of Novato Hazards Mitigation and Preparedness Questionnaire

This questionnaire is designed to help the Local Hazard Mitigation Plan Task Force identify the community's concerns about natural and human-caused hazards, to better understand community needs in reducing risk and loss from such hazards. The questionnaire should be completed by an adult, preferably the homeowner or the head of the household. Please, take a few minutes to complete this questionnaire. All individual responses are strictly confidential, and are for research purposes only.

1. Zip code:____ Community Name or location: _____ Internet Access ? Y/N _____ Own/Rent _____

2. How concerned are you about the following disasters affecting your community? Please give each hazard a priority rating as follows: ***0 = Not concerned; 1 = Somewhat concerned; 2 = Moderately concerned; 3 = Very concerned***

Natural:

Floods	_____	Landslide/Mudslides	_____	Fire	_____
Earthquake	_____	Telecommunications Failure	_____		
High Winds	_____	Biological-plant or animal	_____	Radiological Incident	_____
Dam Failure	_____	Health Alert/Mass Disease	_____		

Human caused: Terrorism/WMD ____ Transportation Loss _____ Utilities Interruption _____

3. What is the most effective way for you to receive information about how to make your household and home safer from natural disasters? (***Please check all that apply***.)

Media:
- ☐ Newspaper stories
- ☐ Newspaper ads
- ☐ Television news
- ☐ Television ads
- ☐ Radio news
- ☐ Radio ads

Other methods:
- ☐ Schools
- ☐ Outdoor advertising (billboards, etc)
- ☐ Books
- ☐ Mail
- ☐ Fire Department
- ☐ Internet
- ☐ Fact sheet/brochure
- ☐ Church/religious organization
- ☐ Employer
- ☐ Public meetings
- ☐ University or research institution
- ☐ Utility Bills

4. In the following list, please check those activities that you ***have done***, ***plan to do*** in the near future, ***have not done***, or are ***unable to do***. (***Please check one answer for each preparedness activity***)

Have you or someone in your household	Have Done	Plan to Do	Not Done	Unable to Do
Attended meetings or received written information on natural disasters or emergency preparedness?				
Talked with family members about what to do in case of a disaster or emergency?				
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?				
Prepared a "Disaster Supply Kit" (extra food, water, medications, batteries, first aid items and other emergency supplies)?				
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?				

5. Building a disaster supply kit, receiving First Aid training and developing a household/family emergency plan are all inexpensive activities that require a personal time commitment. How much time (per year) are you willing to spend on disaster/emergency preparedness? (***Check only one***)
☐ 0-1 hour ☐ 2-3 hours ☐ 4-7 hours ☐8-15 hours ☐16+ hours ☐ Other, please specify

6. Did you consider the possible occurrence of a natural hazard when you bought/moved into your current home?
☐ Yes ☐ No

7. Would you be willing to spend more money on a home that has features that make it more disaster resistant?
☐Yes ☐ No ☐ Don 't know

8. Do you carry flood insurance? If so what is the annual cost?
☐Yes ☐ No _____

9. Would you be willing to make your home more resistant to natural disasters?
☐ Yes ☐ No (***If you answered NO skip to question11)***

10. What nonstructural or structural modifications for earthquakes and floods have you made to your home?
(***Please check all that apply***)

10a. Nonstructural
Anchor bookcases, cabinets to wall
Secure water heater to wall

Install latches on drawers/cabinets
Fit gas appliances with flexible connections
concrete walls and
☐ Others (please explain)
Others (please explain)
☐ None

10*b. Structural*
☐ Secure home to foundation
☐ Brace inside of cripple wall with sheathing
☐ Brace un-reinforced chimney
☐ Brace un-reinforced masonry and foundations

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property					
Protecting critical facilities (hospitals, transportation networks, fire stations)					
Preventing development in hazard areas					
Protecting natural environment					
Protecting historical and cultural landmarks					
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses					
Protecting and reducing damage to utilities					
Strengthening emergency services (police, fire, ambulance)					

11. Natural and human-caused disasters can have a significant impact on a community but planning for these events can help lessen the impact. The following statement will help us determine community priorities for planning for those hazards. Please tell us how important each one is to you.

12. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters.

Communitywide Strategies	Agree	Neutral	Disagree	Not sure
I support a regulatory approach to reducing risk.				
I support a non-regulatory approach to reducing risk.				
I support policies to prohibit development in areas subject to natural hazards.				
I support the use of local tax dollars to reduce risks and losses from natural disasters.				
I support protecting historical and cultural structures.				
I would be willing to make my home more disaster-resistant.				
I support steps to safeguard the local economy following a disaster event				
I support improving the disaster preparedness of schools.				

Mail to: City of Novato Police Department
909 Machin Avenue
City of Novato, CA 94945
Attention: Nancy Andrews

Synopsis of Public Input

City of Novato & Novato Sanitary District Hazards, Mitigation & Preparedness Questionnaire

This questionnaire is designed to help the Local Hazard Mitigation Committee identify the community's concerns about natural and human-caused hazards, to better understand community needs in reducing risk and loss from such hazards. The questionnaire should be completed by an adult, preferably the homeowner or the head of the household. Please, take a few minutes to complete this questionnaire. All individual responses are strictly confidential, and are for research purposes only.

1. Zip code: See Last Page Internet Access ? Y/N **94%**

2. How concerned are you about the following disasters affecting your community? Please give each hazard a priority rating as follows: ***0 = Not concerned; 1 = Somewhat concerned; 2 = Moderately concerned; 3 = Very concerned***

Natural:

Floods	3	Landslide/Mudslides	1	Fire	3
Levee Failure	1	Earthquake	3	Telecommunications Failure	1
High Winds	1	Biological_plant_or_animal	1	Radiological Incident	1
Dam Failure	0			Special Events	0
Health Alert/Mass Disease	1	**Human caused:**		Terrorism	3
		Transportation Loss	1	Utilities Interruption	1

3 What is the most effective way for you to receive information about how to make your household and home safer from natural disasters? (***Please check all that apply***.)

Media:

- ☐ Newspaper stories **66%**
- ☐ Newspaper ads **6.7%**
- ☐ Television news **6.7%**
- ☐ Television ads **53%**
- ☐ Radio news **26%**
- ☐ Radio ads **0%**

Other methods:

- ☐ Schools **20%**
- ☐ Outdoor advertising (billboards, etc) **13%**
- ☐ Books **0%**
- ☐ Mail **66%**
- ☐ Fire Department **53%**
- ☐ Internet **53%**
- ☐ Fact sheet/brochure **60%**
- ☐ Church/religious organization **6%**
- ☐ Employer **52%**
- ☐ Public meetings **46%**
- ☐ University or research institution **7%**
- ☐ Utility Bills **53%**

4 In the following list, please check those activities that you ***have done***, ***plan to do*** in the near future, ***have not done***, or are ***unable to do***. (***Please check one answer for each preparedness activity***)

Have you or someone in your household:	Have done	Plan to do	Not done	Unable to do
Attended meetings or received written information on natural disasters or emergency preparedness?	64%	18%	18%	0%
Talked with family members about what to do in case of a disaster or emergency?	73%	9%	18%	0%
Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a disaster?	55%	18%	17%	9%
Prepared a "Disaster Supply Kit" (extra food, water, medications, batteries, first aid items and other emergency supplies)?	27%	45%	27%	0%
In the last year, has anyone in your household been trained in First Aid or Cardio-Pulmonary Resuscitation (CPR)?	55%	9%	36%	0%

5 Would you be willing to make your home more resistant to natural disasters?
☐ Yes **92%** ☐ No **7%** (***If you answered NO skip to question 7***)

6. What nonstructural or structural modifications for earthquakes and floods have you made to your home?
(***Please check all that apply***)

6a. Nonstructural

- ☐ Anchor bookcases, cabinets to wall **53%**
- ☐ Secure water heater to wall **93%**
- ☐ Install latches on drawers/cabinets **30%**
- ☐ Fit gas appliances with flexible connections **69%**
- ☐ Others (please explain) **46%**
- ☐ None **41%**

6b. Structural

- ☐ Secure home to foundation **58%**
- ☐ Brace inside of cripple wall with sheathing **25%**
- ☐ Brace unreinforced chimney **8%**
- ☐ Brace unreinforced masonry and concrete walls and foundations **0%**

7. Natural and human-caused disasters can have a significant impact on a community but planning for these events can help lessen the impact. The following statement will help us determine community priorities for planning for those hazards. Please tell us how important each one is to you.

Statement	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important
Protecting private property	77%	15%	8%	0%	0%
Protecting critical facilities (hospitals, transportation networks, fire stations)	96%	0%	4%	0%	0%
Preventing development in hazard areas	92%	0%	8%	0%	0%
Protecting natural environment	58%	17%	18%	0%	16%
Protecting historical and cultural landmarks	38%	35%	14%	8%	0%
Promoting cooperation among public agencies, citizens, non-profit organizations and businesses	85%	15%	0%	0%	0%
Protecting and reducing damage to utilities	92%	8%	0%	0%	0%
Strengthening emergency services (police, fire, ambulance)	69%	15%	8%	0%	8%

8. Please check the box that best represents your opinion of the following strategies to reduce the risk and loss associated with natural disasters.

Communitywide Strategies	Agree	Neutral	Disagree	Not Sure
I support a regulatory approach to reducing risk.	50%	25%	8%	17%
I support a non-regulatory approach to reducing risk.	33%	50%	17%	0%
I support policies to prohibit development in areas subject to natural hazards.	92%	8%	0%	0%
I support the use of local tax dollars to reduce risks and losses from natural disasters.	62%	23%	15%	0%
I support protecting historical and cultural structures.	46%	31%	23%	0%
I would be willing to make my home more disaster-resistant.	85%	8%	8%	0%
I support steps to safeguard the local economy following a disaster event	85%	15%	0%	0%
I support improving the disaster preparedness of schools.	92%	0%	0%	8%

THANK YOU VERY MUCH FOR PROVIDING THIS INFORMATION

The survey respondents as of August 22, 2005 are…

19 Web surveys and 39 paper surveys for a total of 58 surveys

Responses per Zip Code

94945 20%
94947 40%
94948 0%
94949 40%

SAMPLE: Jurisdiction & Stakeholder Invitation Letter

City of Novato

(addressee)(Surrounding Cities and the County)

Dear "City Manager" or To Whom It may Concern

The City of Novato is currently involved in writing a Disaster Hazard Mitigation Plan under the 2002 amendment to the Robert Stafford Act (PL 93-288) for reduction of damage from both natural and man caused risks that can affect our City. City of Novato shares common borders with your jurisdiction and our jurisdiction may share some mutual corresponding risks, such as earthquake, flood, dam failure, wildland/urban interface fire, and other disaster hazards.

We are inviting your comments and input into the City of Novato Hazard Mitigation Plan. The Hazard Mitigation Planning Committee (would will) consider projects that you may want the City to participate in for the reduction of risks between our two cities. Attached for you consideration is the list of Disaster Risk priorities in the order they were ranked by the Planning Committee and are being considered for mitigation strategies by the City.

Nancy Andrews, of the City of Novato Police Department, is the Chairperson for the City of Novato Hazard Mitigation Planning Committee. The committee meets April 5 and April April 19, 2005. Your concerns and Hazard Mitigation Strategy input would be both helpful and welcome. Thank you for your consideration.

Sincerely,

Nancy Andrews, Chairperson

Hazard Mitigation Planning Stakeholders

The following organizations are stakeholders in the City of Novato-Novato Sanitary District Hazard Mitigation Program:

- Novato Fire Protection District
- Association of Bay Area Governments
- Water Districts
- Pacific Gas & Electric
- Kaiser Permanente Hospital
- Metro Link Transportation
- Novato Unified School District
- California Highway Patrol
- Chamber of Commerce
- City of Petaluma
- City of San Rafael
- Sanitary District
- Army Corp of Engineers
- Utilities
- City of Novato Historic Society
- Sonoma Marin Area Rail Transit (SMART)
- Novato Community Hospital

Planning Committee Meeting Minutes

City of Novato

Hazard Mitigation Planning Committee

Kick-off Meeting

January 11, 2005

Meeting Started at 10:00 A.M.

Present were:

Bill Philbrick	Maintenance Supervisor	wphilbri@novato.ci.ca.us
Forrest Craig	Division Chief, NFPD	fcraig@novatofire.org
Drew McIntyre	NMWD	Drewm@nmwd.com
Carmela Chandrasekera	NMWD	cchandra@nmwd.com
Rich Hill	Sgt. Novato Police Dept.	rhill@ci.novato.ca.us
Scott Sibbald	Capt. Novato Police Dept.	ssibbbald@ci.novato.ca.us
Mary Neilan	Assist. City Manager	mnelian@ci.novato.ca.us
Richard Scott	GIS Coordinator	dscott@ci.novato.ca.us
Steven Wallace	Public Works Director	swallace@ci.novato.ca.us
Ron Averiette	Chief Building Official	Raveriet@ci.novato.ca.us
Hans Grunt	City of Novato	hgrunt.@ci.novato.ca.us
Nancy Andrews	City of Novato PD	nandrews@ci.novato.ca.us
Janice Rogala	Consultant	janrogala@aol.com

Selection of a Chair and Co-chairperson

The Planning Committee elected Nancy Andrews as the Chairperson and Sgt. Rich Hill as the Co-Chairperson of the Hazard Mitigation Planning Committee.

DMA Plan Process Overview

The Consultant gave an overview of the DMA Planning Process and requirements for the Plan to pass the State and FEMA review process. A DMA 2000 Hazard Mitigation Plan requirement outline was handed out.

The following topics were discussed:

The responsibilities of the planning committee and the process required to formulate a Hazard Mitigation Plan for the City of Novato

The North Marin Water District discussed whether or not to become part of a multi-jurisdictional plan or do a separate Plan and function as a Stakeholder in the Novato Planning effort.

Discussion was also held on whether the Sanitary District would be interested in participating. Nancy agreed to contact them and see what their interest was.

A Discussion was held on what the FEMA/California OES Bench marks for the Plan were. Examples were given as follows:

- A comprehensive hazard analysis and prioritization of risks
- Documentation of the process
- Public Involvement – the process for public involvement will continue to be discussed
- Analysis of hazards, geographical, financial, past, present and future
- Collection and review of documentation and historic events
- Identification of Hazard Mitigation Strategies and goals and objectives for implementing those strategies.

- Discussion was held on what the City's expectation from their participation in the Association of Bay Area Governments Hazard Mitigation Plan efforts. It was decided the committee needs to pursue further information on this issue.
    - The participation and task outline for ABAG may affect the City of Novato's Grant Application
    - Consultant will review ABAG Plan on their website
- The committee discussed outreach to the surrounding jurisdictions and inviting them to participate as interested jurisdiction to give input in to the City's Plan.
- Discussion was held on the City of Novato's constraints to mitigation and the need for further research was identified.

The Novato Hazard Mitigation Planning Committee considered and adopted the attached Goals, Objectives and By-laws. The bylaws were changed to reflect the City of Novato as a single jurisdiction Plan for now, and to reflect the name Novato Hazard Mitigation Planning Committee.

Discussion was held on whether or not to consider an additional grant application for the community house or wait until the next grant year to submit the application. A decision was not made.

Nancy and Jan agreed to follow-up with Marin County and arrange a meeting to discuss how the Plans could share information and compliment each other.

A discussion was held on wildland fire risk in Novato and sources for follow-up data for that fire risk.

The next meeting will be held at the City of Novato Police Training Room, 909 Machin Avenue, Novato, Ca. 94945

Meeting was adjourned at 12 noon.

City of Novato/ Novato Sanitary District
Hazard Mitigation Planning Committee
Meeting Minutes
January 25, 2005

The meeting was called to order by Chairperson Nancy Andrews at 10:00 A.M.

Present were:

Ursula E. Hanks Assist.	Emergency Services	Marin County	415 499 5039
Richard Scott	GIS Coordinator	Novato	415 899-8960
Mary Neilan	Assistant City Manager	Novato	415 899 8906
Bill Philbrick	Maintenance Superintendent	Novato	415 897 4347
Hans Grunt	Senior Planner	Novato	415 897 4347
Carmela Chandrasekera	Asst. Engineer	NMWD	415 897 4133
Scott Sibbald	Captain	Novato	415 897 8913
Dan Weakley	Human Resources Manager	Novato	415 899 8913
Nancy Andrews	Sr. Mgt. Analyst	Novato	415 897 4367
Janice Rogala	Consultant		707 374 6529

The minutes of the January 11 meeting were adopted with the following changes:
Bill Philbrick was changed to Maintenance Superintendent: Carmel Chandrasekerc was changed to Carmela Chandrasekera.

Passage of the minutes included a review of the Goals, Objectives and By-laws, which have been adapted to represent a single jurisdiction. The NMWD is unable to come on board as a planning jurisdiction at this time but will continue to participate in the process as a committee member and Stakeholder.

Nancy Andrews reported she had talked with the Sanitary District and they expressed some interest in the process and will get back to her.

Between the previous meeting and this meeting the committee members reviewed the Hazard Risk Analysis Form and considered each risk presented on the form in terms of no risk, low risk, moderate risk, high risk. These risks were determined by the risk ratings per hazard taking into consideration the:

- Distribution of the risk and depth of effects for the community and State
- The size of the physical are affected
- The historic rate of recurrence of the risk
- How vulnerable the population, housing and infrastructure is to the risk
- How important the risk was to the community and the citizens

The committee then went over each risk and discussed how they had arrived at their rating and reached consensus for the placement of each hazard in the High, Moderate, and Low Risk Analysis category.

The results of the Committee's efforts are as follows:

High Risks

Earthquake
Flood
Transportation
Wildland Urban Interface Fires
Land Slides

Utility Loss
Water, Wastewater Disruption

Moderate Risks

WMD/Terrorism
Hazardous Materials
Dam Failure
Data/Telecommunications
Utility Substation

Low Risks

Aviation Disaster
Explosions
Severe Weather
Biological Health
Radiological
Economic Disruption
Tsunami
Special Events

These Risks will be reviewed once again by the committee upon completion local research and the public's input on the outcome of the process. Risk identification and prioritization will be an ongoing process throughout the planning efforts.

The consultant passed out a copy of the documentation received so far in the process and discussed whether or not there were any plans or documents that had hazard mitigation program mentioned or implemented in them that we don't yet have.

The committee had an opportunity to review the Pico Rivera Multi-jurisdiction Plan and discuss what types of components we will be looking for their expertise on in the Novato Plan.

A discussion was held on our meeting with Ursula Hanks of Marin County and she gave a brief report on the County's progress and was interested in being supportive of the Novato Plan and able to exchange data with the County and the City.

Nancy reported that she and the Consultant will be giving a brief presentation to the Historical Committee following the next meeting and that will be a step in the public input process.

Other Public input needs to be implemented as soon as the Committee ready.
Deborah Smith of the Fred Geller Foundation will be joining the committee as a Public Representative at one of the upcoming meetings. Deborah has a broad history with Disaster work.

The consultant requested each of the Departments make an effort to identify ongoing mitigation in the City and document those activities.

Nancy reported she has not heard back for the Sanitary District and that we will attempt to contact them before the next meeting.

The Consultant and the Committee discussed identifying interested stakeholders for the Committee to write letters to for comment and input. We will discuss this further at the next meeting

The County and the Consultant reported on their attempts to find the scope of work for ABAG, this information is needed so we don't make the mistake of duplication ABAG's efforts.

The City is considering a grant application for a downtown building and will make a decision by the next meeting whether to proceed or not.
Meeting was adjourned at 11:30 A.M.

Attachment to the Minutes of January 25, 2005

Hazard Mitigation Planning Committee By-laws

1. Members shall select a chair and vice-chair.

2. The CITY OF NOVATO Hazard Mitigation Planning Committee agrees to make and pass policy recommendations by a vote of a simple majority of those members present at the scheduled meeting.

3. Members of the CITY OF NOVATO Planning Committee agree to meet bi-weekly to identify hazard priorities and review, identify and implement CITY OF NOVATO hazard mitigation strategy recommendations.

4. Any individual Hazard Mitigation Planning Committee member may request, at a scheduled meeting, of the CITY OF NOVATO Hazard Mitigation Planning Committee as a whole, to request an adoption of, or amendment to the plan or process.

5. The CITY OF NOVATO Hazard Mitigation Planning Committee was organized January 11, 2005, as reflected by the minutes of that meeting, and agreed to meet bi-weekly to identify hazard vulnerabilities and feasible hazard mitigation strategy recommendations.

6. The Planning Committee may form subcommittees to review and develop those feasible hazard mitigation strategy recommendations identified that will be reviewed by the Hazard Mitigation Planning Committee as a whole.

7. The sub-committees will identify and bring forward hazard mitigation strategies from existing recommendations contained in plans and documents, and from the input of regional jurisdictions and the input of private citizens and organizations.

8. The CITY OF NOVATO Planning Committee will identify constraints to mitigation strategies that affect CITY OF NOVATO's ability, authority and responsibility to implement those strategies.

9. Public Input will be implemented in the following manner: through the distribution of questionnaires at public events and at government sites. A notice will be put in the newspaper inviting the public to attend the Planning Committee meetings and a Public meeting will be held as well as the public hearing for the adoption of the plan. The results of the survey and public input will be reported in this Plan.

Hazard Mitigation Planning Committee Tasks

1. Coordinate hazard mitigation planning tasks and activities with the CITY OF NOVATO planning staff and departments to develop an all-hazards disaster mitigation plan.

2. Assist in carrying out the goals and objectives of the CITY OF NOVATO Hazard Mitigation Plan in compliance with FEMA DMA 2000 Hazard Mitigation Act and corresponding requirements of the State of California Office of Emergency Services.

3. Prioritize risks for implementing mitigation strategies.

4. Select designated Critical Facilities owned by the City and surrounding jurisdictions in proximity to CITY OF NOVATO facilities, and develop a risk exposure analysis for those facilities.

5. Select highest priority and most-desired mitigation recommendations and develop those recommendations for further action by the CITY OF NOVATO.

6. Review mitigation planning drafts, recommendations and updates.

7. Develop and implement long- and short-term goals.

8. Develop a feasible relationship for this Plan with all phases of the City's Comprehensive Emergency Management Plan, Master Plans and General Plan Safety Element, and the individual Planning Jurisdictions appropriate plans

9. Provide for the implementation of Planning Committee decisions.

10. Encourage development of, coordinate and implement a methodology for the implementation of public input.

11. Establish Hazard Mitigation Planning Committee responsibilities to include but not be limited to the following:

    - Determine implementation ability and constraints for proposed Hazard Mitigation planning steps and development of strategies

    - Bring forward community concerns through private and public input

    - Identify implementation resources as feasible

    - Identify lead departments in each Planning Jurisdiction for implementation of strategies

    - Provide for the update of the Disaster Mitigation Plan on a regularly scheduled basis

    - Evaluate and carry out mitigation activities

    - Assist in implementation of funding identification and procurement for the implementation of mitigation strategies

Hazard Mitigation Planning Goals

- Support the priorities of the City of Novato; its mandate, employees, citizens and the business community.

- Promote economic development consistent with seismic, floodplain and risk management guidance as developed by the CITY OF NOVATO. Provide for an effective public awareness program for natural and technological hazards present in the City of Novato.

- Encourage scientific study and the development of data to support mitigation strategies for those hazards that are a threat to the Planning Jurisdictions.

- Promote the recognition of the real value of hazard mitigation to public facilities, public safety and welfare of all citizens of CITY OF NOVATO Support the mitigation

efforts of local governments, private citizens, non-profit organizations and private businesses.

- Formulate additional goals for high priority risks

Hazard Mitigation Planning Objectives

- Identify mitigation actions to reduce loss of lives and property.
- Implement mitigation actions to reduce loss of lives and property.
- Identify mitigation strategies that will allow the City of Novato to perform their primary mission and goals.
- Identify mitigation opportunities for short- and long-range planning considerations.
- Adopt safe building and zoning codes that support scientific findings of a known risk. This task is ongoing in the City of Novato.
- Identify lead Planning Jurisdiction Departments that have an interest in mitigation of specific hazards.
- Develop a standard mitigation program utilizing authorities, policies and programs of the City of Novato.
- Organize, train and maintain an ongoing and effective CITY OF NOVATO Hazard Mitigation Planning Committee that will facilitate implementation of the CITY OF NOVATO Mitigation Plan.
- Review and update other CITY OF NOVATO programs to identify current and future mitigation goals and objectives in compliance with all county, state and Federal requirements.
- Achieve the overall goal of developing a comprehensive mitigation program with Federal, State, CITY OF NOVATO and the appropriate Planning and local jurisdictions.
- Support and expand identified hazard mitigation strategies as set forth in CITY OF NOVATO Safety Element of the CITY OF NOVATO General Plan and all other CITY OF NOVATO plans that contain Hazard Mitigation Strategies.

City of Novato
Hazard Mitigation Planning Committee
Meeting Minutes
February 08, 2005

Present were:

Ron Averiette	CD/Building	Novato	415 899 8927
Dan Weakley	Human Resources	Novato	415 899 8913
Richard Scott	Public Works	Novato	415 899 8960
Nancy Andrews	PD	Novato	415 899 8906
Rich Hill	PD	Novato	415 897 4216
Scott Sibbald	PD	Novato	415 897 4357
Mary Neilan	Administration	Novato	415 899 8906
Hans Grunt	Planning	Novato	415 899 3940
Alan Shear	Administration	Novato	415 899 4133
Carmela Chandrasekera	Asst. Engineer	NMWE	415 897 4133
Janice Rogala	Consultant	Dimensions	707 374 6529

The Minutes were approved as submitted:

New Business

The committee was advised of a public input meeting that would follow this meeting with the Novato Historical Guild. We will have a further report at the next meeting

Mitigation Measures for Identified risks:

A preliminary seismic study has been done by a firm called Weir Anderson. The study lists all of the buildings that do not meet current codes and standards. There was also draft cost benefit analysis for specific buildings.

Some of the cost benefit analysis does not meet a 1:1 ration, and a decision will need to be made on its importance to the community or whether or not to redevelop the area.

Specific Buildings were discussed as need mitigation activities.

1. The Church – A survey has been completed recommending two ranges of scenarios one high and low range of cost

2. Sherman House was built in the 1800's, and needs seismic retrofit

3. Historic Community House – draft preliminary study

4. Theaters at both Novato and the Old Hamilton Air Force Base:
   Discussion was held on long term usage and benefit to the community

5. Fire Station at Hamilton was discussed as a potential museum site
   Bldg 500 the Old Hamilton Headquarters for housing artists and commercial clients

The need for mitigation strategies for the above buildings needs further consideration by the City.

The City has some historic slide areas in Pleasant Valley, a mitigation strategy would be to review development proposed in that area for earthquake and slide safety.

The Public Works representative discussed the need for a study of the bridges for seismic and flood safety and specifically measures to upgrade the decking for the pedestrian bridge by the main gate at Hamilton.

Cal-trans should be able to provide report data on the seismic safety of the bridges they have surveyed.

The City is currently adopting the Wildland Fire with amendments.

Storm drains and potential mitigation was discussed and it was identified their may be reports available to further identify areas for mitigation.

Reference was made to the Marin Consortium for Pollution Control which is a Joint Powers Authority with the intent to contact this group as a stakeholder in this process and invite their comments.

The City of Novato has warning capabilities through telephone notification utilizing reverse 911.

The City of Novato has a Chapter 19 Hill side Ordinance that speaks to mitigation of hillside problems.

The City's current siren warning system is out of service due to age of equipment and repair needs. The City will decide whether to continue with a siren warning or utilize the reverse 911 and EAS system as their primary warning capability.

The group discussed the issue with the Meadow Mobile Home Park in that there is a perception by the residents that a slide risk exists. The City owns the property and the residents own the mobile homes. There is a study by Kleinfelder from 1996 that may be able to clarify some of the issues with the Mobile Home Park.

The mitigation strategy would be to further study the hills to determine slide risk and potential mitigation. It was noted that the State of California is the permitting agency for mobile homes and does not fund seismic upgrades. Tie downs for this area would need to come from a local program.

Cost Benefit Analysis:

The methodology for cost benefit analysis was reviewed and some discussion held on the age of the buildings and condition of the City's buildings vs. the cost to bring them up to seismic safety codes.

Old Business

Risk Analysis Review:

The Committee reviewed the earthquake maps from the ABAG website and the Dam Inundation Map provided by Ms. Chandrasekera. There are no changes to the risk prioritization list at this time

Document Review

The committee was given a report on the document received so far and identified the Kleinfelder report and building reports as additional documents needed for the planning process.

Mitigation Strategies currently being practiced

The individual Departments were asked to list the mitigation measures they currently implement for the reduction of hazards.

Hazard Mitigation Constraints

The current benefit cost analysis study was listed as a constraint
Budget constraints
Manpower Constraints
Risk potential from non-City controlled facilities and land was considered

Sanitary District

Nancy reported she had not heard back from the Sanitary District and the Committee agreed to consider them a Stakeholder in the process but not a multi-jurisdictional planning partner.

Identified Stakeholder List

The members were asked to identify other potential stakeholders in the planning process

- Schools
- Transportation Providers
- State Agencies
- Joint Powers Authorities
- Special Districts operating in the City
- Chamber of Commerce
- Citizens Groups
- Neighboring jurisdictions
- Others as identified

ABAG Report

The critical facilities reports from ABAG were reviewed and found to be lacking specific information such as name and location of facility to be utilized for our planning purposes.

Ursula Hanks is requesting the scope of work that ABAG is committed to do in the Multi-jurisdictional planning effort.

SPECIAL POST MEETING REPORT:

Ms. Hanks was able to provide the consultant with a copy of the ABAG grant and the scope of work lists the following Description of Tasks:

1. Identify significant hazards and perform as risk analysis
2. Review current mitigation activities of Cities and Counties
3. Prepare a briefing book on Multi-jurisdictional Hazard Mitigation Plan
4. Hold Workshops to Develop Planning Strategies and Policies
5. Prepare and Finalize Plan
6. Conduct Plan adoption process

Meeting was adjourned at 11:30 A.M.

City of Novato
Hazard Mitigation Planning Committee Meeting
February 22, 2005

The Meeting was called to order at 10:00 A.M. by Chairperson Nancy Andrews

Present were:

Ron Averiette	CD/Building	Novato	415 899 8927
Nancy Andrews	PD	Novato	415 899 8906
Scott Sibbald	PD	Novato	415 897 4357
Mary Neilan	Administration	Novato	415 899 8906
Hans Grunt	Planning	Novato	415 899 3940
Carmela Chandrasekera	Asst. Engineer	NMWD	415 897 4133
Bill Philbrick	Public Works	Novato	415 897 4347
Bruce Stahley	Asst OES Coord.	Marin County	415 499 6584
Sandeep Karkal	Deputy Manager	NSD	415 892 1694
Deborah Smith	Public Representative		415 382 1704
Janice Rogala	Consultant		707 374 6529

New Business

Sandeep Karkal of the Novato Sanitary District was present at the meeting and expressed interest in participating as a multi-jurisdictional planning district with the City of Novato. Mr. Karkal will take the proposal back to his organization and let Nancy know the outcome

Nancy Andrews and Jan Rogala attended a Historic Guild meeting and described the hazard Mitigation Planning Process and invited their public input. Mary Neilan suggested there may be other groups who will want us to contact and meet with them and will provide us with a contact person for those groups.

Jan Rogala met with the Marin County Public Works Association and advised them of the City of Novato's planning process and invited public comment from that group. Jan was invited to the group to speak on Hazard Mitigation Planning Grants and used the opportunity to review Novato's efforts.

Discussion was held on data needs to submit the upcoming PDM 2005 Planning grant for the City of Novato. Note: The grant was completed and submitted prior to the deadline.

Ongoing discussion was held on current mitigation strategies practiced in the City and a detailed examination was given to the Novato Master Plan Safety element for potential future mitigation strategies and past mitigation strategies that have been completed. Those strategies will be outlined in the Hazard Mitigation Plan as completed, ongoing or future plans.

The group deferred the ABAG mitigation Strategies to the next meeting.

The meeting was adjourned at 11:15 A. M.

City of Novato
Hazard Mitigation Committee
Meeting Minutes
March 8, 2005

The meeting was called to order by Chairperson Nancy Andrews at 10:00 A.M.

Present were:

Ron Averiette	CD/Building	Novato	415 899 8927
Dan Weakley	Human Resources	Novato	415 899 8913
Richard Scott	Public Works	Novato	415 899 8960
Nancy Andrews	PD	Novato	415 899 8906
Rich Hill	PD	Novato	415 897 4216
Scott Sibbald	PD	Novato	415 897 4357
Mary Neilan	Assist. CM	Novato	415 899 8906
Bill Philbrick	Maint. Supt.	Novato	414 897 4349
Carmela Chandrasekera	Asst. Engineer	NMWD	415 897 4133
Deborah Smith	Public Rep.	Novato	415 382 1704
Janice Rogala	Consultant		707 374 6529

The Committee looked at the 20 plus pages of recommended and sample mitigation strategies provided by ABAG. The decision was made to remove the strategies that did not directly apply to Novato. After the potential strategy list is generated committee member most familiar with the content of the strategy will review and offer recommendations to the committee on those strategies. Nancy and Jan will meet individually with those committee members in lieu of a committee of the whole meeting on March 22, 2005.

The Committee decided to table the action of adopting the requested ABAG Plan Adoption resolution that is being circulated because they will need to see the Plan before presenting a resolution for adoption.

The City will adopt the Plan portion they are currently developing and then work with ABAG to see if they wish to include this Plan as part of the ABAG Plan and how that may best be done.

The Committee is looking into a place to hold a Public Meeting in April, and will be posting the April 5th. meeting as open to the public for comment. Nancy will follow-up on what needs to be done. Nancy and Jan would be available to meet with groups as invited and provide more public opportunities. There was a discussion of putting a mitigation program on the local public T.V. station.

Jan advised the Committee that the Sanitary District did wish to participate in the City's effort. Sandeep Karkal is the Sanitary Department Deputy Manager- Engineer and will be representing the District. Mr. Karkal had a previous commitment and could not attend this meeting. Jan Rogala will be contacting him separately and bringing the District up to date on the planning efforts.

It was reported that the Committee had determined that no seismic retrofitting has occurred on the bridges and overpasses for Freeway 101 segment that passes through Novato. There has been some work on footings of one bridge due to settlement.

It was also determined that the City did not have a specific drainage bond issue.

The members reviewed the estimated values in the GASBE report and discussed looking at the insurance replacement cost documents or utilizing an average cost per square foot for establishing replacement cost for City owned buildings.

Jan will be contacting Ursula for the Marin County Historic Wildfire Data for Novato, and also reviewing the Novato Fire District's Compliance Document. Discussion was held on the relationship between the City and the Fire District. The City is very pleased with the service it receives from the Novato Fire District and will rely on the District to make hazard mitigation recommendations for the City's Plan.

A report was given on the PDM 2005 planning grant application that was submitted to FEMA and State OES for funding to cover the cost of this Mitigation Planning project.

Dick Scott brought a sample City Map that shows some topographical detail for the City and looked at the maps from the City's Master Plan for making PDF copies for the Plan. Some discussion was held on the size of the City's flood map and to divide it into 4 sections to include in the plan.

Documents provided at the meeting:

City of Novato Community House Renovation Study
Novato Fire Protection District Fire Inspection Report
Draft City of Novato Preliminary Building Evaluation, This is a draft and not for public distribution.

Meeting was adjourned at 11:15 A. M.

Notice:

The Marin County Public Works Association will be hosting a meeting at the Larkspur City Hall and they will be discussing DMA 2000 with Ursula Hanks of Marin County and Robert McCord of FEMA. Jan Rogala will be attending that meeting. If you have any questions to raise with FEMA please let Jan know or come to the meeting. Robert McCord is a very knowledgeable and supportive FEMA representative.

City of Novato
Hazard Mitigation Planning Committee
Minutes

April 5, 2005

The meeting was called to order by Chairperson Nancy Andrews at 10:00 A. M.
Introduction of Members:

Present were:

Ron Averiette	CD/Building	Novato	415 899 8927
Richard Scott	GIS Coordinator	Novato	415 899 8960
Nancy Andrews	PD	Novato	415 899 8906
Scott Sibbald	PD	Novato	415 897 4357
Mary Neilan	Administration	Novato	415 899 8906
Hans Grunt	Planning	Novato	415 899 3940
Carmela Chandrasekera	Asst. Engineer	NMWE	415 897 4133
Bill Philbrick	Public Works	Novato	415 897 4347
Janice Rogala	Consultant		707 374 6529
Richard Rogala	Consultant		

New Business
Report on March 22, Best Practices Subcommittee Reports

Subcommittee participants were:
Dan Weakley, Human Resources
Mary Neilan, Assistant City Manager
Dick Scott, Engineering Technician GIS
Bill Philbrick, Maintenance Superintendent
Ron Averiette, Chief Building Official
Hans Grunt, Senior Planner

Each of the participants reviewed the ABAG suggested mitigation strategies and identified those practices that already exist in the City of Novato. Those practices are substantial and will be outlined in the plan as "best practices by the City" in the Plan. The individual representatives also identified those future mitigation strategies that the City was considering as future practices.

Report on Subcommittee Meetings held March 22, 2005

1. Review of ABAG Mitigation Strategies converted to Best Practices:
   The committee was given copies of the results of the meetings of current Best Practices to review and make corrections or additions for representation in the Plan.

Old Business

1. Novato Sanitary District Participation: it was reported that the sanitary District will participate and the planning committee approved their joining as a multi-jurisdictional agency. Sandeep Karkel has called to report he was unable to attend the meeting but the District will participate in the plan.

2. Public Out Reach – Nancy reported that the notice for the first public participation meeting will be published for the May 3 meeting in the paper and in key City locations, and that she will secure a room for the public participation meeting.

3. A presentation for the public regarding the City's planned hazard mitigation strategies will be held on Tuesday, May 17,7pm at the Margaret Todd Senior Center, meeting room #3. This meeting will be discussed further at our May 3 meeting.

4. Review Values in the GASBE Report: Updates were given for the City's values in keeping with replacement value and not depreciated value.

5. County of Marin Hazard Plan's Historical Wildfire Data for Novato: A review of the Fire Departments Marin County historical fire responses and urban fire interface areas was held.

6. Report on planning grant: A report was given that the FEMA PDM 05 Planning Grant Application had been found to meet the eligibility criteria by State OES and forwarded to FEMA for consideration. This is the first hurdle in getting the funding. The grant is now before FEMA for consideration.

7. Hazard Mitigation Strategies: No new strategies were developed at this meeting outside of those identified in the subcommittee meetings. Further discussion was held on future grants for seismic retrofit for City Buildings and development of studies and plans for those buildings.

8. Rich Rogala of Dimensions Inc. was introduced, and his project to establish the EOC response capabilities for existing resources was discussed. The last step in that process is to organize those resources and make them readily accessible to the EOC.

The committee received the City of Novato Draft Ordinance for adopting the 2003 edition of the International Urban Wildland Fire Interface Code that is ready for adoption.

The Committee received the following maps for use in the Plan

Waterways Map
Historic Baylands
Scenic Resources
Inundation Map of Novato Creek Dam
Gnoss Field future noise Contours and flight track map
Hamilton Army Airfield Reuse Plan Map
Future Noise Contours
Sensitive Noise Receptors
Fire Hazards and Response Constraints 1995
Flood Hazards
Slope Instability
Earthquake Hazard Zones
Bikeways
Projected Traffic Volumes 1995
Existing and Planned Street System
Future Park Development
Questions on how to read
Park and Recreation Facilities and Trails
Open Space
Scenic Resources
Historic Baylands
Waterways
Fire Hazard and response constraints 1996
Special Flood Hazard Areas and 500 Year Flood – General overall map
Special Flood Hazard Areas specific set of 4 maps City of Novato 2004

Also received: The Hamilton Army Airfield Reuse Plan October 1996

The meeting was adjourned at 11:30 A.M. and the Next Meeting will be a Public Meeting at 10:00 A.M. at the Police Department Training Room on May 3, 2005.

City of Novato
Hazard Mitigation Planning Committee
Public Meeting
May 3, 2005

The meeting was called to order by the Chairperson Nancy Andrews at 10:00 A. M.

Members Present:

Bill Northcroft	Novato Sanitary District
Carmela Chandrasekera	North Marin Water District
Richard Scott	Novato GIS Coordinator
Francesca Stafford	Novato Resident
Dan Weakley	Novato Human Resources Manager
Rich Hill	Novato Police Department
Bill Philbrick	Maintenance Supervisor
Hans Grunt	Senior Planner
Janice Rogala	Dimensions Unlimited Inc.

Consideration of Minutes from April 5, 2005 meeting:

The committee considered and passed the April 5, 2005 meeting minutes

New Business:

Nancy Andrews reported she had advertised this meeting as being open to the public and posted the meeting agenda in public areas.

Introduction of Public Participants: Francesca Stafford explained her interest in hazard mitigation and interest in what the committee was accomplishing.

A discussion was held on the upcoming Public Hazard Mitigation Meeting and Briefing.

The meeting will include discussion on the following points for presentation to members of the public:

- Hazard Analysis
- Planning Process
- Identification of Mitigation Strategies
- GIS Mapping Available
- Public Opportunities for participation

Question and Answer Period

Public Recommendations

Report on Subcommittee Meetings held March 22, 2005

Review and update of ABAG Mitigation Strategies that were reviewed and converted to Best Practices and potential mitigation strategies with the participants.

Old Business

Sanitary District Participation reported they were going to be a full participant in the plan.

Public input is available through the City's website on Survey Monkey and several citizens have filled out the report.

The meeting was adjourned at 11:30 A. M.

THE CITY OF
NOVATO
CALIFORNIA

City of Novato
Hazard Mitigation Planning Project
Public Meeting

May 17, 2005
7:00 P. M.

Agenda

Open Meeting	**Nancy Andrews**
Introductions	**Nancy Andrews**
Presentation of Hazard Mitigation Planning Requirements	**Jan Rogala**
Review of Risk Maps	**Jan Rogala**
Public Comments on Risk Analysis	**Open**
Public Hazard Mitigation Strategy Proposals	**Open**
Questions	**Open**
Meeting Adjourned	

City of Novato Public Meeting Minutes

Hazard Mitigation Planning Project
May 17, 2005

Present were:

Nancy Andrews	City of Novato
Janice Rogala	Consultant
Dick Scott	City of Novato
Bill Northcroft	Novato Sanitation District
Debra Smith	Public Representative

Nancy Andrews reported she advertised the meeting in the local newspaper and sent letters to stakeholders and interested parties.

As no one from the public came to the meeting the Planning Committee members present reviewed the GIS maps produced by the Novato GIS Coordinator Dick Scott. No recommendations were provided to the committee for consideration.

The meeting was adjourned at 8:00 P. M.

City of Novato Subcommittee Meeting Documentation

June 14, 2005

On June 14, 2005 the Novato Hazard Mitigation Subcommittee held four subcommittee meetings with the following members to discuss individual department input to the Hazard Mitigation Plan. Each of the meetings were facilitated by the planning consultant: Janice Rogala.

Subcommittee Members

Bill Philbrick	Maintenance Superintendent
Dick Scott	GIS Coordinator
Ron Averette	Chief Building Official

Each of the subcommittee members submitted their additional hazard mitigation strategies at these meetings to be incorporated into the plan.

City of Novato
Hazard Mitigation Planning Committee
Agenda
March 28, 2006

Introduction of Members

Present were: Mary Neilan
Dick Scott
Nancy Andrews
Janice Rogala
Bill Northcroft
Camela Chandrasekera
Dave Jefferies
Jim Berg
Ron Averiette
Hans Grunt
Rich Hill

Old Business:

Plan Reviews

Planning Committee members advised they had not had an opportunity to fully review the plan and Mary, Dick and Nancy agreed to take on the review tasks and complete and have the Plan back to Dimensions in late May or early June 2006.

FEMA Cross Walk Discussion:

Each member of the Committee received a copy of the FEMA crosswalk for Plan approval. Jan went over sections that will need to be included such as the resolution and the adoption by the City Council and the Sanitation District Board.

Approval Process

Jan explained the OES FEMA review process and that it could take from 1 to 2 months for FEMA to review the Plan and get back to the City with comments. Generally we are finding there are one or two minor changes they request with each Plan, and will send a compliance letter when the changes they request are added.

STAPLEE inclusion –

A copy of the FEMA STAPLEE methodology for doing a cost benefit analysis of the project was passed out to the committee members. Jan explained that even after the City Council and the Committee has held public hearings and done financial analysis of its own on the individual mitigation strategies that we will have to address this in this format in the Plan.

Attachment of Flood Mitigation:

Dick Scott requested the current Flood Mitigation Plan be attached as an annex and the new flood mitigation planning efforts be added.

Mitigation Strategies

Jan asked if there were any new or changes to mitigation strategies already submitted or additional ones to add. The group said they had provided all the ones identified in the individual meetings with each Department and were satisfied with the strategies.

New Business:

2006 Flood Damage –

CD from Council Meeting

Jan explained that we were having this extra meeting because of the January 2006 floods, and the input to the City Council on the CD that Dick Scott had provided.

Mitigation Strategies from last flood event

Jan asked the question of whether or not the City had any additional strategies due to this flood or public input clarification.

Mary Neilan expressed her concerns that the mitigation projects to respond to damage caused to private residences was primarily Marin County Flood Control District projects and we had already covered what the City could do.

Jan advised that she has been unable to get a return phone call from the Flood Control District but would pursue a summary of their Capital Projects and responsibilities for future plans.

The Public Works representatives advised that the City did not have any significant damage to City properties, and Bill Northcroft of the Sanitary District advised they suffered very little damage also and did not have any further strategies to add to the Plan.

Other Business As Identified.

Mary Neilan advised at this time the City did not foresee applying for any post or pre-disaster grants.

Meeting was adjourned.

Section 3 – Demographics & Statistics

City of Novato

History

Once the hills and valleys of Novato were the hunting grounds of Miwok Indians who had a village north of Novato at Olompali which is now a State Historic Park. In 1843, Olompali was granted to a Native American, Camilo Ynitia, who raised wheat and became a successful cattle breeder. The area that now includes Ignacio, Hamilton Field, and Bel Marin Keys was once part of land granted to Ignacio Pacheco. Most of the present City of Novato was known as Rancho de Novato in 1839 when it was granted to Fernando Feliz who served in the Mexican Army. The Rancho had a number of owners before Francis DeLong and Joseph Sweetser formed a partnership and bought the property about 1856.

When Marin County was organized in 1850, there were 4 townships: San Rafael, Novato, Sausalito and Bolinas. The City of Novato was incorporated in January of 1960 as a general law city. The Novato Sanitary District was organized October 5, 1925 and was called Sanitary District Number 6.

Hamilton Field: in the late 1920's the local citizens learned the War Department was considering new West Coast defense facilities including a new airbase in California. The Citizens of the City of Novato worked to bring that airbase to Novato in order to provide jobs during the Depression and were successful in their efforts. On May 12, 1935 Hamilton Air Field was dedicated in honor of Lt. Lloyd Hamilton, the first American pilot to fly with the Royal Flying Corps during W.W.I. This airfield was a prime World War II bomber, pursuit and transport aircraft facility. The Base was decommissioned in 1974 and was designated a Historic District in 1998.

Description

The City of Novato is the northernmost city in Marin County, located 29 miles north of San Francisco on Highway 101 across the Golden Gate Bridge, and 37 miles northwest of Oakland. Incorporated in 1960, Novato has the distinction of being the area's newest and largest city in land area, covering 28 square miles. Novato is California's 153rd largest city. The Novato Fire Protection District covers an area of 71 square miles, which includes 15,000 acres of open and park space. The highest point in Novato is Mt. Burdell at 1,558 feet. The elevation in downtown Novato is 18 feet.

Novato has a rural atmosphere largely because of its low population density and the high amount of open space and parks in and near the city. Novato's population density is about one-half that of San Rafael, and is nearly one-third that of Petaluma and Vallejo. Novato's sphere of influence contains seven county-maintained open space preserves with more than 2,600 acres of open space-including 1,600 acres surrounding Mt. Burdell in Northern Novato. Including Olompali State Park, just north of Novato, the total is nearly 3,500 acres. The city itself is home to a total of twenty-seven parks, including three major city parks. The North Marin Water District also maintains an open space preserve near Loma Verda.

There are several modes of transportation within the Novato area including roadways, a general aviation municipal airport, bus service, and a deactivated rail line. Primary access to the City of Novato is US Highway 101, the main north-south corridor in the West Bay Area. Novato is 12 miles north of

Interstate Highway 580, a major east-west corridor serving the Bay Area. State Highway 37 joins US 101 at Novato making this area a hub for North Bay travel. State Highway 116 is ten miles north of Novato.

Government

The City of Novato is a general law city. The City Council consists of five members elected at large, each serving a four-year term. The mayor is selected for a one-year term from among the members of the City Council. The City operates under a council-manager form of government. The City Council appoints the City Manager, City Attorney and City Clerk.

The City of Novato has 214.625 full-time employees and delivers municipal services through six departments: Central Administration (City Manager, City Clerk, City Attorney, Redevelopment, Housing Services), Administrative Services (Finance, Human Resources, Information Technology, Reprographics), Police, Community Development (Planning and Building), Public Works (Engineering and Maintenance), and Parks, Recreation and Community Services.

Other public services provided to the citizens of Novato are: Fire services by Novato by the Novato Fire Protection District; refuse, recycling services and sewage systems by the Novato Sanitary District; water services provided by the North Marin Water District; public transit services by the Golden Gate Bridge, Highway and Transportation District; animal control services by the Marin Humane Society; and library services by the Marin County Free Library.

Pacific Gas and Electric provides gas and electric services in Novato. Telephone service in Novato is provided by Verizon in the northern and central sections of Novato and by SBC in the southern section. Cable television service is provided by Comcast Cable Corporation throughout most of Novato and by Horizon Cable TV Inc. in certain areas of Hamilton.

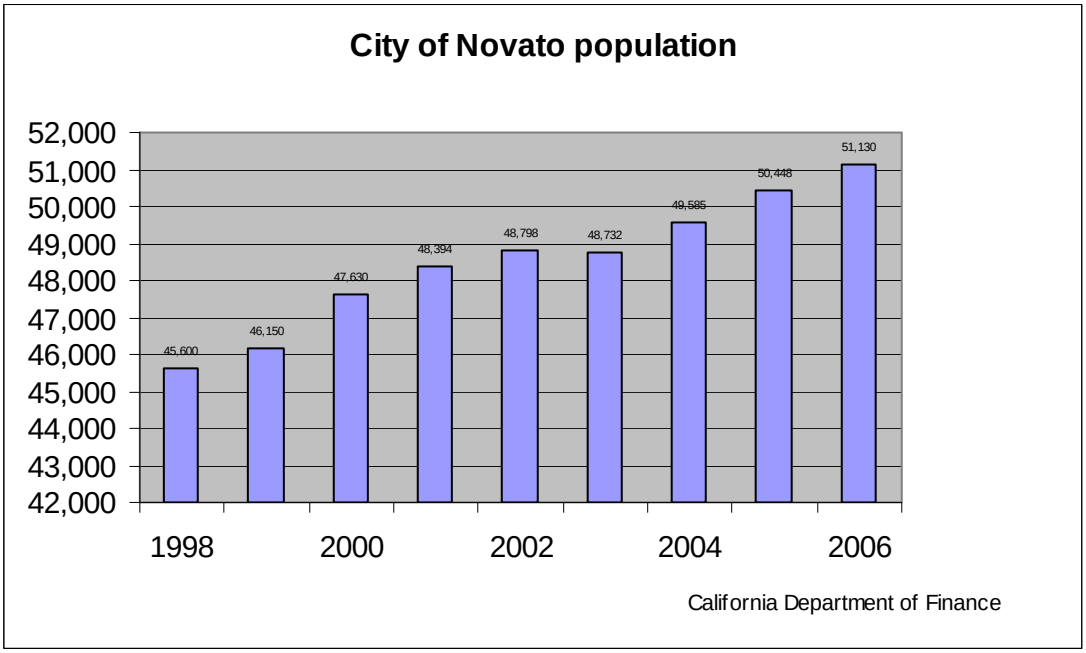
Continuity of Government

A major disaster or an enemy attack could result in loss of life and property, including the death or injury of key government officials. At the same time, there could be partial or complete destruction of established seats of government, and the destruction of public and private records essential to continued operations of government and industry. Applicable portions of the California Government Code and the State Constitution provide authority of the continuity and preservation of state and local government.

The Emergency Operations Plan outlines procedures to assure continued functioning of political subdivisions in the event the governing body is unavailable to serve. A succession list for the City of Novato is approved by the City Council. Copies are kept in the City Manager's office.

Population

Novato's population of 51,130 increased by 1.4%, or 682 people from 2005, making it the fastest growing city in Marin County according to the Department of Finance. The development of Hamilton created the increase. The population of Novato has sustained growth over the past decade with a population of 44,950 in 1997 a 13.7% increase to its present population of 51,130.



According to the Department of Finance, there were 20,469 households, and approximately 12,500 families residing in the city. According to the 2000 census, Novato households had 32.1% children under the age of 18 living with them, 52.7% were married couples living together, 10.3% had a female householder with no husband present, and 33.0% were non-families, 25.2% of them were made up of individuals and 9.3% had someone living alone who was 65 years of age or older. The average household size was 2.52 and the average family size was 3.01. For every 100 females, there were 93.6 males. For every 100 females age 18 and over, there were 90.3 males. The population density of Novato was 1,719 persons per square mile.

Many researchers have focused on the increased disaster vulnerability that ethnic minorities experience in the United States. Research show that minorities are less likely to be involved in pre-disaster planning, that they experience higher mortality rates during an event, and that post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Because higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability. The racial makeup of Novato is 82% Caucasian, the largest minority population is Hispanic, followed by Asian and Black.

Age Structure

In the city, the population was spread out with 23.1% under the age of 18, 6.4% from 18 to 24, 29.9% from 25 to 44, 27.5% from 45 to 64, and 13.0% who were 65 years of age or older. The median age of Novato citizens in 1970 was 23.6 and in 2002 the median age was 40.11.

Significant changes are occurring in the age structure of Novato's population reflecting state and national trends. The City's proportion of elderly residents (over 65 years old) has increased, from 3.6 percent of the population in 1970 to 13.0 percent of the population in 2002. This increase in Novato's senior population is accompanied by a commensurate decrease in the proportion of children. Children under 18 years old constituted 44.1 percent of the population in 1970 and 24.7 percent of the population in 2002. The decrease in those under 18 years is partially attributable to lower birth rates and aging of the population. Nonetheless, there is a higher proportion of children (persons under 16 years of age) in Novato than in Marin County as a whole. The relatively small percentage of residents between the ages of 18 and 29 years can be attributed in part to the scarcity of affordable housing in Novato, as compared with other communities in California.

Jobs

Between 1980 and 1990 the number of jobs in Novato increased by 31 percent, the majority were service and retail jobs. There has been much job growth since 1990, with the opening of the Vintage Oaks shopping center. ABAG projects jobs in Novato will increase by 82 percent between 1995 and 2015.

Marin County and Novato Planning Agency Projections (1995-2020)

Location	1995	2000	2005	2010	2015	2020	Change 2000-2020
Marin County							
Population	238,500	247,289	254,500	264,100	270,900	275,500	+28,211
Households	97,110	100,650	102,690	106,580	109,660	112,030	+11,380
Average Household Size	2.37	2.34	2.37	2.37	2.36	2.35	0.01
Employed Residents	128,000	140,955	145,300	154,200	159,000	161,700	+20,745
Jobs	112,290	112,960	129,290	137,630	146,930	155,160	+32,200
Employed Residents/Job	1.14	1.15	1.12	1.12	1.08	1.04	-0.10
Percent of Bay Area Population	3.7%	3.6%	3.5%	3.5%	3.5%	3.4%	-0.2%
Percent of Bay Area Jobs	3.5%	3.3%	3.3%	3.3%	3.3%	3.3%	0.0%
Jobs/Household	1.16	1.22	1.26	1.29	1.34	1.38	+0.16
Novato Planning Area							
Population	54,000	52,907	55,200	58,700	61,100	63,100	+10,193
Households	20,520	20,503	21,200	22,550	23,550	24,450	+3.947
Average Household Size	2.61	2.53	2.55	2.55	2.55	2.54	+0.01
Mean Household Income	$74,400	$100,800	$105,500	$113,000	$116,000	$121,400	+$20,600
Employed Residents	29,200	30,968	32,300	35,100	36,800	38,000	+7.032
Jobs	20,930	26,520	28,360	31,760	35,350	39,150	+12,630
Jobs/Household	1.02	1.29	1.34	1.41	1.50	1.60	+0.31
Employed Residents/Job	1.40	1.17	1.14	1.11	1.04	0.97	-0.20
Percent of County Population	22.6%	21.4%	21.7%	22.2%	22.6%	22.9%	1.5%
Percent of County Jobs	18.6%	21.6%	21.9%	23.1%	24.1%	25.2%	3.7%

Source: Association of Bay Area Governments, "Projections 2002"

Business & Industry

The City of Novato successfully mixes corporate headquarters, state-of-the art technology companies and a variety of retail centers in its business community. Fireman's Fund Insurance Company is the City's (and Marin County's) largest employer with 2,400 employees. Founded in 1863, Fireman's Fund has been providing premier business and personal insurance for over 135 years. Novato is the United States headquarters for footwear company, Birkenstock and Smith and Hawken, the nation's premier retailer for gardening enthusiasts. The City is home to the Buck Institute for Age Research, and to The Republic of Tea, one of the largest tea distributors in the United States.

Several technology companies are based in Novato, including Drive Savers data recovery, and Sonic Solutions. Broderbund software was based in Novato for a time, but both the education and entertainment divisions moved to separate locations in San Francisco and were subsequently sold. Novato is the birthplace of Battlebots.

Retail businesses in Novato take many forms. The Vintage Oaks Shopping Center is a regional mall that serves as home to Costco, Target, Macy's Furniture Center, Novato Toyota and Silveira Pontiac Buick GMC of Novato. Novato is also home to Travel Smith, a successful company that sells travel clothing and accessories throughout the world through its catalogue business and on the Internet. There is an active retail area in downtown Novato with shops and restaurants as well as other shopping areas located throughout the City.

Housing

In 2005, average home sales in Novato hovered around $780,686, but in February 2006 that amount dropped to $689,070. The General Plan projects a higher number of housing units, about 26,500 at buildout, which could occur later than the year 2015.

About 44 percent of the existing homes in Novato were built more than 30 years ago, which is significantly lower than Marin County as a whole (about two-thirds of the units countywide). In general, the condition of the housing stock in Novato is good, primarily due to the high value of residential property in Novato, which makes improvements to property condition a valuable investment. Still, there are areas where housing condition is an issue, especially where rental units have deteriorated due to age and lack of maintenance.

Climate

The Northern California coast, just north of San Francisco, is a mild climate region of warm days and cool nights. Right along the coast, summers are cool and foggy and the further inland you go, the sunnier and warmer it gets. Coastal low clouds and fog usually burns off by early afternoon. There is little or no rain May through September, with the rainy season beginning in late October or November. Flooding is a problem in winter when rains are heavy within a short period of time. There is an occasional light frost in the area, but generally temperatures stay above the freezing mark. Fall is usually the sunniest season along the northern California coast without the fog of summer or the clouds and rain of winter.

Monthly Weather Summary

Month	High Temp	Low Temp	Rainfall	Ocean Temp
January	56°F	41°F	7.38 in.	52°F
February	61°F	43°F	7.14 in.	52°F
March	64°F	45°F	4.89 in.	52°F
April	68°F	46°F	1.75 in.	50°F
May	72°F	49°F	0.70 in.	50°F
June	77°F	53°F	0.12 in.	51°F
July	80°F	54°F	0.06 in.	52°F
August	81°F	54°F	0.08 in.	54°F
September	79°F	53°F	0.34 in.	55°F
October	74°F	50°F	1.65 in.	54°F
November	63°F	45°F	4.86 in.	54°F
December	56°F	41°F	5.32 in.	53°F

Weather

- Winter temperatures range from 48 to 62
- Spring temperatures range from 64 to 81
- Summer temperatures range from 74 to 98
- Fall temperatures range from 73 to 95
- Rainfall 57 – 65 days per year
- Precipitation 40 inches per year

Geography

The Novato area contains some bodies of water, including:

The Petaluma River, which originates approximately 20 miles north of the City of Petaluma and forms the northeast border of the Novato area. Petroleum and gravel products are transported from Petaluma to San Pablo Bay via the river.

San Pablo Bay, which borders the eastern edge of the area. This shoreline extends for approximately seven miles. San Pablo Bay is a navigable waterway that provides access to San Francisco Bay and the Pacific Ocean.

Novato Creek, which flows from west to east and bisects the area. The watershed of Novato Creek encompasses the majority of the area, and its drainage basin encompasses 44 square miles. Numerous streams flow into Novato Creek, including Warner Creek, with a 5.1-square-mile drainage; Arroyo Avichi, with a 1.6-square-mile drainage; and Arroyo San Jose, with a 5.7-squaremile drainage.

In addition to these major waterways, numerous local drainage channels and storm drains discharge into Novato Creek and its tributaries. Pacheco Creek flows through the southern part of Novato.

Rush Creek, which flows in a north easterly eastward from Highway 101 to the Petaluma River, north of the City limits.

Stafford Lake, a reservoir and headwater for Novato Creek approximately 11 miles upstream from San Pablo Bay. The reservoir, which was established in 1951, stores water for domestic use. The reservoir has a storage capacity of 4,430 acre-feet and a water surface area of 245 acres. The North Marin Water District (NMWD) supplies about 95 percent of Novato with potable water. The Marin Municipal Water District (MMWD) supplies an area including Hamilton Field. NMWD receives most of its water from the Russian River, via the North Marin Aqueduct. NMWD has an agreement with the Sonoma County Water Agency that provides an annual entitlement of 12,360 acre-feet (4 billion gallons) of Russian River water.

Wetlands

Wetlands in the area include saltwater and brackish water-marshland, and freshwater wetland. The marshes and much of the freshwater wetlands habitat are part of the San Francisco Bay Estuary. Saltwater marsh communities occur in the upper inter-tidal zone of protected shallow bays, estuaries, and coastal lagoons. Brackish-water marshes occur at the mouth of large streams, which enter northern San Pablo Bay, creating a gradual transition zone between salt marsh and riparian vegetation communities.

Ridgelines and Other Scenic Resources

Ridgelines surrounding Novato generally enhance the community's visual resources. Mt. Burdell, located north of the City of Novato, is a significant landmark in the open space network surrounding the District. Pinheiro Ridge functions as a ridge and upland greenbelt separator between the Atherton area and Gnoss Field. Big Rock Ridge, with a high point of about 1,400 feet, forms the western and southern edge of the Area of Interest, with an eastward extension to San Pablo Bay separating Hamilton Field from the St. Vincent's Silveira property

Open Space for Environmental Protection

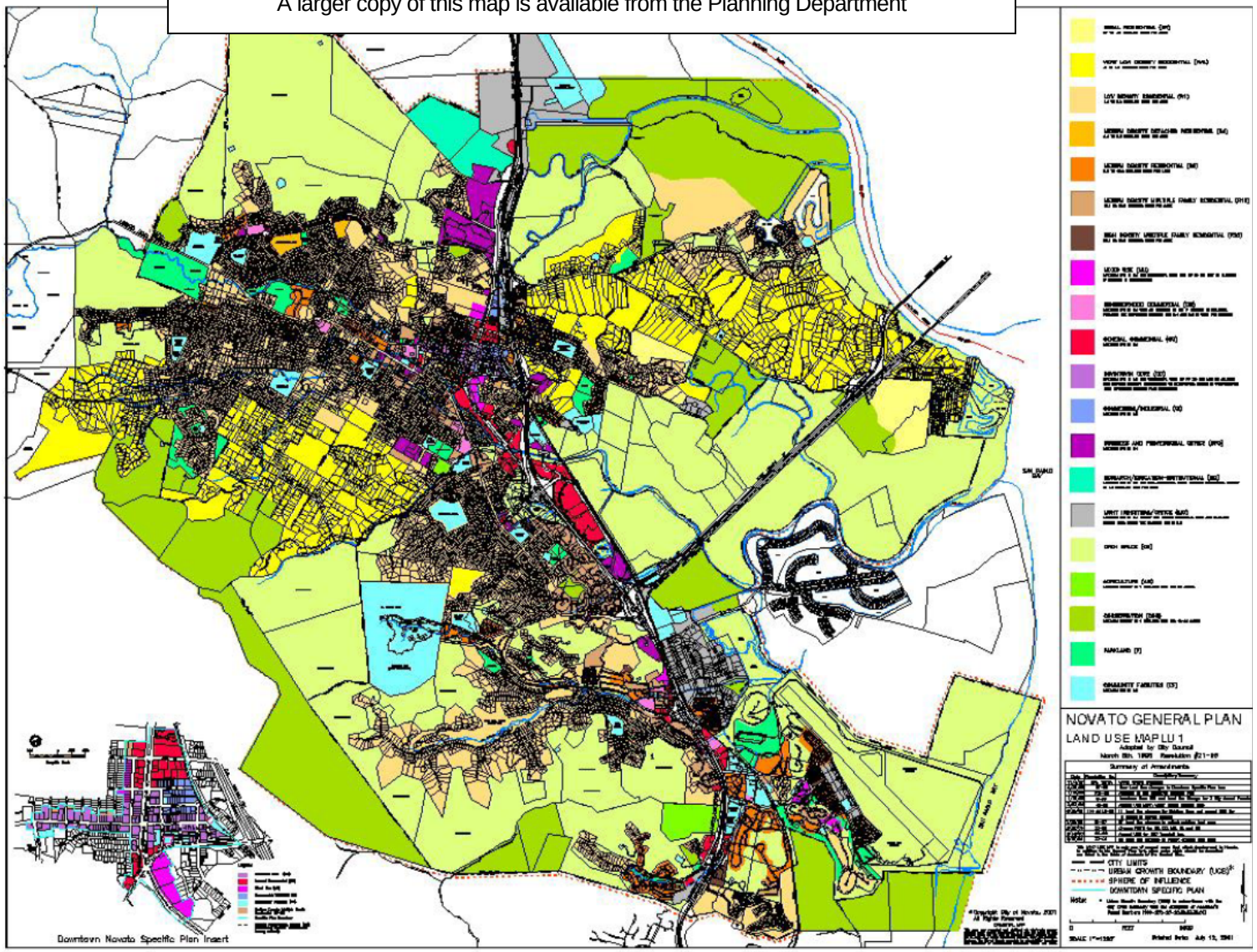
In 1972, Marin County voters established the Marin County Open Space and Water Conservation District and approved the assessment of a property tax for the purpose of acquiring and managing open space in the County. The District works cooperatively with federal agencies, the State Parks Department, and local communities to acquire open space in the eastern part of the County.The City of Novato also owns approximately 200 acres of open space, obtained through acquisition or dedication, and located throughout the City. There is approximately 4,000 acres of open space land in public ownership (state, county, and city) in the City limits with another 1,000 acres in the Sphere of Influence.

Land Use

The City seeks to encourage efficient land use growth patterns that foster and protect the rural character of Novato while encouraging appropriate economic development in accordance with the City's unique local conditions. Ideally, Novato's future land use and development trends aim to attract a variety of businesses that can provide a range of job opportunities suitable for residents to work within the community, thereby reducing out-commuting and traffic congestion. The City has an active Redevelopment Agency that is making considerable strides to redevelop Novato's Historic Downtown

and lands of the prior Hamilton Army airfield consistent with these land use objectives. The City also seeks to protect agricultural, natural resources, open space and community separator uses, public and private outdoor recreation uses that foster public health and safety, and farming enterprises.

A larger copy of this map is available from the Planning Department



There are 20 land use categories in the 1996 General Plan Land Use map. Via goals, objectives, policies and programs, the Plan places emphasis on downtown revitalization. The figures in Table 6 show the estimated maximum development allowed under the Plan; actual development may be considerably less. Maximum remaining potential development within the range and amount of land use areas is provided for future environmental impacts and infrastructure and service needs.

To assure that Levels of Service for transportation other public facilities, services and natural resources are maintained, the 1996 General Plan includes policies and programs for growth management and development on hillsides, slopes, wetlands and other sensitive environment settings.

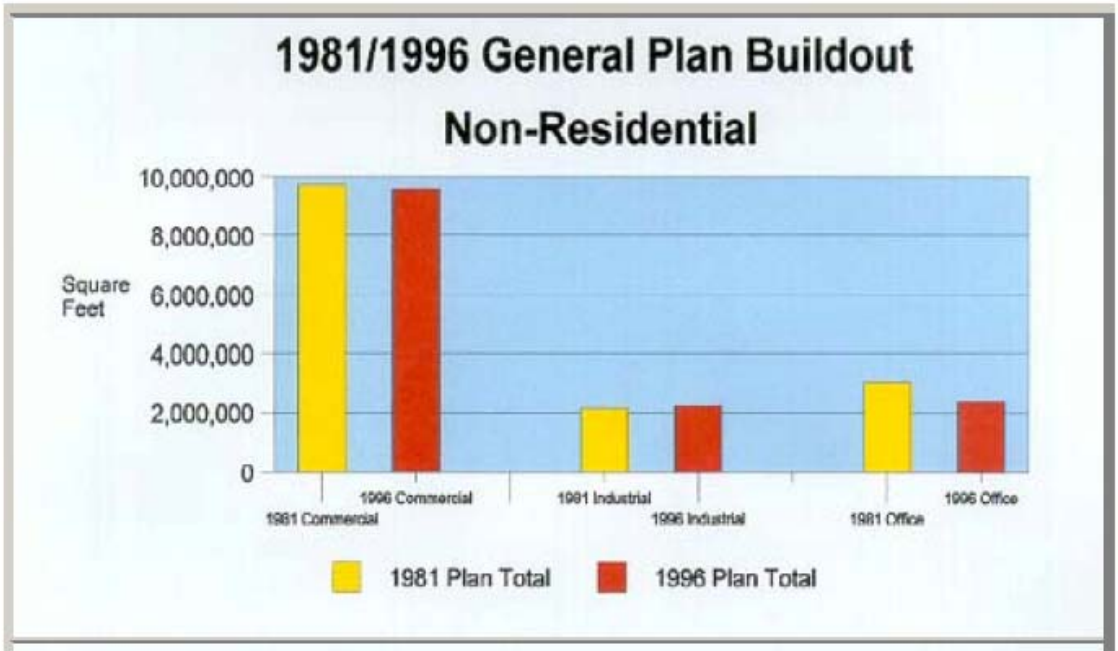
Table 6 - Land Use

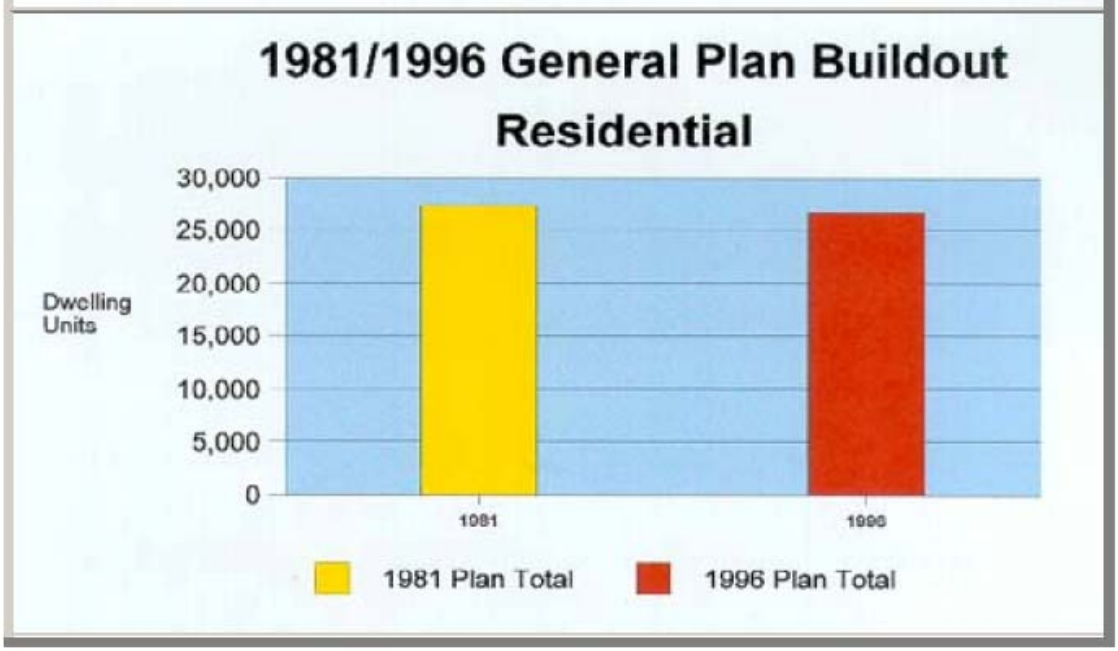
Buildout Under the City's 1996 General Plan

Land Use	Existing Built and Vested 1995	1996 General Plan Estimated Increase Above 1995		1996 General Plan Total Estimated Buildout
Residential	21,044 DUs	5,465 DUs	25%	26,509 DUs
Commercial	6,207,352 SF	3,372,103 SF	54%	9,579,455 SF
Industrial	135,549 SF	2,080,229 SF	1,534%	2,215,778 SF
Office	1,138,793 SF	1,253,848 SF	110%	2,392,641 SF

Notes:

- "Existing built and vested" includes development under construction as of May 1995 and development, which is "vested" as guaranteed by a Development Agreement or other means.
- "Commercial" includes all development not strictly defined as "Industrial" or "office." It includes retail, wholesale, services, mixed non-residential uses, etc.
- Buildout estimates include development on all vacant or under-developed land not publicly owned.





Existing Conditions and Potential Development

Existing land use in Novato is predominantly residential in the valley areas west of Highway 101 and in pockets along the San Pablo Bay historic flood plain east of the freeway. Most units are single-family detached on lots under one acre in size. With the increasing costs of land, however, the number of attached and multi-family units has increased.

Commercial uses are concentrated downtown along Grant Avenue, along Redwood Boulevard, in pockets along Highway 101, and in various small clusters and convenience centers. The Vintage Oaks Shopping Center, located east of the freeway and south of the Rowland Boulevard interchange in the Novato Redevelopment Project Area, opened in 1991. The Novato Redevelopment Agency Project is among the special land use controls in place in the City. To date, it has successfully planned and

redeveloped a regional shopping center, lands of the former Hamilton Army Airfield and initial redevelopment of Novato's historic downtown. The Agency's redevelopment projects have increased employment opportunities and the supply of very low and moderate-income housing, and have provided public improvements. The project areas cover a total of overt 1,800 acres.

Office buildings and / or parks are located along the freeway, in and around Downtown, near the Novato Community Hospital, along Novato and South Novato Boulevards, and within the industrial parks. Novato Industrial Park contains the bulk of the District's warehousing, distribution, and manufacturing uses. Several industrial operations remain near the downtown, between the railroad and Redwood Boulevard. The Bel Marin Keys area has 600 businesses, 2 million square feet of industrial zone: offices, warehouses, manufacturing, auto repair shops, biotechnology, and computer related firms. It is the largest concentration of industry in the County.

Agricultural activities continue primarily outside the City Limits, in the areas west of Gnoss Field, south of Bel Marin Keys, and within the Indian Valley area. A network of open space surrounds the Sphere of Influence defined in the Marin Countywide Plan as bounded by the Inland Rural Corridor on the west and north, San Pablo Bay on the east, and the San Rafael Sphere of Influence on the south. The Ignacio Valley and Indian Valley Open Space Preserves form the southwestern edge of the Sphere of Influence the Verissimo Hills Open Space Preserve, O'Hair Park site, and Mt. Burdell Open Space Preserve form the northwestern edge; Pacheco Valley and Loma Verde form the southeastern edge; and the Petaluma River and San Pablo Bay from the eastern and northeastern edges.

To meet the City's required fair share of regional housing needs, the has granted entitlements in excess of the number of dwelling units neede to meet its total fair share needs determinination. From January 1999 to June 2005 the actual development of approved housing is more accurately tracked based on the number of units that have been constructed or are under construction pursuant to the type of residential building permits issued (single family, multi family or other). The following table, Table --, provides a summary of the actual number of units constructed or that are under construction based on building permits issued for each fiscal year. During Fiscal Year 2004/2005, the Building Division reported that building permits for 150 new residential dwelling units were issued.

Table --: January 1999 - June 2005 Construction Activity

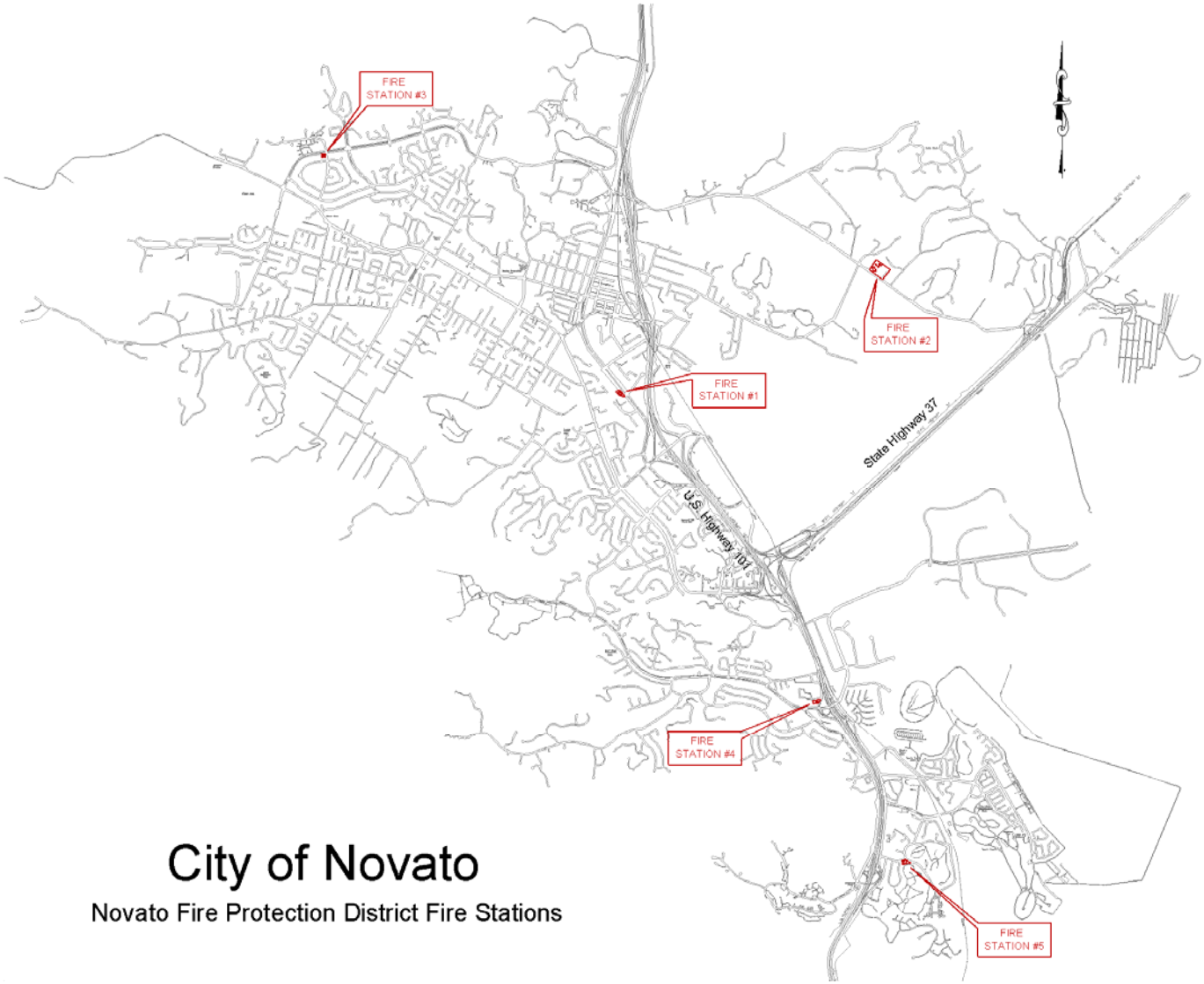
RESIDENTIAL BUILDING PERMITS ISSUED BY FISCAL YEAR						
1999/ 2000	**2000/ 2001**	**2001/ 2002**	**2002/ 2003**	**2003/ 2004**	**2004/ 2005**	**Total**
565*	**188**	**60**	**395**	**511**	**150**	**1,869**

- Building Permits issued from January 1999 through June 2000

Designated Critical Assets

The Following Facilities are designated to be critical facilities in Novato:

1.	Novato Police Department	909 Machin Avenue
2.	Novato City Offices	75 Rowland Way
3.	Novato Fire Protection District Facilities	Fire Administration 95 Rowland Way Fire Station 1- 7025 Redwood Blvd. Fire Station 2 – 450 Atherton Ave. Fire Station 3 – 65 San Ramon Way Fire Station 4 – 319 Enfrente Drive Fire Station 5 – 5 Bolling Drive
4.	Novato Sanitary District	509 Davidson Street
5.	North Marin Water District	909 Rush Creek Place
6.	Maintenance Facilities	550 Davidson Street
7.	Kaiser Permanente Medical Offices	97 San Marin Drive
8.	Novato Community Hospital (Sutter)	180 Rowland Way
9.	Novato Unified School District Office	1015 Seventh
	<u>Elementary Schools</u>	
	Hamilton School	One Main Gate Road
	Loma Verde	399 Alameda de la Loma
	Lu Sutton	1800 Center Road
	Lynwood	1320 Lynwood Drive
	Olive	629 Plum Street
	Pleasant Valley	755 Sutro Avenue
	Rancho	1430 Johnson Street
	San Ramon	45 San Ramon Way
	<u>Middle Schools</u>	
	Hill Middle School	720 Diable Avenue
	San Jose Middle School	1000 Sunset Parkway
	Sinaloa Middle School	2045 Vineyard
	<u>High Schools</u>	
	Marin Oaks High School	611 Arthur Street
	Novato High School	625 Arthur Street
	San Marin High School	15 San Marin Drive
	<u>Alternative Programs</u>	
	Novato Charter	936 C Street
	Marin Technology High School	1850 Ignacio Blvd., Suite 100


FIRE STATION #3
FIRE STATION #2
FIRE STATION #1
State Highway 37
U.S. Highway 101
FIRE STATION #4
FIRE STATION #5
City of Novato
Novato Fire Protection District Fire Stations

Novato Sanitary District

Demographics

Novato Sanitary District provides waste water collection, treatment, and disposal services for the community of Novato, California. In addition, the District is responsible for refuse disposal, recycling, and greenwaste collection through its franchise collector, Novato Disposal Service.

As a special district, Novato Sanitary District is an independent local agency with a publicly elected board of five directors. The District currently serves about 60,000 residents.

The District maintains 200 miles of sewer collection system, two wastewater treatment facilities, and an irrigation system for 820 acres of pastureland. The District also administers the solid waste disposal franchise for the Novato area that includes garbage collection, curbside recycling, and household hazardous waste collection.

Novato Sanitary District has been serving the public since its inception on October 5, 1925. The Board of Directors employs a fulltime staff of 26. The Board of Directors meets the 2nd and 4th Monday of each month at the Administration Building at 500 Davidson Avenue, Novato.

Our History & Mission

Here are a few highlights in the history of Novato Sanitary District:

- Novato Sanitary District was chartered October 5, 1925 as Sanitary District #6.
- Prior to1949, sewage disposal needs of the community of Novato were provided through the use of individual septic tanks and leach fields.
- In 1949, a comprehensive sewerage project built a collection system and a primary treatment plant.
- In 1954, a $450,000 bond measure passed to improve and increase the capacity of the Novato treatment plant to 2 million gallons of wastewater treated per day plant and an assessment district was created to build the Ignacio treatment plant.
- In 1986, a major upgrade was completed to increase both the Novato plant and Ignacio plant capacity and treatment. The upgrade reflected the response by the Board of Directors to the increasing capacity needs of the growing community served. The upgrade also helped to meet the more stringent Federal and State standards of water pollution control.

Our Board

The Board of Directors is comprised of 5 at-large members representing the entire district.

Current Board members are:

- Arthur Knutson, President
- William C. Long, President Pro Tem
- Michael Di Giorgio
- James D. Fritz
- George Quesada

About Wastewater Treatment

The District treats wastewater so that it can be safely released to the San Francisco Bay or reused.

The District operates two wastewater treatment plants. The Novato Treatment Plant serves the northern two thirds of Novato. The Ignacio Treatment Plant serves the southern third.

Each treatment plant provides primary and secondary treatment plus ammonia removal and filtration. During the summer months the treated water is recycled and used to irrigate pastures and operate a wildlife pond adjacent to Highway 37. During the winter months the treated water flows to San Pablo Bay via an outfall pipe.

Primary treatment uses gravity settling to remove solids from the wastewater. Secondary treatment relies on biological processes to removed dissolved organic matter from the water. Ammonia removal is used during the discharge period because the ammonia can be toxic to some aquatic organisms. Filtration also helps to remove fine particles. The treatment not only reduces the organic matter but also reduces the trace metals

Recycled Water

In the mid-1980's, the Novato Sanitary District, with the assistance of Federal and State grants, invested $16 million in reclamation facilities that include water storage ponds, 820 acres of irrigated pastures, and a fifteen acre wildlife pond. The District reclaims an average of over 40% of the average annual dry weather flow.

Solid Waste Management

Novato Disposal has proudly served the Novato Community's solid waste disposal needs since 1978 by providing complete refuse and recycling services to residential and commercial accounts. Included in the fee for residential solid waste service is a weekly curbside recycling program and weekly greenwaste service.

Sewer Use Regulations

Sewer use regulations are outlined in two publications. Both publications can be viewed on Novato Sanitary District's website; www.novatosan.com/sewer/regulations.html.

This plan will include the Overview of Side Sewer Requirements. All side sewers within the Novato Sanitary District must conform to the District's Standard Specifications and Sanitary Code, copies of which are available from the District office. This document provides an overview of the side sewer requirements.

Sewer Ordinance #70 is provided in Adobe Format on the website and will only be referred too. This ordinance regulates the use of public and private sewers and drains, the installation and connection of building sewers, the installation of sewer laterals, and public sewer main extensions. It also provides the fee structure for the installation and connection of sanitary sewers regulates the discharge of waters and wastes into the public sewer systems and provides penalties for the violations of any of these provisions.

All side sewers within the Novato Sanitary District (District) must conform to the District's Standard Specifications and Sanitary Code, copies of which are available from the District office.

Following is a summary of the District's requirements regarding side sewers.

General Information

1-01 Jurisdiction. The District has jurisdiction over all property to receive sewer service within the District boundaries. District jurisdiction includes, but is not limited to: issuing permits to connect to the main sewer2, specification of design, type of material, construction requirements, inspection, and testing.

1-02 Ownership and Maintenance. Each building's side sewer, including sewer ejector pump system if applicable, is owned and maintained by the owner of the building served thereby.

1-03 Liability. The District and its officers and employees shall not be liable for injury or death to any person, or damage to any property, arising during or growing out of, the performance of any work described herein.

1-04 Permits & Regulations. Following is a summary of the permits and regulations that are generally applicable to the installation of side sewers. This list is not intended to be all inclusive.

Sewer Connection Permit. No person shall construct a side sewer or make a connection with any main sewer without first obtaining a written permit from the District and paying all applicable fees and connection charges.

NOTE: Plumbing changes within the building are regulated by the building department of the jurisdiction in which the building is located.

Building Permit. For new buildings, a building permit issued by the building department of jurisdiction must be obtained prior to issuance of a sewer connection permit by the District.

Encroachment Permit. When side sewer construction extends into a street right-of-way, an encroachment permit must be obtained from the agency having jurisdiction over said street, and all construction must comply with the State, County, and City/Town laws, ordinances, rules and regulations pertaining to the cutting of pavement, opening, barricading, lighting, and protection of trenches, backfilling and paving. The encroachment permit and/or other permits required must be obtained prior to issuance of a sewer connection permit by the District.

1Side Sewer means the sanitary sewer line beginning at its point of connection with the main sewer and terminating at its point of connection to the building's sanitary or waste plumbing at the point the plumbing first extends outside the building's foundation, which location must be two feet or less from the building foundation. In this overview, the term side sewer includes the lateral sewer stub.

2Main Sewer means the public sewer which accommodates more than one side sewer, normally eight inches or more in diameter. The District maintains the main sewer.

California Environmental Quality Act Requirements. Any person requesting a sewer connection permit must also comply with all applicable environmental guidelines, including the District's Local Guidelines adopted pursuant to the Environmental Quality Act of 1970, and must make all deposits required and pay all fees established by the District to process applications to comply with said Act.

1-05 Compliance with Regulations. A copy of all required permits must be kept at the job site when the side sewer is being constructed.

1-06 Plans Required. Plans approved by the building department of jurisdiction must be furnished to the District upon making application for a sewer connection permit for new structures. Said plans must show the location of the proposed structure, floor plans showing plumbing fixtures, including any floor drains, and the location of the side sewer. The District may require a survey by a registered land surveyor or engineer if it is necessary to determine: a) the invert elevation of the side sewer and/or building floor; and/or b) that the proposed sewer installation is within the property line or easement.

1-07 Permits are Non-Transferable. Permits are issued for a specific property giving the property's street address and Assessor's Parcel Number. Permits may not be transferred to another property without written approval of the District Board of Directors.

1-08 Time Limit on Permits. The sewer connection permit becomes void and the fees paid are forfeited under the following conditions: a) work is not commenced within one year from date of issue; or b) after partial completion, work is discontinued for a period of one year. Work may not begin/resume until a new, valid sewer connection permit is obtained. The new sewer connection permit will be issued upon application and payment of applicable fees.

1-09 Prohibited Wastes. Except as hereinafter provided, it is unlawful for any person to discharge, or cause to be discharged, any of the following described waters or wastes into any manhole or sanitary sewer line connecting to the main sewer:

a) Drainage. Leaders from roofs and surface drains for rainwater. Surface or subsurface drains for rainwater, stormwater, seepage, industrial cooling water, or unpolluted industrial process waters.

b) Swimming pool discharge water, except when the size of the pipe carrying the discharge water is less than two inches and under a head not to exceed twenty feet. If the water is discharged by pumping, the rate of flow cannot exceed one hundred (100) gallons per minute. The swimming pool discharge connection must be equipped with an approved separator to prevent the backflow of sewage into the swimming pool or piping system.

c) Septic tank sludge.

d) Industrial waste or any solid, semisolid, or liquid substance resulting from any industrial manufacturing, commercial process, or from any garage, service station, or wash rack, without first having obtained a permit to discharge.

e) Liquid or vapor having a temperature higher than 150o F.

f) Water or waste which contains more than 100 parts per million, by weight, of fat, oil, or grease.

g) Garbage that has not been shredded so that all particles will be carried freely under the flow conditions normally prevailing in the main sewer, with no particle greater than one-half inch in any dimension.

h) Ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure, or any other solid or viscous substance capable of causing obstruction to the flow in sewers or causing other interference with the proper operation of the sewage works.

i) Waters or wastes having a PH lower then 5.5 or higher than 9.0 or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the sewage works.

j) Waters or wastes containing toxic or poisonous substance(s) in sufficient quantity to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, or create any hazard in the receiving waters of the sewage treatment plant.

k) Waters or wastes containing suspended solids of such character or quantity that unusual attention or expense is required to handle such materials at the sewage treatment plant.

l) Noxious or malodorous gas or substance capable of creating a public nuisance.

Design Requirements

2-01 Separate Sewers. Each structure requiring sewer service must be separately and independently connected to the main sewer. Upon application, the District may grant an exception in the following situations: a) multiple structures on one lot that cannot be subdivided; or b) condominiums having CC&R's providing for sewer maintenance by the homeowner's association. Exceptions are granted at the discretion of the District.

2-02 Pipe Size. The minimum size of pipe for side sewers is: a) 4-inch inside diameter when serving less than one hundred-fifty (150) fixture units; and b) when serving over one hundred-fifty (150) fixture units, the pipe must conform to the size requirements for horizontal drainage based on fixture unit loading as set out in the Uniform Plumbing Code. In no event will a side sewer be permitted to connect to a main sewer of lesser size on the downstream side.

2-03 Pipe Slope. The minimum slope for a four-inch diameter side sewer is 1.5 foot per 100 feet (1.5%), unless specifically approved by the Manager-Engineer. The minimum slope for a side sewer greater than four inches is 0.7 feet per 100 feet (0.7%).

2-04 Pipe Cover. The minimum cover over the top of a side sewer must be: a) See Table 1 when pipe is outside of street right-of-way; and b) three feet when pipe is in a street right-of-way. When the foregoing pipe cover cannot be maintained, special pipe bedding, rip-rap, and/or concrete cap may be required by the District.

2-05 Pipe Materials. See Table 1 - Approved Side Sewer/Lateral Pipe Materials List

2-06 Cleanouts. Cleanouts must be installed at the following locations: a) at the junction of the building plumbing and the side sewer (two feet or less, outside the building); b) at each bend or change in direction of the side sewer greater than 45o (1/8 bend); and c) where a run of pipe without bends exceeds ninety feet. All cleanouts, except the blowoff cleanout, must be brought to grade, properly capped, and completely watertight.

2-07 Backwater Prevention Device (Blowoff Cleanout). All side sewers must be equipped with a backwater prevention device (blowoff cleanout) as shown in Standard Drawing SD-6. The elevation of the overflow rim of the backwater prevention device must be at least three inches above finish grade and at least six inches below the lowest plumbing fixture. In driveways or other paved areas, a line must be installed to the side from a wye to the backwater prevention device. If this installation is not feasible, a check valve must be installed in the side sewer ahead of the backwater prevention device in accordance with Standard Drawing SD-7.

2-08 Interceptors Required & Maintenance. Grease, oil, and sand interceptors must be installed in conjunction with commercial sewers when necessary, in the opinion of the District, for the proper handling of liquid wastes containing grease in excessive amounts, flammable wastes, sand, or other substances capable of causing: a) a public nuisance, or b) damage or hazard to structures, equipment, and personnel of the sewage works. Interceptors must be: a) a type and capacity approved by the District, b) easily accessible for cleaning and inspection, and) maintained in continuously efficient operation at all times by the property owner at the property owner's expense.

2-09 Residential Sewage Pump Systems. Where gravity service is not feasible, special application may be made to the District to allow installation of a residential sewage pump system. The District must approve the design of the system, and the District reserves the right to prohibit the installation of a residential sewage pump system. When installation of a residential sewage pump system is approved, the following general requirements must be met:

Installation of the sewer ejector pump, electrical work, and holding tank, must: a) meet the codes and regulations of the building department of jurisdiction issuing the building permit; and b) be inspected by an inspector from said building department.

The discharge line from the building outlet to the sewage pump must be gravity flow and be equipped with a blowoff cleanout. The pressurized discharge line from the holding tank must be equipped with a check valve as close as possible to the holding tank, followed by a gate valve. The pressurized discharge line must be installed for the shortest distance feasible, at which point the pressurized discharge line must be converted to gravity flow using a wye, and a cleanout must be installed on the gravity flow portion of the wye. A pressurized discharge line will not be permitted to connect to the main sewer unless no other alternative is possible AND, in the opinion of the District, the main sewer can facilitate the pressurized connection.

All gravity and pressure discharge lines must be inspected by a District Inspector before being covered.

2-10 Taps into Main Sewer. Tap connections to the main sewer, when permitted, must be made in the presence and at the direction of a District Inspector. Subject to approval of the District, connections must be made as follows: a) 6-inch or less diameter main sewers - a wye or tee; b) 8-inch or more diameter main sewers - "Tap Tite" or equal pipe penetration type connection.

2-11 Old Side Sewers. A new structure is not permitted to connect to an old side sewer unless the old side sewer is tested in the presence of a District Inspector and found to meet all current District requirements, including installation of a backwater prevention device. All costs for examination and testing must be paid by the property owner. A sewer connection permit is required for the new structure and said permit will be issued after: a) the building department of jurisdiction issues the building permit; and b) payment of applicable fees to the District.

2-12 Abandoned or Unused Side Sewers. Any abandoned or unused side sewer connected to the main sewer, including side sewers from structures that are demolished, must be dug out to the main sewer, and the wye, tee, or connection area must be cut away and spliced with a solid piece of pipe of the same size and dimension, i.e. plugged off. Plugging off must be done in the presence of a District Inspector.

2-13 Existing Septic Tanks. Septic tanks are under the jurisdiction of the County of Marin Environmental Health Department. The Health Department must be notified when a septic tank is abandoned or encountered during installation of a side sewer. The District's requirements are: a) all building plumbing outlets must connect to the side sewer and completely bypass the septic tank; and b) the septic tank must be abandoned following the Uniform Plumbing Code and the regulations of the County of Marin Environmental Health Department.

Construction

3-01 Location of Lateral Stub. It is the responsibility of the property owner or his contractor to locate and uncover the lateral stub or wye installed to serve the property. When the lateral stub or wye cannot be located, even though the District's records indicate such a connection exists, the side sewer must be connected to the main sewer at a location designated by the District at the expense of the property owner. The District does not guarantee the presence or location of lateral stubs or wyes.

3-02 Laying Pipe. Side sewers must be laid by the shortest route from the building plumbing outlet to connect to the main sewer. All pipe must be laid to line and grade. Each length of pipe must be laid on a firm bed as detailed in Standard Drawing SD-4 and must have full bearing for its entire length between bells. When applicable, an adequate bell hole must be dug at the end of each pipe length for making the joint. Blocking under the side sewer will not be permitted. The inside edge of any cut pipe must be beveled, and both bell and spigot must be marked for proper inspection and cleaned before the joint is made. Care must be taken to prevent foreign materials from entering the pipe. Water must be pumped from the trench while the pipes are laid and the joints made. Backfill must be carefully and uniformly placed around the pipe, with no rocks or clods touching the pipe. In rocky areas, imported bedding material may be required. Pipe must not be covered until inspected by a District Inspector.

3-03 Inspections. Prior to backfilling, side sewer installations and modifications must be inspected by a District Inspector. When required, tests for watertightness must be done in the presence of a District Inspector. Connections to the main sewer must be done in the presence of a District Inspector. Inspections must be scheduled with the District giving three working days advance notice. Inspections are not made on Saturdays, Sundays, or holidays.

3-04 Trenches Side Sewers - Excavation and Backfilling. Trenches for side sewers within public streets must be excavated and backfilled, and the pavement restored in strict accordance with the laws, ordinances, and regulations of the State of California, County of Marin, and/or agency having jurisdiction over said street. The District reserves the right to require compaction tests on trench backfill by a soils engineer. The cost of compaction tests must be paid by the contractor or property owner.

3-05 Clay Plugs. Impervious clay trench plugs must be constructed in the pipe zone backfill at intervals of approximately four hundred (400) feet, or as otherwise directed by a District Inspector. Impervious clay trench plugs must: a) consist of dense clay material free of rocks and vegetation and b) be moisture-conditioned and mechanically compacted to the same density as the adjoining backfill material.

3-06 Trenches in Slopes. Trenches in ground sloping greater than thirty degrees (30o) from the horizontal must be protected from erosion by placing rip-rap in cement mortar or concrete laid flush with the slope over the backfilled trench, or other protective measures must be taken as directed by a soils engineer and approved by the District. Drains which are two inches in diameter must be installed in the concrete covering at five-foot intervals along the trench line.

For trenches in slopes less than thirty degrees (30o), the District may require the use of redwood trench dams or other types of erosion control.

3-07 Testing of Gravity Sewers. Unless otherwise directed by the District, side sewers must be tested by plugging and filling with either water or compressed air to four psi. For water tests, leakage must not exceed fifty gallons per day per inch of internal diameter per mile of sewer line being tested (0.16 gallons per hour per 100 feet of 4-inch diameter pipe). For air tests, the pressure must not drop more than one psi over a three-minute period. Tests must be performed in the presence of a District Inspector. NOTE: Check with a District Inspector before testing Vitrified Clay Pipe.

3-08 Testing of Pressure Sewers. Pressure sewers must be tested under a pressure of not less than 50 psi without leakage for a period of fifteen minutes.

3-09 Special Conditions. When encountering special conditions which are not covered by District Standard Specifications and/or Code, a District Inspector and/or the District Engineer will direct the contractor or property owner in the required procedures.

References:

Table 1 - Approved Side Sewer/Lateral Pipe Materials List
Table 2 - Public Sewer Mains and Public Force Mains
Standard Drawing SD-4 - Typical Trench Section
Standard Drawing SD-5 – Typical Side Sewer Details
Standard Drawing SD-6 - Standard Cleanout and Backwater Prevention Device
Standard Drawing SD-7 - Backwater Check Valve and Shutoff System

TABLE 1
PRIVATE SIDE SEWER/LATERAL
(Specific Use Subject to District Approval)

Pipe Specifications	Can Be Used for Gravity Sewers	Can Be Used for Ejector Pump Discharge Pipelines
Vitrified Clay Pipe (No Hub), VCP	Yes[1]	No
Cast Iron Soil Pipe (No Hub), CIP	Yes[2]	No
Ductile Iron Pipe w/Rubber Ring Joints, DIP	Yes[2]	No
PVC ASTM D-2241, SDR=26	Yes[1]	Yes[1]
PVC AWWA C-900, SDR=21	Yes[2]	Yes[2]
PVC Sch 40	Yes[1]	Yes[1]
PVC Sch 80	Yes[2]	Yes[2]
Polyethylene, min SDR=17	Yes[1]	Yes[1]

[1] Requires minimum 3-foot cover with imported bedding and pipe zone backfill.
[2] Requires minimum 18-inch cover on private property with imported bedding and pipe zone backfill or shaded with select native material containing rocks no larger than 1" sieve size.

TABLE 2
PUBLIC SEWER MAINS AND PUBLIC FORCE MAINS
(Specific Use Subject to District Approval)

Pipe Specifications	Can Be Used for Gravity Sewers	Can Be Used for Force Main Sewers
Ductile Iron Pipe w/Rubber Ring Joints, DIP	Yes	Yes
PVC ASTM D-2241 SDR=21	Yes	Yes
PVC AWWA C-900 SDR=18	Yes	Yes
PVC AWWA C-905 SDR= 25	Yes	Yes
Polyethylene Pipe Min SDR=21	Yes	Yes
Reinforced Concrete Pipe *	Yes	No
Pretensioned Concrete Cylinder Pipe	No	Yes

* For large diameter sewers only

(Source: Novato Sanitary District Marin County, California "Overview of Side Sewer Requirements 2001)

Assets & Facilities

EXECUTIVE SUMMARY OF FINAL 2004-05 BUDGET

The proposed 2004-05 Expenditure Budget for the Operating portion of the District's budget is $6,171,614 which is $376,131 or 6.49% higher than the 2003-04 Budget. The Operating portion of the budget is financed primarily from operating service charges and from the District's share of the County-wide property tax levy. The proposed Operating Budget will require an operating service charge of $162.00 per service unit which is an increase of $32 over last year. Much of the increase is attributed to the fact that the District will lose between 40% - 50% in property tax revenue because of the State's property tax shift.

The proposed Capital Improvement Budget for 2004-05 totals $7,562.000, or $1,649,000 less than last year with 23 recommended carryover projects totaling $7,012,000, and 5 new projects adding up to $550,000. The Capital Improvement Program and the General Obligation Bond Programs are financed by connection charge revenues, capital service charges and interest earnings. The capital improvements service charge rate is set at $100.00, an increase of $75 over last year. $20 of this will provide an amount sufficient to finance annual debt service and $80 will be allocated to fund the Capital Improvement Program.

The total budget requires an operating service charge rate of $262.00 and a capital service charge rate of $100.00, for a total annual rate of $262.00 per service unit. In addition, it is anticipated that the County will establish a charge of $1.64 per account billed to collect the service charges on the tax roll. This means that the typical single family residential homeowner in the District will pay a total annual charge of $263.64 for sewer service. Non-residential users will pay a proportionate charge based on their relative winter water usage and the estimated strength of the wastewater discharged.

The District's annual sewer service charges continue to be among the lowest in the Bay Area.

Novato Sanitary District
2004-05 Budget
Operating Budget - EXPENDITURE SUMMARY

Page 1

	Budget 2003-04	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
TREATMENT PLANTS, LAB AND MONITORING:					
Salaries	790,854	778,501	750,025	866,699	949,117
Materials, Supplies and Ser.	1,586,110	1,537,581	1,414,951	1,574,035	1,539,405
Capital Outlay	9,000	9,000	6,633	10,000	10,000
Totals	2,385,964	2,325,083	2,171,609	2,450,734	2,498,522
RECLAMATION/DISPOSAL FACILITIES:					
Salaries	88,840	87,572	76,923	98,454	114,378
Materials, Supplies and Ser.	334,720	335,184	282,689	321,320	321,320
Capital Outlay	0	0	0	10,000	10,000
Totals	423,560	422,756	359,612	429,774	445,698
SEWERS AND PUMP STATIONS:					
Salaries	444,200	437,863	481,709	492,270	457,512
Materials, Supplies and Ser.	237,960	318,209	331,740	272,860	312,860
Capital Outlay	0	0	0	0	0
Totals	682,160	756,071	813,449	765,130	770,372
AB 939 SOLID WASTE PROGRAMS					
Salaries	0	0	0	0	0
Materials, Supplies and Ser.	295,054	295,054	278,422	345,575	345,575
Capital Outlay	0	0	0	0	N/A
Totals	295,054	295,054	278,422	345,575	345,575
ADMINISTRATION AND ENGINEERING:					
Salaries	631,436	593,293	569,461	609,288	605,729
Materials, Supplies and Ser.	1,358,910	1,129,114	1,117,980	1,454,552	1,398,927
Capital Outlay	18,400	18,400	13,452	15,000	15,000
Totals	2,008,746	1,740,807	1,700,893	2,078,840	2,019,656
Grand Totals	5,795,484	5,539,771	5,323,985	6,070,053	6,079,823

2004-05 Budget
Operating Budget - REVENUE SUMMARY

Acct Number	Item	Budget 2003-04	Revenues Thru April	Est Rev 2003-04	Actual Rev 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
41010	Service Chgs (1)	3,376,107	3,159,243	3,376,107	3,331,880	4,236,000	4,236,000
41020	County Ser Chg Collect Fees	30,529	26,995	30,529	26,995	30,529	30,529
41030	Pub Sewer Plan Chk/Insp Fees	12,000	63,633	65,000	89,770	50,000	50,000
41040	Conn Permit/ Insp Fees	10,000	26,064	27,000	34,963	20,000	20,000
41050	Property Tax Allocation (2)	1,430,000	1,264,178	1,430,000	1,392,792	884,000	884,000
41060	Interest Earn	85,000	40,598	58,000	51,874	70,000	70,000
41070	Annex Fees Leg/File/Engr	0	0	0	0	0	0
41080	Engr/AdminChgs	75,000	0	75,000	102,740	75,000	75,000
41090	Non-Domestic Permit Fees (3)	7,995	3,155	7,995	3,155	4,000	4,000
41100	Garbage Franchise Fee	35,000	35,000	35,000	35,000	35,000	35,000
41105	AB939 Collector Fees (See Page 22)	264,378	0	264,378	310,833	264,378	264,378
41107	Oil/Bev/Tire Grants/ JPA Reimb. Fees	30,676	0	30,676	30,676	80,837	80,837
41110	Sludge Disp Charges(NMWD)	0	67	67	171	70	70
41130	Ranch Income	82,517	82,517	82,517	82,517	82,517	82,517
41140	Other Rev	20,000	45,780	46,000	60,918	84,500	84,500
	TOTALS	5,459,202	4,747,230	5,528,269	5,554,284	5,916,831	5,916,831

(1) Service charge revenue is based on the assumption that operating service charges will increase from $130 to $162.
(2) Property tax revenue is based on the assumption that total county wide property tax collection will decrease approximately 40% due to the State's property tax shift.
(3) Includes application fees, permits, and monitoring charges.

APPROPRIATIONS LIMITATION

The appropriations limitation, pursuant to Article XIIIB of the California Constitution, will be determined prior to submission of the final budget in August.

Novato Sanitary District
2004-05 Budget
FLOW OF FUNDS - OPERATING AND WORKING CAPITAL RESERVE FUNDS

Page 3

	2004-05 Budget	
	Prelim	Final
OPERATING FUND		
FUND BALANCE 6/30/03	0	0
Actual Revenues 2003-04	5,528,269	5,554,284
Actual Expenditures 2003-04	(5,539,771)	(5,323,985)
Transfer from Self-Insurance Fund for Claims	10,000	53,820
Transfer to Self-Insurance Reserve Fund	0	0
Transfer to/from Working Capital Reserve Fund	1,502	(284,119)
FUND BALANCE 6/30/04	0	0
Anticipated Revenues 2004-05	5,916,831	5,916,831
Anticipated Expenditures 2004-05	(6,070,053)	(6,079,823)
Anticipated Transfer from Self-Insurance Fund for Claims	20,000	20,000
Anticipated Transfer from Working Capital Reserve Fund	133,222	142,992
ANTICIPATED FUND BALANCE 6/30/05	0	0
WORKING CAPITAL RESERVE FUND		
FUND BALANCE 6/30/03	3,409,527	3,409,527
Transfer to/from Operating Fund 2003-04	(1,502)	284,119
Transfer to Rate Stabilization Reserve	0	0
Transfer to Emergency Repair Reserve	0	0
FUND BALANCE 6/30/04	3,408,025	3,693,646
Anticipated Transfer to Operating Fund 2004-05	(133,222)	(142,992)
ANTICIPATED FUND BALANCE 6/30/05	3,274,803	3,550,654

Novato Sanitary District
2004-05 Budget
SUMMARY OF FUNDS TO BE RAISED
FROM TAXES AND SERVICE CHARGES

Page 4

	2004-05 Budget	
	Prelim	Final
Proposed Operating Fund Expenditure Budget	6,070,053	6,079,823
Proposed Capital Improvement Portion of 2004-05 Service Charge Revenues	2,615,000	2,615,000
Working Capital Reserve	3,274,803	3,550,654
Less: Anticipated Operating Fund Revenues Other than Taxes and Service Charges	(796,831)	(796,831)
Est. Transfer to Capital Impvt Reserve	0	0
Est. Transfer from Self-Insurance Fund for Claims	(20,000)	(20,000)
Est. Operating Working Capital Reserve Fund Balance 6/30/04	(3,408,025)	(3,693,646)
Est. Property Tax Allocation 2004-05	(884,000)	(884,000)
AMOUNT TO BE RAISED BY SERVICE UNIT CHARGES	6,851,000	6,851,000

Comparison of Total Funds Raised From Taxes and Charges

	2003-04	2004-05	
Property Tax Allocation	1,430,000	884,000	(1)
Service Charge Revenues:			
Operating	3,376,107	4,236,000	(2)
Capital Improvement	654,000	2,615,000	(3)
Service Charge Collection Fees	30,529	30,529	(4)
Totals	5,490,636	7,765,529	

(1) Assumes that total property tax collection will decrease 40% - 50% due to the State property tax shift.

(2) The annual service unit rate required to finance the proposed Operating Budget is $162.00 per unit, an increase of $32 over last year's rate. The estimated total number of service units as of July 1, 2004 is 26,150.

(3) The proposed budget indicates that the Capital Improvements service charge rate increases from $25.00 to $100 per unit. This will provide an amount sufficient to finance annual debt service for the 1986 Series A general obligation bonds, and contribute $2,271,150 to the Capital Improvement budget. Although occupancy of housing units at Hamilton Air Base by the Navy has been discontinued, there continues to be 332 service units on the former base that are served by agreement with the Coast Guard.

(4) Fees for collecting sewer service charges on the tax roll are set by the County Board of Supervisors and are expected to be $1.64 per account billed.

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2004-05 Budget
Operating Budget - NOVATO TREATMENT PLANT

Account Number	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
61010	Salaries/Wages	410,885	342,491	412,640	384,059	455,349	495,639
61060	Gas, Oil & Fuel	20,000	16,477	19,852	17,520	24,000	24,000
61091	Software Maint	0	0	0	0	0	0
61100	Oper Supplies	18,750	23,180	27,928	27,540	24,000	24,000
61101	Oper Chemicals	114,630	76,968	114,630	88,895	114,630	95,000
61111	Radio Maint	0	0	0	0	0	0
61112	Janitorial Services	9,000	7,560	9,108	9,720	12,000	12,000
61113	Grounds Maint	2,500	0	0	0	2,500	2,500
61115	Sludge Disposal-Contr.	0	0	0	0	0	0
61150	Repairs & Maint	150,000	93,440	112,578	125,991	125,000	125,000
61151	Unusual Eq Maint	30,000	22,723	30,000	22,723	45,000	45,000
61191	Gas & Elect	500,000	405,752	488,858	481,161	500,000	500,000
61192	Water	2,500	906	1,092	1,091	1,250	1,250
61193	Telephone	3,400	5,541	6,676	6,934	6,000	6,000
61200	Other	0	0	0	0	0	0
61201	Permits & Fees	75,000	28,889	75,000	32,375	30,000	30,000
61290	Vehicle Repl	16,000	0	16,000	16,000	16,000	16,000
61300	Capital Outlay	0	0	0	0	0	0
Total - NOVATO PLANT		1,352,665	1,023,927	1,314,361	1,214,009	1,355,729	1,376,389

UNUSUAL EQUIP MAINT:

Replace pump seals #2 and #3 ($20,000)
Novato pump controls ($10,000)
Convert blower #1 and #2 to oil bath ($12,000)
Overhaul boiler ($3,000)

PERMITS & FEES:

See page 5A

Novato Sanitary District
2004-05 Budget
Operating Budget
SUPPLEMENTAL NOTES

SOFTWARE MAINTENANCE:
This account was established to account for needed annual maintenance of computer software used by various departments. Following is a breakdown of Computer Program Maintenance for each of the cost centers involved:

	NTP/ITP/S&PS/ RECLAM	LAB/MON	ADM/ENGR	TOTAL
Sewer Service				
Charge Upgrades			3,000	3,000
Misc. Programs/ –				
Updates - Admin.			5,000	5,000
Data Mgt. System		10,000		10,000
Misc. Office Software			4,000	4,000
TOTALS		10,000	12,000	22,000

UNUSUAL EQUIPMENT MAINTENANCE:
The purpose of this account is to identify specific planned extraordinary or unusual equipment maintenance expenses. By contrast, the Repairs and Maintenance expense item is essentially an allowance to cover unknown maintenance and repairs that will occur during the year.

PERMITS AND FEES:
The following is a breakdown of Permits and Fees for each of the cost centers involved:

	NTP	ITP	RECL/ DISP	SEWS/ PS	LAB/ MON	TOTAL
State Water Resources Control Bd:						
NPDES Permit Fees	10,000	10,000				20,000
Waste Discharger Fees	8,000	8,000				
Bay Monitoring Program	5,500	5,500				11,000
County of Marin:						
Haz Matl's Fees	820	820	300	2,000		3,940
BAAQMD Permit Fees:						
Permits to Operate	3,870	3,870	600			8,340
Air Toxics "Hot Spots"	125	125	100			350
Generators	1,685	1,685		500		3,870
State Dept of Health Lab						
Accreditation Fee					3,255	3,255
TOTALS	30,000	30,000	1,000	2,500	3,255	66,755

Novato Sanitary District
2004-05 Budget
Operating Budget - IGNACIO TREATMENT PLANT

Page 6

Account Number	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
62010	Salaries/Wages	166,575	136,285	164,199	157,096	184,601	203,339
62060	Gas, Oil & Fuel	2,750	2,018	2,431	2,699	2,750	2,750
62091	Software Maint	0	0	0	0	0	0
62100	Oper Supplies	10,000	9,702	11,689	11,700	10,000	10,000
62101	Oper Chemicals	97,525	50,244	60,535	56,807	75,000	60,000
62111	Radio Maint	0	0	0	0	0	0
62112	Janitorial Services	0	0	0	0	500	500
62113	Grounds Maintenance	0	0	0	0	0	0
62115	Sludge Disposal-Contr.	25,000	62,234	74,981	62,234	30,000	30,000
62150	Repairs & Maint	53,750	64,363	77,546	81,439	65,000	65,000
62151	Unusual Eq Maint	15,000	0	15,000	0	38,000	38,000
62191	Gas & Elect	220,000	152,257	183,442	179,657	220,000	220,000
62192	Water	400	257	310	331	400	400
62193	Telephone	1,300	1,735	2,090	2,269	1,300	1,300
62200	Other	0	0	0	0	0	0
62201	Permits & Fees	45,000	26,399	45,000	29,886	30,000	30,000
62290	Vehicle Repl	5,200	0	5,200	5,200	5,200	5,200
62300	Capital Outlay	0	0	0		0	0
Total - IGNACIO PLANT		642,500	505,494	642,423	589,318	662,751	666,489

UNUSUAL EQUIP MAINT:

Replace back pump disconnect ($8,000)
Replace/rebuild backwash pump ($10,000)
Replace MCC starter ($10,000)
Replace influent pump #2 seal ($10,000)

PERMITS & FEES: See page 5A

Novato Sanitary District
2004-05 Budget
Operating Budget - WASTEWATER RECLAMATION/DISPOSAL FACILITIES

Page 7

Account Number	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
63010	Salaries/Wages	88,840	72,685	87,572	76,923	98,454	114,378
63060	Gas, Oil & Fuel	1,200	594	716	822	1,200	1,200
63091	Software Maint	0	0	0	0	0	0
63100	Oper Supplies	8,000	7,123	8,582	7,909	8,500	8,500
63101	Oper Chemicals	30,920	26,637	30,920	26,637	30,920	30,920
63111	Radio Maint	0	0	0	0	0	0
63115	Sludge Disposal	12,000	36,708	44,227	38,315	12,000	12,000
63150	Repairs & Maintenance	78,000	61,673	74,305	93,065	78,000	78,000
63151	Unusual Eq Maint	7,500	0	7,500	932	39,500	39,500
63155	Sprinkler Spraying	0	0	0	0	0	0
63157	Ditch/Dike Maintenance	0	0	0	0	0	0
63191	Gas & Elect	150,900	106,469	128,276	111,362	140,000	140,000
63192	Water - Recl	7,000	1,211	1,459	1,508	7,000	7,000
63194	Water - Dechlor	2,000	0	2,000	0	2,000	2,000
63200	Other	0	0	0	0	0	0
63201	Permits & Fees	36,000	939	36,000	939	1,000	1,000
63290	Vehicle Repl	1,200	0	1,200	1,200	1,200	1,200
63300	Capital Outlay	0	0	0	0	10,000	10,000
Total - RECLAMATION/DISP. FACILITIES		423,560	314,039	422,756	359,612	429,774	445,698

UNUSUAL EQUIP MAINT:
Sprinkler Upgrades ($7,500)
Overhaul Flygt decant ($10,000)
Replace rails ($2,000)
Replace anodes ($20,000)

CAPITAL OUTLAY: Sludge pipe ($10,000)

PERMITS & FEES: See page 5A

Novato Sanitary District
2004-05 Budget
Operating Budget - LABORATORY AND MONITORING

Page 8

Account Number	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
64010	Salaries/Wages	213,393	167,380	201,663	208,870	226,749	250,139
64060	Gas, Oil & Fuel	1,250	1,189	1,433	1,643	1,250	1,250
64091	Software Maint	10,000	1,301	10,000	2,568	10,000	10,000
64100	Oper Supplies	21,000	19,200	23,133	25,759	23,100	23,100
64111	Radio Maint	0	0	0	0	0	0
64150	Repairs & Maintenance	2,500	1,637	1,972	3,550	2,500	2,500
64160	Research & Monitoring (Contractual)	130,000	97,478	117,443	115,604	154,000	154,000
64200	Other	0	0	0	0	0	0
64201	Permits & Fees	2,255	2,255	2,255	2,255	3,255	3,255
64290	Vehicle Repl	1,400	0	1,400	1,400	1,400	1,400
64300	Capital Outlay	9,000	4,450	9,000	6,633	10,000	10,000
Total - LABORATORY AND MONITORING		390,798	294,890	368,298	368,282	432,254	455,644

SOFTWARE MAINT: See page 5A

PERMITS & FEES: See page 5A

RESEARCH & MONITORING:
Routine sampling and heavy metals ($60,000)
Non-domestic monitoring ($16,800)
Sludge regulations ($4,300)
Influent and effluent priority pollutants monitoring ($6,000)
Reclamation monitoring ($5,100)
Priority pollutant sampling per 13267 ($21,600)
Priority pollutant sampling for E-003 ($5,000)
Metals sampling for E-003 ($4,000)
Total and fecal coliform ($13,300)
Special studies/blending tests ($15,000)
Miscellaneous ($2,900)

CAPITAL OUTLAY:
Equipment for enterococcus testing ($6,000)
pH meter ($3,000)
Bioassay upgrades ($1,000)

Novato Sanitary District
2004-05 Budget
Operating Budget - SEWERS AND PUMP STATIONS

Page 9

Account Number	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
65010	Salaries/Wages	444,200	363,426	437,863	481,709	492,270	457,512
65060	Gas, Oil & Fuel	7,000	7,492	9,027	9,592	10,000	10,000
65091	Software Maint	0	0	0	0	0	0
65100	Oper Supplies	16,000	24,000	28,916	30,557	16,000	16,000
65101	Oper Chemicals	0	0	0	0	10,000	10,000
65111	Radio Maint	0	0	0	0	0	0
65112	Janitorial Serv	500	0	0	0	500	500
65150	Repairs & Maintenance	90,000	131,934	158,957	172,939	90,000	130,000
65151	Unusual Eq Maint	0	0	0	0	20,000	20,000
65153	TV Inspection	0	0	0	0	0	0
65191	Gas & Elect	85,260	66,405	80,006	77,132	85,260	85,260
65192	Water	2,000	2,356	2,839	2,722	3,000	3,000
65193	Telephone	15,000	13,320	16,048	16,381	15,000	15,000
65200	Other	0	0	0	0	0	0
65201	Permits & Fees	1,600	1,817	1,817	1,817	2,500	2,500
65290	Vehicle Repl	20,600	0	20,600	20,600	20,600	20,600
65300	Capital Outlay	0	0	0		0	0
Total - SEWERS AND PUMP STATIONS		682,160	610,750	756,071	813,449	765,130	770,372

UNUSUAL EQUIP MAINT: Install control system at Olive Street ($5,000)
Replace pump #3 seal at Olive Street ($8,000)
Replace BMK pump ($7,000)

PERMITS & FEES: See page 5A

Novato Sanitary District
2004-05 Budget
Operating Budget - AB 939 SOLID WASTE PROGRAMS

Page 10

Account Number	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
67400	Consulting Services	78,397	60,581	78,397	75,734	83,800	83,800
67500	O/S Contractual - HHW	170,000	133,089	170,000	191,453	217,633	217,633
67520	Perm HHW Facility	10,000	0	10,000	0	10,000	10,000
67530	Used Oil Program	10,500	1,000	10,500	1,000	7,625	7,625
67600	Other	16,157	235	16,157	235	16,517	16,517
67610	City AB 939 Admin	10,000	0	10,000	10,000	10,000	10,000
Total - AB 939 Solid Waste Programs		295,054	194,905	295,054	278,422	345,575	345,575

DOC Beverage Container Recycling - MF	11,157
Other/Contingency	5,360

Novato Sanitary District
2004-05 Budget
Operating Budget - ADMINISTRATION AND ENGINEERING

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Account Number	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
66010	Salaries/Wages	631,436	492,433	593,293	569,461	609,288	605,729
66020	Empl Benefits	593,485	489,621	589,905	576,239	755,000	699,375
66030	Director's Fees	28,606	24,510	29,530	30,960	28,606	28,606
66040	Election Exp	35,000	31,520	31,520	31,520	0	0
66060	Gas, Oil & Fuel	3,903	2,386	2,875	3,805	4,200	4,200
66070	Insurance	101,692	58,133	101,692	58,833	116,946	116,946
66071	Ins Claims Exp	20,000	3,888	10,000	53,820	20,000	20,000
66080	Memberships	34,282	21,628	34,282	26,871	35,000	35,000
66090	Office Expense	21,642	20,081	24,194	25,984	25,000	25,000
66091	Software Maint.	10,000	7,284	10,000	7,734	12,000	12,000
66100	Engr Supplies	6,500	4,424	5,330	6,664	6,500	6,500
66111	Radio Maint	0	0	0	0	0	0
66121	Accounting	13,000	12,125	13,000	12,125	20,000	20,000
66122	Attorney	80,000	44,047	53,069	48,840	80,000	80,000
66123	O/S Contractual	291,500	90,994	109,631	121,621	187,000	187,000
66130	Print & Publ	12,000	8,820	10,627	9,392	14,000	14,000
66150	Repairs & Maintenance	6,500	2,944	3,547	4,531	6,500	6,500
66170	Trav, Mtgs & Trn	40,000	33,945	40,898	39,834	75,000	75,000
66193	Telephone	8,000	6,823	8,220	8,412	8,500	8,500
66200	Other	0	0	0	0	0	0
66201	Annex. Fees	0	0	0	0	0	0
66202	Co. Collection Fees	47,200	45,195	45,195	45,195	47,200	47,200
66250	Ser Chg Sys Exp	0	0	0	0	7,500	7,500
66290	Vehicle Repl	5,600	0	5,600	5,600	5,600	5,600
66300	Capital Outlay	18,400	12,654	18,400	13,452	15,000	15,000
Total - ADMINISTRATION AND ENGINEERING		2,008,746	1,413,455	1,740,807	1,700,893	2,078,840	2,019,656

O/S CONTRACTUAL: Miscellaneous Engineering ($10,000); Public Education/Pollution Prevention ($38,000); Safety ($30,000); NPDES Permit Assistance ($75,000); Standard Specs. & Drawings ($24,000); Personnel Studies - Rules & Regs. ($2,000); Document Archiving $3,000); Misc. ($5,000)

CAPITAL OUTLAY: Computer Equipment ($15,000)

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2004-05 Budget
Operating Budget - PERSONNEL DETAIL

Number	Position	Dept.	Pay Range	Est. 2004-05 Salaries
1	Manager-Engineer	A/E	58	118,034
1	Deputy Manager-Engineer	A/E	55	79,659
1	Construction Supervisor	A/E	49.5	85,308
1	Staff Engineer	A/E	47	75,492
1	Construction Inspector	A/E	44.5	66,840
1	Admin Services Manager	A/E	49.5	85,308
2	Senior Secretary	A/E	39	72,438
1	Wastewater Facilities Manager	M/O	54.5	108,876
1	Plant Superintendent	M/O	51	89,568
1	Mechanical Maintenance Leadworker	M/O	46	71,892
2	Instrument Technician/Electrician	M/O	46.5	138,147
1	Collection System Leadworker.(6 mos.)	M/O	43	26,826
1	Laboratory Supervisor	L/M	49.5	83,613
1	Laboratory Analyst II	L/M	44.5	66,840
1	Pollution Prevention Specialist/Lab. Analyst	L/M	45.5	70,176
1	Operations Leadworker	M/O	45.5	70,176
2	WWTP Operator II	M/O	43	108,822
2	WWTP Operator I	M/O	41.5	86,598
1	WWTP Operator-In-Training	M/O	41	46,344
1	Mechanical Technician II	M/O	43.5	63,660
1	Mechanical Technician I	M/O	41	56,328
4	Collection System Worker II	M/O	40.5	182,220
1	Collection System Worker I	M/O	38.5	43,620
1	Maintenance Worker 1	M/O	38	30,024
1	Intern	A/E	N/A	15,000
1	Temporary Maintenance Worker	M/O	N/A	4,500
1	Temporary Collection System Supervisor (26 weeks)	M/O	N/A	36,192
1	Temporary Lab. Supervisor	L/M	N/A	23,390
	Allowance for Overtime	M/O		30,000
	Allowance for Overtime	A/E		7,650
	Allowance for Overtime	L/M		6,120
	Allowance for Weekend/Standby Duty Pay	M/O		75,275
	CCSR	M/O		1,800
	Subtotal			2,126,736
	Includes 2% allowance for salary adjustments			
				2,126,736

Distribution:

Administration and Engineering (A/E)			=	605,729
Laboratory and Monitoring (L/M)			=	250,139
Treatment Plants:				
Novato	39%	M/O	=	495,639
Ignacio	16%	M/O	=	203,339
Sewers and Pump Stations	36%	M/O	=	457,512
Reclamation/Disposal Facilities	9%	M/O	=	114,378
Total/Check				2,126,736

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2004-05 Budget
Operating Budget - VEHICLE REPLACEMENT FUND DETAIL

	2004-05 Budget	
	Prelim	Final
FLOW OF FUNDS		
FUND BALANCE 6/30/03	499,398	499,398
Sale of Vehicle/s:		
1997 GMC Sonoma Mini Pick-Up Truck	1,905	1,905
Contributions from Operating Fund Accounts 2003-04	50,000	50,000
Purchase of Vehicles:		
2004 Chevrolet K2500 Pick-Up Truck	(24,950)	(24,950)
2004 Chevrolet Silverado Pick-Up Truck	(13,936)	(13,936)
California GSA Fees	(680)	(680)
FUND BALANCE 6/30/04	511,737	511,737
Sale of Vehicle/s: (1988 Ford Vactor; 1995 GMC P-U; 1997 Ford P-U; 1999 Dodge P-U; 1999 Ford 3/4-ton P-U; 1994 Ford Taurus Sedan; 2002 Dodge P-U)	59,000	59,000
Anticipated Contributions from Operating Accounts 2004-05	50,000	50,000
Planned Purchase of Vehicles:		
Vactor	(190,000)	(190,000)
Tractor	(100,000)	(100,000)
Camera Van	(125,000)	(125,000)
Sedan	(20,000)	(20,000)
Extended Cab Pick-Up Truck	(18,000)	(18,000)
3/4-ton Pick-Up Truck	(15,000)	(15,000)
2 Mini Pick-Up Trucks	(28,000)	(28,000)
ANTICIPATED FUND BALANCE 6/30/05	124,737	124,737

Novato Sanitary District
2004-05 Budget
FLOW OF FUNDS - SELF-INSURANCE RESERVE FUND

Page 14

	2004-05 Budget	
	Prelim	Final
FUND BALANCE 6/30/03	168,339	168,339
Interest Earned on Fund Balance	4,084	1,775
Transfer to Operating Fund to Reimburse Fund for Claims	(10,000)	(53,820)
Transfer from Operating Fund to Self-Insurance Reserve Fund	0	0
FUND BALANCE 6/30/04	162,423	116,294
Anticipated Interest Earned on Fund Balance	3,500	1,600
Anticipated Transfer to Operating Fund to Reimburse Fund for Claims	(20,000)	(20,000)
ANTICIPATED FUND BALANCE 6/30/05	145,923	97,894

** The District has general and automobile liability coverage in the amount of $10,000,000 with a $100,000 deductible through the California Sanitation Risk Management Authority (CSRMA). Coverage for Errors and Omissions is included in the CSRMA pooled liability insurance program.

The District also has a property insurance policy through CSRMA to cover buildings, structures and equipment. This policy provides $40,000,000 coverage with a $25,000 deductible.

The self-insurance reserve fund has been set up to cover possible District claims falling within the deductible amounts on these policies.

Novato Sanitary District
2004-05 Budget
FLOW OF FUNDS - RATE STABILIZATION AND EMERGENCY REPAIRS RESERVE FUNDS

Page 15

	2004-05 Budget	
	Prelim	Final
RATE STABILIZATIONFUND**		
FUND BALANCE 6/30/03	600,000	600,000
Contribution to/from Operating Fund to Rate Stabilization Fund 2003-04	0	0
FUND BALANCE 6/30/04	600,000	600,000
Anticipated Contribution to/from Operating Fund to Rate Stabilization Account 2004-05	0	0
ANTICIPATED FUND BALANCE 6/30/05	600,000	600,000
EMERGENCY REPAIR RESERVE FUND**		
FUND BALANCE 6/30/03	600,000	600,000
Contribution to/from Operating Fund to Emergency Repair Reserve Fund 2003-04	0	0
FUND BALANCE 6/30/04	600,000	600,000
Anticipated Contribution from Operating Fund to Rate Stabilization Account 2004-05	0	0
ANTICIPATED FUND BALANCE 6/30/05	600,000	600,000

** In October 2001, the District Board adopted an Operating Reserve Fund Policy that included establishing a Service Charge Rate Stabilization Fund in the amount of $600,000 and an Emergency Repair Reserve Fund in the amount of $600,000.

Novato Sanitary District
2004-05 Budget
FLOW OF FUNDS - SOUTHGATE RESERVE FUND

Page 16

	2004-05 Budget	
	Prelim	Final
SOUTHGATE RESERVE FUND		
FUND BALANCE 6/30/03	890,989	890,989
Contribution from Southgate Reserve Fund to Capital Improvement Fund 2003-04	(192,000)	(192,000)
FUND BALANCE 6/30/04	698,989	698,989
Contribution from Southgate Reserve Fund to Capital Improvement Fund 2004-05	0	0
ANTICIPATED FUND BALANCE 6/30/05	698,989	698,989

** In March 2003, as part of the Settlement Agreement for acceptance of the Southgate Subdivision sewers, Southgate Partners deposited the sum of $890,989 with the District for improvement and continued maintenance and operation of the sewer improvements.

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2004-05 Budget
CAPITAL IMPROVEMENTS BUDGET - REVENUE SUMMARY

Acct Number	Item	Budget 2003-04	Revenues Thru April	Est Rev 2003-04	Actual Rev 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
51010	Service Chgs (1)	654,000	601,907	654,000	634,790	2,615,000	2,615,000
51020	Connection Charges (2)	495,000	572,785	495,000	1,406,645	905,000	905,000
51030	Collector Sewer Charges	3,000	2,000	3,000	4,000	3,000	3,000
51040	Special Equal Charges	600	324	600	15,267	600	600
51050	Trunk Sewer Charges	0	0	0	0	0	0
51060	Interest Earn	340,000	112,535	150,000	144,950	150,000	150,000
51070	Other Revenue	0	0	0	0	0	0
51090	Novato Heights SAD	0	75,000	75,000	75,000	0	0
	TOTALS	1,492,600	1,364,551	1,377,600	2,280,652	3,673,600	3,673,600

(1) Service charge revenue is based on the assumption that capital service charges will increase from $25 to $100

(2) Connection charge revenue is based on the assumption that connection fees will increase from $4,950 to $6,030

Novato Sanitary District
2004-05 Budget
CAPITAL IMPROVEMENTS BUDGET

Page 18

Project	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
94-14	NTP Pavement Overlay	0	(39)	(39)	(39)	0	0
95-7	VFD Revisions	60,000	27,182	30,000	27,422	40,000	40,000
99-7	NTP Chlorination Impvts	20,000	0	0	0	20,000	20,000
99-8	ITP Improvements	155,000	59,295	59,295	64,125	60,000	60,000
00-6	Reclamation Fac. Ditch Maint	200,000	30,782	25,974	39,173	200,000	200,000
00-7	NTP Primary Clarifier Impvts	300,000	0	0	0	300,000	300,000
00-8	Bahia Remote PS Impvts	950,000	654,808	725,000	710,482	200,000	200,000
00-9	NTP Secondary Digester Rehabilitation Project	116,000	116,498	125,000	123,040	30,000	30,000
00-10	NTP Aeration System Retrofit	0	0	0	52	0	0
00-11	Admin. Bldg. Remodel	1,816,000	1,791,256	1,816,000	1,859,316	150,000	150,000
01-5	Facility Plan for NTP & ITP	695,000	252,086	300,000	277,925	700,000	700,000
01-6	Collection System Eval. and Capacity Assurance Plan	560,000	253,310	235,462	305,470	560,000	560,000
01-7	Reclamation Facility Rehab.	100,000	6,260	10,000	21,617	100,000	100,000
01-8	BMK 5 Pump Station Rehab.	595,000	195,434	230,000	279,031	1,200,000	1,200,000
01-10	Drainage PS #3 & #7 Outfall Rehabilitation	50,000	0	0	0	50,000	50,000
01-11	SCADA Phase II	265,000	10,633	15,000	23,858	265,000	265,000
01-13	Pump Station Facility Plan	100,000	0	5,000	52	100,000	100,000
01-15	Grant Ave. Sewer Improvement	800,000	339,507	500,000	354,223	500,000	500,000
01-16	Novato Heights SAD	75,000	(4,586)	(4,586)	(986)	75,000	75,000
01-18	Franklin Ave Main Interceptor Rehabilitation Phase I	450,000	12,646	30,000	20,101	550,000	550,000
02-02	Olive Street Sewer Repair	12,000	32,216	32,771	33,829	0	0
02-03	Bruno Ave Sewer Repair	150,000	127,391	127,391	128,800	0	0
03-01	Minor Projects	50,000	4,160	20,000	19,574	0	0
03-02	Sewer Adj. in Connection with City Projects	100,000	1,500	1,500	2,461	0	0

2004-05 Budget
CAPITAL IMPROVEMENTS BUDGET - CONTINUED

Page 19

Project	Item	Budget 2003-04	Expends Thru April	Est. Expend 2003-04	Actual Expend 2003-04	2004-05 Budget Prelim	2004-05 Budget Final
03-03	Collection System Repairs	700,000	78,246	165,000	125,275	2,370,000	1,370,000
03-05	Southgate Sewer	192,000	0	0	255	192,000	192,000
03-06	Marin Village PS Rehab & Emergency Generator	300,000	9,365	0	9,365	150,000	150,000
03-07	Olive St. PS Controls & Emergency Generator	300,000	0	0	465	150,000	150,000
03-08	SCADA III Control & Data	100,000	0	0	0	50,000	50,000
04-01	Minor Projects	0	0	0	0	50,000	50,000
04-02	Sewer Adj. for City Projects	0	0	0	0	100,000	100,000
04-03	BMK Pump Station Rehab.	0	0	0	0	150,000	150,000
04-04	2005 Collection System Spot Repairs	0	0	0	0	150,000	150,000
04-05	Interim Improvements at NTP	0	0	0	0	100,000	100,000
	TOTALS	9,211,000	3,997,950	4,448,768	4,424,886	8,562,000	7,562,000

(Source: Novato Sanitary District Final Budget for Fiscal Year 2004-05 Adopted August 2004)

Section 4 – Hazard Vulnerability Analysis

Hazard Definitions

A hazard can be defined as a condition that has the potential to result in equipment or system failure that can result in human injury or death or damage to the environment. Hazards are divided into two categories: natural or technological. Natural hazards include earthquakes, wild fires, and floods; while technological hazards include transportation accidents, illegal disposal, and equipment failures during manufacturing, storage, transportation, and use of hazardous materials.

A risk assessment is the process of evaluating the degree of harm a hazard presents. Risk assessments are utilized in developing emergency response plans and procedures, designing and modifying safety systems, identifying needed resources, conducting training and exercises, and minimizing damage and liability.

All urban environments contain a variety of hazards, both natural and human-made, that have the potential to endanger the public safety of the community. Ensuring public safety involves establishing goals and policies that consider all types of potential disasters, crime prevention, fire prevention, and reducing the risk of personal injury and potential property damage.

The Public Safety Element is a detailed plan for addressing and reducing specific hazards in City of Novato. The Safety Element is a required component of the General Plan, mandated by Government Code Section 65302(g). (City of Novato 1996 General Plan, amended March 25, 2003)

Hazard Ratings

Sample of Format Used to Rate Hazards and the Rating Definitions

Note: The Committee considered the STAPLEE FEMA process when considering hazards and Hazard Mitigation Strategies

Rate each hazard by priority category.

0= No Risk in accordance with the definitions for hazard prioritization definitions listed below
1= Low Risk in accordance with the hazard prioritization definitions listed below
2= Moderate Risk in accordance with the hazard prioritization definitions listed below
3= High Risk in accordance with the hazard risk definitions listed below

Total the numbers horizontally for each hazard category. The highest possible score for a hazard is 24; the lowest is 0.

Magnitude

Physical and Economic greatness of a risk-caused event.

Factors to consider:

- Size of Event
- Threat to life
- Threat to Property
    1. Individual
    2. Public Sector
    3. Business and Manufacturing
    4. Tourism

Duration

The length of time the effects of a risk-caused event would last.

Factors to consider:

- Physical duration during emergency phase
- Length of time of threat to life and property
- Physical duration during recovery phase
- Length of time of effects on individual citizens and community recovery
- Length of time of effects on economy, tax base, business and manufacturing, tourism, and employment

Distribution

The depth of impact of a risk-caused event among all sectors of the community

Factors to consider:

- Across the jurisdiction, how wide spread are the effects of the disaster?
- Are all sectors of the community affected equally or disproportionately?

Area Affected

How large of an area is physically threatened or potentially impaired by a risk-caused event?

Factors to Consider:

- Geographic area affected by primary event.
- Geographic, physical, economic areas affected by potential secondary effects.

Frequency

The historic and predicted rate of recurrence of a risk-caused event (generally expressed in years such as the 100-year flood)

Factors to consider:

- Historic events and recurrences of events in a measured time frame.

Probability

The degree of likelihood or calculated odds that a risk-caused event would occur (such as a 62% chance of a magnitude 6.7 earthquake along a given fault within a 30 year period).

Factors to consider:

- Scientifically-based predictions for occurrence of an event in a given period of time.

Degree of Vulnerability

How susceptible are the population, community infrastructure and state resources to the effects of a risk-caused event.

Factors to Consider:

- History of the impact of similar events.
- Mitigation steps taken to lessen impact.
- Community preparedness to respond to and recover from the event.

Community Priorities

The importance placed on a particular risk by the citizens and their elected officials.

Factors to consider:

- Willingness to prepare for and respond to a particular risk.
- More widespread concerns over a particular risk than other risks.
- Cultural significance of the threat associated with a risk.

Prioritization of Hazard Matrix Results

Hazard Prioritization as of January 2005 Hazard Planning Committee meeting.

High Risk Priority Hazards

Earthquake	Natural Hazard
Flood	Natural Hazard
Wildland Urban Interface Fires	Natural Hazard
Utility Loss	Human-Caused Hazard
Transportation Loss	Human-Caused Hazard
Land Slides	Natural Hazard
Hazardous Materials	Human-Caused Hazard
Water, Wastewater Disruption	Human-Caused Hazard

Moderate Risk Priority Hazards

Dam Failure	Human-Caused Hazard
Weapons of Mass Destruction (WMD) Terrorism	Human-Caused Hazard
Data/telecommunications	Human-Caused Hazard
Utility Substation	Human-Caused Hazard

Low Risk Priority Hazards

Aviation Disasters	Human-Caused Hazard
Explosions	Human-Caused Hazard
Severe Weather/Winds/Drought	Natural Hazard
Radiological	Human-Caused Hazard
Economic	Human-Caused Hazard
Tsunami	Natural Hazard
Special Events	Human-Caused Hazard
Biological Health	Human-Caused Hazard

High Risk Priority Hazards

Earthquake

Earthquake was rated a HIGH PRIORITY HAZARD in the City of Novato and for the Novato Sanitary District.

Major Earthquake

The following information is summarized and from the Novato General Plan Safety Element.

The City of Novato recognizes that it is located in one of the most seismically active areas of the nation. The severity of damage to buildings from earthquakes is related to the intensity of ground shaking, shills and geologic characteristics, the type of building construction used and other potential hazards listed such as:

- Rupture of the Ground Surface by displacement faults.
- Shaking of the ground caused by the passage of seismic waves through the earth.
- Ground failure induced by shaking such as landslides, liquefaction, and subsidence of unstable ground, with associated effects, including fire and disruption of utilities and transportation routes.
- Tsunamis and seiches which occur in enclosed bodies of water such as reservoirs or lakes. This is listed as an insignificant risk in the Safety Element of the Novato General Plan.

The City of Novato is traversed by several faults (see page 164). A major earthquake along any of the faults could cause substantial and damage resulting in collapsed buildings, damaged roads, bridges, fires, flooding and other threats to life and property. The City of Novato is in a seismic Zone 4 (USGS), being the area of greatest risk. The western edges of the continental plates run along the California shoreline and the resulting stresses have produced a complex network of faults. The San Andreas Fault is located 12-14 miles west of the City: This fault is subject to a maximum credible earthquake of 8.3 on the Richter Scale. ABAG concludes the chance of a major earthquake on the Northern Segment of the San Andreas Fault in the next 30 years is only 2 percent. An inactive fault the Burdwell Mountain Fault, crosses the northeastern portion of the City.

The Hayward Fault and the Healdsburg-Rodgers Creek Fault located northeast of the City are both active faults with maximum credible earthquakes of 7.5 and 7.2 respectively. The ABAG report predicts the probability of an earthquake on the Healdsburg-Rodgers Creek fault as being 22 percent and on the Hayward Fault as being 28 percent chance.

The bay front and marshland areas of Novato are potentially hazardous to buildings. Some of these lands have been reclaimed through construction of levees and drainage channels and used for urban development. During an earthquake, the sandy soils fail though liquefaction, greatly increasing the potential damage to buildings.

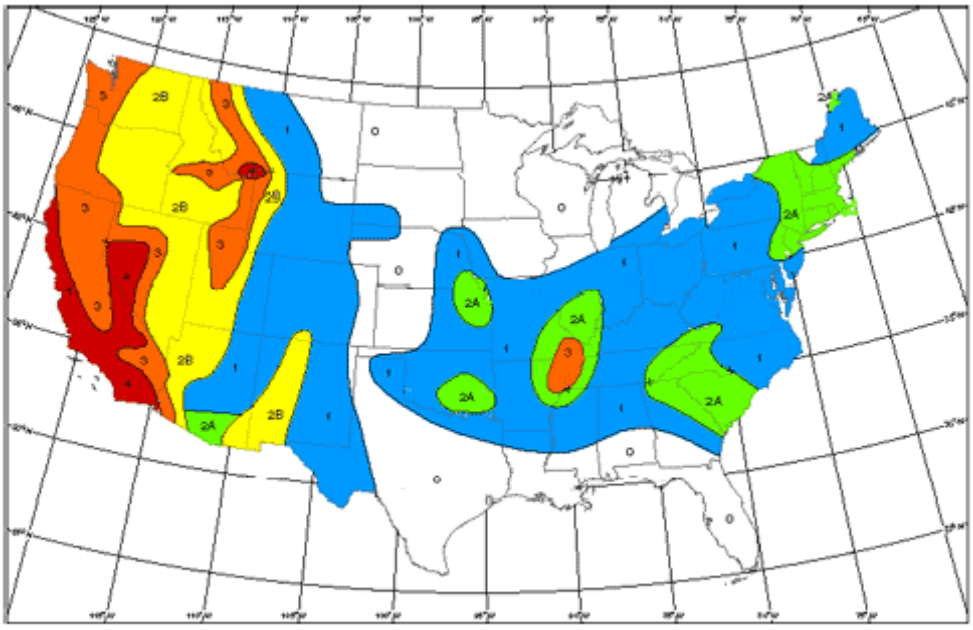
The severity of damage to buildings from earthquakes is related to the intensity of ground shaking, soils and geologic characteristics, the type of building construction used, and other potential hazards listed above.

Critical Facilities are those facilities identified that, if damaged or destroyed, could severely hinder a jurisdiction's ability to respond or provide vital services in the event of a catastrophic disaster. The City of Novato has determined that it does not have facilities which meet these criteria.

The Uniform Building Code (UBC) is one of three major codes used by local and state jurisdictions throughout the United States to regulate building construction. The UBC is a consensus-based document that is updated annually and published every third year by the International Conference of Building Officials (ICBO). The principal issues the code addresses are those related to fire resistance, occupant safety, accessibility, energy conservation and structural adequacy.

Within the United States, there are six seismic zones: 0, 1, 2A, 2B, 3 and 4. Zone 0 represents minimum seismic risk with higher numbers showing increasing risk up to Zone 4, the maximum seismic risk zone. Zone 2 is subdivided into two different zones, 2A and 2B. The distinction between these two zones is that zone 2A is associated with unknown geologic conditions, whereas zone 2B is associated with known crustal faults.

The City of Novato is within Seismic Zone 4. The seismic zones are in order of magnitude with Seismic Zone 4 being in an area of greatest risk.



Map Key: Red, Zone 4; Orange, Zone 3; Yellow, Zone 2B; Green, Zone 2A; Blue, Zone 1

The seismic status of buildings by their seismic classification as summarized in the City of Novato Master Plan Safety Element.

1. Emergency Buildings, such as police and fire stations have been constructed recently and have been built with earthquake damage mitigation features (Note: The older hospital has been relocated and rebuilt and no longer is a high risk.)

2. Many of the high priority buildings, (City buildings, schools, limited care facilities) are mostly of recent construction. Many are steel or wood-frame buildings which are the least susceptible to earthquake damage.

3. The majority of high use buildings (commercial and office buildings, apartment buildings of 50 or more units and churches) are of recent construction and were designed to Seismic Risk Zone 4 Standards.

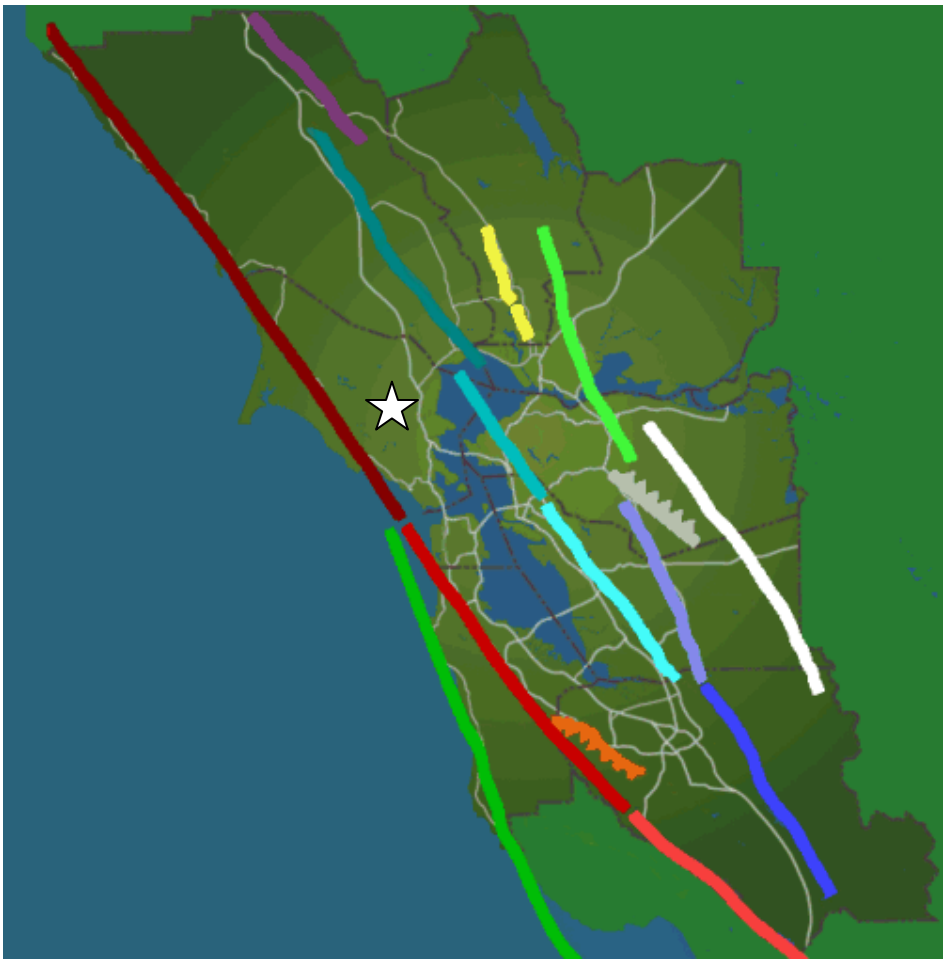
4. Duplexes and the majority of housing in Novato have been built with one and two-story wood-frame construction which has a high survivability in the event of an earthquake.

5. Bridges across Highway 101 could be vulnerable in the event of a major earthquake and Caltrans reports at this time (2004 to 2006) that they have not been seismically retrofitted.

6. Many of the older historical structures in Novato have not been retrofitted to meet recent seismic building standards.

A hypothetical earthquake on the Hayward Fault illustrated by ABAG as SF Map 1: Earthquake Hazard. SF Map shows fault traces in Marin County and adjoining areas. A major earthquake would be expected to cause considerable damage to transportation systems. Roads, bridges and highway overpasses are susceptible to damage or failure in the event of a major earthquake. Landslides would be intensified as a result of ground shaking and could affect portions of the roadway system located in landslide areas in. Seismic damage could also occur to treated water and sewage pipelines, gas pipeline and to telephone and utility systems.

Seismic Faults in Vicinity of Novato

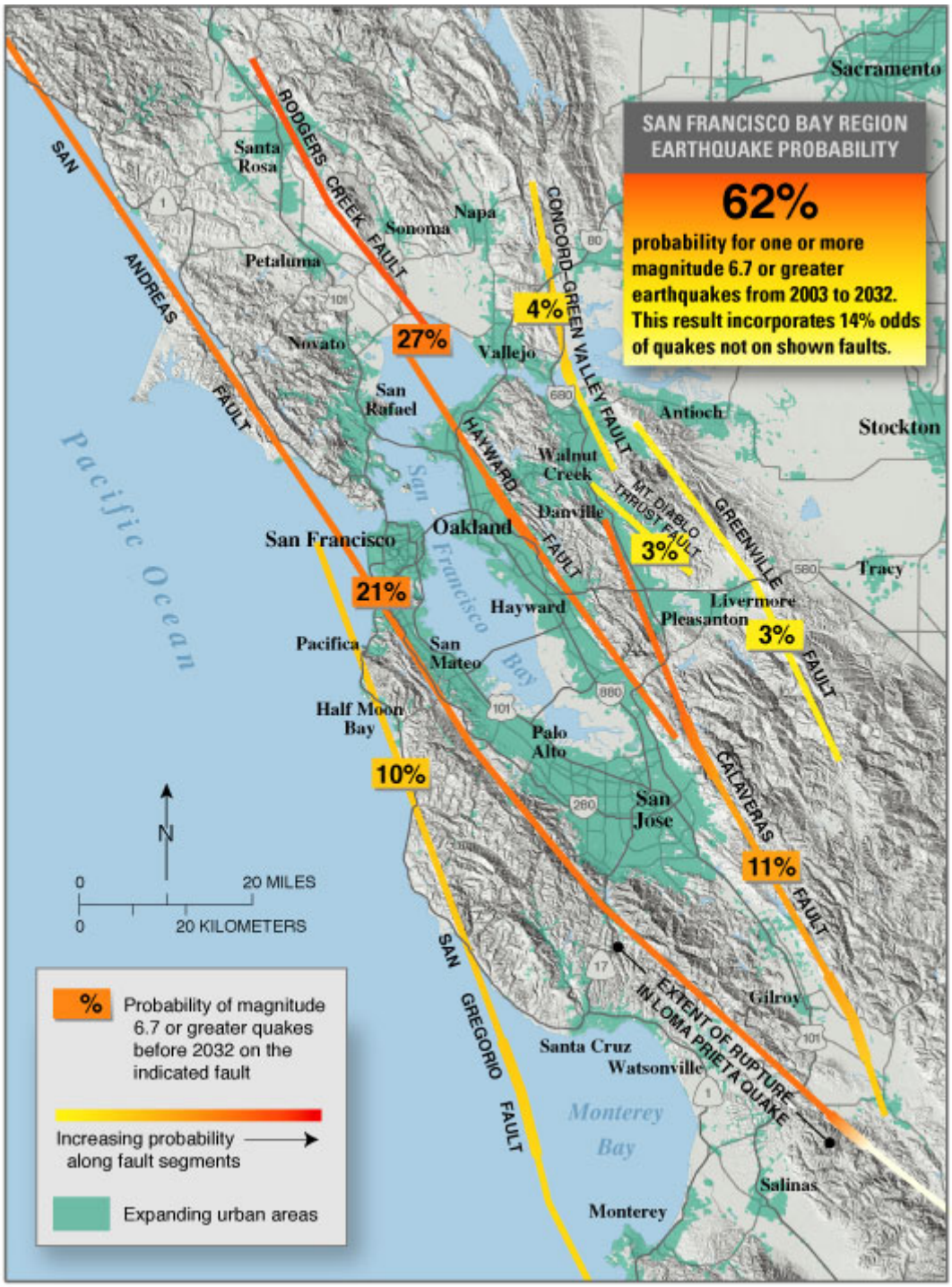


Color Codes:

San Andreas-North Golden Gate
San Andreas - - Peninsula
San Andreas - - Santa Cruz
Entire San Andreas (1906 Quake)
Rodgers Creek
Rodgers Ck + North Hayward
North Hayward
South Hayward
North + South Hayward
Northern Calaveras
Central Calaveras
Maacama
West Napa
Concord/Green Valley
Greenville (White
Mount Diablo (thrust fault)
Northern San Gregorio
Monte Vista (thrust fault)

☆ **Novato Location**

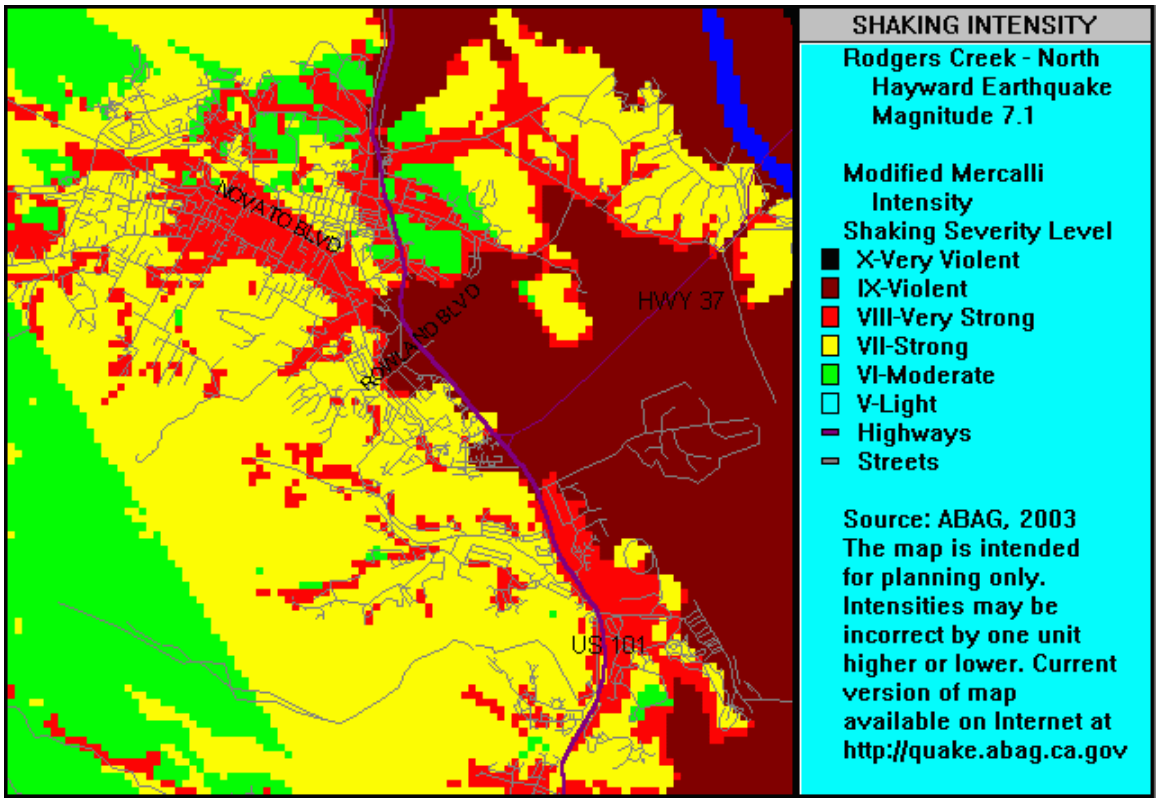
Earthquake Probability

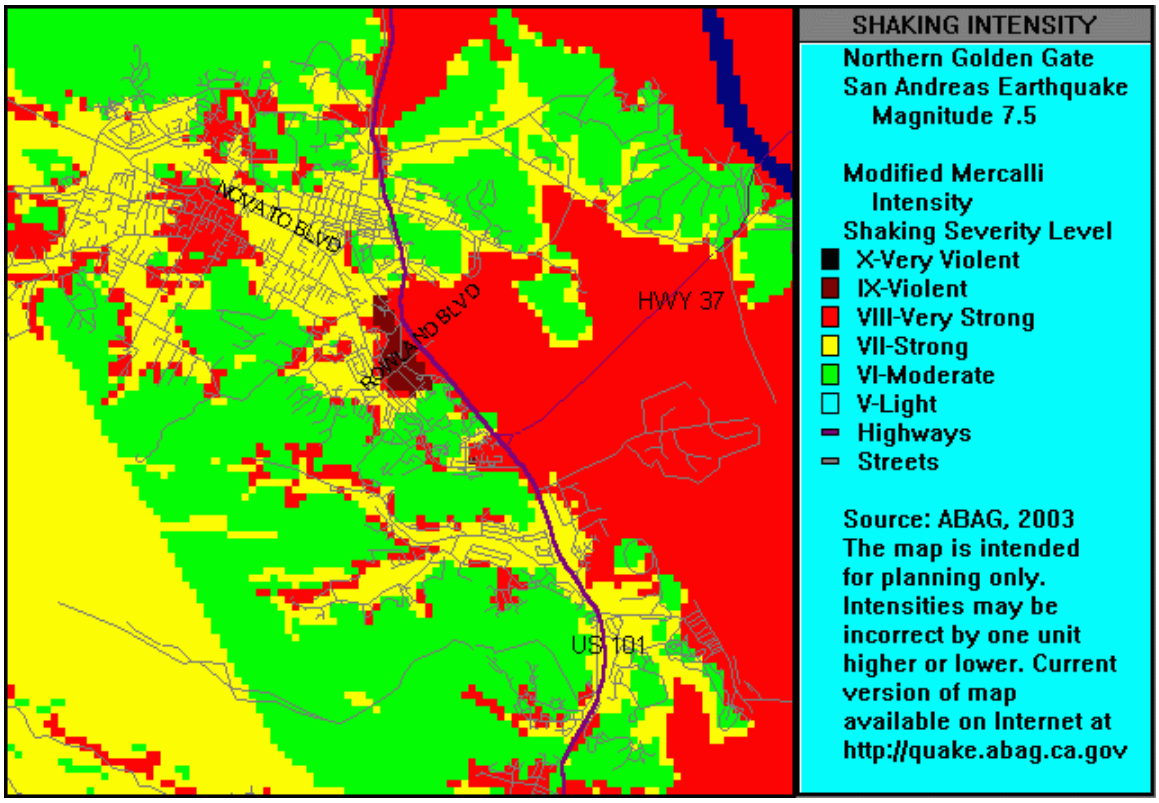


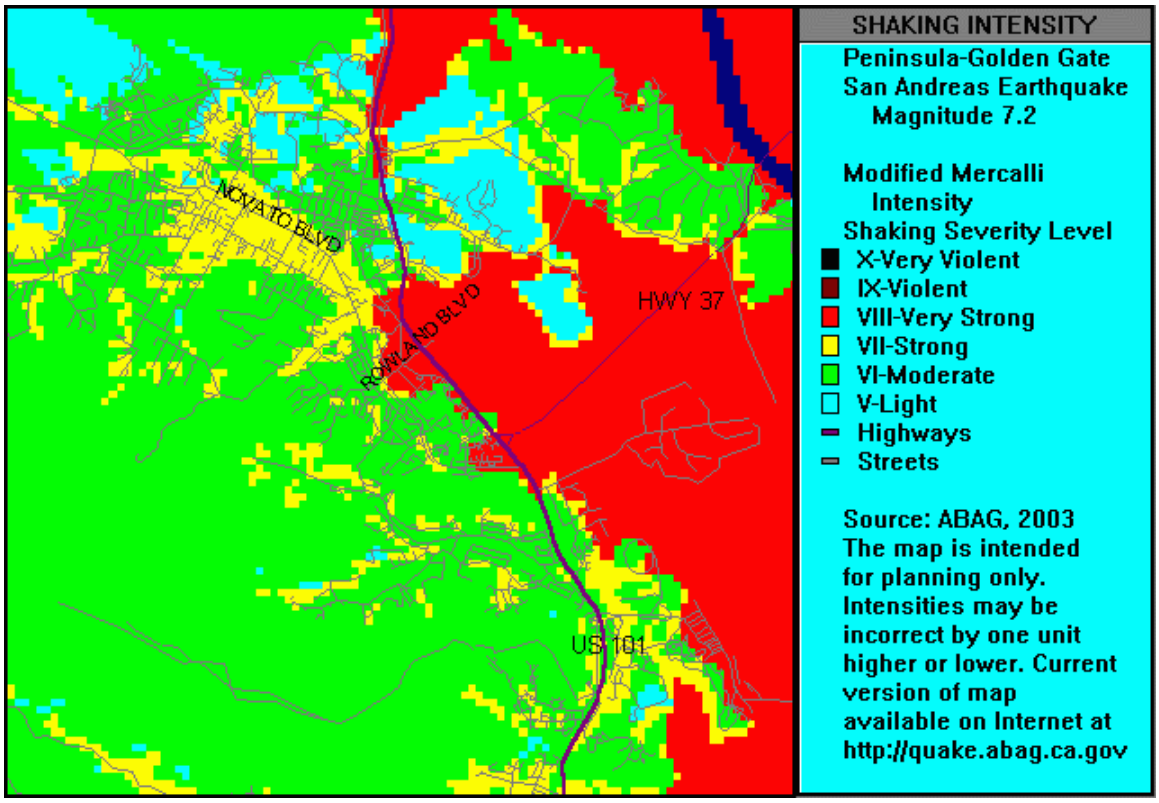
Association of Bay Area Governments (ABAG)

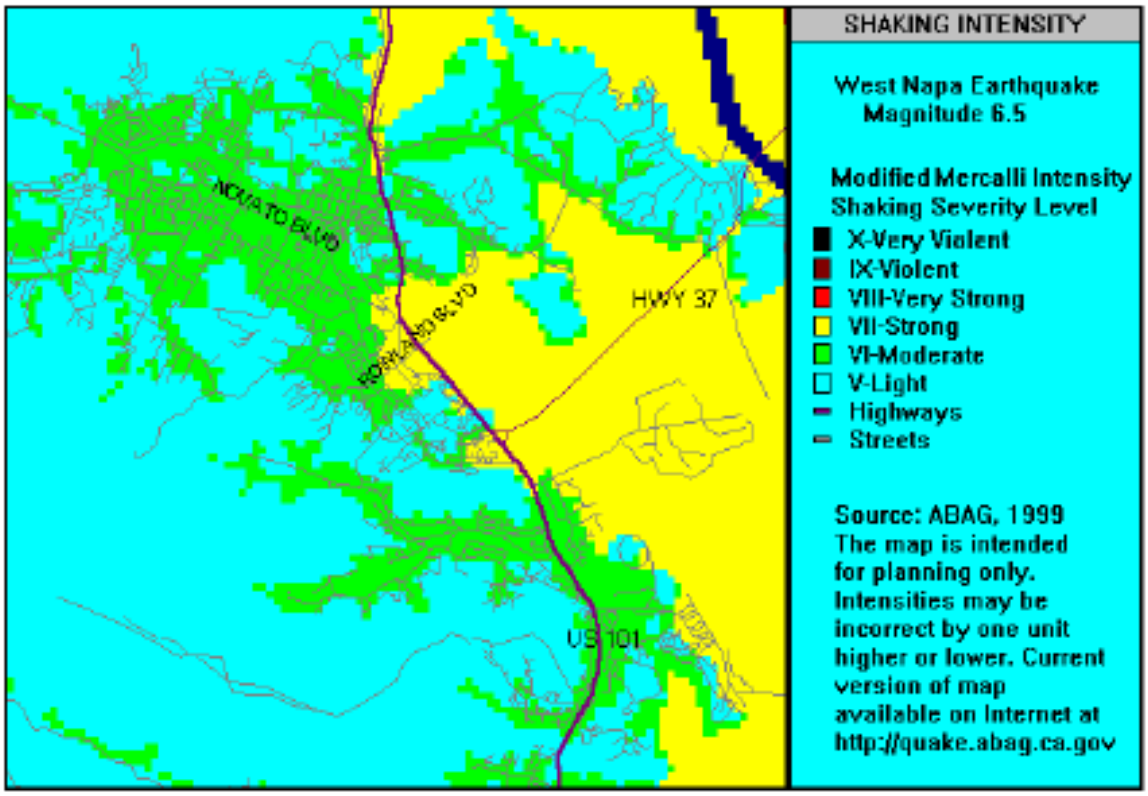
General Map of Bay Area

Shake Intensity

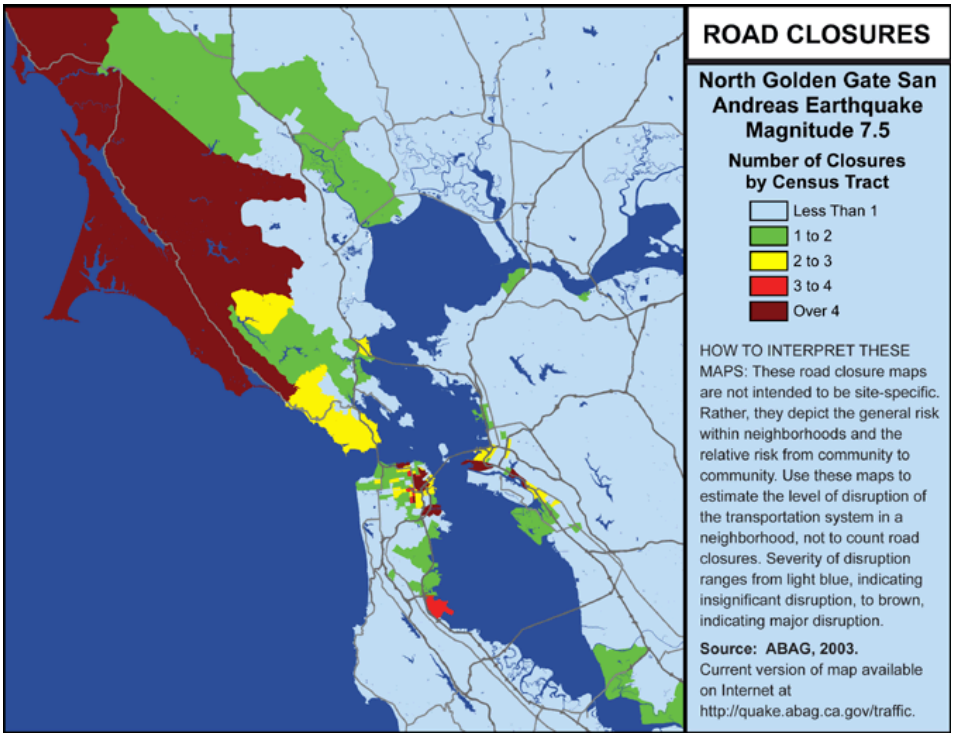





NOVATO BLVD
ROWLAND BLVD
HWY 37
US 101
SHAKING INTENSITY
Peninsula-Golden Gate
San Andreas Earthquake
Magnitude 7.2
Modified Mercalli
Intensity
Shaking Severity Level
X-Very Violent
IX-Violent
VIII-Very Strong
VII-Strong
VI-Moderate
V-Light
Highways
Streets
Source: ABAG, 2003
The map is intended
for planning only.
Intensities may be
incorrect by one unit
higher or lower. Current
version of map
available on Internet at
http://quake.abag.ca.gov

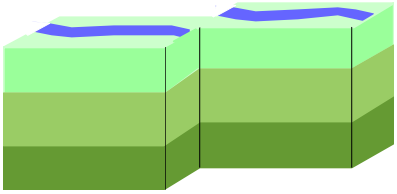


Transportation Impact



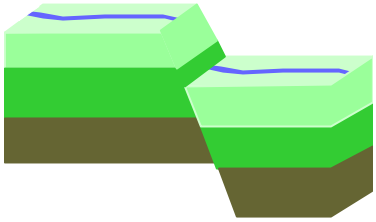
Causes and Characteristics of Earthquakes in California

Fault



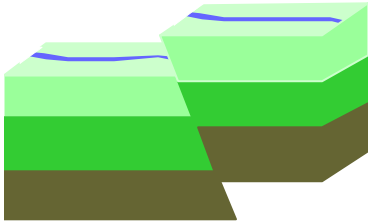
A fault is a fracture along between blocks of the earth's crust where either side moves relative to the other along a parallel plane to the fracture.

Strike-slip



Strike-slip faults are vertical or almost vertical rifts where the earth's plates move mostly horizontally. From the observer's perspective, if the opposite block looking across the fault moves to the right, the slip style is called a right lateral fault ; if the block moves left, the shift is called a left lateral fault.

Dip-slip



Dip-slip faults are slanted fractures where the blocks mostly shift vertically. If the earth above an inclined fault moves down, the fault is called a normal fault, but when the rock above the fault moves up, the fault is called a reverse fault. Thrust faults have a reverse fault with a dip of 45 ° or less.

The earthquakes of California are caused by the movement of huge blocks of the earth's crust. Southern California straddles the boundary between the Pacific and North American plates. These large sections of the earth's crust (the North American plate extends east to Iceland while the Pacific plate extends west to Japan) are moving past each other. The Pacific plate is moving northwest, scraping horizontally past North America at a rate of about 50 millimeters (2 inches) per year.

About two-thirds of these 50 millimeters per year occurs on the San Andreas Fault.

Earthquake Related Hazards

Ground shaking, landslides, liquefaction, and amplification are the specific hazards associated with earthquakes. The severity of these hazards depends on several factors, including soil and slope conditions, proximity to the fault, earthquake magnitude, and the type of earthquake.

Ground Shaking

Ground shaking is the motion felt on the earth's surface caused by seismic waves generated by the earthquake. It is the primary cause of earthquake damage. The strength of ground shaking depends on the magnitude of the earthquake, the type of fault, and distance from the epicenter (where the earthquake originates). Buildings on poorly consolidated and thick soils will typically see more damage than buildings on consolidated soils and bedrock.

These regions are near major, active faults and will on average experience stronger earthquake shaking more frequently. This intense shaking can damage even strong, modern buildings. The regions distant from known, active faults will experience lower levels of shaking.

Hazard curves show the probability of exceeding different ground motion values at a site. For example, the 10% probability of exceedance in 50 years is one point on a hazard curve. The hazard curves are important for comparing the hazard at different sites. Some sites may have a high probability of exceeding small ground motions, but a very small probability of exceeding large ground motions. These curves are important for understanding the types of ground motions that one can expect to exceed at a site. Also the hazard curve is important for determining the expected losses. Losses can be caused by frequent smaller events or from less frequent large events.

Earthquake Induced Landslides

Earthquake induced landslides are secondary earthquake hazards that occur from ground shaking. They can destroy the roads, buildings, utilities, and other critical facilities necessary to respond and recover from an earthquake.

Liquefaction

Liquefaction hazards can occur in areas where groundwater exists near the ground surface.

Earthquake Hazard Assessment

Hazard Identification

In California, many agencies are focused on seismic safety issues: the State's Seismic Safety Commission, the Applied Technology Council, Association of Bay Area Governments (ABAG) Governor's Office of Emergency Services, United States Geological Survey, Cal Tech, the California Geological Survey as well as a number of universities and private foundations.

These organizations, in partnership with other state and federal agencies, have undertaken a rigorous program in California to identify seismic hazards and risks including active fault identification, bedrock shaking, tsunami inundation zones, ground motion amplification, liquefaction, and earthquake induced landslides. Seismic hazard maps have been published and are available for many communities in California through the State Division of Mines and Geology and ABAG.

Flood

Flood was rated a HIGH PRIORITY HAZARD in the City of Novato and the Novato Sanitary District.

Reference: City of Novato General Plan Safety Element
City of Novato Flood Mitigation Plan

Flooding in City of Novato has the potential to result in damage to life and property. Rapid storm water and debris runoff can create flood conditions.

From the Multi Functional Hazard Plan

A flood may be defined as a temporary rise in stream flow that results in water overtopping its banks and inundating areas adjacent to the channel. The size and frequency of occurrence of a flood depends on a complex combination of conditions, including the amount, intensity, and distribution of rainfall, previous moisture conditions, and drainage pattern.

Floods are generally classified either as slow-rise or flash floods. Slow rise floods in City of Novato may be preceded by a warning period of hours or days. Evacuation and sandbagging for slow-rise floods may have often lessened damage. Conversely, flash floods are most difficult to prepare for due to extremely limited, if any, advance warning and preparation time.

The area subject to inundation is referred to as the "Flood-Plain." The flood-plain is divided into two hazard areas: 1- The "Floodway," which is the portion that carries the deep fast moving water (usually defined as the area needed to contain a 100-year storm) and 2- The flood fringe area which is the remainder of the flood-plain, subject to shallow slow moving water.

The magnitude of the flood is measured in terms of its "peak" discharge, which is the maximum volume of water (in cubic feet) passing a point on the channel. Floods are usually referred to in terms of their frequency of occurrence, which is related to the discharge; for example the "100 year flood" for a particular channel is the size flood selected by a government agency for planning purposes (usually a 50-year or 100- year) is referred to as the "selected or regulatory flood."

Flooding is a natural occurrence, however once it occurs; personnel will be needed to assist in rescuing any person trapped by flood waters, securing utilities, and controlling traffic. These actions can overtax the city resulting in requiring mutual aid from outside agencies.

The City of Novato Local Flood Hazard Mitigation Plan (Appendix A) of this Plan contains the following risk identification:

"Novato Creek has a long history of flooding and is the main flood hazard to the community. According to the most recent Flood Insurance Study (FIS), flooding is caused by steep slopes in the upper reaches of streams and short duration storms of high intensity. Several inadequate bridges and culverts add to the flood problem. The main flood problem occurs in the lower reaches of Novato and Warner Creeks, and consists primarily of ponding behind the levees of these channels, whose capacities are inadequate to carry off large flows. Down stream of U.S. Highway 101, Novato Creek has little/no bed gradient and is influenced by tidal action from San Pablo Bay.

Warner Creek and Arroyo Avichi rise and overflow their banks at the confluence with Novato Creek. Localized flooding occurs periodically along Wilson Creek, Vineyard Creek, Ignacio Creek, Arroyo San Jose and Pacheco Creek."

"The City has implemented a Local Drainage Master Plan to accommodate the 25 year storm flow, as a result of a Storm Drainage Improvement Bond Measure approved in 1989. The previously mentioned 1985 Bond Measure for Flood Control is being implemented by the Marin County Flood Control and Water Conservation District. These improvements include a detention pond and pump station at Deer Island on the lower portion of Novato Creek and channel improvements to Novato Creek, Warner Creek, and Arroyo Avichi."

City of Novato Flood-related Capital Improvement Plans

Clean Storm Water Capital Improvement (321) Fund

This fund was established in FY 95/96 for the capital improvement element of the City of Novato's Clean Stormwater program. The expenditures for capital improvement projects are typically used to fund storm drain improvements as part of street reconstruction projects. These projects provide for pollution prevention by allowing for more effective street sweeping and storm drainage system maintenance.
The fund receives $45,000 per FY from storm water fees. This fund received an an interfund loan from the underground utility fund of $124,000 in FY 97/98 in order to maintain a positive cash balance.

	ACTUAL FY 04/05	ESTIMATED FY 05/06	PROPOSED FY06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11
FUND BALANCE - BEGIN FY	18,884	(19,126)	(6,776)	347	11,436	53,224	96,267
AVAILABLE FUNDS	101,871	63,861	58,037	347	11,436	53,225	96,267
Revenues:							
Investments Earnings	2,895	3,279	863	174	956	2,209	3,501
Other							
Subtotal Revenues	2,895	3,279	863	174	956	2,209	3,501
Transfers In							
General Fund							
Clean Stormwater Fund	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Interfund Loan - Underground Utility Fund							
TOTAL FINANCING AVAILABLE	149,766	112,140	103,900	45,521	57,392	100,434	144,767
Expenditures							
Transfers Out:							
Capital Projects	85,905	54,103	9,361	34,085	4,167	4,167	4,166
Interfund Loan - Underground Utility Fund			64,813				
Carryover			29,379				
TOTAL EXPEND & TRANSFERS	85,905	54,103	103,553	34,085	4,167	4,167	4,166
FUND BALANCE - END FY	(19,126)	(6,776)	347	11,436	53,224	96,267	140,601
AVAILABLE FUNDS	63,861	58,037	347	11,436	53,225	96,267	140,601

Clean Storm Water Capital Improvement (321) Projects

Project No.	Project Name	Sub Object	FISCAL YEARS Prior FY 06/07	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	TOTAL
93-002	Diablo Avenue Drainage Improvements	410	4,221	0	0	0	0	0	4,221
93-002	Diablo Avenue Drainage Improvements	430	42,208	0	0	0	0	0	42,208
93-002	Diablo Avenue Drainage Improvements	440	2,110	0	0	0	0	0	2,110
98-008	Storm Drain Master Plan	410	37,500	12,381	29,919	0	0	0	79,800
99-006	Drainage Facilities-Minor Works	410	0	5,313	833	833	834	833	8,646
99-006	Drainage Facilities-Minor Works	430	15,000	(8,333)	3,333	3,334	3,333	3,333	20,000
	TOTAL		101,039	9,361	34,085	4,167	4,167	4,166	156,985
	CARRYOVER			29,379					

Street and Storm Drain Maintenance (322) Fund

This fund was established in fiscal year 1997-98 to provide interest revenue to be used for ongoing maintenance and emergency needs in connection with the City's streets and storm drains. It was originally established with a transfer from the emergency and Disaster Response Reserve in the amount of $100,000. An additional transfer in the amount of $81,330 was authorized by the City Council in fiscal year 1998-99 using the previous fiscal year's general fund balance. $77,000 and $20,000 is proposed for transfer from the general fund to cover the cost of refurbishing the Hamilton Pedestrian Bridge on Main Gate Road over the Railroad

	ACTUAL FY 04/05	ESTIMATED FY 05/06	PROPOSED FY06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11
FUND BALANCE - BEGIN FISCAL Y	322,263	317,374	372,293	339,915	242,583	245,332	248,162
AVAILABLE FUNDS	222,263	217,374	272,293	239,915	242,583	245,332	248,162
Revenues:							
Investments Earnings	5,611	10,217	7,497	6,835	6,915	6,997	7,082
Prior Period Adjustment							
Subtotal Revenues	5,611	10,217	7,497	6,835	6,915	6,997	7,082
Transfers In:							
General Fund		170,270	4,901	20,000	20,000	20,000	20,000
TOTAL FINANCING AVAILABLE	227,874	397,861	284,691	266,750	269,498	272,329	275,244
Expenditures							
Transfers Out:							
Capital Projects	8,280	114,593	5,302	24,167	24,166	24,167	24,168
Engineering Services	2,220						
Contract Services		10,975					
Carryover			39,474				
TOTAL EXPEND & TRANSFERS	10,500	125,568	44,776	24,167	24,166	24,167	24,168
FUND BALANCE - END FISCAL YR	317,374	372,293	339,915	242,583	245,332	248,162	251,076
AVAILABLE FUNDS	217,374	272,293	239,915	242,583	245,332	248,162	251,076

Street and Storm Drain Maintenance (322) Fund

Project No.	Project Title	Sub Fund	Prior FY06/07	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	TOTAL
99-006	Drainage Facilities-Minor Works	410	4,136	1,175	834	833	833	834	8,645
99-006	Drainage Facilities-Minor Works	430	0	6,666	3,333	3,333	3,334	3,334	20,000
06-007	Traffic, Bicycle, Pedestrian Enhancements	410	5,000	5,000	5,000	5,000	5,000	5,000	30,000
06-007	Traffic, Bicycle, Pedestrian Enhancements	430	15,000	15,000	15,000	15,000	15,000	15,000	90,000
06-008	Hamilton Pedestrian Bridge Refurbishment	410	25,220	(729)	0	0	0	0	24,491
06-008	Hamilton Pedestrian Bridge Refurbishment	430	104,000	(22,539)	0	0	0	0	81,461
06-008	Hamilton Pedestrian Bridge Refurbishment	440	10,060	729	0	0	0	-0	10,789
	TOTAL		163,416	5,302	24,167	24,166	24,167	24,168	265,386
	CARRYOVER			39,474					

Street and Storm Drain Bond Project Fund (307 Measure "B")

This fund was established to account for the proceeds and use of the Street and Storm Drain General Obligation Bonds (Measure B) approved by the voters in March 2000. Bonds are schedule to be issued in three series of $5,000,000 each: One was issued in 2000, another is scheduled for 2004, and the last one in scheduled for 2007.

	ACTUAL	ESTIMATED	PROPOSED				
	FY 04/05	FY 05/06	FY06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11
FUND BALANCE - BEGIN FY	1,741,067	4,605,893	2,115,599	337,500	2,998,880	1,888,505	1,490,743
AVAILABLE FUNDS	1,741,067	4,605,893	2,115,599	337,500	2,998,880	1,888,505	1,490,743
Revenues:							
Bond Proceeds	5,080,161	0	0	5,000,000	0	0	0
Investments Earnings	116,032	153,453	158,057	49,714	72,650	50,377	40,189
Subtotal Revenues	5,196,193	153,453	158,057	5,049,714	72,650	50,377	40,189
Transfers In							
General Fund							
Capital Projects							
Interfund Loan Repayment							
TOTAL FINANCING AVAILABLE	6,937,260	4,759,346	2,273,656	5,387,214	3,071,529	1,938,881	1,530,933
Expenditures							
Transfers Out:							
Capital Projects	2,307,178	2,618,348	469,317	2,360,732	1,154,457	418,570	302,201
Carryover			1,440,171				
General Fund Clerical Support	24,189	25,398	26,668	27,602	28,568	29,568	30,603
TOTAL EXPEND & TRANSFERS	2,331,367	2,643,746	1,936,156	2,388,334	1,183,025	448,138	332,804
FUND BALANCE - END FY	4,605,893	2,115,599	337,500	2,998,880	1,888,505	1,490,743	1,198,129

Street & Storm Drain Bond Projects (307) (Measure "B")

Project No.	Project Name	Sub Object	FISCAL YEARS						TOTAL
			Prior FY 06/07	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	
93-002	Diablo Avenue Drainage Impts	410	41,763	(3,832)	0	0	0	0	37,931
93-002	Diablo Avenue Drainage Impts	430	643,632	(3,348)	0	0	0	0	640,284
93-002	Diablo Avenue Drainage Impts	440	30,822	(2,462)	0	0	0	0	28,360
93-012	Grant Avenue Improvements	410	235,135	0	0	0	0	0	235,135
93-012	Grant Avenue Improvements	430	449,588	(187,176)	0	0	0	0	262,412
93-012	Grant Avenue Improvements	440	71,493	187,176	0	0	0	0	258,669
96-003	Simmons Lane Pedestrian Bridge	410	14,353	0	0	0	0	0	14,353
96-003	Simmons Lane Pedestrian Bridge	430	0	150,184	0	0	0	0	150,184
96-003	Simmons Lane Pedestrian Bridge	440	0	13,216	0	0	0	0	13,216
00-011	Redwood Blvd Pavt Rehab Lamont-Olive	410	69,556	(1,121)	0	0	0	0	68,435
00-011	Redwood Blvd Pavt Rehab Lamont-Olive	430	626,106	(40,261)	0	0	0	0	585,845
00-011	Redwood Blvd Pavt Rehab Lamont-Olive	440	69,035	4,048	0	0	0	0	73,083
00-015	Rush Creek Drainage Impts	410	57,407	0	0	0	0	0	57,407
00-015	Rush Creek Drainage Impts	420	20,000	0	0	0	0	0	20,000
00-015	Rush Creek Drainage Impts	430	0	0	229,630	0	0	0	229,630
00-015	Rush Creek Drainage Impts	440	0	0	22,963	0	0	0	22,963
00-016	Pavement Management System	410	8,087	0	0	0	0	0	8,087
01-002	Measure 'B' Bond Pavt Rehabilitation Program	410	375,244	(63,009)	0	0	0	0	312,235
01-002	Measure 'B' Bond Pavt Rehabilitation Program	430	4,143,711	426,419	0	0	0	0	4,570,130
01-002	Measure 'B' Bond Pavt Rehabilitation Program	440	470,388	91,758	0	0	0	0	562,146
01-004	Impts to Novato Bl (Diablo Ave/Grant Ave)	410	0	0	0	0	92,299	0	92,299
01-004	Impts to Novato Bl (Diablo Ave/Grant Ave)	430	0	0	0	0	0	266,748	266,748
01-004	Impts to Novato Bl (Diablo Ave/Grant Ave)	440	0	0	0	0	0	35,453	35,453
01-009	Slurry Seal Grp 1	410	14,844	0	0	27,400	0	0	42,244
01-009	Slurry Seal Grp 1	430	0	0	0	0	158,600	0	158,600
01-009	Slurry Seal Grp 1	440	0	0	0	0	14,000	0	14,000
02-008	Sherman Avenue/Cain Lane Impts	410	35,304	0	11,625	0	0	0	46,929
02-008	Sherman Avenue/Cain Lane Impts	430	0	0	0	0	135,632	0	135,632
02-008	Sherman Avenue/Cain Lane Impts	440	0	0	0	0	18,039	0	18,039
02-009	Mill Rd Impts (Trumbull Ave/Sinaloa Ct)	410	0	0	26,756	0	0	0	26,756
02-009	Mill Rd Impts (Trumbull Ave/Sinaloa Ct)	430	0	0	0	166,249	0	0	166,249
02-009	Mill Rd Impts (Trumbull Ave/Sinaloa Ct)	440	0	0	0	14,678	0	0	14,678
02-011	Traffic Signal Redwood Bl/Olive Ave & Redwood Bl Pav't Rehab	410	29,912	0	0	0	0	0	29,[illegible]
02-011	Traffic Signal Redwood Bl/Olive Ave & Redwood Bl Pav't Rehab	430	0	0	172,922	0	0	0	[illegible]

Street & Storm Drain Bond Projects (307) (Measure "B")

Project No.	Project Name	Sub Object	Prior FY 06/07	FY 06/07	FY 07/08	FY 08/09	FY 09/10	FY 10/11	TOTAL
			FISCAL YEARS						
02-011	Traffic Signal Redwood Bl/Olive Ave & Redwood Bl Pav't Rehab	440	0	0	15,266	0	0	0	15,266
03-003	Alameda Del Prado and Measure B Groups 5 and 6	410	145,676	(25,832)	0	0	0	0	119,844
03-003	Alameda Del Prado and Measure B Groups 5 and 6	430	0	0	1,563,000	0	0	0	1,563,000
03-003	Alameda Del Prado and Measure B Groups 5 and 6	440	0	0	77,800	0	0	0	77,800
03-009	Cypress Avenue Improvements	410	22,330	1,563	0	0	0	0	23,893
03-009	Cypress Avenue Improvements	430	129,074	27,286	0	0	0	0	156,360
03-009	Cypress Avenue Improvements	440	11,396	25,812	0	0	0	0	37,208
04-001	Kendon Lane Improvements	410	46,649	(30,733)	0	0	0	0	15,916
04-001	Kendon Lane Improvements	430	134,824	(88,824)	0	0	0	0	46,000
04-001	Kendon Lane Improvements	440	17,527	(11,547)	0	0	0	0	5,980
04-002	Hill Road and Indian Valley Road Impts	410	0	0	82,721	0	0	0	82,721
04-002	Hill Road and Indian Valley Road Impts	430	0	0	0	239,104	0	0	239,104
04-002	Hill Road and Indian Valley Road Impts	440	0	0	0	31,775	0	0	31,775
05-001	Redwood Bl Pav't Rehab OaK Crest-Yukon	410	0	0	52,252	0	0	0	52,252
05-001	Redwood Bl Pav't Rehab OaK Crest-Yukon	430	0	0	0	302,187	0	0	302,187
05-001	Redwood Bl Pav't Rehab OaK Crest-Yukon	440	0	0	0	26,661	0	0	26,661
07-001	Novato Bl Pavement Rehabilitation West	410	0	0	105,797	0	0	0	105,797
07-001	Novato Bl Pavement Rehabilitation West	430	0	0	0	305,756	0	0	305,756
07-001	Novato Bl Pavement Rehabilitation West	440	0	0	0	40,647	0	0	40,647
	TOTAL		7,913,856	469,317	2,360,732	1,154,457	418,570	302,201	12,619,133
	CARRYOVER			1,440,171					

Wilmac Avenue – McKeon Court Flood Study

(Map available with study documents. Too large for this document.)

Wilmac Avenue - McKeon Court Flood Study

For

Marin County Flood Control and Water Conservation District

April 12, 2006

White & Prescott
Engineering and Surveying
1620 Grant Avenue
Novato, CA 94945

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Wilmac-Avenue - McKeon Court, Novato
Flood Study

Area Studied

The area of this study was originally Vineyard Creek and nearby drainage bounded by Center Road, Wilson Avenue, Novato Boulevard and McClay Road. A major portion of the creek within this area runs between Wilmac Avenue and McKeon Court. After the study began, the homes at the northerly end of Arbor Circle were added to the study area.

See accompanying map which shows creeks, streets, homes , addresses, surveyed grades and elevations. This map also shows high water elevations at various locations during the peak of the December 31, 2005 flood.

Purposes of Study

1. Identify the probable causes of the flooding which occurred December 31, 2005 in and near homes on Wilmac Avenue and McKeon Court, Novato.

2. Recommend work and construction for the short-term alleviation or reduction of this flooding.

3. Make recommendations for long-term permanent solutions to alleviate this flooding if these solutions become apparent during the course of our work.

Work Performed

In accordance with an agreement with the Marin County Flood Control and Water Conservation District, we provided the following items of work.

1. Met with County personnel shortly after the storm and reviewed the impacts of the flooding.

2. Acquired maps from the City of Novato for our use in this study. These maps included: a) topographic maps with drainage features shown, b) orthophoto maps, and c) computer generated maps which show topography, property lines, addresses and street numbers.

3. Surveyed storm drainage elevations, street grades, wall grades, finished floor elevations, garage elevations, and other features. Added survey information to map.

2

4. Reviewed City of Novato Local Drainage Master Plan. Reviewed Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM).

5. Interviewed neighborhood residents, County personnel, and City personnel to acquire information concerning the recent flooding and past flooding.

6. Analyzed flooding based on maps, surveys and interviews.

This resultant study is divided into two parts. The first part consists of a flooding analysis and recommendations for work and improvements within entire area studied. The second part consists of flooding analyses and recommendations for work and improvements for local drainage sub-areas.

In general, costs and priority of work were not considered when making our recommendations. Costs will be considered and priorities of work will be assigned by the jurisdictions responsible for such work.

Entire Study Area

Flooding Analysis (Flood of December 31, 2005)

1. Vineyard Creek was too congested and possibly not wide enough to carry the high flows which resulted from this storm. The floodway was narrow with shrubs and vines on the banks. Trees with multiple trunks and low branches also obstructed the floodway. The entrance to the concrete box culvert at Center Road was partially blocked with silt and shrubs. We estimate that this blockage reduced the capacity of the culvert by approximately fifteen percent.

2. Movement and deposits of gravel and sediment from upstream created less flow capacity in the creek and possibly flatter slopes in the creek flow line.

3. The concrete box culvert at Center Road may not be adequate to accommodate high flows.

4. The concrete encased sewer lines which cross the creek near the McKeon Court cul de sac act as weirs. These sewer lines prevent the creek from seeking a more efficient, natural slope. The creek flowline drops approximately one foot immediately below the downstream sewer line crossing, thus indicating that the flood water surface would most likely be lower if not for the weir effect of the two concrete encased sewer crossings.

5. When flood levels rise above the banks in Vineyard Creek adjacent to Wilmac Avenue, the concrete wall along the westerly side of Wilmac Avenue parallel to the creek prevents flood water from spilling onto Wilmac Avenue, but also causes flood water to rise to elevations whereby adjacent homes and properties on McKeon Court are flooded. Originally there was a wood wall at this location which was placed sometime after the Wilmac Avenue Subdivision was constructed. The wood wall was replaced with a rock-faced concrete wall in 1996. We surveyed the top of this wall at the projections of the side property lines on McKeon Court. We compared the surveyed top of wall to the design grades for this wall shown on the County Improvement Plans for the wall replacement. We found that the wall as built is higher than the design grades by one and one-half inches to three inches. In order to determine adverse impacts, if any, due to the increase in height of the wall, we recommend that a hydrology/hydraulic study be made to analyze its effect on the flooding issue. The relationship of the top of this existing wall to the grades and elevations on adjacent properties on McKeon Court is given in the following Table A.

Table A

McKeon Court Address	Top of Wall at Center of Lot	Average Ground at Rear Fence	Approximate Ground at Back Yard	House Finished Floor	Garage Elevation at Entrance
10	45.80	44.05	44.40	46.13	44.19
20	45.10	43.35	43.80	45.52	43.97
30	44.65	43.05	43.20	44.57	43.16
40	44.35	42.80	43.00	44.44	42.97
50	44.15	42.75	43.00	44.11	42.64
60	43.95	42.35	42.50	43.87	42.57
70	43.65	42.00	42.50	43.72	42.30
80	43.25	41.85	41.90	43.52	41.95
90	42.90	41.40	42.00	43.50	41.95

Recommended Short-term Work and Improvements

1. Calculate the floodway cross-section needed for this creek to pass a 100-year storm.

2. Enlarge the creek, if needed. (The recent widening and cleaning during January, 2006 may have provided most, or all, the floodway needed.)

3. Maintain this floodway aggressively every year for its entire length between Center Road and McClay Avenue. Remove all debris and brush. Remove all new-growth tree saplings. Trim additional trunks from trees to create single-trunk trees within floodway. Trim lower limbs which would interfere with flood flows.

4. Remove silt and sediment if they interfere with the capacity of the creek.

5. Remove any barriers to the inlets and outlets of the concrete box culverts at Center Road and McClay Road.

Recommended Long-term Work and Improvements

1. Widen the creek, if needed, and maintain the creek yearly to accommodate the 100-year storm.

2. Lower the sewer lines which cross the creek.

3. Replace the concrete box culvert at Center Road, if warranted, to accommodate a 100-year storm. Consider lowering the flowline of this structure in order to reduce backup ponding on either side. This flowline lowering should be associated with dropping the sewer line crossings.

4. Study the installation of a wall or other barrier between the creek and the rear fences of the homes on McKeon Court. Provide for drainage from rear yards.

Local Study Areas

Center Road at Vineyard Creek - Flooding Analysis (Flood of December 31, 2005)

The flood water surface rose above the back of sidewalk at the upstream end of the concrete box culvert at Center Road. The top of sidewalk at this structure is higher than the adjoining street. The flood flows split at this point. Roughly half of the flood waters went down Wilmac Avenue and to the sump area approximately 120 feet southeasterly at 1958 Center Road. The other half flowed northwesterly to the intersection of Arbor Circle and Center Road. This flooding eventually overwhelmed both these sump areas. On the Arbor Circle side, flood water crossed Center Road and flowed down McKeon Court. On the southeasterly side, flood waters flowed from the street onto private property at 1958 Center Road.

Arbor Circle - Flooding Analysis

Water flooded from the creek, flowed between houses to the street and thence down Arbor Circle to pond at the intersection of Center Road. At this point the flood water joined with water backing out of the catch basins at this intersection. Ponding rose to a height where it flowed across Center Road and down McKeon Court.

Arbor Circle - Recommended Short-term Work and Improvements

1. Install a flap gate and a manually-operated gate in the storm drainage system between the Center Road box culvert and Arbor Circle in order to prevent storm water from backing out of Vineyard Creek and flooding the intersection.

2. During the times the gates are engaged, use a portable water pump to pump the local surface runoff into Vineyard Creek below the box culvert.

Arbor Circle - Recommended Long-term Work and Improvements

If feasible, install a storm drain bypass from the drainage system in the Arbor Circle sump area down McKeon Court; thence to Vineyard Creek. Combine this improvement with the recommended improvements for the McKeon Court cul de sac.

the lower area where Wilmac Avenue turns away from Vineyard Creek.

4. Where the rear yards of the homes on Wilmac Avenue adjoin the creek, storm water flowed from the creek between the houses to the street. Some garages and two portions of homes which had rooms converted from garages were flooded. Once the water reached the street, it flowed to the low point at the cul de sac.

5. At the cul de sac, storm water ponded to a depth which inundated garage floors, but did not flood finished floors of homes. The storm drain system at this cul de sac appeared to be working, but could not keep up with the flood volume. This system was probably not operating efficiently due to the high water surface elevation in the creek. One of the property owners at this location observed that the storm drain system at this location did not work at the peak of the 1982 and 1998 floods. During the 2005 storm, flood water flowed easterly between houses to get out of the cul de sac area.

Wilmac Avenue - Probable Causes of Flooding

1. The southerly end of the concrete flood wall in Wilmac Avenue was not connected to the back of sidewalk at the box culvert.

2. The garages along this street are only approximately 4 inches higher (average) than the adjacent curbs and sidewalks. Therefore, when flood flows cannot exit completely through the storm drainage system, the cul de sac and lower street area flood rapidly. The street was constructed using rolled curb and gutter and the pavement is fairly high, so there is minimal storage available in the street for extra storm water.

Wilmac Avenue - Recommended Short-term Work and Improvements

In the cul de sac area, remove any obstructions where flood waters need to move through. For example, the bottoms of fences should be at least 6 inches above adjacent ground. Any re-surfacing of the cul de sac pavement should be done in such a way that the pavement elevation does not become significantly higher.

Wilmac Avenue - Recommended Long-term Work and Improvements

1. Analyze the concrete flood wall. It may be possible to place a parallel wall to protect McKeon Court residences from high water in the creek, in which case the gap in the concrete wall just below the box culvert could be closed.

2. Construct a new catch basin on either side of the street just before the cul de sac and connect to the existing catch basin in a straight line with the existing storm drain line. This will allow more water to enter the storm drain system.

3. Replace the outlet storm drain pipe with a larger pipe.

Margory Court Cul de Sac - Flooding Analysis

The water surface rose to an elevation of approximately 38.5 feet and this cul de sac flooded. One garage may have had a couple of inches of water inside, but no other garages or finished floors of homes were affected. Probable causes of this flooding are as follows.

1. Storm water flowed overland from the sump area in the street at 1958 Center Road.

2. Water backed up from the Wilmac Avenue area to the north.

3. Flood waters were not able to exit immediately through the storm drain system because of possible system overload due to flooding at Margory Court and Wilmac Avenue. Additionally, high water surface elevation at the storm drain outlet in the creek may have helped prevent this discharge.

Margory Court Cul de Sac - Recommended Long-term Work and Improvements

1. Replace the existing 15 inch diameter storm drain with a larger pipe to help accommodate flood flows.

2. Analyze the storm drainage system at the easterly corner of 18 Margory Court. If possible, eliminate two of the three drainage structures at this location.

Other Flood Control Projects (City of Novato)

Funded Projects

Pavement Rehabilitation Elm Drive and Neighborhood Street and Drainage Improvements

Project No.: 00-009 **Base Code:** 431

Funded

Project Objective: To resurface existing streets and to address neighborhood drainage problems.

Project Description and Background: These streets have been on the City maintenance list as streets receiving periodic one-inch overlay. This overlay has deteriorated and failed in about 40-60% of the street. There are 20 homeowners that live on Elm Drive and all 20 have petitioned the City to have work done. Other homeowners on Mirabella Avenue have likewise requested street and drainage improvement over the years. This project includes Elm Drive, Mirabella Avenue, Fourth Street between Elm Avenue and Mirabella Avenue, and Bruno Street between Elm Drive and Court Road. The project previously shown as Fourth Street Drainage Improvements (Project No. 90-009) has been combined with this project. Industrial Way will also be included as it is in the immediate vicinity of the project and is a Measure "B" candidate street for pavement rehabilitation.

Basis for Cost Estimate: Costs are based on the Measure "B" Engineer's Report. The Measure "B" funding OF $466,800 is based on November 1999 estimates in the February 2000 Measure "B" Report. Appendix APP-15 and APP-16 contains the Engineering News Record Construction Cost Index which tracks changes in construction costs on a monthly basis. Note: Measure "B" oversight committee recommended extending limits of Elm Drive Pavement Rehabilitation.

Basis for Schedule: The project is scheduled for construction in the summer of 2004.

Revenue Considerations: Measure "B" is the primary revenue source of this project. The cost of new driveway approaches or sidewalk would be assessed to fronting property owners per construction agreement or cash payment made by individual property owners. AB 2928 funds will be used to cover additional construction costs replacing budgeted Gas Tax dollars.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	103,410						103,410
Acquisition	420							
Construction	430	0	370,500					370,500
Construction Mgt	440	0	40,955					40,955
Equip/Furnish	450							
TOTAL		103,410	411,455	0	0	0	0	514,865

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
AB 2928 (274)	430	0	25,065					25,065
Bond "B"	410	101,410						101,410
Bond "B"	430	325,435						325,435
Bond "B"	440	39,955						39,955
Chapter 27	410	2,000						2,000
Chapter 27	430	20,000						20,000
Chapter 27	440	1,000						1,000
Gas Tax	430	25,065	-25,065					0
TOTAL		514,865	0	0	0	0	0	514,865

C-33 6/28/04

Hamilton Field Flood Protection Levee Improvement

Project No.: 00-013 **Base Code:** 431

Funded

Project Objective: To reestablish the original height of the levee at Hamilton Field in order to address the current and projected settlement due to construction over compressible Bay mud. This project was contemplated in the improvement projects to be funded by the Hamilton Community Facilities District annual special tax for maintenance.

Project Description and Background: In October 1996, the levee at Hamilton Field adjacent to the Phase I Master Plan development was constructed. The levee protects the new homes from inundation by San Pablo Bay (as most of the homes are constructed below sea level). The Hamilton Phase I neighborhoods require that all drainage be pumped beyond the levee (old runway area) into the area that ultimately will be converted to tide lands. Because the levee construction is over Bay mud, settlement has occurred during the first five years after construction (ultimate settlement will be as much as two to three feet). After initial settlement occurs, projected settlements will be expected to be considerably less over time. The City has been monitoring these settlements since the levee construction in 1996 and has found them to be approaching the two-foot settlement level currently. The City is obligated by the terms of the agreements for facility maintenance at Hamilton and by FEMA to reestablish the original height of the levee.

Basis for Cost Estimate: The cost estimates are for raising the levee with the stockpiled native material and imported borrow and also for raising the masonry block "splash" wall that was constructed on top of the levee.

Basis for Schedule: The project was scheduled to be designed and constructed in FY 01/02; however, the Army Corps of Engineers are looking to implement a project directly adjacent to the levee which may impact this project. The City and its consultant will be monitoring the Corps project closely and if needed, the project may be scheduled for the late summer of 2004. Studies are currently being undertaken by the COE. Prior to final design meetings will be held with homeowners in the area.

Revenue Considerations: Community Facilities District No. 1994-1 (CFD Hamilton Field) annual special tax levy for maintenance will be used to fund this project.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	36,356	3,000					39,356
Acquisition	420	0						0
Construction	430	0	331,100					331,100
Construction Mgt	440	0	15,500					15,500
Equip/Furnish	450	0						
TOTAL		36,356	349,600	0	0	0	0	385,956

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Hamilton CFD (241)	410	32,420	6,936					39,356
Hamilton CFD (241)	430	331,100						331,100
Hamilton CFD (241)	440	15,500						15,500
TOTAL		379,020	6,936	0	0	0	0	385,956

C-26 6/28/04

Grant Avenue Improvements Between Seventh Street and Scott Court

Project No.: 93-012 **Base Code:** 431

Funded

Project Objective: To reconstruct pavement and damaged sidewalks and improve Downtown Nova's main street as indicated in the adopted Downtown Specific Plan and utilizing available funding.

Project Description and Background: The project involves Grant Avenue from Scott Court to Seventh Street. With the input of the Council, the public and staff during project development, different levels of improvements were identified and are being under- taken in accordance with available funding.

The project improvements are as indicated in the Downtown Specific Plan and the various grants for the project. These improvements include new storm drains, new street paving, new sidewalks, "bulbous" at intersections, historic-style light standards, street furniture, transit center shelter improvements on Redwood Boulevard, and new street trees. The City has applied for a low interest loan with the California Infrastructure and Economic Development Bank (CIEDB). The CIEDB program, available through the Department of Commerce, provides loans for qualified economic development projects. Two Measure "B" candidate streets for pavement rehabilitation, Logan Street and Scorn Lane, have been added to the project as they are in the immediate project area.

Basis for Cost Estimate: Construction costs are based on prices from the successful bidder on the contract. Project Development are actual and Construction Management costs are a combination of actual costs and estimates to complete the project.

Basis for Schedule: The design process started in 2000. The concept design was completed in late November 2001 and involved an extensive community participation process. The construction schedule and staging has received careful attention, including tight contract time limits and thorough investigation of underground utilities. As of May 2004 street reconstruction has been completed from Scott Court to 2nd Street. It is anticipated that the rest of the street reconstruction will be completed by November 2004.

Revenue Considerations: Measure "B" per the engineer's report. CIEDB Loan. Development Impact Fees per the 1999 and 2002 updates. State Transportation Improvement Program and Transportation for Livable Communities Grants. Loans from the Vehicle and Equipment Replacement Fund and the Community Center Performing Arts Fund. State Local Transportation Partnership and utility reimbursements. The Redevelopment Agency (RDA) contribution of $1,038,186 will come from loans to the RDA from Development Impact Fees $60,000 (70% Streets and Intersections and 30% Civic Facilities, per the 4/02 DIF Report) for the ZenK lot Improvements, utility reimbursements from

Project Expenditure	Sub Objects	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	1,994,953						1,994,953
Acquisition	420	1,345						1,345
Construction	430	4,399,535	2,982,952					7,382,487
Construction Mgt	440	513,172	180,000					693,172
Equip/Furnish	450	0						
TOTAL		6,909,005	3,162,952	0	0	0	0	10,071,957

Funding Source	Sub Objects	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond "B" (307)	410	591,624	(408,691)					182,933
Bond "B" (307)	430	205,178	351,396					556,574
Bond "B" (307)	440	5,012	66,481					71,493
CIEDB Loan	410	391,385	(337,035)					54,350
CIEDB Loan	430	2,602,399	1,043,251					3,645,650
Comm Cen PA (331)	430	300,000						300,000
Dev Impact-St/Int (327)	410	444,135	(364,966)					79,169
Dev Impact-St/Int (327)	420	1,345						1,345
Dev Impact-St/Int (327)	430	0	395,846					395,846
Dev Impact-St/Int (327)	440	130,143	(90,558)					39,585
Equip/Vehicle Repl Loan (605)	410	0	1,000,000					1,000,000
Equip/Vehicle Repl Loan (605)	430	901,100	(901,100)					0
Equip/Vehicle Repl Loan (605)	440	98,900	(98,900)					0
Gas Tax (272)	410	300,000						300,000
Interest	410	715						715
Private Financing	430	412,572	(412,572)					0
RDA Contribution (400)	410	0	202,324					202,324
RDA Contribution (400)	430	0	318,555					318,555
RDA Contribution (400)	440	100,000	417,307					517,307
STIP Grant	410	130,000						130,000
STIP Grant	430	500,000						500,000
SB 300 (271)	410	45,462						45,462
TLC Grants	430	1,130,000						1,130,000
Utility Reim	430	0	535,862					535,862
Utility Reim	440	0	64,787					64,787
TOTAL		8,289,970	1,781,987	0	0	0	0	10,071,957
CARRYOVER		1,380,965						

C-25

6/28/04

Eucalyptus Avenue Improvements
Between Novato Boulevard and Vineyard Road

Project No.: 89-016 **Base Code:** 431

Funded

Project Objective: To repair pavement and provide pedestrian and drainage improvements.

Project Description and Background: This street was shown as a priority in the Measure "F" campaign literature. The budget is based on reconstructing the pavement at rural width standards. Comments received at neighborhood workshops was the basis for the concept plan development. The concept plan was approved by council in January of 2003. In February 1998, the Planning Division recommended that Eucalyptus Avenue be designated as a rural street and required a pathway on one side. The project also includes pavement rehabilitation on Measure "B" street Santa Ynez Circle. Another Measure "B" street Mendocino Lane ($33,500) was completed in 2001 in conjunction with the Thorssen Subdivision private portion of Mendocino Lane. The Developer's contractor was paid for resurfacing the public portion of the street.

Basis for Cost Estimate: Project development costs are based on actual costs. The construction costs are based on a preliminary estimate of contract quantities and prices. Construction Management costs are based on past projects. Acquisition costs of 50,000 is based on appraisals; utility easements are needed to move poles off the proposed roadway and shoulder. Measure "B" costs are per the engineer's report. The Measure "B" funding OF $428,300 is based on November 1999 estimates in the February 2004 Measure "B" Report. Appendix APP-15 and APP-16 contains the Engineering News Record Construction Cost Index which tracks changes in construction costs on a monthly basis.

Basis for Schedule: The project is currently scheduled for construction in the summer of 2004. Right of way acquisition needs to be fully completed prior to award of a construction contract.

Revenue Considerations: In-lieu fees collected in 1992 from Hanzlik Land Division and Falzon Land Division are proposed to be applied to pavement rehabilitation, shoulders, and sidewalk, to the extent these improvements are included in the final design. Additional funding will come from Measure "B", Gas Tax, SB300, AB 2928, Measure F, recently adopted assessment district (4-13-04) and utility reimbursements.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	0809	Total
Proj Develop	410	513,085						513,085
Acquisition	420	50,000						50,000
Construction	430	0	1,030,000					1,030,000
Construction Mgt	440	0	90,000					90,000
Equip/Furnish	450	0						
TOTAL		563,085	1,120,000	0	0	0	0	1,683,085

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	0809	Total
AB 2928 (274)	410	0	38,000					38,000
Bond "B" (307)	410	85,792	7,833					93,625
Bond "B" (307)	430	274,887	22,658					297,545
Bond "B" (307)	440	34,121	3,009					37,130
Bond "F" (305)	410	50,021						50,021
Gas Tax (272)	410	129,464	167,153					296,617
Gas Tax (272)	420	30,000	20,000					50,000
Gas Tax (272)	430	471,006	57,533					528,539
Gas Tax (272)	440	37,367	6,823					44,190
Ch 27 (251)	410	24,420						24,420
Ch 27 (251)	430	325,660	(152,064)					173,596
Ch 27 (251)	440	24,420	(15,740)					8,680
Rest Rev Falzon D/L (325)	430	7,104	(3,304)					3,800
Rest Rev Hanzlik D/L (325)	430	21,343	177					21,520
SB 300 (271)	410	10,402						10,402
Util Reim	430	0	5,000					5,000
TOTAL		1,526,007	157,078	0	0	0	0	1,683,085
CARRYOVER		962,922						

C-24

6/28/0

Project Study Report for Novato Boulevard Between Diablo Avenue and Grant Avenue

Project No.: 97-003 **Base Code:** 442

Funded

Project Objective: The Project Study Report (PSR) is a technical and community input process that results in a master plan for a future street or highway improvement project. This PSR will also develop a "Deficiency (Improvement) Plan" as required by the Marin County Congestion Management Program for this segment of Novato Boulevard, which is in the future expected to fall below acceptable standards for traffic congestion. The project is also identified for construction in a future year depending on the outcome of this PSR and future funding (see Project AGP-1).

Project Description and Background: This planning project is funded by grant funds from the federal Surface Transportation Program (STP); the grant application was authorized by City Council on 11/28/95. The project would evaluate options for reducing congestion and enhancing safety with the minimum impact on the existing neighborhood. The General Plan identifies improvements needed at the intersection of Novato Boulevard and Seventh Street/Tamalpais Avenue; this project would provide preliminary engineering for those improvements and for the entire block between Diablo Avenue and Grant Avenue. A Transportation Engineering Technical Assistance Program (TETAP) grant was obtained in the fall of 1999 which analyzed the traffic at the intersections and developed recommendations to improve the efficiency; however, the STP/CMAQ 25 percent Golden Gate Corridor Management Program grant applied for in December 2000 was not successful in an effort to obtain funding for the improvements recommended by the TETAP funded study.

Basis for Cost Estimate: Costs are based on a preliminary estimate of hours needed by engineering staff and consultants. The project team includes a traffic engineer, landscape architect, land use planner, surveyor, and right-of-way consultant.

Basis for Schedule: This will be completed in December 2004.

Revenue Considerations: Primary funding is from the Surface Transportation Program funds allocated by the Metropolitan Transportation Commission (MTC). In-lieu fees collected in 1977 from the Weiss Company for a project at 1649 Novato Boulevard would be used as the local match for the grant funds. In accordance with Government Code 66000 et seq, this project is found to have a reasonable relationship to the purpose for which the fees were charged. The Citywide development impact fees is an additional funding source for this report.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	144,738	117,239					261,977
Acquisition	420	0						0
Construction	430	0						0
Construction Mgt	440	0						0
Equip/Furnish	450	0						0
TOTAL		144,738	117,239	0	0	0	0	261,977

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Dev Impact-St/Int (327)	410	130,000						130,000
Res Rev, Weiss (325)	410	19,977						19,977
STP Grant	410	112,000						112,000
TOTAL		261,977	0	0	0	0	0	261,977

6/28/04

C-15

Drainage Facilities - Minor Work, Various Locations (Citywide)

Project No.: 99-006 **Base Code:** 431

Funded

Project Objective: The general project objective is to enable the case-by-case improvement of key components of the storm drainage system. Work may include construction of new inlet structures, debris grates, backflow prevention devices (flap gates), sedimentation basins, and miscellaneous drainage structures. Relatively short segments of failed storm drain pipe may be replaced under this project.

Project Description and Background: The project is a reactivation of work originally budgeted as Project No. 90-013 (Miscellaneous Drainage Project) in the adopted FY 90/91 through FY 94/95 Capital Improvement Budget. It has been found that as problems are discovered through routine maintenance or from winter storm situations that an ongoing budget for this type of work is desirable. The project ties in with the "Storm Drain Master Plan (Project No. 98-008)" since the work was originally prioritized as a project eligible for Measure "F" bond funds. The ongoing linkage with the Storm Drainage Master Plan results from the continuing inventory of the storm drainage facilities for which the City of Novato is responsible.

This project will enable the improvement of existing drainage systems where the project scale does not justify a separate capital improvement project. A criteria or "matrix of factors" will be utilized to bring approval recommendations for specific projects back to the City Council. The Maintenance and Engineering Divisions of the Public Works Department will coordinate efforts so that the most cost-effective construction can be implemented. Where scope of projects is small and Maintenance personnel are available, the work will be done as a Maintenance Division force account project. Otherwise, projects will be bid out.

Basis for Cost Estimate: The recommended strategy is to fund projects on an as needed basis depending upon the urgency if beyond the scope of the Maintenance Division and to provide funding from Contingency Reserve if critical in nature.

Basis for Schedule: The project is scheduled for implementation on an annual and case by case basis. Additional funding sources will be needed should a multitude of projects requiring attention arises.

Revenue Considerations: Funding for this project was budgeted from the Measure "F" bond funds. The project is a project that would serve the public well in terms of localized flood prevention and the project is Citywide with specific locations identified by the Storm Drainage Master Plan project (98-008) or by the Maintenance Division. In FY 99/00, $47,000 was reappropriated to the South Novato Boulevard (between Rowland Boulevard to U.S. 101) Improvement Project to fund drainage improvements. The remaining Measure F funds are being eliminated due to depleted funding. Funding to serve the project will be required from other sources such as the Street and Storm Drain Maintenance Fund interest earnings and Clean Storm Water Fund.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	3,411	3,068					6,479
Acquisition	420	0						0
Construction	430	0	15,000					15,000
Construction Mgt	440	0						0
Equip/Furnish	450	0						
TOTAL		3,411	18,068	0	0	0	0	21,479

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond "F" (305)	410	2,343						2,343
Clean Storm (321)	430	15,000						15,000
St/Storm Drain Maint. (322)	410	4,136						4,136
TOTAL		21,479	0	0	0	0	0	21,479

C-14 6/28/04

Diablo Avenue Drainage Improvements and Diablo Avenue and Center Road Pavement Rehabilitation

Project No.: 93-002 **Base Code:** 431

Funded

Project Objective: To improve the local drainage system per Novato's Storm Drainage Master Plan between Center Road to Warner Creek. To rehabilitate the pavement on Diablo Avenue between Center Road and Novato Boulevard, on Center Road between South Novato Boulevard and Diablo Avenue and on Center Road between Tamalpais Avenue and Crescent Lane.

Project Description and Background: This project is needed to construct a "trunk" storm drain in Diablo Avenue between Center Road and Warner Creek. The drainage project was identified in the Local Storm Drainage Master Plan. The first phase of the drainage improvements (in Diablo Avenue between Hill School and Center Road) was completed during the Bond Group 4 Pavement Rehabilitation Project funded by Measure "F." Measure "B" candidate streets Diablo Avenue (transferd from bond group 2) and Center Road are being added in FY 03/04 for ease of construction and cost savings due to larger bid quantities. The private development project will provide all of its frontage street improvements and a pipe stub-out for this proposed drainage project as a condition of approval of the development project.

In the spring of 2004 Staff applied for a Transportation For Clean Air (TFCA) 40% County Grant that would pay for bike lanes on Diablo Avenue between Center Road and South Novato Boulevard. The City received the highest score of all applications and it appears the City may recieve the Grant.

Basis for Cost Estimate: Construction costs are based on a preliminary estimate of contract quantities and recent bid prices. Project Development and Construction Management costs are based on past projects. Pavement Rehabilitation costs are from the Measure "B" Engineers report. Appendix APP-15 and APP-16 contains the Engineering News Record Construction Cost Index which tracks changes in construction costs on a monthly basis.

Basis for Schedule: The drainage portion of this project was previously scheduled for FY 00/01 and construction was deferred to FY 04/05 during the last budget cycle to include the pavement portion (Diablo Avenue and Center Road). With the high possibility of obtaining the TFCA grant for the bike lanes construction is being deferred to FY 05/06 to include the grant. In addition, the Novato Sanitary District is replacing the sewer line down Center Road between South Novato Boulevard and Diablo Avenue in the summer of 2004 deferring the project to FY 05/06 allows the City to pave the street after the sewer work is complete.

Revenue Considerations: The cost of drainage improvements will be from Clean Storm Water and Measure B Revenue sources as previously budgeted for this project. Measure F funding originally appropriated for the project has been depleted. Pavement Rehabilitation will be funded by Measure B.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	12,419	49,300					61,719
Acquisition	420	0						0
Construction	430	0		323,699				323,699
Construction Mgt	440	0		28,206				28,206
Equip/Furnish	450	0						
TOTAL		12,419	49,300	351,905	0	0	0	413,624

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond "B" (307)	410	51,395						51,395
Bond "B" (307)	430	0		297,360				297,360
Bond "B" (307)	440	0		26,245				26,245
Clean Storm Water (321)	410	10,324						10,324
Clean Storm Water (321)	430	0		26,339				26,339
Clean Storm Water (321)	440	0		1,961				1,961
TOTAL		61,719	0	351,905	0	0	0	413,624

C-13 6/28/04

Cherry Street Drainage Project

Project No.: 03-007 **Base Code:** 431

Funded

Project Objective: To alleviate localized flooding on local streets.

Project Description and Background: There is 30" storm drain which currently conveys drainage flows down Cherry Street and outlets at U.S. Highway 101 where it is piped under the freeway by twin 36" culverts to a channel on the west side of the freeway which flows into Rush Creek near the Golden Gate Transit bus facility. The storm drain crosses Cherry Street near the intersection of Armstrong Avenue. The cover to the drainage structure at this crossing has been displaced during heavy storms causing the street and the intersection to become flooded. The current system drains approximately 50+/- acres of watershed area above Cherry Street and outlying neighborhood. With additional development, the problem will continue to be exacerbated unless a solution to the problem is provided

Basis for Cost Estimate: Currently, the basis of the cost estimate for the project will assume drainage structure addition and modification along with adding a parallel system to the existing 30" storm drain downstream of the crossing at Cherry Street near Armstrong Avenue. The estimate reflects current unit prices from previous projects of similar scope and magnitude.

Basis for Schedule: This project was scheduled for Project Development in FY 03/04, however, there will not be enough Development Impact Fees (Drainage) for construction until fiscal year 2005/2006, therefore, project development will be delayed until spring of 2005 and construction in the summer of 2005.

Revenue Considerations: Development Impact Fee Drainage will be utilized to fund this project.

Project Expenditure	Sub Objects	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	5,911	19,089					25,000
Acquisition	420	0						0
Construction	430	0		150,000				150,000
Construction Mgt	440	0		15,000				15,000
Equip/Furnish	450	0						
TOTAL		5,911	19,089	165,000	0	0	0	190,000

Funding Source	Sub Objects	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Dev Impact-Dra (327)	410	25,000						25,000
Dev Impact-Dra (327)	430	0		150,000				150,000
Dev Impact-Dra (327)	440	0		15,000				15,000
TOTAL		25,000	0	165,000	0	0	0	190,000

C-11 6/28/04

Cherry Street Drainage Project

Project No.: 03-007

Base Code: 431

Funded

Project Objective: To alleviate localized flooding on local streets.

Project Description and Background: There is 30" storm drain which currently conveys drainage flows down Cherry Street and outlets at U.S. Highway 101 where it is piped under the freeway by twin 36" culverts to a channel on the west side of the freeway which flows into Rush Creek near the Golden Gate Transit bus facility. The storm drain crosses Cherry Street near the intersection of Armstrong Avenue. The cover to the drainage structure at this crossing has been displaced during heavy storms causing the street and the intersection to become flooded. The current system drains approximately 50+/- acres of watershed area above Cherry Street and outlying neighborhood. With additional development, the problem will continue to be exacerbated unless a solution to the problem is provided

Basis for Cost Estimate: Project development costs are actural and an estimate to complete the design. Construction cost estimate for the project includes drainage structure addition and modification along with adding a parallel system to the existing 30" storm drain downstream of the crossing at Cherry Street near Armstrong Avenue and existing infrastructure that needs to be removed and replaced in install the drainage improvements. The estimate reflects current unit prices from previous projects of similar scope and magnitude. Construction management is an estimate based on inspection and quality control testing.

Basis for Schedule: This project is being scheduled with the Measure B Group 3 streets for pavement rehabilitation in the summer of 2005. The Measure B Group 3 project includes a portion of Cherry Street and Armstrong Drive for pavement rehabiliation which are in the general vicinity of the drainage improvements and combining the projects

Project Expenditure	Sub Objects	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Proj Develop	410	15,595						15,595
Acquisition	420	0						0
Construction	430	0	120,000					120,000
Construction Mgt	440	0	6,000					6,000
Equip/Furnish	450	0						0
TOTAL		15,595	126,000	0	0	0	0	141,595

Funding Source	Sub Objects	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Dev Impact-Dra (327)	410	25,000	(25,000)					0
Gas Tax (272)	410	0	15,595					15,595
Gas Tax (272)	430	0	120,000					120,000
Gas Tax (272)	440	0	6,000					6,000
TOTAL		25,000	116,595	0	0	0	0	141,595

C-11

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Cypress Avenue Improvements Chapter 27 Assessment District

Project No.: 03-009

Base Code: 430

Funded

Project Objective: Repair pavement, provide drainage improvements and upgrade street with frontage improvements to current standards.

Project Description and Background: The project is located on the south side of Novato Boulevard just westerly of Diablo Avenue. The roadway is currently an unimproved street in an older neighborhood which residents have requested consideration for curbs and gutter and drainage improvements. The street is identified in the Measure "B" bond program.

Basis for Cost Estimate: Measure "B" engineering report for Measure "B" portion. The Measure "B" funding of $162,800 is based on November 1999 estimates in the February 2000 Measure "B" Report. Assessment district costs are based upon rough estimate of contract quantities and recent bid prices.

Basis for Schedule: The street was included in the Group 2 Pavement Rehabilitation Project tentatively scheduled for construction in the summer of 2003. Because it will now be considered as a stand alone project, design will occur in the fall and winter of 2004 and spring of 2005 and construction will be scheduled for the summer of 2005.

Revenue Considerations: Measure "B" is the primary source of revenue. Possible additional revenue may be generated through an Assessment District. For this to take place, an election, pursuant to Proposition 218, must be held and approved by majority vote. The assessment would provide for the curb and gutter improvements fronting the currently unimproved properties in the project limits. AB 2928 are being added to cover additional project development costs.

Project Expenditure	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Proj Develop	410	67,378						67,378
Acquisition	420	0						0
Construction	430	0	199,074					199,074
Construction Mgt	440	0	13,396					13,396
Equip/Furnish	450	0						0
TOTAL		67,378	212,470	0	0	0	0	279,848

Funding Source	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
AB 2928 (274)	410	36,548						36,548
Bond "B" (307)	410	22,330						22,330
Bond "B" (307)	430	0	129,074					129,074
Bond "B" (307)	440	0	11,396					11,396
Chapter 27 (251)	410	8,500						8,500
Chapter 27 (251)	430	0	70,000					70,000
Chapter 27 (251)	440	0	2,000					2,000
TOTAL		67,378	212,470	0	0	0	0	279,848
CARRYOVER		0						

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Diablo Avenue Drainage Improvements and Diablo Avenue and Center Road Pavement Rehabilitation

Project No.: 93-002

Funded

Base Code: 431

Project Objective: To improve the local drainage system between Center Road to Warner Creek. To rehabilitate the pavement on Diablo Avenue from Center Rd to Novato Blvd, on Center Road from South Novato Blvd to Diablo Ave and from Tamalpais Ave to Crescent Lane on Betty Lane from Center Road to northerly end on Plaza Amapola from Center Road to southerly end and on Villa Maria Court from Center Road to southerly end.

Project Description and Background: This project is needed to construct a "trunk" storm drain in Diablo Avenue between Center Road and Warner Creek as identified in the Local Storm Drainage Master Plan. The first phase of the drainage improvements (Diablo Avenue from Hill School to Center Road) was completed during the Bond Group 4 Pavement Rehabilitation Project funded by Measure "F." Measure "B" candidate streets Diablo Avenue and Center Road were added in FY 03/04 from group 2 and Betty Lane, Plaza Amapola and Villa Maria Court were added in FY 04/05 from group 3 for ease of construction and cost savings due to larger bid quantities.

In the spring of 2004 Staff applied for and received a Transportation For Clean Air (TFCA) 40% County Grant that would pay for bike lanes on Diablo Avenue from Center Rd to South Novato Blvd.

Basis for Cost Estimate: Project Development costs are a combination of actual and estimated to complete design. Construction costs are based on a preliminary estimate of contract quantities and recent bid prices. Construction Management costs are based on past projects.

Basis for Schedule: The project is scheduled for the summer of 2005 to comply with the TFCA bike grant and to allow the Novato Sanitary District to replace sewer lines down Center Road from South Novato Blvd and Diablo Ave in the spring or early summer of 2005. Once the Sanitary District project is nearing completion the City will advertise for bids for construction of this project.

Revenue Considerations: The cost of drainage improvements will be from Clean Storm Water, Development Impact Fees Drainage (24.4% of drainage cost per 2002 DIF update) and Measure B Revenue sources as previously budgeted for this project. Pavement Rehabilitation will be funded by Measure B.

Project Expenditure	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Proj Develop	410	41,338	18,165					59,503
Acquisition	420	0						0
Construction	430	0	710,889					710,889
Construction Mgt	440	0	40,800					40,800
Equip/Furnish	450	0						
TOTAL		41,338	769,854	0	0	0	0	811,192

Funding Source	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Bond "B" (307)	410	62,944	(21,181)					41,763
Bond "B" (307)	430	77,956	504,633					582,589
Bond "B" (307)	440	6,882	23,940					30,822
Clean Storm Water (321)	410	10,324	(6,103)					4,221
Clean Storm Water (321)	430	0	42,208					42,208
Clean Storm Water (321)	440	0	2,110					2,110
DIF Drainage (327)	410	0	5,539					5,539
DIF Drainage (327)	430	0	29,792					29,792
DIF Drainage (327)	440	0	2,728					2,728
TFCA Grant	410	7,100						7,100
TFCA Grant	430	47,500						47,500
TFCA Grant	440	4,700						4,700
Utility Reimbursement	410	0	880					880
Utility Reimbursement	430	0	8,800					8,800
Utility Reimbursement	440	0	440					440
TOTAL		217,406	593,786	0	0	0	0	811,192
CARRYOVER		176,068						

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Drainage Facilities - Minor Work, Various Locations (Citywide)

Project No.: 99-006 **Base Code:** 431

Funded

Project Objective: The general project objective is to enable the case-by-case improvement of key components of the storm drainage system. Work may include construction of new inlet structures, debris grates, backflow prevention devices (flap gates), sedimentation basins, and miscellaneous drainage structures. Relatively short segments of failed storm drain pipe may be replaced under this project.

Project Description and Background: The project is a reactivation of work originally budgeted as Project No. 90-013 (Miscellaneous Drainage Project) in the adopted FY 90/91 through FY 94/95 Capital Improvement Budget. It has been found that as problems are discovered through routine maintenance or from winter storm situations that an ongoing budget for this type of work is desirable. The project ties in with the "Storm Drain Master Plan (Project No. 98-008)" since the work was originally prioritized as a project eligible for Measure "F" bond funds. The ongoing linkage with the Storm Drainage Master Plan results from the continuing inventory of the storm drainage facilities for which the City of Novato is responsible.

This project will enable the improvement of existing drainage systems where the project scale does not justify a separate capital improvement project. A criteria or "matrix of factors" will be utilized to bring approval recommendations for specific projects back to the City Council. The Maintenance and Engineering Divisions of the Public Works Department will coordinate efforts so that the most cost-effective construction can be implemented. Where scope of projects is small and Maintenance personnel are available, the work will be done as a Maintenance Division force account project. Otherwise, projects will be bid out.

Basis for Cost Estimate: The recommended strategy is to fund projects on an as needed basis depending upon the urgency if beyond the scope of the Maintenance Division and to provide funding from Contingency Reserve if critical in nature.

Basis for Schedule: The project is scheduled for implementation on an annual and case by case basis. Additional funding sources will be needed should a multitude of projects requiring attention arises.

Revenue Considerations: Funding for this project was budgeted from the Measure "F" bond funds. The project is a project that would serve the public well in terms of localized flood prevention and the project is Citywide with specific locations identified by the Storm Drainage Master Plan project (98-008) or by the Maintenance Division. The remaining Measure F funds are being eliminated due to depleted funding. Funding to serve the project will be required from other sources such as the Street and Storm Drain Maintenance Fund interest earnings and Clean Storm Water Fund.

Project Expenditure	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Proj Develop	410	3,411	3,068					6,479
Acquisition	420	0						0
Construction	430	0	15,000					15,000
Construction Mgt	440	0						0
Equip/Furnish	450	0						0
TOTAL		3,411	18,068	0	0	0	0	21,479

Funding Source	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Bond "F" (305)	410	2,343						2,343
Clean Storm (321)	430	15,000						15,000
St/Storm Drain Maint. (322)	410	4,136						4,136
TOTAL		21,479	0	0	0	0	0	21,479
CARRYOVER		18,068						

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Partially Funded Projects

Mill Road Improvements (Trumbull Avenue to Sinaloa Court) and Measure B Pavement Rehabilitation Group (5)

Project No.: 02-009 **Base Code:** 430

Partially Funded

Project Objective: Repair pavement, provide drainage improvements and non Measure "B" upgrade street improvements to current standards.

Project Description and Background: The project is located adjacent to unincorporated (southerly side) and City of Novato (northerly side) lands. The roadway narrows in this block and the pavement is need of improvement to enhance safety, drainage, and road conditions. Mill Road and the other the street is identified in the Measure "B" bond program.

Basis for Cost Estimate: Project Development, Construction and Construction Management costs of $926,300 are for pavement rehabilitation and $15,000 for drainage on Mill Road only and are from the Measure "B" engineering report. The Measure "B" funding is based on November 1999 estimates in the February 2000 Measure "B" Report. Appendix APP-15 and APP-16 contains the Engineering News Record Construction Cost Index which tracks changes in construction costs on a monthly basis. Possible assessment costs and acquisition costs will not be estimated until FY 05/06 when preliminary design development occurs.

Basis for Schedule: The project will include Measure "B" Group 5 streets which are scheduled for the 2006/07 Fiscal Year. with Pavement Rehabilitation Group 5. For list of Group 5 streets see appendix 8-E.

Revenue Considerations: Measure "B" is the source of funds for the pavement rehabilitation work and drainage on Mill Road. Additional revenue may be generated through a future assessment district. For this to take place, an election, pursuant to Proposition 218, must be held and approved by majority vote. The assessment would provide for the curb, gutter and sidewalk construction fronting the currently unimproved properties in the project limits.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	0		127,030				127,030
Acquisition	420	0						0
Construction	430	0			734,428			734,428
Construction Mgt	440	0			64,842			64,842
Equip/Furnish	450	0						
TOTAL		0	0	127,030	799,270	0	0	926,300

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond "B" (307)	410	0		127,030	0			127,030
Bond "B" (307)	430	0			734,428			734,428
Bond "B" (307)	440	0			64,842			64,842
TOTAL		0	0	127,030	799,270	0	0	926,300

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Hill Road and Indian Valley Road Improvements

Project No.: 04-002 **Base Code:** 431

Partially Funded

Project Objective: To restore the surface of Hill Road between Diablo Avenue and Indian Valley Road. To restore the surface of Indian Valley Road between Hill Road and the City Limits. To address bikeway, walkway, and drainage deficiencies.

Project Description and Background: These portions of Hill Road and Indian Valley Road are ready for timely pavement rehabilitation. Bikeway, walkway, and drainage needs should be addressed as part of the street project.

Basis for Cost Estimate: Measure "B" Engineer's Report. The Measure "B" funding of 363,600 and other funding $150,000 (Gas Tax in Measure "B" Report) are based on November 1999 estimates in the February 2000 Measure "B" Report. Appendix APP-15 and APP-16 contains the Engineering News Record Construction Cost Index which tracks changes in construction costs on a monthly basis. The current cost estimate does not include any funds for acquiring right of way or easements which may be needed for bikeway, walkway or drainage improvements. These costs would need to be funded, if necessary, by other funding than Measure "B".

Basis for Schedule: Measure "B" Implementation Report.

Revenue Considerations: The project is funded by Measure "B". Staff will apply for federal or state grant funding for the other funding and to supplement and/or replace Measure "B" funding. Additional revenue needed for right of way or easements will be determined during project development.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410			117,362				117,362
Acquisition	420							0
Construction	430				340,524			340,524
Construction Mgt	440				45,264			45,264
Equip/Furnish	450							0
TOTAL		0	0	117,362	385,788		0	503,150

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond "B" (307)	410			82,721				82,721
Bond "B" (307)	430				239,104			239,104
Bond "B" (307)	440				31,775			31,775
TOTAL		0	0	82,721	270,879	0	0	353,600

C-40

6/28/04

Rowland Boulevard/Rowland Way Intersection Capacity Improvements

Project No.: 98-025 **Base Code:** 431

Partially Funded

Project Objective: The project will develop a project study report with a preferred alternative to improve this critical intersection. The project will be expanded after adoption of the study report to include construction of the identified improvements.

Project Description and Background: Possible project components may include (1) traffic engineering analysises to determine viable alternatives for intersection improvements, (2) actual traffic engineering and civil engineering design work, and (3) construction of a preferred alternative to addressing the needs of the intersection.

Basis for Cost Estimate: Project costs will not be totally known until viable alternatives are developed. The project will require a traffic engineering consultant to identify viable alternatives to improve this critical intersection. Construction estimates would also be developed at that time.

Basis for Schedule: The schedule is indefinite pending selection of a preferred alternative and resource assurances as described below.

Revenue Considerations: The only revenue source is a $50,000 restricted revenue deposit paid in June 1988 to make traffic signal improvements required of the Rowland 101 Properties, the developer of the Rowland Plaza Project. The initial signalization work at this intersection was completed by the Vintage Oaks shopping center project. Currently, the restricted revenue amount including interest accruals totals approximately $129,000. This fund source will be used to develop project alternatives to improve traffic flow and capacity at this intersection. Developer contributions would also be required of the proposed Hanna Ranch project that will impact this intersection.

Project Expenditure	Sub Objects	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	1,614	129,000					130,614
Acquisition	420	0						0
Construction	430	0						0
Construction Mgt	440	0						0
Equip/Furnish	450	0						0
TOTAL		1,614	129,000	0	0	0	0	130,614

Funding Source	Sub Objects	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond F (305)	410	1,614						1,614
Res Rev- Row 101 Pro(325)	410		129,000					129,000
TOTAL		1,614	129,000	0	0	0	0	130,614
Carryover		0						

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Rush Creek Drainage Improvements

Base Code: 431

Project No.: 00-015

Partially Funded

Project Objective: To reduce flooding risk in the northeasterly area of Downtown Novato. Rush Creek runs generally along the railroad right of way northerly to the flood plain in the northern part of Downtown Novato and wetlands northerly of Atherton Avenue.

Project Description and Background: Flooding has been a recurring problem in Downtown Novato. This project will reduce flooding risk at the intersection of Reichert Avenue and Sweetser Avenue, which flooded most recently in 1/95, 2/98, and 11/98. In 1998, the U.S. Congress appropriated $350,000 for flood damage reduction in Novato and the Council adopted this project as the highest priority for those funds. The project, was to be designed by the U.S. Army Corps of Engineers (COE), and would install a culvert in Railroad Avenue, running north from Sweetser Avenue to Olive Avenue. The COE studies and preliminary design are complete. The COE determined that the project is non policy compliant under Section 205 Flood Control Act of 1948 and, therefore, they cannot participate in a construction project. A goal of the project is to involve the several public entities having jurisdiction over various segments of the creek and wetlands.

Basis for Cost Estimate: A detailed cost estimate has not yet been prepared. It is expected that the cost for the culvert between Sweetser and Olive will be approximately $420,000 because of the complex utility relocation, engineering design, and environmental compliance costs. The Measure "B" report allocated $330,000 for this project. The Measure "B" funding of $330,000 is based on November 1999 estimates in the February 2000 Measure "B" Report. Appendix APP-15 and APP-16 contains the Engineering News Record Construction Cost Index which tracks changes in construction costs on a monthly basis.

Basis for Schedule: The Corps of Engineers has administered the initial phase of this project. The City will be the lead agency in the project design and construction. The City will be retaining engineering consulting firms to perform environmental review and complete the design. Environmental review is scheduled for 2004 and construction in the summer of 2005.

Revenue Considerations: The remaining federal funds administered by the Corps of Engineers for this project will not be used due to eligibility criteria. The City of Novato is discussing the possibility of a loan with the County to fully fund the project. An allocation of $330,000 of Measure "B" funding is identified in the measure "B" Report. The Downtown Redevelopment Area is another potential source of funds to accomplish this project.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	13,643	40,277					53,920
Acquisition	420	0	20,000					20,000
Construction	430	0		330,000				330,000
Construction Mgt	440	0		15,000				15,000
Equip/Furnish	450	0						0
TOTAL		13,643	60,277	345,000	0	0	0	418,920

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond "B" (307)	410	53,920						53,920
Bond "B" (307)	420	20,000						20,000
Bond "B" (307)	430	0		241,080				241,080
Bond "B" (307)	440	0		15,000				15,000
TOTAL		73,920	0	256,080	0	0	0	330,000

6/28/04

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Olive Avenue Improvements, Phase III
Between Redwood Boulevard and Railroad Avenue

Project No.: 97-001 **Base Code:** 431

Partially Funded

Project Objective: To repair pavement and drainage along Olive Avenue between Redwood Boulevard and Railroad Avenue.

Project Description and Background: This project was shown as a priority in the Measure "F" campaign literature, but full funding was not available since the expected costs exceed available balances. The project will rehabilitate the pavement along with improving the sight distance and providing a smoother transition across the railroad tracks. Widening the railroad crossing will require negotiations with SMART, owners of the tracks. The project originally would have built the frontage improvements along Olive Avenue as part of an assessment district, however, with the pending development at the corner of Redwood Boulevard and Olive Avenue those improvements would be built by the development. Anticipated right of way acquisitions may no longer be necessary and construction amounts may be reduced.

Basis for Cost Estimate: The total estimated cost of the project is $879,000 ($100,000 for Project Development, $110,000 for Acquisition, $620,000 for Construction, and $49,000 for Construction Management) including frontage improvement costs. Construction costs are based on a preliminary estimate of contract quantities and recent bid prices and do not include traffic signals or utility undergrounding. Project Development and Construction Management costs are based on past projects. Acquisition costs are based on a rough estimate in the absence of appraisals. The revenue for the project does not currently include the replacement of the railroad crossing safety arms. Once development is confirmed this projects scope and costs will be reevaluated.

Basis for Schedule: Project development is tentatively scheduled to start in fiscal year 2005/2006 to allow the City to coordinate the design of the railroad crossing with the development's frontage improvements. The project is not scheduled for construction until the summer of 2009 to allow the development to conclude and to allow the traffic signal at Redwood Boulevard and Olive Avenue (CIP project 02-011) to be completed. At least two years of Project Development work is needed for advance planning of the widened railroad crossing and obtaining the funding for that aspect of the project.

Revenue Considerations: Gas Tax is the funding source for this project. Project development is fully funded. Acquisition and construction costs are subject to the pending development northeast corner of Redwood Blvd and Olive Avenue. Construction and construction management are only partly funding. The frontage improvements on the northerly side of this street would be provided by the development.

Project Expenditure	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Proj Develop	410	1,443	18,557	59,000				79,000
Acquisition	420	0		64,000	46,000			110,000
Construction	430	0				620,000		620,000
Construction Mgt	440	0				49,000		49,000
Equip/Furnish	450	0						0
TOTAL		1,443	18,557	123,000	46,000	669,000	0	858,000

Funding Source	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Gas Tax (272)	410	20,000		59,000				79,000
Gas Tax (272)	420	0		64,000	46,000			110,000
Gas Tax (272)	430	0				210,000		210,000
Gas Tax (272)	440	0				20,000		20,000
TOTAL		20,000	0	123,000	46,000	230,000	0	419,000
CARRYOVER		18,557						

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Rush Creek Drainage Improvements

Project No.: 00-015 **Base Code:** 431

Partially Funded

Project Objective: To reduce flooding risk in the northeasterly area of Downtown Novato. Rush Creek runs generally along the railroad right of way northerly to the flood plain in the northern part of Downtown Novato and wetlands northerly of Atherton Avenue.

Project Description and Background: Flooding has been a recurring problem in Downtown Novato. This project will reduce flooding risk at the intersection of Reichert Avenue and Sweetser Avenue, which flooded most recently in 1/95, 2/98, and 11/98. In 1998, the U.S. Congress appropriated $350,000 for flood damage reduction in Novato and the Council adopted this project as the highest priority for those funds. The project, was to be designed by the U.S. Army Corps of Engineers (COE), and would install a culvert in Railroad Avenue, running north from Sweetser Avenue to Olive Avenue. The COE studies and preliminary design are complete. The COE determined that the project is non policy compliant under Section 205 Flood Control Act of 1948 and, therefore, they cannot participate in a construction project. A goal of the project is to involve the several public entities having jurisdiction over various segments of the creek and wetlands.

Basis for Cost Estimate: A detailed cost estimate has not yet been prepared. It is expected that the cost for the culvert between Sweetser and Olive will be approximately $420,000 because of the complex utility relocation, engineering design, and environmental compliance costs. The Measure "B" report allocated $330,000 for this project.

Basis for Schedule: The Corps of Engineers has administered the initial phase of this project. The City will be the lead agency in the project design and construction. The City will be retaining engineering consulting firms to perform environmental review and complete the design. Environmental review is scheduled for 2005 and the construction schedule will be determined once environmental review is completed. The potential development at the corner of Redwood Boulevard and Olive Avenue extends to the Railroad tracks on Olive Avenue and needs to also be coordinated with this project.

Revenue Considerations: The remaining federal funds administered by the Corps of Engineers for this project will not be used due to eligibility criteria. The City of Novato is discussing the possibility of a loan with the County to fully fund the project. An allocation of $330,000 of Measure "B" funding is identified in the measure "B" Report. The Downtown Redevelopment Area is another potential source of funds to accomplish this project. Development Impact Fees Drainage are eligible for this project since Railroad Avenue is a collector and are added here at the 20.2% future development share per the Development Impact Fees For Public Facilities 2002 Update. The project is approximately $170,000 under funded.

Project Expenditure	Sub Object	Prior to 05/06	05/06	06/07	0708	08/09	09/10	Total
Proj Develop	410	10,643	63,733	51,624				126,000
Acquisition	420	0		20,000				20,000
Construction	430	0		420,000				420,000
Construction Mgt	440	0		42,000				42,000
Equip/Furnish	450	0						0
TOTAL		10,643	63,733	533,624	0	0	0	608,000

Funding Source	Sub Object	Prior to 05/06	05/06	06/07	0708	08/09	09/10	Total
Bond "B" (307)	410	53,920	3,488					57,408
Bond "B" (307)	420	20,000						20,000
Bond "B" (307)	430	0		229,630				229,630
Bond "B" (307)	440	0		22,963				22,963
DIF Drainage (327)	410	0	16,968					16,968
DIF Drainage (327)	430	0		84,840				84,840
DIF Drainage (327)	440	0		6,787				6,787
TOTAL		73,920	20,456	344,220	0	0	0	438,596

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Hill Road and Indian Valley Road Improvements

Project No.: 04-002

Base Code: 431

Partially Funded

Project Objective: To restore the surface of Hill Road between Diablo Avenue and Indian Valley Road. To restore the surface of Indian Valley Road between Hill Road and the City Limits. To address bikeway, walkway, and drainage deficiencies.

Project Description and Background: These portions of Hill Road and Indian Valley Road are ready for timely pavement rehabilitation. Bikeway, walkway, and drainage needs should be addressed as part of the street project.

Basis for Cost Estimate: Measure "B" Engineer's Report. The Measure "B" funding of 363,600 and other funding $150,000 (Gas Tax in Measure "B" Report) are based on November 1999 estimates in the February 2000 Measure "B" Report. The current cost estimate does not include any funds for acquiring right of way or easements which may be needed for bikeway, walkway or drainage improvements. These costs would need to be funded, if necessary, by other funding than Measure "B".

Basis for Schedule: This project is being scheduled for project development in Fiscal Year 2006/2007.

Revenue Considerations: The project is funded by Measure "B". Staff will apply for federal or state grant funding for the other funding and to supplement and/or replace Measure "B" funding. Additional revenue needed for right of way or easements will be determined during project development.

Project Expenditure	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Proj Develop	410	0		117,362				117,362
Acquisition	420	0						0
Construction	430	0			340,524			340,524
Construction Mgt	440	0			45,264			45,264
Equip/Furnish	450	0						0
TOTAL		0	0	117,362	385,788		0	503,150

Funding Source	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Bond "B" (307)	410	0		82,721				82,721
Bond "B" (307)	430	0			239,104			239,104
Bond "B" (307)	440	0			31,775			31,775
TOTAL		0	0	82,721	270,879	0	0	353,600
CARRYOVER		0						

C-31

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Completed Projects

Bradley Avenue Improvements Between Hill Road and End

Project No.: 97-002 **Base Code:** 431

Completed

Project Objective: Reconstruct pavement and improve drainage.

Project Description and Background: The work included in this project was originally to have been performed at the same time as the improvements on Hill Road and Tamalpais Avenue but had to be deferred because it was more complex and costly than preliminary estimates had indicated.

Basis for Cost Estimate: Construction costs are actual. Project Development are actual and Construction Management Costs are actual. Clean storm water funds were applied in the 97/98 CIP Budget to pipe overland flows in conduit.

Basis for Schedule: The project was completed in the summer of 2002.

Revenue Considerations: The cost of driveway repairs was assessed to the individual property owner by the use of construction agreements to secure repayment to the City. Chapter 27 funds was used to fund this aspect of the project. AB 2928 funding was programmed for the project when the appropriation was secured in previous years. Clean Storm Water revenue was utilized to fund drainage improvements. This project was a hold over from the Measure "F" bond and was identified as committed capital improvement project in the Measure "B" Report. Measure "B" funding was needed for full funding of the street repairs and drainage improvements.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	97,402						97,402
Acquisition	420	0						0
Construction	430	242,908						242,908
Construction Mgt	440	57,626						57,626
Equip/Furnish	450							
TOTAL		397,936	0	0	0	0	0	397,936

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
AB 2928 (274)	410	88,920						88,920
Bond "B" (307)	410	157						157
Bond "B" (307)	430	71,928						71,928
Gas Tax (272)	430	120,071	(32,080)					87,991
Gas Tax (272)	440	25,783	(4,130)					21,653
Chapter 27 (251)	430	25,964	198					26,162
Chapter 27 (251)	440	3,895						3,895
Rest Rev (325)	430	2,450	(2,450)					0
Storm (321)	410	8,325						8,325
Storm (321)	430	50,293	(3,196)					47,097
Storm (321)	440	30,886						30,886
Util Reim	430	7,950	1,780					9,730
Util Reim	440	1,192						1,192
TOTAL		437,814	(39,878)	0	0	0	0	397,936
Carryover		39,878						

C-54 6/28/04

Bahia Neighborhood Street Improvements

Project No.: 01-014

Base Code: 431

Complete

Project Objective: To restore the surface of existing streets. To address existing drainage problems. To correct concrete/street tree problems. To correct accessibility problems.

Project Description and Background: This project focused on the list of Measure "B" candidate streets in the Bahia Area of Novato. The streets included: Albatross Drive from Laguna Vista to Topaz Drive, Baruna Court from Topaz Drive to the Southerly End; Bolero Court from Topaz Drive to Northerly end; Bugeia Lane from Atherton Avenue to "H" Lane; Circle Court from Topaz Drive to the Southerly End; Laguna Vista from Albatross Drive to the Westerly End; and River Vista Court from Albatross Drive to the Easterly End. Altogether, this project completed 1.6 miles of the 34 mile Measure "B" street resurfacing program.

Basis for Cost Estimate: Project development, construction and construction management costs are actual.

Basis for Schedule: The project was completed in the Winter of 2002/03.

Revenue Considerations: The project was fully funded by the Measure "B" bond in the amount of $518,900 per the Measure B report. City staff miscalculated the final construction cost in the fiscal year 2003/2004 budget and, therefore, needs to correct the final project costs this budget cycle. The final cost of the project results in a Measure B unused amount of $42,270 that will be returned to the fund and can be applied to other Measure B street projects.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	64,199						64,199
Acquisition	420	0						
Construction	430	388,776						388,776
Construction Mgt	440	23,355						23,355
Equip/Furnish	450							
TOTAL		476,330	0	0	0	0	0	476,330

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Bond "B" (307)	410	63,726	473					64,199
Bond "B" (307)	430	344,309	44,467					388,776
Bond "B" (307)	440	25,269	(1,914)					23,355
TOTAL		433,304	43,026	0	0	0	0	476,330
Carryover		(43,026)						

C-53

6/28/04

O'Hair Park Drainage Extension Project

Project No.: 00-010 **Base Code:** 431

Completed

Project Objective: To extend to Novato Creek the drainage system installed by the Brookside (Novato Chase) Development which is located on the north side of Novato Boulevard just westerly of San Marin High School.

Project Description and Background: As a condition of project approval, the Brookside Development was required to fund drainage improvements on O'Hair Park in the amount of $19,550. The project proposes to extend the drainage system from its present terminus on the south side of Novato Boulevard to Novato Creek. The storm drain will be easterly from the parking lot for the Novato Dog Park Project at O'Hair Park. Initial constructilon of an overland creek through O'Hair Park was completed in the winter of 2002. Plans to complete the project landscaping of the creekway will be complete in the summer of 2004.

Basis for Cost Estimate: Project costs will be based upon the contribution made by the developer for the extension of the drainage to Novato Creek.

Basis for Schedule: The project is scheduled for completion by the winter of 2004.

Revenue Considerations: The project construction is being funded from the transfer of developer contributions ($19,500) previously included in Project No. 96-011, Dog Park-Joint Project O'Hair Park. Interest accrued on the developer contributions are being added to the project.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	7,930						7,930
Acquisition	420	0						0
Construction	430	3,198	12,333					15,531
Construction Mgt	440	0	500					500
Equip/Furnish	450	0						
TOTAL		11,128	12,833	0	0	0	0	23,961

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Gas Tax (272)	410	8,500	(8,500)					0
Gas Tax (272)	440	2,000	(2,000)					0
Rest Rev-Brookside (325)	410	0	7,930					7,930
Rest Rev-Brookside (325)	430	23,830	(8,299)					15,531
Rest Rev-Brookside (325)	440	0	500					500
TOTAL		34,330	(10,369)	0	0	0	0	23,961

C-30 6/28/04

Measure "B" Bond Pavement Rehabilitation Program

Project No.: 01-002 **Base Code:** 431

Project Objective: To restore the surface of existing streets. To address existing drainage problems. To correct concrete repair/street tree problems. To correct accessibility problems.

Project Description and Background: This project will complete a significant percentage of the 34 miles of pavement work identified for Measure "B." Streets will be assigned to pavement rehabilitation groups on a "worst first" basis for the first grouping of streets Citywide. This group is comprised of streets with ratings typically greater than 6.7 on a scale of 1 to 10 with 1 being the best and 10 the worst. All of the Bel Marin Keys area streets were completed with this first group to reduce the construction impacts to this heavy traffic industrial complex. The other five groups consisting of streets with an average rating of 6 will then be completed. For listing of groups 2, 3 and 4 streets see appendix 8-E. Group 5 streets were added to Mill Road Improvements and Group 6 streets were added to Alameda Del Prado Improvements.

Basis for Cost Estimate: The Measure "B" Engineer's Report. The Measure "B" funding is based on November 1999 estimates in the February 2000 Measure "B" Report. It is anticipated that the recently completed Group 1 streets will have a total project cost of $1,935,893, total Measure "B" funding per the engineer report is $2,177,800, total Measure "B" funds utilized on Group 1 $1,828,693 for a potential savings of $349,107. The recently bid Group 2 streets has a projected total cost of $1,044,123 which is $159,523 over the November 1999 estimates in the February 2000 Measure "B" Report. Appendix APP-15 and APP-16 contains the Engineering News Record Construction Cost Index which tracks changes in construction costs on a monthly basis. Note: Measure "B" oversight committee recommended extending San Felipe limit beyond Measure "B" Report.

Basis for Schedule: The schedule for the projects are affected by the cash flow requirements of Measure "B" bond issuance's. The cash flow diagram is incorporated with the schedule of projects in the Measure B Implementation section. The Measure "B" Implementation Report is the reference document, subject to review to reflect current street rehabilitation needs. Group 1 streets were completed in the summer of 2003, the remainder of the streets to be rehabilitated in the plan will be completed in four main groups comprising the North, Central and South areas of the City.

Revenue Considerations: AB 2928 Traffic Congestion Relief funding was added to Group 1 in fiscal year 2000/2001 to meet spending deadlines. Gas Tax was added in fiscal year 2003/2004 to cover the pavement rehabilitation of a non Measure "B" street in Group 1. The unused Measure "B" funding for Group 1 streets is being returned to the fund this fiscal year. The funding for Groups 3 through 6 are per the Measure "B" engineer's report.

Project Expenditure	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
Proj Develop	410	222,086	298,784	152,118	0	0	0	672,988
Acquisition	420	0	0	0	0	0	0	0
Construction	430	1,532,663	1,264,350	1,488,292	658,438	0	0	4,943,743
Construction Mgt	440	248,917	97,000	131,624	58,644	0	0	536,185
Equip/Furnish	450	0	0	0	0	0	0	0
TOTAL		2,003,666	1,660,134	1,772,034	717,082	0	0	6,152,916

Funding Source	Sub Object	Prior to 04/05	04/05	05/06	06/07	07/08	08/09	Total
AB2928 (274)	410	100,000	0	0	0	0	0	100,000
Bond "B" (307)	410	478,368	(57,498)	152,118	0	0	0	572,988
Bond "B" (307)	430	2,357,698	432,115	1,488,292	658,438	0	0	4,936,543
Bond "B" (307)	440	225,794	120,123	131,624	58,644	0	0	536,185
Gas Tax (272)	430	7,200	0	0	0	0	0	7,200
TOTAL		3,169,060	494,740	1,772,034	717,082	0	0	6,152,916
CARRYOVER		1,165,394						

C-29 6/28/04

O'Hair Park Drainage Extension Project

Project No.: 00-010 **Base Code:** 431

Completed

Project Objective: To extend to Novato Creek the drainage system installed by the Brookside (Novato Chase) Development which is located on the north side of Novato Boulevard just westerly of San Marin High School.

Project Description and Background: As a condition of project approval, the Brookside Development was required to fund drainage improvements on O'Hair Park in the amount of $19,550. The project proposes to extend the drainage system from its present terminus on the south side of Novato Boulevard to Novato Creek. The storm drain will be easterly from the parking lot for the Novato Dog Park Project at O'Hair Park. Initial constructilon of an overland creek through O'Hair Park was completed in the winter of 2002. Plans to complete the project landscaping of the creekway will be complete in the summer of 2005.

Basis for Cost Estimate: Project costs will be based upon the contribution made by the developer for the extension of the drainage to Novato Creek.

Basis for Schedule: The project is scheduled for completion by the winter of 2005.

Revenue Considerations: The project construction is being funded from the transfer of developer contributions ($19,500) previously included in Project No. 96-011, Dog Park-Joint Project O'Hair Park. Interest accrued on the developer contributions have been and are being added to the project.

Project Expenditure	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Proj Develop	410	7,930						7,930
Acquisition	420	0						0
Construction	430	13,531						13,531
Construction Mgt	440	2,000	1,180					3,180
Equip/Furnish	450	0						0
TOTAL		23,461	1,180	0	0	0	0	24,641

Funding Source	Sub Object	Prior to 05/06	05/06	06/07	07/08	08/09	09/10	Total
Gas Tax (272)	410	0						0
Rest Rev-Brookside (325)	410	7,930						7,930
Rest Rev-Brookside (325)	430	15,531	(2,000)					13,531
Rest Rev-Brookside (325)	440	500	2,680					3,180
TOTAL		23,961	680	0	0	0	0	24,641
CARRYOVER		500						

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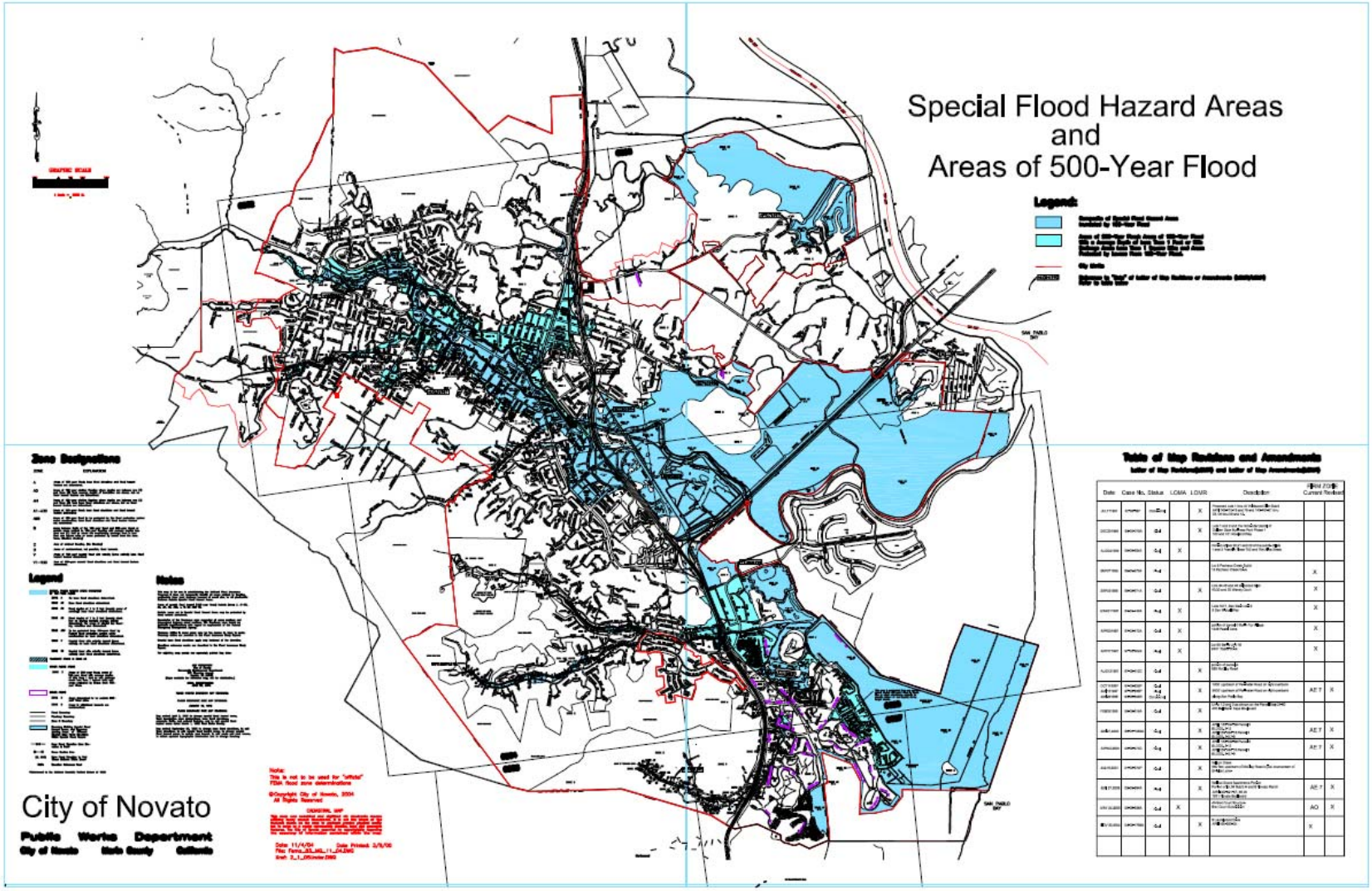
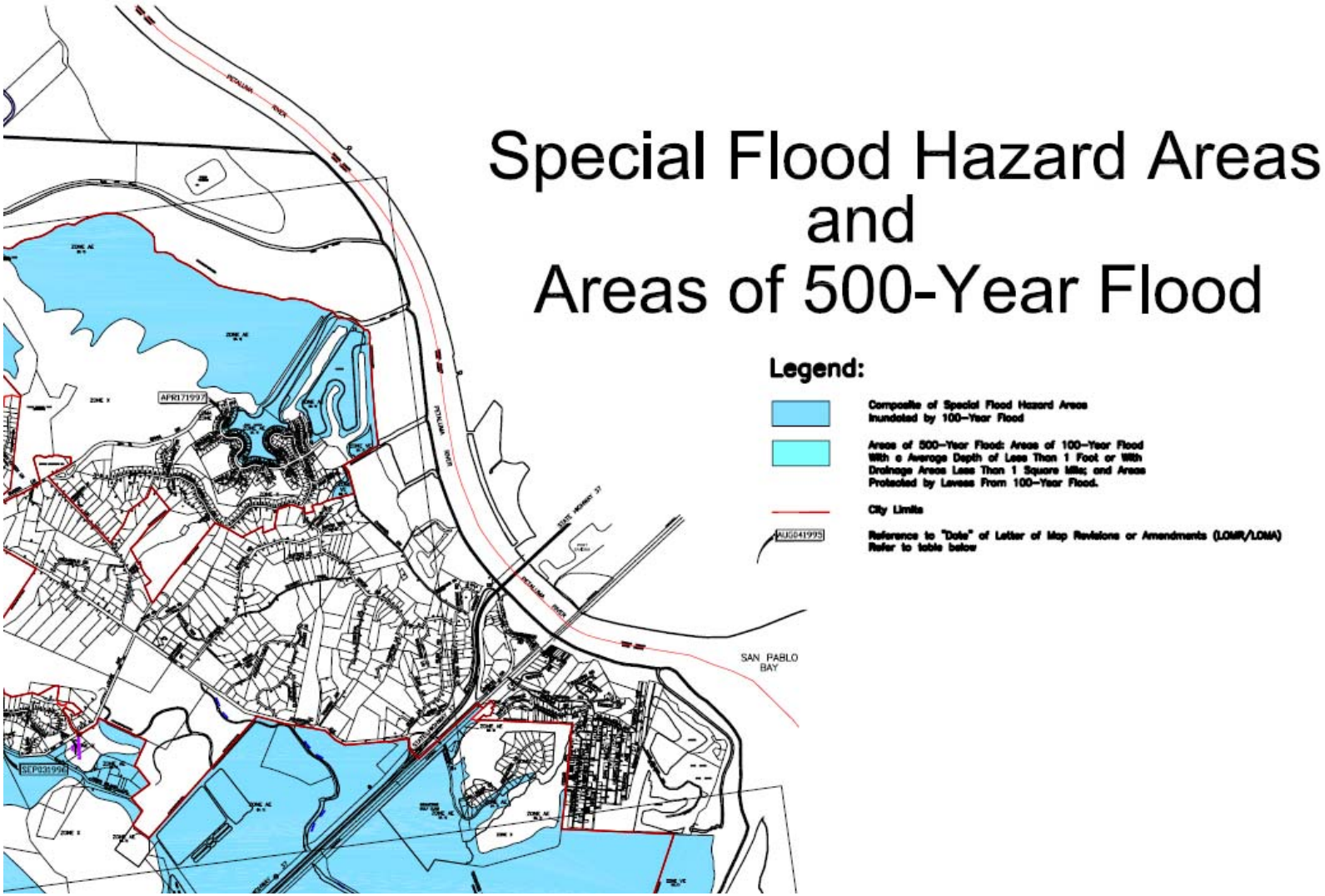

Special Flood Hazard Areas
and
Areas of 500-Year Flood
Legend
Zone Designations
Legend
Notes
Table of Map Revisions and Amendments
City of Novato
Public Works Department


Special Flood Hazard Areas
and
Areas of 500-Year Flood
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Composite of Special Flood Hazard Areas Inundated by 100-Year Flood
Areas of 500-Year Flood: Areas of 100-Year Flood With a Average Depth of Less Than 1 Foot or With Drainage Areas Less Than 1 Square Mile; and Areas Protected by Levees From 100-Year Flood.
City Limits
Reference to "Date" of Letter of Map Revisions or Amendments (LOMR/LOMA) Refer to table below
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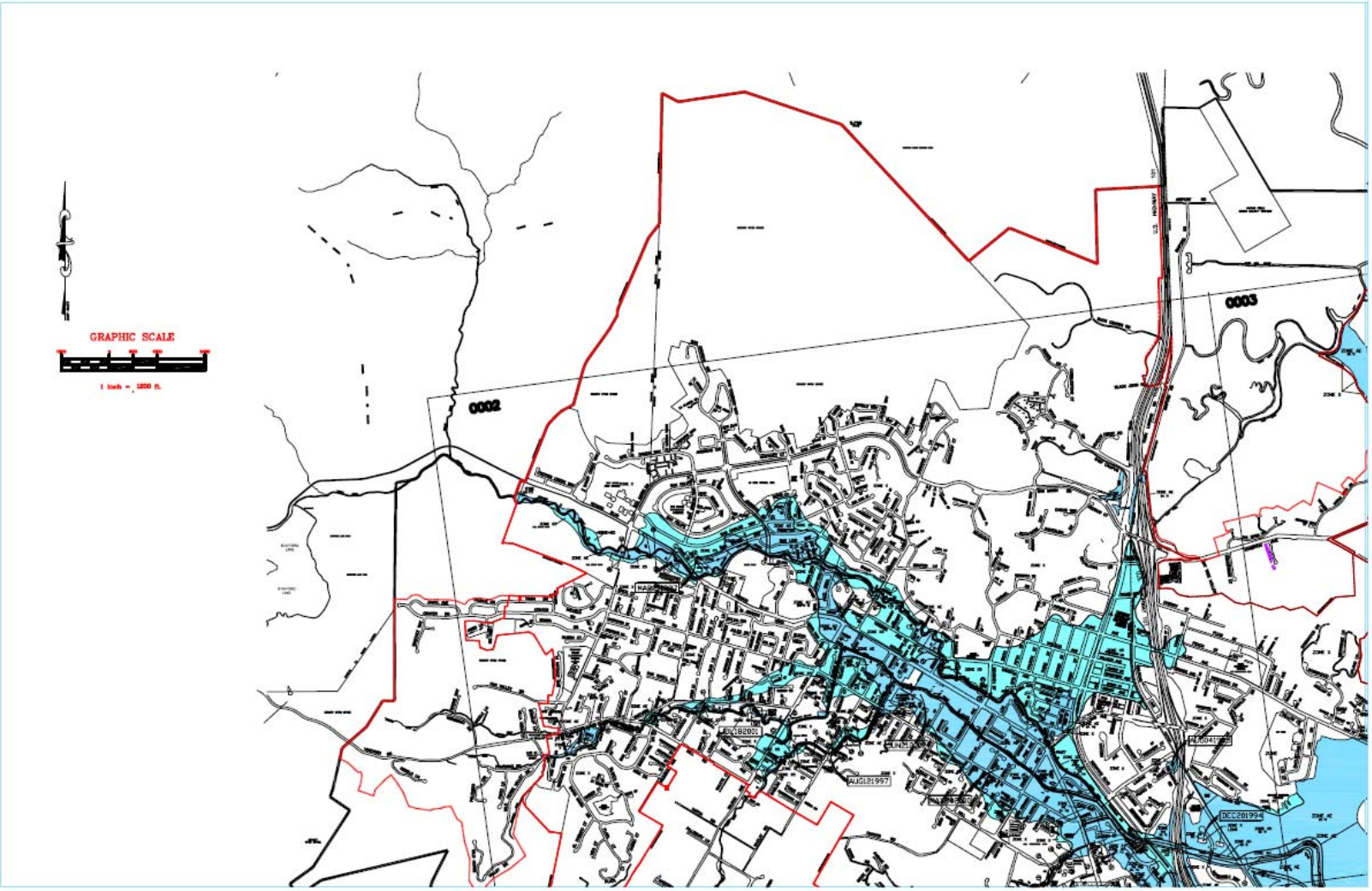
SEP031996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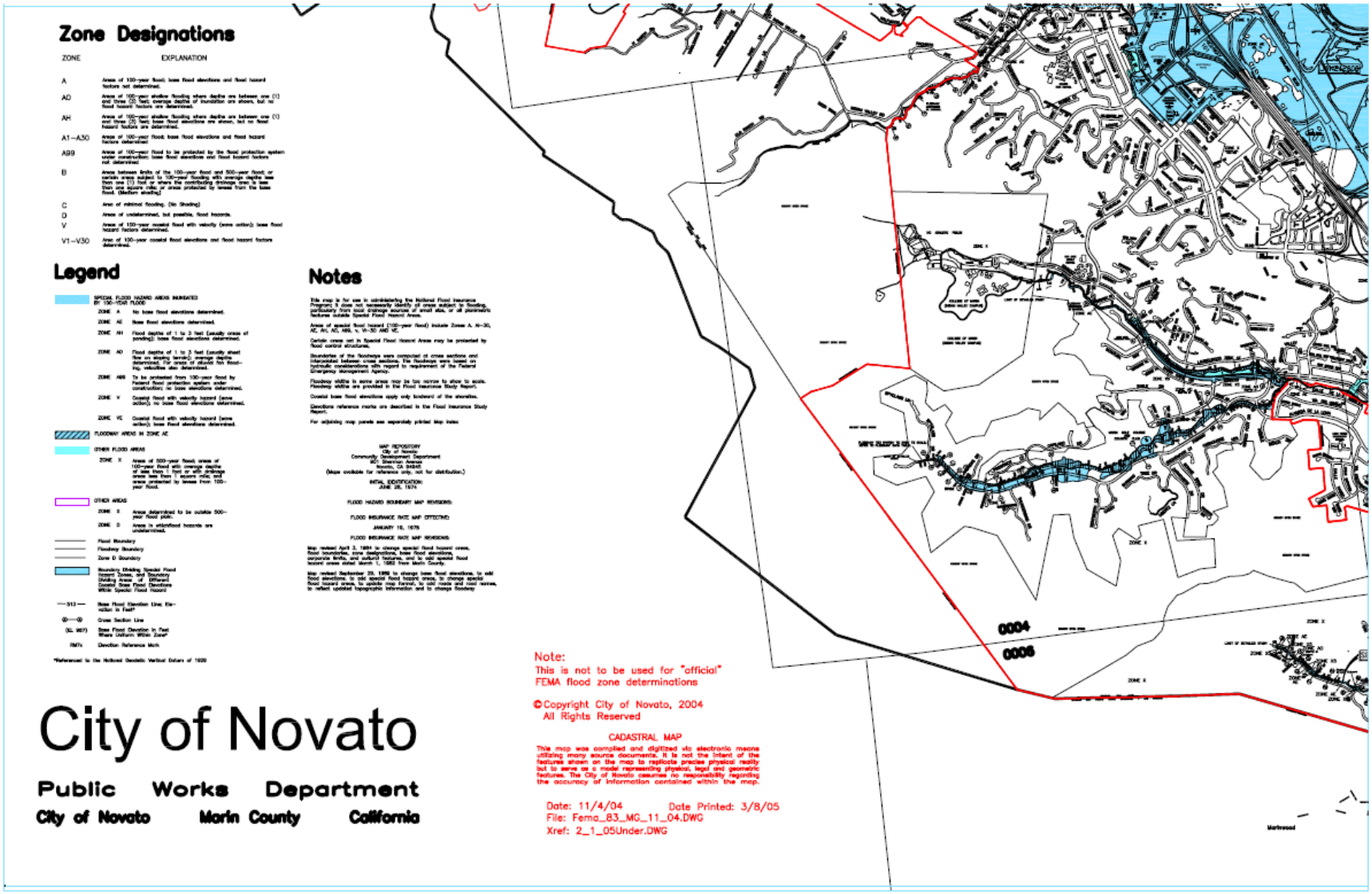
Zone Designations
ZONE
EXPLANATION
A
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AH
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AR9
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C
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V
V1–V30
Legend
Notes
City of Novato
Public Works Department
City of Novato
Marin County
California
Note:
This is not to be used for "official"
FEMA flood zone determinations
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CADASTRAL MAP
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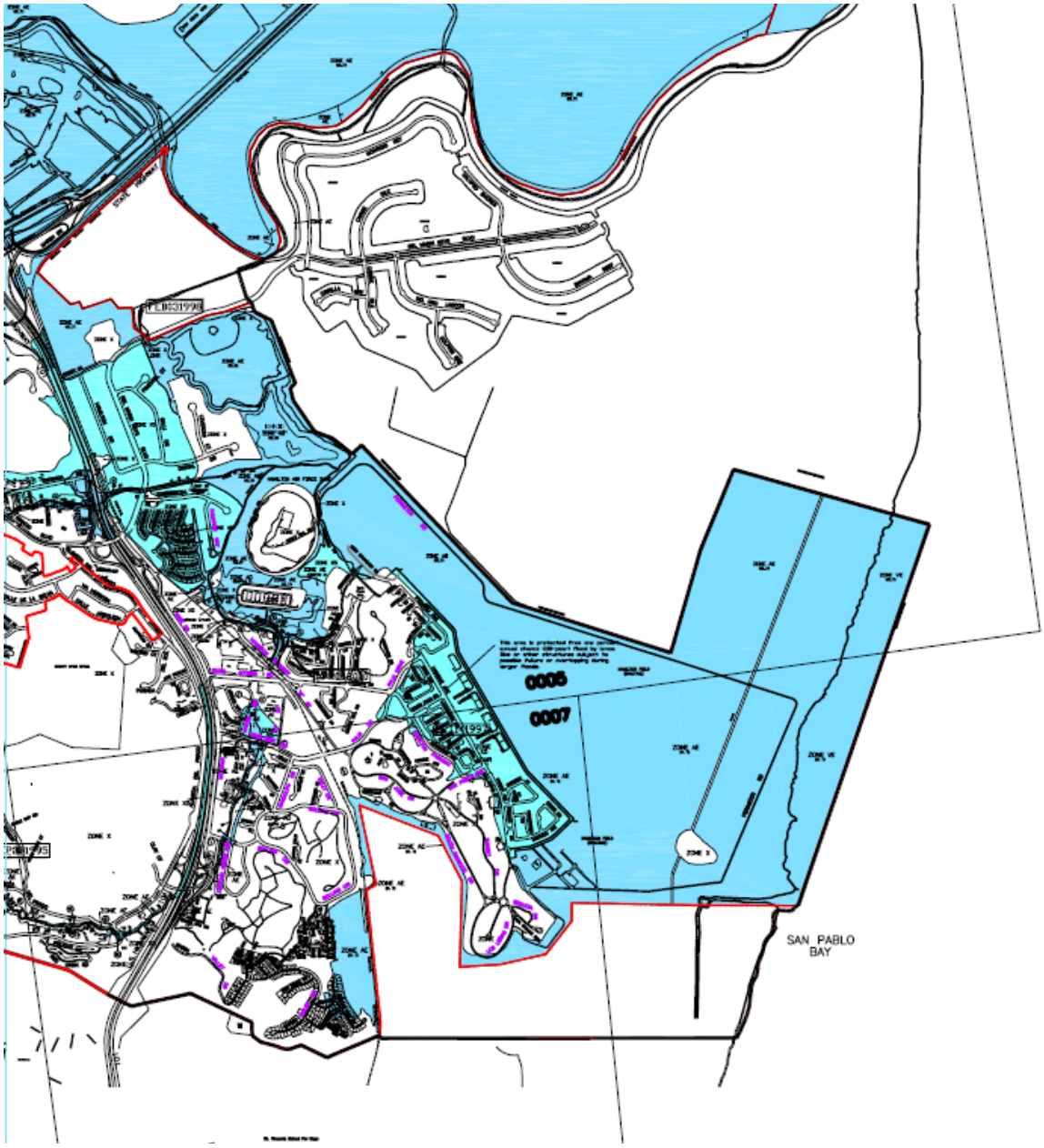
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SAN PABLO
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Repetitive Loss and Community Rating System

Introduction

The CRS Program serves to advise the public about flood issues in their area, how to reduce property damage from floods, and to take advantage of the availability of Flood Insurance. The City of Novato voluntarily entered FEMA's CRS Program in the fall of 1994, when it submitted an application for a Class 9 rating (10 being the lowest). At that time, the City was already performing most of the activities that FEMA tracks and credits as part of normal City Planning, Zoning and Code Enforcement work. The City's application simply identified all of these different activities in the CRS Program's format in order to complete the application.

One of the benefits of obtaining a rating in the CRS Program is that every Flood Insurance policyholder in the City then receives a discount on a portion of their annual flood insurance policy premium. The discount is 5% for every Class rating that is achieved. The City's initial Class 9 rating, effective in 1995, was worth a 5% discount to each flood insurance policyholder. Currently, the City qualifies for a Class 7 rating, or 15% discount. With over 1,300 flood insurance policies currently in force in Novato, a total annual savings of approximately $80,000 in flood insurance premiums is being realized.

The City's participation in the program requires annual reporting to FEMA, in order to maintain the current Class Rating. In addition, once every five years FEMA performs a Site Verification Visit, to ensure that the City is maintaining the required records as documentation of its activities. As a result of this year's verification visit, and changes to the CRS Program requirements, the City is now required to prepare and adopt a Repetitive Loss Plan.

Nationwide, more than 2.5 million buildings are insured by the National Flood Insurance Program (NFIP). However, less than 2% of these properties account for 33% of the total flood insurance claims paid since 1978 because they have flooded more than once, and some of them have been flooded numerous times. In an effort to address this fact, FEMA requires communities with more than ten (10) repetitive loss properties to develop and adopt a Repetitive Loss Plan. FEMA currently lists 22 repetitive loss properties in Novato, the majority of which are located immediately upstream of the confluence of Novato, Warner and Arroyo Avichi Creeks, as shown in the map attachment. Heavy rains in 1980, 1982, 1983, 1986, 1989, and 1998 caused flooding and damage to buildings within this area.

The purpose of a Repetitive Loss Plan is to obtain public input/consensus by following a proper planning process, so as to develop a plan that determines what is best/feasible for the community in addressing the issue of local repetitive loss properties. A Repetitive Loss Plan is considered a "living document". Plan progress will be reviewed annually by City staff and reported to FEMA, as required by the CRS Program. The Plan may be updated as often as desired by the local community, however the CRS Program requires mandatory Repetitive Loss Plan updates at least once every five (5) years.

Table of Map Revisions and Amendments

Letter of Map Revisions (LOMR) and Letter of Map Amendments (LOMA)

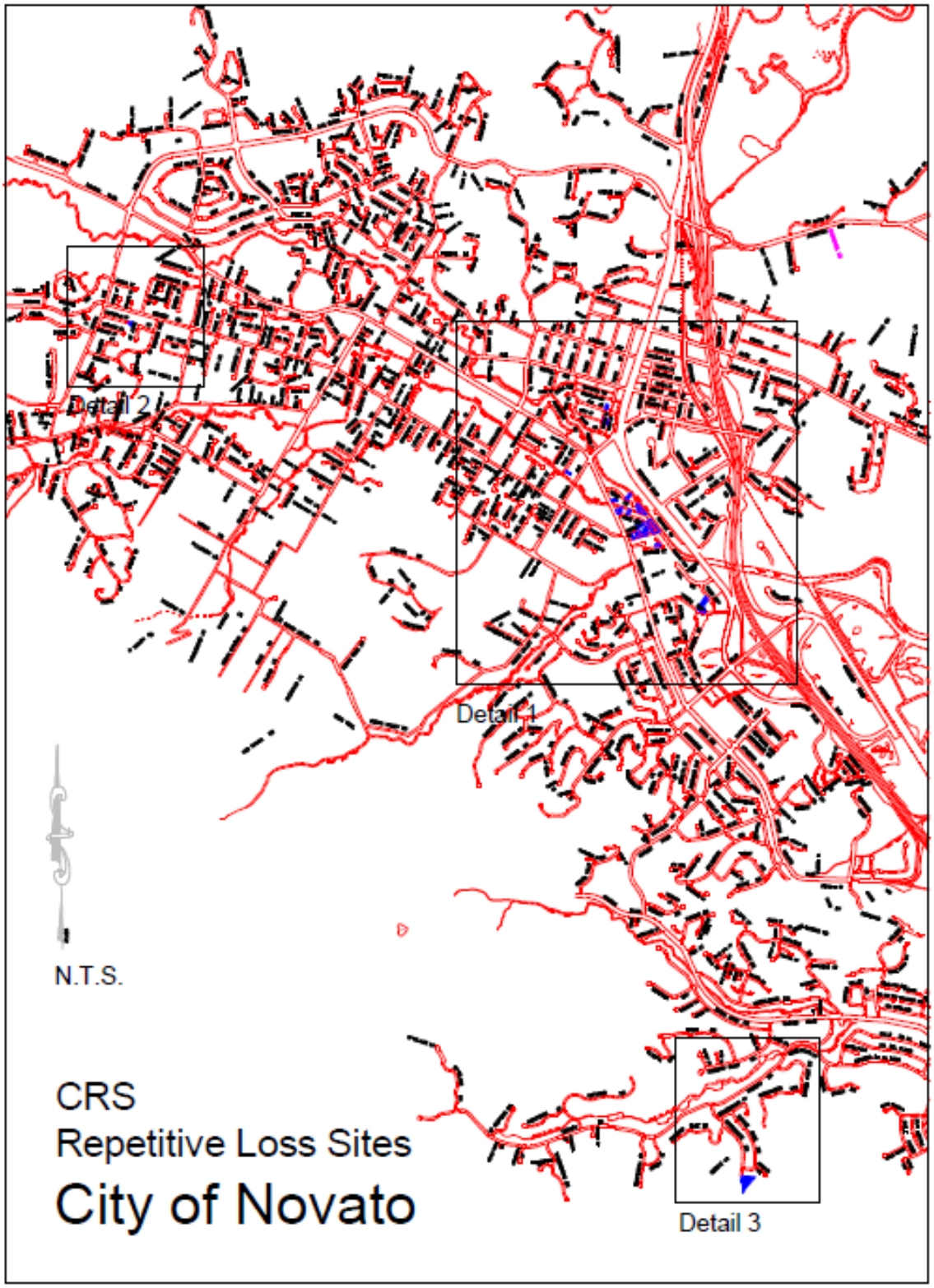
	Date	Case #	Status	LOMA	LOMR	Description	Firm Zone Current	Firm Zone Revised
	7/11/91	91-09-.8F	Conditional		X	Processed lots 1-47 Wildwood Glen Sub'd APN-143-110-75 & 78 & 143-491-01 thru 03, 05 thru 09 & 12		
Not Incorporated	12/20/94	95-09-075A	Final		XP	Lots 1 & 2 & the remainder of Golden Gate Business Park Phase 1 – 100 and 101 Rowland Way		
Un-determined	8/04/95	95-09-654A	Final	X		Portion of lots 20,21 & 22 on the sub'd of lots 1 & 2 Franklin Pl 702 and 704 Alice St		
Not Incorporated	9/27/95	95-09-879A	Final			Lot 5 Pacheco Creek Sub'd 12 Pacheco Creek Dr	X	
Not Incorporated	9/3/96	96—09-971A	Final		XS	Lot 44,45,& 46 Wildwood Glen 40,30 & 20 Wendy Ct	X	
Not Incorporated	3/21/97	97-09-449A	Final	XP		Lot 1077 – San Marin Unit 9 8 San Miguel Way	X	
Not Incorporated	4/03/97	97-09-472A	Final	XS		Portion of parcel 0 Marin Fur Village 1448 Pastel Lane	X	
Not Incorporated	4/17/97	97-09-802A	Final	X		Lot 66 Bahia Unit 1B 2441 Topaz Dr	X	
Not Identified in FEMA	8/12/97	97-09-812C	Final		X	Portion of parcel A 680 McClay Rd		
Incorporated	10/14/97 6/13/97 1/26/95	97-09-835P 97-09-835P 94-09-833R	Final Final Conditional		XP	1200' upstream of Perimeter Rd on right overbank 5900' upstream Along San Pablo Bay	AE7	X
Not Incorporated	2/3/98	98-09-315A	Final		XS	Units 1,2 & 3 as shown on the Parcel Map 21-92 400 Bel Marin Keys Blvd		
Not Incorporated	1/21/00	99-09-1082A	Final		XS	APN 154-034-29 Parcel 5 BLDGS 2-12 APN 153-034-15 Parcel 3 BLDGS 2-5,7-9	AE7	X
Not Identified in FEMA	4/4/00	00-09-474C	Final		XS	Portsmouth Drive	AE7	X
Incorporated	7/18/01	01-09-674P	Final		XP	Wilson Creek 500' upstream of McClay Rd to just downstream of Shields Ln (Elkin Property)		
Not Incorporated	6/21/02	02-09-994A	Final		XP	Walnut Grove Apts Portion of lot 54 Sub'd A & B Novato Ranch AMN 140-021-57,58,61 1811 Novato Blvd	AE7	X
Not Incorporated	5/24/00	00-09-635A	Final	XS		45 Bret Ct Structure Bret Court Sub'd	AO	X
Not Incorporated	11/23/04	04-09-1765A	Final		XS	9 Laurelwood Dr APN 160-930-05	X	

	Date	Case #	Status	LOMA	LOMR	Description	Firm Zone	
							Current	Revised
Un-determined	8/30/05	05-09-1406A	Finbal		XS	Olive Ridge Sub'd Club Drive	AE7	X
Not Incorporated	1/5/05	05-09-1406A	Final	XS		Bahia Unit 1B lot 90 2589 Topaz Dr		
Not Incorporated	1/18/02	05-09-1406A	Final	XS		Creekside Housing 1744 & 1748 Novato Blvd		
Not Incorporated	10-29-99	05-09-1406A	Final	XS		Marin Golf & Country Club 7 Nassau Ct		
Not Incorporated	6/8/98	05-09-1406A	Final	X		Bay Tree Park 419A & 425 A Enfrente Rd		
Not Incorporated	5/19/92	05-09-1408A	Final	X		1462A Pastel Ln		
Not Incorporated	10/11/91	05-09-1406A	Final	X		548 Fairway Dr		
Un-determined	6/14/05			X		105,109,113,117,145,149 Laurelwood Drive		
Un-determined	8/14/79			X		Lot 233 Bahia, Unit 4		
Un-determined	10/31/90			X		Kaehler Sub'd		
Un-determined	1/27/88	98-09-654			X	Saddlebrook Estates Unit II		
Un-determined	12/2/87				X	Parcel 2, Lands of Fan		
Un-determined	6/11/87					Building 1-6 Redwood Landing		
Un-determined	9/4/85					1340 Monte Maria Ave		
Un-determined	3/29/85					Building #5 Unit 82		
Un-determined	12/14/84					Lots 38-44 Valley Oaks Estates		
Un-determined	1/25/82					Lots 93,94,108,109 Valley Oaks Estates		
Un-determined	2/23/83			X		The Woodlands, Lot 12		
Un-determined	10/4/83			X		Lots 93,94,108,109 Valley Oaks Estates		
Un-determined	1/25/83			X		Walnut Grove Apts Lot 54 Map Divisions A,B Novato Ranch		
Un-determined	1/25/82			X		Donner Springs Sub'd Unit #2 C-2 Lots 7-21 & 29-32, Block B		
Un-determined	1/25/82			X		Northlake Estates #10 Lots 1-11 Block 2 Lot 26 Block 4		
Un-determined	1/25/82			X		University Park, Lot 2		
Un-determined	3/24/81			X		Block 65 Admin Building Pump Station		

	Date	Case #	Status	LOMA	LOMR	Description	Firm Zone	
							Current	Revised
Un-determined	8/14/79			X		Lot 233 Bahia Unit 4		
New	4/19/06	05-09-A080P 04-09-1085R			XP	Pointe Marin Phase 2 & 4 Ignacio Creek		
New	1/23/07	07-09-0583A		XS		Marin Highlands Unit 2B Lot 11 6 Zoila Court		

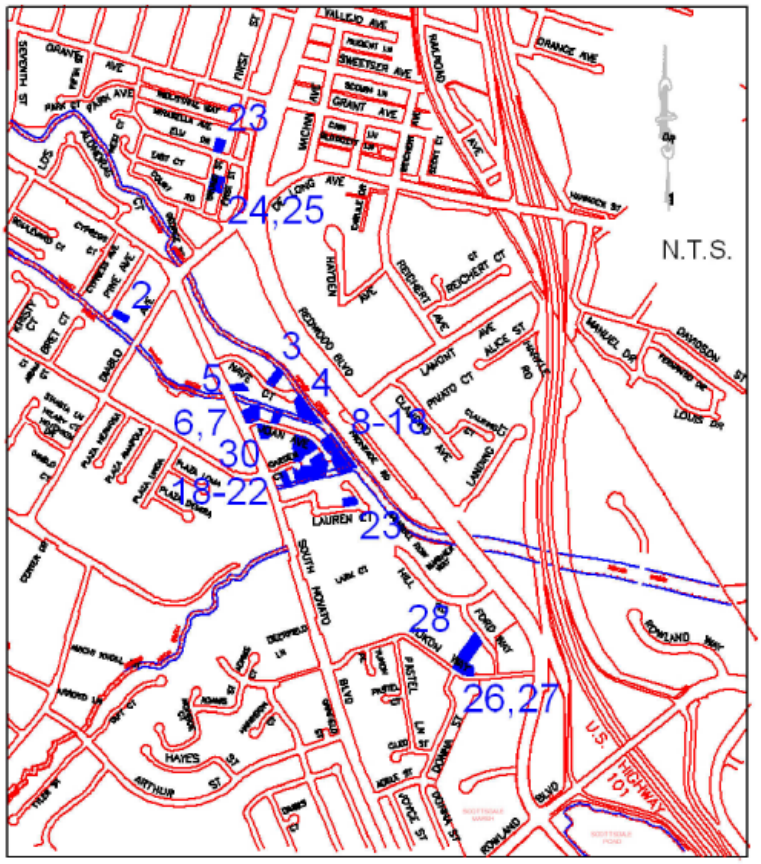
Per the Flood Insurance Rate Map (FIRM) Review Dated 9/27/2005
XP = Property
XS = Structure
Undetermined – Needs more information

Repetitive Loss Map (Detail on following pages)



Detail 2

Detail 3



Detail 1

CRS Repetitive Loss Sites

#	Parcel	Address
1	132-191-20	1 Gustafson Court
2	140-053-26	850 Pine Avenue
3	140-071-06	17 Nave Court
4	140-071-09	26 Nave Court
5	140-071-23	1570 South Novato Blvd.
6	140-071-27	1 Joan Avenue
7	140-071-27	3 Joan Avenue
8	140-071-31	9 Joan Avenue
9	140-11-04	25 Joan Avenue
10	140-141-05	27Joan Avenue
11	140-141-06	29 Joan Avenue
12	140-141-07	31 Joan Avenue
13	140-141-09	30 Joan Avenue
14	140-141-10	28 Joan Avenue
15	140-141-12	22 Joan Avenue
16	140-141-13	18 Joan Avenue
17	140-141-14	16 Joan Avenue
18	140-141-28	9 Garden Court
19	140-141-10	10 Garden Court
20	140-141-31	8 Garden Court
21	140-141-33	4 Garden Court
22	140-141-45	41 Lauren Drive
23	141-285-16	1104 Elm Drive
24	141-302-03	942 Brouno Street
25	141-302-04	940 Bruno Street
26	152-031-05	1220 Yukon Way
27	152-031-06	1230 Yukon Way
28	152-051-12	150 Ford Way
29	160-030-37	37 Carnoustie Drive
30	140-141-19	4 Joan Avenue

Revised Date July 18, 2006

The City of Novato Local Flood Hazard Mitigation Plan of March 1996 is Appendix A of this Plan.

The City of Novato is currently updating its flood hazard mitigation Plan. Through a FEMA grant, work is expected to be completed by September 2007.

The City experienced flooding in the December/January storms of 2005- 2006 the following is a description of that storm and its affect on the City of Novato.

Wildland Urban Interface Fire

Wildland Urban Interface Fire was rated a HIGH PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

The location of the City of Novato is such that the adjacent land and jurisdictions are densely populated and industrialized. The Hazard Mitigation Planning Committee felt that the hazard posed by Wild Land Urban Interface Fires was little to none for the City.

Levels of Wildland Fire Protection Services

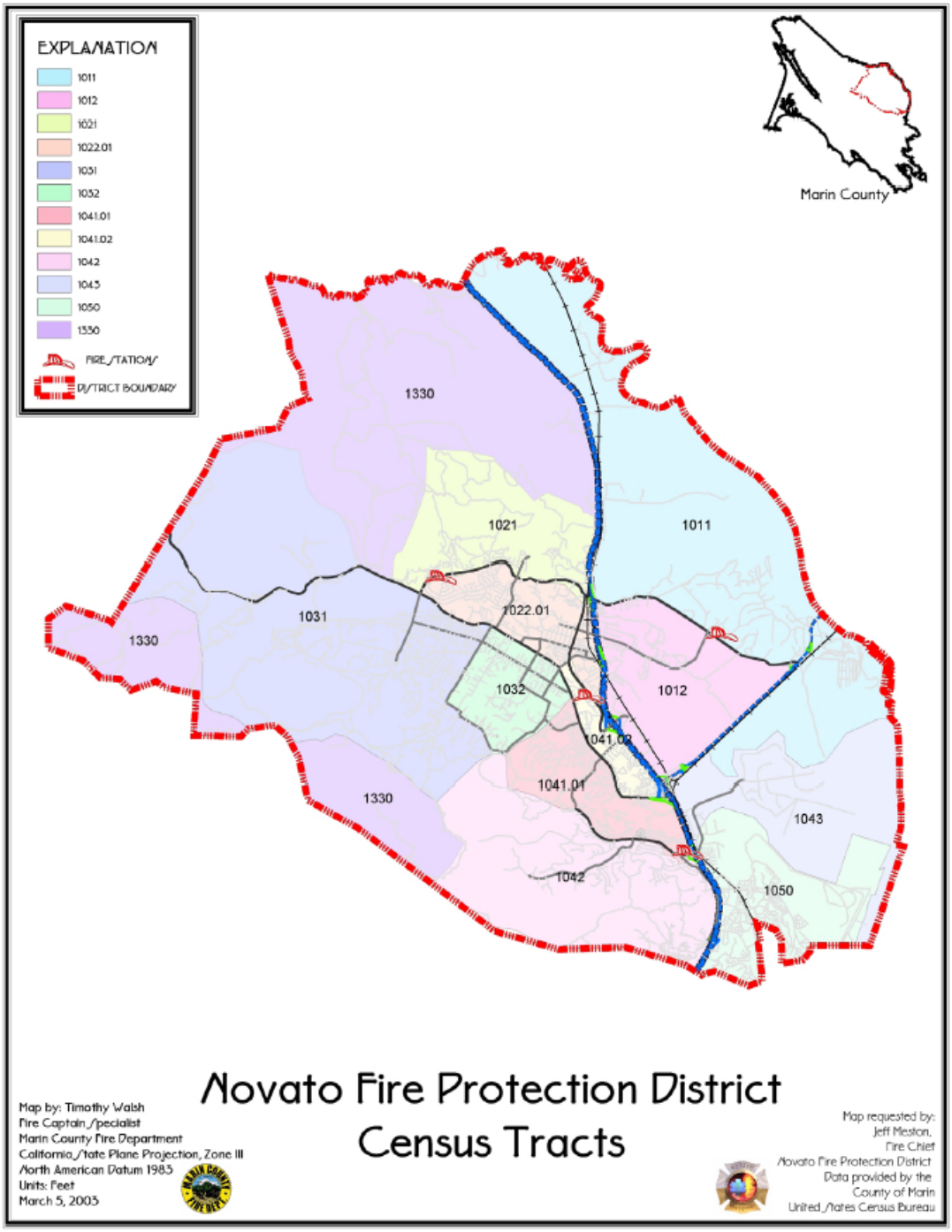
The history of California wildfires indicates that the following trends will continue. Risk from wildfire to life, property, natural resources, and firefighter safety is increasing.

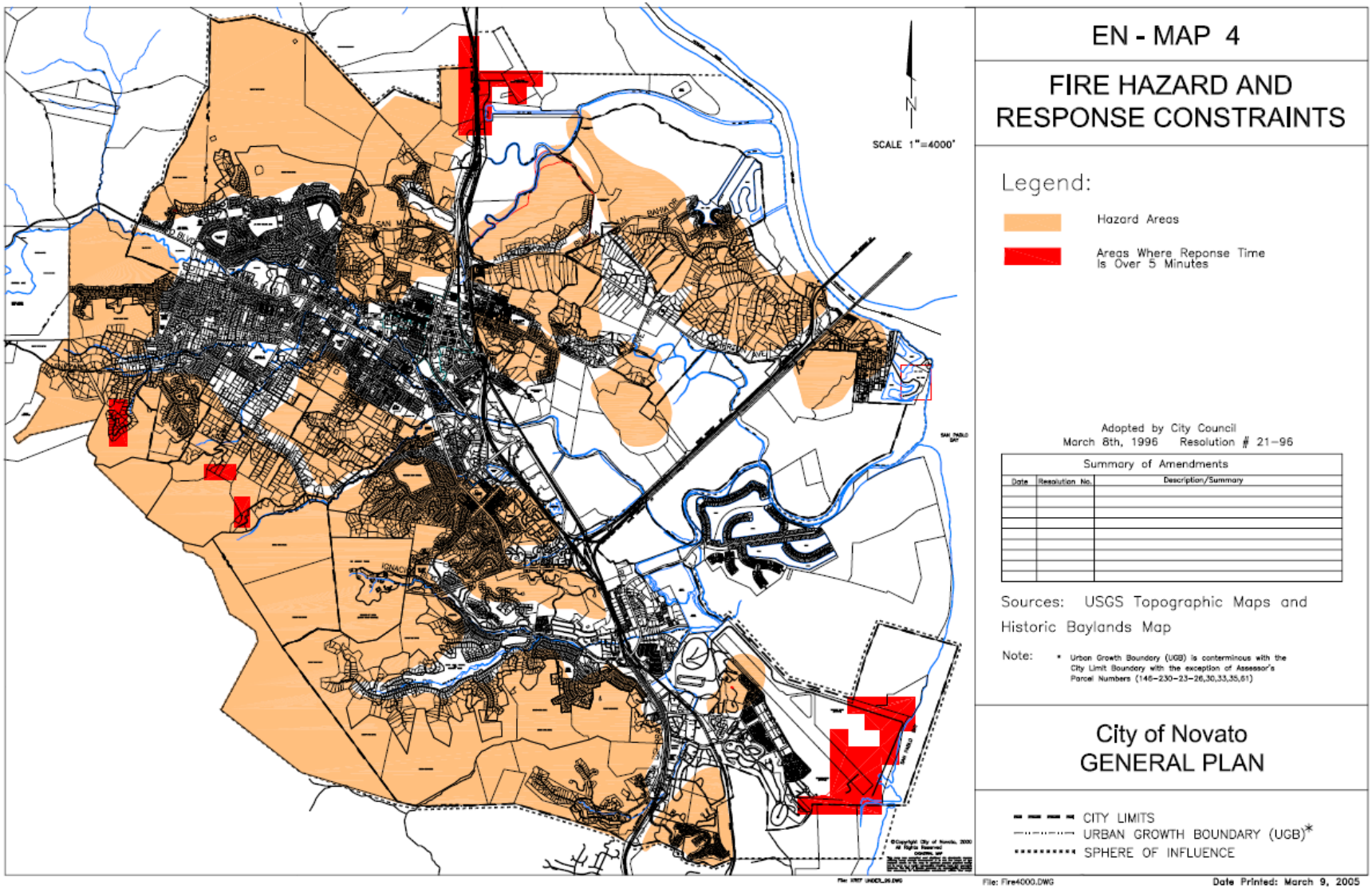
- Population will grow and more people will live and use wildland areas.
- Topography and climate support ecosystems where large wildfires can be expected.
- Drought and fuel moisture conditions will be unpredictable but almost always dangerous in fire season.
- More structures will be constructed in areas that are very susceptible to wildfire.
- Historical legacy of narrow roads, difficult entrance, insufficient water supplies, flammable building construction and location that make many communities and homes wildfire-prone still exits.
- Public demand for wildland fire protection and other services will increase.
- Deteriorating woodland health, increasing fuel loads and other factors have led to more intense, destructive wildfires; unabated this pattern will continue.
- Assets at risk will increase, especially watershed assets, because of the rapid rise in the demand for water to supply more people. Based on population projections, the potential for accelerating loss of protected assets, especially life and property, will be greater from disastrous wildfires.

Large wildfires do not respect political or property boundaries. Historically, a strength of California's firefighting agencies is found within a concept of mutual cooperation at the federal, state, and local levels of government. Day-to-day mutual aid for initial attack, as well as a statewide mutual-aid system for fire disasters, is the basis of this cooperation and coordination. The ability to rapidly mobilize, effectively deploy and support large numbers of specialized firefighting resources is essential to cope with large multiple fires. Hence, the California Department of Forestry and Fire Protection (CDF), in cooperation with other fire agencies, must maintain infrastructure, including communications and capital improvements necessary to facilitate such a response.

Fire protection forces in California must have sufficient depth to respond to large, multiple wildfires and still prevent other small fires from becoming large damaging fires. CDF plays a key role in supplying and coordinating such forces; it should maintain and enhance this ability. The 1985 Fire Plan includes a model to provide adequate depth of resources that show CDF needing 96 additional engines and 825 personnel for managing large fires using the Incident Command System. There is a greater need today as reflected in the California Fire Plan.

California Fire Plan 2003




EN - MAP 4
FIRE HAZARD AND RESPONSE CONSTRAINTS
Legend:
Hazard Areas
Areas Where Reponse Time Is Over 5 Minutes
Adopted by City Council
March 8th, 1996 Resolution # 21-96
Summary of Amendments
Date
Resolution No.
Description/Summary
Sources: USGS Topographic Maps and Historic Baylands Map
Note: * Urban Growth Boundary (UGB) is conterminous with the City Limit Boundary with the exception of Assessor's Parcel Numbers (146-230-23-26,30,33,35,61)
City of Novato
GENERAL PLAN
CITY LIMITS
URBAN GROWTH BOUNDARY (UGB)*
SPHERE OF INFLUENCE
SCALE 1"=4000'
N
File: Fire4000.DWG
Date Printed: March 9, 2005

Wildland Fire Protection Fiscal Issues

Multi-year fiscal problems are occurring at all governmental levels, constraining the availability of funding to address the increasing workload, costs and losses of the California wildland fire protection system. The increasing number of structures and people in California wild lands and the growing importance of the state's natural resources create a growing demand to fund additional wildland fire protection services for both the structures and the wildland resource assets.

The primary fiscal responsibilities for the initial attack responsibilities: (1) for federal wildland fire protection are the federal taxpayers, (2) for privately owned wildland fire protection are the state taxpayers, and (3) for structure fire protection in wildland areas are the local taxpayers. However, during the annual fire season, the state and federal taxpayers provide a minimum level of structural fire protection that is incidental to their primary missions of wildland fire protection. Similarly, in most wildland areas, local taxpayers provide year-round wildland fire protection on both state and federal responsibility areas that is incidental to the local government primary mission of structural fire protection.

Over the last decade, part of the increased costs for additional initial attack wildland resource protection and structural protection have been funded by local taxpayers through property taxes, fire district fees and volunteer firefighters. However, when a wildland fire overwhelms local resources and reaches a major fire status, both the state and the federal taxpayers pay for the costs of wildfires, structure protection, and the resulting disaster relief.

For the local taxpayers, the following continue to increase: (1) the structural values and number of people being protected on wild lands, (2) the costs of wildland and structure initial attack fire suppression funded at the local levels, and (3) the losses from the extended attack and larger fires.

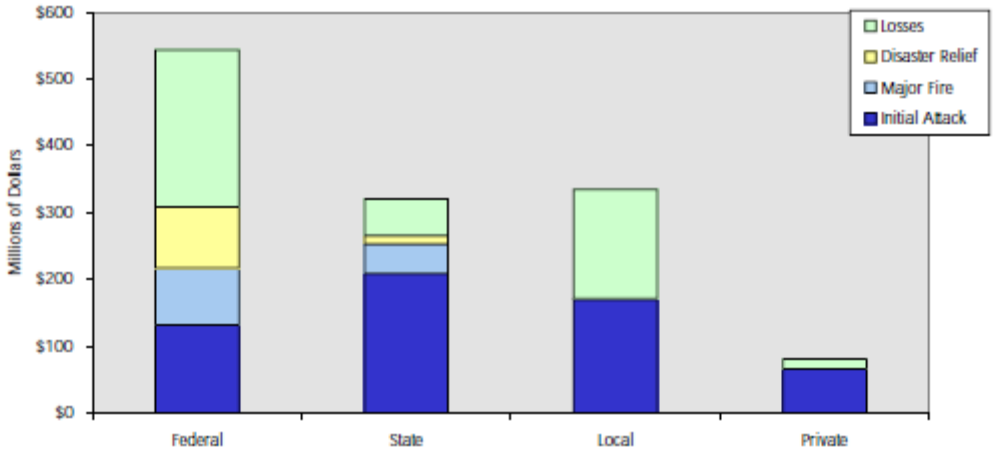
For state and federal taxpayers, the following will continue to increase: (1) extended and large fire emergency fund expenditures for wildland fires, (2) protecting structures during initial attack and extended attack fires, and (3) state and federal agency disaster expenditures for damages to wildland resources and structures. Health and Safety Code Section 13009 allows for recovery of fire suppression costs which, when obtained, be placed back into the state's general fund rather than invested in a pre-fire management program.

There is a direct relationship between reduced expenditures for pre-fire management and suppression and increased emergency fund expenditures, disaster funding, and private taxpayer's expenditures and losses. Reduction of pre-fire management or suppression resources allows more fires to become major disastrous fires. Major fires create additional suppression and disaster relief costs at all levels of government and increase citizen and business losses.

According to representatives of the insurance industry that insures structures in California wildland areas, (1) the insurer average costs and losses are about $1.09 for each $1.00 received in premiums, and (2) the urban dwellers are subsidizing the wildland homeowner through service-wide rating schedules.

Who Pays for Fire Protection Costs and Wildfire Damage

	Millions of Dollars				
	Initial Attack	Major Fire	Disaster Relief	Losses	Total
Federal	$132	$85	$92	$235	$544
State	208	45	13	54	320
Local	170	1	1	164	336
Private	66	0	0	14	80
Total	$576	$131	$106	$467	$1,280



Losses for federal agencies are estimates only due to insufficient data.

Cost Impacts Associated with Intense Wild Fire (California Fire Plan_

Beneficial Use	Benefit (+) or Cost (-) Per Acre Burned ($)	Comments
Water Yield	+$3 to +$12	1st two years
Hydropower generation	+$17.50	1st two years
Reservoir Storage Capacity	-$9 to -$90	1st two years
Reservoir Sedimentation	-$40 to -$100	1st two years
Debris Basin Cleanout	0 to -$8000	Southern CA
Watershed Rehab	-$30 to -$200	1st year only
Water Quality	negative, unquantifiable	Increased turbidity, suspended sediment
Flooding	negative, unquantifiable	Increased peak flow, debris
Fisheries	negative, unquantifiable	Increased sediment, water temperature
Recreation	negative, unquantifiable	Degraded aesthetics

Fire History

20 Largest California Wildland Fires by Structures Destroyed

	FIRE NAME/*CAUSE*	DATE	COUNTY	ACRES	*STRUCTURES*	DEATHS
1	TUNNEL *(REKINDLE)*	October 1991	ALAMEDA	1,600	2,900	25
*2	CEDAR *(HUMAN)*	October 2003	SAN DIEGO	273,246	2,820	15
*3	OLD *(HUMAN)*	October 2003	SAN BERNARDINO	91,281	1,003	6
4	JONES *(UNDETERMINED)*	October 1999	SHASTA	26,200	954	1
5	PAINT *(ARSON)*	June 1990	SANTA BARBARA	4,900	641	1
6	FOUNTAIN *(ARSON)*	August 1992	SHASTA	63,960	636	0
7	CITY OF BERKELEY *(POWERLINES)*	September 1923	ALAMEDA	130	584	0
8	BEL AIR *(UNDETERMINED)*	November 1961	LOS ANGELES	6,090	484	0
9	LAGUNA FIRE *(ARSON)*	October 1993	ORANGE	14,437	441	0
*10	PARADISE *(HUMAN)*	October 2003	SAN DIEGO	56,700	415	2
11	LAGUNA *(POWERLINES)*	September 1970	SAN DIEGO	175,425	382	5
12	PANORAMA *(ARSON)*	November 1980	SAN BERNARDINO	23,600	325	4
13	TOPANGA *(ARSON)*	November 1993	LOS ANGELES	18,000	323	3
14	49ER *(BURNING DEBRIS)*	September 1988	NEVADA	33,700	312	0
*15	SIMI *(UNDER INVESTIGATION)*	October 2003	VENTURA	108,204	300	0
16	SYCAMORE *(MISC. - KITE)*	July 1977	SANTA BARBARA	805	234	0
17	CANYON *(VEHICLE)*	September 1999	SHASTA	2,580	230	0
18	KANNAN *(ARSON)*	October 1978	LOS ANGELES	25,385	224	0
19	KINNELOA *(CAMPFIRE)*	October 1993	LOS ANGELES	5,485	196	1
*19	GRAND PRIX *(HUMAN)*	October 2003	SAN BERNARDINO	69,894	136	0
20	OLD GULCH *(EQUIP. USE)*	August 1992	CALAVERAS	17,386	170	0

Note that this list does not include fire jurisdiction. These are the Top 20 within California, regardless of whether they were state, federal, or local responsibility. Also note that "structures" is meant to include all loss - homes and outbuildings, etc.

4/22/2004

20 Largest California Wildland Fires by Acres Burned

	FIRE NAME/CAUSE	DATE	COUNTY	*ACRES*	STRUCTURES	DEATHS
*1	CEDAR *(HUMAN)*	October 2003	SAN DIEGO	273,246	2,820	15
2	MATILIJA *(UNDETERMINED)*	September 1932	VENTURA	220,000	0	0
3	MARBLE CONE *(LIGHTNING)*	July 1977	MONTEREY	177,866	0	0
4	LAGUNA *(POWERLINES)*	September 1970	SAN DIEGO	175,425	382	5
5	MCNALLY *(HUMAN)*	July 2002	TULARE	150,696	17	0
6	STANISLAUS COMPLEX *(LIGHTNING)*	August 1987	TUOLUMNE	145,980	28	1
7	BIG BAR COMPLEX *(LIGHTNING)*	August 1999	TRINITY	140,948	0	0
8	CAMPBELL COMPLEX *(POWERLINES)*	August 1990	TEHAMA	125,892	27	0
9	WHEELER *(ARSON)*	July 1985	VENTURA	118,000	26	0
*10	SIMI *(UNDER INVESTIGATION)*	August 1996	VENTURA	108,204	300	0
11	HWY. 58 *(VEHICLE)*	August 1996	SAN LUIS OBISPO	106,668	13	0
12	CLAMPITT *(POWERLINES)*	September 1970	LOS ANGELES	105,212	86	4
13	WELLMAN *(EQUIP. USE)*	June 1966	SANTA BARBARA	93,600	0	0
*14	OLD *(HUMAN)*	October 2003	SAN BERNARDINO	91,281	1,003	6
15	KIRK *(LIGHTNING)*	September 1999	MONTEREY	86,700	0	0
16	REFUGIO *(MISC. - STRUCTURE)*	September 1955	SANTA BARBARA	84,770	20	0
17	FORK *(UNDETERMINED)*	August 1996	LAKE	82,980	40	0
18	SCARFACE *(LIGHTNING)*	August 1977	MODOC	79,904	0	0
19	LAS PILITAS *(EQUIP. USE)*	July 1985	SAN LUIS OBISPO	74,640	41	0
20	MANTER *(UNDER INVESTIGATION)*	July 2000	TULARE	74,439	15	0

There is no doubt that there were fires with significant acreage loss in years prior to 1932, but those records are less reliable, and this list is meant to give an overview of the large acreage-loss fires in more recent times. (Also note that this list does not include fire jurisdiction. These are the top 20 within the state, regardless of whether they were state, federal, or local responsibility.)

Structures (California Fire Plan)

Loss of structures is one of the more emotionally gripping and economically significant impacts of wildland fire in California. Statewide, there are an estimated one million housing units within California's wildlands or the wildland/urban interface. Approximately 500,000 of these housing units are owner-occupied, single-family homes with an average replacement cost of $140,000. Taken as a whole, these housing units have an estimated replacement cost of approximately $107 billion.

Based on fire records for 1985-94, an average 703 homes are lost per year to wildland fire in California. It should be noted, however, that the number of homes lost varies significantly from year to year. Housing values typically range from $15,000 on up, with the median, owner-occupied single-family home valued at $140,000 (excluding land value). Since the value of the homesite is not generally affected by wildfire, only the value of structures and contents should be considered.

Discussions with insurance and fire officials indicate that the average market value of a home's contents is 20-25 percent of the replacement value, or about $35,000 per home. Thus, as a first approximation, the median house and contents are valued at an estimated $175,000. When insurance claims are filed for homes lost to wildland fire, insurance companies face costs to process claims. The overall cost of operating insurance programs is estimated to be 45 cents per dollar of premium. However, this represents the average of all operating costs for an insurance company, not the marginal cost of handling a claim. As a rough approximation, it is estimated here that the transaction cost to insurance companies to settle a claim is 1 percent of the claim amount, on average.

In addition to insured property loss, homeowners also face a significant loss of intangibles in a house fire. While these losses are difficult to quantify and value, they should be considered in the evaluation of the effects of wildland fire on homeowners. As an approximation, we will assume that the average homeowner faces an uninsured loss of $10,000 when his or her home is lost to wildfire.

Additional costs associated with the loss of homes to wildland fire include disruption of utilities, transportation, and other public services. In addition, there are lost wages, costs of temporary shelter, and other costs that cannot be captured easily. We will assume that these costs average $10,500 per house lost to wildland fire.

Table 11 summarizes and totals the above-described costs. Total average annual costs statewide associated with loss of homes to wildfire is $163,271,750, or $232,250 per home.

Table 11. Estimated Average Annual Losses Due to Destruction of Homes by Wildland Fire

Category	Loss Amount
Dwellings and contents lost: 703/year @ $140,000 each	$ 98,420,000
Contents valued at 25 percent of dwelling	24,605,000
Total home and contents loss (equals insurance claim amount)	123,025,000
Insurance company transaction cost	
1 percent of claim cost or 1 percent of $123,025,000	1,230,250
Uninsured losses	
Intangibles: 703 dwellings/year @ $10,000 each	7,030,000
Other improvements on site: 25 percent of home loss or 25 percent x $98,420,000	24,605,000
Total uninsured losses	31,635,000
Disruption costs: 703 dwellings/year @ $10,500 each	7,381,500
Total loss to homeowner and others	$163,271,750

Fire Hazard to Novato

The Novato Fire Protection District (NFPD) has experienced several devastating fires (I-Zone Fires) over the years. (I-Zone is defined as the urban/wildland interface.) The fuel, weather and topographic conditions that support the ignition and spread of wildland I-Zone fires are still present within the District. This area is in the High Fire Hazard rating and the conditions qualifying it as such are not expected to change in the near future.

NOTE

(Since this information was recorded in the Novato Fire Protection District, another Fire Station has been added to the service area in South Novato. Please see the map on the next page for the most current locations of NFPD Fire Stations.)

	1983	1991	2002
Population	55,000	58,000	60,000
District	71 Sq. Miles	71 Sq. Miles	71 Sq. Miles
Fire Stations	4	4*	4
Personnel	72	82	86
Responses	2100 +	3000 +	4700 +
Wildland Fires	66	88	92

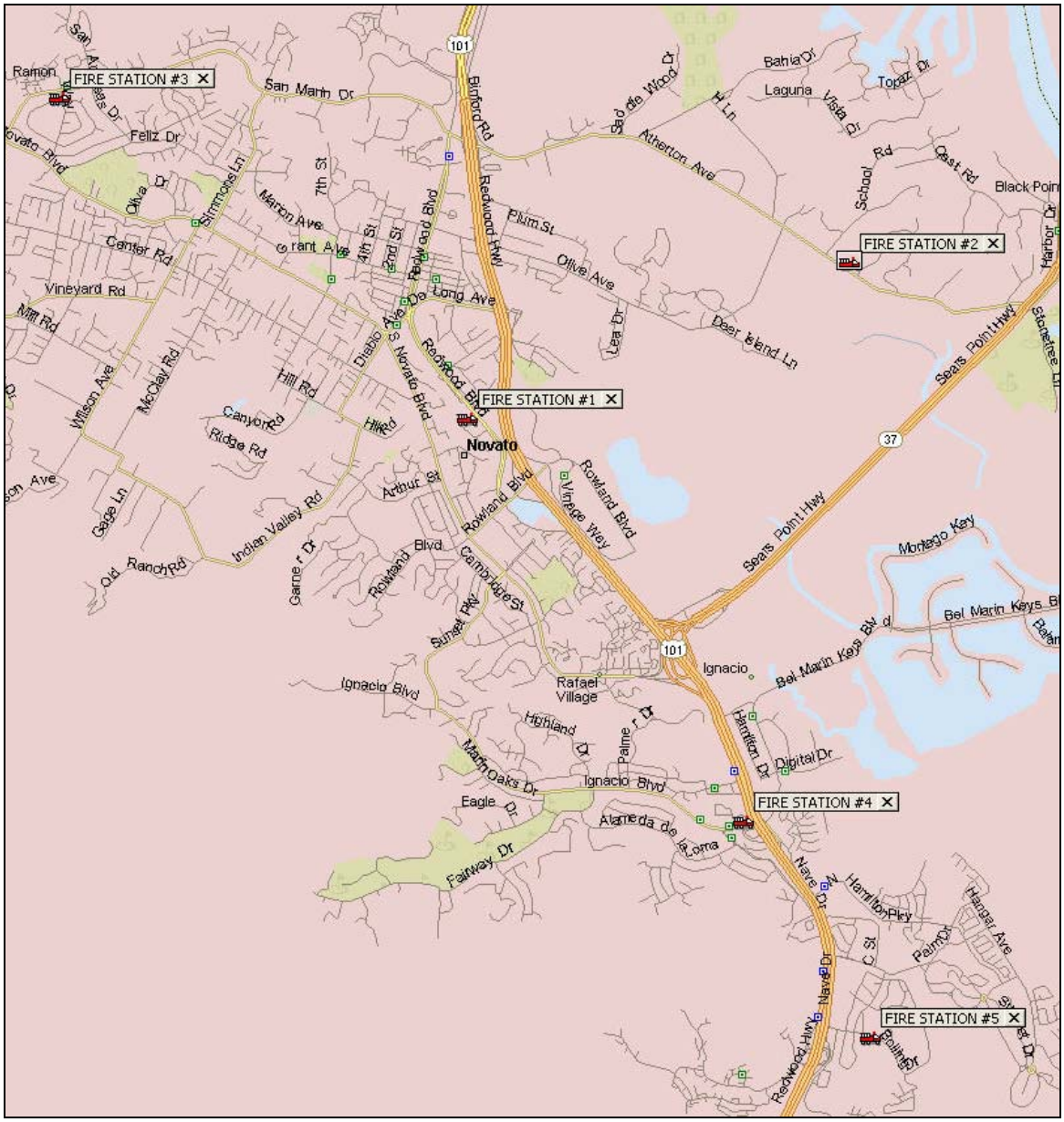
* Two stations strategically relocated for better response times and future growth.

National Oceanic and Atmospheric Administration (N.O.A.A.) statistics are used fo developing a range of summertime conditions that could Influence fire behavior. Those factors included;

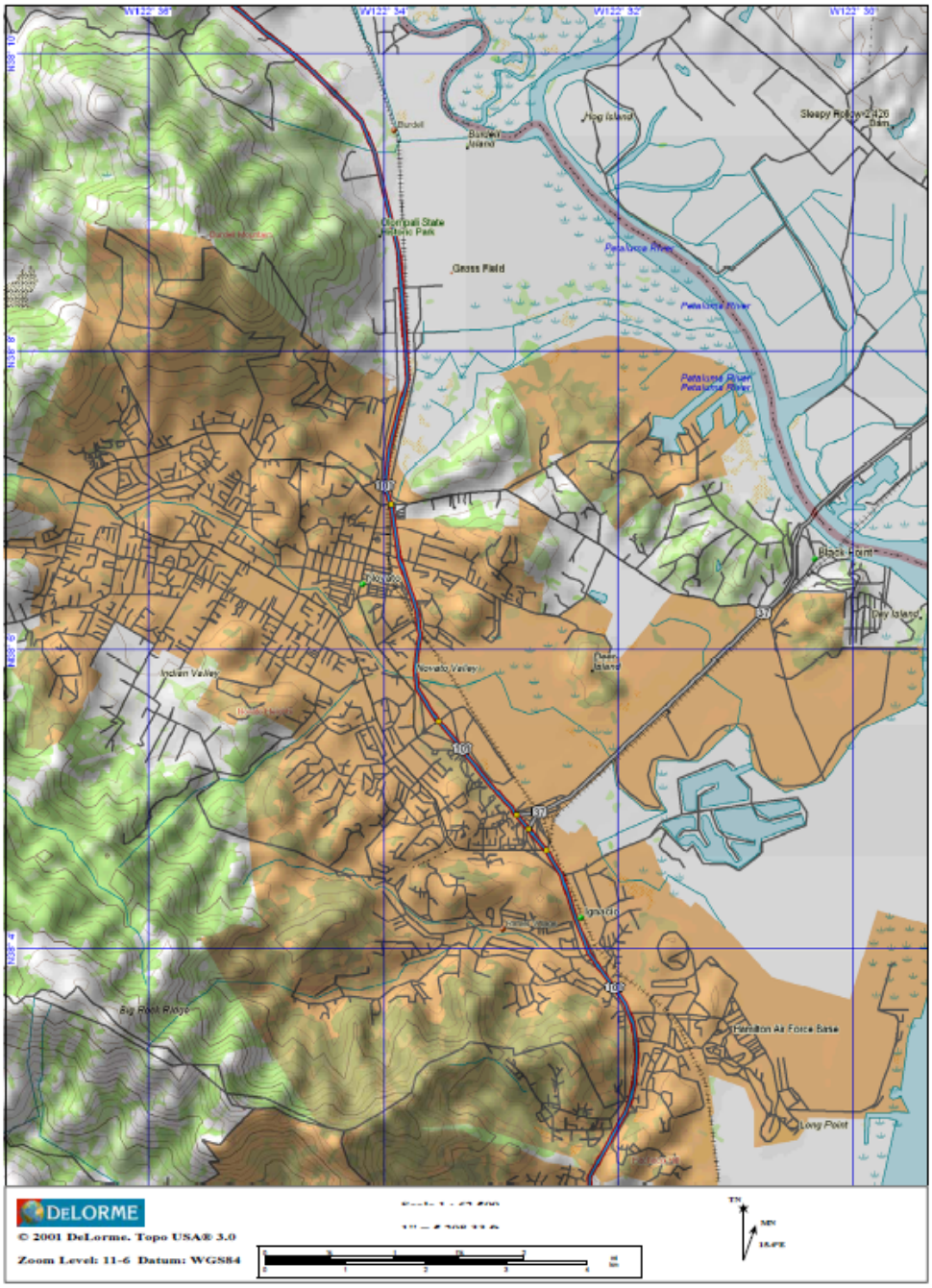
Table 25 - Climatological Data

Extreme temperature (2002):	104-f
Normal temperature (2002)	85-f
Extreme wind speed (2002):	41m.p.h.
Normal wind speed at 1300 hours (2002):	5.2 m.p.h.
Critical wind direction (2002):	West or SW
Critical wind direction:	West or SW
Critical wind speed (average):	15 m.p.h.

Locations of Novato Fire Protection District Stations #1 through #5



A fundamental concept of fire risk is associated with living in the wildland/interface. The NFPD attempts to reduce the risk within the district by taking measures to prevent the outbreak of fires, to limit the extent and severity of those fires that do start, provide for the removal or rescue of endangered persons, control and extinguish fires that occur within the district, as well as to perform other emergency response operations and delivery of emergency medical services.



Wildfire Smoke

Characteristics of Wildfire Smoke

The behavior of smoke depends on many factors, including the fire's size and location, the topography of the area and the weather. Inversions are common in mountainous terrain. Smoke often fills the valleys, where people usually live. Smoke levels are unpredictable: a wind that usually clears out a valley may simply blow more smoke in, or may fan the fires, causing a worse episode the next day. Smoke concentrations change constantly. By the time public health officials can issue a warning or smoke advisory, the smoke may already have cleared. National Weather Service satellite photos, weather and wind forecasts, and knowledge of the area can all help in predicting how much smoke will come into an area, but predictions are rarely accurate for more than a few hours.

Smoke Hazards as a Result of Wildland Fires

Smoke is composed primarily of carbon dioxide, water vapor, carbon monoxide, particulate matter, hydrocarbons and other organic chemicals, nitrogen oxides, trace minerals and several thousand other compounds. The actual composition of smoke depends on the fuel type, the temperature of the fire, and the wind conditions. Different types of wood and vegetation are composed of varying amounts of cellulose, lignin, tannins and other polyphenolics, oils, fats, resins, waxes and starches, which produce different compounds when burned.

Particulate matter is the principal pollutant of concern from wildfire smoke for the relatively short-term exposures (hours to weeks) typically experienced by the public. Particulate matter is a generic term for particles suspended in the air, typically as a mixture of both solid particles and liquid droplets. Particles from smoke tend to be very small - less than one micrometer in diameter. For purposes of comparison, a human hair is about 60 micrometers in diameter. Particulate matter in wood smoke has a size range near the wavelength of visible light (0.4 – 0.7 micrometers). Thus, smoke particles efficiently scatter light and reduce visibility. Moreover, such small particles can be inhaled into the deepest recesses of the lung and are thought to represent a greater health concern than larger particles.

Another pollutant of concern during smoke events is carbon monoxide. Carbon monoxide is a colorless, odorless gas, produced by incomplete combustion of wood or other organic materials. Carbon monoxide levels are highest during the smoldering stages of a fire. Other air pollutants, such as acrolein, benzene, and formaldehyde, are present in smoke, but in much lower concentrations than particulate matter and carbon monoxide.

The effects of smoke range from eye and respiratory tract irritation to more serious disorders, including reduced lung function, bronchitis, exacerbation of asthma, and premature death. Studies have found that fine particles are linked (alone or with other pollutants) with increased mortality and aggravation of pre-existing respiratory and cardiovascular disease. In addition, particles are respiratory irritants, and exposures to high concentrations of particulate matter can cause persistent cough, phlegm, wheezing and difficulty breathing. Particles can also affect healthy people, causing respiratory symptoms, transient reductions in lung function, and pulmonary inflammation. Particulate matter can also affect the body's immune system and make it more difficult to remove inhaled foreign materials from the lung, such as pollen and bacteria. The principal public health threat from short-term exposures to smoke is considered to come from exposure to particulate matter.

Wildfire smoke also contains significant quantities of respiratory irritants. Formaldehyde and acrolein are two of the principal irritant chemicals that add to the cumulative irritant properties of smoke, even though the concentrations of these chemicals individually may be below levels of public health concern.

Table 5. Overall Marginal Pollution Impact Values for PM10 (1995 dollars)

				Including Pollution Right Value	
Air Basin	Marginal Emission Value ($/ton)	Grass and Woodland ($/acre)	Timber and Brush ($/acre)	Grass and Woodland ($/acre)	Timber and Brush ($/acre)
San Francisco Bay Area	24,258	279	7,641	295	8,093
South Central Coast	6,441	74	2,029	74*	2,029*
South Coast	46,458	534	14,634	550	15,086
San Diego	24,593	283	7,747	283*	7,747*
Sacramento Valley	2,935	34	925	50	1,377
Southeast Desert	708	8	223	88*	223*
San Joaquin Valley	5,184	60	1,633	60*	1,633*
North Central Coast	6,441	74	2,029	74*	2,029*
North Coast	1,703	20	536	20*	536*
Great Basin Valley	125	1	39	1*	39*
Northeast Plateau	395	5	124	5*	124*
Lake Tahoe	924	11	291	11*	291*
Lake County	908	10	286	10*	286*

Sensitive Populations

Most healthy adults and children will recover quickly from smoke exposures and will not suffer long-term consequences. However, certain sensitive populations may experience more severe short-term and chronic symptoms from smoke exposure. Much of the information about how particulate matter affects these groups has come from studies involving airborne particles in cities, though a few studies examining the effects of exposure to smoke suggest that the health effects of wildfire smoke are likely to be similar. More research is needed to determine whether particles from wildfires affect susceptible subpopulations differently.

Individuals with asthma and other respiratory diseases: Levels of pollutants that may not affect healthy people may cause breathing difficulties for people with asthma or other chronic lung diseases. Asthma, derived from the Greek word for panting, is a condition characterized by chronic inflammation of the airways, with intermittent bronchial-constriction and airflow obstruction, causing shortness of breath, wheezing, chest tightness, coughing, sometimes accompanied by excess phlegm production. During an asthma attack, the muscles tighten around the airways and the lining of the airways becomes inflamed and swollen, constricting the free flow of air. Because children's airways are narrower than those of adults, irritation that would create minor problems for an adult may result in significant obstruction in the airways of a young child. However, the highest mortality rates from asthma occur among older adults. Individuals with chronic obstructive pulmonary disease (COPD), which is generally considered to encompass emphysema and chronic bronchitis, may also experience a worsening of their conditions because of exposure to wildfire smoke. Patients with COPD often have an asthmatic component to their condition, which may result in their experiencing asthma-like symptoms. However, because their pulmonary reserve has typically been seriously compromised, additional bronchial-constriction in individuals with COPD may result in symptoms requiring medical attention. Epidemiological studies have indicated that individuals with COPD run an increased risk of requiring emergency medical care after exposure to particulate matter or forest fire smoke. Exposure to smoke may also depress the lung's ability to fight infection. People with COPD may develop lower respiratory infections after exposure to wildfire smoke, which may require urgent medical care as well. In addition, because COPD is usually the result of many years of smoking, individuals with this condition may also have heart disease, and are potentially at risk from both conditions.

Individuals with airway hyper-responsiveness: A significant fraction of the population may have airway hyper-responsiveness, an exaggerated tendency of the bronchi and bronchioles to constrict in

response to respiratory irritants and other stimuli. While airway hyper-responsiveness is considered a hallmark of asthma, this tendency may also be found in many non-asthmatics, as well; for example, during and following a lower respiratory tract infection. In such individuals, smoke exposure may cause bronchial-spasm and asthma-like symptoms.

Individuals with cardiovascular disease: Diseases of the circulatory system include, among others, high blood pressure, cardiovascular diseases, such as coronary artery disease and congestive heart failure, and cerebro-vascular conditions, such as atherosclerosis of the arteries bringing blood to the brain. These chronic conditions can render individuals susceptible to attacks of angina pectoris, heart attacks, sudden death due to a cardiac arrhythmia, acute congestive heart failure, or stroke. Cardiovascular diseases represent the leading cause of death in the United States, responsible for about 30 to 40 percent of all deaths each year. The vast majority of these deaths are in people over the age of 65. Studies have linked urban particulate matter to increased risks of heart attacks, cardiac arrhythmias, and other adverse effects in those with cardiovascular disease. People with chronic lung or heart disease may experience one or more of the following symptoms: shortness of breath, chest tightness, pain in the chest, neck, shoulder or arm, palpitations, or unusual fatigue or lightheadedness. Chemical messengers released into the blood because of particle-related lung inflammation may increase the risk of blood clot formation, angina episodes, heart attacks and strokes.

The elderly. In several studies researchers have estimated that tens of thousands of elderly people die prematurely each year from exposure to particulate air pollution, probably because the elderly are more likely to have pre-existing lung and heart diseases, and therefore are more susceptible to particle-associated effects. The elderly may also be more affected than younger people because important respiratory defense mechanisms may decline with age. Particulate air pollution can compromise the function of alveolar macrophages, cells involved in immune defenses in the lungs, potentially increasing susceptibility to bacterial or viral respiratory infections.

Children. Children, even those without any pre-existing illness or chronic conditions, are considered a sensitive population because their lungs are still developing, making them more susceptible to air pollution than healthy adults. Several factors lead to increased exposure in children compared with adults: they tend to spend more time outside; they engage in more vigorous activity, and they inhale more air (and therefore more particles) per pound of body weight. Studies have shown that particulate pollution is associated with increased respiratory symptoms and decreased lung function in children, including symptoms such as episodes of coughing and difficulty breathing. These can result in school absences and limitations of normal childhood activities.

Pregnant women. While there have not been studies of the effects of exposure to wildfire smoke on pregnancy outcomes, there is substantial evidence of adverse effects of repeated exposures to cigarette smoke, including both active and passive smoking. Wildfire smoke contains many of the same compounds as cigarette smoke. In addition, recent data suggest that exposures to ambient air pollution in cities may result in low birth weight and possibly other, more serious adverse reproductive effects. Therefore, it would be prudent to consider pregnant women as a potentially susceptible population as well.

Smokers. People who smoke, especially those who have smoked for many years, have already compromised their lung function. However, due to adaptation of their lungs to ongoing irritation, smokers are less likely to report symptoms from exposure to irritant chemicals than are nonsmokers. However, they may still be injured by wildfire smoke. Therefore, some smokers may unwittingly put themselves at greater risk of potentially harmful wildfire smoke exposures, believing that they are not being affected.

Utility Loss

Utility Loss was rated a HIGH PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

The 2000-2001 California electricity crisis brought to light many critical issues surrounding the state's power generation and distribution system, including its dependency on out-of-state resources. Although California has implemented effective energy conservation programs, the state continues to experience both population growth and weather cycles that contribute to a heavy demand for power.

Hydro-generation provides approximately 25 percent of California's electric power, with the balance coming from fossil fuels, nuclear, and green sources. As experienced in 2000 and 2001, blackouts can occur due to losses in transmission or generation and/or extremely severe temperatures that lead to heavy electric power consumption.

The Impact of Loss of Power on Water & Sewer Systems

California is a populous state that receives minimal rainfall. Approximately 70% of the population obtains its drinking water from surface sources with the remainder relying on ground water supplies. The basic types of system used by the water companies are pressurized (pressure fed) and non-pressurized (gravity fed) systems. The basic types of system used by the sewer companies are collection and treatment systems that use force pumps to move sewerage.

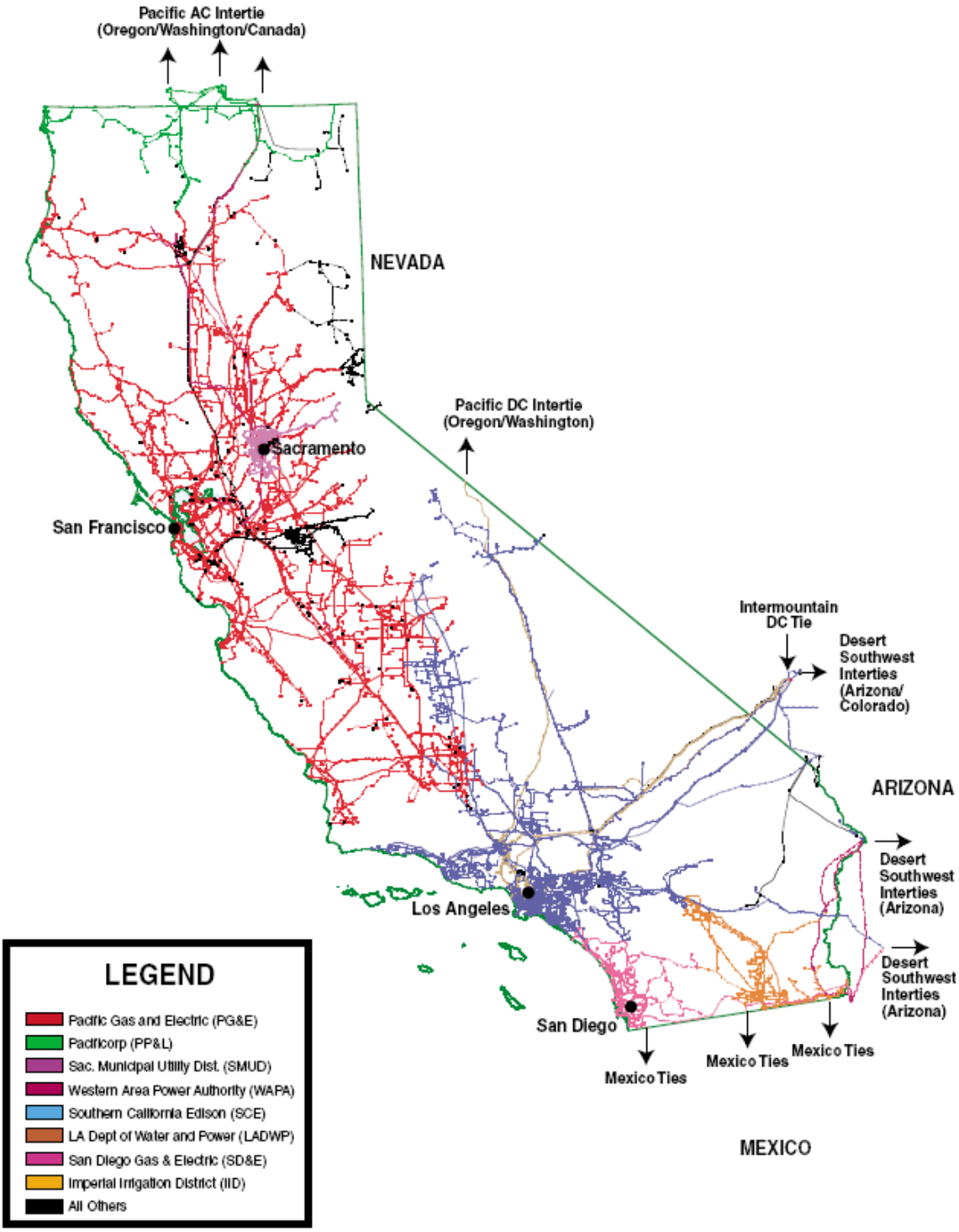
Drinking water is supplied to California residents through a myriad of governmental agencies, cities, districts, private utilities, mutual water companies, private businesses, and individually owned wells. There are over 10,000 public water suppliers in the state serving water to approximately 29 million consumers. Less than 10% of the public water systems in the state serve collectively more than 95% of the state's population. The remaining 90% of the systems serves less than 5% of the population. D.01-05-089 added Category M (limited other customers as necessary to protect public health and safety, to the extent exempted by the Commission) to the list of essential customers normally exempt from rotating outages.

Due to the energy situation and rolling blackouts that occurred earlier in the year, the California Department of Water Resources has conducted an informal inquiry into the impact of the rolling blackouts and has concluded that during the first four months of the year, California energy situation and rolling blackouts have had no significant impact upon the California Water and Sewer System Industries, in part due to the "Y2K" efforts in 1999. Water utilities and sewer system utilities appear to have the matter well under control with little to no impact on customer service at this time.

The Effects on Public Health & Safety

Public health and safety must be the primary factor used to evaluate a customer's eligibility for exemption from rotating outages. Exempting a fire department from rotating outages is of little value if the water resources needed to fight these fires are not available to it, particular during the high fire season. Fires that start during extreme fire weather conditions are a high risk to the safety of the residents and firefighters, and have a high probability of spreading rapidly and inflicting major property loss, if water pumping facilities are compromised.

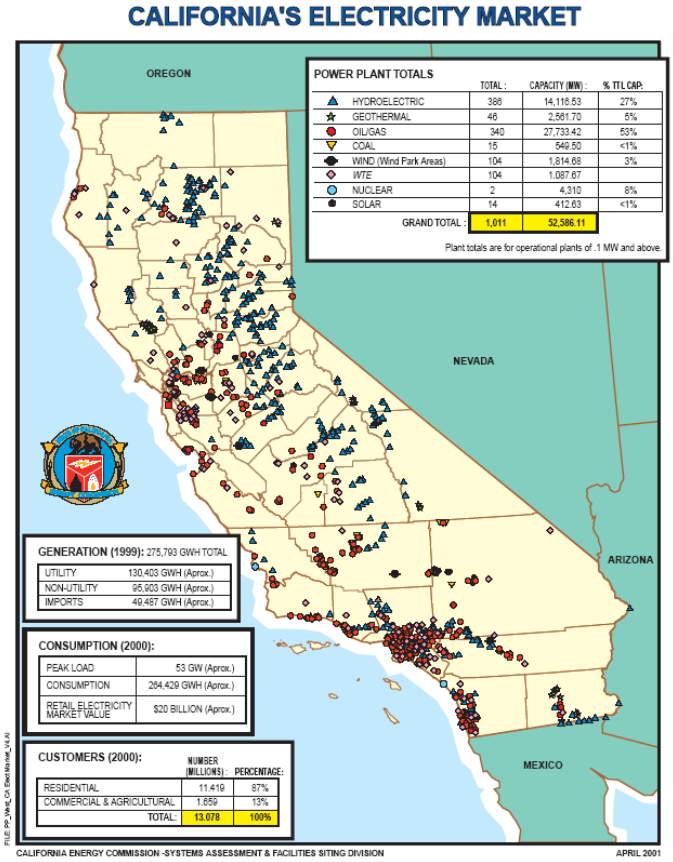
Power Transmission Lines in California



California Department of Energy

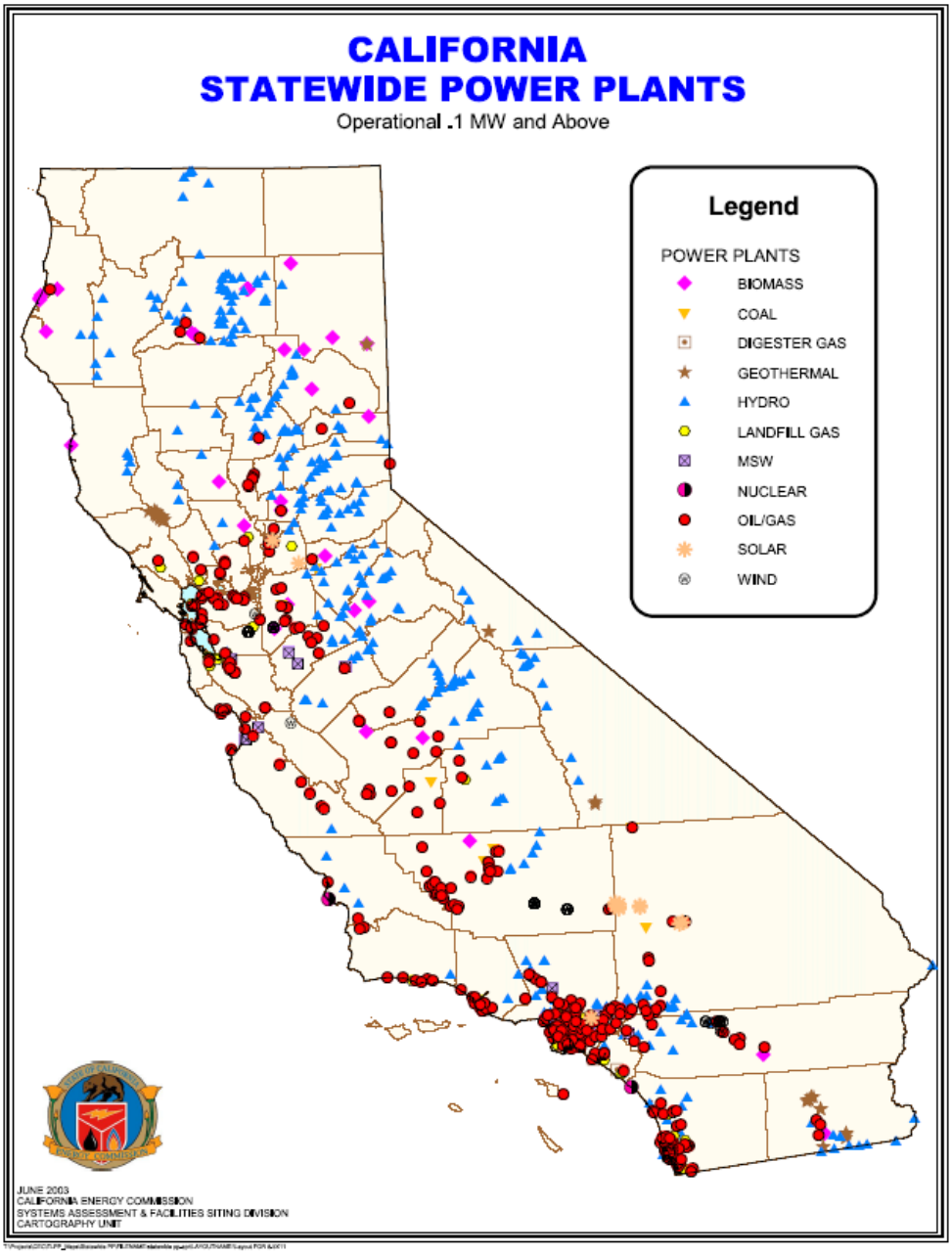
California has experienced many power outages from natural disasters such as fires, floods, earthquakes, and rainstorms. This means that water and sewer systems must have adequate back up power for extended electric outages independent of rolling blackouts. Many large water systems have adequate storage facilities and have installed backup generators to maintain system pressures during power failure due to "Y2K" efforts. Rotating power outage duration is usually less than two hours or between two to four hours. Therefore, rolling blackouts have little impact on customer service.

In addition, water and sewer treatment utilities may request partial or complete rotating outage exemption from electric utilities in times of emergency identified as requiring their service, such as fire fighting. The Department of Water Resources believes that it is reasonable to order electric companies to notify all of their water and sewer customers and test the emergency restoration procedures to minimize the effects on public health and safety.



Mitigation Measures Available for These Systems

Backup power was a big issue due to the energy situation and rolling blackouts that occurred this summer. Many water systems have argued that backup power was not necessary since they received electrical power from more than one substation, but the power shortage has negated that argument. Many large water systems have adequate storage facilities and have installed backup generators to maintain system pressures during power failures due to "Y2K" efforts. It is the smaller systems that generally do not have backup power.



Transportation Loss

Transportation Loss was rated a HIGH PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

The City of Novato is served by Gnoss Airport within the City Limits in Northern Novato, Northwestern Pacific Railroad. Neither of these transportation links are readily available for passenger or emergency services. The primary access to Novato is US Highway 101, the main north-south corridor in the West Bay area. US Highway 101 links with State Route (SR) 37 at Novato making Novato a hub for North Bay travel. State Highway 116 is 10 miles north of Novato and Interstate Highway 580 is 12 miles South of Novato.

Several incidents or disasters can cause significant risk and transportation failure for the City of Novato. Any incident accident that closes Highway 101 causes immediate gridlock for both citizens and emergency vehicles.

All of the Highway 101 interchanges in and near Novato are at risk from earthquake. The Novato Safety Element advises that "a major earthquake would be expected to cause considerable damage to transportation systems. Roads, bridges and highway overpasses are susceptible to damage or failure in the event of a major earthquake. Landslides would be intensified as a result of ground shaking, and could affect portions of the roadway system located in landslide potential area"

A serious hazardous materials spill, flooding or multiple car wreck could close the Highway 101 in both directions for hours or even days. This would in turn cause gridlock and the inability of citizens to either return from work in the area or go to work.

These incidents would prevent access to the area by Golden Gate Bridge and Transportation District which operates the Golden Gate Transit and local bus service, ferry service and the Golden Gate Bridge linking Novato to Sonoma and Marin County cities and the City of San Francisco.

Marin County maintains and plans the county road system. There is a Marin Countywide Congestion Management Agency: they develop and administer a Countywide Congestion Management Plan (CMP)as required by State low under the a referendum approved in 1990. The State law requires all State highway plus the principal arterials in Marin County to be on the designated CMP system. The following facilities in Novato are on the CMP.

- US 101
- SR 37
- Bel Marin Keys Blvd from US 101 interchange to Commercial Blvd.
- South Novato Boulevard from Diablo Avenue to US 101
- Novato Boulevard from Sutro Avenue to Diablo Avenue

The City is also a member of the Marin Countywide Planning Agency which is conduction a Sonoma/Marin multi-modal transportation and land use study.

The City of Novato is at risk of become land locked and inaccessible due to its dependence on Highway 101, Highway 37 and access to the surrounding communities.

This would cause severe economic hardship on the City and put the ability for emergency responders to move from one side of the City to another in a timely manner at risk. For this reason transportation emergencies are considered a high risk.

While identifying transportation emergencies as a high risk, Novato must also recognize it is not within their authority or ability to mitigate this risk and can only request the State of California Caltrans to provide immediate seismic retrofit response to the Highway 101 corridor.

Bridges

There are currently 16 public highway bridges located throughout Novato. The oldest was constructed in 1929 and the latest in 1992. Under Title 23 of the Code of Federal Regulations (Federal Highway Act), Caltrans Division of Structure Maintenance and Investigations performs biennial inspections of bridges throughout the state, counties and local jurisdictions. These reports contain descriptions of physical changes to the structure, recommendations for work to be done, or additional information.

The FHWA bridge inspection program regulations were developed as a result of the Federal-Aid Highway Ace of 1968 (Section 26, Public Law 90-945, 82 Stat. 815, at 829) that required the Secretary of Transportation to establish national bridge inspection standards (NBIS). The primary purpose of the NBIS is to locate an evaluate existing bridge deficiencies to ensure the safety of the traveling public. FHWA holds the State responsible for the inspection of public highway bridges within the State, with the exception for those that are federally or tribally owned. Caltrans bridge inspectors are responsible for maintaining the safety and integrity of over 24,000 bridges owned by the State of California and California's local government agencies.

The following is a listing of types of repairs recommended through biennial bridge inspections:

1. Novato Creek and Sutro Avenue

    - Remove the debris in the existing channel in span 1
    - Repair the moderate to severe cracking in the approaching AC at Abutment 5

2. Novato Creek at Bel Marin Keys Boulevard

    - Seal the cracks in the approach paving to Abutment 5
    - Clean out and reseal the joint in the AC at the paving notch at Abutment 5

3. Arroyo de San Hose at Bel Marin Keys Boulevard

    - Place riprap in channel adjacent to cutoff walls

4. Ignacio Boulevard OC east of Route 101

    - Chip out loose concrete at Abutment 4 left sidewalk and repair it
    - Repair AC potholes in westbound lane 2 at Abutment 4
    - Patch pothole in AC overlay near Abutment 1 Rt.

5. Novato Creek at Redwood Boulevard (both left and right bridges)

    - Seal cracks in the bridge deck AC overlay in the AC approaches

6. Warner Creek at Diablo Avenue

- Clean and reseat the cracks at both abutments

7. Novato Creek at Seventh Street

- Construct PCC cutoff walls at upstream ends of slope paving at both Abutment 1 and 4

8. Novato Creek at Grant Avenue

- Add rock slope protection at Abutment 2L

9. Warner Creek at South Novato Boulevard

- As needed, remove the deteriorated portions of the abutment joint seals and run AC up to the bridge deck

10. Novato Creek at Simmons Avenue

- Remove and replace pourable joint seals at Abutment 1
- Clean exposed rebar and repair spall at the left deck overhang at Abutment 1

Many of these repairs are performed by the Maintenance Division work force under the annual operating budget. Others requiring special engineering, design and construction are incorporated within Capital Improvement Project (CIP) budget and scheduled for repairs and retrofitting within the 5-yeay CIP program.

Seismic Safety Retrofit Program

The Local Bridge Seismic Safety Retrofit Program is a part of the statewide Seismic Safety Retrofit Program. This program was established by emergency legislation (SC-36X) enacted during an extraordinary legislative session after the October 1989 Loma Prieta Earthquake. The purpose of this program is to provide funding assistance to local agencies for remedying structural seismic design deficiencies of public bridges on local streets and roads in California. At the time this program was created, there were about 12,000 publicly owned local agency bridges in California. All these bridges were screened for risk of collapse during seismic events. Currently, there are 1234 bridges in the program at various stages of project development. The Director of Caltrans has set the Seismic Safety Retrofit Program as the top priority of the Department.

Candidates for this state-mandated program are those bridges that are determined to be Category 1 (bridges that may collapse in a seismic event and potentially threaten public safety). Eligibility of a bridge is decided by a series of screening processes.

The screenings were based on the following factors:

- Proximity to earthquake faults
- Age and date of construction
- Soil conditions (depth and type) found at the site
- Number of columns
- Length
- ADT
- Type of route
- Type of facility crossed
- Skew
- Outriggers

- Joints
- Number and type of hinges

Length of available detour

It was determined that the Redwood Boulevard bridge at Novato Creek was eligible under the program in 1992. Design and authorization for construction occurred in 1994 and the retrofit project was completed in January 1995.

No other bridges in Novato have been identified for retrofits under the Seismic Safety Retrofit Program.

Status Report for Local Seismic Retrofit Projects (as of 4/11/2001)

27C0103L — Complete
Feature Carried: REDWOOD BLVD
Feature Intersected: NOVATO CREEK
Proj. ID: STPLX-5361(004) — 49
County Name: Marin — Dist.: 04
Novato

Schedule	Planned	Actual
Strategy	11/4/92	11/4/92
Design		1/4/94
Constru. Auth.		6/16/94
Project Complete		1/4/95

Current $ Estimate: $181,331
Comments: The cost of $181,331 covers both 27C0103L and R.

27C0103R — Complete
Feature Carried: REDWOOD BLVD
Feature Intersected: NOVATO CREEK
Proj. ID: STPLX-5361(004) — 50
County Name: Marin — Dist.: 04
Novato

Schedule	Planned	Actual
Strategy	11/4/92	11/4/92
Design		1/4/94
Constru. Auth.		
Project Complete		1/4/95

Current $ Estimate: $0
Comments: Cost is shown under 27c0103L.

27C0113 — In Design
Feature Carried: MRSHAL-PETALUMA RD
Feature Intersected: SALMON CREEK
Proj. ID: — 51
County Name: Marin — Dist.: 04
Marin County

Schedule	Planned	Actual
Strategy	2/27/97	2/27/97
Design	12/9/97	1/21/98
Constru. Auth.	1/15/00	
Project Complete		

Current $ Estimate: $57,000
Comments:

27C0144 — In Design
Feature Carried: CREEK ROAD
Feature Intersected: SAN ANSELMO CREEK
Proj. ID: STPLZ-5277(005) — 52
County Name: Marin — Dist.: 04
Fairfax

Schedule	Planned	Actual
Strategy	2/27/97	2/27/97
Design		1/26/98
Constru. Auth.	8/1/00	
Project Complete		

Current $ Estimate: $67,000
Comments:

27C0150 — In Design
Feature Carried: ALEXANDER AVE
Feature Intersected: ALEXANDER AV
Proj. ID: STPLZ-5166(004) — 53
County Name: Marin — Dist.: 04
Larkspur

Schedule	Planned	Actual
Strategy	4/17/97	4/17/97
Design		1/21/98
Constru. Auth.		
Project Complete		

Current $ Estimate: $108,000
Comments:

28C0006 — Complete
Feature Carried: WATERFRONT RD
Feature Intersected: PACHECO SLOUGH
Proj. ID: BHLS-5928(011) — 54
County Name: Contra Costa — Dist.: 04
Contra Costa County

Schedule	Planned	Actual
Strategy	1/7/92	1/7/92
Design		1/5/93
Constru. Auth.		
Project Complete		9/6/95

Current $ Estimate: $53,996
Comments:

28C0012 — Pre-Strategy
Feature Carried: SPRR
Feature Intersected: PORT CHICAGO
Proj. ID: — 55
County Name: Contra Costa — Dist.: 04
Contra Costa County

Schedule	Planned	Actual
Strategy		
Design		
Constru. Auth.		
Project Complete		

Current $ Estimate: $108,000
Comments:

28C0054 — In Design
Feature Carried: WILBUR AVE
Feature Intersected: WILBUR AVE OH (AT&SF RR)
Proj. ID: BHLS-5038(006) — 56
County Name: Contra Costa — Dist.: 04
Antioch

Schedule	Planned	Actual
Strategy		
Design		
Constru. Auth.		
Project Complete		

Current $ Estimate: $417,960
Comments:

7

Printed: April 11, 2001

Structure Maintenance & Investigations

SM&I

February 2005

MARIN COUNTY BRIDGE LIST

Bridge Number	Dist	Bridge Name	Facility Carried	City	Bypass Length	Lanes ONUN	AADT	Appr Width	Str Type	Road Width	Year Built	SD/FO	Length	Suff Rating
27C0008	04	SAN ANSELMO CREEK	MEADOW WAY	FRFX	199	0100	55	5.5	302	3.0	1950	FO	21	43.1
27C0013	04	MILLER CREEK	LUCAS VALLEY RD		3	0200	6500	12.5	104	11.2	1959		20	89.0
27C0016	04	MILLER CREEK	LUCAS VALLEY ROAD		3	0200	1000	11.3	201	11.3	1961		40	85.8
27C0017	04	NICASIO CREEK	PT RYES PETLUMA RD		32	0200	1100	11.6	204	12.3	1960		41	95.3
27C0018	04	LAGUNITAS CREEK	SIR FRANCIS DRAKE		16	0200	2300	11.6	204	12.3	1964		59	94.3
27C0019	04	SAN RAFAEL CREEK	GRAND AVE	SRF	5	0300	19800	12.2	101	12.2	1965		74	75.2
27C0021	04	NOVATO CREEK	GRANT AVE	NVTO	2	0200	9343	13.7	104	9.2	1936	FO	11	75.9
27C0022	04	IRWIN CREEK	2ND ST	SRF	2	0400	20000	19.2	201	13.6	1965	FO	19	75.5
27C0023	04	ESTERO DE SAN ANTONIO	VLY FD FRNKLIN SCH		10	0200	100	7.3	201	8.5	1964		74	97.0
27C0024	04	NOVATO CREEK	NOVATO BLVD	NVTO	2	0200	4100	12.2	204	12.3	1969		30	96.6
27C0028	04	CORTE MADERA CREEK	BON AIR RD	LKSP	5	0200	3000	14.0	302	8.5	1958	SD	129	36.5
27C0030	04	WIDOW REED CREEK	CAMINO ALTO	MLV	2	0400	3000	21.6	101	17.0	1970		17	91.7
27C0031	04	HALLECK CREEK	NICASSIO VLY RD		23	0200	2000	6.7	104	11.0	1931		10	78.3
27C0032	04	NICASIO DRAIN #1	NICASSIO VLY RD		23	0200	1750	11.6	119	12.6	1968		7	97.1
27C0033	04	NICASIO DRAIN NO 2	NICASSIO VLY RD		27	0200	1750	12.2	119	12.3	1968		7	94.8
27C0035	04	NICASIO CREEK	PT REYES PETLMA RD		16	0200	2590	6.4	104	7.3	1937	FO	31	70.4
27C0036	04	ARROYO SAUSAL(CHSE FACY)	PT REYES PETLMA RD		51	0200	2590	7.9	119	13.6	1933		10	86.0
27C0037	04	BOWMAN CANYON	NOVATO BLVD		35	0200	1250	6.7	104	7.3	1948		7	78.4
27C0038	04	NOVATO CREEK	DIABLO AVE	NVTO	2	0600	17918	25.9	101	24.6	1966		10	89.2
27C0039	04	LAGUNITAS CREEK	SIR-FRANCIS DRAKE		32	0200	3000	12.2	505	9.8	1982		24	88.1
27C0040	04	CORTE MADERA CR(DRAKE)	SIR-FRANCIS DRAKE	SLMO	2	0500	18300	29.9	104	19.9	1929		13	67.9
27C0041	04	DEVILS GULCH	SIR-FRANCIS DRAKE		31	0200	3000	10.7	111	12.6	1920		14	68.0
27C0042	04	LAGUNITAS CREEK	SIR-FRANCIS DRAKE		27	0200	2000	7.3	104	7.3	1929		18	61.1
27C0043	04	SAN GERONIMO CREEK	SIR-FRANCIS DRAKE		31	0200	3500	7.0	104	11.3	1929		10	92.8
27C0044	04	SIR FRANCIS DRAKE BL UP	SIR FRANCIS DRK BL	LKSP	199	0004	0		702		1935		17	
27C0045	04	WOLFE GRADE POC	SIR FRANCIS DRK BL	LKSP	3	0005	0	0.0	502	2.4	1968		31	
27C0046	04	WIDOW REED CREEK	MILLER AVE (MLVLY)	MLV	2	0200	11300	12.2	101	12.6	1929		6	79.3
27C0048	04	KEYES CREEK	TOMALES PETALUMA R		13	0200	1200	11.6	119	12.5	1977		7	96.3
27C0050	04	CORTE MADERA CR(DRAKE)	SIR FRANCIS DRAKE	ROS	2	0200	18300	9.1	111	9.3	1926	FO	19	62.3
27C0051	04	SOUTH SAN ANTONIO CREEK	SAN ANTONIO RD		3	0200	200	7.6	104	7.0	1917		31	51.6
27C0052	04	SUMMIT AVE SIDEHILL VIADUCT	SUMMIT AVE	MLV	199	0200	157	5.8	701	5.0	1980	FO	22	50.0
27C0053	04	BUNKER ROAD TUNNEL	ALEXANDER AVE		6	0200	2000	11.0	111	11.0	1938	FO	7	77.9
27C0054	04	EAST GATE RD UC	SAUSALITO LATERAL		3	0200	11400	11.0	104	11.0	1938	FO	12	68.8

Data presented here is for information only. It should not be used to determine the official status of a bridge's eligibility for HBRR money

Structure Maintenance & Investigations

SM&I

February 2005

MARIN COUNTY BRIDGE LIST

Bridge Number	Dist	Bridge Name	Facility Carried	City	Bypass Length	Lanes ONUN	AADT	Appr Width	Str Type	Road Width	Year Built	SD/FO	Length	Suff Rating
27C0055	04	IGNACIO BLVD OH	IGNACIO BLVD	NVTO	2	0500	18100	23.2	205	23.2	1984		39	96.3
27C0065	04	WIDOW REED CREEK	LOCUST AVE	MLV	2	0200	3000	11.0	101	12.2	1934		8	80.7
27C0066	04	MARIN CNTRY DAY SCH POC	PARADISE DR	CMAD	13	0002	2730	0.0	702	2.4	1970		29	
27C0067	04	ARROYO HOLON	DOHERTY DR	LKSP	5	0200	3000	12.5	101	10.9	1965	SD	13	30.9
27C0068	04	BRANCH CORTE MADERA CRK	MEADWOOD DR	LKSP	2	0200	3000	11.0	105	8.6	1974		13	80.6
27C0069	04	BRANCH CORTE MADERA CRK	LUCKY DRIVE	LKSP	5	0200	3000	12.2	119	12.2	1970		8	96.3
27C0070	04	CORTE MADERA CREEK	COLLEGE AVE		3	0200	3000	13.4	101	13.3	1970		10	97.6
27C0071	04	CORTE MADERA CREEK	LAGUNITAS ROAD	ROS	3	0200	1500	11.9	204	6.2	1930	FO	24	47.9
27C0072	04	ROSS CREEK	GLENWOOD AVE	ROS	3	0200	1500	5.5	201	5.3	1930		16	73.5
27C0073	04	CORTE MADERA CREEK	BARBER AVE	SLMO	2	0200	900	7.9	204	7.3	1930		35	62.5
27C0074	04	CORTE MADERA CREEK	WINSHIP ROAD	ROS	2	0200	1500	5.5	111	5.5	1925	FO	28	54.7
27C0075	04	BELLUM BLVD UP	BELLUM BLVD	SRF	3	0002	0		702		1930		21	
27C0076	04	MAHON CREEK	LINDARO ST	SRF	2	0200	5735	14.0	119	14.1	1962		8	96.5
27C0077	04	SAN RAFAEL CREEK	LINCOLN AVE	SRF	2	0200	11601	13.4	201	13.4	1959	SD	18	79.7
27C0078	04	ROSS CREEK	SHADY LANE	ROS	2	0200	1500	7.3	111	6.6	1930	FO	13	62.9
27C0079	04	SAN ANSELMO CR-SYCMRE BR	CENTER BLVD	SLMO	2	0100	10000	5.5	204	5.4	1940	FO	23	74.6
27C0080	04	SAN ANSELMO CREEK	MADRONE AVE	SLMO	71	0200	1000	7.0	104	5.5	1930	FO	9	55.1
27C0081	04	SLEEPY HOLLOW CREEK	CALETA AVE	SLMO	2	0200	400	7.9	501	7.9	1989		19	92.5
27C0082	04	GALLINAS CREEK	REDWOOD HWY	SRF	3	0200	8000	10.1	119	10.0	1969		15	93.8
27C0083	04	MILLER CREEK	LAS GALLINAS AVE		3	0200	3830	19.5	201	19.5	1970		16	97.5
27C0084	04	GALLINAS CREEK	FREITAS PRKY	SRF	2	0200	8738	9.4	119	9.4	1970	FO	8	82.0
27C0085	04	GALLINAS CREEK	LAS GALINAS AV	SRF	2	0400	6871	17.4	101	17.4	1965		7	96.3
27C0086	04	ARROYO SAN JOSE	BEL MARIN KEYS BL	NVTO	199	0400	15000	22.6	119	22.6	1970		17	78.0
27C0088	04	WARNER CREEK	DIABLO BLVD	NVTO	2	0200	17918	9.8	101	12.1	1970		9	93.3
27C0089	04	NOVATO CREEK	SUTRO AVE	NVTO	2	0200	6583	10.7	101	13.1	1935		10	96.4
27C0090	04	NOVATO CREEK	SIMMONS AVE	NVTO	2	0200	4217	11.3	104	7.2	1932	FO	11	76.5
27C0091	04	WARNER CREEK	TAMALPAIS AVE	NVTO	2	0200	4207	9.8	101	9.7	1973		11	95.6
27C0092	04	NOVATO CREEK	SEVENTH ST	NVTO	2	0400	8997	20.7	201	19.4	1971		18	91.1
27C0093	04	NOVATO CREEK DRAIN	BEL MARIN KEYS BL	NVTO	199	0200	9800	11.0	201	19.6	1960	SD	12	48.0
27C0094	04	SAN ANSELMO CREEK	SAUNDERS AVE	SLMO	2	0200	2000	9.1	104	9.1	1935		23	73.0
27C0095	04	ARROYO SAN JOSE	IGNACIO BLVD	NVTO	2	0400	6743	24.4	119	31.1	1960		8	96.4
27C0096	04	DUTTON SLOUGH	REDWOOD BLVD	NVTO	5	0400	6683	24.1	319	19.2	1968		9	89.1
27C0097	04	IRWIN CREEK	3RD ST	SRF	2	0400	20000	12.5	119	15.2	1968	FO	7	75.6

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Bridge Number	Dist	Bridge Name	Facility Carried	City	Bypass Length	Lanes ONUN	AADT	Appr Width	Str Type	Road Width	Year Built	SD/FO	Length	Suff Rating
27C0098	04	ARROYO NICASIO	NICASIO VAL RD		199	0200	1330	6.7	104	6.5	1928	FO	32	58.0
27C0099	04	SN GERON NAT GLF CRS POC	NICASIO VALLEY RD		32	0002	1330	0.0	702	0.0	1960		27	
27C0100	04	SAN ANSELMO CREEK	BRIDGE AVE	SLMO	2	0200	3000	9.4	104	9.3	1935		35	65.6
27C0101	04	SAN ANSELMO CREEK	CENTER BLVD	SLMO	2	0200	10000	9.1	111	8.6	1935	FO	14	48.2
27C0102	04	SAN RAFAEL CREEK	W SAN FRANCISCO BL	SRF	199	0300	50	9.1	201	9.7	1981	FO	15	87.5
27C0103L	04	NOVATO CREEK	REDWOOD BLVD	NVTO	2	0200	5000	10.1	104	8.2	1947	FO	57	78.4
27C0103R	04	NOVATO CREEK	REDWOOD BLVD	NVTO	2	0200	5000	13.7	104	9.4	1929		57	80.4
27C0104	04	OLEMA CREEK	SIR FRANCIS DRAKE		8	0200	3370	7.3	101	7.3	1930	FO	18	72.2
27C0105	04	ARROYO SAUSAL TRIBUTARY	WILSON HILL RD		29	0200	330	6.1	119	7.3	1928		8	79.2
27C0106	04	OLEMA CREEK	BEAR VALLEY RD		8	0200	1270	7.3	104	6.4	1937	FO	25	77.4
27C0107	04	REDWOOD CREEK	MUIR WOODS RD		10	0200	2187	7.0	104	7.3	1946	SD	7	47.5
27C0108	04	REDWOOD CREEK	MUIR WOODS RD		10	0200	2187	7.6	201	8.4	1958	FO	31	79.0
27C0109	04	SAN ANTONIO CREEK	MRSHAL PETALUMA RD		23	0200	328	7.3	104	7.4	1929		8	89.6
27C0110	04	SALMON CREEK	MARSHALL-PETALUMA		48	0200	328	5.5	104	7.3	1928	FO	7	83.4
27C0111	04	SALMON CREEK	MARSHALL PETLUM RD		43	0200	328	4.9	104	7.3	1931	FO	10	74.0
27C0112	04	SALMON CREEK TRIBUTARY	MRSHAL-PETALUMA RD		42	0200	328	5.2	104	7.3	1928		7	84.2
27C0113	04	SALMON CREEK	MRSHAL-PETALUMA RD		40	0200	400	5.5	104	9.9	1931	FO	42	93.2
27C0116	04	PINE GULCH CREEK	OLEMA-BOLINAS RD		199	0200	2076	7.6	101	9.8	1986		13	75.0
27C0119	04	CHILENO CREEK TRIBUTARY	CHILENO VALLEY RD		26	0200	213	5.8	104	6.4	1927		13	82.7
27C0120	04	ESTERO DE SAN ANTONIO	FALLON-TWO ROCK RD		11	0200	249	5.8	104	7.9	1932		7	89.8
27C0121	04	STEMPLE CREEK	ALEXANDER RD		6	0200	60	6.7	504	7.8	1962		25	86.0
27C0122	04	STEMPLE CREEK	TWN BRIDGE RD		6	0200	80	6.4	201	7.3	1958		28	76.1
27C0123	04	ESTERO AMERICANO	SLAUGHTER HOUSE RD		13	0200	125	4.9	201	7.3	1990		23	94.4
27C0124	04	ESTERO DE SAN ANTONIO	MIDDLE RD		10	0200	40	6.7	201	8.4	1958		60	97.0
27C0125	04	ESTERO AMERICANO	VLY-FRD-FRKLN SCH		5	0200	100	9.8	201	9.8	1961		60	97.0
27C0126	04	SAN GERONIMO CREEK	S GERONIMO VLLY DR		2	0200	1500	5.5	104	9.1	1929		7	92.1
27C0127	04	SAN GERONIMO CREEK	MONTEZUMA RD		199	0200	50	7.3	119	7.3	1938		10	84.3
27C0128	04	COYOTE CREEK	FLAMINGO RD		2	0200	1605	9.1	201	10.0	1964		22	95.8
27C0129	04	COYOTE CREEK TRIBUTARY	ENTERPRISE CONCRSE		2	0200	50	7.3	702	7.3	1950		7	73.0
27C0130	04	SAN GERONIMO CREEK	LAGUNITAS RD		2	0200	200	6.7	504	6.6	1964		20	84.5
27C0131	04	REDWOOD CREEK	PACIFIC WAY		2	0200	50	5.5	102	5.1	1956	FO	7	85.5
27C0132	04	MILLER CREEK	MOUNT SHASTA DR		2	0200	500	12.2	201	12.2	1962		27	95.0
27C0133	04	MILLER CREEK	MT MCKINLEY RD		2	0200	800	12.2	201	12.2	1963		19	96.3

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MARIN COUNTY BRIDGE LIST

Bridge Number	Dist	Bridge Name	Facility Carried	City	Bypass Length	Lanes ONUN	AADT	Appr Width	Str Type	Road Width	Year Built	SD/FO	Length	Suff Rating
27C0134	04	MILLER CREEK	MOUNT LASSEN DR		2	0200	980	6.1	101	6.1	1925	FO	9	84.1
27C0135	04	MILLER CREEK	MOUNT LASSEN DR		2	0200	980	6.1	201	6.1	1965	FO	24	92.9
27C0136	04	SAN GERONIMO CREEK	CREAMERY RD		2	0200	50	6.1	104	7.3	1948		7	97.0
27C0137	04	SAN GERONIMO CREEK	MEADOW WAY		2	0200	100	6.7	201	8.5	1965		21	95.0
27C0140	04	WIDOW REED CREEK	LAGOMA ST	MLV	2	0200	2000	14.3	101	11.3			8	75.8
27C0141	04	FAIRFAX CREEK	SPRUCE RD	FRFX	2	0200	255	4.9	104	7.4	1930		7	52.9
27C0142	04	FAIRFAX CREEK	AZALEA AVE	FRFX	2	0200	110	6.4	104	5.5	1930	SD	9	30.9
27C0143	04	FAIRFAX CREEK	MARIN DR	FRFX	2	0200	110	7.3	111	7.5	1930		13	59.0
27C0144	04	SAN ANSELMO CREEK	CREEK ROAD	FRFX	2	0200	255	6.1	104	6.2	1929		42	57.9
27C0146	04	SAN ANSELMO CREEK	CANYON ROAD	FRFX	999	0100	100	3.6	101	3.5	1998	FO	10	67.8
27C0147	04	SAN ANSELMO CREEK	PASTORI ST	FRFX	199	0100	55	5.5	101	5.4	1930	FO	12	60.9
27C0148	04	S HEIGHT SIDEHILL VIADUCT	SOUTHERN HEIGHT BL	SRF	3	0100	120	3.4	702	2.7		SD	49	29.2
27C0149	04	ROSS CREEK	NORWOOD AVE	ROS	2	0200	1000	4.6	111	5.2	1908	FO	16	64.1
27C0150	04	ALEXANDER AVE OH	ALEXANDER AVE	LKSP	2	0200	150	6.7	112	6.2	1925	SD	50	29.8
27C0151	04	SAN ANTONIO CREEK	PT REYES PETLMA RD		32	0200	1450	11.6	201	12.2	1964		31	94.8
27C0152	04	SIR FRANCIS DRAKE POC	SIR FRANCIS DRK BL	LKSP	5	0004			205	3.0	1981		120	
27C0153	04	SAN ANSELMO CREEK	NOKOMIS AVE	SLMO	2	0200	300	7.3	104	5.5	1930	FO	35	60.0
27C0154	04	SAN GERONIMO CREEK	MOUNTAIN VIEW RD		2	0100	100	3.7	402	3.3	1962	FO	16	59.0
27C0155	04	MILLER CREEK	BRIDGEGATE DR		199	0200	500	11.0	504	11.0	1987		19	88.3
27C0156	04	WARNER CREEK	SOUTH NOVATO BLVD	NVTO	2	0200	18000	21.3	501	21.3	1992		15	96.3
27C0158	04	LINDEN LANE UP	RAILROAD	SRF		0200			106				15	100.0
27P0001	04	LAGUNITAS CREEK	STATE PARK ROAD	STPK	0	0200		7.3	402	7.3	1947		37	66.5
27P0002	04	LAGUNITAS CREEK	MILL CROSSING	STPK	0	0100		3.0	309	3.1	1947	FO	34	42.6
27P0007	04	AYALA COVE PIER	PIER	STPK	0	0000			504		1967		0	
27P0010	04	POINT BLUNT PIER	POINT BLUNT PIER	STPK	0	0000		0.0	702	0.0	1961		0	
27P0011	04	BIKE PATH OC	BIKE PATH	STPK	27	0000			502		1980		53	
27U0001	04	ESKOOT CREEK	STINSON BEACH RD	NRA	0	0200		7.9	101	8.7	1959		10	98.0
27U0007	04	RODEO LAGOON	BUNKER RD	NRA	0	0200	600	8.5	505	8.5	1983		15	99.0
27U0009	04	BAKER-BARRY TUNNEL	BUNKER ROAD	NRA	6	0001		7.9	018	4.9	1918	SD	721	24.5

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Rail

In 2000, the Sonoma Marin Area Rail Transit Commission (SMART) released the Sonoma Marin Rail Implementation Plan, following an 18-month process of consultant analysis and public meetings. The plan addressed the feasibility of implementing a commuter rail operating system, including recommendations for key station sites along the route; service intervals and funding options.

In 2001, the project plan was further refined to include:

- A 70-mile corridor extending from Cloverdale in Sonoma County through Marin County to a San Francisco bound ferry terminal.
- 14 station sites along the corridor, nine in Sonoma County and five in Marin County.

Additionally, in 2001, a Vehicle Advisory Committee was formed to assist the SMART Board of Directors in selecting an appropriate rail vehicle type (link to VAC page)

In November of 2002, five Public Scoping Meetings were held to conduct a preliminary environmental assessment to help identify potential impacts that may occur as a result of SMART's implementation as the kick-off for the full Environmental Impact Report (EIR).

In June of 2003 a Bicycle Pedestrian Advisory Group was formed to determine the alignment of the bicycle pedestrian pathway that will follow the SMART corridor.

Four Public Open Houses were held in September 2003 to present the current status of the EIR process and to obtain feedback from citizens and public agencies.

In September 2004, the SMART Board of Directors adopted an Expenditure Plan linked to the November 2006 quarter-cent ballot measure. The expenditure plan is structured to provide funding for passenger rail service from Cloverdale to Larkspur using a mix of local, state and federal funding.

On January 1, 2003 a new regional transportation district was established to oversee the development and implementation of passenger rail service in Sonoma and Marin Counties. The new rail district, created with the passage of California State Assembly Bill 2224 (Nation, District 6), holds in public ownership, over seventy miles of railroad right-of-way (ROW), estimated to be worth over a billion dollars. The Sonoma Marin Area Rail Transit (SMART) District is governed by a 12-member Board consisting of elected officials: two County Supervisors each from Marin and Sonoma counties, three appointed City Council members from each county and two representatives from the Golden Gate Bridge District. The SMART District is charged with planning, engineering, evaluating and implementing passenger train service and corridor maintenance from Cloverdale to a Ferry Terminal that connects to San Francisco.

The Directors include:

Marin County

Al Boro- Chair of SMART Board of Directors- Mayor of the City of San Rafael

Peter Breen- San Anselmo City Council

Hal Brown - Marin County Board of Supervisor

Carole D. Knutson - Novato City Council

Charles McGlashan - Marin County Board of Supervisors

Sonoma County

Mike Kerns- Vice Chair SMART Board of Directors- Sonoma County Board of Supervisors

Mike Reilly- Sonoma County Board of Supervisors

Robert Jehn- Mayor of the City of Cloverdale

Mike Healy - Petaluma City Council

Deborah Fudge- Windsor City Council

Golden Gate Bridge and Highway Transportation District

Barbara Pahre - GGBHTD Board

Jim Eddie - GGBHTD Board

SMART Staff

Lillian Hames- General Manager

Lucrecia Milla - Property Manager

John Nemeth - Transportation Planner

Vehicles

Diesel multiple units (DMUs) are the proposed vehicles for the SMART passenger rail system. A vehicle alternatives study, including public workshops and a summary report were completed in 2002. After reviewing the report and receiving additional public input, the SMART Board selected the DMU as the preferred vehicle to be carried forward in the environmental review of the proposed project. DMUs are rail cars that contain both passenger accommodations and propulsion (diesel engines located below the passenger compartment). Because they are self-propelled, no large locomotive engine is required. As a result, a DMU has less noise and lower emissions when compared to a locomotive-hauled train system, but is still compatible with freight operations on the same line (unlike a light rail vehicle). In addition, DMUs are shorter than trains with a locomotive, which is critical to accommodate the block lengths in downtown areas such as San Rafael.

DMUs are also capable of running in the reverse direction, with dual cab train set configurations, eliminating the need for turnaround tracking. Source: Colorado Railcar, 2002 Based on projected ridership and passenger loads, SMART rail service would require a fleet of 14 DMUs, consisting of five two-car trains, two one-car trains and two spare cars. The proposed train fleet would be comprised of single-level DMUs, approximately 85 feet long, 10 feet wide and 15 feet high.

Vehicle capacity would be approximately 90 passengers per rail car. All cars would be powered by either one engine in a single car that in combination with a second car with a single engine would form two-car trains, or a single car that has an engine at either end (double cab unit) that would operate as a one-car train; in either case, trains could travel in both directions without needing to turn around.

SMART is considering the use of a biodiesel fuel mixture. Biodiesel is a clean-burning alternative fuel produced from domestic, renewable resources (most commonly soybeans). Biodiesel contains no petroleum, but can be blended with petroleum diesel at any level (e.g., 20 percent biodiesel mixed with 80 percent petroleum diesel, which is called "B20"). Biodiesel is becoming increasingly popular as a cost-effective way of reducing emissions from personal automobiles, municipal bus and truck fleets, and ferry vessels and rail vehicles. Because it works with existing diesel engines, biodiesel offers a way to improve some emissions of existing diesel vehicles. Biodiesel blends of 20 percent or less can be used in DMU vehicles with no modification.

Rail Freight Service

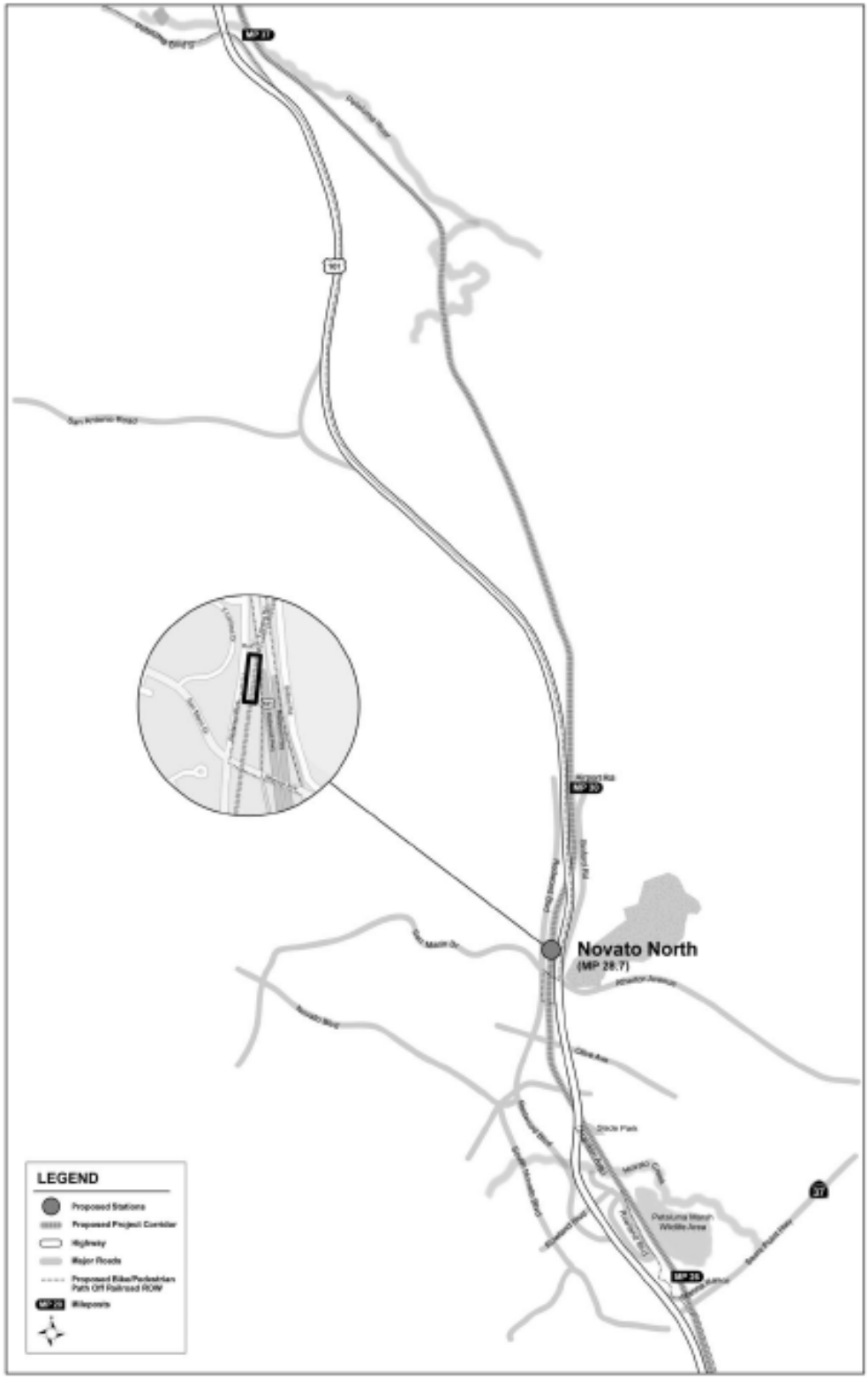
The NWP connects to the national railroad network through a segment that branches northeast from the Ignacio Wye (at Highway 37) to Schellville and then east to Lombard in Napa County. Freight service operated on the NWP corridor from points north to the Ignacio Wye and then eastward until 2001; no freight service exists or has existed in the last several decades south of the Ignacio Wye. Up to 1997, NCRA served customers as far north as Eureka/Arcata. In 1997, the portion of the railroad north of Willits became inactive, leaving only the southern segment of the corridor operational until service was halted by the Federal Railroad Authority (FRA) in 2001.[2] FRA required NCRA to halt operations until trackway upgrades and bridge enhancements were constructed. The FRA stop order remains in effect at this time.

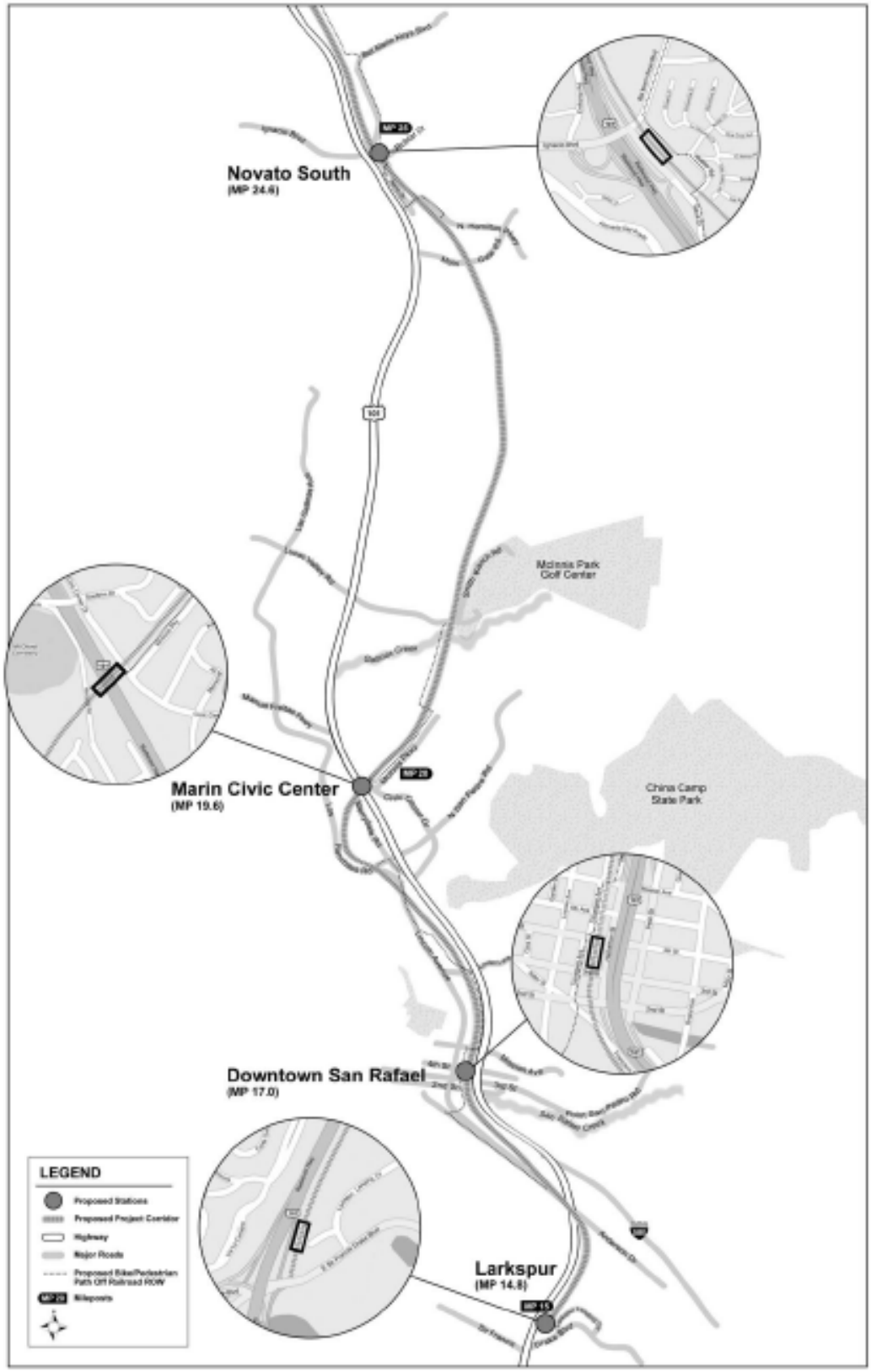
The primary railroad customers before freight services ceased in 2001 were forest products manufacturers and feed mills serving local farms in Sonoma County. Although there are currently no active freight services on the NWP, NCRA intends to re-introduce freight service north of the Ignacio Wye. The NCRA has stated that this service could begin as soon as funding and reconstruction efforts are complete. There is no adopted service plan or schedule for start-up; however, preliminary operations planning calls for four northbound and four southbound trains per day running five to six days a week.[3] Freight service on the proposed SMART corridor would operate between Cloverdale and the Ignacio Wye as it continues to and from points east of the Wye and north of Cloverdale. With the added passing sidings that would be constructed as part of the proposed project, adequate track capacity would exist to operate freight service along with the proposed passenger rail operations, assuming freight trains would operate primarily in off-peak hours.

NCRA has a freight and passenger excursion service easement over the railroad right-of-way owned by SMART, and SMART has a passenger service easement over the portion of the right-of-way owned by NCRA between Healdsburg and Cloverdale. SMART's enabling legislation (Assembly Bill (AB) 2224) provides that the District must work with NCRA and the FRA "to achieve safe, efficient, and compatible operations of both passenger rail and freight service along the rail line in Sonoma and Marin Counties."

Coordination of SMART's passenger rail service and NCRA's freight service is governed by an existing Operating Agreement, which generally provides that freight service shall be subordinate to passenger rail service. It is anticipated that a new Operating Agreement will be negotiated prior to the implementation of either freight or passenger service to address hours of operation, schedule priorities, corridor maintenance responsibilities, and joint dispatching functions, etc.

Station Locations in Novato

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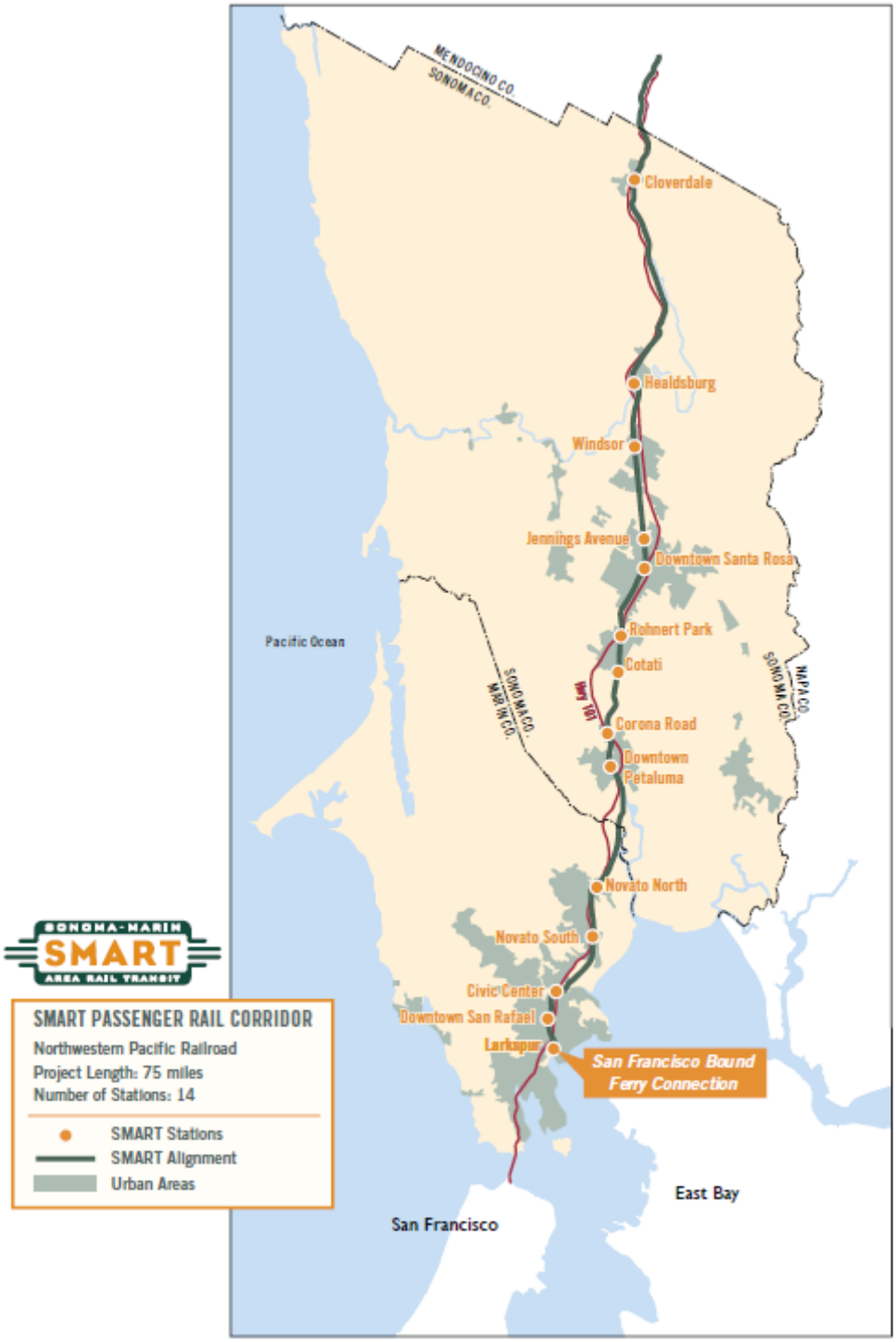
(MP 24.6)
Marin Civic Center
(MP 19.6)
Downtown San Rafael
(MP 17.0)
Larkspur
(MP 14.8)
Mclonis Park
Golf Center
China Camp
State Park
LEGEND
Proposed Stations
Proposed Project Corridor
Highway
Major Roads
Proposed Bike/Pedestrian Path Off Railroad ROW
Mileposts


MENDOCINO CO.
SONOMA CO.
Cloverdale
Healdsburg
Windsor
Jennings Avenue
Downtown Santa Rosa
Rohnert Park
Cotati
Hwy 101
Corona Road
Downtown Petaluma
Novato North
Novato South
Civic Center
Downtown San Rafael
Larkspur
San Francisco Bound Ferry Connection
Pacific Ocean
SONOMA CO.
MARIN CO.
NAPA CO.
SONOMA CO.
East Bay
San Francisco
SONOMA-MARIN
SMART
AREA RAIL TRANSIT
SMART PASSENGER RAIL CORRIDOR
Northwestern Pacific Railroad
Project Length: 75 miles
Number of Stations: 14
SMART Stations
SMART Alignment
Urban Areas

Public Safety (from the SMART Final Environmental Impact Report)

This provides information regarding the safety issues of single track rail operations, accident rates for commuter systems, freight safety, security, and emergency preparedness.

Single Track Operations

It is not uncommon for rail systems to be based principally on a single track design. Such systems involving commuter rail services include the *Coaster* that links San Diego to areas to the north, the Altamont Commuter Express (ACE) in Bay Area, portions of the Metrolink system in the Los Angeles metro area, Sounder in the Seattle Area, Trinity Railroad Express in the Dallas/Forth Worth area, and Tri-Rail in South Florida.

Well-placed "passing sidings", which consist of short stretches of double track, are generally provided along the rail line to allow trains to travel in opposite directions and safely pass each other. The limitation of single tracking is that it cannot easily accommodate a large volume of rail traffic. When railways are upgraded from a single track with sidings to a fully double-tracked system, the chief benefit is to capacity and operation flexibility, with safety being a more minor advantage.

In addition, the “sharing” of trackage by commuter and freight rails is not uncommon or unmanageable. Large commuter rail systems, such as Metrolink in the L.A. metro area, and Metra in the Chicago area, share some portion of their lines with freight service. Many systems, such as the Virginia Railway Express in the Washington D.C. metro area, and Sounder, ACE and Capitol Corridor (which links San Jose to Sacramento) in the Bay Area, not only share trackage with freight service but operate on lines owned by freight companies.

There have not been any recent incidents involving commuter rail trains colliding with one another (data since 1990 examined). There has only been one incident in the past ten years in which passengers on a commuter rail were killed due to a collision with another train. In 2002, a Metrolink train was struck by a Burlington Northern Santa Fe freight train, resulting in three passenger deaths. Investigations concluded that human error on the part of the freight train operators was responsible, not rail equipment or signaling systems. It should be noted that even with incidents like the aforementioned one, passenger rail is still considerably safer for vehicle occupants on a per passenger mile basis than automobiles and trucks.

(See information in following section.)

Comparative Safety Statistics

The following is statistical information about commuter rail safety, including grade crossing accidents and fatalities in one given year. The data analyzes commuter rail fatalities over a five year period, broken out into four distinct categories.

The categories include:

1) Safety of train passengers, with comparisons to bus passengers and other motor vehicle occupants;

2) Risks posed by commuter rail for bicyclists and pedestrians at grade-crossings, with comparisons to the risks to bicyclists and pedestrians posed by all motor vehicles;

3) Incidents along the right-of-way involving trespassers, including suicides; and

4) Commuter rail/motor vehicle incidents at grade-crossings.

Passengers / Occupants Safety

Commuter Rail

Generally speaking, commuter rail service in the United States is extremely safe for passengers. According to the Federal Railroad Administration (FRA), the number of passenger fatalities on commuter rail systems in the most recent five year period was as follows:

Year	2000	2001	2002	2003	2004	5-year average
Passenger Fatalities	0	1	3	1	1	1.2

The 2001 incident occurred in Essex County, MA when a Massachusetts Bay Transit Authority (MBTA) passenger disembarked and was struck by a train. The 2002 fatalities all stemmed from one incident in which a Burlington Northern Santa Fe freight train struck a Metrolink passenger train in Orange County, California. The 2003 incident occurred in Los Angeles County and involved a truck that drove around the barrier gates and was struck by a Metrolink train. And lastly, the 2004 incident involved a passenger in Montgomery County, Pennsylvania, who disembarked from a SEPTA passenger train and was struck by a train.

According to the Bureau of Transportation Statistics, the average annual passenger miles for commuter rail systems from the years 2000 to 2004 was 9.5 billion per year (data not yet available for 2005). Consequently, the total number of passenger fatalities per billion passenger miles was 0.126.

Motor Vehicles

Safety statistics indicate that roadways are considerably more dangerous for drivers and passengers on a per passenger mile basis than commuter rail. According to the National Highway Transportation Safety Administration (NHTSA), the number of motor vehicle fatalities (excluding buses and tractor-trailers) for vehicle occupants in the last five years was as follows:

Year	2000	2001	2002	2003	2004	5-year average
Occupant Fatalities	35,572	35,698	36,641	36,574	36,340	36,165

According to the Bureau of Transportation Statistics, the average annual passenger miles for autos, trucks & motorcycles from the years 2000 to 2004 was 4.28 trillion per year. Consequently, the total number of passenger fatalities per billion passenger miles was 8.45. This means that over the given five year period, for vehicle occupants on a per passenger mile basis, commuter rail has been 67 times safer than cars, light trucks and motorcycles.

Transit Buses

Bus transportation, including transit buses and school buses, are slightly more dangerous for occupants than commuter rail but still much safer than other types of roadway transportation. According to the NHTSA, the number of bus fatalities in the last five years was as follows:

Year	2000	2001	2002	2003	2004	5-year average
Passenger Fatalities	22	34	45	41	41	36.6

According to the Bureau of Transportation Statistics, the average annual passenger miles for transit buses from the year 2000 to 2004 was 148,120,400,000. [2] Consequently, the total number of passenger fatalities per billion passenger miles was .247. This means that over the given five year period, for vehicle occupants on a per passenger mile basis, buses were approximately twice as dangerous for passengers as commuter rail. However, they were more than 35 times safer than cars, light trucks and motorcycles. In summary, the following table compares the annual fatality rate for passengers/occupants for three different modes, per billion passenger miles:

Summary of Fatality Rates

	Commuter Rail 5 Year Average	Buses 5 Year Average	Motor Vehicles 5 Year Average
Annual Fatalities (2000-2004 average)	1.2	36.6	36,165
Passenger Miles	9,503,250,000	148,120,400,000	4,280,674,000,000
Fatality rate per billion passenger miles	0.13	0.25	8.45

Pedestrian & Bicyclist Fatal Accidents by Type

Commuter Rail

The following figures represent the annual numbers of pedestrians and bicyclists fatally struck by commuter rail trains at grade crossings.[14] Altogether, the rate of such incidents, per billion passenger miles, is very similar to the rate for pedestrians and bicyclists being fatally struck by motor vehicles on roadways.

Year	2000	2001	2002	2003	2004	5-year average
Fatalities	11	19	12	7	12	12.2

As mentioned previously, based on the average annual passenger miles for commuter rail systems of 9,503,250,000, the total number of pedestrian and bicycle fatalities per billion passenger miles was 1.28. Motor Vehicle Accidents. According to the National Highway Transportation Safety Administration (NHTSA), the number of pedestrians and bicyclists killed by motor vehicles (including autos, trucks and buses) in the last five years was as follows:

Year	2000	2001	2002	2003	2004	5-year average
Fatalities	5,597	5,756	5,630	5,543	5,494	5,604

Based on the average annual passenger miles for all motor vehicles of 4,651,035,000,000, the total number of pedestrian and bike fatalities per billion passenger miles was 1.20, slightly less than for commuter rail systems.

Rail Trespassers & Suicides

In addition to incidents at grade crossings, there are also some commuter rail incidents that involve what the FRA refers to as "trespassers." These individuals are not walking or riding their bicycles across the tracks at a formal road or bikepath crossing, but instead are somewhere else along the right-of-way. The following figures show the number of fatal incidents over a five year period involving trespassers on rail lines:

Year	2000	2001	2002	2003	2004	5-year average
Trespasser Fatalities	58	68	60	38	41	53

According to the NHTSA, 34% of pedestrians involved in fatal incidents (all, not just rail-related) have a blood alcohol count (BAC) greater than .08 g/dL. This rate could be lower or higher for rail incidents, but it is impossible to determine from the available statistics.

In addition, a substantial portion of fatal incidents involving trespassers is suicides. The FRA does not keep statistics that separate suicide incidents from other types of incidents. However, the casualty reports are replete with examples of individuals standing still on the tracks and waiting for the train to approach.

Estimates by commuter rail agencies based on police reports have determined that over half of all trespasser deaths are probable suicides. Characteristically, given the high number of incidents that involve alcohol or suicide, there are not a large number of children involved in commuter rail / trespasser fatalities. In fact, over the last five-year period, there were no incidents involving anyone under 11 years old. By contrast, nearly 1 in 5 (19%) bicyclists killed by motor vehicles are between the ages of 5 and 15.[19] Most rail trespassing victims are in their thirties and forties. The following table shows the age distribution of those fatally struck by commuter rail trains over a five year period from 2000 to 2004.

Age Distribution of Rail Fatalities	
Age Cohorts	**Commuter Rail Trespasser Fatalities 2000-2004**
0-10	0
11-13	3
14-18	20
19-29	34
30-39	53
40-49	44
50-59	20
60-69	13
70-79	7
80-89	4
Unknown	67

Although it is impossible to completely eliminate the risk of trespasser casualties on a rail line, there are steps that an agency can take to try to reduce these types of injuries. Fencing in certain locations can discourage people from wandering into the right-of-way, and signage can reinforce the trespassing danger.

The proposed safety structure along the pedestrian/bicycle pathway is intended to keep people away from the tracks. Along the Caltrain right-of-way, signage has been posted at key locations in an effort to diminish suicide attempts. Law enforcement patrols of the rail line may also encounter trespassers and can, at a minimum, warn of the danger of being too near the rail tracks. In Los Angeles, citations can carry fines to act as a disincentive for trespassing. Lastly, education and outreach efforts, like the Operation Lifesaver Program proposed for SMART's project, can help to ensure that people are aware of the rail line, and know how to stay safe around it.

Commuter Rail and Motor Vehicle Incidents

On occasion, there are fatal incidents involving commuter rail and motor vehicle collisions at grade crossings. The following figures show the number of annual fatalities nationwide.

Year	2000	2001	2002	2003	2004	5-year avg.
Motor Vehicle Fatalities	5	11	11	16	14	11.4

Most of these incidents involved vehicles that drove around or through barrier gates onto the rail tracks and/or ignored warning signals. The following table shows a breakdown of motor vehicle fatalities by type.

Commuter Rail / Motor Vehicle Fatalities, 2000-2004	
Incident Type	**Number**
Drove around or through gates	40
Drove through stops signs and signals	14
U-turn on tracks	1
Motor vehicle accident, pushed onto tracks	1
Drove through locked private gate after vehicle theft	1

Freight Safety

Since 1990, there has only been one fatal commuter rail incident that involved freight. As mentioned previously, in 2002 a Metrolink train was struck by a Burlington Northern Santa Fe freight train, resulting in three passenger deaths.

It is difficult to determine how the presence of freight rail service on a commuter rail line adds to the risks for pedestrians, bicyclists and cars at grade crossings or for trespassers. FRA statistics break out information by railroad. However, with freight incidents, it is difficult to determine whether an incident occurred within a commuter rail service zone or outside of it.

The table on DEIR page 3-218 indicates that freight accident rates are higher than commuter rail accident rates. However, given the stronger safety measures that are often present in commuter rail systems, it is likely that freight rail incident rates are closer to commuter rail incident rates in commuter

rail service areas. Consequently, the addition of freight service will probably add risks in proportion to its service levels.

Nevertheless, freight rail is a considerably safer means of transporting goods than trucks. In 2001, for example, large trucks were involved in 429,823 reported accidents, according to the National Highway Safety Administration.[22] At the same time trucks hauled 1,051,000,000,000 ton miles of goods. This means that trucks had .41 accidents for every million ton miles traveled.

All rail services combined (include commuter, intercity and freight) had 16,086 accidents and incidents in 2001. At the same freight rail hauled 1,474,000,000,000 ton miles of goods. Consequently, freight rail has an accident rate approximately .01 accidents per ton mile. Factoring out commuter and intercity rail, although difficult to do with available data, would show a slightly better performance. This means that as a distributor of goods, freight rail is at least 40 times safer than truck transportation, according to available statistics. Should freight rail service be implemented by NCRA in the NWP rail corridor north of the Ignacio Wye in Novato, any corresponding reduction in truck traffic could have a positive effect on roadway safety.

Security Responsibilities

As noted on DEIR page 2-62, security services for the proposed project can be provided by in-house personal, contracted local law enforcement, contracted security firms, or some combination. Personnel working in rail operations often provide a primary level of security. The conductor and assistant conductor on Virginia Railway Express trains, for example, in addition to their regular duties, check the trains during the trip for suspicious activity or packages. These personnel can also summon local law enforcement officers in the event of an incident or emergency.

Security is often supplemented with contracted personnel that patrol and monitor station facilities and may also inspect tracks, as well. Sounder, for example, which serves the Seattle area, contracts with a private firm to provide security personnel to patrol and monitor stations, platforms, parking facilities, and administrative buildings. The Capitol Corridor system has uniformed security guards posted at selected stations. Many commuter rail systems also incorporate security cameras to monitor stations and station parking lots.

There are some systems that contract with local law enforcement agencies to provide an array of security services. Metrolink, for example, contracts with the Los Angeles County Sheriff's Office to provide fare enforcement, on-board security, and supervision of other security guard contracts. As noted on DEIR page 2-66, SMART will provide rail system security, either in-house or by contract. SMART's 2006 Draft Expenditure Plan includes a line item for the costs of providing security services. The precise details of security service contracts will be established in the future in consultation with local jurisdictions and first responders.

Land Slide

Land slides were rated a HIGH PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Introduction

Slides and earth flows are landslides that can pose serious hazard to property in the hillside terrain of the San Francisco Bay region. They tend to move slowly and thus rarely threaten life directly. When they move - in response to such changes as increased water content, earthquake shaking, addition of load, or removal of down slope support - they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, and breaking of underground pipes within and along the margins of the landslide, as well as overriding of property and structures down slope.

Description

The best available predictor of where movement of slides and earth flows might occur is the distribution of past movements (Nilsen and Turner, 1975). These landslides can be recognized from their distinctive topographic shapes, which can persist in the landscape for thousands of years. Most of the landslides recognizable in this fashion range in size from a few acres to several square miles. Most show no evidence of recent movement and are not currently active. Some small proportion of them may become active in any one year, with movements concentrated within all or part of the landslide masses or around their edges.

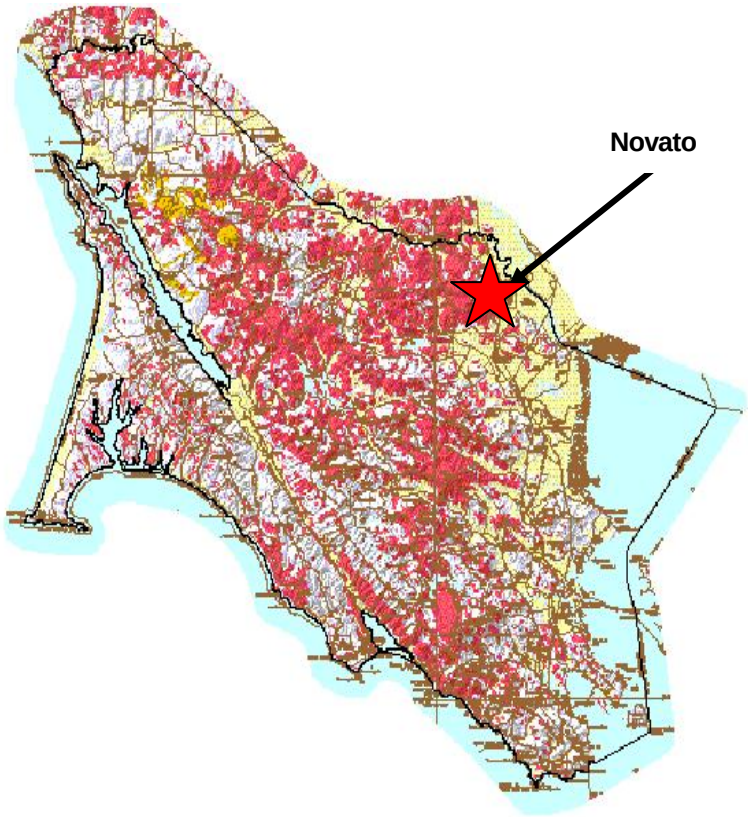
Debris flows are shallow landslides that transform into muddy slurries and travel down slope rapidly. On January 3-5, 1982, an exceptional rainstorm created debris avalanches throughout the San Francisco Bay area. These avalanches resulted in damages to at least 100 homes, and in the deaths of 15 residents.

Some of the largest ancient landslides in the San Francisco Bay area are on a four-mile stretch on the coastal side of Inverness Ridge at the south end of Point Reyes. Most of the area is now stable, but several lakes there owe their existence to these slides.

Total direct costs of landslide damage for the storm in Bay area counties exceeded $66 Million. Debris flow and other landslides resulting from the January 3-5, 1982, storm were mapped throughout the San Francisco Bay region from aerial photographs. Larger landslides are examined in selected areas.

Landslides and associated types of slope failure have become major geologic hazards in the San Francisco Bay region. As increasing development of hillside areas has taken place, the annual cost of damage from slope failure can be in the tens of millions of dollars. These losses can be greatly reduced by using geologic information to recognize, evaluate, and map those areas of potential instability, and applying this information in planning, designing, and organizing the use of hillside areas. The report contains maps showing all landslides in the San Francisco Bay region that had been recognized by 1975.

Marin County Landslide Map (USGS)



Map Units

Mostly Landslide - consists of mapped landslides, intervening areas typically narrower than 1500 feet, and narrow borders around landslides; defined by drawing envelopes around groups of mapped landslides.

Many Landslides - consists of mapped landslides and more extensive intervening areas than in 'Mostly Landslide'; defined by excluding areas free of mapped landslides; outer boundaries are quadrangle and County limits to the areas in which this unit was defined.

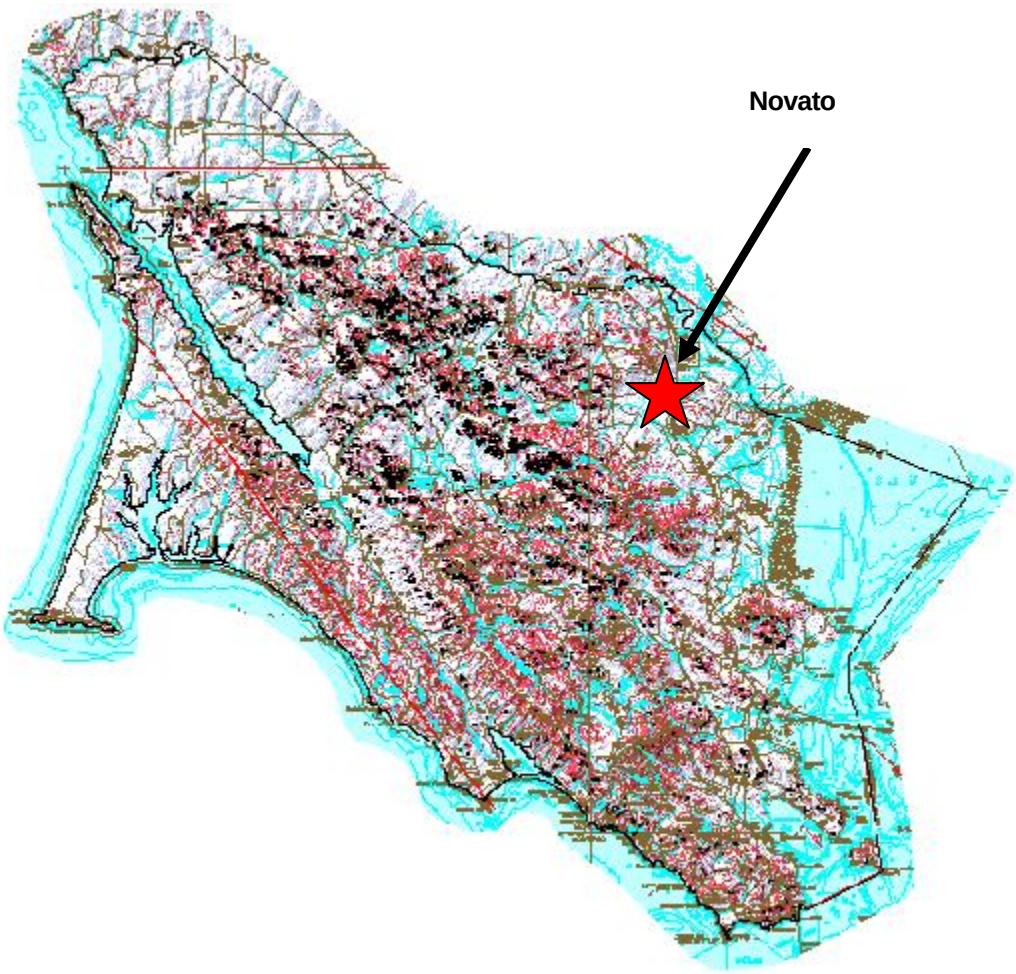
Few Landslides - contains few, if any, large mapped landslides, but locally contains scattered small landslides and questionably identified larger landslides; defined in most of the region by excluding groups of mapped landslides but defined directly in areas containing the 'Many Landslides' unit by drawing envelopes around areas free of mapped landslides.

Flat Land - areas of gentle slope at low elevation that have little or no potential for the formation of slumps, translational slides, or earth flows except along stream banks and terrace margins; defined by the distribution of surficial deposits (Wentworth, 1997).

Marin County Debris Flows (USGS)

The map below identifies the principal areas in the San Francisco Bay region that are likely to produce debris flows, which are also called "mudslides." Debris flows that occur in the bay region are fast-moving down slope flows of mud that may include rocks, vegetation, and other debris. These flows begin during intense rainfall as shallow landslides on steep slopes. The rapid movement and sudden arrival of debris flows pose a hazard to life and property during and immediately following the triggering rainfall.

Debris flows in a given storm originate from a number of sources scattered throughout steep parts of the landscape during subsequent storms, new debris flows originate from different sources. These various sources, however, are similar in topographic form because debris-flow initiation requires steep slopes and prefers concave parts of hillsides. These topographic characteristics are used to predict the likely future source areas shown on this map.



Map Units

The red zones of the map portray the principal areas from which debris flows can be expected during future storms. The black dots represent the debris-flow sources mapped after the catastrophic storm of January 1982. The dots provide an example of the abundance of debris flows that might be expected during a major rainstorm, and they illustrate the approximate nature of this predictive map.

Hazard

Because debris flows travel down slope and downstream from source areas, hazards commonly extend beyond the red zones of the map. In the vicinity of the red zones, common areas of hazard are 1) near the base of steep hillsides, 2) near the mouths of steep sidehill drainages, and 3) in and near the mouths of canyons that drain steep terrain.

The map shows the principal source areas of debris flows from natural hill slopes in the region. Debris flows and other fast-moving landslides may also occur from man-made slopes, such as the cut slopes along highways in hilly terrain, but such sources generally are not shown on the map. Debris flows also are possible from unmodified steep areas outside of the red zones, but we expect that most debris flows will originate in or near the red zones of the map.

Because the map depicts source areas and not flow paths, and because of its broad area coverage and small scale, the map is intended to be used as a guide to general areas of debris-flow hazard rather than as a predictor of hazard at specific sites. Appropriate uses include storm-preparedness planning for emergency access and response.

EXPLANATION

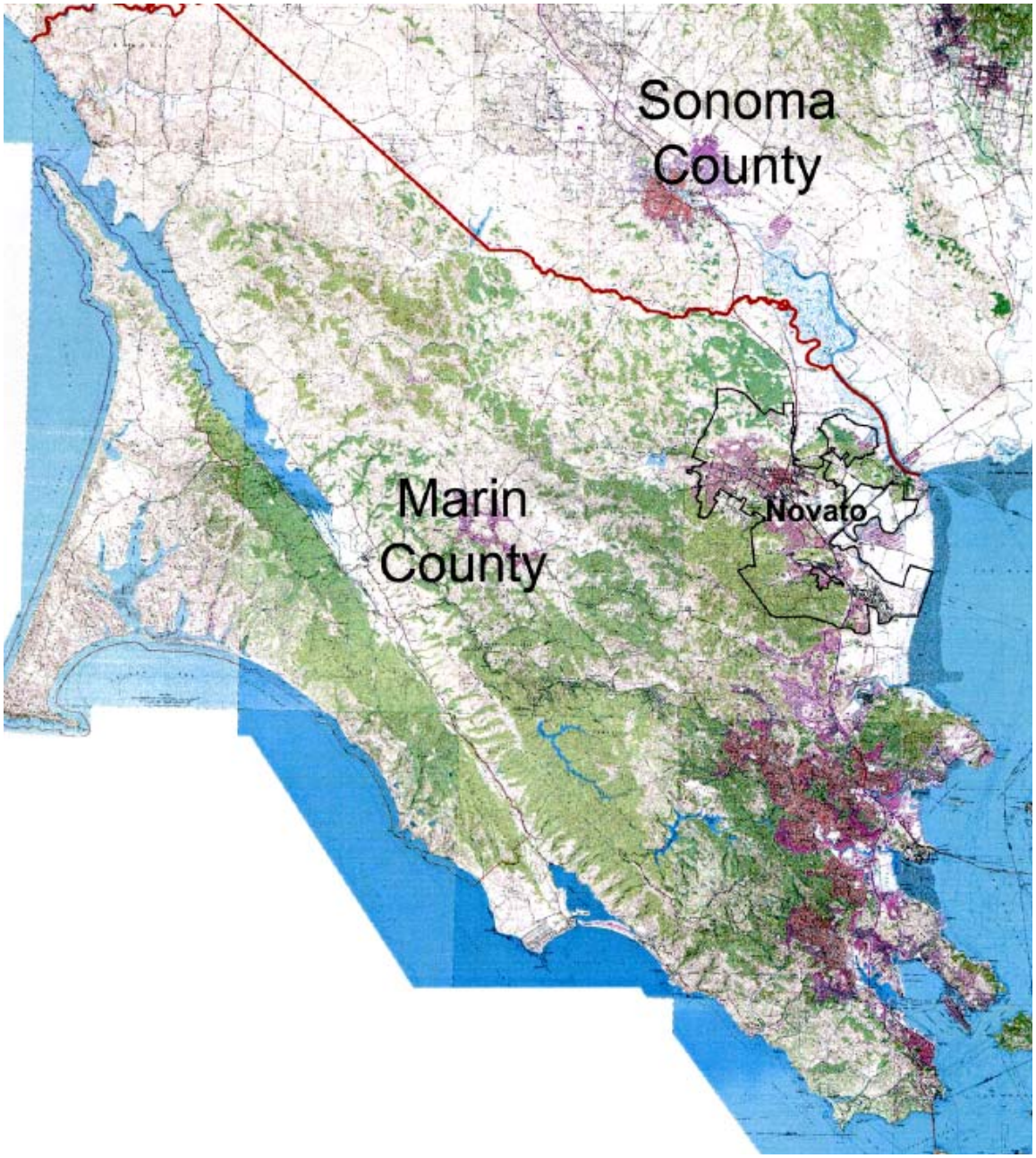
Principal predicted debris-flow source areas

Approximate source areas of debris flows triggered during the storm of January 1982

Approximate extent of mapping of 1982 debris flows

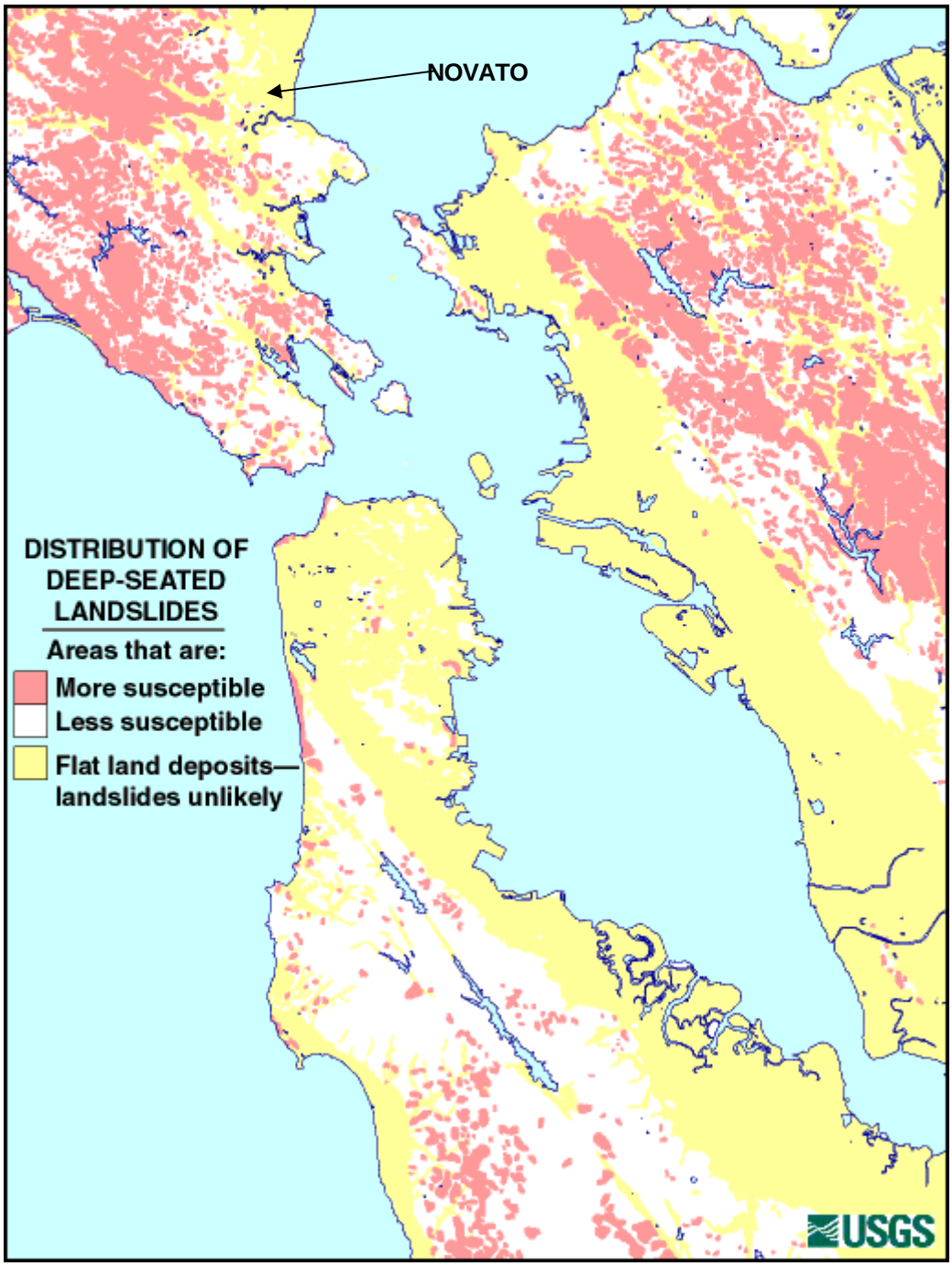
USGS Seismic Hazard Map

This is an aerial topographically-enhanced map showing established seismic geological hazards. The colors (magenta to purple) indicate the magnitude of the hazard. The lighter the hue the less hazard.



Deep-Seated Landslides (USGS)

This map, prepared by the U. S. Geological Survey, indicates the susceptibility of area in the San Francisco Bay Area to Deep-Seated destructive Landslides. The yellow coloring indicates flat land deposits where landslides are unlikely. Whit coloring shows areas less susceptible and the salmon coloring indicates areas more susceptible to deep-seated landslides.



Hazardous Materials

Hazardous Materials was rated a HIGH PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

The City of Novato has prepared a Safety Element to the General Plan which provides an encompassing overview of the City's industrial locations and the potential involvement of hazardous material incidents. Coupling the database of potentially hazardous locations with other elements of the plan provides an analysis and planning tool that should prove most beneficial.

Hazardous materials are any substance or combination of substances which because of quantity, concentration, or characteristics may cause or significantly contribute to an increase in death or serious injury, or pose substantial hazards to humans and/or the environment. The production and use of these hazardous materials is a part of our society over which local governments have little control.

Hazardous material incidents differ from other emergency response situations because of the wide diversity of causative factors and the pervasiveness of the potential threat. Circumstances such as the prevailing wind and geographic features in vicinity of emergency incidents are relevant factors which may greatly increase the hazardous chemical dangers. Incidents may occur at fixed facilities where, most likely, the occupants have filed site specific emergency response contingency and evacuation plans. However, incidents may also occur at any place along any land, water or air chemicals and /or illegal dumping these may occur in unpredictable areas, relatively inaccessible by ground transportation.

Commercial Transportation

Transport of hazardous materials by truck or rail is regulated by the U.S. Department of Transportation through national safety standards. The federal safety standards are also included in the California Administrative Code, Environmental Health Division. The California Health Services Department regulates hazardous waste haulers.

Major Truck Routes

Chemicals are often transported through the city on surface street truck routes when serving local commercial and/or industrial businesses.

Because of the volume of transportation (commercial and private) into and out of Marin County, the potential for a disastrous transportation-related event exists. Generally, transportation accidents are incidents that are handled by local jurisdictions or by jurisdictional mutual aid responses. A transportation accident, combined with a volatile hazardous substance or a large number of people, has the potential for becoming an event that requires a major mobilization of local, county, state and federal agencies.

Highway 101 and State Route 37 through the City of Novato is the primary and major truck route that affects the City. Any other truck traffic would be thought of as local delivery services and does not pose a major threat to the City.

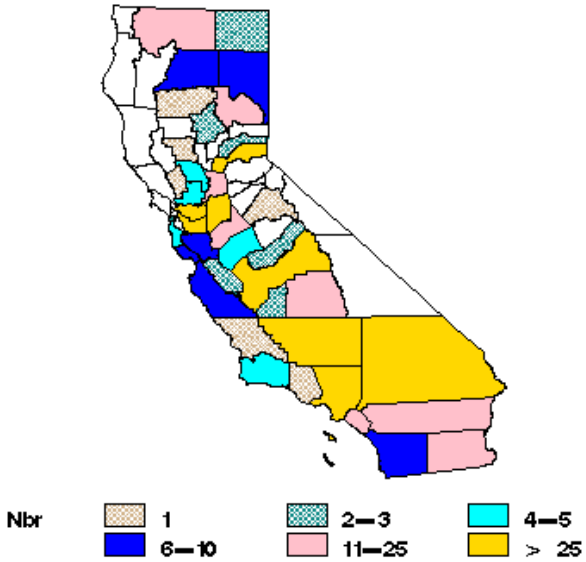
According to the Department of Transportation, from 1994 to 2000 there were more than 1,800 fatal tractor-trailer accidents in the state, and from 1990 to 2001 more than 4,200 train accidents.

Rail Incidents

There is one rail line that bisects the city. Trains operating on this line pass through developed areas of the city. Because the railroads and interstate highways are federally controlled or regulated, the city's option in regulating transport on these lines are limited or non-existent. (See Transportation Incidents)

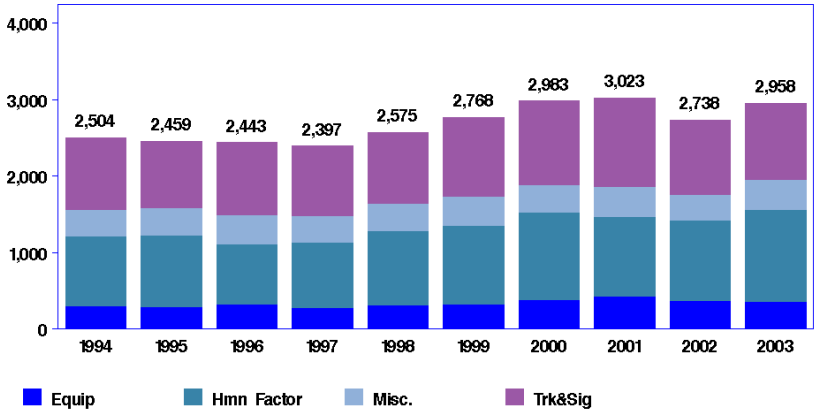
TRAIN ACCIDENTS FOR CALIFORNIA, January 2000 TO June 2004

RAILROAD: ALL TYPE OF TRACK: All



Excludes Highway Rail Incidents

8 — TRAIN ACCIDENTS BY PRIMARY CAUSE, JAN — DEC (2003 preliminary)



Date of run: Wed, Sep 1, 2004

Federal Railroad Administration, Office of Safety Analysis

The transportation and storage of hazardous materials is clearly a regional issue. Large quantities of hazardous products are transported on highways and railways where the potential for release of this material into the environment represents a potentially significant public health risk. The policies and programs dealing with hazardous materials incorporate and build on the relevant portions of the Safety Element of the Marin Countywide Plan. The County is responsible for:

- Regulating hazardous materials over specified quantities
- Developing and implementing Area Plans for emergency response of hazardous materials spills
- Implementing risk management and prevention programs, business plans and inventories of hazardous waste storage and transportation, and implementing procedures for handling hazardous substances

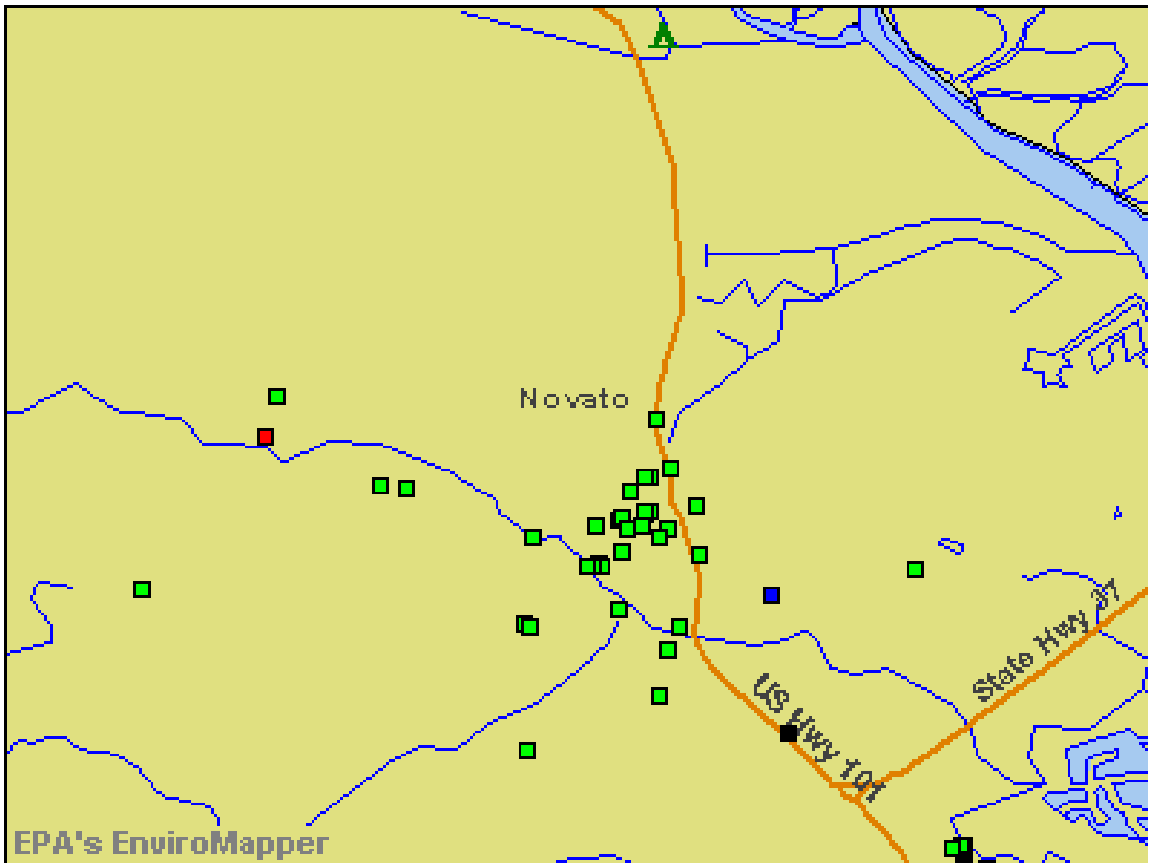
Radioactive materials are distinguished from other hazardous materials and specific federal and state regulations address handling and transportation of these substances. The use and storage of radioactive materials in Novato is limited to medical facilities and the Buck Center for Research in Aging, since no other primary users of radioactive materials, such as research laboratories, nuclear power plants or active military facilities are located within the area of interest.

The principal potential danger to Novato residents from these materials is related to the possibility of a truck accident resulting in rupture of containers holding radioactive materials.

Asbestos used as an insulating material in public buildings is a potential health hazard. The Novato Unified School District has determined that its public schools are in compliance with the 1986 Federal and State Building Codes for asbestos insulation.

In recent years, the number and severity of hazardous materials incidents appears to be increasing on a national level. It is not uncommon for freeways to be closed and even large-scale evacuations to take place die to the discharge or potential of a hazardous materials incident.

Hazardous Materials Spill Sites



LEGEND

- Discharges to water
- Superfund sites
- Hazardous waste
- Toxic releases
- Air releases
- Others
- Multiple
- Streets
- Water Bodies
- Counties

Water/Waste Water Emergency

Water/Waste Water Emergencies were rated a HIGH PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Water

With a growing population and economy, increasing environmental concerns and vibrant agriculture industry at play, how we choose to collect, store, distribute, use and dispose of water has never been more critical.

Every drop of water not used by a household, farm or business can be used to create higher river flows to benefit fisheries and floodways. Likewise, recycled water stored in new reservoirs can be used to recharge over-drafted groundwater aquifers. In short, new and innovative ideas are on the table that will help California rework its waterworks so that it is not necessary to choose between the environment, the economy, and people's livelihoods and lifestyles.

From the northern reaches to the San Joaquin Delta, which provides two-thirds of the state's residents with their drinking water, California is under pressure to reconstruct and rehabilitate its water and wastewater systems. The challenge is being met on many fronts. On these pages you will find a summary of the water and wastewater challenges California faces today, along with the lowdown on solutions in the works.

Problems

- Our groundwater basins are over-drafted and our existing surface storage cannot meet future water demands, particularly in times of drought.

- The gap between water supply and demand in California is predicted to total 2.4 million acre feet during drought years and up to 6.2 million acre feet in drought years by 2020. (An acre foot is enough to meet the annual needs of between one and two households.) Six million acre feet is roughly triple the amount of water the Bay Area uses in a year. At the same time, growers, manufactures and businesses are demanding more reliable and better quality water.

- It can take 20 years or longer to develop and finance a supplemental water supply for new developments.

- About 894 gallons of water are needed to grow the food for the daily diet of an average person. On an annual basis, an individual's water use is about 326,310 gallons.

- Some of our cities rely on water mains and sewers that are more than 100 years old.

- In 2001 California officials issued more than 2,000 beach closings and health advisories because of sewer spills and overflows. Spills and overflows typically happen because wastewater systems have not been upgraded to facilitate new growth, and sewer pipes have not been replaced in time to avert a main break.

- When it rains, at times as little as one-quarter inch, rainwater runoff can enter the sewer collection system and the volume of combined runoff and wastewater becomes too great for sewage treatment plants to handle, and the flow is diverted to outfall points that discharge raw sewage, toxic industrial waste and floatables such as garbage and syringes.

- California needs an estimated $8.4 billion for local wastewater treatment improvements.

Solutions - Water

Through a state/federal partnership known as CALFED, for example, some $10 billion in expanded storage, increased recycling and conservation, ecological restoration of key watersheds, and improved water distribution and conveyance has been identified that over the next few decades help meet some of these challenges. Cities are expanding water treatment systems, improving water distribution infrastructure, and developing local recycling programs as well, some using funds from the CALFED program.

To offset water shortages, the state's water recycling program needs more investment. In 1998, the last year it revised its state Water Plan, the California Department of Water Resources issued a 10-year capital improvement forecast calling for more than $1.6 billion in spending to ensure delivery of clean water. In addition, a state/federal partnership known as CALFED is overseeing a vast reworking of the state's water storage and distribution system. The CALFED program as it is known foresees $10 billion in environmental and ecological restoration projects, new storage facilities, recycling programs, water transfer arrangements to help strike a balance the state's competing water needs.

Solutions - Wastewater

State and federal water quality regulations require cities and other municipalities to upgrade wastewater collection and treatment systems to prevent overflows during wet weather no later than 2014. Pipe replacement projects, construction of new retention ponds, increased recycling and conservation programs, and expanded treatment facilities are all part of the mix of solutions.

California Dept. of Water Resources, Water Education Foundation, Natural Resources Defense Council

Moderate Risk Priority Hazards

Dam Failure

Dam Failure was rated a MODERATE PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Dam Inundation is defined as the flooding which occurs as the result of structural failure of a dam. Structural failure may be caused by seismic activity. Seismic activity may also cause inundation by the action of a seismically induced wave which overtops the dam without also causing dam failure. This action is referred to as a seiche. Landslides flowing into a reservoir are also a source of potential dam failure or overtopping.

Dam failures can result in the worst flood events. A dam failure is usually the result of neglect, poor design, or structural damage caused by a major event such as an earthquake. When a dam fails, a gigantic quantity of water is suddenly let loose downstream, destroying anything in its path. For example, in 1889, more than 2,200 lives were lost as a result of the Johnstown, Pennsylvania flood caused by an upstream dam failure. Billions of dollars of property damage can also occur as a result of a dam failure.

Besides the passage of the Dam Safety Act, other improvements concerning dams have been made throughout California as a result of the near-failure of the Lower San Fernando Valley Dam. Hydraulic fill dams, the type of dam that the Lower San Fernando Valley Dam was, were deemed to be unsafe and have been replaced with other types of dams (usually rolled earth dams in the Bay Area). Various other standards for dam structures have been improved and applied.

Stafford Lake

Stafford Lake was created with the construction of Stafford Dam on Novato Creek in 1951. It was created to provide a drinking water source of supply for the growing Novato community.

Stafford Lake has also developed into a recreation destination for many in the community. It provides opportunities for fishing and is stocked with Florida-strain large mouth bass. Because it is a drinking water source access for fishing is restricted within 1500 feet of the dam and intake tower.

No swimming or boating is allowed at the lake as a protective measure.

Location

On Novato Creek, four miles west of downtown Novato adjacent to Novato Boulevard (old Hicks Valley Road)

Owner

All of Stafford Lake and much of the land adjacent to the shoreline is owned by North Marin Water District (870+ acres)

Beneficial Uses

Water Supply - provides 20% of the Novato area's water supply

Recreation - fishing from shoreline only; Marin County Regional Park, Indian Valley Golf Course (open to public); hiking, etc.

Cattle Grazing - in areas fenced off from lake shoreline

Flood Control - incidental, some flood control occurs within the notched overflow when the lake is spilling

Novato Creek Dam

- Dam Name: Novato Creek Dam
- Lake Name: Stafford Lake
- Owner: North Marin County Water District
- Phone (415) 897-4133
- Capacity 4230 Acre Feet
- Height of Dam: 71 Feet (Rock & Earth Fill)

The Novato Creek Dam (also known as Stafford Dam) Analysis of Recorded Earthquake Ground Motion and Evaluation of Seismic Stability was prepared for the North Marin Water District by Woodward-Clyde Consultants in 1992. The study confirmed the following information contained in the City of Novato General Plan:

The Stafford Dam was designed to withstand a magnitude 8.25 Richter earthquake on the San Andreas Fault.

Stafford Treatment Plant

About 20% of Novato's water supply originates from Stafford Lake. Stafford Treatment Plant is typically operated in the late spring through early fall to supplement the North Marin Water District's purchased water supply. The amount of Stafford water used during the year depends on the storage levels attained with the previous winter's rainfall.

Full treatment of Stafford water is required because it is a surface water. Water is drawn through the intake tower and before it enters the plant coagulation basin, chlorine and aluminum sulfate are added. Chlorine kills any bacteria, viruses or other potential disease-causing organisms. The aluminum sulfate binds with the dirt and clay particles in the raw lake water so they can be settled and filtered out. After settling, water is filtered through special filters that are made of anthracite coal, garnet and sand. These filters remove all the dirt and the aluminum floc that binds it. As water is passed through each filter instruments continuously monitor the turbidity of the water. The California State Health Department requires that Stafford Treatment Plant produce a water with no more than 0.5 turbidity units. It is typical that Stafford water has less than 0.1 turbidity units.

After filtration, excess chlorine, if any, is removed and a small amount of sodium hydroxide is added to raise the pH in order to minimize corrosion of pipes.

Periodically activated carbon may be added prior to filtration to control taste and odors that develop when the lake is experiencing an algae bloom.

Novato Water Service Area		
(Year ending June 30, 2005)		
§	Service Area (Square Miles)	75
§	Active Connections	19,738
§	Dwelling Units	22,801
§	Estimated Population	59,000
§	Average Household Size (People)	2.6
§	Miles of Pipeline	288
§	Number of Hydrants	2,413
§	Number of Main Valves	3,830
§	FY 2005 Annual Water Production (Acre-Feet):	
	Stafford Lake & Treatment Plant	734
	Russian River Aqueduct	9,326

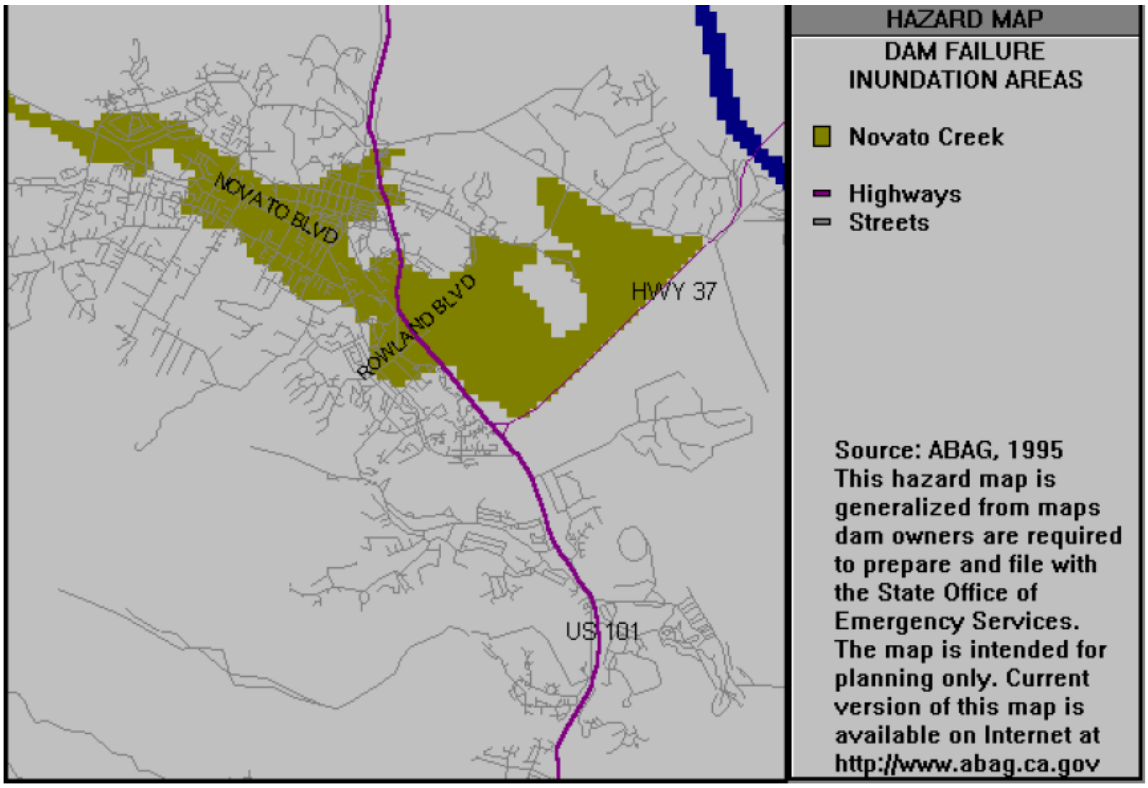
Novato Creek Dam Failure

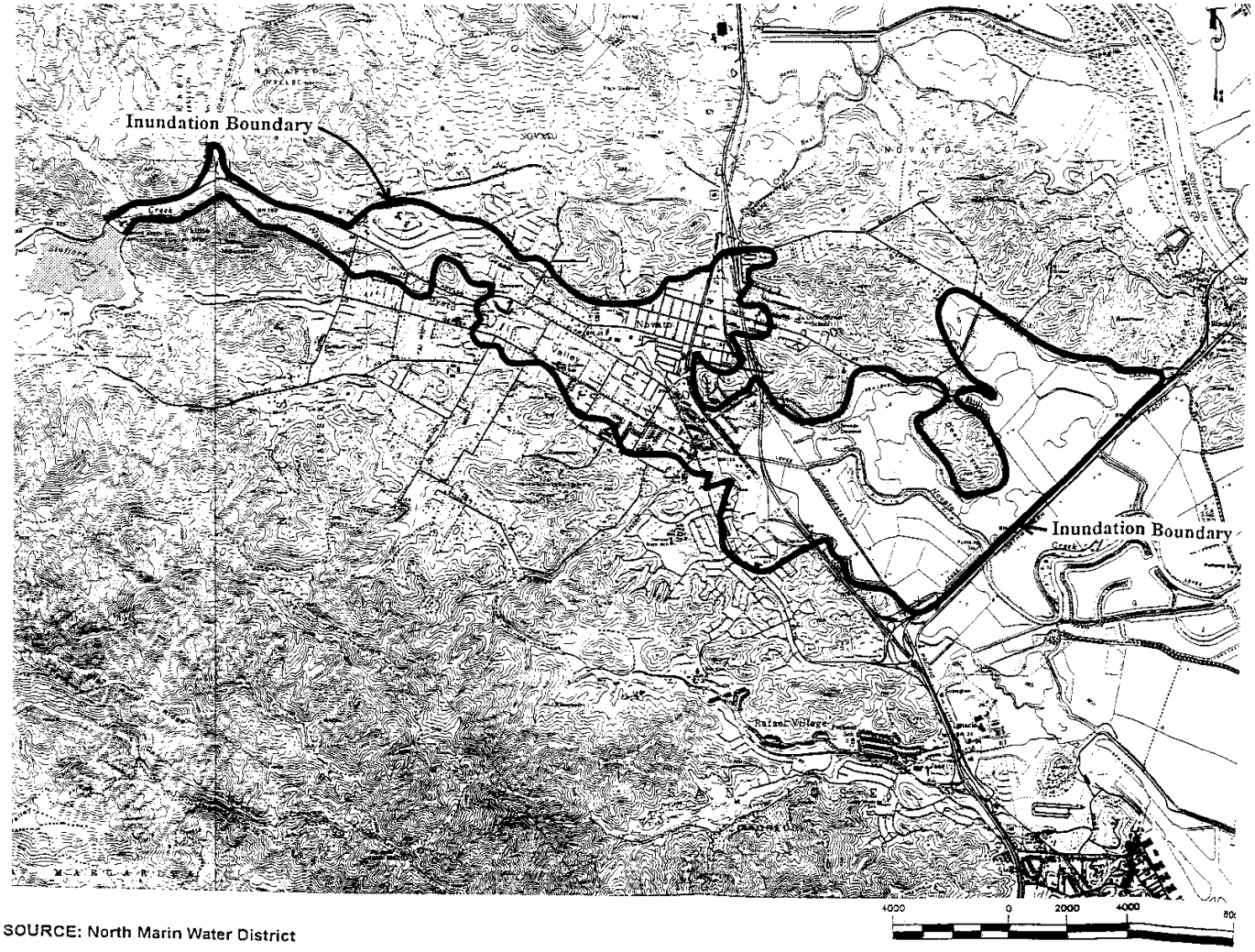
The dam failure evacuation area extends approximately 4 1/2 miles, passing Through the City of Novato & ending in the agricultural area between the City of Novato and San Pablo Bay.

The threat to the City of Novato is severe. The most critical zone is the San Marin residential area in the vicinity of Miwok Park & will be flooded very shortly after dam failure. The flood waters will reach the first built up area at San Marin Drive/Sutro Avenue 11 minutes after dam failure. 32 minutes after dam failure, the flood waters will begin to inundate the business district & city government buildings, & will reach U.S. Highway 101 approximately 50 minutes after dam failure.

As a result of the near failure of the Lower San Fernando Valley Dam, the Dam Safety Act was passed into law. This new law required dam owners to create maps showing areas that would be flooded if the dam failed. The California Office of Emergency Services (OES) approves the maps and distributes them to local governments, who in turn adopt emergency procedures for the evacuation and control of areas in the event of a dam failure.

This map shows the swath of inundation in the event that the dam at Novato Creek were to fail.





SOURCE: North Marin Water District

Novato Creek Inundation Map, City of Novato General Plan

Terrorism & Weapons of Mass Destruction (WMD)

Terrorism & Weapons of Mass Destruction were rated a MODERATE PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Terrorism is defined as the use of fear for intimidation, usually for political goals. Terrorism is crime where the threat of violence is often as effective as the commission of the violent act itself. Terrorism affects us through fear, physical injuries, economic losses, psychological trauma, and erosion of faith in government. Terrorism is not an ideology. Terrorism is a strategy used by individuals or groups to achieve political goals.

Terrorists espouse a wide range of causes. They can be for or against almost any issue, religious belief, political position, or group of people of one national origin or another. Because of the tremendous variety of causes supported by terrorists and the wide variety of potential targets, there is no place that is truly safe from terrorism. Throughout California there is a nearly limitless number of potential targets, depending on the perspective of the terrorist. Some of these targets include: abortion clinics, religious facilities, government offices, public places (such as shopping centers), schools, power plants, refineries, utility infrastructures, water storage facilities, dams, private homes, prominent individuals, financial institutions and other businesses.

Under Federal Law, the Federal Bureau of Investigation (FBI) is designated as the lead law enforcement agency in responding to threats or acts of terrorism, to include terrorist threats involving nuclear, biological, and chemical weapons or materials.

Should the city become aware of the presence of any of these weapons or groups that may possess them, immediate notification to the Federal Bureau of Investigation would be made by the Police Department.

Emergency Readiness Stages

Because a terrorist attack is generally sudden and without any prior warning such as the World Trade Center incident in New York, there are few stages of emergency readiness however, employees have received training in this area and those of bioterrorism and weapons of mass destruction.

The complexity, scope, and potential consequences of a terrorist threat or incident require that there be a rapid and decisive capability to resolve the situation. The resolution to an act of terrorism demands an extraordinary level of coordination of crisis and consequence management functions and technical expertise across all levels of government. No single Federal, State, or local governmental agency has the capability or requisite authority to respond independently and mitigate the consequences of such a threat to national security.

The incident may affect a single location or multiple locations, each of which maybe a disaster scene, a hazardous scene and/or a crime scene simultaneously.

Differences between WMD Incidents and Other Incidents

As in all incidents, WMD incidents may involve mass casualties and damage to buildings or other types of property. However, there are several factors surrounding WMD incidents that are unlike any other type of incidents that must be taken into consideration when planning a response. First responders'

ability to identify aspects of the incident (e.g., signs and symptoms exhibited by victims) and report them accurately will be essential to maximizing the use of critical local resources and for triggering a Federal response.

1. The situation may not be recognizable until there are multiple casualties. Most chemical and biological agents are not detectable by methods used for explosives and firearms. Most agents can be carried in containers that look like ordinary items.

2. There may be multiple events (e.g., one event in an attempt to influence another event's outcome).

3. Responders are placed at a higher risk of becoming casualties. Because agents are not readily identifiable, responders may become contaminated before recognizing the agent involved. First responders may, in addition, be targets for secondary releases or explosions.

4. The location of the incident will be treated as a crime scene. As such, preservation and collection of evidence is critical. Therefore, it is important to ensure that actions on-scene are coordinated between response organizations to minimize any conflicts between law enforcement authorities, who view the incident as a crime scene, and other responders, who view it as a hazardous materials or disaster scene.

5. Contamination of critical facilities and large geographic areas may result. Victims may carry an agent unknowingly to public transportation facilities, businesses, residences, doctors' offices, walk-in medical clinics, or emergency rooms because they don't realize that they are contaminated. First responders may carry the agent to fire or precinct houses, hospitals, or to the locations of subsequent calls.

6. The scope of the incident may expand geometrically and may affect mutual aid jurisdictions. Airborne agents flow with the air current and may disseminate via ventilation systems, carrying the agents far from the initial source.

7. There will be a stronger reaction from the public than with other types of incidents. The thought of exposure to a chemical or biological agent or radiation evokes terror in most people. The fear of the unknown also makes the public's response more severe.

8. Time is working against responding elements. The incident can expand geometrically and very quickly. In addition, the effects of some chemicals and biological agents worsen over time.

9. Support facilities, such as utility stations and 911 centers along with critical infrastructures, are at risk as targets.

10. Specialized State and local response capabilities may be overwhelmed.

State of California Terrorism Guidance

The catastrophic attacks on the World Trade Center Building in New York City and the Alfred P. Murrah Federal Building in Oklahoma City shocked the nation into the reality that there are no domestic safe havens from acts of terrorism. These two apparently unrelated events punctuate our nation's vulnerability, and highlight California's risk of similar attack against its public officials, private and multi-national corporations, public infrastructure, and government facilities.

Historically, California has had a long experience combating terrorist groups, both domestic and international. Domestic terrorist groups in the state have been largely issue-oriented, while the few

known internationally based incidents have mostly targeted the state's émigré communities and been related to foreign disputes. Today, however, both groups are more likely to be aligned nationally and/or internationally through electronic networking. The issues and politics of these groups remain essentially unchanged but now include increasing expressions of hatred for existing forms of government. The World Trade Center Incident demonstrates that international terrorist groups have the potential to operate with deadly effectiveness in this country. Such groups may offer no allegiance to any particular country but seek political or personal objectives that transcend national/state boundaries.

There is appropriate concern that such attacks as witnessed in Tokyo, New York City and Oklahoma City could occur in California. A terrorist acting alone or in concert with any of the known national or international groups could readily commit acts of terrorism in California. The open availability of basic shelf-type chemicals and mail order biological research materials, coupled with an access to even the crudest laboratory facilities, could enable the individual extremist or an organized terrorist faction to manufacture proven highly lethal substances or to fashion less sophisticated weapons of mass destruction. The use of such weapons could result in mass casualties, long term contamination, and wreak havoc to both the state and national economies.

The freedom of movement and virtually unrestricted access to government officials, buildings, and critical infrastructure afforded to California's citizens and foreign visitors, presents the terrorist with the opportunity and conditions of anonymity to deliver such devastation and its tragic consequences with only the crudest devices of nuclear, chemical, or biological content.

Terrorist incidents create a unique environment in which to manage emergency response. Local responders are typically the first on scene during an actual incident and local government has primary responsibility for protecting public health and safety. Ordinarily, the local first response will be conducted under California's Standardized Emergency Management System (SEMS) which forms the basis of California's concept of operations for managing any kind of emergency or disaster, including terrorist incidents. The local responders will manage all aspects of the incident until the FBI assumes command, by virtue of its legal authority, of the law enforcement aspects relating to identifying, apprehending, and neutralizing the terrorists and their weapons. Local and state authorities always maintain control of their response resources and continue to operate utilizing SEMS.

Governor's Office of Emergency Services Terrorism Response Plan

Biological & Chemical Terrorism

The Public Health Response to Biological and Chemical Terrorism: Interim Planning Guidance for State Public Health Officials (hereafter referred to as the Planning Guidance) outlines steps for strengthening the capacity of the public health system to respond to and protect the nation against the dangers of a terrorism incident. Although the Planning Guidance focuses on the biological and chemical terrorism preparedness efforts of state-level health department personnel, it can be used as a planning tool by anyone in the response community, regardless of his or her position within that community or level of government.

The public health community at large also can use this document to improve its terrorism preparedness and develop terrorism response plans. The preparedness program outlined in this Planning Guidance, once implemented, should improve the ability of all public health agencies to respond to emergency situations arising from all sources, not just terrorism.

Background

The intentional release of sarin, an organophosphate nerve agent, into the Tokyo subway system helped to focus the United States on its need to prepare for what was once unthinkable. Aum

Shinrikyo, the group responsible for the Tokyo incident, disbursed botulinum toxin and anthrax bacteria, and the group attempted to obtain Ebola.

The World Trade Center and Oklahoma City bombings confirm that terrorism is not an event that occurs only on foreign soil. Terrorism incidents or threats involving *Salmonella* (2) and ricin (3) amply demonstrate that the United States is vulnerable not only to bombs but to biological and chemical threats as well.

These and other events caused health departments across the country to consider their ability to respond to a terrorism incident. In addition to their more traditional responsibilities in disease surveillance and management, health departments are defining their roles to respond effectively to an intentional release of biological organisms or hazardous chemicals into an unsuspecting population.

Because states differ in size, population, risks, needs, and capabilities, terrorism preparedness and response efforts inevitably must differ. This document does not establish a A one-size-fits-all@ model; rather, it addresses important areas of preparedness and response that can be tailored to meet the needs of individual jurisdictions. Health department officials should consider the information contained in this guidance, identify the health and medical effects that an explosion or the intentional release or threatened release of a biological organism or hazardous chemical could have on the population, and prepare to address the public health consequences of those effects.

Well-developed surveillance and epidemiologic capacity is the foundation on which health departments will detect, evaluate, and design effective responses to terrorism events. Not only will this capacity facilitate the initial detection and response in a terrorism event, it will be essential to monitoring the impact of these events and the effectiveness of public health responses. Detection of acute or insidious terrorism attacks using biological (or certain chemical) agents also will require linking of data from a variety of sources. An effective public health response will depend on the timeliness and quality of communications among numerous public health agencies at local, state, and federal levels; clinicians; laboratories; poison centers; medical examiners; and other health response partners.

Complementing the need for accurate and timely case reports is the need for expertise to analyze the information properly. Epidemiologic expertise is critical to judging whether the incident involves biological or chemical agents or is a consequence of a natural phenomenon, an accident, or terrorism. Expertise also is critical in determining the likely site and time of the exposure; size and location of the population exposed; prospect for delayed exposure or secondary transmission of an infectious agent; and whether any people should receive prophylaxis (either medications or vaccines) and, if so, which population groups.

Timely and accurate information and analysis must be coupled with effective and rapid dissemination of information to those who need to know (e.g., response partners and the public) to instill confidence in both the short- and long-term response of the affected community.

Data/Telecommunications Disruption

Data/Telecommunications Disruption was rated a MODERATE PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

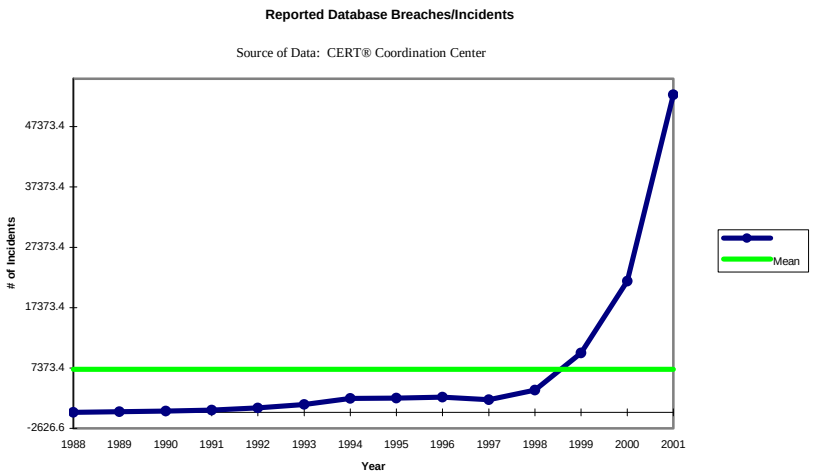
Novato City Government and Novato Sanitary District depend upon information systems and communications networks to carry out nearly all aspects of day to day business. In this digital era, as we use automated information technology (IT) systems to process information for better support of our missions, risk management plays a critical role in protecting an our information assets, and therefore our missions, from IT-related risk.

An effective risk management process is an important component of a successful IT security program. The principal goal of an organization's risk management process should be to protect the *organization and its ability to perform their mission*, not just its IT assets. Therefore, the risk management process should not be treated primarily as a technical function carried out by the IT experts who operate and manage the IT system, but as an essential management function of the organization.

Computer Security Breaches

Computer breach incidents have risen sharply since the 1980s. These include viruses, worms, Trojan horses, break–ins, spyware and other damaging breaches. Whereas only six incidents were reported in 1988, the number rose gradually during the late 1980s and 1990s, they made a sharp rise beginning in 1998, and have risen exponentially since. To date, there have been over 142,500 computer breaches.

The 2002 Computer Security Institute (CSI) Computer Crime and Security Survey revealed that each year, over half of all databases have some kind of breach and that the average breach amounts to nearly $4 million in losses. This percentage is staggeringly high given that these are the security problems that companies are reporting. Organizations don't want to advertise the fact that their internal people have access to customer data, can steal that data, cover their tracks, give the data to anybody and stay undetected and employed while a crime is committed.



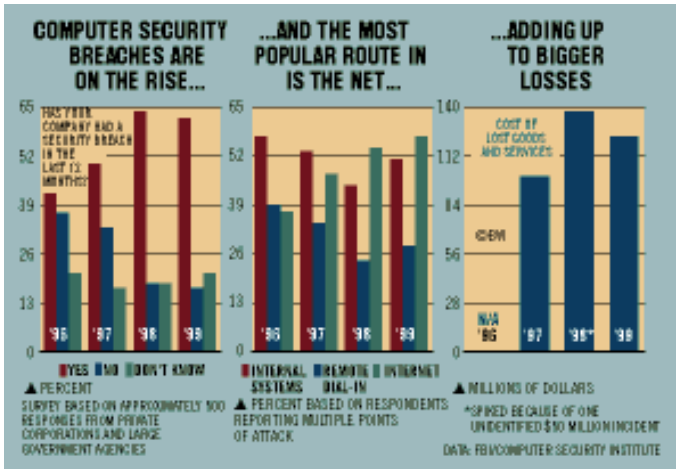
California recently enacted a law mandating the public disclosure of computer security breaches involving confidential information. The law covers not just state agencies but all private enterprises doing business in California. Starting July 1, 2003, any entity that fails to disclose that a breach has occurred could be liable for civil damages or face class action suits.

Cyber Crime

"…Cyber crime is becoming one of the Net's growth businesses. The recent spate of attacks that gummed up Web sites for hours--known as "denial of service"--is only one type. Today, criminals are doing everything from stealing intellectual property and committing fraud to unleashing viruses and committing acts of cyber terrorism in which political groups or unfriendly governments nab crucial information. Indeed, the tactic used to create mayhem in the past few days is actually one of the more innocuous ones. Cyber thieves have at their fingertips a dozen dangerous tools, from "scans" that ferret out weaknesses in Web site software programs to "sniffers" that snatch passwords. All told, the FBI estimates computer losses at up to $10 billion a year.

As grim as the security picture may appear today, it could actually get worse as broadband connections catch on. Then the Web will go from being the occasional dial-up service to being "always on," much as the phone is. That concept may be nirvana to e-tailers, but could pose a real danger to consumers if cyber crooks can come and go into their computer systems at will. Says Bruce Schneier, chief technical officer at Counterpane Internet Security Inc. in San Jose, Calif.: "They'll keep knocking on doors until they find computers that aren't protected." Sadly, the biggest threat is from within. Law enforcement officials estimate that up to 60% of break-ins are from employees. Take the experience of William C. Boni, a digital detective for PricewaterhouseCoopers in Los Angeles. Last year, he was called in by an entertainment company that was suspicious about an employee. The employee, it turns out, was under some financial pressure and had installed a program called Back Orifice on three of the company's servers. The program, which is widely available on the Internet, allowed him to take over those machines, gaining passwords and all the company's financial data. The employee was terminated before any damage could be done.

The dirty little secret is that computer networks offer ready points of access for disgruntled employees, spies, thieves, sociopaths, and bored teens. Once they're in a corporate network, they can lift intellectual property, destroy data, sabotage operations, even subvert a particular deal or career. "Any business on the Internet is a target as far as I'm concerned," says Paul Field, a reformed hacker who is now a security consultant.



It's point and click, then stick 'em up. Interested in a little mayhem? Security experts estimate that there are 1,900 Web sites that offer the digital tools--for free--that will let people snoop, crash computers,

hijack control of a machine, or retrieve a copy of every keystroke. Steve O'Brien, vice-president for information operation assessments at Info-Ops.com, an Annapolis (Md.)-based company that provides intrusion detection services and security solutions, says the number of ways to hack into computers is rising fast. He tracks potential threats both from hacker groups and from the proliferation of programs. Once a rare find, he now discovers at least three new nasty software programs or vulnerabilities every day. And those tools aren't just for the intellectually curious. "Anyone can get them off the Internet--just point and click away," says Robert N. Weaver, a Secret Service agent in charge of the New York Area Electronic Crimes Task Force.

Experts say the first step for companies is to secure their systems by searching for hacker programs that might be used in such attacks. They also suggest formal security policies that can be distributed to employees letting them know how often to change passwords or what to do in case of an attack. An added help: Constantly updating software with the latest versions and security patches. Down the road, techniques that can filter and trace malicious software sent over the Web may make it harder to knock businesses off the Net. Says Novell Inc. CEO Eric Schmidt: "Security is a race between the lock makers and the lock pickers." Regulators say that cybercrime thrives because people accord the Internet far more credibility than it deserves. "You can get a lot of good information from the Internet--95% of what you do there is bona fide," says G. Philip Rutledge, deputy chief counsel of the Pennsylvania Securities Commission. "Unfortunately, that creates openings for fraud."…"

Excerpts from "Business Week Online, Ira Sager in New York, with Steve Hamm and Neil Gross in New York, John Carey in Washington, D.C., and Robert D. Hof in San Mateo, Calif.

Top Ten Computer Security Breaches

Systems affected: All system and network devices

BIND weaknesses: The Berkeley Internet Name Domain (BIND) package is the most widely used implementation of Domain Name Service (DNS) by which we locate systems on the Internet by name, without having to know specific IP addresses. In a typical example of a BIND attack, intruders erase system logs, and install tools to gain administrative access. They then compile and install IRC utilities and network scanning tools, which are used to scan more than a dozen class-B networks in search of additional systems running vulnerable versions of BIND. In a matter of minutes, they can use the compromised system to attack hundreds of remote systems.

Systems affected: Multiple UNIX and Linux systems

Vulnerable CGI (Common Gateway Interface) programs and application extensions (e.g., ColdFusion) installed on Web servers: Most Web servers support CGI for data collection and verification. Intruders are known to have exploited vulnerable CGI programs to vandalize Web pages, steal credit card information, and set up back doors to enable future intrusions, even if the CGI programs are secured. As a general rule, sample programs should always be removed from production systems.

Systems affected: All Web servers

Remote procedure call (RPC) weaknesses: Remote procedure calls (RPC) allow programs on one computer to execute programs on a second computer. They are widely used to access network services such as shared files in NFS. There is compelling evidence that the vast majority of distributed denial of service attacks launched during 1999 and early 2000 were executed by systems that had been victimized because they had RPC vulnerabilities. The broadly successful attack on US military systems during the Solar Sunrise incident also exploited an RPC flaw found on hundreds of Department of Defense systems.

Systems affected: Multiple UNIX and Linux systems

RDS security hole in Microsoft Internet Information Server (IIS): Programming flaws in Microsoft's Internet Information Server (IIS) used to host websites deployed on Microsoft Windows NT and Windows 2000 are employed by malicious users to run remote commands with administrator privileges. Some participants who developed the "Top Ten" list believe that exploits of other IIS flaws, such as .HTR files, are at least as common as exploits of RDS.

Systems affected: Microsoft Windows NT systems using Internet Information Server

Sendmail: Sendmail is the program that handles most e-mail on the Internet. It's widespread use makes it a prime target. In one of the most common exploits, the attacker sends a crafted mail message to the machine running Sendmail, and Sendmail reads the message as instructions requiring the victim machine to send its password file to the attacker's machine (or to another victim) where the passwords can be cracked.

Systems affected: Multiple UNIX and Linux systems

Sadmind and mounted: Sadmind allows remote administration access to Solaris systems, providing graphical access to system administration functions. Monitors controls and arbitrates access to NFS mounts on UNIX hosts. Buffer overflows in these applications can be exploited, allowing attackers to gain control with root access.

Systems affected: Multiple UNIX and Linux systems; Sadmind: Solaris machines only

Global file sharing and inappropriate information sharing via NetBIOS and Windows NT ports: These services allow file sharing over networks. When improperly configured, they can expose critical system files or give full file system access to hostile parties.

Systems affected: UNIX, Windows and Macintosh systems.

User IDs, especially root/administrator with no passwords or weak passwords: Some systems come with "demo" or "guest" accounts with no passwords or with widely-known default passwords. Service workers often leave maintenance accounts with no passwords, while some database management systems install administration accounts with default passwords. In addition, busy system administrators often select system passwords that are easily guessable ("love," "money," "wizard" are common) or just use a blank password. Many attackers try default passwords and then try to guess passwords before resorting to more sophisticated methods.

Systems affected: All systems.

IMAP and POP buffer overflow vulnerabilities or incorrect configuration: IMAP and POP are popular remote access mail protocols, allowing users to access their e-mail accounts. The "open access" nature of these services makes them especially vulnerable to exploitation because openings are frequently left in firewalls to allow for external e-mail access. Attackers who exploit flaws in IMAP or POP often gain instant root-level control.

Systems affected: Multiple UNIX and Linux systems

Default SNMP community strings set to 'public' and 'private': The Simple Network Management Protocol (SNMP) is widely used by network administrators to monitor and administer all types of network-connected devices, ranging from routers to printers to computers. SNMP uses an unencrypted

"community string" as its only authentication mechanism. Lack of encryption is bad enough, but the default community string used by the vast majority of SNMP devices is "public", with a few clever network equipment vendors changing the string to "private". Attackers can use this vulnerability in SNMP to reconfigure or shut down devices remotely.

Express Computer Business Weekly

Information Technology Security Practices

Computer Security Policy

The term *computer security policy* has more than one meaning. Policy is senior management's directives to create a computer security program, establish its goals, and assign responsibilities. The term policy is also used to refer to the specific security rules for particular systems. Additionally, policy may refer to entirely different matters, such as the specific managerial decisions setting an organization's e-mail privacy policy or fax security policy.

Program Management

Managing computer security at multiple levels brings many benefits. Each level contributes to the overall computer security program with different types of expertise, authority, and resources. In general, executive managers (such as those at the headquarters level) better understand the organization as a whole and have more authority. On the other hand, front-line managers (at the computer facility and applications levels) are more familiar with the specific requirements, both technical and procedural, and problems of the systems and the users. The levels of computer security program management should be complementary; each can help the other be more effective. Many organizations have at least two levels of computer security management; the *central* level and the *system* level.

Risk Management

Risk is the possibility of something adverse happening. Risk management is the process of assessing risk, taking steps to reduce risk to an acceptable level and maintaining that level of risk. Risk management requires the analysis of risk, relative to potential benefits, consideration of alternatives, and, finally, implementation of what management determines to be the best course of action. Risk management consists of two primary and one underlying activity; risk assessment and risk mitigation are the primary activities and uncertainty analysis is the underlying one. An organization should consider the following when assessing risks.

Life Cycle Planning

Security, like other aspects of an IT system, is best managed if planned for *throughout* the IT system life cycle. There are many models for the IT system life cycle but most contain five basic phases: initiation, development/acquisition, implementation, operation, and disposal.

Personnel/User Issues

Many important issues in computer security involve users, designers, implementers, and managers. A broad range of security issues relate to how these individuals interact with computers and the access and authorities they need to do their job. No IT system can be secured without properly addressing these security issues.

Preparing for Contingencies and Disasters

Contingency planning directly supports an organization's goal of continued operations. Organizations should practice contingency planning because it makes good business sense. Contingency planning addresses how to keep an organization's critical functions operating in the event of disruptions, both large and small. This broad perspective on contingency planning is based on the distribution of computer support throughout an organization. The following six steps describe the basic functions an organization should employ when developing contingency plans.

Computer Security Incident Handling

A computer security incident can result from a computer virus, other malicious code, or a system intruder, either an insider or an outsider. The definition of a computer security incident is somewhat flexible and may vary by organization and computing environment. An incident handling capability may be viewed as a component of contingency planning, because it provides the ability to react quickly and efficiently to disruptions in normal processing. Incident handling can be considered that portion of contingency planning that responds to malicious technical threats.

Awareness and Training

An effective computer security awareness and training program requires proper planning, implementation, maintenance, and periodic evaluation.

Security Considerations in Computer Support and Operations

Computer support and operations refers to system administration and tasks external to the system that support its operation (e.g., maintaining documentation). Failure to consider security as part of the support and operations of IT systems is, for many organizations, a significant weakness. Computer security system literature includes many examples of how organizations undermined their often expensive security measures because of poor documentation, no control of maintenance accounts, or other shoddy practices.

Physical and Environmental Security

Physical and environmental security controls are implemented to protect the facility housing system resources, the system resources themselves, and the facilities used to support their operation. An organization's physical and environmental security program should address the following seven topics. In doing so, it can help prevent interruptions in computer services, physical damage, unauthorized disclosure of information, loss of control over system integrity, and theft.

Identification and Authentication

Identification and Authentication is a critical building block of computer security since it is the basis for most types of access control and for establishing user accountability. Identification [6] and Authentication is a technical measure that prevents unauthorized people (or unauthorized processes) from entering an IT system. Access control usually requires that the system be able to identify and differentiate among users. For example, access control is often based on *least privilege*, which refers to the granting to users of only those accesses minimally required to perform their duties. User accountability requires the linking of activities on an IT system to specific individuals and, therefore, requires the system to identify users.

Logical Access Control

Access is the ability to do something with a computer resource (e.g., use, change, or view). Logical access controls are the system-based means by which the ability is explicitly enabled or restricted in some way. Logical access controls can prescribe not only who or what (e.g., in the case of a process) is to have access to a specific system resource but also the type of access that is permitted.

Audit Trails

Audit trails maintain a record of system activity by system or application processes and by user activity. In conjunction with appropriate tools and procedures, audit trails can provide a means to help accomplish *several* security-related objectives, including individual accountability, reconstruction of events, intrusion detection, and problem identification.

Cryptography

Cryptography is a branch of mathematics based on the transformation of data. It provides an important tool for protecting information and is used in many aspects of computer security. Cryptography is traditionally associated only with keeping data secret. However, modern cryptography can be used to provide many security services, such as electronic signatures and ensuring that data has not been modified. Several important issues should be considered when designing, implementing, and integrating cryptography in an IT system.

Utility Substations

Substations were rated a MODERATE PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

The City of Novato has two utility substations that serve the City. A long term power outage in the city of Novato could cause economic damage and life safety threats due to lack of water and sanitary services.

Ignacio Substation Facility Description

Location

137 Hamilton Drive
Marin County
Novato, CA 94949
Phone: (707) 577-7283

Facility

This staffed substation, which has been in operation since 1941, houses oil-filled electrical equipment (transformers, oil circuit breakers and regulators) and associated equipment, materials and controls. The operating electrical equipment is located throughout the substation yard. This substation also includes storage areas or spare oil-filled electrical equipment and gas cylinders.

The property to the south of the yard across Hamilton Drive is business/industrial property, and the property to the north and east is undeveloped open wetland. There is a flood control canal along the west and north fence outside the yard.

In addition to the operating equipment, the following buildings and structures are located in the substation yard. The locations of these buildings and structures are shown on the facility layout:

Control Building:	This building houses the main control for the substation equipment. Substation systems operators operate these controls 24 hours per day, 7 days per week.
Maintenance Building:	This building houses spill control equipment, and miscellaneous materials and supplies necessary for the maintenance and repair of equipment.
Office Trailers:	These two trailers provide office space for facility personnel.
Storage Shed:	A storage shed near the couth fence houses a stand-by generator.
Cargo Containers:	These four containers store materials and supplies for facility personnel.
Fence:	The entire yard is surrounded by a six-foot high chain link fence topped with one foot of barbed wire. There are two vehicle entrance gates to the facility.

Low Risk Priority Hazards

Aviation Disasters

Aviation Disasters were rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

A major air crash that occurs in a heavily populated residential area can result in considerable loss of life and property. The impact of a disabled aircraft as it strikes the ground creates the likely potential for multiple explosions, and fires have the potential to cause injuries, fatalities and the destruction of property at and adjacent to the impact point. The time of day when the crash occurs may have a profound affect on the number of dead and injured. Damage assessment and disaster relief efforts associated with an air crash incident will require support form other local governments, private organizations and in certain instances from the state and federal governments.

It can be expected that few, if any, airline passengers will survive a major air crash. The intense fires, until controlled, will limit search and rescue operations. Police barricades will be needed to block off the affected area. The crowds of onlookers and media personnel will have to be controlled. Emergency medical care, food and temporary shelter will be required by injured or displaced persons. Many families may be separated, particularly if the crash occurs during working hours; and a locator system should be established at a location convenient to the public. Investigators from the National Transportation and Safety Board and the Marin County Coroners Office will have short-term jurisdiction over the crash area and investigations will be completed before the area is released for clean up. The clean-up operation may consist of the removal of large debris, clearing roadways, demolishing unsafe structures and towing of demolished vehicles.

It can be anticipated that the mental health needs of survivors and the surrounding residents will greatly increase due to the trauma associated with such a catastrophe. A coordinated response team, comprised of mental health professionals, should take a proactive approach toward identifying and addressing mental health needs stemming from any traumatic disaster.

It is impossible to totally prepare, either physically or psychologically, for the aftermath of a major air crash. However, since Northern California is becoming one of the States most overcrowded airspaces, air crash incidents are no longer a probability but a reality. Therefore, air crash incidents must be included among other potential disasters.

Gnoss Field

Gnoss Field is located in the County outside of Novato's Sphere of Influence. It is a general aviation airport owned by the County and has no scheduled commercial flights. It has, however, a significant number of private aircraft operations and an air taxi service.

The County's *Gnoss Field Master Plan* describes the expected growth in airport operations and related development. It projects a doubling of based aircraft in the period 1986 to 2006, with an increase in operations (one landing or one take-off) from 189,000 in 1996 to 204,000 in 2006. The improvements called for in the Master Plan include facilities to maintain a fixed-based aviation operator.

Novato is represented on the County's Airport Land Use Commission (ALUC), which reviews all projects adjacent to Gnoss Field for compliance with their plan. Additional policies and programs dealing with Gnoss Field are in the Safety Chapter.

Explosion

Explosion was rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

An explosion is a rapid release of stored energy characterized by a bright flash and an audible blast. Part of the energy is released as thermal radiation (flash); and part is coupled into the air as air blast and into the soil (ground) as ground shock, both as radially expanding shock waves.

To be explosive, the material:

1. Must contain a substance or mixture of substances that remains unchanged under ordinary conditions, but undergoes a fast chemical change upon stimulation.

2. This reaction must yield gases whose volume—under normal pressure, but at the high temperature resulting from an explosion—is much greater than that of the original substance.

3. The change must be exothermic in order to heat the products of the reaction and thus to increase their pressure.

Common types of explosions include construction blasting to break up rock or to demolish buildings and their foundations, and accidental explosions resulting from natural gas leaks or other chemical/explosive materials.

The rapid expansion of hot gases resulting from the detonation of an explosive charge gives rise to a compression wave called a **shock wave,** which propagates through the air. The front of the shock wave can be considered infinitely steep, for all practical purposes. That is, the time required for compression of the undisturbed air just ahead of the wave to full pressure just behind the wave is essentially zero.

If the explosive source is spherical, the resulting shock wave will be spherical. Since its surface is continually increasing, the energy per unit area continually decreases. Consequently, as the shock wave travels outward from the charge, the pressure in the front of the wave, called the **peak pressure**, steadily decreases. At great distances from the charge, the peak pressure is infinitesimal, and the wave can be treated as a sound wave.

Behind the shock wave front, the pressure in the wave decreases from its initial peak value. At some distance from the charge, the pressure behind the shock front falls to a value below that of the atmosphere and then rises again to a steady value equal to that of the atmosphere. The part of the shock wave in which the pressure is greater than that of the atmosphere is called the **positive phase**, and, immediately following it, the part in which the pressure is less than that of the atmosphere is called the **negative or suction phase**.

Conventional structures, in particular those above grade, are susceptible to damage from explosions, because the magnitudes of design loads are significantly lower than those produced by most explosions. The peak pressure in the blast pulse produced by 10 lb of TNT at a range of about 50’ is approximately 2.4 psi (which is 348 psf!) with a duration of the positive phase of 7.7 ms. Conventional structures are not normally designed to resist blast loads.

Recent terrorist attacks demonstrate the types of damage that can be produced. The 1993 terrorist attack on the World Trade Center in New York City removed several thousand square feet of concrete

floor slabs in the general area of the explosion and severely damaged several buildings' communication, transportation and utility systems. Due to the inherent redundancy of the steel frames, the structures did not collapse.

The 1995 attack on the Alfred P. Murrah Federal Building in Oklahoma City revealed the vulnerability of conventional structural designs when subjected to blast loads. When a source is located at street level, the blast shock wave acts up against the underside of the floor slabs at upper stories. Floor slabs are not designed for this magnitude and direction of load—for this direction of load, the reinforcement is in the wrong place.

Explosion Hazards

There are many potential explosion hazards in Marin County. Catastrophic explosions could be caused by:

- Exotic Chemicals and Substances
- Natural Gas and Propane
- Methane Gas
- Gasoline and other liquid fuels
- Manufactured and Military Explosives

The origin of a catastrophic explosion may be:

- Stationary pressure vessels and tanks
- Rail tank cars
- Truck tanks
- Pipelines
- Cargo ships carrying explosive materials

Explosions can be triggered by:

- Manual of Accidental Detonation of Explosives
- Fire/Open Flame
- Electrical Discharge
- Chemical Interaction
- Radiological Reaction
- Faulty Containment
- Equipment Malfunctions

Explosion Consequences

A catastrophic explosion could challenge responders to deal with:

- Mass casualties
- Fires
- Building and property destruction
- Infrastructure failure (telecommunications, transportation, etc.)
- Lifeline interruption
- Chemical or radiation contamination
  Debris removal

Severe Weather

Severe Weather was rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Windstorms

The potential risk of widespread damage in Marin County from wind is not as considerable as the risk from earthquakes or wildfires. Nevertheless, severe windstorms pose a significant risk to life and property by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes.

High winds can and do occasionally cause damage to homes and businesses. Severe windstorms can present a very destabilizing effect on the dry brush that covers local hillsides and urban wildland interface areas and increase wildfire threat. Destructive impacts to trees, power lines, and utility services also are associated with high winds.

In windstorms, reports of dislodged roofs and fallen trees and power lines are common. The winds are not considered major widespread threats to population and property, but do involve responses from emergency service personnel. Fallen power lines may cause widespread power outages and fire. Falling trees can occasionally cause fatalities and serious structural damage. These incidents are rare as well as localized.

El Niño

In the spring of 1997, Pacific Ocean temperatures along the equator from South America to Australia were rising above normal, changing wind patterns in the area. This is phenomenon known as El Nino. As part of the global impact of El Nino, heavy storms for 1997-1998 were predicted for the State of California.

> On February 9, 1998, President Clinton, in response to a request from Governor Wilson, declared a major disaster for 27 counties in the State of California. The disaster was designated as FEMA-1203-DR-CA. On February 13, 1998 four additional counties were added; on February 26, four more counties were added, and on March 6, 1998, six additional counties were designated, bringing the total to 41. Most damage was caused by flooding; however there was extensive damage from high winds and slides as well.

Radiological Incidents

Radiological Incidents were rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District. The only potential radiological incidents would result from a low level materials spill from a hospital device or from a transportation incident of unknown radiological origin traveling on U.S. Highway 101. There is no history, however, of such an occurrence.

Economic Disruption

Economic Disruption was rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Two in three county residents predict bad economic times for California during the next 12 months. This is a considerably higher percentage than we found in Statewide Surveys in 2000, 2001, and 2002. These pessimistic views are shared across geographic, racial/ethnic, demographic, and political groups.

"Turning to economic conditions in California, do you think that during the next 12 months we will have good times financially or bad times?

When asked to evaluate the Marin County economy today, only 24 percent of resident's rate it as excellent or good—48 percent say it is fair, and 27 percent rate it as poor. The low ratings are consistent across geographic areas and demographic groups.

As for their parts of Marin County, half of county residents report their areas are now in a mild (12%), moderate (25%) or serious (14%) recession. The Central/Southeast area has the highest percentage of residents (58%) who say their part of the county is in a recession. Higher percentages of Latinos (58%) and blacks (57%) than whites (44%) say their areas are in a recession. Residents with lower incomes and less education and immigrants are also more likely than others to share this view.

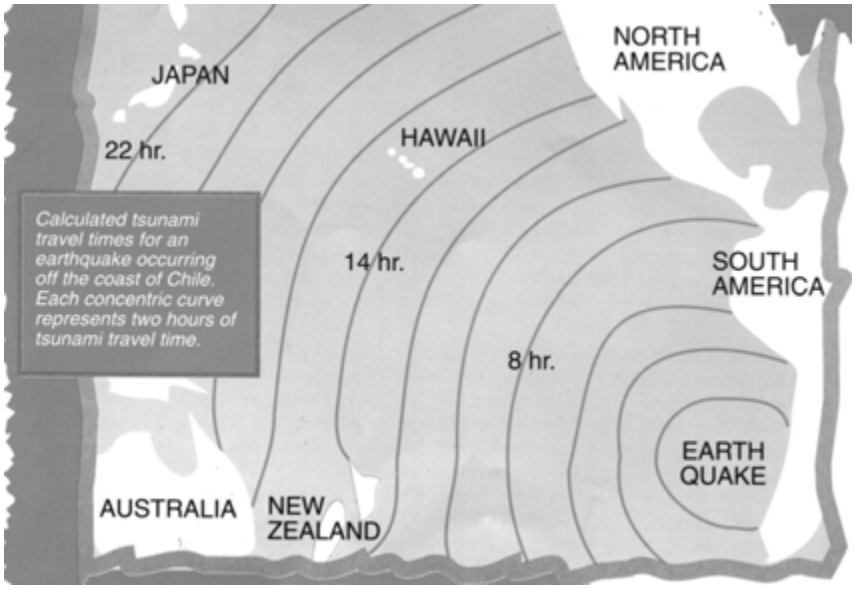
"Do you think that things in Marin County are generally going in the right direction or the wrong direction?

Residents are divided about their overall outlook for the county: Forty percent say that Marin County is headed in the right direction, and 43 percent believe that it is headed in the wrong direction. Concerning quality of life, 61 percent of Marin County residents say things are going well, and 36 percent say they are not. More than one-third of residents in all four areas believe things are going badly. Although 51 percent see themselves living in the same neighborhood five years from now, 22 percent expect to be living elsewhere in the county, and 17 percent expect to be living outside the county. Younger and more educated residents are most likely to say they will move out of the county in the next five years.

Tsunami

Tsunami was rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Tsunamis, also called seismic sea waves or, incorrectly, tidal waves, generally are caused by earthquakes, less commonly by submarine landslides, infrequently by submarine volcanic eruptions and very rarely by a large meteorite impact in the ocean. Submarine volcanic eruptions have the potential to produce immense tsunami waves. The Great Krakatau Volcanic Eruption of 1883 generated giant waves reaching heights of 125 feet above sea-level, killing thousands of people and wiping out numerous coastal villages.



The 1992 Nicaragua tsunami may have been the result of a "slow" earthquake comprised of very long-period movement occurring beneath the sea floor. This earthquake generated a devastating tsunami with localized damage to coastal communities in Nicaragua.

In 2004 a devastating tsunami was generated in Indonesia and was responsible for killing thousands and causing billions of dollars in damage.

Not all earthquakes generate tsunamis. To generate tsunamis, earthquakes must occur underneath or near the ocean, be large and create movements in the sea floor. All oceanic regions of the world can experience tsunamis, but in the Pacific Ocean there is a much more frequent occurrence of large, destructive tsunamis because of the many large earthquakes along the margins of the Pacific Ocean.

Wave Height and Water Depth

In the open ocean a tsunami is less than a few feet high at the surface, but its wave height increases rapidly in shallow water. Tsunamis wave energy extends from the surface to the bottom in the deepest waters. As the tsunami attacks the coastline, the wave energy is compressed into a much shorter distance creating destructive, live-threatening waves.

In the deep ocean, destructive tsunamis can be small--often only a few feet or less in height--and cannot be seen nor can they be felt by ships. But, as the tsunami reaches shallower coastal waters, wave height can increase rapidly. Sometimes, coastal waters are drawn out into the ocean just before the tsunami strikes. When this occurs, more shoreline may be exposed than even at the lowest tide. This major withdrawal of the sea should be taken as a warning of the tsunami waves that will follow.

Pacific-Wide and Local Tsunamis

The last large tsunami that caused widespread death and destruction throughout the Pacific was generated by an earthquake located off the coast of Chile in 1960. It caused loss of life and property damage not only along the Chile coast but in Hawaii and as far away as Japan. The Great Alaskan Earthquake of 1964 produced deadly tsunami waves in Alaska, Oregon and California.

In July 1993, a tsunami generated in the Sea of Japan killed over 120 peoples in Japan. Damage also occurred in Korea and Russia but not in other countries since the tsunami wave energy was confined within the Sea of Japan. The 1993 Sea of Japan tsunami is known as a "local event" since its impact was confined to the nearby regional area in the proximity of the earthquake that generated the tsunami. For people living along the northwestern coast of Japan, the tsunami waves followed the earthquake within a few minutes. Local tsunamis also occurred in Nicaragua (1992), Indonesia (1992, 1994) and the Philippines (1994) killing thousands of people. Scientific studies indicate that local tsunamis generated off the northern California, Oregon and Washington coast can arrive within five to 30 minutes after the earthquake is felt.

The Association of Bay Area Governments describes the potential risk for damage from a tsunami to be greatest in San Francisco and San Mateo Counties. Data for Marin County is not yet available.

Warnings

The Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii, serves as the regional Tsunami Warning Center for Hawaii and as a national/international warning center for tsunamis that pose a Pacific-wide threat. This international warning effort became a formal arrangement in 1965 when PTWC assumed the international warning responsibilities of the Pacific Tsunami Warning System (PTWS). The PTWS is comprised of 26 international Member States that are organized as the International Coordination Group for the Tsunami Warning System in the Pacific. Many Member States countries operate national tsunami warning centers, providing warning services for their local area.

The objective of the PTWS is to detect, locate and determine the magnitude of potentially tsunamigenic earthquakes occurring in the Pacific Basin or its immediate margins. Earthquake information is provided by seismic stations operated by PTWC, ATWC, the U.S. Geological Survey's National Earthquake Information Center and international sources. If the location and magnitude of an earthquake meet the known criteria for generation of a tsunami, a tsunami warning is issued to warn of an imminent tsunami hazard.

The warning includes predicted tsunami arrival times at selected coastal communities within the geographic area defined by the maximum distance the tsunami could travel in a few hours. A tsunami watch with additional predicted tsunami arrival times is issued for a geographic area defined by the distance the tsunami could travel in a subsequent time period.

Tsunami Research Activities

With the broad availability of relatively inexpensive yet powerful computers and desk-top workstations, there is growing interest and activity in tsunami research. Using the latest in computer technology,

scientists are able to numerically model tsunami generation, open ocean propagation and coastal run-up. Recent advances in the technology have led to improved propagation and run-up models.

Sub-surface pressure sensors, able to measure tsunamis in the open ocean, are providing important data on the propagation of tsunamis in deep water. Unfortunately, the mechanism of tsunami generation is not well understood.

Seismologists, studying the dynamics of earthquakes, are formulating new methods to analyze earthquake motion and the amount of energy released. Where the traditional Richter (surface wave) magnitude of earthquakes is not accurate above 7.5, the seismic moment is designed to better define the amount of energy released and the potential for tsunami generation. It is hoped that this relationship between seismic moment and the potential for tsunami generation can be refined so that the near-real time analysis of earthquakes can be performed for tsunami warning purposes.

Tsunami inundation models, defining the extent of coastal flooding, are an integral aspect of tsunami hazard and preparedness planning. Using worst case inundation scenarios, these models are critical to defining evacuation zones and routes so that coastal communities can be evacuated quickly when a tsunami warning has been issued. NOAA's Pacific Marine Environmental Laboratory is taking a lead role in developing tsunami inundation maps for coastal communities in Alaska, California, Hawaii, Oregon and Washington states.

In the area of improved tsunami wave detection instrumentation, recording systems comprised of sub-surface pressure sensors have been tested over the last decade off the Alaska and Oregon coasts. These pressure sensors, located on the sea floor, have successfully measured tsunami wave amplitudes in the open ocean. The final step in developing a deep water tsunami wave detection system for warning purposes brings together the collection of the pressure data and its subsequent rapid, reliable telemetry to the shore-based warning center. Open ocean tsunami wave detection systems using satellite or radio telemetry are being tested off the California coast.

Special Event

Special Events were rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Large crowds, gathered for special events, represent disaster hazards in the following ways:

- Viable targets for a terrorists
- Concentration of people in a relatively small, enclosed area during earthquakes
- Site for mass casualties in the event of an aviation disaster
- Challenge to egress in the event of a large fire elevating the risk of mass casualties
- Depending on the event, could be prone to civil disobedience or riots

Biological & Health Emergencies

Biological/Health Emergencies were rated as a LOW PRIORITY HAZARD in the City of Novato-Novato Sanitary District.

Marin County has experienced numerous disasters, varying in type and severity. Disasters often result in the need for health and human services as part of the immediate and long-term recovery period. Some disasters are localized with service needs focused in a single location; other disasters, such as earthquakes and civil unrest, result in geographically widespread health and human services needs.

It is essential following a disaster to identify locations where large numbers of people are gathered in open areas. These areas will require evaluation in order to assess health and human service needs. The recovery period may be shortened if health, mental health, and housing problems can be addressed quickly.

Health Hazards

West Nile Virus

1. West Nile virus (WNV) is a mosquito-borne disease that is common in Africa, west Asia and the Middle East.

2. West Nile virus was first detected in the United States in New York in 1999. Since then, WNV has spread to 46 states, Canada, and Mexico.

3. In 2003, three locally acquired human WNV cases were detected in residents of Los Angeles , Imperial, and Riverside counties, and WNV activity was detected in dead birds, mosquitoes, sentinel chickens, and a horse in six southern California counties. West Nile virus has also been detected in 2004 in southern California.

4. Last year there were almost 10,000 human cases of WNV detected, including 262 deaths in the United States.

5. People usually get WNV from the bite of an infected mosquito. There is also evidence that WNV can be acquired via a blood transfusion or organ transplant from an infected donor.

6. Most people who are bitten by a mosquito with WNV will not get sick. People who do become ill may experience mild to moderate flu-like symptoms like fever, headache and body ache. It is estimated that less than 1% of the people who are infected with WNV become severely ill and require hospitalization. The elderly and immuno-compromised are particularly susceptible to illness caused by WNV.

7. Currently there is no specific treatment for WNV infection. Since it is a virus it does not respond to antibiotics. In severe cases hospitalization and supportive care is important.

8. California has a long history of conducting surveillance for mosquito-borne viruses and has taken active steps to ensure early detection of WNV. Due to ongoing collaboration between over 70 local mosquito and vector control agencies and state public agencies, California is well

prepared to detect, monitor, and respond to WNV. These agencies use a variety of scientific techniques and products to control mosquitoes in their earliest stages and play a key role in reducing the risk of WNV. Also California has launched a statewide public education effort about personal protection measures and reporting dead birds.

9. The public is encouraged to assist in the efforts to detect and monitor WNV by calling the WNV hotline if they find a crow, raven, magpie, jay, sparrow, finch, or hawk that has been dead for about a day. Birds play an important role in maintaining and spreading this virus. Mosquitoes acquire the virus from infected birds, and then transmit the virus to people. Evidence of the virus in dead birds is often the first indication that WNV has been introduced into a new region.

Vector Control

A surveillance program adequate to monitor WNV activity levels associated with human risk must be in place. Detection of epizootic transmission of enzootic arboviruses typically precedes detection of human cases by several days to 2 weeks or longer (e.g., as found in SLE epidemics). If adequate surveillance is in place, the lead time between detecting significant levels of epizootic transmission and occurrence of human cases can be increased, which will allow for more effective intervention practices. Early-season detection of enzootic or epizootic WNV activity appears to be correlated with increased risk of human cases later in the season. Control activity should be intensified in response to evidence of virus transmission, as deemed necessary by the local health departments.

Such programs should consist of public education emphasizing personal protection and residential source reduction; municipal larval control to prevent repopulation of the area with competent vectors; adult mosquito control to decrease the density of infected, adult mosquitoes in the area; and continued surveillance to monitor virus activity and efficacy of control measures.

Severe Acute Respiratory Syndrome (SARS)

Marin County includes major port cities, and as such diseases anywhere in the world constitute a potential threat. Severe acute respiratory syndrome (SARS), a recently recognized, contagious febrile lower respiratory infection caused by a novel corona virus called SARS-CoV, is an example of a potential threat to a port city.

The worldwide outbreak of SARS that occurred between November 2002 and July 2003 most likely originated in China and then spread through travel. During this outbreak 22 potential SARS cases were investigated in Los Angeles. Seven were considered probable SARS but none of these cases had a specimen that was positive for SARS-CoV infection. The investigation and monitoring required for 22 potential cases was considerable.

It is possible that SARS may re-emerge; therefore, it is important that Marin County be prepared to immediately identify cases and contain the disease.

The California Health and Safety Code (H&S), the California Code of Regulations (CCR) and the Marin County Code (LACC) grant the Marin County Health Officer authority to collect records and data with respect to communicable disease, initiate disease control measures, control property and manage persons (including isolation and quarantine).

SARS Case Count

During November 2002-July 2003, a total of 8,098 probable SARS cases were reported to the World Health Organization (WHO) from 29 countries. In the United States, only 8 cases had laboratory evidence of infection with SARS-CoV. Since July 2003, when SARS-CoV transmission was declared

contained, active global surveillance for SARS-CoV disease has detected no person-to-person transmission of SARS-CoV. CDC has therefore archived the case report summaries for the 2003 outbreak.

During the 2003 epidemic, CDC and the Council of State and Territorial Epidemiologists (CSTE) developed surveillance criteria to identify persons with SARS in the United States. The surveillance case definition changed throughout the epidemic, to reflect increased understanding of SARS-CoV disease.

In California, there were a total of 29 cases, 22 of which were suspect, 5 were probably SARS and 2 were confirmed.

SARS Surveillance

The key to controlling a SARS outbreak is prompt detection of cases and their contacts, followed by rapid implementation of control measures. Identification of SARS cases is the basic step in prevention efforts, whereas contact tracing provides a means to focus case-finding and containment efforts on persons who are at greatest risk of SARS-CoV disease. Two features of SARS-CoV disease pose challenges for case surveillance. First, the early signs and symptoms are not specific enough to reliably distinguish SARS-CoV disease from other common respiratory illnesses. Second, existing laboratory diagnostic tests are not adequately sensitive early in the course of illness. Therefore, risk of exposure (i.e., to another case of SARS-CoV disease or to a setting where SARS-CoV transmission is occurring) is key to considering the likelihood of a diagnosis of SARS-CoV disease.

Potential sources of SARS-CoV for future exposures include persistent infection in previously ill persons or reintroduction to humans from an animal reservoir. In the absence of SARS-CoV transmission worldwide, the most likely sites of recurrence are the original site of introduction of SARS-CoV from animals to humans and locations where person-to-person SARS-CoV transmission previously occurred. Laboratories that contain live SARS-CoV could be a source of further transmission if compromised laboratory techniques result in laboratory-acquired infections and report from the Department of Health, Taiwan Because persons with SARS-CoV disease tended to appear in clusters (e.g., in healthcare facilities, households, and a few special settings) during the 2003 outbreaks, early signals of the reappearance of the illness in U.S. communities could include unusual clusters of unexplained pneumonia.

Mad Cow Disease (Creutzfeldt-Jakob disease (vCJD))

The Novato Sanitary District leases land to a cattle farmer adjacent to the City of Novato.

New variant CJD (vCJD) is a rare, degenerative, fatal brain disorder in humans. Although experience with this new disease is limited, evidence to date indicates that there has never been a case of vCJD transmitted through direct contact of one person with another. However, a case of probable transmission of vCJD through transfusion of blood components from an asymptomatic donor who subsequently developed the disease has been reported.

As of December 1, 2003, a total of 153 cases of vCJD had been reported in the world: 143 from the United Kingdom, six from France, and one each from Canada, Ireland, Italy, and the United States (note: the Canadian, Irish, and U.S. cases were reported in persons who resided in the United Kingdom during a key exposure period of the U.K. population to the BSE agent).

Almost all the 153 vCJD patients had multiple-year exposures in the United Kingdom between 1980 and 1996 during the occurrence of a large UK outbreak of bovine spongiform encephalopathy (BSE, commonly known as mad cow disease) among cattle.

There has never been a case of vCJD that did not have a history of exposure within a country where this cattle disease, BSE, was occurring.

It is believed that the persons who have developed vCJD became infected through their consumption of cattle products contaminated with the agent of BSE. There is no known treatment of vCJD and it is invariably fatal.

Since 1996, evidence has been increasing for a causal relationship between ongoing outbreaks in Europe of a disease in cattle, called bovine spongiform encephalopathy (BSE, or "mad cow disease"), and a disease in humans, called variant Creutzfeldt-Jakob disease (vCJD). Both disorders are invariably fatal brain diseases with unusually long incubation periods measured in years, and are caused by an unconventional transmissible agent.

On December 23, 2003, the U.S. Department of Agriculture (USDA) announced a presumptive diagnosis of bovine spongiform encephalopathy (BSE, or "mad cow" disease) in an adult Holstein cow from Washington State. The diagnosis was confirmed by an international reference laboratory in Weybridge, England, on December 25, 2003. Preliminary trace-back based on an ear-tag identification number suggests that the BSE-infected cow was imported into the United States from Canada in August 2001.

Influenza (Flu)

Epidemics of influenza typically occur during the winter months and have been responsible for an average of approximately 36,000 deaths/year in the United States during 1990–1999. Influenza viruses also can cause pandemics, during which rates of illness and death from influenza-related complications can increase dramatically worldwide. Influenza viruses cause disease among all age groups. Rates of infection are highest among children, but rates of serious illness and death are highest among persons aged ≥ 65 years and persons of any age who have medical conditions that place them at increased risk for complications from influenza.

Influenza vaccination is the primary method for preventing influenza and its severe complications. In this report from the Advisory Committee on Immunization Practices (ACIP), the primary target groups recommended for annual vaccination are 1) groups that are at increased risk for influenza-related complications (e.g., persons aged ≥ 65 years and persons of any age with certain chronic medical conditions); 2) the group aged 50–64 years because this group has an elevated prevalence of certain chronic medical conditions; and 3) persons who live with or care for persons at high risk (e.g., health-care workers and household contacts who have frequent contact with persons at high risk and who can transmit influenza to persons at high risk). Vaccination is associated with reductions in influenza-related respiratory illness and physician visits among all age groups, hospitalization and death among persons at high risk, otitis media among children, and work absenteeism among adults. Although influenza vaccination levels increased substantially during the 1990s, further improvements in vaccine coverage levels are needed, chiefly among persons aged <65 years who are at increased risk for influenza-related complications among all racial and ethnic groups and among blacks and Hispanics aged ≥ 65 years. ACIP recommends using strategies to improve vaccination levels, including using reminder/recall systems and standing orders programs. Although influenza vaccination remains the cornerstone for the control and treatment of influenza, information is also presented regarding antiviral medications, because these agents are an adjunct to vaccine.

Influenza Epidemic

The influenza (flu) epidemics that happen nearly every year are important events. Influenza is a respiratory illness that makes hundreds of thousands of people sick each year. The illness can cause severe health problems for the elderly and younger people with diseases, such as diabetes, heart or

lung disease, and illness that can weaken the immune system. Typical primary influenza illness lasts about a week and is characterized by abrupt onset of fever, muscle aches, sore throat, and nonproductive cough. In some persons, severe malaise and cough can persist for several days or weeks.

Influenza infection not only causes primary illness but also can lead to severe secondary medical complications, including influenza viral pneumonia, secondary bacterial pneumonia, worsening of underlying medical conditions, such as congestive heart failure, asthma, or diabetes, or other complications such as ear infections (i.e., otitis media) in children.

Elderly persons (i.e., those 65 years and over) and persons with certain underlying medical conditions, such as chronic heart or lung disease, are at increased risk for developing complications from influenza infection. These complications increase the risk for hospitalization or death.

One of the most important features about influenza viruses is that their structure changes slightly but frequently over time (a process known as “drift”), and that this process results in the appearance of different strains that circulate each year. The composition of the flu vaccine is changed each year to help protect people from the strains of influenza virus that are expected to be the most common ones circulating during the coming flu season.

The ability of the vaccine to protect against influenza during a particular season depends on several factors, but particularly 1) the match between influenza strains in the vaccine and strains circulating in the community, and 2) the ability of each person's immune system to mount a protective response as a result of the vaccination. Although the vaccine may not prevent everyone who takes it from getting sick, it does reduce the risk of severe illness, hospitalization, and death. That's why it is so important for anyone who wants to reduce his or her risk of getting severely ill from influenza to receive the vaccine each year.

Influenza Pandemic

By contrast to the more gradual process of drift, in some years, the influenza virus changes dramatically and unexpectedly through a process known as “shift.” Shift results in the appearance of a new influenza virus to which few (if any) people are immune. If this new virus spreads easily from person to person, it could quickly travel around the world and cause increased levels of serious illness and death, affecting millions of people. **This is called an influenza pandemic.**

Fortunately, pandemics don't occur very often. There has not been an influenza pandemic since 1968. In 1997, however, a flu virus, that had previously infected only birds, caused an outbreak of illness in humans. This virus, known as the “avian flu,” resulted in 18 illnesses and six deaths in Hong Kong but did not easily spread from person to person. Still, it provided a frightening reminder that the next pandemic could occur at any time. Governments around the world took notice. The U.S. government worked with State and local governments, and private-sector partners, to develop strategies and programs that would prepare our country for a pandemic.

Avian Influenza (Bird Flu)

Influenza viruses that infect birds are called “avian influenza viruses.” Only influenza A viruses infect birds. All known subtypes of influenza A virus can infect birds. However, there are substantial genetic differences between the subtypes that typically infect both people and birds. Within subtypes of avian influenza viruses there also are different strains (described in “Strains”).

Avian influenza H5 and H7 viruses can be distinguished as “low pathogenic” and “high pathogenic” forms on the basis of genetic features of the virus and the severity of the illness they cause in poultry;

influenza H9 virus has been identified only in a "low pathogenicity" form. Each of these three avian influenza viruses (H5, H7, and H9) can theoretically be partnered with any one of nine neuraminidase surface proteins; thus, there are potentially nine different forms of each subtype (e.g., H5N1, H5N2, H5N3, H5N9).

Below is summary information about these three prominent subtypes of avian influenza virus:

Influenza A H5

- Potentially nine different subtypes
- Can be highly pathogenic or low pathogenic
- H5 infections have been documented among humans, sometimes causing severe illness and death

Influenza A H7

- Potentially nine different subtypes
- Can be highly pathogenic or low pathogenic
- H7 infection in humans is rare, but can occur among persons who have close contact with infected birds; symptoms may include conjunctivitis and/or upper respiratory symptoms

Influenza A H9

- Potentially nine different subtypes
- Documented only in low pathogenic form
- Three H9 infections in humans have been confirmed.

Spread of Avian Influenza Viruses among Birds

Avian influenza viruses circulate among birds worldwide. Certain birds, particularly water birds, act as hosts for influenza viruses by carrying the virus in their intestines and shedding it. Infected birds shed virus in saliva, nasal secretions, and feces. Susceptible birds can become infected with avian influenza virus when they have contact with contaminated nasal, respiratory, or fecal material from infected birds. Fecal-to-oral transmission is the most common mode of spread between birds.

Most often, the wild birds that are host to the virus do not get sick, but they can spread influenza to other birds. Infection with certain avian influenza A viruses (for example, some H5 and H7 strains) can cause widespread disease and death among some species of domesticated birds.

Avian Influenza Infection in Humans

Although avian influenza A viruses do not usually infect humans, several instances of human infections and outbreaks of avian influenza have been reported since 1997. Most cases of avian influenza infection in humans are thought to have resulted from contact with infected poultry or contaminated surfaces. However, there is still a lot to learn about how different subtypes and strains of avian influenza virus might affect humans. For example, it is not known how the distinction between low pathogenic and highly pathogenic strains might impact the health risk to humans. Of the documented

cases of human infection with avian influenza viruses, illnesses caused by highly pathogenic viruses appear to be more severe.

Small Pox

Smallpox virus is a high-priority "Category A" agent that poses a risk Marin County, California and national security because it can be easily disseminated and transmitted from person to person, results in high mortality rates and has the potential for major public health impact, might cause public panic and social disruption, and requires special action for public health preparedness.

Vaccination

The federal government has not yet provided definitive guidance on the extent of preparedness vaccination (smallpox vaccination of persons prior to a confirmed case of smallpox). It is anticipated that the guidance will be forthcoming in the near future. Such guidance, and release of sufficient quantities of smallpox vaccine, may be for: (1) specified first responders only, (2) a larger group of health care workers, law enforcement, and emergency responders, or (3) the entire population on a voluntary basis. Guidance may be provided in a phased manner for these, or other, groups over time.

Monkey Pox

The Centers for Disease Control and Prevention (CDC) and state and local health departments continue to investigate cases of monkeypox among persons who had close contact with wild or exotic mammalian pets or persons with monkeypox. Results of serologic testing, polymerase-chain-reaction analysis, viral culture and gene sequencing performed at the CDC indicate that the causative agent is monkeypox virus, a member of the orthopoxvirus group of viruses. CDC is updating previous interim guidance concerning infection control precautions and exposure management in the health-care and community settings. The guidance will be further updated as additional information about the epidemiology of disease transmission is better understood.

Limited data on transmission of monkeypox virus are available from studies conducted in Africa. Person-to-person transmission is believed to occur primarily through direct contact and also by respiratory droplet spread. Transmission of monkeypox within hospitals has been described, albeit rarely. Extrapolating from smallpox for which airborne transmission has been clearly described, airborne transmission of monkeypox virus cannot be excluded, especially in patients presenting with cough.

To date in the United States there has been no evidence of person-to-person transmission of monkeypox. However, recovery of monkeypox virus from skin lesions and tonsillar tissue demonstrates the potential for contact and droplet transmission, and at least a theoretical risk for airborne transmission.

Hoof & Mouth Disease

In the United States we usually call it "Hoof and Mouth Disease." In the U.K. they call it "Foot and Mouth Disease." But, wherever it appears, and whatever it's called, this highly contagious livestock disease means trouble. The outbreak of the disease in Great Britain quickly spread to the European continent, and British officials even considered eradicating that country's entire livestock population. The last major outbreak in the U.S. was in 1929.

Hoof and mouth disease is a viral infection that afflicts animals with cloven hooves such as cattle, pigs, and sheep. Onset of the disease is characterized by fever, which is followed by the development of

blisters inside the mouth and on the feet. It is transmitted easily among animals through fluids such as blood, saliva, and milk. Fluid from broken blisters has especially high concentrations of the virus. The disease is not necessarily fatal, and symptoms can clear up after several weeks, but the disease generally leaves animals underweight and sometimes disabled. Because of the highly infectious nature of the disease, and the condition in which it leaves animals even after they have recovered, farmers almost always destroy infected animals and burn their carcasses.

Hepatitis

Hepatitis is inflammation of the liver. Several different viruses cause viral hepatitis. They are named the hepatitis A, B, C, D, and E viruses.

All of these viruses cause acute, or short-term, viral hepatitis. The hepatitis B, C, and D viruses can also cause chronic hepatitis, in which the infection is prolonged, sometimes lifelong.

Other viruses may also cause hepatitis, but they have yet to be discovered and they are obviously rare causes of the disease.

Hepatitis Incidence/Epidemiology

Hepatitis A occurs sporadically and epidemically worldwide, with a tendency to cyclic recurrences.

Epidemics are uncommon in developing countries where adults are generally immune. Improved sanitary and hygiene conditions in different parts of the world leave large segments of the population susceptible to infection, and outbreaks may result whenever the virus is introduced.

Common-source epidemics, related to contaminated food or water, may evolve explosively, as did the largest mollusc-linked epidemic in Shanghai, in 1988, involving about 300 000 people.

Worldwide, HAV infections account for 1.4 million cases annually.

Strain	Disease Spread	People at Risk	Prevention	Treatment
Hepatitis A	Primarily through food or water contaminated by feces from an infected person. Rarely, it spreads through contact with infected blood	International travelers; people living in areas where hepatitis A outbreaks are common; people who live with or have sex with an infected person; during outbreaks, day care children and employees, men who have sex with men, and injection drug users	The hepatitis A vaccine, also, avoiding tap water when traveling internationally and practicing good hygiene and sanitary	Hepatitis A usually resolves on its own over several weeks
Hepatitis B	Through contact with infected blood, through sex with an infected person, and from mother to child during childbirth	People who have sex with an infected person, men who have sex with men, injection drug users, children of immigrants from disease-epidemic areas, infants born to infected mothers, people who live with an infected person, health care workers, hemodialysis patients, people who received a transfusion of blood or blood products before July 1992 or clotting factors made before 1987, and international travelers	Hepatitis B vaccine	For chronic hepatitis B: drug treatment with alpha interferon, peginterferon, lamivudine, or adefovir dipivoxil. Acute hepatitis B usually resolves on its own. Very severe cases can be treated with lamivudine
Hepatitis C	Primarily through contact with infected blood, less commonly, through sexual contact and childbirth	Injection drug users, people who have sex with an infected person, people who have multiple sex partners, health care workers, infants born to infected women, hemodyalysis patients, and people who received a transfusion of blood or blood products before July 1992 or clotting factors made before 1987	There is no vaccine for hepatitis C; the only way to prevent the disease is to reduce the risk of exposure to the virus. This means avoiding behaviors like sharing drug needles or sharing personal items like toothbrushes, razors, and nail clippers with an infected person	Chronic hepatitis C: drug treatment with perginterferon alone or combination treatment with peginterferon and the drug ribavirin. Acute hepatitis C: treatment is recommended if it does not resolve within 2 to 3 months
Hepatitis D	Through contact with infected blood. This disease occurs only in people who are already infected with hepatitis B	Anyone infected with hepatitis B: injection drug users who have hepatitis B have the highest risk. People who have hepatitis B are also at risk if they have sex with a person infected with hepatitis D or if they live with an infected person. Also at risk are people who received a transfusion of blood or blood products before July 1992 or clotting factors made before 1987	Immunization against hepatitis B for those not already infected; also. avoiding exposure to infected blood, contaminated needles, and an infected person's personal items.	Chronic hepatitis D: drug treatment with alpha interferon
Hepatitis E	Through food or water contaminated by feces from an infected person. This disease in uncommon in the United States	International travelers; people living in areas where hepatitis E outbreaks are common; and people who live or have sex with an infected person	There is no vaccine for hepatitis E; the only way to prevent the disease is to reduce the risk of exposure to the virus. This means avoiding tap water when traveling internationally and practicing good hygiene and sanitary	Hepatitis E usually resolves on its own over several weeks or months

Hepatitis Facts

- An estimated 40,000 people were infected with the hepatitis C virus (HCV) in 1998.
- There are an estimated 3.9 million people who are or have been infected with hepatitis C, 2.7 of whom are chronically infected; approximately 70% of people infected do not know they have the virus.
- 8,000 – 10,000 people die of hepatitis C each year. The Centers for Disease Control and Prevention (CDC) estimate that the number of annual deaths from hepatitis C will triple in the next 10 –20 years.
- Hepatitis B is responsible for 5,000 deaths annually, including 3,000 – 4,000 from cirrhosis and approximately 1,000 – 1,500 from primary liver cancer.
- One out of every 250 people is a carrier of hepatitis B and can pass it on to others, often unknowingly.
- There were approximately 80,000 estimated new infections of hepatitis B in the United States in 1999.
- Up to 90% of pregnant women who are carriers of the hepatitis b virus could transmit the virus to their children. Vaccinations of the newborns would prevent them from becoming carriers.
- Due to the screening of pregnant women for HBV and vaccinations of newborns with the hepatitis B vaccine, there has been a decline in that number of infected newborns.
- Hepatitis B is 100 times more infectious than HIV, the virus that causes AIDS. There are 500 million hepatitis B viral particles in one teaspoon of blood compared to 5-10 HIV particles.
- The estimated medical and work loss cost per year of hepatitis B is $700 million; the estimated medical and work loss cost per year of hepatitis C is $600 million.
- One out of every 20 people will be infected with hepatitis B in his/her lifetime.
- Approximately 5,000 liver transplants were performed in 2000. Because of the shortage of organs, it is estimated that nearly 1,700 prospective recipients died in 2001 while waiting for a liver for transplantation. There are currently over 18,000 people waiting for a liver transplant.
- Non-Hispanic African Americans have the highest infection rate for hepatitis C; Asian and Pacific Islanders have the highest rate for hepatitis B infection.

Other Diseases

Plague

Plague is transmitted to humans by fleas or by direct exposure to infected tissues or respiratory droplets; the disease is characterized by fever, chills, headache, malaise, prostration, and leukocytosis that manifests in one or more of the following principal clinical forms:

- Regional lymphadenitis (bubonic plague)

- Septicemia without an evident bubo (septicemic plague)
- Plague pneumonia, resulting from hematogenous spread in bubonic or septicemic cases (secondary pneumonic plague) or inhalation of infectious droplets (primary pneumonic plague)
- Pharyngitis and cervical lymphadenitis resulting from exposure to larger infectious droplets or ingestion of infected tissues (pharyngeal plague)

Brucellosis

Brucellosis is an infectious disease caused by the bacteria of the genus *Brucella*. These bacteria are primarily passed among animals, and they cause disease in many different vertebrates. Various *Brucella* species affect sheep, goats, cattle, deer, elk, pigs, dogs, and several other animals. Humans become infected by coming in contact with animals or animal products that are contaminated with these bacteria. In humans brucellosis can cause a range of symptoms that are similar to the flu and may include fever, sweats, headaches, back pains, and physical weakness. Sever infections of the central nervous systems or lining of the heart may occur. Brucellosis can also cause long-lasting or chronic symptoms that include recurrent fevers, joint pain, and fatigue.

Brucellosis is not very common in the United States, where100 to 200 cases occur each year. But brucellosis can be very common in countries where animal disease control programs have not reduced the amount of disease among animals.

Botulism (Food-borne)

Ingestion of botulinum toxin results in an illness of variable severity. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis may progress rapidly.

Botulism (Wound)

An illness resulting from toxin produced by *Clostridium botulinum* that has infected a wound. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis may progress rapidly.

Section 5 – Hazard Mitigation Strategies

Mitigation Goals and Objectives

The information in the hazard vulnerability analysis and loss estimation information was used as a basis for developing mitigation goals and objectives. Mitigation goals are defined as general guidelines explaining what each jurisdiction wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing city-wide visions. Objectives are statements that detail how the City's goals will be achieved, and typically define strategies or implementation steps to attain identified goals. Other important inputs to the development of city-level goals and objectives include performing reviews of existing local plans, policy documents, and regulations for consistency and complementary goals, as well as soliciting input from the public.

Identification and Prioritization of Mitigation Actions

The Steering Committee met collectively and individually with City department Directors to identify and prioritize mitigation strategies. The Steering Committee Chairman directed the participates take into account several factors, such as

- Economic benefits for the City and Community
- Reduce and/or eliminate the hazard vulnerability
- Does not conflict with existing plans and studies
- Improves the quality of life for the City and Community
- Reduces or eliminates hazard vulnerability to critical facilities
- Is consist with the Citizens survey and public input results

The Committee members developed mitigation strategies by evaluating the cost and mitigation strategy benefit, and Capital Expenditure Plans. The City is supportive of the following hazard mitigation strategies. The City shall make every effort, given appropriate funding, to implement these strategies as conditions warrant.

Mitigation actions that address the goals and objectives were identified, evaluated, and prioritized. These actions form the core of the mitigation plan. The City conducted an assessment, reviewing existing local plans, policies, and regulations for any other capabilities relevant to hazard mitigation planning. An analysis of its capability to carry out the implementation measures with an eye toward hazard and loss prevention was conducted. The capabilities assessment required an inventory of the city's legal, administrative, fiscal and technical capacities to support hazard mitigation planning (see Section 6).

After completion of the capabilities assessment, the City evaluated and prioritized its proposed mitigations. The City considered the social, technical, administrative, political, legal, economic, and environmental opportunities and constraints of implementing a particular mitigation action as described in the STAPLEE+E form. This step resulted in a list of acceptable and realistic actions that address the hazards identified in each jurisdiction. A full suite of goals, objectives and action items for the City is presented in this Plan. The City then identified and prioritized actions with the highest short to medium term priorities. An implementation, schedule, funding source and coordinating individual or agency is identified for each prioritized action item.

City of Novato Hazard Mitigation Best Practices

Economic Mitigation Practices

1. The City of Novato works closely with the real estate industry to ensure the enforcement of real estate disclosure requirements, and the resources to keep those disclosures current.

2. While the City has very few soft story (as defined in the Building Code) commercial buildings the City encourages the mitigation of those buildings and conducts reviews of commercial buildings

3. The City of Novato identified one un-reinforced masonry building in the City and worked with the property owner to ensure the building was retrofitted. That has been accomplished.

4. Privately owned structures are inventoried and checked for code compliance.

5. The City is prepared to adopt the 2003 International Building Codes, however, the City must wait for the State of California to first adopt the codes and the City will then adop the codes locally. The City has guidelines that require certain property owners in high fire hazard areas be constructed of fire resistant building materials and fire resistant design features.

6. The City is waiting for the State of California to adopt the updated version of the California Building and Fire Codes. Once the State acts on the codes the City is prepared to follow to adopt the codes locally.

7. The City of Novato inspects buildings prior to occupancy for building code and fire codes compliance, once the building is occupied the Novato Fire Protection District is responsible for Fire Code Enforcement. This is a joint effort between the Fire Protection District and the City.

8. The City of Novato conducts vegetation management on its properties that are accessible to the public for fire prevention.

9. The City of Novato is engaged with ongoing flood prevention work to enforce flood prevention and lower risk through the FEMA Community Rating System (CRS).

10. The City of Novato charges developer fees for infrastructure support

11. The City of Novato Public Works departments provides emergency flood control resources such as plastic sheeting and sand bags to businesses and citizens in emergencies.

12. The City of Novato enforces floodplain management, ordnances and applies all flood plain requirements in its flood hazard areas.

13. The City of Novato inspects its flood control pumps and structures on an annual basis.

14. The City of Novato enforces land use codes and has adopted new hillside development standards including lower density development on hillsides. Zoning Code Chapter 19

15. The City of Novato reduces landslide risks in future development through stringent plan reviews and peer reviews. All building development is required to be in accordance with current codes and standards.

16. The City of Novato provides ongoing training for code enforcement and building inspections employees as required.

17. The City of Novato refers developers, businesses and citizens to ABAG for updated hazard information mapping as appropriate.

18. The City of Novato conducts storm drain public information programs to prevent clogging of the drains and hazardous materials pollution.

19. The City of Novato supports the Novato Fire Protection District for implementation of hazardous materials and fire safety inspections and enforcement programs.

20. The City works cooperatively with the local school district and the American Red Cross in a memorandum of understanding for use of education facilities as emergency shelters following disasters.

Environmental Mitigation Best Practices

1. The City complies with the California Environmental Quality Act

2. The City encourages regulatory agencies to work collaboratively with safety professionals to develop mitigation strategies

3. The City complies with and enforces the California Environmental Quality Act

4. The City has a comprehensive watershed maintenance and pollution control plan.

5. The City has a stream management plan for the protection of streambed vegetation and flood control efforts.

6. The City Public Works and Planning Department utilize emerging information on the management of changes in San Pablo Bay.

7. The City complies with the standards of the National Pollutant Discharge and Elimination System.

8. The City implements and cooperates in prohibiting the discharge of concentrated storm water flows by other than approved methods.

9. The City has conducted a critical facilities assessment

10. The City is working to replace critical facilities that are vulnerable to disasters as economically feasible.

11. The City informs its employees of risks related to hazards in the City of Novato.

12. The City reviews its facilities for securing of contents and architectural components to protect building functions before and after a disaster.

13. The City utilizes limited surveillance cameras around public assets.

14. The City has completed a vulnerability assessment on its non critical City owned facilities.

15. The City complies with applicable building and building and fire codes, as well as other regulations when constructing or significantly remodeling government-owned facilities.

16. The City does a due diligence assessment of future City building sites to evaluate geological and man made hazards.

17. The City of Novato Police Department is responsible for Emergency Management Coordination. The City Police have established a Emergency Operations Center and a SEMS compliant Plan for the City of Novato.

Government Mitigation Strategies

1. The City of Novato meets annually with all agencies involved in Marin County Flood control projects.

2. The City of Novato encourages their staff to participate in professional organizations to share information and increase understanding of risks in the City.

3. The City of Novato attends meetings concerning Hazard Mitigation sponsored by ABAG and Marin County as well as other conferences and workshops on hazard mitigation.

Housing Mitigation Strategies

1. The City of Novato works with realtors to ensure all hazard risk analysis disclosure is made when property is bought and sold. Realtors utilize ABAG, State, County and City data to keep their disclosures current.

2. The City of Novato requires engineered plan sets for retrofitting of heavy two-story homes with living areas over garages.

3. The City requires engineered plan sets for retrofitting of homes on steep hillsides

4. The City charges fees to provide funding for staff to stay trained on retrofitting of homes and buildings. The City conducts appropriate training for its building and code enforcement staff.

5. The City has a assistance program for homeowners wishing to retrofit their own homes.

6. The City requires engineered plan sets for voluntary or mandatory soft-story retrofits.

7. The City has conducted a inventory of existing soft story buildings and discovered it has very few.

8. The City identified one un-reinforced masonry building in the City and the owner voluntarily retrofitted the building.

9. The City has inventoried its non-ductile concrete tit-up concrete and other privately-owned structures. The tilt-up buildings in Novato are generally built to seismic code and are less then 15 years old.

10. The City coordinates with the Novato Fire Protection District for to reduce the dangers of urban wildland fire interfaces. The City has a Urban Wildland Fire Interface Code. This code covers the

features required to reduce fire dangers. The City enforces all codes and regulation during the construction of houses and businesses in relation to fire safety and upon completion and occupancy it becomes the responsibility of the Novato Fire Protection District.

11. The City considers evacuation and emergency vehicle access when reviewing proposals for new construction and redevelopment.

12. The City coordinates and relies on the North Marin County Water District to provide reliable sources of water for fire suppression in the City of Novato.

13. The City has ingress agreements with property owners to ensure adequate access and evacuation in wildland-urban –interface fire zones where feasible.

14. The City requires all new homes and substantially remodeled multifamily homes to have fire sprinkler systems.

15. The City Code requires the bracing of water heaters and flexible couplings on gas appliances.

16. The City actively is taking steps to reduce the threat of flooding.

17. The City's policies balance the housing needs of residents against the risk from potential flood related hazards by enforcing flood plain management and building and code requirements.

18. The City both encourages and requires some homes and apartments to do home elevation projects, particularly with new construction as appropriate.

19. The City supports the requirements of financial institutions and encourages homeowners in flood prone areas to purchase flood insurance.

20. The City Planning, Building and Public Works Departments currently have information available for disaster risk mitigation for private property.

21. City Public Works personnel are trained in flooding techniques.

22. The City of Novato has a Public Information program that encourages citizens to keep storm drains free of debris.

City of Novato Infrastructure Mitigation Practices

1. Assesses the City owned critical facilities

2. The City meets monthly with utilities, the County, special districts and other lifeline providers to exchange risk data and information on current status operations and potential problems.

3. The City has pre-positioned emergency power generators at the Police Department, Public works Corporation Yard and the Community House.

4. The City works with electrical provider P G & E on a monthly basis to discuss and plan for prevention of/ or orderly implementation of rolling blackouts.

5. The City requires all new construction to have underground utilities and encourages older construction to replace above ground electric and phone wires as feasible.

6. The City maintains fire access roads and/or public right-of-way roads as passable for emergency vehicles.

7. The City addresses watershed analysis and the impact of development in both their Master Plan and their requirements for new development.

8. Watershed analysis is done on an ongoing basis in the City of Novato

9. The City of Novato supports the Army Corps of Engineers, flood control agencies/districts and water conservation agencies in the development and funding of flood control projects that are feasible within the City's sphere of influence.

10. The City pursues and provides funding for the design and construction of storm drainage projects to protect property. The City has a maintenance program that evaluates and schedules drainage infrastructure upgrades and repairs as the City deems feasible.

11. The City of Novato enforces the Regional Water Quality Management Control Board's Best Management Practices, including, the provisions under creek protection, storm water management and discharge control ordinances to protect drainage facilities.

12. The City of Novato has 4 siltation basins that they inspect and clean on a regular maintenance schedule.

13. The City of Novato has a proactive policy to work with water agencies, flood control districts, Caltrans, Novato Fire Protection District and local transportation agencies to determine, implement and enforce appropriate criteria for water shed analysis and protection.

14. The City of Novato broadcast road closures and traffic delays over its public access radio station. They share this station with the Novato School District and the Novato Fire Protection District.

City of Novato Land Use Hazard Mitigation Practices

1. The City of Novato distributes public safety materials prepared by other public safety agencies via their public offices, library, television and public safety radio.

2. Although the City of Novato is not within the Alquist-Priolo Earthquake Fault Zones, the City does consider itself to be at risk from earthquakes and enforces all earthquake building and code regulations for a Seismic Zone 4 (see Earthquake – Section 4) Earthquake area.

3. The City of Novato's Planning Department require site-specific geologic and geotechnical reports for development and redevelopment proposals.

4. The City of Novato utilizes landslide and liquefaction resources available from the USGS and the California Geological Survey in their plan reviews as well as utilizing peer review of proposed projects.

5. The City of Novato supports all efforts to the California Geological Survey to complete the earthquake-induced landslide and liquefaction mapping for the North Bay Area.

Strategies & Recommendations for City of Novato

Strategy Synopsis Matrix

The matrix below shows the strategies on record for the City of Novato and indicates the risks they address. "P" indicates the strategy's primary risk and "X" indicates related risks.

	Strategy Humber	ALL HAZARD (AH)						FLOOD (FL)											WILD FIRE (WF)		HAZMAT (HM)	EARTH-QUAKE (EQ)		
		1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	11	1	2	1	1	2	3
HIGH RISK	EARTHQUAKE (EQ)	X	X	X	X	X	X									X	X					P	P	P
HIGH RISK	FLOOD (FL)	X	X	X	X	X	X	P	P	P	P	P	P	P	P	P	P	P				X		
HIGH RISK	WILD FIRE (WF)	X	X	X	X	X													P	P	P			
HIGH RISK	UTILITY LOSS (UL)	X	X	X	X	X	X																	
HIGH RISK	TRANSPORTATION LOSS (TL)	X	X	X	X	X	X						X	X	X			X					X	
HIGH RISK	LAND SLIDE (LS)	X	X	X	X	X																X		
HIGH RISK	HAZARDOUS MATERIALS (HM)	X	X	X	X	X																		
HIGH RISK	WATER/WASTE WATER (WW)	X	X	X	X	X	X																	
MODERATE RISK	DAM FAILURE (DF)	X	X	X	X	X	X																	
MODERATE RISK	WMD TERRORISM (WT)	X	X	X	X	X	X																	
MODERATE RISK	DATA/TELECOM (TC)	X	X	X	X	X	X																	
MODERATE RISK	UTILITY SUBSTATION (US)	X	X	X	X	X	X																	

	Strategy Humber	ALL HAZARD (AH)						FLOOD (FL)											WILD FIRE (WF)		HAZMAT (HM)	EARTH-QUAKE (EQ)		
		1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10	11	1	2	1	1	2	3
LOW RISK	AVIATION DISASTER (AD)	X	X	X	X	X	X																	
	EXPLOSION (EX)	X	X	X	X	X	X																	
	SEVERE WX (SW)	X	X	X	X	X	X																	
	RADIOLOGICAL (RD)	X	X	X	X	X	X																	
	ECONOMIC (ED)	X	X	X	X	X	X																	
	TSUNAMI (TS)	X	X	X	X	X	X																	
	SPECIAL EVENTS (SE)	X	X	X	X	X	X																	
	BIO- HEALTH (BH)	X	X	X	X	X	X																	

Using a 1 to 3 rating definition assign a number to each mitigation strategy recommendation in accordance with the following definitions.

RATING DEFINITIONS:

High Priority – mitigation measure serves the jurisdictions' best interests and needs to move forward in the process as a potential project for further strategy development.

Medium Priority – mitigation measure serves the jurisdictions' needs and should be left in the process for future consideration.

Low Priority – mitigation measure does not serve the jurisdictions' best interest and should be removed from the process for consideration/or legal or logistical barriers to this measure cannot be surmounted and the measure should be removed from the process.

All Hazard Mitigation Strategy AH-1

Program/Project Description	Commercial Building Inspection for code compliance Occupancy Hazardous Materials Flood Compliance Seismic Compliance
Estimated Cost	$200,000
Timeline/Schedule	1-5 years
Responsible Agency/Dept.	Community Development
Financing	City of Novato General Fund and grants
Goal(s) Addressed	All hazard Code Compliance
Related Hazard(s)	All Hazard
Constraints	Funding

All Hazard Mitigation Strategy AH-2

Program/Project Description	Compile and Inventory City-owned Buildings at risk
Estimated Cost	$150,000.00
Timeline/Schedule	1-5 years
Responsible Agency/Dept.	Community Development
Financing	City of Novato
Goal(s) Addressed	All hazard Public Safety Assessment
Related Hazard(s)	All Hazard
Constraints	funding

All Hazard Mitigation Strategy AH-3

Program/Project Description	Implement a code enforcement inspection program for all apartments in the City to find seismic safety, flood and health and safety compliance issues and to identify buildings at risk to specific hazards
Estimated Cost	$150,000.00
Timeline/Schedule	1-5 years
Responsible Agency/Dept.	Community Development
Financing	$200,000.00
Goal(s) Addressed	All Hazard abatement and identification of risk
Related Hazard(s)	All Hazard
Constraints	Funding

All Hazard Mitigation Strategy AH-4

Program/Project Description	Develop a program to supplies tools and public education to citizens to do voluntary seismic retro-fit in residential areas. Provide classes on retrofit methods. Develop general public handouts on how to do flood, earthquake and fire mitigation for business and homeowners. Provide tool lending system to allow homeowners to do the work t Program would include personnel for training and public education, Research other similar programs for implementation strategies
Estimated Cost	$75,000.00
Timeline/Schedule	1 to 5 Years
Responsible Agency/Dept.	Community Development
Financing	City of Novato Budget Grants
Goal(s) Addressed	All Natural Hazards and Hazardous Materials
Related Hazard(s)	All Hazard
Constraints	Funding

All Hazard Mitigation Strategy AH-5

Program/Project Description	Develop a Public Information System for • Flood Insurance and Prevention • Hazardous Materials dumping and handling Program • Earthquake damage prevention measures • Urban Interface Fire Prevention To develop and distribute public information to educate the public on the reduction of the above risk through the use of existing programs and public action strategies.
Estimated Cost	$50,000.00
Timeline/Schedule	1-5 Years
Responsible Agency/Dept.	City of Novato various agencies Public Works Flood Control Emergency Services
Financing	City budget Grants
Goal(s) Addressed	To educate the Public on how to reduce risks from the listed hazards
Related Hazard(s)	Earthquake Flood Wildland Urban Interface Fire Hazardous Materials
Constraints	Funding

Flood Mitigation Strategy FL-1

Program/Project Description	Support Marin County Flood Control Projects by Deepening Channel, Stabilizing Bank, Smoothing out Flow, Purchasing land for easements along area of Novato Blvd.
Estimated Cost	To be determined
Timeline/Schedule	1 to 5 years
Responsible Agency/Dept.	Marin County Flood Control District City of Novato
Financing	Marin County Flood Control District Capital Funds Grants Taxes
Goal(s) Addressed	Reduce Flooding
Related Hazard(s)	Flood
Constraints	Budgetary

Flood Mitigation Strategy FL-2

Program/Project Description	Work with Marin County Flood Control District on specific projects in Novato Kenden Lane – 4 year clean up and clean out of drains
Estimated Cost	To be determined
Timeline/Schedule	Every 4 years
Responsible Agency/Dept.	Novato Creek Flood Control
Financing	Taxes through Flood Control District
Goal(s) Addressed	Reduce Flooding
Related Hazard(s)	Flood
Constraints	Budgetary

Flood Mitigation Strategy FL-3

Program/Project Description	Repair separation in drainage pipes at Partridge Gardens There is a video of the damage and a plan has been formulated to do the repairs. The detailed repair description for this project is in the White/Prescott Report and will be defined in the actual grant application.
Estimated Cost	$50,000.00
Timeline/Schedule	1 to 5 years
Responsible Agency/Dept.	City of Novato
Financing	To be determined City Funds Grants
Goal(s) Addressed	Flood Control
Related Hazard(s)	Flood
Constraints	Budgetary

Flood Mitigation Strategy FL-4

Program/Project Description	Widening channel, Dredging, Expanding secondary channel at Railroad Bridge. (see Rich Creek Drainage Project).
Estimated Cost	$608,000
Timeline/Schedule	1-15 years long term project scheduled to begin in July 2008
Responsible Agency/Dept.	City of Novato
Financing	General Fund Grants
Goal(s) Addressed	Flood control
Related Hazard(s)	Flood
Constraints	Funding available $438,595

Flood Mitigation Strategy FL-5

Program/Project Description	Conduct Storm Sewer Inspection Annually
Estimated Cost	$65,000
Timeline/Schedule	Annual Project
Responsible Agency/Dept.	Public Works
Financing	City of Novato Budget
Goal(s) Addressed	Respond to inspection findings of repair and upgrade
Related Hazard(s)	Flood and secondary earthquake
Constraints	Funding

Flood Mitigation Strategy FL-6

Program/Project Description	McKeon Court/Wilmac Drainage Project – Requested by citizens for realignment of outlet piping to facilitate flow into the creek and installation of positive shut off valve to prevent creek backflow into drainage system.
Estimated Cost	$25,000
Timeline/Schedule	Long Term
Responsible Agency/Dept.	Public Works
Financing	Potential Flood Grant project or future city funding
Goal(s) Addressed	Flood Mitigation
Related Hazard(s)	None
Constraints	

Flood Mitigation Strategy FL-7

Program/Project Description	Cherry Street Drainage Improvement
Estimated Cost	$103,449.00
Timeline/Schedule	1-3 year timeline.
Responsible Agency/Dept.	Public Works
Financing	Public Works Project Funds for June 07
Goal(s) Addressed	Flooding Mitigation
Related Hazard(s)	Transportation
Constraints	

Flood Mitigation Strategy FL-8

Program/Project Description	Diablo Avenue Drainage Improvements and rehabilitation project
Estimated Cost	$926,269
Timeline/Schedule	1-3 years To be considered for 2007
Responsible Agency/Dept.	Public Works
Financing	Public Works Transportation, Drainage & Utilities Project Budget
Goal(s) Addressed	Flood Reduction
Related Hazard(s)	Transportation
Constraints	

Flood Mitigation Strategy FL-9

Program/Project Description	Davidson Street Area Subdrain System
Estimated Cost	$279,000.00
Timeline/Schedule	1-3 years 2007 Target Date
Responsible Agency/Dept.	Public Works
Financing	Public Works Transportation, Drainage & Utilities Project Budget
Goal(s) Addressed	Flood Mitigation
Related Hazard(s)	Transportation
Constraints	

Flood Mitigation Strategy FL-10

Program/Project Description	Hamilton Field Flood Protection Levee Improvement
Estimated Cost	$411,188
Timeline/Schedule	1-3 years Targeted for 2007
Responsible Agency/Dept.	Public Works
Financing	Public Works Transportation, Drainage & Utilities Project Budget
Goal(s) Addressed	Flood Mitigation
Related Hazard(s)	Earthquake
Constraints	

Flood Mitigation Strategy FL-11

Program/Project Description	O'Hara Park Drainage Extension Project
Estimated Cost	$25,098
Timeline/Schedule	1-3 years Targeted for 2007
Responsible Agency/Dept.	Public Works
Financing	Public Works Transportation, Drainage & Utilities Project Budget
Goal(s) Addressed	Flooding Mitigation and Transportation Enhancement
Related Hazard(s)	Flood
Constraints	

Wild Fire Mitigation Strategy WF-1

Program/Project Description	Incorporate Wildland Urban Fire Interface data into GIS system and City Data including area and vegetation mapping, areas defensible space programs cover, survey for building related issues and code violations and make recommendations
Estimated Cost	To be determined
Timeline/Schedule	1- 5 years
Responsible Agency/Dept.	Public Works Department and NFPD GIS and Mapping
Financing	To be determined
Goal(s) Addressed	Urban Wildland Fire Interface
Related Hazard(s)	Urban Wildland Fire Interface and secondary hazards
Constraints	Funding

Wild Fire Mitigation Strategy WF-2

Program/Project Description	Clear cut swaths and create defensible space on City land behind homes in Novato Work in coordination with Novato Fire Protection District
Estimated Cost	$100,000 annual budget
Timeline/Schedule	Annually
Responsible Agency/Dept.	Novato Public Works
Financing	Grants City Funds
Goal(s) Addressed	Reduce wildland fire risk to homes and business that interface with City Property
Related Hazard(s)	Wildland Urban Interface Fires
Constraints	Budget

Hazardous Materials Mitigation Strategy HM-1

Program/Project Description	Upgrade and Replace City-owned Underground Fuel tanks
Estimated Cost	Replacement Cost $150,000
Timeline/Schedule	1-5 years
Responsible Agency/Dept.	Public Works
Financing	City funds Grant
Goal(s) Addressed	Reduce Hazardous Materials Spill potential
Related Hazard(s)	Hazardous Materials
Constraints	Funding

Earthquake Mitigation Strategy EQ-1

Program/Project Description	Study to identify solutions for Bel Marin Keyes Flood and Subsidence (Landslide) issues
Estimated Cost	$75,000 for Study
Timeline/Schedule	1-5 years
Responsible Agency/Dept.	Public Works Flood Control
Financing	Grants City Budget
Goal(s) Addressed	Subsidence Earthquake Flooding
Related Hazard(s)	Earthquake Flooding Landslide
Constraints	May not be cost effective

Earthquake Mitigation Strategy EQ-2

Program/Project Description	Study the Hamilton Base Officers Club / Hospital and Gym to assess lead paint risk. Determine if cost effective to retrofit or if facility need to be replaced
Estimated Cost	$150,000.
Timeline/Schedule	1 to 5 years
Responsible Agency/Dept.	Public Works
Financing	City of Novato Grant Funds
Goal(s) Addressed	Earthquake retrofit Hazardous Materials abatement
Related Hazard(s)	Earthquake Hazardous Materials
Constraints	Funding

Earthquake Mitigation Strategy EQ-3

Program/Project Description	Make strong recommendations to Caltrans for seismic retro-fit of U.S. Highway 101. Currently no retrofit has taken place on any US-101 bridge sections located within the City of Novato. Risk is high due to age of construction
Estimated Cost	Unknown
Timeline/Schedule	1-10 years
Responsible Agency/Dept.	U.S. Department of Transportation Caltrans
Financing	Federal Funds through State
Goal(s) Addressed	Transportation continuity Earthquake Seismic retrofit
Related Hazard(s)	Transportation Failure Earthquake
Constraints	City does not have control over project or ability to implement, but will suffer negative outcome if not done

Novato Sanitary District Strategies and Recommendations

Strategy Synopsis Matrix for the Novato Sanitary District

The matrix below shows the strategies on record for the Novato Sanitary District and indicates the risks they address. "P" indicates the strategy's primary risk and "X" indicates related risks.

RISK FACTOR		STRATEGY NUMBER		
		WW-1	WW-2	EQ-1
HIGH RISK	EARTHQUAKE (EQ)	X	X	P
	FLOOD (FL)			
	WILD FIRE (WF)			
	UTILITY LOSS (UL)			
	TRANSPORTATION LOSS(TL)	X		X
	LAND SLIDES (LS)			
	HAZARDOUS MATERIALS (HM)	P	P	X
	WATER/WASTE WATER (WW)			
MODERATE RISK	DAM FAILURE (DF)			
	WMD TERRORISM (WT)			
	DATA/TELECOMM (TC)			
	UTILITY SUBSTATION (US)			
LOW RISK	AVAITION DISASTER (AD)			
	EXPLOSION (EX)			
	SEVERE WEATHER (SW)			
	RADIOLOGICAL (RD)			
	ECONOMIC (ED)			
	TSUNAMI (TS)			
	SPECIAL EVENTS (SE)			
	BIO HAZARD (BH)			

Strategies

Water-Waste Water Hazard Mitigation Strategy WW-1

Program/Project Description	Consolidating treatment facilities in a new larger Novato Plant. Converting the Ignacio Plant into a pump Station. Install new pipe line between the two plants.
Estimated Cost	$75,000.000
Timeline/Schedule	Work scheduled to start in 2006
Responsible Agency/Dept.	Novato Sanitary District
Financing	Grants, State loans and rate payers
Goal(s) Addressed	Much of the equipment at both plants are 25-50 years old, well beyond their useful life.
Related Hazard(s)	Water/Waste Water interruption Earth Quake Hazardous Materials Biological Health
Constraints	

Water-Waste Water Hazard Mitigation Strategy WW-2

Program/Project Description	Rate increase package to raise the rates to the customers yearly through the year 2010.
Estimated Cost	None
Timeline/Schedule	Starting with the 2005/2006 rate year
Responsible Agency/Dept.	Novato Sanitary District
Financing	By the Districts customers (rate payers)
Goal(s) Addressed	Bring the fees in line with other areas. Provide needed income for facilities operational and seismic upgrades and general operations.
Related Hazard(s)	Water/Waste Water Earthquake
Constraints	

Earthquake Hazard Mitigation Strategy EQ-1

Program/Project Description	Seismic retrofit of existing building that will remain after the upgrades to both Novato and Ignacio Treatment Facilities.
Estimated Cost	Undetermined
Timeline/Schedule	During the upgrading procedures for both plants.
Responsible Agency/Dept.	Novato Sanitary District
Financing	Grants, loans, rate payers
Goal(s) Addressed	Bringing existing buildings and equipment up to current seismic codes.
Related Hazard(s)	Earthquake Water/Wastewater disruption Hazardous Materials (spill)
Constraints	Funding

Applicable City of Novato Codes and Ordinances

4-1 Building Code; Mechanical Code; Plumbing Code; Electrical Code; Housing Code; Swimming Pool Code; Solar Code.

4-1.1 *Purpose of this Section*. This section is adopted for the purpose of establishing rules and regulations governing building activity in the city, provide for the collection of permit fees, the issuance of permits, provide for the adoption of the latest editions of recognized construction codes; provides for amending such codes and thus specifically regulates erection, construction, enlargement, alteration, repair, moving, removal, conversion, demolition, occupancy, equipment, facilities, height, area and maintenance of buildings and/or structures in the city, including electrical, gas, plumbing, mechanical and similar installations, and the maintenance and operation of such systems; includes regulations applying to construction of fences and swimming pools and provides for the abatement of unsafe buildings.

Wherever a conflict occurs between or within building codes, State regulations or city ordinances, the more restrictive shall apply. (Ord. No. 923, § 1; Ord. No. 1127, § 1)

4-1.2 *Codes Adopted by Reference*. The following codes or portions thereof hereafter set forth or hereinafter set out by amendment or revisions are hereby adopted and are made a part of this section by reference, without further publication or posting thereof. Three copies of each code as listed herein shall be kept on file for use and examination by the public in the office of the city clerk. (Ord. No. 923, § 1)

4-1.3 *Construction Codes*. The Construction Codes for the City of Novato shall adopt by reference the 2001 Edition of the California Building Standards Code, known as the California Code of Regulations, Title 24 (CCR, T-24), incorporating;

a. The 2001 Edition of the California Building Code, known as the California Code of Regulations, Title 24, incorporating the 1997 Edition of the Uniform Building Code published by the International Conference of Building Officials Volume I, except Sections 106.2(1.), (4.) and (5.) and 107.2, 107.3, 107.4, 107.5.2 and 107.6, but including only Chapters A3 (Division IV only), A4 (with amendment to Section 421.1 1.), A12, A15 (excluding Section 1515), A18, A29, A31 (Division III only) A33 of appendices as published by the International Conference of Building Officials.

The Uniform Building Code 1997 Edition Volumes 2 and 3, as published by the International Conference of Building Officials.

b. The 2001 Edition of the California Mechanical Code, known as the California Code of Regulations, Title 24, incorporating the 2000 Edition of the Uniform Mechanical Code published by the International Association of Plumbing and Mechanical Officials, Chapters 1 through 16 and Appendices A, B, C and D.

c. The 1997 Edition of the Uniform Housing Code, as published by the International Conference of Building Officials.

d. The 2001 Edition of the California Electrical Code, known as the California Code of Regulations, Title 24, incorporating the 1999 Edition of the National Electrical Code published by the National Fire Protection Association.

e. The 2001 Edition of the California Plumbing Code, known as the California Code of Regulations, Title 24, incorporating the 2000 Edition of the Uniform Plumbing code as published by the International Association of Plumbing and Mechanical Officials, Chapters 1 through 16 and Appendices A, B, C, D and I.

f. The 1997 Edition of the Uniform Swimming Pool, Spa, and Hot Tub Code, as published by the International Association of Plumbing and Mechanical Officials, Chapters 2 through 6, with exceptions, additions, and deletions provided in this chapter.

g. The 1997 Edition of the Uniform Solar Energy Code, as published by the International Association of Plumbing and Mechanical Official.

h. The 1997 Edition of the Uniform Code for the Abatement of Dangerous Buildings, as published by the International Conference of Building Official.

i. The 1997 Edition of the Uniform Administrative Code, as published by the International Conference of Building Official with tables.

j. The Uniform Fire Code, 2000 Edition, as published by the International Conference of Building Officials and the Western Fire Chiefs Associations. (Ord. No. 923, §1; Ord. No. 1127, § 2; Ord. No. 1226, § 1; Ord. No. 1327, § 1; Ord. No. 1328, § 1; Ord. No. 1345, § 1; Ord. No. 1346, § 1; Ord. No. 1410, § 1; Ord. No. 1465 § 1)

4-1.4 *Stop-Work Orders*. Whenever any work is being done contrary to the provisions of this chapter, or any other ordinance of the City of Novato or rules and regulations of other public agencies that are applicable to the work being done, the building official may order the work stopped by notice in writing served on any persons engaged in doing or causing such work to be done, then such persons shall forthwith stop work until authorized by the building official to proceed with the work. An order to stop work due to a violation of ordinances or rules and regulations of other public agencies shall be issued only upon written request from the official of such other agency charged with the enforcement of said ordinances or rules and regulations. (Ord. No. 923, § 1)

5-12 Construction and Repair

Editor's Note: Section 5-12 was originally codified in Chapter IV as section 4-6. Ordinance No. 1127, § 11 renumbered these provisions to section 5-12.

5-12.002 *Definitions*. As used in this section:

a. *Department* shall mean the Department of Community Development of the City of Novato.

b. *City Engineer* shall mean the City Engineer of the City of Novato.

c. *Dam* shall mean any artificial barrier, together with appurtenant works, if any, across a stream, channel, watercourse, or natural drainage area, which does or may impound or divert water, and which is less than 25 feet in height from natural stream bed to crest of spillway, or has an impounding capacity of less than 50 acre feet. No obstruction in a canal used to raise or lower

water therein or divert water therefrom, no levy, no railroad fill or structure, and no road or highway fill or structure, shall be considered a dam.

d. *Owner* shall mean and include any person, firm corporation, or any duly authorized agents, lessees or trustees thereof who own, control, operate, maintain, manage or propose to construct a dam.

e. *Alteration, repairs* or either of them shall mean only such alterations or repairs as may affect the safety of a dam.

f. *Enlargement* shall mean any change in or addition to an existing dam which raises or may raise the water storage elevation of the water impounded by the dam. Water storage elevation means that elevation of water surface which could be obtained by the existing dam as previously operated were there no outflow and were the reservoir full of water.

(Ord. No. 923, § 1; Ord. No. 989, § 1)

City of Novato Capabilities Assessment

The City of Novato identified current capabilities available for implementing hazard mitigation activities. The Capability Assessment portion of the Hazard Mitigation plan identifies administrative, technical, legal and fiscal capabilities. This includes a summary of departments and their responsibilities associated to hazard mitigation planning as well as codes, ordinances, and plans already in place associated to hazard mitigation planning. The second part of the Assessment provides fiscal capabilities that may be applicable to providing financial resources to implement identified mitigation action items.

Existing Institutions, Plans, Policies and Ordinances

The following is (1) a summary of existing positions their responsibilities related to hazard mitigation planning and implementation; and (2) a list of existing planning documents and regulations related to mitigation efforts within City of Novato. The administrative and technical capabilities, as shown in the table below, provides an identification of the staff, personnel, and department resources available to implement the actions identified in the mitigation section of the Plan. Specific resources reviewed include those involving technical personnel such as planners/engineers with knowledge of land development and land management practices, engineers trained in construction practices related to building and infrastructure, planners and engineers with an understanding of natural or human-caused hazards, floodplain managers, surveyors, personnel with GIS skills and scientists familiar with hazards in the community.

Administrative & Technical Capacity

Position	Y/N	Department/Agency
Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	Community Development and Public Works
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Y	Community Development and Public Works
Planners or Engineer(s) with an understanding of natural and/or human-caused hazards	Y	Community Development and Public Works
Floodplain manager	Y	
Surveyors	Y	
Staff with education or expertise to assess the community's vulnerability to hazards	Y	
Personnel skilled in GIS	Y	Public Works
Scientists familiar with the hazards of the community	N	
Emergency manager	Y	Police
Grant writers	Y	Administration

Regulatory Tools

The legal and regulatory capabilities of the City of Novato are shown in the table below, which presents the existing ordinances and codes that affect the physical or built environment of the City. Examples of legal and/or regulatory capabilities can include: a City's building codes, zoning ordinances, subdivision ordnances, special purpose ordinances, growth management ordinances, site plan review, general plans, capital improvement plans, economic development plans, emergency response plans, and real estate disclosure plans.

Regulatory Tools (ordinances, codes, plans)	Y/N	Comments
Building code	Y	
Zoning ordinance	Y	
Subdivision ordinance or regulations	Y	
Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	Y	National Pollution Discharge Elimination System/National Flood Insurance Program (NFIP)
Growth management ordinances (also called "smart growth" or anti-sprawl programs)	Y	
Site plan review requirements	Y	
General or comprehensive plan	Y	
A capital improvements plan	Y	
An economic development plan	Y	
An emergency response plan	Y	
A post-disaster recovery plan	N	To be developed
A post-disaster recovery ordinance	N	To be developed
Real estate disclosure requirements	Y	
Habitat Management Plan	Y	
Master Drainage, Sewer, Water, & Reclaimed Water	Y	City & NSD
Redevelopment Master Plan	Y	The City has separate plans for each of our seven redevelopment areas.

Fiscal Resources

The table below shows specific financial and budgetary tools available to City of Novato such as community development block grants; capital improvements project funding; authority to levy taxes for specific purposes; fees for water, sewer, gas, or electric services; impact fees for homebuyers or developers for new development; ability to incur debt through general obligations bonds; and withholding spending in hazard-prone areas.

Financial Resources	Y/N	Comments
Community Development Block Grants	Y	
Capital improvements project funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric service	N	
Impact fees for homebuyers or developers for new developments/homes	Y	
Incur debt through general obligation bonds	Y	
Incur debt through special tax and revenue bonds	Y	
Incur debt through private activity bonds	Y	
Withhold spending in hazard-prone areas	Y	Unless spending is for hazard mitigation measures

Novato Sanitary District Capabilities Assessment

The Novato Sanitary District identified current capabilities available for implementing hazard mitigation activities. The Capability Assessment portion of the Hazard Mitigation plan identifies administrative, technical, legal and fiscal capabilities. The second part of the Assessment provides fiscal capabilities that may be applicable to providing financial resources to implement identified mitigation action items.

Existing Institutions, Plans, Policies and Ordinances

The following is (1) a summary of existing positions their responsibilities related to hazard mitigation planning and implementation; and (2) a list of existing planning documents and regulations related to mitigation efforts for Novato Sanitary District.

Administrative & Technical Capacity

Position	Y/N	Department/Agency
Planner(s) or engineer(s) with knowledge of land development and land management practices	Y	NSD Administration
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Y	NSD Administration
Planners or Engineer(s) with an understanding of natural and/or human-caused hazards	Y	NSD Administration
Floodplain manager	N	
Surveyors	Y	NSD Administration
Staff with education or expertise to assess the community's vulnerability to hazards	Y	NSD Administration
Personnel skilled in GIS	N	
Scientists familiar with the hazards of the community	N	
Emergency manager	N	
Grant writers	N	

Regulatory Tools

The legal and regulatory capabilities of the Novato Sanitary District are shown in the table below.

Regulatory Tools (ordinances, codes, plans)	Y/N	Comments
Ordinances and regulations	Y	
Special purpose ordinances (floodplain management, storm water management, hillside or steep slope ordinances, wildfire ordinances, hazard setback requirements)	n/a	
Site plan review requirements	Y	
General or comprehensive plan	Y	
A capital improvements plan	Y	
An emergency response plan	Y	
A post-disaster recovery plan	N	
Environmental Management Plan	Y	
Master Drainage, Sewer, Water, & Reclaimed Water	Y	

Fiscal Resources

The table below shows specific financial and budgetary tools available to Novato Sanitary District.

Financial Resources	Y/N	Comments
Annual Expenditure Budget	Y	
Capital Improvement Budget	Y	
General Obligation Bonds	Y	
Property Tax Revenue	Y	
User Service Charges	Y	
Fees (Inspection, Permits, Annex, Franchise, AB939, Other)	Y	
Ranch Income	Y	
Capital Reserves	Y	

Section 6 – Future Actions & Goals

Mitigation Goals and Objectives

The information in the hazard vulnerability analysis and loss estimation information was used as a basis for developing mitigation goals and objectives. Mitigation goals are defined as general guidelines explaining what each jurisdiction (the City of Novato and the Novato Sanitary District) wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing city-wide visions. Objectives are statements that detail how the City's goals will be achieved, and typically define strategies or implementation steps to attain identified goals. Other important inputs to the development of jurisdiction-level goals and objectives include performing reviews of existing local plans, policy documents, and regulations for consistency and complementary goals, as well as soliciting input from the public.

Novato Sanitary District and the City of Novato are supportive of the following actions and goals. The City shall make every effort, given appropriate funding, to implement these actions and goals as conditions warrant.

Goals, Objectives and Actions

Listed below are the Novato Sanitary District/City of Novato specific long-term hazard mitigation goals, objectives and related potential actions.

For each goal, one or more objectives have been identified that provide strategies to attain the goal.

Where appropriate, the jurisdictions have identified a range of specific actions to achieve the long term objective and goal.

The goals and objectives were developed by considering the risk assessment findings, localized hazard identification and loss/exposure estimates, and an analysis of the jurisdictions' current capabilities assessment. These preliminary goals, objectives and actions were developed to represent a vision of long-term hazard reduction or enhancement of capabilities.

In addition, the Hazard Mitigation Planning Committee representatives met with the consultant staff and various Department representatives to specifically discuss these hazard-related goals, objectives and actions as they related to the overall Plan. Representatives of numerous departments were involved in hazard mitigation planning. Those Departments are listed specifically on the minutes of the meetings.

Goals

The Hazard Mitigation Planning Committee developed the following Long Term Goals for the Novato Sanitary District and the City of Novato's Hazard Mitigation Plan Program.

Goal 1. Promote Disaster-resistant future development.

Task: Apply all current codes and standards to both future development and redevelopment

Goal 2. Increase public understanding and support for effective hazard mitigation.

Goal 3. Build and support local support and commitment to become less vulnerable to hazards.

Goal 4. Continue hazard mitigation coordination and communication with federal, state, local and private entities.

Task: Meet regularly with affected agencies to discuss hazards and joint mitigation efforts

Goal 5. Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and District/City-owned facilities from the following ***high*** risks:

- Earthquake
- Flood
- Wildland Urban Interface Fire
- Utility Loss
- Transportation Loss
- Land Slides
- Hazardous Materials
- Water-Waste Water Disruption

Objectives and Actions

The Hazard Planning Committee developed the following broad list of objectives and actions to assist in the implementation of each of their identified goals. They developed objectives to assist in achieving their hazard mitigation goals. For each of these objectives, specific actions were developed that would assist in their implementation. A discussion of the prioritization and implementation of the action item.

Objective 1: Facilitate the development or updating of general plans and zoning ordinances to limit development in hazard areas.

Action 1. Update General Plan every 10 years as feasible.

Action.2 Continue to attract and retain qualified, professional and experienced staff.

Action 3 Monitor and continue to Identify high hazard areas.

Objective 1.B: Facilitate the adoption of building codes that protect existing assets and restrict new development in hazard areas.

Action 4 Review Codes every 3 years. Adopt Codes as the State of California Adopts them.

Objective 2: Facilitate consistent enforcement of general plans, zoning ordinances, and building codes.

Objective 3: Limit future development in hazardous areas

Action 5 Development should be in harmony with existing topography.

Action 6 Development patterns should respect environmental characteristics.

Action 7 Development should be limited in areas of known geologic hazards.

Action 8 Development in floodplains shall be limited to protect lives and property and to comply with Federal, State and Local codes for floodplain development.

Objective 4: Address identified data limitations regarding the lack of information about new development and build-out potential in hazard areas

Objective5: Increase public understanding, support and demand for hazard mitigation for new developments.

Action 9 Gain public acceptance for avoidance policies in high hazard areas.

Future Goals and Objectives

Goal 1: Increase public understanding and support for effective hazard mitigation.

Objective 1: Educate the public to increase awareness of hazards and opportunities for mitigation actions.

Action 1 - Publicize and encourage the adoption of appropriate hazard mitigation actions.

Action 2 - Provide information to the public on the Planning Jurisdictions website.

Action 3 - Gain public acceptance for avoidance policies in high hazard areas.

Goal 2: Increase public understanding and support for effective hazard mitigation.

Objective 1: Educate the public to increase awareness of hazards and opportunities for mitigation actions.

Action 1 - Publicize and encourage the adoption of appropriate hazard mitigation actions.

Action 2 - Provide information to the public on the Planning Jurisdictions website.

Action 3 - Gain public acceptance for avoidance policies in high hazard areas.

Goal 3: Enhance hazard mitigation coordination and communication with federal, state, County and local regional jurisdictions.

Objective 1 Establish and maintain closer working relationships with state agencies, county departments and local regional jurisdictions..

Action 1 - Develop multi-jurisdictional/ multi-functional training and exercises to emergency response and identify hazard mitigation opportunities.

Goal 4: Enhance hazard mitigation coordination and communication with federal, state, county and local regional jurisdictions

Objective 1 Encourage other organizations to incorporate hazard mitigation activities.

Action 1 - Leverage resources and expertise that will further hazard mitigation efforts.

Action 2 - Update the all-hazard mitigation plan on a regular basis.

Action 3- Establish and maintain lasting partnerships through existing Organizations.

Action 4 - Maintain coordination, communication and cooperation with the State in administering recovery programs.

Action 5 - Continue to exchange resources and work with local and regional partners.

Goal 5: Reduce the possibility of damage and losses to existing assets, including people, critical facilities/infrastructure, and public facilities due to earthquakes.

Objective 1: Develop a comprehensive approach to reducing the possibility of damage and losses due to earthquakes.

Action 1 - Maintain Building Codes to reflect current earthquake standards. The State of California must first adopt a code for local governments to implement it.

Action 2 - Encourage and participate in community awareness meetings.

Action 3 - Distribute printed publications to the communities concerning hazards.

Action 4- Adopt the most up to date building and seismic codes when they are adopted by the State of California.

Objective 2: Protect existing assets with the highest relative vulnerability to the effects of earthquakes.

Action 1 - Identify hazard-prone structures as feasible.

Action 2 - Encourage and continue the study ground motion, landslide, and liquefaction.

Task: Support ABAG and California Mines and Geology efforts to continue these studies

Task: Utilize data developed by California Mines and Geology and ABAG for the City's decision making process.

Objective 3: Coordinate with and support existing efforts to mitigate earthquake hazards

Action 1 - Identify projects for pre-disaster mitigation funding.

Action 2 - Design and implement an ongoing public seismic risk assessment program.

Action 3 - Collaborate with Federal, State, universities and local agencies' mapping, efforts.

Task: Support local GIS efforts to map hazards

Task: Support ABAG's efforts to map hazards

Objective 4: Address identified data limitations regarding the lack of information about the relative vulnerability of assets from earthquakes.

Action 1 - Assess City of Novato's utility infrastructure with regard to earthquake risk, including public and private utilities. Meet regularly with utility providers to accomplish this action.

Action 2 - Encourage the public to prepare and maintain a 3-day preparedness kit for home and work for all hazards.

Task: Encourage schools to distribute preparedness information

Task: Make preparedness information available at City Departments

Prioritization and Implementation of Action Items

Once the comprehensive list of Jurisdictions' goals, objectives, and action items listed above was developed, the proposed mitigation actions were prioritized by the Planning Executive Committee. This step resulted in a list of acceptable and realistic long-term actions that address the hazards identified in the Jurisdictions.

The Disaster Mitigation Act of 2000 (at 44 CFR Parts 201 and 206) requires the development of an action plan that not only includes prioritized actions but one that includes information on how the prioritized actions will be implemented. Implementation consists of identifying who is responsible for which action, what kind of funding mechanisms and other resources are available or will be pursued, and when the action will be completed.

The top 4 prioritized mitigation actions as well as an implementation strategy for each are:

Action Item #1: Coordinate the development of a multi-Hazard DMA 2000 plan.

Coordinating Individual/Organization: City of Novato

Potential Funding Source: FEMA Grants/ General Funds for Planning

Implementation Timeline: 1 Year

Action Item #2: Publicize and encourage the adoption of appropriate hazard mitigation actions.

Coordinating Individual/Organization: Planning Jurisdictions

Potential Funding Source: General Fund/Federal or State grants.

Implementation Timeline: 1 - 3 years

Action Item #3: Review and compare existing flood control standards, zoning and building requirements.

Coordinating Individual/Organization: Department of Public Works (PW)/Novato Sanitary District Technical Services

Potential Funding Source: General Fund/Federal or State Grants

Implementation Timeline: 1 - 3 years

Action Item #4: Encourage the public to prepare and maintain a 3-day preparedness kit for home and work.

Coordinating Individual/Organization: OEM/ Media & Public Relations/IT

Potential Funding Source: General Fund/Federal or State grants

Implementation Timeline: 1 - 3 years

Section 7 – Plan Maintenance

Monitoring, Evaluating & Updating

This section of the Plan describes the formal process that will ensure that the Plan remains an active and relevant document. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing a plan revision every five years.

This section describes how the Novato Sanitary District and the City of Novato will integrate public participation throughout the plan maintenance process. Finally, this section includes an explanation of how the jurisdictions intend to make considerations for the mitigation strategies outlined in this Plan into existing planning mechanisms.

City of Novato (Emergency Management Coordinator (EMC) and a representative from the Novato Sanitary District will be responsible for monitoring the plan annually for updates to jurisdictional goals, objectives, and action items. If needed, the EMC will coordinate through the Hazard Mitigation Planning Committee to integrate these updates into the Plan. The Chairman of the Hazard Mitigation Planning Committee will be responsible for monitoring the overall Plan for updates on an annual basis. The Chairman will reconvene the Planning Committee as needed to make these updates.

The Plan will be evaluated by the Novato Sanitary District and City of Novato (EMC) at least every two years to determine the effectiveness of programs, and to reflect changes in land development or programs that may affect mitigation priorities. The Plan will also be re-evaluated based upon the initial Plan criteria used to draft goals, objectives, and action items for this Plan. Action items will be reviewed to determine their relevance to changing situations in the Novato Sanitary District and in the City of Novato, Marin County, as well as changes in State or Federal regulations. The jurisdictions will conduct an assessment of each portion of the Plan to determine if this information should be updated or modified, given any new available data.

All City Departments and District Technical Services will be responsible to provide the Planning Committee Chairperson with jurisdictional-level updates to the Plan when/if necessary as described above. Every five years the updated plan will be submitted to the State of California and FEMA for review.

The jurisdictions will have the opportunity to implement recommended action items through existing programs and procedures that are deemed appropriate.

Continued Public Involvement

The Novato Sanitary District and City of Novato are dedicated to involving the public directly in review and updates of the Plan.

A representative from each participating jurisdiction will be responsible for monitoring, evaluating, and updating the Plan as described above. During all phases of plan maintenance the public will have the opportunity to provide feedback.

A copy of the Plan will be publicized and available for review on the City of Novato website. In addition, copies of the plan will be catalogued and kept at all of the appropriate Departments and District Administrative Services. The existence and location of these copies will also be posted on the

City of Novato website. The site will contain contact information for public to which people can direct their comments and concerns.

All public feedback will be forwarded to the appropriate city department for review and incorporation (if deemed appropriate).

A press release requesting public comments will also be issued after each evaluation or when deemed necessary. The press release will direct people to the website or appropriate local location where the public can review proposed updated versions of the Plan. This will provide the public an outlet for which they can express their concerns, opinions, or ideas about any updates/changes that are proposed to the Plan. The Emergency Management Coordinator will assure the resources are available to publicize the press releases and maintain public involvement through public access channels, web pages, and newspapers as deemed appropriate.

Glossary of Acronyms

ARC	American Red Cross
BFE	Base Flood Elevation (100 yr.)
BIA	Bureau of Indian Affairs
BICEP	Business and Industry Council for Emergency Preparedness
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CALTRANS	California Department of Transportation
CBSC	California Building Standards Commission
CCC	California Conservation Corp
CDC	Center for Disease Control
CDEC	California Data Exchange Center
CDF	California Dept. of Forestry and Fire Protection
CDFA	California Department of Food and Agriculture
CFSA	Consolidated Farm Service Agency
CFR	Code of Federal Regulations
CIS	Chemical Inventory System
CRDL	Chemical and Radiation Detection Laboratory
CLETS	California Law Enforcement Telecommunication System
CRS	NFIP Community Rating System
DHS	Department of Homeland Security
DMA 2000	Disaster Mitigation Act of 2000
DFG	California Department of Fish and Game
DOC/DMG	California Department of Conservation/Division of Mines and Geology
DoD	U.S. Department of Defense
DOT	U.S. Department of Transportation
DOE	U.S. Department of Energy
DPR	California Department of Parks and Recreation
DPW	Department of Public Works
DWR	California Department of Water Resources
EAL	Federal Emergency Action Levels
EIS	Early Implementation Strategy
EIS/EIR	Environmental Impact Statement & Environmental Impact Report

EMC	Emergency Management Coordinator
EPA	U.S. Environmental Protection Agency
ESA	Explosive Storage Area
EXPL	Explosives
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
GHAD	Geological Hazard Statement Districts
GIS	Geographic Information System
HMP	Hazard Mitigation Program
HMGP	Hazard Mitigation Grant Program
HUD	US Department of Housing and Urban Development
HVA	Hazard Vulnerability Analysis
IA	Individual Assistance Program
ICBO	International Congress of Building Officials
ICS	Incident Command System
IFGP	Individual Family Grant Program
IHMT	Interagency Hazard Mitigation Team
JFOC	Joint Flood Operations Center
JIC	Joint Information Center
JOC	Joint Operations Center
LACO	Marin County
LPG	Liquefied Petroleum Gas
MSDS	Material Safety Data Sheet
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Agency
NPDES	National Pollutant Discharge Elimination System
NOAA	National Oceanic and Atmospheric Administration
NMF	National Marine Fisheries
NPGA	National Propane Gas Association
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NRCS	U.S. Natural Resource Conservation Service
NSD	Novato Sanitary District
NWS	National Weather Service
OEM	Office of Emergency Management

OES	Office of Emergency Services
OMB	US Office of Management and Budget
PA	FEMA Public Assistance Program
PDA	Preliminary Damage Assessment
PG&E	Pacific Gas and Electric
RCD	Resource Conservation Districts
RFC	NWS River Forecast Center
SBA	U.S. Small Business Administration
SCCAG	Southern California Council of Governments
SEMS	Standard Emergency Management System
SOP	Standard Operating Procedure
SRB	State Reclamation Board
UBC	Uniform Building Code
USACE	US Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFS	United States Forestry Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNRC	U.S. Nuclear Regulatory Commission
VOLAG	Volunteer Agencies

APPENDIX 1

Multi-Hazard Mitigation Plan Adoption Resolution

CITY COUNCIL OF THE CITY OF NOVATO

RESOLUTION NO. 92-07

RESOLUTION OF THE CITY COUNCIL OF THE CITY OF NOVATO ADOPTING THE MULTI-JURISDICTIONAL ALL-HAZARD MITIGATION PLAN AND AUTHORIZING THE CITY MANAGER TO IMPLEMENT THE PLAN

WHEREAS, to strongly encourage local governments to improve mitigation planning; Congress enacted the Disaster Mitigation Act of 2000 (DMA 2000). The legislation reinforces the importance of planning for disasters before they occur and requires all state and local governments to develop comprehensive mitigation plans as a condition of eligibility for future post-disaster mitigation grants after November 4, 2004; and

WHEREAS, the City Manager created a Hazard Mitigation Planning committee which received input from the community and adjacent jurisdictions, during the preparation of the Plan; and

WHEREAS, the agency's plan must include hazard identification and risk assessment, mitigation strategy, a prioritized list of actions to address the issues identified and a maintenance plan; and

WHEREAS, the Multi-jurisdictional All-Hazard Mitigation Plan satisfies all the requirements under the law.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Novato hereby:

1. The City of Novato Multi-jurisdictional All-Hazard Mitigation Plan as submitted to the City Council is approved.

2. The City Manager, or his designee is authorized to submit the Plan and all necessary documents to the Federal Emergency Management Agency (FEMA), the State Office of Emergency Services, and any other appropriate government entity. Finally, in the event changes or modifications are requested by any agency, the City Manager, or his designee, is authorized to make such changes and resubmit the document.

3. The City Manager or his designee is authorized to implement the Plan once accepted by FEMA and to evaluate the Plan annually with the Hazard Mitigation Planning committee and make updates as necessary. Every five years the Plan shall be submitted to the appropriate government entities for the review.

RES/3869
7/12/7

I HEREBY CERTIFY that the foregoing resolution was duly and regularly adopted by the City Council of the City of Novato, Marin County, California, at a meeting thereof, held on the 10th day of July, 2007, by the following vote, to wit:

AYES:	Councilmembers	Dillon-Knutson, Gray, Leland, Eklund
NOES:	Councilmembers	None
ABSTAIN:	Councilmembers	None
ABSENT:	Councilmembers	MacLeamy

City Clerk of the City of Novato

APPENDIX 2

Hazard Impact Table

HAZARDS	CITY OF NOVATO	NOVATO SANITARY DISTRICT
	IMPACT	IMPACT
Earthquake	High Risk: The impact to critical facilities is low, but the potential loss of life is high.	High Risk: The impact from liquefaction, ground rupture, and shaking poses a high threat to Novato Sanitary District's underground pipes and systems.
Flooding	High Risk: The impact from flooding in the City of Novato is high. The City has a long history of repetitive flood damage which affects approximately 35% of its jurisdiction. There are 22 houses located in high repetitive flood areas and approximately 300 homes vulnerable from the impact of flooding.	Low Risk: The impact from flooding to the Novato Sanitary District buildings and underground systems is low.
Wildland Urban Interface Fire	High: The direct impact from a Wildland Urban Interface Fire to the City is low. But the potential for wildland fires is high based on the history of California. The indirect impact to the City is high due to the surrounding dense vegetation and trees.	High: Same impact as the City
Utility Loss	High Risk:	High Risk: Same impact as the City
Transportation Loss	High Risk: The impact to the City is high. Any incident and or accident that close Highway 101 cause immediate gridlock for the City, citizens, emergency vehicles and travelers.	High Risk: Same impact as the City

HAZARDS	CITY OF NOVATO	NOVATO SANITARY DISTRICT
	IMPACT	IMPACT
Landslides	High Risk: The potential impact from landslides is high according to the Marin County Landslide map. It is rated as a moderate risk due to no historical damage to the City. The City is mainly urbanized and developed. The vulnerable areas are the hillside terrains. The most serious impact would be debris flowing on to the roads and Highway 101.	Moderate Risk: The impact to the Novato Sanitary District is moderate to low. Depending on the severity and area affected. The District would be impacted if the landslide uncovered or broke the underground pipe systems.
Hazardous Materials	High Risk: The impact from a hazardous materials spill or explosions is high due to the quantity and frequency of hazardous materials being transported to and through the City. The impact would be transportation loss, explosions, and loss of live from hazardous material flumes.	Moderate Risk: Same impact as the City.
Water & Wastewater Disruption	High Risk: Loss of potable water would impact the citizens, agricultural economy and environment. Lack of water could potentially have an impact on the City's ability to combat wildland fire.	High Risk: The impact from loss of potable water or disruption of wastewater would be an economical disaster for the Novato Sanitary District.
Dam Failure	Moderate Risk:	Moderate Risk: Same as the City
Weapons of Mass Destruction: Terrorism	Moderate Risk: The impact to the City would be secondary to an event in the San Francisco Bay area. The City does not have any known hard terrorist targets. If a terrorist act occurred in the San Francisco Bay area, the impact could be economical loss to the local businesses, psychological impact to citizens and children, and loss of transportation routes.	Moderate Risk: The act of sabotage to the sanitary district's infrastructure would have a serious impact. Sanitary districts have been an identified target of terrorists. Loss of pipelines, internal filtration systems and data systems could cause a biological sanitation disaster.

HAZARDS	CITY OF NOVATO	NOVATO SANITARY DISTRICT
	IMPACT	**IMPACT**
Data/Telecommunication	Moderate Risk: The City depends on data information systems to carry out nearly all aspects of day-to-day operations. If the City lost its IT and communications systems, the impact would be to emergency services, data collection, tax base, and citizen records, and law enforcement	Moderate Risk: Same as the City
T***he following natural disasters have been rated a low risk to the City of Novato and Novato Sanitary District due to the lack of impact upon them.***		
Severe Weather: Winds	Low Risk:	Low: Same as the City
Drought	Low Risk:	Low: Same as the City
Tsunami	Low:	Low: Same as the City