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DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT

PACIFIC COMMONS PROJECT
CATELLUS DEVELOPMENT CORP.

City of Fremont, California

STATE CLEARINGHOUSE# 8721715

GENERAL PLAN AMENDMENT AND
PLANNED DISTRICT REZONING

DUNCAN & JONES
Urban & Environmental Planning Consultants

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City of Fremont, California

May 1, 1996

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This **Supplemental Environmental Impact Report** was prepared by **Duncan & Jones**, Berkeley, California, and its affiliate consultants. The Consultants have devoted their best efforts to preparing a comprehensive information document that identifies and evaluates the possible environmental impacts of the proposed Project, and the possible measures which could be taken to mitigate adverse impacts.

This report is intended to be a full disclosure document and is provided solely to assist in the evaluation of the proposed Project. The Consultant shall not be liable for costs or damages of any client or third party caused by the use of this document for any other purposes, for such costs or damages of any client or third parties caused by delay or termination of any project due to judicial or administrative action, whether or not such action is based on the form or content of this report or any portion thereof prepared by the Consultants.

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EXECUTIVE SUMMARY

This report, together with its appendices, constitutes a second Draft Supplemental Environmental Impact Report (SEIR) on the Project first identified in 1987 as the Santa Fe Pacific Realty Project General Plan Amendment. It evaluates the environmental impacts associated with the request submitted to the City of Fremont for approval of a General Plan Amendment and Planned District rezoning on approximately 877 acres of land located in Fremont, California, southwest of Interstate 880 (the Nimitz Freeway) between the Auto Mall Parkway and Fremont Boulevard interchanges. These approvals would enable development of the property primarily in industrial and commercial uses, and would eliminate all residential uses on those portions of the property currently designated for such development in the Fremont General Plan. The Project applicant is Catellus Development Corporation.

CEQA Guidelines (Section 15163) require that a Supplemental EIR be prepared when minor additions or changes would be necessary to make a previously-prepared EIR adequate. In this case, the character of the Project as originally proposed by the Project applicant has been modified since certification of the initial EIR for the proposed Project in 1988 (please refer to Draft EIR dated November 24, 1987 and Final EIR dated January 22, 1988, City of Fremont, EIR-86-85, SCH#8721715). This document is the second Draft Supplemental EIR to be prepared for the proposed Project. An earlier Supplemental EIR on the proposed Project was certified in 1989 (please refer to Draft Supplemental EIR dated December 12, 1988 and Final Supplemental EIR dated February 24, 1989, City of Fremont, EIR-86-85, SCH#8721715), and an Addendum to the EIR on the proposed Project was certified in 1991 (please refer to Addendum to the EIR dated August 12, 1992, City of Fremont, Special Study Application 90-6, SCH#8721715). All of these previous environmental documents on proposed Project are incorporated in this document by reference.

The Project site would be developed largely in industrial uses (including wholesaling and campus-style Research and Development) and commercial uses, although some portions of the Project site would support institutional open space uses (commercial recreation, parks and wetlands) and public facility uses (a fire station).

The following acreage would be developed in each of the following land use categories:

Land Use	Net Acres
Research & Development	125.6
Commercial	78.0
Campus Research & Development	127.8
Industrial/Research & Development	118.7
Wholesale/Industrial	50.8
Wholesale	86.0
Fire Station	1.0
Parks and Project Plazas	14.1
Streets	79.4
Auto Mall	40.6
Open Space (Commercial Recreation/City Parks/Wetlands)	155.0
Total	877.0

Following an Introduction (Chapter I), Chapter II briefly describes the location and nature of the Project site, as well as the chronology of development applications for the site. Chapter III evaluates the planning and policy context of the Project applicant's revised proposal for site development in terms of its relationship to the City's General Plan, Industrial Redevelopment Plan, zoning and development patterns and policies. Traffic and circulation conditions and impacts are addressed in Chapter IV. The capability of public services and facilities to accommodate the demands of the modified Project are discussed in Chapter V. Other issues, including hazardous/toxic materials, vegetation and wildlife, air quality, noise, visual considerations, geotechnical considerations and archaeological considerations, are addressed in Chapter VI. Within each chapter in turn, the character of existing conditions is described (under the sub-heading "Setting"), then the probable effects of the proposed Project are discussed ("Impacts"), and finally the corrective actions applicable to these impacts are identified ("Mitigation Measures"). Impacts and Mitigation Measures are numbered within each chapter so that each identified impact within that chapter is linked with a corresponding Mitigation Measure (i.e., Impact **4-1** is the first Impact discussed in Chapter IV, and the corresponding Mitigation Measure is also numbered **4-1**). These numbered references are set at the left edge of the text in a larger and distinctive type-face which differs from the type used throughout the report.

Mitigation Measures are expressed in a mandatory form (i.e., "the applicant shall ..."), rather than in a less forceful manner (i.e., "the City might require ...", the applicant could provide ...", etc.). This usage enables the determination of significant impact avoidance to be stated unequivocally and without confusion. The decision to require each and every mitigation measure, as stated, to be applied to the Project as a condition of approval continues to reside with the City Council and Planning Commission, and these bodies can choose to delete or change any mitigation measure. In approving a Project for which an EIR has been completed, and where the EIR identifies one or more significant environmental effects of the Project, CEQA requires the City to make written findings for each such effect (as specified in Sec. 15091 (a) [1] through [3]).

In Chapter VII, four alternatives to the proposed Project are presented for the purposes of comparison. Chapter VIII: Overview of Analysis, summarizes the significant unavoidable adverse effects/irreversible environmental changes, growth inducing impacts and cumulative impacts associated with the Project. Chapter IX provides a listing of the authors of the Supplemental EIR, persons and organizations consulted, and references.

The Appendices include the TJKM Traffic Analysis, a letter from the Alameda County Water District, the ENTRIX Methodology for Wetland Mapping, Plant Species Observed on the Project Site, Habitat Evaluation, Special Status Species, Burrowing Owl Habitat Assessment, Conceptual Mitigation Plan, Mitigation Site Assessment, Air Quality Methodology and Assumptions, Fundamental Concepts of Environmental Noise and Archaeological Evaluation.

In the Summary of Significant Impacts and Mitigation Measures which follows, beginning on page ES-3, each and every individual Impact identified in the body of the Draft Supplemental EIR is presented along with the applicable Mitigation Measure (or Measures) in the numerical sequence in which they are addressed in the full text. This compilation provides an overview of the evaluation, together with an indication of the extent to which the Project's significant impact may be susceptible to avoidance or mitigation.

SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Traffic and Circulation

Impact 4-1: Development of the proposed project would *significantly* impact the intersection of I-880 SB Off-Ramp and Stevenson Boulevard. With the proposed Project and road network implemented, this intersection is forecast to exceed LOS D operations during the AM peak hour. The intersection is forecast to operate at LOS E (v/c=0.94) during the AM peak hour. With the existing General Plan land use and road network implemented, LOS C operations are forecast during the AM and PM peak hours.

Mitigation 4-1: I-880 SB Off-Ramp/Stevenson Blvd. Additional intersection improvements beyond the expected improvements are not feasible. Therefore, the impact to peak hour operations at the I-880 SB Off-Ramp/Stevenson Boulevard intersection cannot be mitigated via geometric improvements. **The impact to this intersection related to Project development is an unavoidable significant impact.**

Impact 4-2: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of Christy Street and Auto Mall Parkway. With the proposed Project and road network implemented, this intersection is forecast to operate at LOS E (v/c=0.95) during the PM peak hour. With the existing General Plan implemented, LOS C operations are forecast for the PM peak hour.

Mitigation 4-2: Christy St/Auto Mall Parkway. Restriping the southbound approach to provide two exclusive left-turn lanes and one shared through, left-and right-turn lane would improve the intersection V/C ratio to 0.87 during the PM peak hour. This improvement would reduce impacts related to Project development to a level of *less than significant*.

Impact 4-3: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of the I-880 NB Ramps and Fremont Boulevard. This intersection is forecast to operate at LOS E (v/c=0.92) during the AM peak hour with the proposed Project and road network developed. With the existing General Plan, this intersection is forecast to operate at LOS A (v/c=0.60).

Mitigation 4-3: I-880 NB Ramps/Fremont Blvd. Additional improvements to this intersection are not feasible due to right-of-way constraints. **The Project-related impact to this intersection is an unavoidable significant impact.**

Impact 4-4: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of the I-880 SB Ramps and Auto Mall Parkway. This intersection is forecast to operate at LOS F (v/c=1.25) during the AM peak hour with the proposed Project developed versus LOS D (v/c=0.83) with the existing General Plan.

Mitigation 4-4: I-880 SB Ramps/Auto Mall Parkway. Additional improvements beyond the expected improvements are not feasible. Widening to provide a two-lane on-ramp from eastbound Auto Mall Parkway to southbound I-880 would improve the operation of the weaving maneuver on eastbound Auto Mall Parkway between Christy Street and the I-880 southbound

on-ramp. However, this improvement would not improve the operation of the I-880 SB Ramps/Auto Mall Parkway intersection. **The Project-related impact to this intersection is an unavoidable significant impact.**

Impact 4-5: Development of the proposed Project would improve the AM level of service from "F" to "E", but because the PM peak hour degrades from an acceptable LOS D to an unacceptable LOS F, the proposed project is considered to *significantly* impact peak hour traffic operations at this intersection. This intersection would operate at LOS E (v/c=0.98) during the AM peak hour and LOS F (v/c=1.02) during the PM peak hour with the proposed Project developed. With the existing General Plan, this intersection would operate at LOS F (v/c=1.11) during the AM peak hour and LOS D (v/c=0.82) during the PM peak hour.

Mitigation 4-5: Cherry St/Boyce Rd/Stevenson Blvd. Signalization and improvement of three of the intersection approaches would improve the AM peak hour V/C ratio to 0.84 (LOS D) and the PM peak hour V/C ratio to 0.85 (LOS D). The following improvements are required:

- Westbound Approach -- widen to provide two exclusive left-turn lanes, one exclusive through lane and one exclusive right-turn lane;
- Eastbound Approach -- restripe to provide one exclusive left-turn lane, one exclusive through lane, and one shared through and right-turn lane; and
- Northbound Approach -- widen the east leg and redesign southeast corner to provide a northbound free right turn lane.

Implementation of these improvements would reduce Project impacts to a level of *less than significant.*

Impact 4-6: The proposed Project is considered to *significantly* impact peak hour traffic operations at the intersection of Grimmer Boulevard/Auto Mall Parkway because the proposed Project would degrade unacceptable (LOS E) operations with the existing General Plan by more than five percent during the AM and PM peak hours. This intersection is forecast to operate at LOS E during the AM and PM peak hours with the existing General Plan land use and road network plans implemented. With the proposed Project, this intersection is forecast to operate at LOS F during the AM and PM peak hours.

Mitigation 4-6: Grimmer/Auto Mall Parkway. No additional capacity related improvements are feasible at this intersection due to right-of-way constraints. **The Project-related impact to this intersection is an unavoidable significant impact.**

Impact 4-7: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of Boyce Road and Auto Mall Parkway. This intersection is forecast to operate at LOS D (v/c=0.85) during the PM peak hour with the existing General Plan implemented versus LOS F (v/c=1.05) with the proposed Project implemented.

Mitigation 4-7: Boyce Rd/Auto Mall Parkway. The PM peak hour level of service can be improved to LOS D (v/c=0.84) by reconfiguring the southbound approach to provide two exclusive left-turn lanes, two exclusive through lanes and one free right-turn lane. To implement

this improvement would require narrowing the median on the southbound approach. Implementation of this improvement would reduce Project impacts to a level of *less than significant*.

Due to the elimination of the Stevenson Boulevard extension from the study area road network, the lane requirements on the eastbound approach to Boyce Road/Auto Mall Parkway can be reduced from those presented in the previous Addendum to the EIR (Ref. 14). At a minimum, the eastbound approach could provide one exclusive left-turn lane and one shared through and right-turn lane, and would operate at LOS D during both peak hours (v/c=0.85 during the AM peak hour and 0.87 during the PM peak hour).

Impact 4-8: The southbound I-680 segment between Washington Boulevard and Durham Road would be *significantly* impacted by the proposed Project during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.03) with the proposed Project.

Mitigation 4-8: To mitigate regional impacts related to Project development, the City should consider requiring the developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute. Elements of the program and strategies that should be considered include the following:

- Establishment of a Transportation Management Associate for the Project area development with a TDM program manager to assist employers in the Project area (and surrounding areas) with the program;
- Transit user subsidies including 1) establishment of a shuttle service between the Project and BART or other transit service and 2) the bulk purchase of transit passes to underwrite the establishment of AC transit to the area;
- Implementation of a parking cash-out program. A parking cash-out program is an employer-funded program in which an employer offers to provide a cash allowance to an employee equivalent to the parking subsidy that the employer would otherwise pay to provide the employee with a parking space. The City of Pleasanton has established a parking cash-out program for City employees. The ACCMA estimates that the program reduces employee commute traffic by five percent from previous non-monetary incentive-based programs and reduces parking utilization by an estimated three percent;
- Flex-time schedules;
- Telecommuting;
- Utilization of site design standards that would benefit transit, pedestrians and bicyclists;
- Preferential parking for carpools and vanpools;
- Rideshare matching programs such as the ridematching program offered by RIDES for Bay Area Commuters;
- Guaranteed Ride Home program (provides carpool and vanpool participants with a vehicle in an emergency or if they cannot leave at their usual time); and
- Funding for City monitoring of the programs.

In evaluating these potential measures, the practical effort and the cost to private and public entities should be addressed. It is not possible to precisely quantify the reduction in peak hour and daily traffic that will be achieved through a TDM program because the reduction in trips depends on the trip reduction measures implemented and the cooperation and support provided by employers. **Therefore, reduction of impacts to the regional road network to less-than-significant levels could not be assured, and impacts to the southbound I-680 between Washington Boulevard and Auto Mall Parkway are considered unavoidable significant impacts.**

Impact 4-9: The proposed Project would *significantly* impact southbound I-880 from SR 84 to Thornton during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Mitigation 4-9: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to southbound I-880 between SR 84 and Thornton Road during the AM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to southbound I-880 between SR 84 and Thornton Road during the AM peak hour are considered unavoidable significant impacts.**

Impact 4-10: The proposed Project would *significantly* impact southbound I-880 from Mowry to Stevenson during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.98) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Mitigation 4-10: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to southbound I-880 between Mowry Avenue and Stevenson Boulevard during the AM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to southbound I-880 between Mowry Avenue and Stevenson Boulevard during the AM peak hour are considered unavoidable significant impacts.**

Impact 4-11: The proposed Project would *significantly* impact southbound I-880 from Stevenson to Auto Mall during the AM peak hour. This segment is forecast to operate at LOS E (v/c=1.00) with the existing General Plan and LOS F (v/c=1.02) with the proposed Project.

Mitigation 4-11: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to southbound I-880 between Stevenson Boulevard and Auto Mall Parkway during the AM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to southbound I-880 between Stevenson Boulevard and Auto Mall Parkway the AM peak hour are considered unavoidable significant impacts.**

Impact 4-12: The proposed Project would *significantly* impact northbound I-880 from Mowry to Thornton during the PM peak hour. This segment is forecast to operate at LOS E (v/c=0.98) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Mitigation 4-12: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to northbound I-880 between Mowry Avenue and Thornton Avenue during the PM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to northbound I-880 between Mowry Avenue and Thornton Avenue during the PM peak hour are considered unavoidable significant impacts.**

Impact 4-13: The proposed Project would *significantly* impact northbound I-880 from Thornton to SR 84 during the PM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.02) with the proposed Project.

Mitigation 4-13: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to northbound I-880 between Thornton Avenue and SR 84 during the PM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to northbound I-880 between Thornton Avenue and SR 84 during the PM peak hour are considered unavoidable significant impacts.**

Impact 4-14: In addition to the minimum street segment lanes shown in **Figure 18**, additional approach lanes and/or channelization may be required at the intersections of internal roadways. Also, additional lanes and/or channelization may be required on Streets "A" and "B" adjacent to the proposed retail areas and on Street "C" through the Auto Mall. Failure to provide geometrics necessary to maintain LOS D operations would represent a *significant impact*.

Mitigation 4-14: Additional analysis of traffic operations at the intersection of internal Project roadways should be performed to establish the ultimate design of these intersections. Because it may not be possible to thoroughly assess the long-term design requirements of in the internal Project roadways until additional information regarding the characteristics of the development and the location and size of buildings, sufficient right-of-way should be provided at the intersections of internal Project roadways to ensure that additional turning lanes can be provided in the future. If potential impacts are found to be significant, it should be possible to incorporate technical modifications in order to reduce these impacts to a level of *less than significant*.

The analysis should include the evaluation of Streets "A" and "B" adjacent to the retail areas and Street "C" through the Auto Mall. The access requirements for existing Auto Mall development should be considered when the design of Street "C" is developed. Additional analysis of operations on Street "F" may be warranted when the precise uses being developed on the adjacent parcels are known. The additional analyses of Streets "A" and "B" adjacent to the retail areas and Street "C" through the Auto Mall should evaluate intersection/driveway spacing, travel lane requirements, traffic control requirements, left-turn lane requirements, queue lengths on the

approaches of Streets "A", "B" and "C" to Auto Mall Parkway, and queuing on the approaches of the retail area exit driveways to Streets "A" and "B". Until these studies are completed, the ultimate design for Streets "A", "B" and "C" adjacent to the retail areas and the Auto Mall should not be established.

To promote efficient traffic flows on all Project roadways, the Project developer should work with the City of Fremont in the development of access management guidelines for the internal roadways. These guidelines should establish typical roadway cross-sections, minimum spacing between intersections and driveways, minimum spacing between median openings, where relevant and conceptual access plans for individual parcels, including potential inter-parcel connections. Access management on Street "C" is particularly important given that this roadway will not only provide access to adjacent parcels, but serve as a major north-south arterial and will provide an alternative to I-880.

If the internal intersections, including intersections on Streets "A", "B" and "C" at the retail areas and Auto Mall, are designed to maintain LOS D operations, *there will be no significant impacts.*

Transit and Road Maintenance

Impact 5-1: The proposed Project will increase the demand for transit at a location that is not currently served by commuter rail service or transit service. This is considered a *significant impact.*

Mitigation 5-1: The Project developer should assist AC Transit with the extension of bus service the Project site. Purchasing transit passes in bulk for distribution as a component of a TDM program is one means of assisting AC Transit with system expansion. Bus service to the Project site should be provided on 30 minute headways or on headways consistent with CMP transit performance standards and AC Transit service standards. Transit service to the Project site should include linkage with BART. The location of transit stops shall be coordinated with AC Transit and the City of Fremont as additional information concerning the location of buildings becomes known. The transit stops shall be clearly marked with route and schedule information. Adequate support of public transit operations would reduce the impact to a level of *less than significant.*

Storm Drainage, Flooding and Water Quality

Impact 5-2: The Project site does not have an adequate drainage plan. This is a *potentially significant impact.*

Mitigation 5-2: On-site drainage improvements are required to collect runoff and convey it into Line N-1. All on-site drainage facilities must be designed to handle the runoff associated with the 15-year storm design as determined by the Alameda County Flood Control and Water Conservation District, and all drainage plans and calculations shall be submitted to the District for approval. The development of satisfactory drainage plans and the subsequent completion of the required on-site drainage improvements would reduce the impact to a level of *less than significant.*

Impact 5-3: Portions of the Project site and adjacent areas occupy areas of the 100-year flood zone. This is considered a *potentially significant impact.*

Mitigation 5-3: The Project applicant shall comply with the following mitigations to address potential on-site flooding impacts.

All structures located within the 100-year flood zone shall be constructed at least one foot above the elevations identified within the 100-year flood hazard zone, as specified by the current FEMA Flood Insurance Rate Map.

or

Project design shall incorporate levees so that the southern portion of the Project site will be removed from the designated flood plain. These levees shall be designed with the approval of the Alameda County Flood Control and Water Conservation District.

Implementation of either of these mitigation alternatives would reduce the impact to a level of *less than significant.*

Impact 5-4: Soil erosion during construction at the Project site is considered a *potentially significant impact.*

Mitigation 5-4A: Grading occurring on an area greater than five acres requires an erosion control plan. The Project grading plan shall include a City-approved drainage and erosion control plan in order to minimize the impacts from erosion and sedimentation during construction. This plan, at a minimum, shall incorporate: (1) restricting grading to the dry season; (2) protecting downstream storm drainage facilities from sedimentation; and (3) using silt fencing to retain sediment on the Project site.

Mitigation 5-4B: Upon completion of the proposed Project, Line N-1 shall be inspected for accumulated sediments, The Project applicant is responsible for the clearing of accumulated debris and sediment within these channels.

Mitigation 5-4C: The Project applicant shall apply for and obtain an NPDES Grading Permit from the regional Water Quality Control Board through the City of Fremont.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

Impact 5-5: Future relative sea level rise could result in possible tidal and runoff related flooding at the Project site. This is a *potentially significant impact.*

Mitigation 5-5: The design of the proposed business development shall be made based upon the knowledge that the south San Francisco Bay will likely experience a significant relative sea level rise during the life of the Project. This would reduce the impact to a level of *less than significant.*

Impact 5-6: Water quality effects on the urban runoff waters entering the District Zone 6 watershed, especially in the reaches of Line N, are considered a *potentially significant impact* associated with Project development.

Mitigation 5-6A: The Project applicant shall apply for and obtain an NPDES Permit. A comprehensive urban runoff control program will be needed to mitigate the non-point source water quality effects of the Project during construction. To achieve this, the Project applicant shall develop specific stormwater management plans for each major sub-area of the Project. At a minimum, the plan(s) shall: (1) identify the specific types and sources of stormwater pollutants; (2) determine the location and nature of potential impact; and (3) specify appropriate control measures to eliminate any potentially significant impacts to receiving water quality from stormwater runoff. Control measures may include "water quality" detention and retention basins, site development restrictions, subsurface disposal, grass-lined drainage ditches, street sweeping and other design or source control management practices, as appropriate, to mitigate potential water quality effects.

Mitigation 5-6B: Water quality control and protection measures during construction shall conform to the City's pollution prevention requirements for construction contracts, which may include the following:

- Performing major vehicle maintenance, repair jobs and equipment washing off-site;
- Maintaining all vehicles and heavy equipment and inspecting frequently for leaks;
- Designating one area of the construction site, well away from any streams or storm drain inlets, for auto and equipment parking and routine vehicle and equipment maintenance;
- Cleaning up spilled dry materials immediately. Do not "wash them away" with water, or bury them;
- Using only minimal water for dust control;
- Cleaning up liquid spills in paved or impermeable surfaces using "dry" cleanup methods (i.e., absorbent materials, cat litter and/or rags);
- Cleaning up spills on dirt areas by removing and properly disposing of contaminated soil;
- Reporting significant spills to the appropriate spill response agencies;
- Storing stockpiled materials, wastes, containers and dumpsters under a temporary roof or secured plastic sheeting;
- Properly storing containers of paints, chemicals, solvents and other hazardous materials in garages or sheds with double containment during rainy periods;
- Placing dumpsters under roofs or covering them with plastic sheeting at the end of each work day and during rainy weather;
- Washing out concrete mixers only in designated wash-out areas where the water will flow into settling ponds or onto stockpiles of aggregate base or sand. Whenever possible, recycling washout by pumping back into mixers for reuse. Never disposing of washout into the street, storm drains, drainage ditches or streams;

- Applying concrete, asphalt and seal coat during dry weather. Keeping contaminants from fresh concrete and asphalt out of the storm drains and creeks by scheduling paving jobs during periods of dry weather, allowing new pavement to cure before stormwater flows across it;

- Covering catch basins and manholes when applying seal coat, slurry seal, fog seal, etc.; and,

- Always parking pavers over drip pans or absorbent materials, since they tend to drip continuously.

Mitigation 5-6C: Impacts to water quality from potential spills of hazardous or toxic materials can be prevented by strict adherence to applicable regulations and guidelines. City of Fremont Ordinance 1946 is one such set of regulations which must be followed by all industries and businesses storing or handling hazardous or toxic materials.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

Wastewater Collection, Treatment and Disposal

Impact 5-7: Portions of the Project site lie beyond the boundaries of the Union Sanitary District Service. This is a *potentially significant impact.*

Mitigation 5-7A: Annexation will be required for the USD to serve this area. The annexation of the property requires the approval of the Board of Directors. All extensions of service area boundaries may be subject to CEQA review.

Mitigation 5-7B: The area outside the USD service area shown as commercial recreation/city parks in **Figure 3** (page 9) will also require further study to determine how flows will be conveyed to the USD's facilities. Additional pump stations may be required.

Mitigation 5-7C: Final plans for the sewer system extensions must be reviewed and approved by the USD.

Mitigation 5-7D: Funding for all new wastewater collection facilities needed to serve the Project will be provided by the applicant.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

Impact 5-8: Industrial development at the Project site will result in an increase of wastewater generated through industrial processes. This is a *potentially significant impact.*

Mitigation 5-8: Industries locating at the Project site will be required to comply with the USD Waste Source Control Program and, if necessary, obtain a Waste Discharge Permit from the USD Waste Source Control Division. An Industrial Waste Discharge Permit will be needed by

any industries that could be categorized as potential dischargers of either prohibited wastes or toxic pollutants. Industries discharging prohibited or toxic wastes in excess of Federal, State or District standards will be required to pre-treat the waste before discharge to the USD collection system. The pre-treatment costs will be met by each industry. Industries will be required to monitor and test their own waste discharges, with additional periodic sampling being conducted by the USD Waste Source Control Division for verification. Industrial wastewater connection fees and annual charges will be based on the quantity and strength of wastewater to be generated. Implementation of this mitigation measure would reduce the impact to a level of *less than significant.*

Impact 5-9: High groundwater levels at the Project site could cause water to infiltrate into the wastewater discharge system. Inflow and infiltration of groundwater into the sewer lines of the Project site is considered a *potentially significant impact.*

Mitigation 5-9: The Project applicant shall follow appropriate construction guidelines requiring all sewer trunk lines and laterals to minimize the potential of infiltration and inflow of groundwater. Implementation of this mitigation measure would reduce the impact to a level of *less than significant.*

Water Supply

Impact 5-10: The proposed Project does not contain adequate plans for the water supply infrastructure. This is considered a *potentially significant impact.*

Mitigation 5-10A: Any industries requiring improved quality or higher pressure will have to take appropriate measures such as filters or booster pumps.

Mitigation 5-10B: The Project applicant shall provide the funding for all extensions to the water distribution system within the Project site.

Mitigation 5-10C: Final plans for the water distribution system must be approved by the ACWD and the City of Fremont Fire Department.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

Impact 5-11: The ACWD currently has the capability to meet Project water demands. However, these demands represent a net increase in water consumption. This is considered a *potentially significant impact.*

Mitigation 5-11A: The Project developer shall promote water conservation among the Project occupants. This could entail promoting the use of reclaimed wastewater or on-site recycling in occupant production processes.

Mitigation 5-11B: All commercial landscape areas at the Project site shall use drought tolerant plantings.

Mitigation 5-11C: Future industrial and commercial businesses at the Project site shall be required to institute water conservation measures. These measures may include the installation of low flow pumping fixtures, and industrial water conservation devices such as low flow dishwashers and other appliances.

Mitigation 5-11D: The possibility of using reclaimed wastewater for park turf grass irrigation shall be investigated.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant*.

Fire Protection Services

Impact 5-12: The proposed Project would have a significant impact on fire protection services by substantially increasing the need for these services in the area west of I-880. The increased demand for fire protection represents a *significant impact* associated with Project development.

Mitigation 5-12A: A one-acre site for a fire station at the Project site has been designated by the Project applicant, and the proposed Development Agreement proposes to locate a fire station on this site as early as practicable in the development schedule.

Mitigation 5-12B: The Project applicant shall comply with fire impact fees in effect at the time such fees are levied.

Mitigation 5-12C: Development at the Project site shall comply with all standard City requirements for fire protection and suppression (e.g. Fire Department review of precise development plans; hydrant, fire flow, water pressure and sprinkler requirements).

These measures would reduce the identified impact to a level of *less than significant*.

Police Protection Services

Impact 5-13: The Project would result in a significant increase in demand for police services in the vicinity of the Project site. This would represent a *significant impact* associated with Project development.

Mitigation 5-13A: Development plans for any portion of the Project site shall be reviewed by the Crime Prevention Division of the Police Department.

Mitigation 5-13B: Operators of commercial facilities at the Project site should be encouraged to supplement Police Department services by providing private security guards and crime prevention equipment.

These measures would reduce the identified impact to a level of *less than significant*.

Emergency Medical Services

Impact 5-14: Although the proposed development of the Project site would require less in the way of emergency medical services than the currently approved development plans for the area, it would still have a significant impact on emergency medical services by substantially increasing the need for these services in the area west of I-880. The increased demand for emergency medical services represents a *significant impact* associated with Project development.

Mitigation 5-14: A one-acre site for a fire station at the Project site has been designated by the Project applicant. At least one paramedic would be assigned to the engine company at this station on a 24-hour basis, and firefighters and paramedics would generally be able to respond to respond to medical emergencies at the Project site within five minutes or less. This would reduce the identified impact to a level of *less than significant.*

Hazardous/Toxic Materials

Impact 6-1: Project construction personnel may be exposed to hazardous chemicals that may be present in local groundwater during dewatering for construction. Since a complete and absolute site assessment is not feasible, the possibility exists for construction personnel to encounter hazardous materials due to the past history of on-site hazardous materials storage. This is considered a *potentially significant impact.*

Mitigation 6-1: In order to reduce exposure of construction personnel to contaminated groundwater, the following procedure shall be followed. All construction of utility trenches and/or structure foundations (around areas of known potential contamination) which encounter groundwater during construction shall be investigated. This includes testing the local groundwater for hazardous materials, including gasoline and related substances. If groundwater contamination is found, then appropriate cleanup procedures shall be followed under the regulatory auspices of the Regional Water Quality Control Board, the California Department of Toxic Substances Control (DTSC) and the City of Fremont. These measures will reduce the identified potential health and safety impacts associated with possible hazardous materials in groundwater at the Project site to levels of *less than significant.*

Impact 6-2: It is likely that hazardous materials will be used on, or transported to, the Project site. This represents a *potentially significant impact.*

Mitigation 6-2: The most effective way to limit any potentially significant environmental impact from hazardous/toxic materials would be to exclude those businesses that handle such materials from locating at the Project site. However, since businesses that use, transport and store hazardous/toxic materials already exist in the vicinity of the Project site, this alternative would not totally eliminate potential risks to future occupants on the site. Such restrictions may also have the effect of forcing certain otherwise desirable businesses to locate elsewhere, possibly in neighboring cities.

Short of these measures, impact minimization could include prohibition of certain materials (e.g., those that are extremely hazardous and/or toxic) or regulation of the quantities of materials transported, stored or utilized. Examples of extremely hazardous materials and/or toxic materials

are listed in **Figure 41** under the categories "Systemic Poisons Upon Exposure Above Permitted Exposure Levels" and "Animal and Human Carcinogens". At this stage in the review of the proposed Project, however, determinations cannot reasonably be made regarding types or quantities of materials that would be unacceptable for use, storage or transport at the Project site. Some businesses may use extremely hazardous materials in quantities small enough to pose only a minimal risk. Others may use large quantities of a hazardous/toxic material, but may have adequate procedures to minimize the risk involved.

Accordingly, it is required by California law that businesses involved with the utilization of hazardous materials must be reviewed on a case-by-case basis through the permit procedures of the City's Hazardous Materials Ordinance No. 1946 under Chapter 12 of Title 3 of the Fremont Municipal Code. The Hazardous Materials Ordinance encompasses Chapter 6.95 of the California Health and Safety Code. The ordinance incorporates state and federal regulations, and imposes restrictions on activities that would involve the potential for hazardous materials release, contamination or other impact on future occupants of the Project site. The regulation of industrial hazardous materials usage in the City of Fremont is supervised by the Hazardous Materials Division of the Fremont Fire Department. Businesses using hazardous materials must go through a standard review procedure and mandates the preparation of a Hazardous Materials Management Plan (HMMP). The Hazardous Materials Division reviews the HMMP, notifies the City Planning Department, and issues appropriate permits. The Hazardous Materials Ordinance includes a provision where the City Planning Department Manager has the final decision on business permits involving the use of hazardous materials. These procedures determine whether a proposed business is an appropriate use for the site based on the nature of its operation, proximity to recreational and park areas, likelihood of an accidental spill or release of hazardous/toxic materials, and other factors. The permitting procedure could include a requirement for a focused environmental assessment of individual developments at the Project site, perhaps as part of the HMMP required by the Hazardous Materials Ordinance. As part of the environmental assessment, specific mitigation measures could be defined to offset the hazardous materials impacts of the proposed development.

If feasible, businesses and related traffic with the highest potentially significant environmental impact, including light industry, R&D and possibly warehousing, shall be located away from recreational areas, parks and major drainages. As previously recommended in the City of Fremont Hazardous Materials Management Study, buffer zones between these operations and the recreational and park areas shall be included in the development. Buffer zones and locations of proposed hazardous materials operations would be determined by the City Planning Department Manager. In any event, all sections of the City of Fremont's Hazardous Materials Ordinance (No. 1946), contingency planning in particular, shall be strictly enforced. Further mitigation measures may stem from zoning, use and design criteria, and CC&R restrictions on the components of the approved Project.

Businesses that use hazardous/toxic materials shall be required to have spill and accidental release emergency response procedures. All spills and/or accidental releases shall be cleaned up immediately to reduce the possibility of being washed into local drainages and, ultimately, the sloughs and San Francisco Bay. Spill and release containment facilities or devices shall be required and shall meet the standards of the State's Department of Health Services.

The City of Fremont shall continue to increase public awareness and knowledge of potentially hazardous/toxic materials and their associated impacts. The future occupants and visitors at the Project site shall be made aware of the emergency procedures that would be required in the event of an accident involving such materials. The Fremont Fire Department currently provides to the public, free of charge, handouts and other forms of information dealing with the handling and disposal of hazardous and toxic materials. This practice shall be continued through the proposed on-site fire station.

The measures above will reduce the identified health and safety impacts associated with possible hazardous materials in Project soils, air and groundwater to levels of *less than significant*.

Vegetation and Wildlife

Impact 6-3: Project development would eliminate all or a substantial portion of the non-native grassland on the Project site. This plant community is very common and is not considered sensitive (CNDDB, 1995); the vegetation is dominated by non-native species; it generally does not support special status plant or animal species; and the habitat can easily be created or improved. However, because of the potential of the non-native grassland to provide nesting and foraging habitat for the burrowing owl, and nesting habitat for the northern harrier, this loss is considered a *potentially significant impact*.

Mitigation 6-3: Implementation of Mitigation Measures **6-6** and **6-7** below will reduce to *less than significant* the impacts to non-native grassland associated with the loss of suitable burrowing owl and northern harrier habitat.

Impact 6-4: Based on the surveys performed for purposes of this Supplemental EIR, the Project site contains roughly 100.30 acres of wetland resources as follows: 2.30 acres of non-tidal salt marsh; 56.70 acres of seasonal marsh; and 41.30 acres of wet meadow habitat. The current development plan for the proposed Project will eliminate all wetland resources on the Project site, excepting approximately 4.30 acres of seasonal marsh on the Stem parcel.

Seasonal marsh areas on the Project site (which include the non-tidal salt marsh for evaluation purposes) are considered moderate value due to their cover by native and perennial species. The seasonal wetlands on the Stem parcel are in a relatively undisturbed condition; potentially support special status plant and animal species; and are adjacent to the San Francisco Bay National Wildlife Refuge.

Wet meadow areas are considered low value because of their artificial origins (substantial grading has occurred on portions of the main Catellus site); dominance by non-native plants; and hydrologic isolation which greatly reduces their water quality improvement functions.

Loss of Project site wetland resources is considered a *significant impact*.

Mitigation 6-4: Open Space (OS) Goal 2 of the Fremont General Plan states: "Recognition, protection, and enhancement of significant natural areas and wildlife habitats in the city, including Bay tidal, seasonal, and freshwater wetlands, and open meadows and fields." Objective OS 2.2 is the "[p]rotection and enhancement of wetlands within the city." Policy OS 2.2.1 states:

"The City shall take an active role in protecting wetlands. There shall be no net loss of wetlands as a result of development in Fremont." Because Project site wetland resources do not represent significant natural areas, no net loss of wetland values is used in establishing appropriate mitigation for loss of wetland resources.

A detailed wetland mitigation plan as described in Appendix H shall be developed for City approval for all or a portion of the Stem parcel and/or the 56-acre Stevenson Boulevard property, or similar site located in proximity to the Project site, to compensate for the loss of wetland resources resulting from Project construction. Using a target of no net loss of wetland values, and based on the low to moderate value of the wetland resources on the Project site, and the relative ease of constructing seasonal wetlands such as those occurring on the Project site, mitigation wetlands could be of a lesser extent than those being filled by Project construction.

Based on the habitat evaluation of Project site wetland resources contained in Appendix E, the seasonal marsh (which for purposes of the evaluation and mitigation includes the non-tidal salt marsh) proposed for fill on the Project site (59 acres) has a value of 2.1, for a rating of 124; the wet meadow habitat (41.30 acres) has a value of 1.2, for a rating of 50. Accordingly, mitigation wetlands must rate a total of 174. Using the performance criteria set forth in Appendix E, it is anticipated that mitigation wetlands will have a value of 3; therefore, a minimum of 58 acres of seasonal wetlands meeting the performance criteria established in Appendix E (and in the subsequently approved detailed mitigation plan) must be created to mitigate for the fill of wetland resources on the Project site.

As stated in Appendix H, the mitigation wetlands will be monitored for five years. If any of the performance criteria are not met at the end of the five-year period, appropriate remedial measures shall be employed and the wetlands monitored for an additional three years. If the performance criteria are not met after the additional three-year monitoring period, the Project applicant shall propose supplemental mitigation (e.g., enhancement or refinement of the approved mitigation) to be approved by the City to achieve no net loss of wetland values.

Implementation of this mitigation measure shall reduce impacts to wetland resources to a level of *less than significant.*

Impact 6-5: Project site development may result in impacts to the following special status plant species which may occur in the seasonal wetlands on the Stem parcel: alkali milk-vetch; delta tule-pea; Hoover's button-celery; Congdon's tarplant; San Joaquin spearscale; and Contra Costa goldfields. Impacts to these species are considered *potentially significant.*

Mitigation 6-5: Surveys for the special status plant species potentially occurring on the Stem parcel (alkali milk-vetch, delta tule-pea, Hoover's button-celery, Congdon's tarplant, San Joaquin spearscale, and Contra Costa goldfields) shall be performed by a qualified biologist during the appropriate period in any seasonal wetland proposed for fill on this parcel. If any of these plant species are found, mitigation based upon the individual species' horticultural requirements shall be developed by a qualified biologist and approved by the City. This mitigation plan may be incorporated into the wetland mitigation plan required in Mitigation Measure **6-4** above, and shall require, at a *minimum*, plant density and general distribution similar to existing conditions on the Project site for two successive years after implementation of the mitigation.

Implementation of this mitigation measure shall reduce impacts to special status plant species to a level of *less than significant.*

Impact 6-6: Project site development will result in the elimination of suitable nesting and foraging habitat for the burrowing owl over most of the Project site. Impacts to this species and its habitat are considered *potentially significant.*

Implementation of all of the following mitigation measures shall reduce impacts to the burrowing owl to levels of *less than significant.*

Mitigation 6-6: A survey for burrowing owls in accordance with CDFG guidelines shall be performed by a qualified biologist no more than six months but at least 45 days prior to commencement of any construction activities in areas of burrowing owl observances and in areas with mounds, berms or other suitable ground-nesting locations. Prior to construction, burrowing owl nesting sites impacted by development shall be relocated in accordance with CDFG guidelines, or as may otherwise be developed by a qualified biologist and approved by the City. Uplands on the wetland mitigation site(s) may be considered for the burrowing owl nesting site relocation. Occupied burrows shall not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist verifies that either: 1) the birds have not begun egg-laying and incubation; or 2) juveniles from the occupied burrows are foraging independently and capable of independent survival. The City shall approve any such request for nest disturbance during the nesting season.

In the alternative, surveys in conformance with applicable CDFG guidelines shall be performed during the breeding (February 1 - August 31) and wintering (generally December 1 - January 31 when wintering owls are most likely to be present) seasons to estimate burrowing owl populations on the Project site. If owl populations are confirmed, and avoidance is not practicable, the extent of impacts to the entire Project site shall be assessed and a comprehensive relocation and mitigation plan shall be developed by a qualified biologist and approved by the City.

Impact 6-7: Project site development will result in the elimination of suitable nesting habitat for the northern harrier over most of the Project site. Impacts to this species and its habitat are considered *potentially significant.*

Implementation of all of the following mitigation measures shall reduce impacts to the northern harrier to levels of *less than significant.*

Mitigation 6-7: A survey for northern harrier nesting sites shall be performed by a qualified biologist during the breeding season, June - July, prior to any grading or other ground disturbing activities during those months. If nesting sites are found, they shall not be disturbed during the breeding season and protective measures shall be developed by a qualified biologist and approved by the City. A mitigation plan prepared by a qualified biologist and approved by the City shall be developed for those nesting sites that will be disturbed by Project construction after the breeding season. This mitigation plan may be incorporated into the wetland mitigation plan required in Mitigation Measure **6-4** above, and shall provide, at a minimum, for creation of the same number of nesting sites as are disturbed by Project construction. Performance standards shall be developed that require evidence of use by northern harriers of the newly created nesting sites over two succeeding seasons.

In the alternative, a survey of the entire Project site during the breeding season shall be performed by a qualified biologist. If northern harrier nesting sites are found, and avoidance is not practicable, the extent of impacts to the Project site shall be assessed and a comprehensive mitigation plan shall be developed by a qualified biologist and approved by the City.

Impact 6-8: The seasonal wetlands on the Stem parcel may provide breeding habitat for the California tiger salamander. Impacts to this species and its habitat are considered *potentially significant.*

Implementation of all of the following mitigation measures shall reduce impacts to the California tiger salamander to levels of *less than significant.*

Mitigation 6-8: A survey for California tiger salamander larvae shall be performed by a qualified biologist during the winter months when the seasonal wetlands are ponded on the Stem parcel if any of these areas are proposed for development. If larvae are found, a mitigation plan shall be developed by a qualified biologist and approved by the City. This mitigation plan may be incorporated into the wetland mitigation plan required in Mitigation Measure **6-4** above, and shall require, at a minimum, evidence of California tiger salamander densities and distribution in the created habitat similar to those found on the Project site for two successive years following implementation of the mitigation plan.

Impact 6-9: The seasonal wetlands on the Stem parcel may provide habitat for the vernal pool tadpole shrimp. Impacts to this species and its habitat are considered *potentially significant.*

Implementation of all of the following mitigation measures shall reduce impacts to the vernal pool tadpole shrimp to levels of *less than significant.*

Mitigation 6-9: Surveys for the vernal pool tadpole shrimp in accordance with protocols to be developed by the Project applicant (in consultation with a qualified biologist) and approved by the City, shall be performed by a qualified biologist on any area of the Stem parcel proposed for development which contains seasonal wetlands. If vernal pool tadpole shrimp are found, and avoidance is not practicable, a mitigation plan shall be developed by a qualified biologist and approved by the City. This mitigation plan may be incorporated into the wetland mitigation plan required in Mitigation Measure **6-4** above, and shall require, at a minimum, evidence of densities and distribution of vernal pool tadpole shrimp in the created habitat similar to those found on the Project site for two successive years following implementation of the mitigation plan.

Air Quality

Impact 6-10:Dust generated during Project construction would represent a *potentially significant adverse environmental impact.*

Conditions of approval should require contractors to reduce dust generation. Construction dust impacts can be reduced by the following measures:

Mitigation 6-10A: Suspend earthmoving or other dust-producing activities during periods of high winds when dust control measures are unable to avoid visible dust plumes.

Mitigation 6-10B: Provide equipment and staffing for watering of all exposed or disturbed soil surfaces sufficient to suppress dust plumes, including weekends and holidays. An appropriate dust palliative or suppressant, added to water before application, should be utilized.

Mitigation 6-10C: Water or cover stockpiles of debris, soil, sand or other materials that can be blown by the wind.

Mitigation 6-10D: Sweep construction area and adjacent streets of all mud and debris, since this material can be pulverized and later resuspended by vehicle traffic.

Mitigation 6-10E: Limit the speed of all construction vehicles to 15 miles per hour while travelling on unpaved surfaces.

Mitigation 6-10F: All inactive portions of the site shall be watered with an appropriate dust suppressant, covered or seeded.

The use of watering alone for dust control is estimated to reduce dust emissions by about 50 percent. The combined effect of the above measures, including the use of a dust suppressant, would have a control efficiency of 70 to 80 percent, which would reduce Project impacts to a level of *less than significant*.

The monitoring of construction mitigation measures would be the responsibility of the City of Fremont.

Impact 6-11: The Project would have a *significant adverse impact* on regional air quality, and would contribute to the continuing ozone problem in the region.

Mitigation 6-11A: The City of Fremont should require the Project applicant to develop a TDM (Transportation Demand Management) program for the proposed Project. An aggressive TDM program has the potential to reduce daily trips by approximately 10 to 25 percent, and air quality impacts associated with auto use would be reduced proportionally.

Mitigation 6-11B: When a significant amount of development has been completed, the City of Fremont should require annual surveys documenting the effectiveness of the TDM program in reducing single-occupant commuting.

Although implementation of these two mitigation measures would reduce the regional air quality impacts associated with the proposed Project, these impacts would remain *significant*.

Noise

Impact 6-12: Noise along Cushing Parkway (Street "C"), Auto Mall Parkway and along I-880 will exceed a DNL of 65 dB. This represents a *potentially significant impact*.

Mitigation 6-12: Commercial retail or industrial developments along Cushing (Street "C"), I-880 and Auto Mall Parkway east of Boyce Road shall be required to control interior noise levels

in private offices within these buildings to an L_{eq} of 45 dB as recommended in the Noise Element of the Fremont General Plan. This indoor goal can typically be achieved with sound-rated windows and/or wall construction. Implementation of this mitigation measure would reduce the impact to a level of *less than significant.*

Impact 6-13: Noise during Project construction could have an impact on existing land uses near the northern and southern portions of the Project site or on future land uses at the Project site. The existing land uses are offices, research and development, and the Auto Mall. When construction activities are closest to the existing uses, noise levels could reach maximum levels of 85 to 95 dBA at 50 feet. These noise levels may cause some annoyance or disturbance of occupants within existing structures if windows are left open, and would represent a *potentially significant impact.*

Mitigation 6-13: Construction at the Project site shall be limited to 7:00 AM to 7:00 PM, Monday through Friday and 9:00 AM to 6:00 PM Saturday and Sunday, in accordance with City policy. However, if pile driving or extremely noisy activities would occur next to existing offices, these noisy tasks may have to be performed after hours to minimize impacts on existing uses. All construction equipment shall be required to be adequately muffled and maintained. Noisy stationery equipment such as compressors shall be required to be located away from adjacent property lines of existing land uses and, if necessary, enclosed in noise-attenuating shrouds to minimize impacts. Implementation of these mitigation measures would reduce the impact to a level of *less than significant.*

Visual Considerations

Impact 6-14: The Project would replace grassland views from inland Fremont, I-880 and surrounding streets with views of commercial and business park development, and would alter semi-rural views from the Project site, possibly disrupting distant views of the San Francisco Bay and the Fremont Hills due to the placement of new structures at the Project site. This would represent a *significant environmental impact.*

Mitigation 6-14: Conceptual and detailed landscape plans shall be required at later stages in the development approval process. Project developers shall be required to comply with all regulations related to landscaping, signage, outdoor lighting, screening and site maintenance. Outdoor lighting fixtures to be used at the Project site shall be designed to minimize illumination of the night sky. Although the character of views at the Project site would be changed from rural to urban as a result of Project development, these measures would reduce the impact to a level of *less than significant.*

Geotechnical Considerations

Impact 6-15: Development of the Project site would expose a larger number of people to geologic and seismic hazards. The degree of hazard would depend to some extent on the nature of the site development. The greater the density of development on the site, the larger the number of people likely to be exposed to seismic hazards. Increased exposure to seismic impacts represents a *potentially significant environmental impact.*

Mitigation 6-15A: In accordance with Fremont General Plan Policy HS 2.1.1 (Ref. 20, page 10-47), site-specific soils, geologic and/or geotechnical engineering studies shall be conducted prior to development approval, since the Project site has been identified as having an "S4" groundshaking potential and portions of the Project site have been identified as having an "L4" liquefaction potential. Applicant-submitted geotechnical studies shall be reviewed by a qualified consulting geological engineer reporting to the City of Fremont, and development must conform with the recommendations of the City's consulting engineer.

Mitigation 6-15B: Facilities and structures shall be designed in compliance with seismic requirements of the current Uniform Building Code to minimize earthquake danger to building occupants.

When implemented, these measures would reduce the identified impact to some extent, but it would remain *potentially significant*.

Archaeological Considerations

Impact 6-16:Development at the Project site could potentially disturb prehistoric and historic cultural resources, although previous field and archival surveys have not conclusively determined that such resources either do or do not exist on the site. Development on the site would bring larger numbers of people to the area, thereby increasing the risk of damage and/or vandalism to any cultural resources which may be found on or surrounding the site. This represents a *potentially significant environmental impact.*

Mitigation 6-16A: In the event that significant cultural materials (e.g. human skeletal remains, habitation features, artifact concentrations, heat-affected rock or other features) are uncovered during excavation or earthmoving, all grading shall be halted until appropriate mitigation measures are defined.

Mitigation 6-16B: If human remains are found, the County Coroner, Native American Heritage Commission, and representatives of local Native American groups shall be notified pursuant to State law. Further actions shall be coordinated with these agencies.

Mitigation 6-16C: If any historic or cultural resources are discovered, the State Office of Historic Preservation shall be notified pursuant to State law. Identified cultural resources should be recorded on forms DPR 422 (archaeological sites) and/or DPR 523 (historic properties) or similar forms.

The implementation of these measures would reduce the identified impact to a level of *less than significant.*

IMPACTS WHICH WOULD NOT BE MITIGATED TO A LEVEL OF LESS THAN SIGNIFICANT

Of the Impacts listed and described above, the following thirteen impacts would not be susceptible to being mitigated to a less than significant level, would remain at least potentially significant, and would require findings of overriding considerations to be made in order to permit the proposed Project to be approved.

Impact 4-1: Development of the proposed project would *significantly* impact the intersection of I-880 SB Off-Ramp and Stevenson Boulevard. With the proposed Project and road network implemented, this intersection is forecast to exceed LOS D operations during the AM peak hour. The intersection is forecast to operate at LOS E (v/c=0.94) during the AM peak hour. With the existing General Plan land use and road network implemented, LOS C operations are forecast during the AM and PM peak hours.

Impact 4-3: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of the I-880 NB Ramps and Fremont Boulevard. This intersection is forecast to operate at LOS E (v/c=0.92) during the AM peak hour with the proposed Project and road network developed. With the existing General Plan, this intersection is forecast to operate at LOS A (v/c=0.60).

Impact 4-4: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of the I-880 SB Ramps and Auto Mall Parkway. This intersection is forecast to operate at LOS F (v/c=1.25) during the AM peak hour with the proposed Project developed versus LOS D (v/c=0.83) with the existing General Plan.

Impact 4-6: The proposed Project is considered to *significantly* impact peak hour traffic operations at the intersection of Grimmer Boulevard/Auto Mall Parkway because the proposed Project would degrade unacceptable (LOS E) operations with the existing General Plan by more than five percent during the AM and PM peak hours. This intersection is forecast to operate at LOS E during the AM and PM peak hours with the existing General Plan land use and road network plans implemented. With the proposed Project, this intersection is forecast to operate at LOS F during the AM and PM peak hours.

Impact 4-8: The southbound I-680 segment between Washington Boulevard and Durham Road would be *significantly* impacted by the proposed Project during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.03) with the proposed Project.

Impact 4-9: The proposed Project would *significantly* impact southbound I-880 from SR 84 to Thornton during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Impact 4-10: The proposed Project would *significantly* impact southbound I-880 from Mowry to Stevenson during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.98) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Impact 4-11: The proposed Project would *significantly* impact southbound I-880 from Stevenson to Auto Mall during the AM peak hour. This segment is forecast to operate at LOS E (v/c=1.00) with the existing General Plan and LOS F (v/c=1.02) with the proposed Project.

Impact 4-12: The proposed Project would *significantly* impact northbound I-880 from Mowry to Thornton during the PM peak hour. This segment is forecast to operate at LOS E (v/c=0.98) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Impact 4-13: The proposed Project would *significantly* impact northbound I-880 from Thornton to SR 84 during the PM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.02) with the proposed Project.

Impact 6-11: The Project would have a *significant adverse impact* on regional air quality, and would contribute to the continuing ozone problem in the region.

Impact 6-15: Development of the Project site would expose a larger number of people to geologic and seismic hazards. The degree of hazard would depend to some extent on the nature of the site development. The greater the density of development on the site, the larger the number of people likely to be exposed to seismic hazards. Increased exposure to seismic impacts represents a *potentially significant environmental impact.*

I. INTRODUCTION

This report, together with its appendices, constitutes a second Draft Supplemental Environmental Impact Report (SEIR) on the Project first identified in 1987 as the Santa Fe Pacific Realty Project General Plan Amendment. It evaluates the environmental impacts associated with the request submitted to the City of Fremont for approval of a General Plan Amendment and Planned District rezoning on approximately 877 acres of land located southwest of Interstate 880 (the Nimitz Freeway) between the Auto Mall Parkway and Fremont Boulevard interchanges. These approvals would enable development of the property primarily in industrial and commercial uses, and would eliminate all residential uses on those portions of the property currently designated for such development in the Fremont General Plan. The Project applicant is Catellus Development Corporation.

A. NATURE AND PURPOSE OF THE SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT

The California Environmental Quality Act of 1970 as amended (CEQA) requires EIRs to be prepared for all projects which may have a significant impact on the environment.

An EIR is an informational document, the purpose of which, according to the State Guidelines, is "...to identify alternatives to the project, and to indicate the manner in which such significant effects can be mitigated or avoided." The information contained in this report is intended to be objective and impartial, so as to permit the reader to arrive at an independent judgment regarding the probable character and significance of the impacts resulting from the proposed Project.

CEQA Guidelines (Section 15163) require that a Supplemental EIR be prepared when minor additions or changes would be necessary to make a previously-prepared EIR adequate. In this case, the character of the Project as originally proposed by the Project applicant has been modified since certification of the initial EIR for the proposed Project in 1988 (please refer to Draft EIR dated November 24, 1987 and Final EIR dated January 22, 1988, City of Fremont, EIR-86-85, SCH#8721715).

This document is the second Draft Supplemental EIR to be prepared for the proposed Project. An earlier Supplemental EIR on the proposed Project was certified in 1989 (please refer to Draft Supplemental EIR dated December 12, 1988 and Final Supplemental EIR dated February 24, 1989, City of Fremont, EIR-86-85, SCH#8721715), and an Addendum to the EIR on the proposed Project was certified in 1991 (please refer to Addendum to the EIR dated August 12, 1992, City of Fremont, Special Study Application 90-6, SCH#8721715). All of these previous environmental documents on proposed Project are incorporated in this document by reference.

B. CONTENT OF THE SUPPLEMENTAL EIR

CEQA Guidelines (Section 15163) specify that a Supplemental EIR "need contain only the information necessary to make the previous EIR adequate for the project as revised." Accordingly, the analysis of topic areas in this Supplemental EIR is similar in format and level of detail to the evaluation contained in the previous environmental documents associated with the proposed Project.

I. INTRODUCTION

Following this introduction, Chapter II briefly describes the location and nature of the Project site, as well as the chronology of development applications for the site. Chapter III evaluates the planning and policy context of the Project applicant's revised proposal for site development in terms of its relationship to the City's General Plan, Industrial Redevelopment Plan, zoning and development patterns and policies. Traffic and circulation conditions and impacts are addressed in Chapter IV. The capability of public services and facilities to accommodate the demands of the modified Project are discussed in Chapter V. Other issues, including hazardous/toxic materials, vegetation and wildlife, air quality, noise, visual considerations, geotechnical considerations and archaeological considerations, are addressed in Chapter VI. Within each chapter in turn, the character of existing conditions is described (under the sub-heading "Setting"), then the probable effects of the proposed Project are discussed ("Impacts"), and finally the corrective actions applicable to these impacts are identified ("Mitigation Measures"). Impacts and Mitigation Measures are numbered within each chapter so that each identified impact within that chapter is linked with a corresponding Mitigation Measure (i.e., Impact **4-1** is the first Impact discussed in Chapter IV, and the corresponding Mitigation Measure is also numbered **4-1**). These numbered references are set at the left edge of the text in a larger and distinctive type-face which differs from the type used throughout the report.

In each of these topic areas, impacts (defined as changes from existing conditions likely to result from execution of the Project as proposed) are considered "significant" when the degree of change exceeds specified levels or thresholds. Only impacts determined to be "significant" are called out and assigned number references in the Chapters described above. Apparently feasible and available mitigation measures are identified by the EIR preparers to address each impact, and the probable extent to which each mitigation measure would enable the respective impact to be avoided or to be reduced to a less than significant level is indicated. Mitigation Measures are expressed in a <u>mandatory</u> form (i.e., "the applicant shall ..."), rather than in a less forceful manner (i.e., "the City might require ...", the applicant could provide ...", etc.). This usage enables the determination of significant impact avoidance to be stated unequivocally and without confusion. The decision to require each and every mitigation measure, as stated, to be applied to the Project as a condition of approval continues to reside with the City Council and Planning Commission, and these bodies can choose to delete or change any mitigation measure. In approving a Project for which an EIR has been completed, and where the EIR identifies one or more significant environmental effects of the Project, CEQA requires the City to make written findings for each such effect (as specified in Sec. 15091 (a) [1] through [3]).

In Chapter VII, four alternatives to the proposed Project are presented for the purposes of comparison. Chapter VIII: Overview of Analysis, summarizes the significant unavoidable adverse effects/irreversible environmental changes, growth inducing impacts and cumulative impacts associated with the Project. Chapter IX provides a listing of the authors of the Supplemental EIR, persons and organizations consulted, and references.

The Appendices include the TJKM Traffic Analysis, a letter from the Alameda County Water District, the ENTRIX Methodology for Wetland Mapping, Plant Species Observed on the Project Site, Habitat Evaluation, Special Status Species, Burrowing Owl Habitat Assessment, Conceptual Mitigation Plan, Mitigation Site Assessment, Air Quality Methodology and Assumptions, Fundamental Concepts of Environmental Noise and Archaeological Evaluation.

Every effort has been made to ensure that this Supplemental EIR is useful in the decision-making process. To this end, the report has been made as concise and as readable as possible through the use of references. The report includes references to figures and statistical tables found either in the text or in the appendices. Parenthetical references are also made in the text to individuals who have provided information in telephone or other conversations. In addition, the numbers assigned to documents in the reference section of Chapter VIII are used as references throughout this report. These references are shown in parentheses, for example: (Ref. 7) or (Ref. 16, page 4). This reference system is used in lieu of footnotes.

It should be noted that the proposed Project has been subject to a continuing process of modification and refinement. For the purposes of this Supplemental EIR, the basic characteristics of the Project are defined by the Planned District Development Conceptual Plan (MacKay & Somps, March 29, 1996) submitted by the Project applicant.

Although this Draft Supplemental EIR incorporates all of the information presented in all previous environmental documents related to this Project (Refs. 14, 16, 17, 18, and 19), where comparisons with earlier versions of the proposed Project are made, it should generally be assumed that the basis of comparison is the Project as defined in the original Draft EIR (Ref. 18) unless otherwise stated.

C. SUPPLEMENTAL EIR REVIEW PROCESS

This Supplemental EIR addresses the requested General Plan Amendment and Planned District rezoning. Each of these actions would require City of Fremont Planning Commission and City Council approval for the proposed Project to proceed. In accordance with State law, the Supplemental EIR is to be certified by the City of Fremont prior to taking the first discretionary approval action on the proposed Project.

During the public review period, interested individuals, organizations and agencies may offer their comments on the Supplemental EIR's evaluation of Project impacts. The comments received during this period will be compiled in a supplement to the Draft Supplemental EIR, along with responses to comments, prepared by the Consultants. The Response Document and the Draft Supplemental EIR will together comprise the Final Supplemental EIR.

After a review of the Draft Supplemental EIR and the Final Supplemental EIR, and following action to certify the Supplemental EIR as complete and adequate, the City of Fremont Planning Commission and City Council will be in a position to determine whether the Project should be approved as submitted, be subject to revision, or be rejected. This determination will be based upon information presented on the proposed Project, its relationship to the City's policies, goals and regulations, its impacts and probable consequences, and the possible alternatives or mitigation measures available.

I. INTRODUCTION

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II. DESCRIPTION OF THE PROJECT

A. INTRODUCTION

This Supplemental EIR evaluates the impacts of the proposed "Pacific Commons" Project, which would result in the development of approximately 877 acres west of Interstate 880 (the Nimitz Freeway) in Fremont. The proposed Project is a modification of an existing approved project (identified in this Supplemental EIR as the "Pacific Greens" project), which was the subject of the earlier Addendum to the EIR (Ref. 14). The proposed development would require a General Plan Amendment and Planned District rezoning. The Project applicant (Catellus Development Corporation) also proposes a development agreement between Catellus and the City of Fremont. The Project applicant has provided a map showing the Planned District Development Conceptual Plan (MacKay & Somps, March 29, 1996) which indicates the spatial distribution of proposed development at the Project site, and which supplements a map of the land use designations which would be associated with the proposed General Plan Amendment.

B. LOCATION AND ENVIRONS OF THE PROJECT SITE

The Project site is located within the City of Fremont in Alameda County, California (see **Figure 1**). It is bounded generally by the Nimitz Freeway (Interstate 880) to the east, Auto Mall Parkway to the north, Cushing Parkway to the south, and the Pacific Gas and Electric Company transmission lines to the west, although the northwest corner of the Project site extends beyond the transmission lines west to the Southern Pacific railroad tracks (see **Figure 2**). Existing land uses in the immediate vicinity of the Project site include offices, research and development activities, and related uses along Brandin Court (between the Project site and I-880), across Auto Mall Parkway to the north, and along Cushing Parkway and Northport Loop to the south. Portions of the San Francisco Bay National Wildlife Refuge are west of the Project site, and the Tri-Cities Landfill is located nearby at the western end of Auto Mall Parkway. The New United Motors Manufacturing, Inc. factory is located southeast of the Project site to the east of I-880, and a Union Sanitary District pumping station is located south of the Project site along Fremont Boulevard.

C. THE PROJECT SITE

The gross area of the previous project (referred to as the Pacific Greens project) together with the current proposal is approximately 877 acres, which includes 40.6 acres of land which is partially developed and in use by automobile dealerships as an auto mall. The developed and undeveloped auto mall parcels together comprise about half of the site of the previously approved auto mall, and are not part of the proposed Project for which the current applications have been submitted to the City. Although the Project site is currently vacant, former land uses have included a glider port (Sky Sailing Airport), a drag strip (Baylands Raceway Park), horse stables and a caretakers residence. The Project site can be generally characterized as flat grassland, and some portions of the site have previously been used for the production of hay and straw.

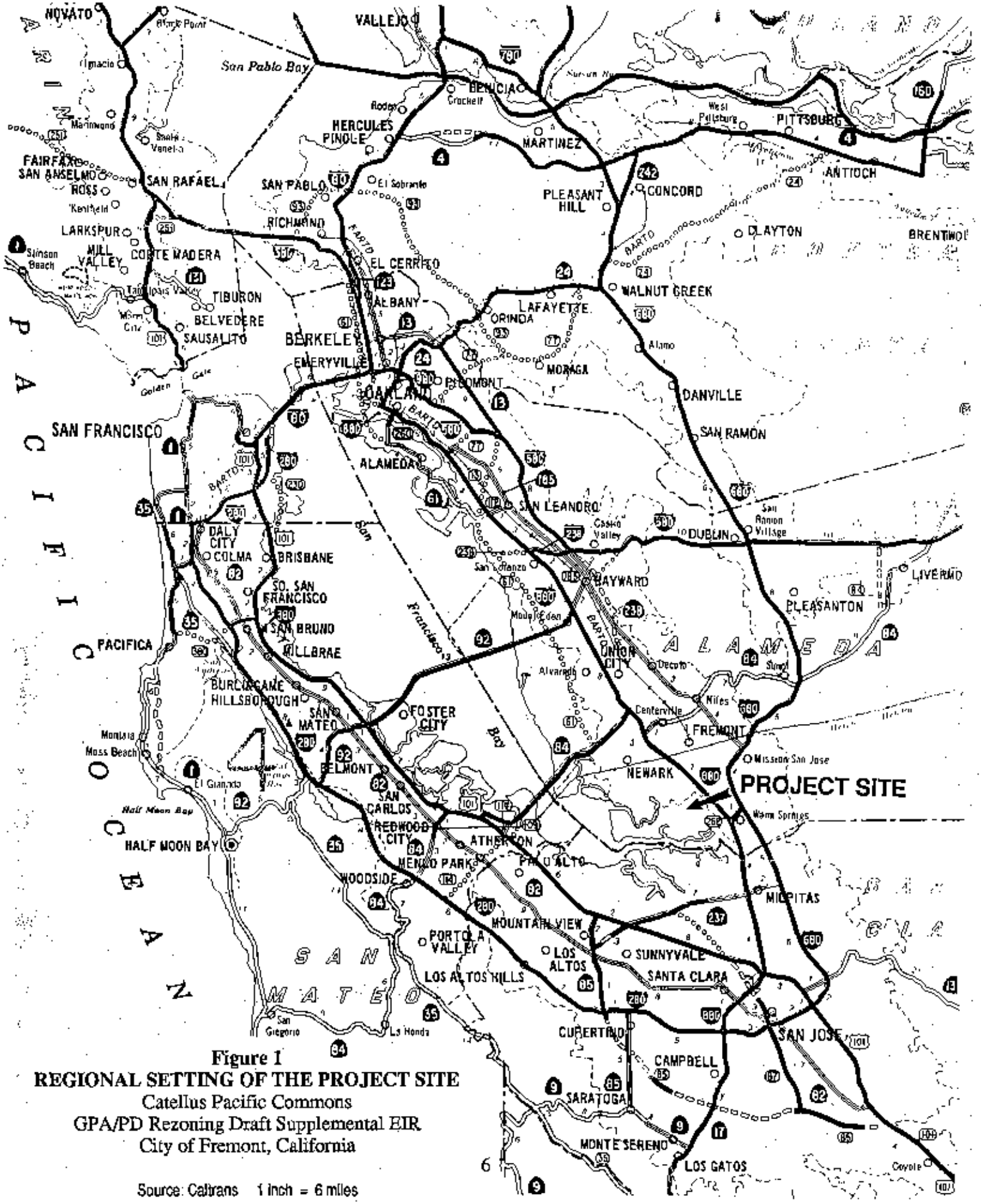
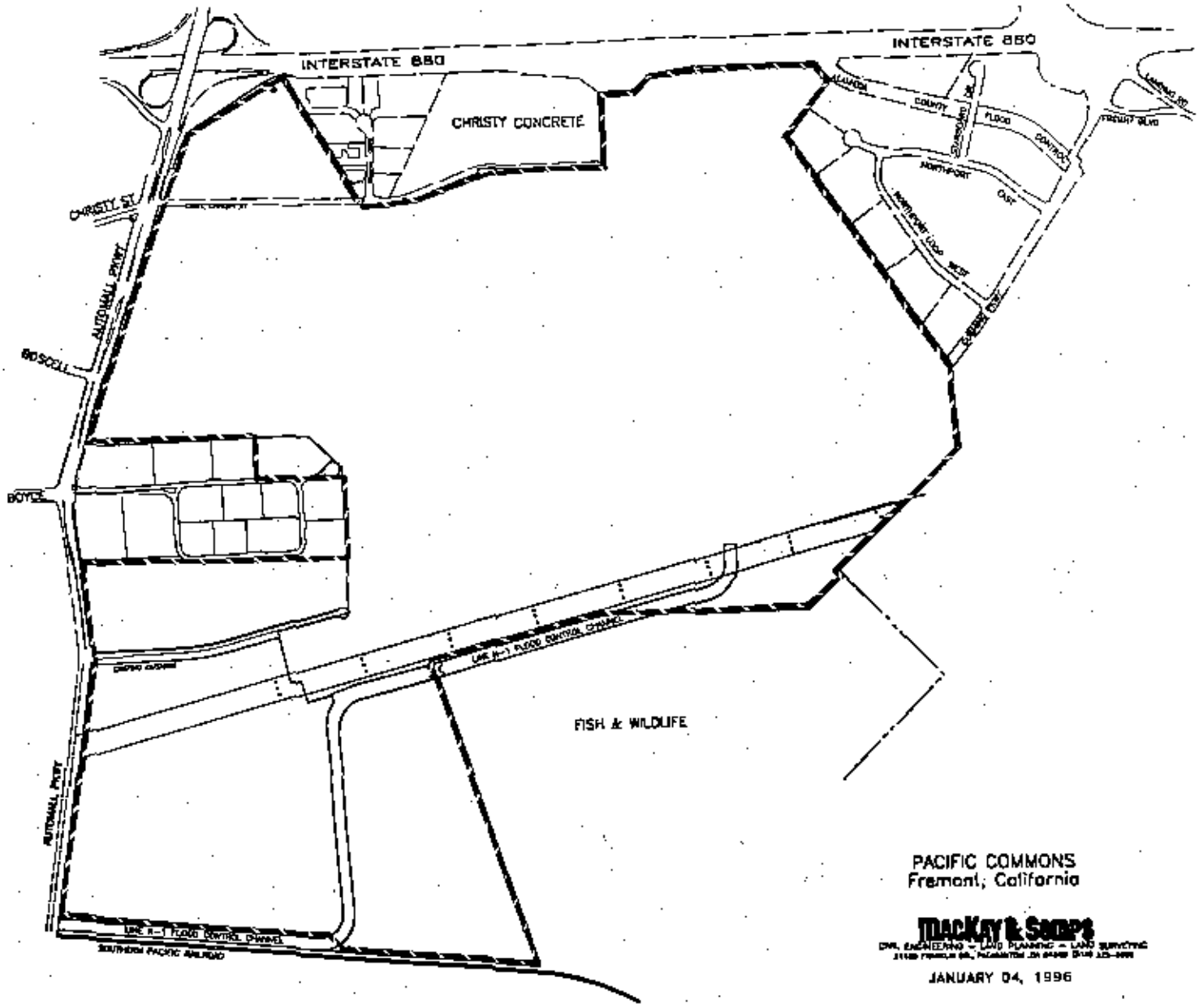


Figure 1
REGIONAL SETTING OF THE PROJECT SITE
Catellus Pacific Commons
GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Source: Caltrans 1 inch = 6 miles

Figure 2
BOUNDARIES OF THE PROJECT SITE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



II. DESCRIPTION OF THE PROJECT

D. DESCRIPTION OF THE PROJECT

Based on the current application for a General Plan Amendment submitted by the Project applicant (Planned District Development Conceptual Plan, McKay & Somps, March 29, 1996), the Project site would be developed largely in industrial uses (including wholesaling and campus-style Research and Development) and commercial uses, although some portions of the Project site would support institutional open space uses (commercial recreation, parks and wetlands) and public facility uses (a fire station), as shown in **Figure 3**.

The acreages of proposed uses on the Project site would be in accordance with the distribution by the land use categories shown below, as follows:

Land Use	Net Acres
Research & Development	125.6
Commercial	78.0
Campus Research & Development	127.8
Industrial/Research & Development	118.7
Wholesale/Industrial	50.8
Wholesale	86.0
Fire Station	1.0
Parks and Project Plazas	14.1
Streets	79.4
Auto Mall	40.6
Open Space (Commercial Recreation/City Parks/Wetlands)	155.0
Total	877.0

These acreages represent the Project applicant's best estimates by land use category, and the actual acreage in each category may vary to some extent.

The map provided by the Project applicant showing the land use designations associated with the proposed General Plan Amendment (MacKay & Somps, March 29, 1996) shows three basic designations at the Project site (see **Figure 4**):

Land Use Designation	Net Acres
Restricted Industrial	508.9
High Volume Commercial	128.0
Open Space	159.7

These acreage figures do not include the 1.0 acre site for the proposed Fire Station, or streets within the Project site (approximately 79.4 acres).

The Restricted Industrial designation would include those areas shown in the Planned District Development Conceptual Plan (**Figure 3**) as Research & Development, Campus Research & Development, Industrial/Research & Development, Wholesale, Wholesale/Industrial and a small Commercial area adjacent to one of the Project Plazas. The High Volume Commercial designation would include those areas shown in the Planned District Development Conceptual Plan (**Figure 3**) as Commercial and Auto Mall. The Open Space designation would include the areas identified in the Planned District Development Conceptual Plan as Park and Commercial Recreation/City Parks/Wetlands. The Project Plaza designation would include the four Project Plaza areas shown in the Planned District Development Conceptual Plan (**Figure 3**).

Figure 3
CONCEPTUAL PLAN FOR PLANNED DISTRICT DEVELOPMENT
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

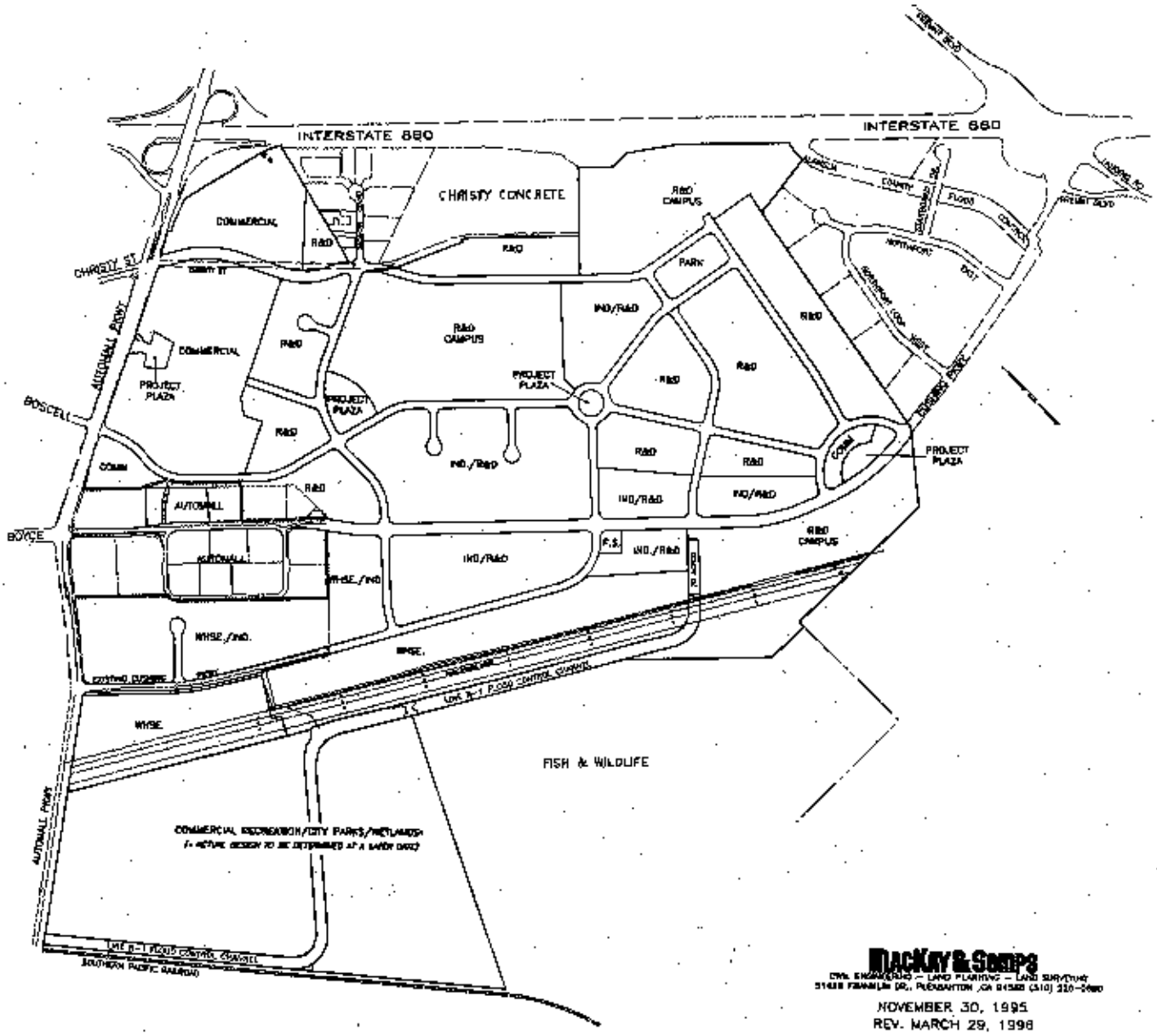
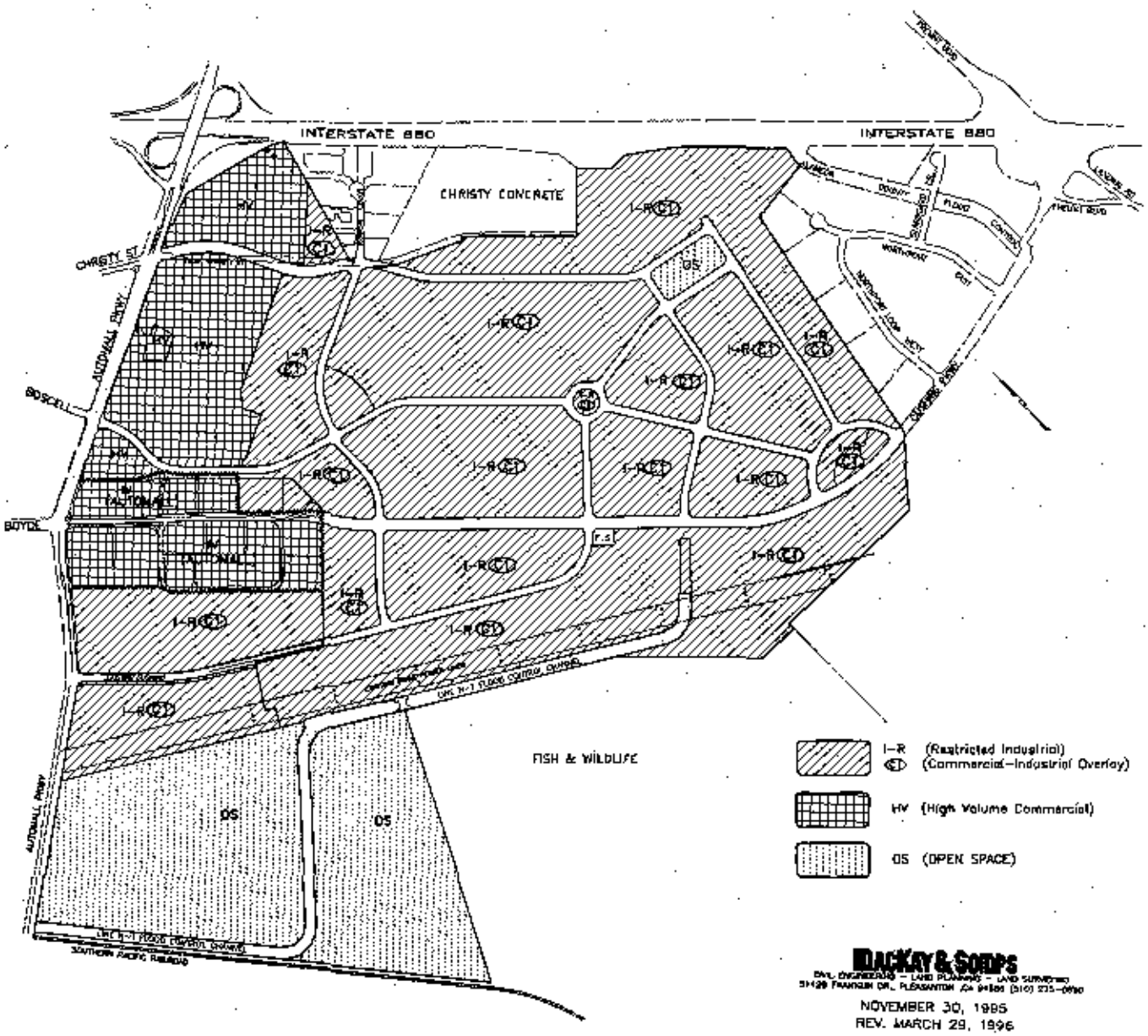


Figure 4
DESIGNATIONS REQUESTED FOR GENERAL PLAN AMENDMENT
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



E. PROJECT BACKGROUND

In December 1986, the Santa Fe Pacific Realty Corporation (now Catellus Development Corporation) applied for a General Plan Amendment, a Redevelopment Plan Amendment, and the rezoning of approximately 700 acres of the 877-acre Project site to allow for mixed use development. The environmental impacts associated with this proposal were evaluated in the Draft EIR dated November 24, 1987 (Ref. 18) and Final EIR dated January 22, 1988 (Ref. 19).

After the Fremont Planning Commission denied the Project in February, 1988, the Project applicant appealed the decision to the Fremont City Council, which denied the appeal but voted to appropriate funds for a Supplemental EIR to evaluate the environmental impacts associated with a modified proposal. This action was intended to facilitate the recommendation of the Planning Commission that a rezoning be approved to allow the development of an auto mall on a portion of the Project site.

In March 1988, the Project applicant substantially revised its proposal, which was subsequently analyzed as "Alternative 1" in a Draft Supplemental EIR (Refs. 16 and 17). The Fremont City Council directed that this revised mixed use development proposal be placed on the November 1988 ballot as an advisory measure. In that election, 51 percent of voters expressed support for the revised mixed use project, and 49 percent were opposed to it. In March, 1989, the Fremont Planning Commission recommended that the Planned District P-88-15, which would allow for a mixed use development (including an auto mall, retail/commercial hotel center, research and development office and warehousing uses) be approved, and that a Development Agreement for a mixed use project without residential elements (DA-88-1) be approved by the City Council. That April, the Fremont City Council adopted Resolution 7577 amending the General Plan by redesignating the Project site Industrial and Commercial (GPA-88-18) and by making changes in the Circulation Element to service the Project site. The City Council also adopted Ordinance 1862, which rezoned the property from General Industrial (G-I), Restricted Industrial (I-R), Commercial Thoroughfare (C-T) and Flood Combining (F) districts to a Planned (P) district, adopted a preliminary and precise site plan for the P district (P-88-15), and adopted Ordinance 1863 approving the Development Agreement.

In September 1990, the Project applicant submitted a Special Study Application which proposed modifications of the approved development project which had previously been evaluated as "Alternative 2" ("All-Industrial") in the Supplemental EIR. The modified mixed-use development proposed at that time required a General Plan Amendment, a Redevelopment Plan Amendment, rezoning, a major amendment to the existing P district, a new Tentative Tract Map and an Amended and Restated Development Agreement. The proposed General Plan Amendment would permit a mixed-use development at the Project site which would include restricted industrial uses, neighborhood commercial uses, residential uses, a hotel, an auto mall (which had already been approved), a fire station, a school/park, a park, a golf course/driving range, wetlands and open space. An Addendum to the EIR (Ref. 14) was certified, the new Development Agreement was approved, and the Fremont General Plan was amended to reflect the changes in land use designations which had been requested by the Project applicant.

Early in 1995, the Project applicant approached the City of Fremont with requests to amend the Development Agreement and to modify the General Plan to eliminate all residential designations and the golf course associated with them at the Project site, replacing them with commercial and

industrial designations. This proposed modification to the General Plan and the Planned District rezoning would also eliminate the previously proposed elementary school at the Project site. The size of the Project site (as evaluated in previous environmental documents) was expanded by the addition of two adjacent parcels (the 126-acre Robbins parcel and the 65-acre Stem parcel), bringing the total size of the Project site to approximately 877 acres. Now identified as "Pacific Commons", this is the Project which is now the subject of this second Draft Supplemental EIR.

III. PLANNING AND POLICY CONTEXT

A. SETTING

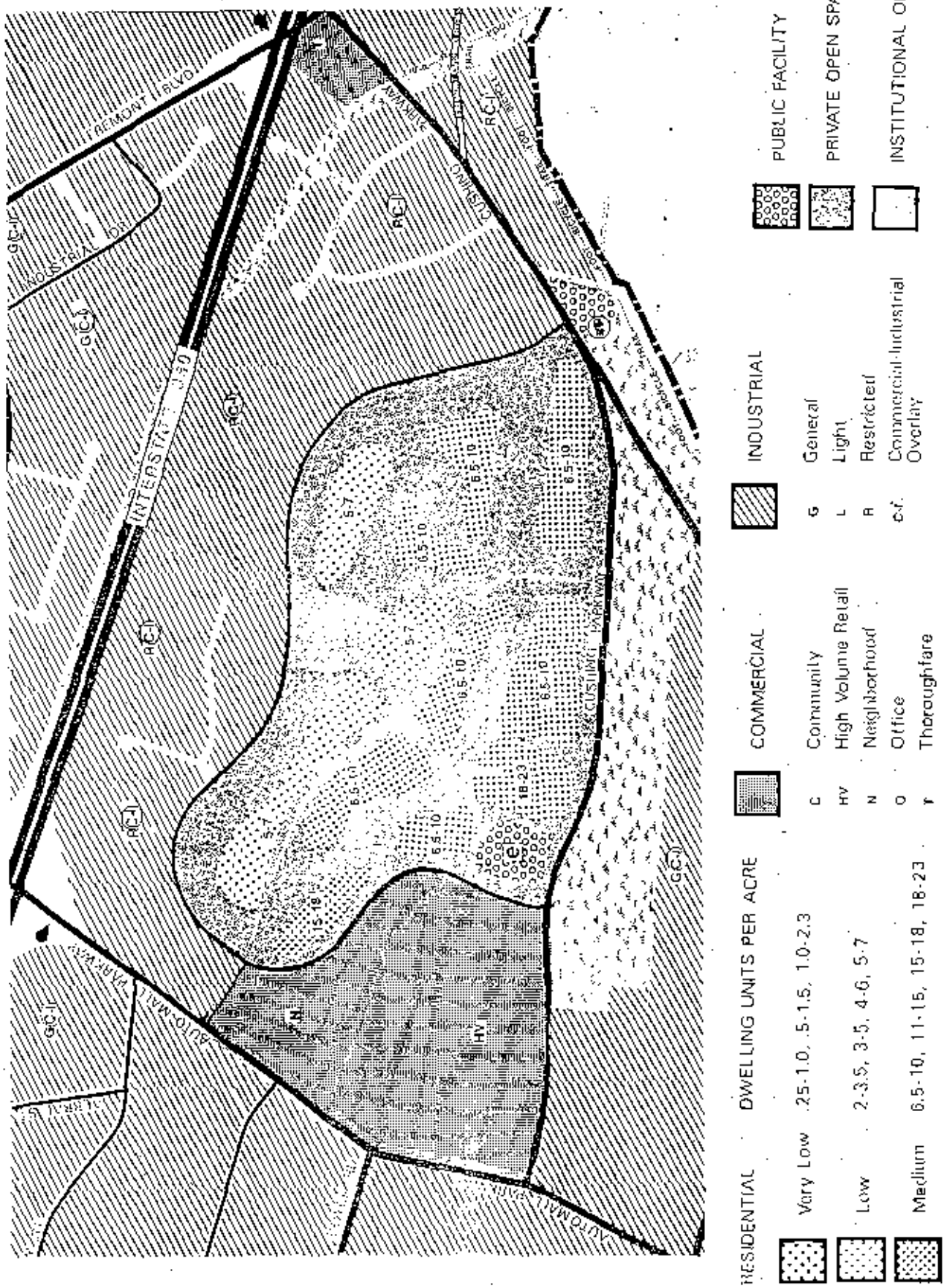
The Project site is located within the jurisdiction of the City of Fremont, and is subject to the land use designations and requirements of the Fremont General Plan and the Zoning Ordinance. The proposed Project would require a General Plan Amendment and a rezoning of the existing Planned District at the Project site. These actions would require the review and approval of the Fremont Planning Commission and the City Council.

The Project site is located within the Fremont's Industrial Planning Area. Although Fremont seeks to conserve the majority of designated industrial land in this area for future industrial development, the General Plan indicates that a large portion of the Project site known as the "Fremont Shores Study Area" was to be evaluated for possible conversion to residential and other uses (Ref. 20, page 3-21). The previous Addendum to the EIR (Ref. 14) and staff reports to the Planning Commission and City Council provided this evaluation, and the General Plan has since been modified to permit residential development within the boundaries of the Fremont Shores Study Area. The General Plan also indicates that additional industrial land within the Industrial Planning Area could be converted to a "High Volume Commercial" area (Ref. 20, page 3-21).

On the General Plan Map of the Industrial Planning Area (**Figure 5**), portions of the Project site are currently designated for Low Density Residential uses (with residential densities ranging from 5 to 7 units per acre), Medium Density Residential uses (with residential densities ranging from 6.5 to 10 units per acre), High Density Residential uses (with residential densities ranging from 18 to 23 units per acre), Restricted Commercial-Industrial uses, Neighborhood Commercial uses, public facility uses (an elementary school and a fire station), private open space uses (a golf course/driving range) and institutional open space uses. The Robbins and Stem parcels which now comprise a portion of the Project site are currently designated General Industrial (Commercial-Industrial Overlay) on the General Plan Map of the Industrial Planning Area.

General Plan Policy LU 2.33 indicates that the auto mall has been identified as a "High Volume Commercial" area, but goes on to state that "other high-volume oriented retail uses should not be allowed in this area in order to reserve land (and road capacity) for expansion of auto-related sales and service" and that "there is insufficient road capacity to permit a significant increase in retail development beyond that currently planned" in that area (Ref. 20, page 3-52). General Plan Policy LU 2.34 states that expansion of currently designated High Volume Commercial areas should be allowed only when roadway capacity can be increased or projected congestion can be mitigated (Ref. 20, page 3-52). General Plan Policy LU 2.35 states that an area can be designated High Volume Commercial if sufficient market demand indicates additional area within the city is required for this use if it has convenient access from a freeway, if it has convenient access from an arterial with sufficient road capacity to accommodate expected traffic at acceptable levels of service and without adverse impacts on existing residential or industrial uses, and if the proposed retail sales area would not have an impact on existing industrial uses or would not be in the midst of existing industrial uses (Ref. 20, pages 3-52 - 3-53). General Plan Policy LU 2.36 states that high volume retail stores shall only be allowed in industrially designated areas meeting the identified criteria for conversion to a High Volume Commercial designation (Ref. 20, page 3-53).

Figure 5
EXISTING FREMONT GENERAL PLAN LAND USE DESIGNATIONS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



General Plan Policy LU 3.2 describes the type of development permitted in each land use category within industrial areas, while General Plan Policy LU 3.3 describes the type of commercial development permitted in these areas (Ref. 20, page 3-57). General Plan Policy LU 3.4 indicates that public and private recreational facilities and parks may be allowed in industrial areas (Ref. 20, page 3-57). General Plan Policy LU 3.9 provides the criteria for conversion of industrially designated land to an alternative use (Ref. 20, pages 3-59 - 3-60).

General Plan Policy LU 7.0 states that the Commercial/Industrial Overlay designation recognizes that land with convenient freeway access presents a special opportunity for retailers with a regional customer base (Ref. 20, pages 3-77 - 3-78).

General Plan Policy LE 3.5.1 calls for the provision of high-volume retail shopping opportunities in concentrated centers with freeway access, while General Plan Policy LE 3.6.1 calls for the provisions of retail and commercial services areas in the industrial areas to serve industrial employers and employees (Ref. 20, page 5-20).

General Plan Policy OS 2.1.2 states that land uses and activities in areas adjacent to the San Francisco Bay National Wildlife Refuge must be compatible with, and if possible, promote the goals of, the Refuge (Ref. 20, page 6-25). General Plan Policy OS 2.2.1 states that there shall be no net loss of wetlands as a result of development in Fremont (Ref. 20, page 6-25).

General Plan Policy NR 1.1.1 states that whenever feasible, natural and semi-natural wetlands areas and their wildlife habitats shall be preserved or impacts minimized (Ref. 20, page 9-50). General Plan Policy NR 2.2.2 calls for the minimization of development impacts in upland areas adjacent to or associated with seasonal and other wetlands (Ref. 20, page 9-53). General Plan Policy NR 2.2.4 indicates that disruption of grassed or naturalized areas known to provide groundnesting for endangered, threatened or candidate animals is to be avoided (Ref. 20, page 9-53).

B. IMPACTS

Proposed development at the Project site would primarily involve land uses which could be categorized as either Restricted Industrial (including Office, Research & Development, Campus Research & Development, Industrial/Research & Development, Wholesale and Wholesale/Industrial uses) or High-Volume Commercial, although portions of the Project site would remain in Open Space uses supporting community recreation facilities, parks and wetlands. Several Project Plaza areas would be developed, and a new fire station would be built at the Project site. Development of the Project site as currently proposed would not involve a residential component, and no elementary school would be built.

As currently proposed on the Planned District Development Conceptual Plan (see **Figure 3**), the realignment of Cushing Parkway/Boyce Road near Auto Mall Parkway differs from the alignment shown on the General Plan Map of the Industrial Area (see **Figure 5**).

Under the Fremont General Plan a "High Volume Commercial" area at the Project site should be allowed only when roadway capacity can be increased or projected congestion can be mitigated. Such development may not have a significant impact on existing industrial uses in the area, but it would take place in the midst of what is now a largely industrial area.

Portions of the Project site are adjacent to the San Francisco Bay National Wildlife Refuge, and under the Fremont General Plan, land uses in those areas must be compatible with the Refuge. To achieve consistency with the General Plan, development at the Project site may not result in any net loss of wetlands, development impacts in upland areas adjacent to or associated with seasonal and other wetlands must be minimized, and the disruption of grassed or naturalized areas known to provide groundnesting for endangered, threatened or candidate species at the Project site is to be avoided (see Chapter VI, Section B for a discussion of wetlands and habitat impacts which may be associated with the proposed Project).

In order to proceed with development of the Project site as proposed, the Project applicant has requested a General Plan Amendment which would re-designate large portions of the Project site for commercial and industrial uses from the current designations (which include designations which would permit residential uses). Development of the Project site as proposed would involve General Plan land use and circulation changes which by definition would be inconsistent with the land use designations currently shown in the Fremont General Plan for the site. However, the Project may be consistent with General Plan goals and objectives (e.g. economic goals), and the adoption of the proposed General Plan Amendment would effectively eliminate any inconsistency between current land use designations and proposed Project land uses.

C. MITIGATION MEASURES

Although development of the Project site as proposed would be inconsistent with the land use designations currently shown in the Fremont General Plan for the site, adoption of the proposed General Plan Amendment would result in a modification of the current land use designations at the Project site, which would enable the proposed Project to be fully consistent with the amended Fremont General Plan. Therefore, no mitigation measures are indicated beyond adoption of the proposed General Plan Amendment which reflects the current proposal by the Project applicant.

IV. TRAFFIC AND CIRCULATION

A. SETTING

1. Roadways

Figure 6 shows the location of the Project site with respect to the local road network. Primary regional access to the Project site is provided by I-880 and local access is provided by Auto Mall Parkway and, ultimately, Cushing Parkway. The highways and local roadways providing access to the Project site are described below.

I-880 extends between San Jose and Oakland and is a six-lane freeway near the Project site. Interchanges with Auto Mall Parkway and Fremont Boulevard provide primary links between the freeway and the local road network serving the Project site. In 1994, I-880 carried approximately 150,000 vehicles per day at the Fremont Boulevard interchange. The I-880/Auto Mall Parkway and I-880/Fremont Boulevard interchanges are currently being reconstructed and high-occupancy vehicle (HOV) lanes are being added to I-880 in the vicinity of the Project site. Reconstruction of the I-880/Auto Mall interchange is scheduled to be completed by August 1996, and reconstruction of the I-880/Cushing Road/Fremont Boulevard interchange is scheduled to be completed by Summer 1997.

Widening of I-880 to eight lanes is currently scheduled for completion by 1998. The City of Fremont is widening portions of I-880 at the Auto Mall and Cushing/Fremont interchanges. The Alameda County Transportation Authority is planning to complete the widening of I-880 through this area via the Measure B program. The seventh and eighth lanes on I-880 will be designated for HOV use during the morning and evening peak commute periods.

Auto Mall Parkway borders the Project site on the north and is designed as a six-lane arterial. Twenty- four hour vehicle counts obtained in 1995 indicate that this roadway carries 13,400 vehicles per day east of Boyce Road and 31,600 vehicles per day east of Grimmer Boulevard.

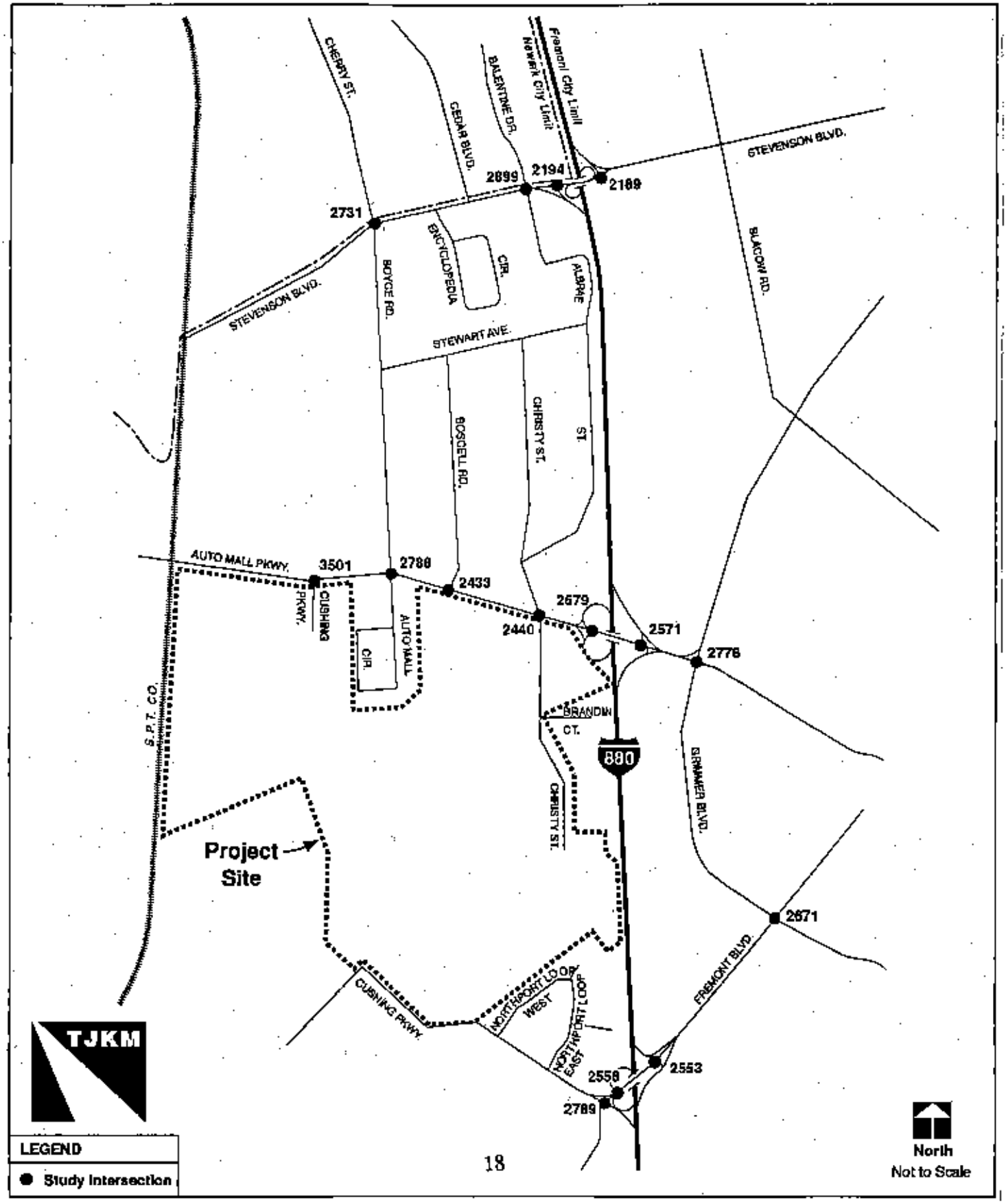
Stevenson Boulevard is a four-lane arterial located north of the Project site. Twenty-four hour vehicle counts obtained in 1995 indicate that this roadway carries 48,600 vehicles per day east of I-880 and 42,900 vehicles per day west of I-880.

Cushing Parkway is a four-lane undivided roadway that is currently accessible from Fremont Boulevard. Ultimately, Cushing Parkway will extend to Auto Mall Parkway. Weekday counts obtained in 1995 indicate that west of Fremont Boulevard, Cushing Parkway carries 11,100 vehicles per day.

Christy Street is a two-lane roadway north and south of Auto Mall Parkway and provides access to existing industrial development located on Brandin Court.

Auto Mall Circle is an existing private "loop" roadway serving the partially developed Auto Mall. The northern leg of the circle, immediately south of Auto Mall Parkway, is a four-lane divided roadway. The loop section of the roadway is a two-lane one-way roadway that operates with a counter-clockwise traffic flow.

Figure 6
LOCATION OF THE PROPOSED PROJECT WITH RESPECT TO THE LOCAL ROAD NETWORK
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



The Alameda County Congestion Management Program (ACCMP) transportation system includes state highways, major arterials and transit systems. Elements of the ACCMP transportation system near the Project site are shown in **Figure 7**.

2. Bicycle Routes/Trails

There are no marked bicycle routes or trails in the immediate vicinity of the Project site.

B. IMPACTS

This section describes the potential impacts of the proposed Project to the transportation facilities in the vicinity of the Project site. Project-related impacts are evaluated for the following elements of the transportation system:

- AM and PM peak hour traffic operations at several key intersections in the vicinity of the Project site;
- Internal site access and circulation; and
- Traffic control.

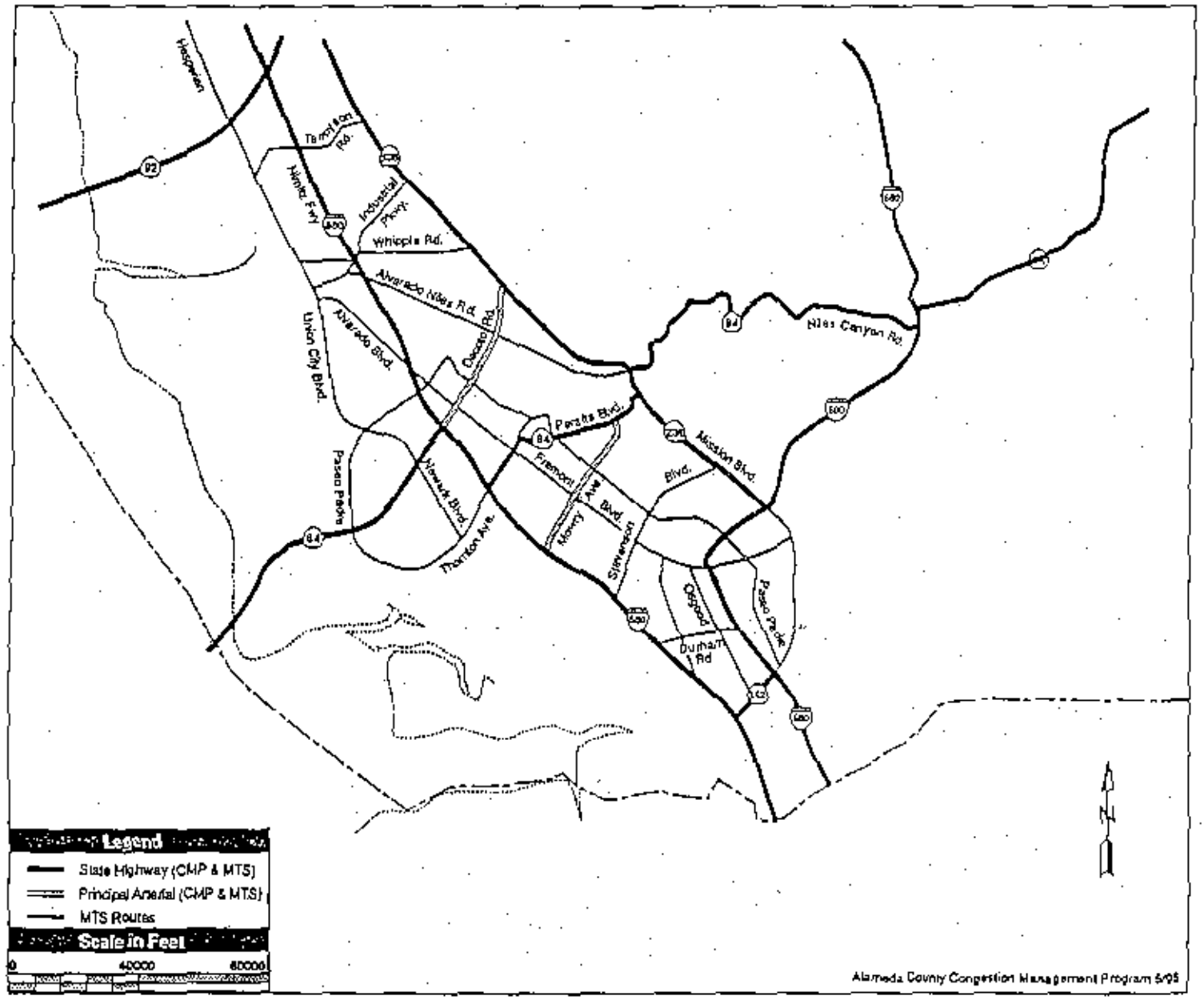
In addition, the proposed Project is subject to the requirements of the ACCMP because of the size of the Project and because the Project involves a General Plan Amendment. An analysis of the impact of the proposed Project on the regional ACCMP roadway system using the Alameda County Congestion Management Agency (ACCMA) travel demand modelling data was performed.

At this level of planning, detailed traffic operational analyses of internal intersections and street segments are not typically performed and detailed geometric designs of internal elements of the road network are not typically prepared. This report includes analyses of two unique roadway design elements within the proposed Project - a roundabout (traffic circle) and a half-moon shaped roadway. Several operational, design and right-of-way issues are identified for further analysis as the planning and design of this Project continues.

1. Analysis Methodology

The technical data and analyses presented in this section were developed by TJKM (see Appendix A, Traffic Impact Study for the Proposed Pacific Commons Development, April 16, 1996). Analyses utilized to assess the impacts associated with development of the previous development proposal for the Project site, which are documented in the Addendum to the Environmental Impact Report, Pacific Greens Project (Ref. 14) were updated to assess Project-related impacts with the current development proposal.

Figure 7
CMP ROAD NETWORK
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



Alameda County
Congestion Management Program -- 1995 Update

2. Description of the Proposed Project

The proposed Project consists of industrial (R&D, warehouse and manufacturing), retail and recreation uses. The site plan for the proposed Project is shown in **Figure 3** on page 9 (see also Figure 3 of the TJKM Traffic Analysis in Appendix A), and the proposed land uses are summarized in **Figure 8** (which also shows the land uses currently allowed on the site per the existing General Plan.) Land uses are shown in **Figure 8** for the Pacific Commons Project area and for the Auto Mall area. The floor area figures shown in **Figure 8** represent a reasonable assumption for the ultimate build-out of the project site, but do not represent a definitive development plan for the site.

Figure 8
COMPARISON OF CURRENT GENERAL PLAN LAND USE PLAN AND PROPOSED LAND USE PLAN
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Land Use	Existing General Plan	Proposed Project
Pacific Commons		
Retail	305,000 sf	-
Retail >100 ksf	-	676,000 sf
Retail < 100 ksf	-	25,000 sf
R&D	2,058,000 sf	4,640,000 sf
Warehouse	2,682,000 sf	1,966,000 sf
Office	-	150,000 sf
Industrial	-	347,000 sf
Restaurant	-	21,000 sf
Golf Course	170 acres	9 holes
Hotel	350 rooms	-
Park	10 acres	45 acres
Single Family	944 DU's	-
Multi-Family	427 DU's	-
School	420 pupils	-
Manufacturing	842,000 sf	515,000 sf
Auto Mall		
Auto Retail	87 acres	45 acres

The Project applicant has proposed a land use plan that establishes acreages to be developed with various uses and the general areas for development of various land use types. For purposes of traffic modeling, it is necessary to estimate the amount of floor area that would be developed for each land use type. The Project applicant provided an estimate of the potential build-out floor area of each proposed land use.

The majority of the Project site would be developed with industrial uses with a significant concentration of commercial retail uses located on the northern portion of the site adjacent to Auto Mall Parkway. Most of the Robbins-Stem parcels located south of Auto Mall Parkway and west of Cushing Parkway would be developed with open space and recreation uses. A narrow band of the easterly portion of the Robbins parcel would be developed with warehouse uses or possibly recreational uses.

The proposed road network for the project consists of four north-south roadways ("A", "B", "C" and "D" Streets). Street "C" would extend Cushing Parkway through the Project site and through the existing Auto Mall to Auto Mall Parkway at Boyce Road. Streets "D" and "E" provide east-west internal circulation within the Project site. The proposed road network integrates Christy Street and Auto Mall Circle into the internal circulation road network for the Project.

3. Analysis Alternatives

To provide a thorough evaluation of the impact of the proposed Project, the following three alternative development and network assumptions were analyzed:

Scenario 1 - General Plan Approved Land Use and Road Network

Scenario 2 - Proposed Land Use with a Modified General Plan Road Network

Scenario 3 - Proposed Land Use with Proposed Road Network

The land use and transportation network assumptions associated with each of these scenarios are described in the sections below.

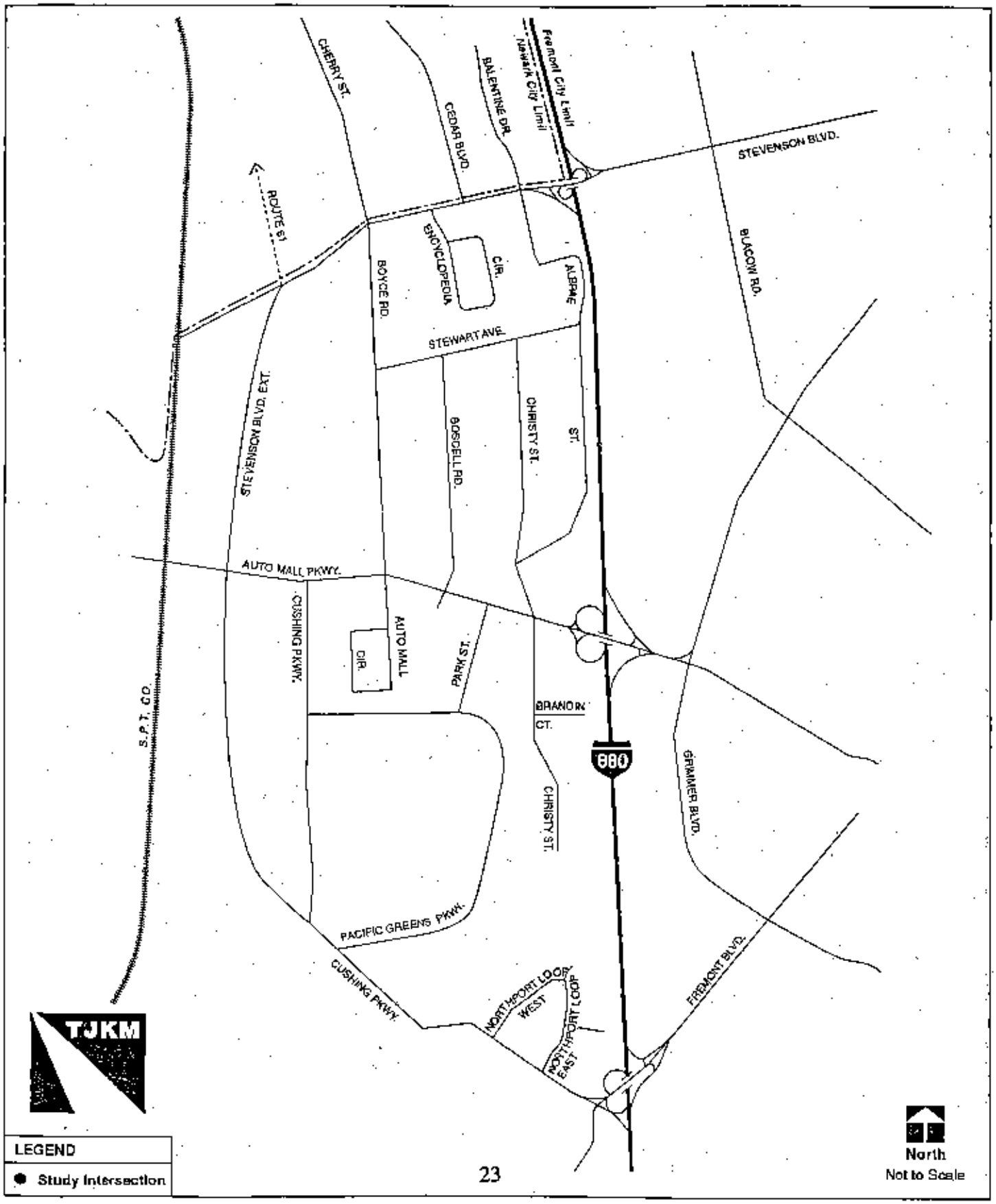
Scenario 1 - General Plan Approved Land Use and Road Network

This scenario represents the land use and road network assumptions currently allowed by the General Plan and consists of the land use and roadway network for the Project site evaluated in the Addendum to the EIR (Ref. 14). This scenario provides the approved future base against which the proposed Project is compared.

The land use development allowed by the existing General Plan is shown in **Figure 8**. The approved Project consists of a mix of residential, employment and retail uses. In addition to a hotel, golf facilities, park and school, the approved land uses includes 305,000 square feet of retail use, 5,582,000 square feet of R&D, manufacturing and warehouse uses and 1,371 residential dwelling units.

Figure 9 shows the approved General Plan road network. The existing General Plan road network consists of the extension of Cushing Parkway to Auto Mall Parkway on a westerly alignment where it would connect with the extension of Stevenson Boulevard. Internal circulation is achieved via Cushing Parkway and an internal loop road (Pacific Greens Parkway). Christy Street south of Auto Mall Parkway would be abandoned and access to Brandin Court would be provided by Pacific Greens Parkway and a connection to Auto Mall Parkway via Park Road. The existing General Plan would maintain Auto Mall Circle as currently configured.

Figure 9
GENERAL PLAN ROAD NETWORK
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



Scenario 2 - Proposed Land Use with a Modified General Plan Road Network

This scenario models the proposed Project land use plan (see **Figure 8**) with a modified General Plan road network. The proposed land use plan eliminates the residential use and the hotel which are currently allowed and includes 701,000 square feet of retail use and 7,618,000 square feet of R&D, warehouse, office, industrial and manufacturing uses.

The Scenario 2 road network maintains the Stevenson Boulevard extension and Cushing Parkway connection to Stevenson Boulevard, but the road network is modified to reflect the proposed configuration of internal roads at the Project site (as shown in **Figure 3** on page 9). Boscell Road is extended onto the site as Street "B" and Christy Street is maintained and extended to the south as Street "A". Street "A" provides access to Brandin Court. Two east-west collectors are also included in the on-site road network. Auto Mall Circle is maintained as currently configured, although a connection between Auto Mall Circle and Street "B" is provided. The on-site road network features a roundabout at the intersection of Street "D" and Street "B" and a semi-circle shaped road (Street "F").

Scenario 3 - Proposed Land Use with Proposed Road Network

Scenario 3 models the proposed Project land use plan and access plan as shown in **Figure 3** on page 9. Scenario 3 assumes the same land use as modeled in Scenario 2, but the road network is modified to replace the Stevenson Boulevard extension with a Boyce Road extension to the south as Street "C." The western alignment of Cushing Parkway is maintained as Street "D." In addition, existing Christy Street and Auto Mall Circle are incorporated into the internal circulation system for the proposed Project.

4. CMP Analysis

To conform with the requirements of the ACCMP, the ACCMA provided year 2010 traffic volume forecasts from the ACCMP travel demand model assuming development of the Project site as currently allowed and as proposed. These forecasts were utilized to assess impacts of the project to regional roadway facilities.

5. Forecasting and Analysis Methodology

Traffic forecasts from two traffic forecasting models were utilized for this analysis. Traffic forecasts from the Alameda County Congestion Management Agency travel demand model were utilized to evaluate impacts to the Congestion Management Program road network. Traffic forecasts from the City of Fremont travel demand model were utilized to evaluate impacts at several key intersections serving the Project site.

The City of Fremont and the ACCMA use gravity-equation based travel demand forecasting models to forecast long-range traffic volumes. The models produce AM and PM peak hour traffic volume forecasts for year 2010 development assumptions, although the land development (land use density) assumptions incorporated into each model may differ. The City of Fremont model forecasts traffic volumes for key intersections in Fremont as well as freeways. The ACCMA model forecasts traffic volumes on regionally significant freeways and major arterials.

Signalized intersection performance was measured using the Intersection Capacity Utilization (ICU) method. Peak hour intersection conditions are reported in terms of volume-to-capacity (V/C) ratios with corresponding levels of service. Level of service ratings, qualitative descriptions of intersection operations, are reported using an A through F rating system to describe travel delay and congestion. Level of Service (LOS) "A" describes free-flow conditions with little or no delay and LOS F describes jammed conditions with excessive delays and long traffic queues. A description of the level of service ratings is included in Appendix A (as Appendix A of the TJKM Traffic Report).

Freeway and arterial segment levels of service are based on hourly directional segment volumes and capacity.

6. Significance Criteria

The City of Fremont has established Level of Service (LOS) "D" and a target V/C ratio of 0.85 as the maximum acceptable intersection operating condition. Policy T1.2.1 of the Fremont General Plan (Ref. 20, page 8-39) states:

> "Maintain a level of service "D", with a target Volume to Capacity ratio of .85 at major intersections, except where the achievement of such a level of service can be demonstrated to conflict with environmental, historic or aesthetic objectives or where regional traffic is a significant cause of congestion. LOS D may also not be achieved within the Central Business District."

City of Fremont engineering staff have indicated that while mid-range LOS D is the target level of service for Fremont, high LOS D with a V/C ratio of up to 0.90 is acceptable. Therefore, for this analysis, an impact is considered significant when during the AM and/or PM peak hour an intersection degrades from an acceptable operating condition (better than mid-range LOS D) with implementation of the existing General Plan land uses and road network to below the mid-range LOS D (V/C ratio greater than 0.85) target with development of the Project. Where an intersection is forecast to exceed the mid-range LOS D target with development of the existing General Plan land uses and road network, a five percent increase in the V/C ratio with development of the proposed Project is considered a significant impact.

Similarly, an impact is considered significant to the CMP system when implementation of the proposed Project would degrade system operations to below the CMP level-of-service standard during the AM and/or PM peak hour. The CMP roadway level of service standard is LOS E, except where LOS F was originally measured at the time the CMP was initially adopted. In Fremont, the only LOS F roadway segments are as follows:

- Northbound I-880 from Dixon Landing Road to SR 262;
- Westbound SR 84 (Fremont Blvd) from Peralta Blvd to Thornton Avenue; and
- Eastbound Mowry Avenue from I-880 southbound to Farwell Drive.

These segments have a CMP level of service standard of "F." All other CMP roadway facilities in Fremont have a CMP level of service standard of "E."

7. Traffic Forecasts

Trip Generation

Figure 10 shows the volume of AM and PM peak hour trips generated by full development of the land area within the Project area as allowed by the existing General Plan. Full development would generate an estimated 91,837 daily vehicular trips, 8,670 vehicular trips during the AM peak hour and 11,558 vehicular trips during the PM peak hour.

Figure 11 shows the volume of AM and PM peak hour trips generated by development of the land area within the Project area with the proposed Project. The trip generation estimates shown in **Figure 11** assume full development of the Project site based on the buildout scenario developed by the Project applicant. The proposed Project is forecast to generate 100,270 daily trips, 8,260 trips during the AM peak hour and 10,524 trips during the PM peak hour.

Figure 12 shows a comparison of the trips generated by the proposed Project and the trips generated by the existing General Plan. On the basis of daily trips, the proposed Project would generate about 9 percent more trips than would be generated by the existing General Plan. The proposed Project would generate about 5 percent fewer trips during the AM peak hour and 9 percent fewer trips during the PM peak hour. Compared with the land uses under the current General Plan, land uses under the proposed land use plan would reduce AM peak hour outbound trips by 42 percent and increase AM peak hour inbound trips by 15 percent. During the PM peak hour, land uses under the proposed land use plan would reduce inbound trips by 33 percent and increase outbound trips by 4 percent compared with land uses under the current General Plan. These trip generation changes are attributable to the replacement of the residential uses with employment-based uses (warehouse, industrial, office).

Total Traffic Volumes

Figure 13 shows a comparison of daily traffic volumes on key roadway links serving the Project site. **Figure 14** shows the total daily, AM peak hour and PM peak hour traffic volumes on the Pacific Commons road network for Scenario 2 (proposed land uses with the approved General Plan road network). **Figure 15** shows the total daily, AM peak hour and PM peak hour traffic volumes on the Pacific Commons road network for Scenario 3 (proposed land uses with the proposed General Plan road network).

8. Level of Service Comparison

The AM and PM peak hour intersection levels of service for the three analysis scenarios are summarized in **Figure 16**. With implementation of the existing General Plan and the General Plan road network, the following three intersections would exceed LOS D operations:

- Cherry St/Boyce Rd/Stevenson Blvd;
- Grimmer/Auto Mall Parkway; and
- Albrae St/Stevenson Blvd.

Figure 10
CURRENT GENERAL PLAN LAND USE - TRIP GENERATION
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Use	Size		Daily Trip Ends		A.M. Peak Hour					P.M. Peak Hour				
			Rate per Unit	Total	Rate per Unit	In: Out	Vehicle Trip Ends			Rate per Unit	In: Out	Vehicle Trip Ends		
							In	Out	Total			In	Out	Total
Previous Pacific Greens														
Retail	305	ksf	65.889	20,096	1.876	69:31	395	177	572	6.658	43:57	873	1,158	2,031
R&D	2,058	ksf	9.049	18,623	1.079	85:15	1,887	333	2,220	1.083	18:82	401	1,828	2,229
Golf Course	170	acres	8.000	1,360	0.480	80:20	66	16	82	0.720	30:70	37	85	122
Hotel	350	rooms	7.342	2,570	0.278	72:28	70	27	97	0.478	39:61	38	59	97
Park	10	acres	12.79	128	0.440	65:35	3	1	4	0.890	45:55	4	5	9
Single-Family	944	DU	8.635	8,151	0.836	19:81	150	639	789	0.894	72:28	608	236	844
Multi-Family	427	DU	6.441	2,750	0.609	20:80	52	208	260	0.669	71:29	203	83	286
School	420	pupils	1.169	491	0.228	72:28	69	27	96	0.077	34:66	11	21	32
Robbins-Stern (now Catellus)														
Manufacturing	842	ksf	4.033	3,396	0.649	86:14	470	76	546	0.643	18:82	97	444	541
Warehouse	2,682	ksf	4.501	12,072	0.572	70:30	1,074	460	1,534	0.642	16:84	276	1,446	1,722
Auto Mall														
Auto Retail	87	acres	---	22,200	28.4	61:39	1,507	963	2,470	41.9	40:60	1,458	2,187	3,645
TOTAL				91,837			5,743	2,927	8,670			4,006	7,552	11,558

Source: *Pacific Greens - Addendum to Environmental Impact Report*, Duncan & Jones, August, 1991.

Figure 11
EXPECTED DEVELOPMENT PLUS POTENTIAL BUILD-OUT OF PROPOSED PROJECT - TRIP GENERATION

Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Use	Size[1]		Daily Trip Ends		A.M. Peak Hour					P.M. Peak Hour				
			Rate per Unit[2]	Total	Rate per Unit[2]	In:Out	Vehicle Trip Ends			Rate per Unit[2]	In:Out	Vehicle Trip Ends		
							In	Out	Total			In	Out	Total
Proposed Pacific Commons														
Warehouse[3]	1,966	ksf	4.501	8,849	0.572	70:30	788	337	1,125	0.642	16:84	202	1,060	1,262
Office	150	ksf	9.049	1,357	1.079	85:15	138	24	162	1.083	18:82	29	133	162
Industrial	347	ksf	4.033	1,399	0.649	86:14	194	31	225	0.643	18:82	40	183	223
Restaurant	21	ksf	187.925	3,946	9.627	66:34	133	69	202	9.165	43:57	83	109	192
Retail > 100 ksf	676	ksf	39.752	26,872	0.438	74:26	199	70	269	3.081	41:59	854	1,229	2,083
Retail < 100 ksf	25	ksf	65.889	1,647	1.876	69:31	32	15	47	6.658	43:57	71	95	166
R&D	4,640	ksf	9.049	41,987	1.079	85:15	4,256	751	5,007	1.083	18:82	905	4,120	5,025
Manufacturing[4]	515	ksf	4.033	2,077	0.649	86:14	287	47	334	0.643	18:82	60	271	331
Golf Course[5]	9	holes	40.00	360	3.220	83:17	24	5	29	3.360	52:48	16	14	30
Public Park[5,6]	45	acres	12.79	576	0.440	65:35	13	7	20	0.890	45:55	18	22	40
Auto Mall														
Auto Retail	45	acres	—	11,200	—	—	510	330	840	—	—	400	610	1,010
TOTAL				100,270			6,574	1,686	8,260			2,678	7,846	10,524

Notes:

1. Square footages are based on estimated build-out potential as supplied by the applicant.
2. City of Fremont standard rates based on *San Diego Trip Generators*, San Diego Association of Governments.
3. 20 acres of the proposed warehouse use will be located on the Robbins-Stern parcels. Approximately 36 acres are to be located on the Fremont Auto Mall site.
4. Manufacturing is part of the Campus use.
5. These uses to be located on the Robbins-Stern parcels.
6. The park is located on the Robbins-Stern parcels. Smaller parks and plazas within the Pacific Commons project site will be primarily for internal use on weekdays and public use during the weekends. Therefore, they will not generate any new external weekday peak hour trips.

Figure 12
TRIP GENERATION COMPARISON
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

	Current General Plan Land Use	Proposed General Plan Land Use	Difference	
Daily	91,838	100,270	+8,432	(+9.2%)
AM Peak Hour				
Inbound	5,743	6,574	+831	(+14.5%)
Outbound	2,927	1,686	-1,241	(-42.4%)
Total	8,670	8,260	-410	(-4.7%)
PM Peak Hour				
Inbound	4,006	2,678	-1,328	(-33.2%)
Outbound	7,552	7,846	+294	(+3.9%)
Total	11,558	10,524	-1,034	(-8.9%)

Figure 13
COMPARISON OF AVERAGE DAILY TRAFFIC
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Roadway/Segment	GP Land Use GP Network[1]	Proposed Land Use, GP Network[2]	Proposed Land Use, Proposed Network[2]
Stevenson Blvd			
I-880 to Albrae	54,200	61,800	62,700
Albrae to Cedar	38,900	38,700	39,500
Cedar to Boyce	25,400	23,800	24,600
West of Boyce	9,100	9,700	6,000
Stevenson Extension			
Stevenson to Auto Mall	22,000	6,300	2,200
Auto Mall to Cushing	13,200	4,400	-
Auto Mall Parkway			
I-880 to Christy	53,400	62,000	58,600
Christy to Project entrance	43,100	31,100	27,800
Project entrance to Boscell	21,200	30,100	26,800
Boscell to Boyce	20,900	15,300	13,400
Boyce to Street "D"	8,700	1,800	2,100
West of Street "D"	8,800	2,000	2,200
Cushing Parkway			
Fremont to Northport Loop	34,300	38,000	40,700
Street "F" to Street "D"	3,500	13,800	17,700
Street "E" to Auto Mall	2,500	2,600	2,500

Notes: [1]Source: Addendum to the Environmental Impact Report - Pacific Greens Project,Duncan & Jones, August 1991 (Ref. 14).

[2] Source: TJKM (Appendix A).

Figure 14
2010 ROADWAY SEGMENT TRAFFIC VOLUMES - STEVENSON ALTERNATIVE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

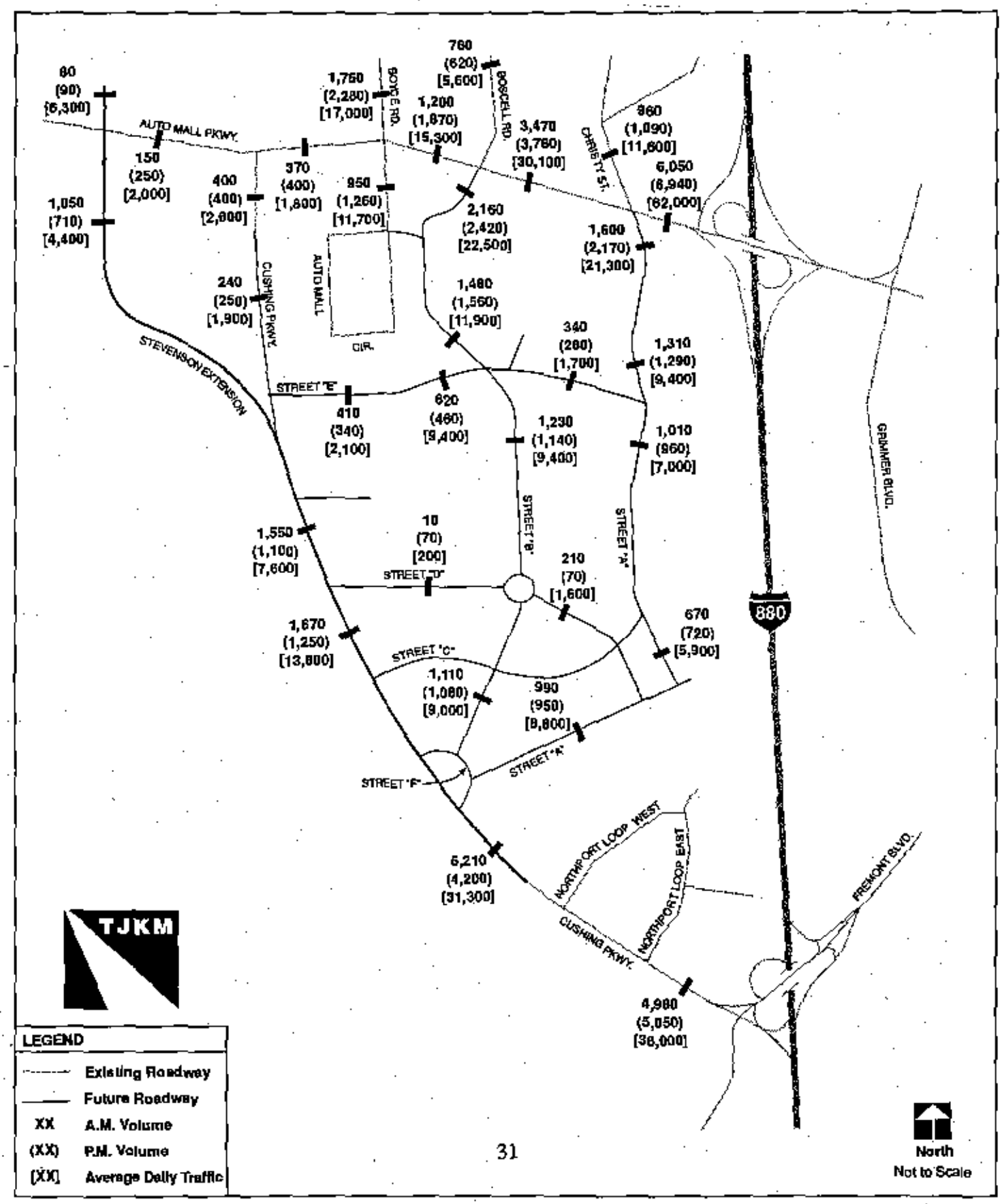


Figure 15
2010 ROADWAY SEGMENT TRAFFIC VOLUMES - BOYCE ALTERNATIVE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

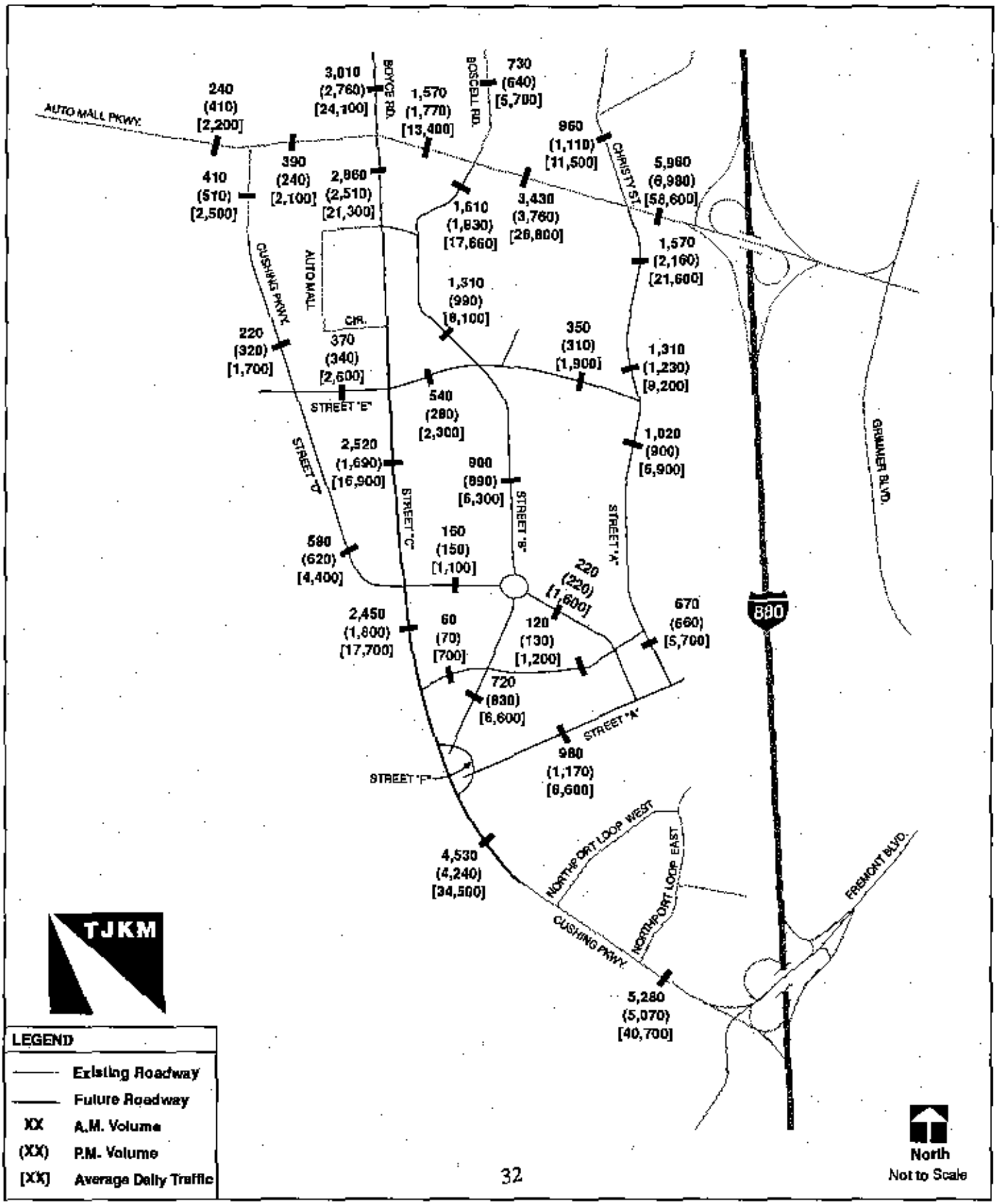


Figure 16
LEVEL OF SERVICE COMPARISON
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

ID	Intersection	Peak Hour	GP Land Use, GP Network*		Proposed Land Use, GP Network		Proposed Land Use, Proposed Network			
							Unmitigated		Mitigated	
			V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
2189	I-880 NB Off-Ramp/	A.M.	0.53	A	0.66	B	0.67	B		
	Stevenson Boulevard	P.M.	0.78	C	0.79	C	0.81	D		
2194	I-880 SB Off-Ramp/	A.M.	0.78	C	0.92	E	0.94	E		
	Stevenson Boulevard	P.M.	0.76	C	0.90	D	0.89	D		
2433	Boscell Road/	A.M.	0.59	A	0.76	C	0.66	B		
	Auto Mall Parkway	P.M.	0.76	C	0.81	D	0.81	D		
2440	Christy Street/	A.M.	0.74	C	0.74	C	0.71	C	0.69	B
	Auto Mall Parkway	P.M.	0.73	C	0.94	E	0.95	E	0.87	D
2553	I-880 NB Ramps/	A.M.	0.60	A	0.88	D	0.92	E		
	Fremont Boulevard	P.M.	0.44	A	0.44	A	0.42	A		
2556	I-880 SB Off-Ramp/	A.M.	0.59	A	0.80	C	0.82	D		
	Fremont Boulevard	P.M.	0.46	A	0.54	A	0.52	A		
2571	I-880 NB Ramps/	A.M.	0.81	D	0.84	D	0.82	D		
	Auto Mall Parkway	P.M.	0.73	C	0.68	B	0.64	B		
2579	I-880 SB Ramps/	A.M.	0.83	D	1.22	F	1.25	F		
	Auto Mall Parkway	P.M.	0.71	C	0.82	D	0.83	D		
2671	Fremont Boulevard/	A.M.	0.67	B	0.75	C	0.76	C		
	Grimmer Boulevard	P.M.	0.47	A	0.65	B	0.66	B		
2731	Cherry/Boyce/	A.M.	1.11	F	0.83	D	0.98	E	0.84	D
	Stevenson Boulevard	P.M.	0.82	D	1.11	F	1.02	F	0.85	D
2778	Grimmer Boulevard/	A.M.	0.93	E	1.14	F	1.13	F		
	Auto Mall Parkway	P.M.	0.98	E	1.33	F	1.34	F		
2788	Boyce Road/	A.M.	0.63	B	0.54	A	0.82	D	0.84	D [1]
	Auto Mall Parkway	P.M.	0.85	D	0.85	D	1.05	F	0.84	D
2789	Fremont Boulevard/	A.M.	0.84	D	0.74	C	0.81	D		
	Cushing Parkway	P.M.	0.76	C	0.89	D	0.89	D		
2899	Albrae Street/	A.M.	0.65	B	0.74	C	0.77	C		
	Stevenson Boulevard	P.M.	1.05	F	1.00	E	0.99	E		
3375	Stevenson Boulevard/	A.M.	0.60	A	0.42	A	0.27	A		
	Auto Mall Parkway	P.M.	0.81	D	0.40	A	0.37	A		
3501	Cushing Parkway/	A.M.	0.25	A	0.30	A	0.33	A		
	Auto Mall Parkway	P.M.	0.49	A	0.32	A	0.39	A		

* Source = *Pacific Greens EIR*, Duncan & Jones, August 1991.

[1] LOS calculation assumes one exclusive left turn lane, one exclusive through lane and one shared through/right turn lane on the eastbound approach. With one exclusive left turn lane and one shared through right turn lane, this intersection would operate at LOS D during both peak hours with a V/C ratio of 0.85 during the AM peak hour and 0.87 during the PM peak hour.

IV. TRAFFIC AND CIRCULATION

With development of the proposed Project, but with the existing General Plan (Stevenson Boulevard extension) road network, six intersections would experience unacceptable operating conditions during the AM and/or PM peak hours. The intersections are as follows:

- I-880 SB Off-Ramp/Stevenson Blvd;
- Christy St/Auto Mall Parkway;
- I-880 SB Ramps/Auto Mall Parkway;
- Cherry St/Boyce Rd/Stevenson Blvd;
- Grimmer/Auto Mall Parkway; and
- Albrae St/Stevenson Blvd.

With development of the proposed Project and the proposed road network (Cushing Parkway extension to Boyce Road), the following eight intersections would operate at less than LOS D during the AM and/or PM peak hours:

I-880 SB Off-Ramp/Stevenson Blvd. With the proposed Project and road network implemented, this intersection is forecast to exceed LOS D operations during the AM peak hour. The intersection is forecast to operate at LOS E (v/c=0.94) during the AM peak hour. With the existing General Plan land use and road network implemented, LOS C operations are forecast during the AM and PM peak hours.

Impact 4-1: Development of the proposed project would *significantly* impact the intersection of I-880 SB Off-Ramp and Stevenson Boulevard.

Christy St/Auto Mall Parkway. With the proposed Project and road network implemented, this intersection is forecast to operate at LOS E (v/c=0.95) during the PM peak hour. With the existing General Plan implemented, LOS C operations are forecast for the PM peak hour.

Impact 4-2: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of Christy Street and Auto Mall Parkway.

I-880 NB Ramps/Fremont Blvd. This intersection is forecast to operate at LOS E (v/c=0.92) during the AM peak hour with the proposed Project and road network developed. With the existing General Plan, this intersection is forecast to operate at LOS A (v/c=0.60).

Impact 4-3: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of the I-880 NB Ramps and Fremont Boulevard.

I-880 SB Ramps/Auto Mall Parkway. This intersection is forecast to operate at LOS F (v/c= 1.25) during the AM peak hour with the proposed Project developed versus LOS D (v/c=0.83) with the existing General Plan.

Impact 4-4: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of the I-880 SB Ramps and Auto Mall Parkway.

Cherry St/Boyce Rd/Stevenson Blvd. This intersection would operate at LOS E (v/c=0.98) during the AM peak hour and LOS F (v/c=1.02) during the PM peak hour with the proposed Project developed. With the existing General Plan, this intersection would operate at LOS F (v/c=1.11) during the AM peak hour and LOS D (v/c=0.82) during the PM peak hour.

Impact 4-5: Development of the proposed Project would improve the AM level of service from "F" to "E", but because the PM peak hour degrades from an acceptable LOS D to an unacceptable LOS F, the proposed project is considered to *significantly* impact peak hour traffic operations at this intersection.

Grimmer/Auto Mall Parkway. This intersection is forecast to operate at LOS E during the AM and PM peak hours with the existing General Plan land use and road network plans implemented. With the proposed Project, this intersection is forecast to operate at LOS F during the AM and PM peak hours.

Impact 4-6: The proposed Project is considered to *significantly* impact peak hour traffic operations at the intersection of Grimmer Boulevard/Auto Mall Parkway because the proposed Project would degrade unacceptable (LOS E) operations with the existing General Plan by more than five percent during the AM and PM peak hours.

Boyce Rd/Auto Mall Parkway. This intersection is forecast to operate at LOS D (v/c=0.85) during the PM peak hour with the existing General Plan implemented versus LOS F (v/c=1.05) with the proposed Project implemented.

Impact 4-7: The proposed Project would *significantly* impact peak hour traffic operations at the intersection of Boyce Road and Auto Mall Parkway.

Albrae St/Stevenson Blvd. Traffic operations are forecast to improve from LOS E (v/c=1.00) during the PM peak hour with the existing General Plan implemented to LOS E (v/c=0.99) with the proposed Project developed. Even though the intersection would not operate at an acceptable LOS D with the proposed Project developed, the proposed Project would not significantly impact peak hour traffic operations at this intersection.

9. CMP Analysis

AM and PM peak hour roadway and highway segment levels of service for key CMP roadways located in the vicinity of the Project are shown in **Figure 17**. The SR 84 highway segments between Paseo Padre and I-880 are forecast to operate within the range of acceptable operations (LOS E or better) in year 2010 with and without development of the proposed Project. Traffic operations on segments of SR 238, I-680 and I-880 are forecast to exceed the LOS E CMA threshold as described below.

Figure 17
SUMMARY OF YEAR 2010 CMA LEVELS OF SERVICE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

		AM Peak Hour				PM Peak Hour			
		Existing GP		Proposed Plan		Existing GP		Proposed Plan	
CMP Segment	Direction	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
State Route 84									
Paseo Padre to Ardenwood	EB	0.25	A	0.24	A	0.50	A	0.48	A
	WB	0.58	A	0.57	A	0.32	A	0.33	A
Ardenwood to I-880	EB	0.50	A	0.48	A	0.72	C	0.70	B
	WB	0.76	C	0.74	C	0.63	B	0.63	B
State Route 238									
I-680 to Driscoll	NB	0.70	B	0.79	C	**1.19**	F	**1.06**	F
	SB	0.81	D	0.76	C	0.57	A	0.61	B
Washington to I-680	NB	0.90	D	0.88	D	**1.28**	F	**1.26**	F
	SB	**1.44**	F	**1.40**	F	0.94	E	0.93	E
Durham to Washington	NB	0.57	A	0.55	A	**1.25**	F	**1.22**	F
	SB	**1.41**	F	**1.34**	F	0.87	D	0.86	D
I-680									
Washington to Mission (SR-238)	NB	0.68	B	0.67	B	1.08	F	1.10	F
	SB	**1.07**	F	**1.10**	F	0.73	C	0.73	C
Washington to Durham	NB	0.56	A	0.56	A	**1.04**	F	**1.07**	F
	SB	0.97	E	**1.03**	F	0.63	B	0.62	B
Durham to Mission	NB	0.52	A	0.51	A	0.89	D	0.90	D
	SB	0.88	D	0.87	D	0.61	B	0.58	A
I-880									
SR 84 to Thornton	NB	0.83	D	0.81	D	0.97	E	**1.02**	F
	SB	0.97	E	**1.01**	F	0.86	D	0.85	D
Thornton to Mowry	NB	0.75	C	0.74	C	0.98	E	**1.01**	F
	SB	**1.06**	F	**1.11**	F	0.90	D	0.90	D
Mowry to Stevenson	NB	0.67	B	0.63	B	**1.01**	F	**1.01**	F
	SB	0.98	E	**1.01**	F	0.74	C	0.73	C
Stevenson to Auto Mall	NB	0.69	B	0.64	B	**1.05**	F	**1.05**	F
	SB	1.00	E	**1.02**	F	0.72	C	0.72	C
Auto Mall to Fremont	NB	0.63	B	0.57	A	0.95	E	0.94	E
	SB	0.94	E	0.91	E	0.64	B	0.64	B
Fremont to Mission	NB	0.59	A	0.70	B	0.82	D	0.82	D
	SB	0.75	C	0.69	B	0.60	A	0.68	B

The southbound SR 238 segments between Washington Boulevard and I-680 are forecast to exceed the LOS E threshold during the AM peak hour with both the existing General Plan developed and with the proposed Project developed. During the PM peak hour, the LOS E threshold is forecast to be exceeded in the northbound direction on SR 238 between Durham Road and Driscoll Road with either development scenario. However, even though the LOS E CMA threshold is exceeded, the V/C ratio with development of the proposed Project is lower than V/C ratio with the existing General Plan developed. Therefore, the proposed Project would not significantly impact traffic operations on SR 238 between Durham Road and Driscoll Road.

The southbound I-680 segment from Mission Boulevard to Washington Boulevard is forecast to exceed the LOS E CMA threshold during the AM peak hour with the existing General Plan (v/c=1.07) and with the proposed Project (v/c=1.10). The proposed Project is forecast to increase the V/C ratio by 3.7 percent. This is not considered a significant impact.

During the AM peak hour, the southbound I-680 segment from Washington Boulevard to Durham Road is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c= 1.03) with the proposed Project. This is considered a significant impact.

Impact 4-8: The southbound I-680 segment between Washington Boulevard and Durham Road would be *significantly* impacted by the proposed Project during the AM peak hour.

During the PM peak hour, the northbound I-680 segment from Durham Road to Washington Boulevard is forecast to operate at LOS F (v/c=1.04) with the existing General Plan and LOS F (v/c= 1.07) with the proposed Project. The proposed Project is forecast to increase the v/c ratio on this segment of I-680 by 3.9 percent. This is not considered a significant impact.

During the PM peak hour, the northbound I-680 segment from Washington Boulevard to Mission Boulevard is forecast to operate at LOS F (v/c=1.08) with the existing General Plan and LOS F (v/c= 1.10) with the proposed Project. The proposed Project is forecast to increase the v/c ratio on this segment of I-680 by 1.9 percent. This is not considered a significant impact.

On I-880, the proposed Project is not considered to significantly impact I-880 at the following three locations which are forecast to operate at LOS F with the proposed Project:

- Southbound I-880 from Thornton to Mowry during the AM peak hour (v/c=1.06 w/existing General Plan; v/c=1.11 w/proposed Project; an increase of 4.7 percent);
- Northbound I-880 from Auto Mall Parkway to Stevenson during the PM peak hour (v/c=1.05 w/existing General Plan; v/c=1.05 w/proposed Project; no change); and
- Northbound I-880 from Stevenson Boulevard to Mowry Avenue during the PM peak hour (v/c=1.01 w/existing General Plan; v/c=1.01 w/proposed Project; no change).

Impact 4-9: The proposed Project would *significantly* impact southbound I-880 from SR 84 to Thornton during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Impact 4-10: The proposed Project would *significantly* impact southbound I-880 from Mowry to Stevenson during the AM peak hour. This segment is forecast to operate at LOS E (v/c=0.98) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Impact 4-11: The proposed Project would *significantly* impact southbound I-880 from Stevenson to Auto Mall during the AM peak hour. This segment is forecast to operate at LOS E (v/c=1.00) with the existing General Plan and LOS F (v/c=1.02) with the proposed Project.

Impact 4-12: The proposed Project would *significantly* impact northbound I-880 from Mowry to Thornton during the PM peak hour. This segment is forecast to operate at LOS E (v/c=0.98) with the existing General Plan and LOS F (v/c=1.01) with the proposed Project.

Impact 4-13: The proposed Project would *significantly* impact northbound I-880 from Thornton to SR 84 during the PM peak hour. This segment is forecast to operate at LOS E (v/c=0.97) with the existing General Plan and LOS F (v/c=1.02) with the proposed Project.

10. Internal Access and Circulation

Figure 18 shows the recommended number of lanes that should be provided on the internal Project roads. The ultimate design of several internal intersections within the Project have not been determined. The lane configurations shown in **Figure 18** are for street segments and additional lanes may be required at the intersections of the internal roads.

In addition, operational analyses of traffic operations on Streets "A" and "B" at the access driveways to the retail areas and on Street "C" through the existing Auto Mall have not been documented. Typically, these studies would evaluate intersection/driveway spacing, lane geometrics, turn lane storage requirements and signal coordination and would be accomplished at another level of Project review.

Impact 4-14: In addition to the minimum street segment lanes shown in **Figure 18**, additional approach lanes and/or channelization may be required at the intersections of internal roadways. Also, additional lanes and/or channelization may be required on Streets "A" and "B" adjacent to the proposed retail areas and on Street "C" through the Auto Mall. Failure to provide geometrics necessary to maintain LOS D operations would represent a *significant impact*.

A roundabout is proposed at the intersection of Street "B" and Street "D." Traffic in the roundabout would operate in a one-way, counter-clockwise direction around a central circular island. Traffic circulating in the roundabout is provided the right-of-way and the approaches to the roundabout are controlled by YIELD signs.

Figure 18
RECOMMENDED STREET SEGMENT LANE GEOMETRICS
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City of Fremont, California

Roadway/Segment	Number of Lanes
Street "A" (Christy St extension)	
Auto Mall Parkway to southern boundary of commercial center	4 lanes plus median
Street "E" to Street "F"	3 lanes (one lane in each direction plus a center turn lane)
Street "B" (Boscell Rd extension)	
Auto Mall Parkway to southern boundary of commercial center	4 lanes plus median
Street "E" to Street "F"	3 lanes
Street "C" (Boyce Rd extension)	
Auto Mall Parkway to Street "F"	4 lanes plus median
Street "F" to Fremont Boulevard	6 lanes plus median
Street "D" (extension of north Cushing Pkwy)	
Auto Mall Parkway to Street "A"	3 lanes
Street "E"	
Street "D" to Street "A"	3 lanes

Source: TJKM (Appendix A).

Note: Recommended number of lanes are for street segments. Additional turn lanes may be required at intersections.

While roundabouts are not new, the use of these intersection designs in new roadway networks has been limited in the United States until recently. Roundabouts are typically applied on low-volume residential streets to allow vehicles to flow efficiently through an intersection, although they have been successfully applied on collectors and at freeway interchanges. Roundabouts can provide substantially lower delays than observed at STOP-controlled and signal-controlled intersections. In addition, properly designed roundabouts can improve the safety of an intersection if properly designed. The first modern roundabout installed by the Maryland State Highway Administration in 1993 reduced accidents from an average of about eight accidents per year over the six years prior to intersection redesign to two accidents in the two years after redesign.

According to traffic projections developed by TJKM (see Appendix A), the intersection of Street "B" and Street "D" is expected to serve approximately 822 vehicles during the AM peak hour and 859 vehicles during the PM peak hour. According to capacity data published by the National Association of Australian State Road Authorities, a one-lane roundabout at the intersection of Street "B"/Street "D" would operate at an acceptable level of service.

Figure 19 shows a conceptual design, including a traffic control plan, for the Street "B"/Street "D" roundabout. The proposed center island is approximately 236 feet in diameter. According to TJKM, with this diameter, vehicles will be able to circulate through the roundabout at about 15 to 20 miles per hour. TJKM recommends the roundabout contain the following design elements and traffic controls:

- The circulating lane should be at least 18 feet in width;
- Flaring the approach and exit lanes at the intersection (especially at Street "B") should be investigated;
- YIELD signs should be posted on each approach;
- Pictorial roundabout warning signs should be placed in advance of each intersection approach;
- "ONE WAY" signs should be installed facing each intersection approach.
- Vertical features on the central island should be set back to provide at least 220 feet of distance between vehicles in the roundabout and vehicles entering the roundabout (measured along the roadway centerline; and
- Parking should be prohibited within the roundabout.

Street "F" is designed as a large semi-roundabout, approximately 1,400 feet in length, with two-way traffic operation. The semi-circle is intersected by Street "A," Street "B" and Street "C." **Figure 20** shows a conceptual design for Street "F." According to TJKM, the radius of Street "F" is approximately 470 feet, equating to a design speed of 35 miles per hour. The Street "F" geometrics shown in **Figure 20** provide 600 feet between Streets "C" and "A"; 400 feet between Streets "A" and "B"; and 400 feet between Streets "B" and "C." Approximately three acres of commercial uses would be developed on the inner circumference of Street "F."

11. Traffic Control

Figure 21 shows a potential traffic control plan developed by TJKM for the internal roadways and the intersections of the internal roadways with the adjacent arterials. Signalization of all major intersections on Street "C" may be warranted due to high traffic volumes on Street "C". The TJKM analysis also suggests that signalization may ultimately be required at the intersection of Street "A" and Street "F" and at the intersection of Street "A" with the main access driveway to the northern retail area. STOP signs are recommended at the other intersections of internal Project roadways and YIELD signs are recommended at the Street "B"/Street "D" roundabout.

The northern retail area will be served by two driveways to Street "A" and to Street "B", as well as driveways to Auto Mall Parkway and a connection to Street "E". The TJKM report suggests that a traffic signal will likely be required on Street "A" at the main access point for the retail area. Stop controls on the driveway approaches from the retail area to Streets "A" and "B" are recommended until signalization is warranted.

Figure 19
CONCEPTUAL ROUNDABOUT GEOMETRICS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

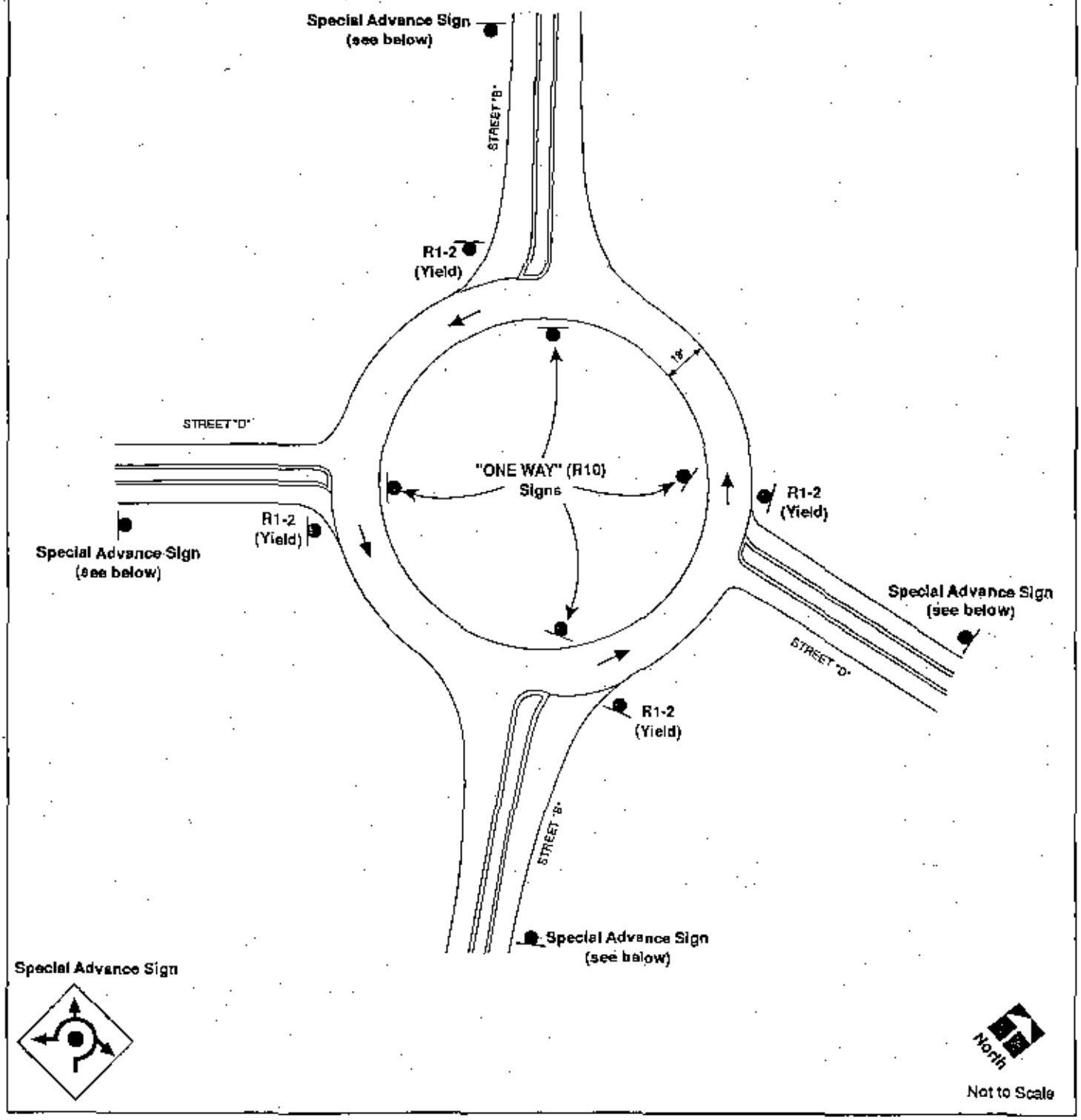


Figure 20
STREET "F" GEOMETRICS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

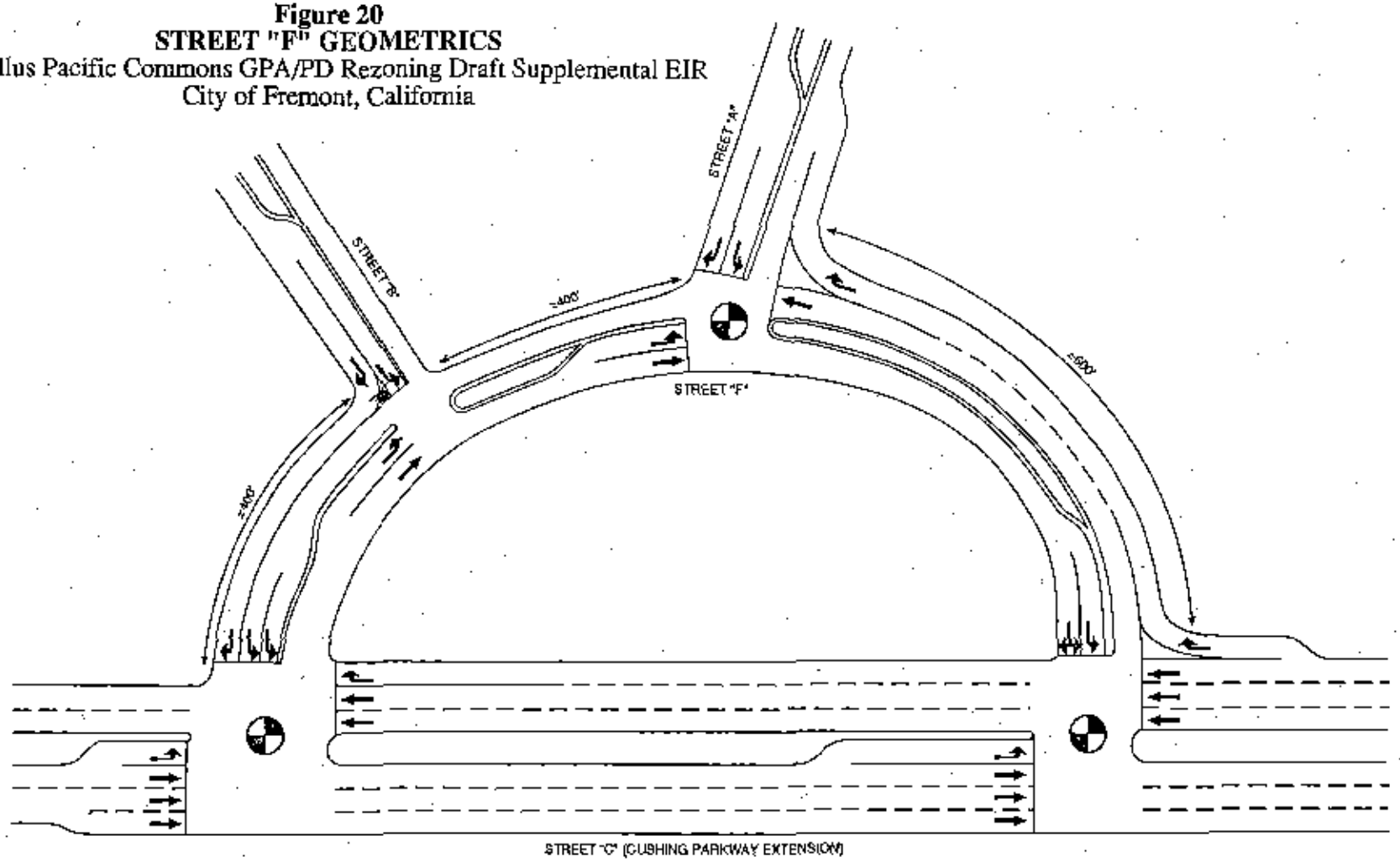
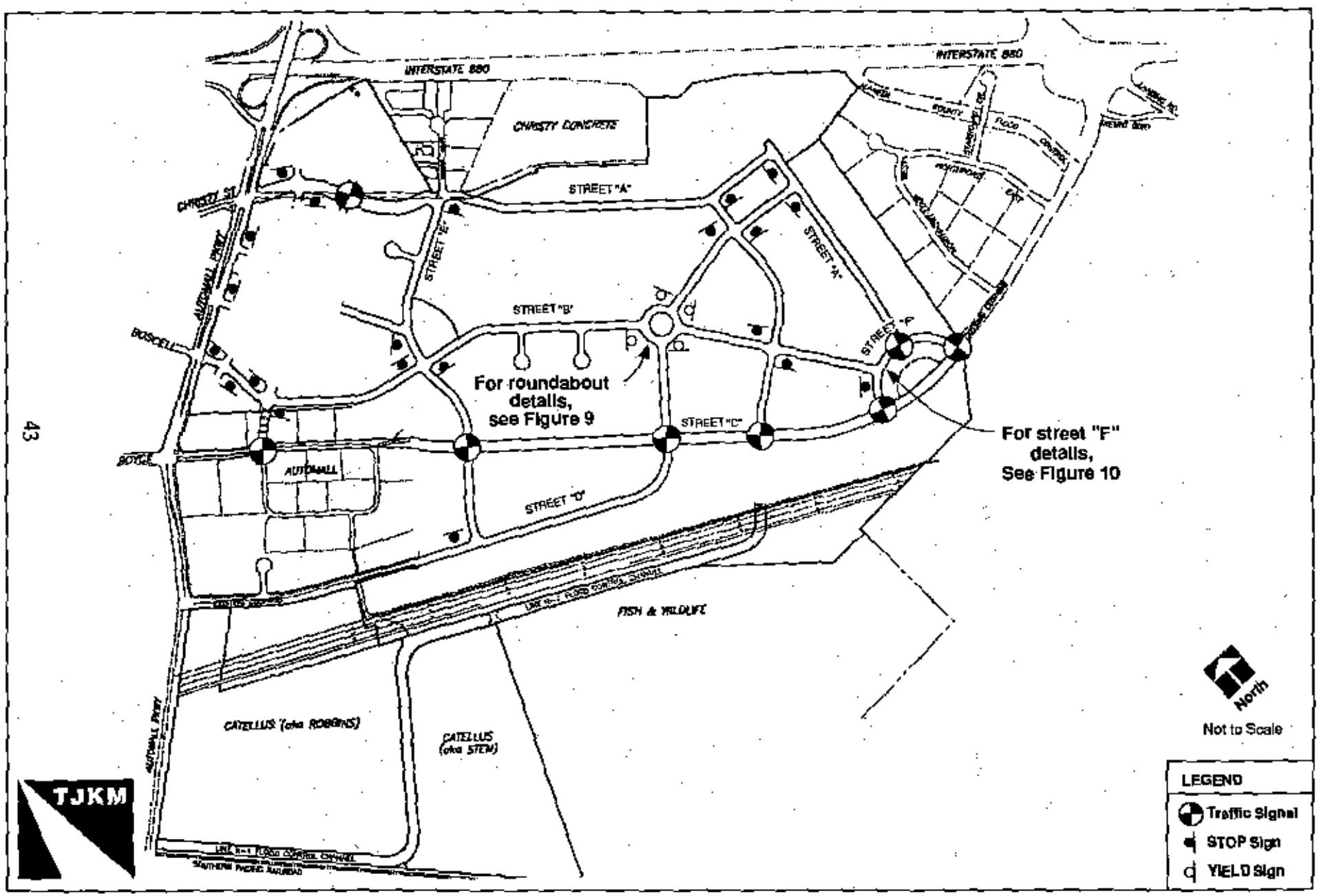


Figure 21
RECOMMENDED INTERSECTION CONTROL - INTERNAL ROADWAYS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



The traffic control measures shown in **Figure 21** represent a recommended traffic control plan based on the traffic forecasts developed for the study. As Project planning and design proceeds, the recommended traffic control measures should be modified to reflect changes in site development, network configurations and parcel access. In addition, field measured volumes should be the predominant factor in establishing the type of traffic control utilized and timing of installation.

C. MITIGATION MEASURES

In this section, recommended mitigation measures to reduce the impacts related to Project development are described. The analysis of year 2010 traffic conditions indicate that the proposed road network and intersection geometrics will not be sufficient to serve the projected travel demand at all study intersections. At several study intersections, the lane geometrics utilized in this analysis represent ultimate lane geometrics and provide ultimate intersection capacities given existing right-of-way limits and/or geometric design constraints. Therefore, to achieve acceptable intersection operating conditions, an intensive trip reduction program will be necessary, not only for the Project site, but for other nearby development. Reducing the scale of development or changing some of the land uses to land uses which generate less traffic may provide an additional alternative for mitigating off-site traffic impacts related to Project development. The Project applicant will be expected to pay any applicable traffic impact fees in compliance with the City of Fremont's Development Impact Fees Program.

1. Road Network

In this section, recommended intersection improvement mitigation measures are described. Intersection levels of service with implementation of the recommended mitigation measures are summarized in **Figure 17**. The recommended mitigation measures are described below.

Mitigation 4-1: I-880 SB Off-Ramp/Stevenson Blvd. Additional intersection improvements beyond the expected improvements are not feasible. Therefore, the impact to peak hour operations at the I-880 SB Off-Ramp/Stevenson Boulevard intersection cannot be mitigated via geometric improvements. **The impact to this intersection related to Project development is an unavoidable significant impact.**

Mitigation 4-2: Christy St/Auto Mall Parkway. Restriping the southbound approach to provide two exclusive left-turn lanes and one shared through, left-and right-turn lane would improve the intersection V/C ratio to 0.87 during the PM peak hour. This improvement would reduce impacts related to Project development to a level of *less than significant.*

Mitigation 4-3: I-880 NB Ramps/Fremont Blvd. Additional improvements to this intersection are not feasible due to right-of-way constraints. **The Project-related impact to this intersection is an unavoidable significant impact.**

Mitigation 4-4: I-880 SB Ramps/Auto Mall Parkway. Additional improvements beyond the expected improvements are not feasible. Widening to provide a two-lane on-ramp from eastbound Auto Mall Parkway to southbound I-880 would improve the operation of the weaving maneuver on eastbound Auto Mall Parkway between Christy Street and the I-880 southbound on-ramp. However, this improvement would not improve the operation of the I-880 SB Ramps/Auto Mall Parkway intersection. **The Project-related impact to this intersection is an unavoidable significant impact.**

Mitigation 4-5: Cherry St/Boyce Rd/Stevenson Blvd. Signalization and improvement of three of the intersection approaches would improve the AM peak hour V/C ratio to 0.84 (LOS D) and the PM peak hour V/C ratio to 0.85 (LOS D). The following improvements are required:

- Westbound Approach -- widen to provide two exclusive left-turn lanes, one exclusive through lane and one exclusive right-turn lane;
- Eastbound Approach -- restripe to provide one exclusive left-turn lane, one exclusive through lane, and one shared through and right-turn lane; and
- Northbound Approach -- widen the east leg and redesign southeast corner to provide a northbound free right turn lane.

Implementation of these improvements would reduce Project impacts to a level of *less than significant.*

Mitigation 4-6: Grimmer/Auto Mall Parkway. No additional capacity related improvements are feasible at this intersection due to right-of-way constraints. **The Project-related impact to this intersection is an unavoidable significant impact.**

Mitigation 4-7: Boyce Rd/Auto Mall Parkway. The PM peak hour level of service can be improved to LOS D (v/c=0.84) by reconfiguring the southbound approach to provide two exclusive left-turn lanes, two exclusive through lanes and one free right-turn lane. To implement this improvement would require narrowing the median on the southbound approach. Implementation of this improvement would reduce Project impacts to a level of *less than significant.*

Due to the elimination of the Stevenson Boulevard extension from the study area road network, the lane requirements on the eastbound approach to Boyce Road/Auto Mall Parkway can be reduced from those presented in the previous Addendum to the EIR (Ref. 14). At a minimum, the eastbound approach could provide one exclusive left-turn lane and one shared through and right-turn lane, and would operate at LOS D during both peak hours (v/c=0.85 during the AM peak hour and 0.87 during the PM peak hour).

Albrae St/Stevenson Blvd. No additional mitigation measures are feasible for this intersection. While this intersection is forecast to operate at LOS E during the PM peak hour, PM peak hour operations would not worsen with the proposed Project versus the existing General Plan. As previously indicated, the proposed Project would not significantly impact peak hour traffic operations at this intersection.

Figure 22 shows the recommended intersection geometrics for the Christy Street/Auto Mall Parkway, Cherry/Boyce Road/Stevenson Boulevard and Boyce Road/Auto Mall Parkway intersections. **Figures 23** and **24** show the recommended lane geometrics for Auto Mall Parkway between I-880 and existing Cushing Parkway.

To achieve the lane geometrics shown in **Figures 23** and **24**, Auto Mall Parkway would require widening between Christy Street and the I-880 southbound ramps to provide one additional eastbound lane and the I-880 southbound on-ramp would require widening to provide a second lane. In addition, widening between Boscell Road and the western commercial driveway may be necessary to accommodate four eastbound through lanes plus five westbound lanes (including two left-turn lanes) and a median. Assuming 12-foot through lanes, 11-foot left-turn lanes and 13-foot through lanes next to medians and sidewalks, an addition five feet of paved width may be necessary on the south side of Auto Mall Parkway and eight feet on the north side. These widths would taper to zero near the proposed driveway. If lane widths could be reduced to 11 feet, no widening would be necessary on the south side of Auto Mall Parkway and only a small 4-foot section would be necessary on the north side. The widening requirement on the north side will extend a few hundred feet west of Boscell Road.

Based on technical analyses performed by TJKM, the following minimum left-turn storage lengths are recommended along Auto Mall Parkway (entering the project, westbound-to-southbound):

- Christy Street -- 1,200 feet (two lanes at 600 feet each);
- Limited Access Project driveway (between Christy Street & Boscell Road) -- 200 feet;
- Boscell Road -- 1,000 feet (two lanes at 500 feet each); and
- Boyce Road -- 500 feet (two lanes at 250 feet each).

2. CMP

Project-related impacts were identified on six segments of the regional transportation system (I-680 and I-880). The highest V/C ratio on these six segments is 1.03 and the largest change in the V/C ratio between the existing General Plan situation and the proposed Project is 0.06. These results indicate that while the Project has an impact on the regional facilities, the actual change in operating conditions between the with Project and the without Project scenario is relatively small and the facilities impacted minimally exceed acceptable operations.

While the provision of additional capacity on the impacted facilities would mitigate Project-related impacts, additional improvement of I-680 and I-880 is probably not certain beyond what is currently funded given transportation improvement funding shortfalls currently being experienced statewide. Given the relatively small increases in the V/C ratios attributable to the Project, it is recommended that regional mitigation efforts be directed to trip reduction strategies.

Figure 22
RECOMMENDED INTERSECTION MITIGATION MEASURES
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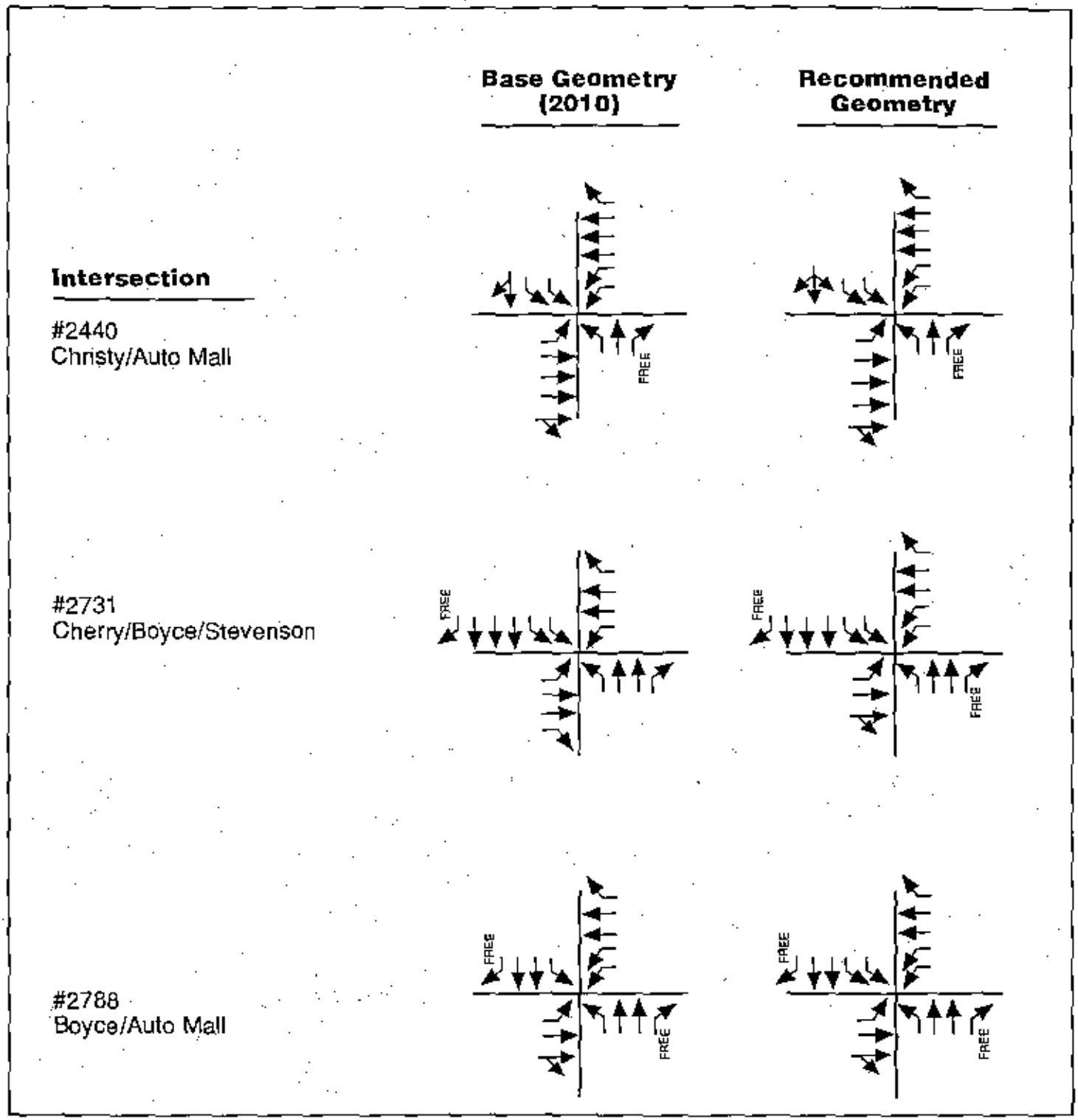
City of Fremont, California



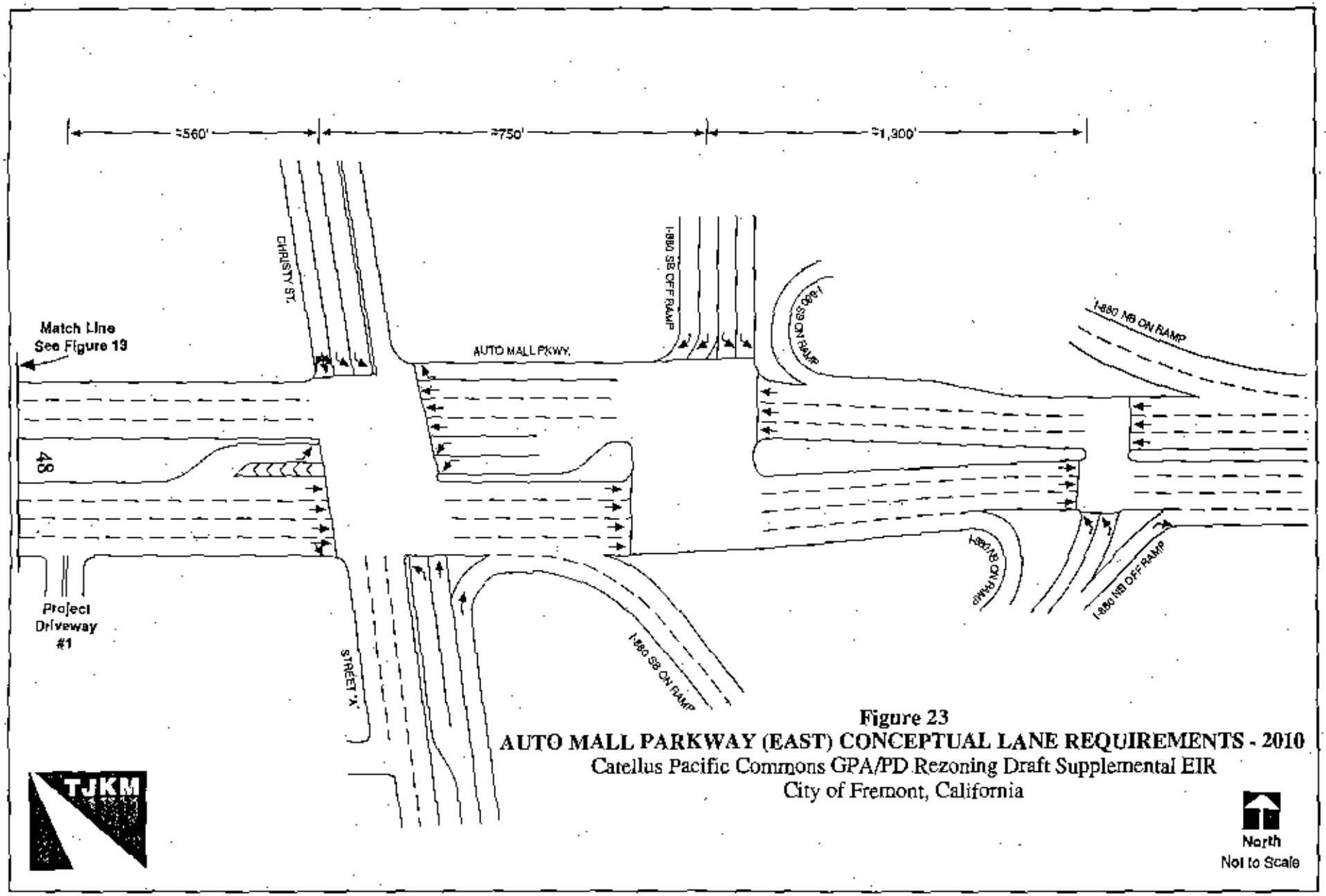
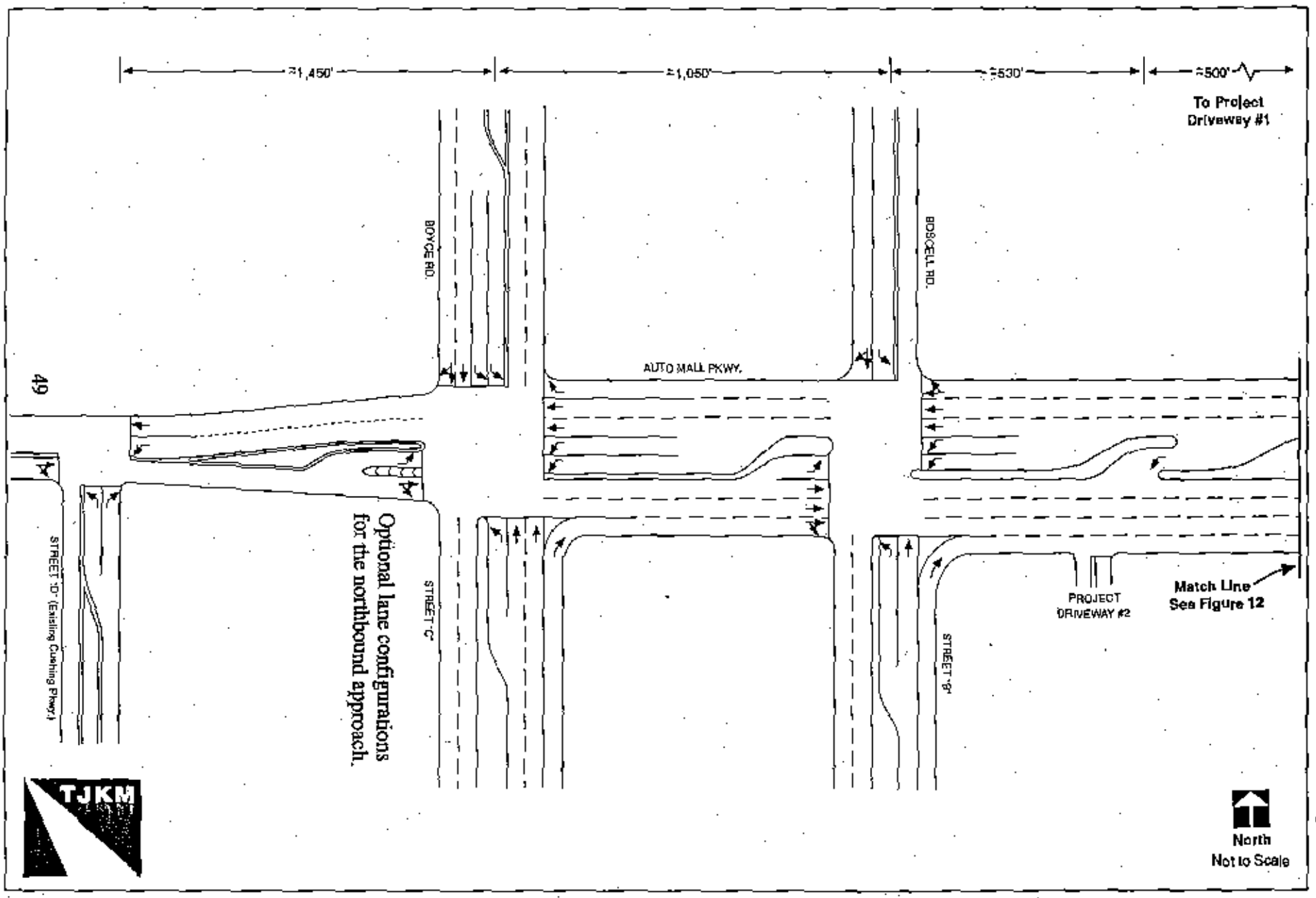


Figure 23
AUTO MALL PARKWAY (EAST) CONCEPTUAL LANE REQUIREMENTS - 2010
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Figure 24
AUTO MALL PARKWAY (WEST) CONCEPTUAL LANE REQUIREMENTS - 2010
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



Mitigation 4-8: To mitigate regional impacts related to Project development, the City should consider requiring the developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute. Elements of the program and strategies that should be considered include the following:

- Establishment of a Transportation Management Associate for the Project area development with a TDM program manager to assist employers in the Project area (and surrounding areas) with the program;
- Transit user subsidies including 1) establishment of a shuttle service between the Project and BART or other transit service and 2) the bulk purchase of transit passes to underwrite the establishment of AC transit to the area;
- Implementation of a parking cash-out program. A parking cash-out program is an employer-funded program in which an employer offers to provide a cash allowance to an employee equivalent to the parking subsidy that the employer would otherwise pay to provide the employee with a parking space. The City of Pleasanton has established a parking cash-out program for City employees. The ACCMA estimates that the program reduces employee commute traffic by five percent from previous non-monetary incentive-based programs and reduces parking utilization by an estimated three percent;
- Flex-time schedules;
- Telecommuting;
- Utilization of site design standards that would benefit transit, pedestrians and bicyclists;
- Preferential parking for carpools and vanpools;
- Rideshare matching programs such as the ridematching program offered by RIDES for Bay Area Commuters;
- Guaranteed Ride Home program (provides carpool and vanpool participants with a vehicle in an emergency or if they cannot leave at their usual time); and
- Funding for City monitoring of the programs.

In evaluating these potential measures, the practical effort and the cost to private and public entities should be addressed. It is not possible to precisely quantify the reduction in peak hour and daily traffic that will be achieved through a TDM program because the reduction in trips depends on the trip reduction measures implemented and the cooperation and support provided by employers. **Therefore, reduction of impacts to the regional road network to less-than-significant levels could not be assured, and impacts to the southbound I-680 between Washington Boulevard and Auto Mall Parkway are considered unavoidable significant impacts.**

A study of two Bay Area business parks found that reduction of 8 percent and 17 percent in the volume of daily trips generated by the parks could be attributable to TDM programs (Evaluation of Travel Demand Management Measures to Relieve Congestion, U.S. Department of Transportation, FHWA, February 1990). The TDM program for Bishop Ranch located in San Ramon, California, includes computerized ridematching using the RIDES system, sale of discounted transit tickets and transit scheduling information, special assistance for companies relocating to Bishop Ranch, vanpool formation assistance and referrals to existing vans, flexible working hours (implemented by individual employers at their own prerogative), and transit shuttle service to BART. Based on survey data collected in 1988, it was estimated that Bishop Ranch generated 17 percent fewer daily trips with the TDM program versus without the program. A similar analysis of Hacienda Business Park in Pleasanton indicated that with approximately three million square feet of development and 9,900 employees on-site, implementation of a TDM program had reduces daily trip generation by 8 percent. While no information was provided regarding reductions in peak hour travel, comparable reductions could be expected because the emphasis of the programs are to reduce employee-generated vehicle trips.

Mitigation 4-9: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to southbound I-880 between SR 84 and Thornton Road during the AM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to southbound I-880 between SR 84 and Thornton Road during the AM peak hour are considered unavoidable significant impacts.**

Mitigation 4-10: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to southbound I-880 between Mowry Avenue and Stevenson Boulevard during the AM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to southbound I-880 between Mowry Avenue and Stevenson Boulevard during the AM peak hour are considered unavoidable significant impacts.**

Mitigation 4-11: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to southbound I-880 between Stevenson Boulevard and Auto Mall Parkway during the AM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to southbound I-880 between Stevenson Boulevard and Auto Mall Parkway the AM peak hour are considered unavoidable significant impacts.**

Mitigation 4-12: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to northbound I-880 between Mowry Avenue and Thornton Avenue during the PM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to northbound I-880 between Mowry Avenue and Thornton Avenue during the PM peak hour are considered unavoidable significant impacts.**

Mitigation 4-13: The City should consider requiring the Project developer to implement a Transportation Demand Management program to promote trip reduction measures and alternative modes of commute to mitigate impacts to northbound I-880 between Thornton Avenue and SR 84 during the PM peak hour (as indicated in Mitigation **4-8**). **However, because it is not possible to assure that the necessary level of trip reduction will be achieved to reduce impacts to less-than-significant levels, impacts to northbound I-880 between Thornton Avenue and SR 84 during the PM peak hour are considered unavoidable significant impacts.**

An analysis of the travel demand forecasts developed by ACCMP and the City of Fremont indicates that a 9 percent reduction in the volume of AM peak hour trips and a 7 percent reduction in the volume of PM peak hour trips would be required to return all impacted sections of I-880 to acceptable (LOS E) operations. These reductions are within the range of reductions measured at Bishop Ranch and Hacienda Business Park. It is not certain that implementation of a TDM program would fully mitigate impacts to I-680 from Washington Boulevard to Auto Mall Parkway (Durham Road) during the AM peak hour. A lower percentage of Project-generated trips utilizes this section of I-680 for access versus I-880. Therefore, greater TDM-related trip reductions may be required to mitigate impacts to this section.

To encourage the utilization of public transit, ridesharing, walking and cycling, site design standards for the Project should include the following:

- Buildings should be clustered to the extent possible so that transit stops can be consolidated and walking distances between buildings minimized;
- The location of transit stops should be coordinated with the City of Fremont and AC Transit;
- Bus turnouts and bus shelters should be provided at the transit stops;
- Passenger drop-off areas should be located with the building parking lots, near the building entrances;
- Paved sidewalks should be provided between the buildings and the transit stops;
- Sidewalks or pedestrian pathways should be provided along all internal roadways; and
- Bikelanes should be provided along all internal streets or a bike path system should be developed for the Project.

Other planning and design activities may influence future operations on the regional road network. The 1995-1996 workplan for the ACCMA includes preparation of corridor/areawide transportation planning studies, including the I-880 corridor, that would establish a framework to demonstrate how each jurisdiction's share of cumulative regional transportation impacts could be mitigated through cooperative planning and investment. Additional objectives include the assessment of longer term land use impacts and possible solutions and the identification of comprehensive approaches to congestion management which can aid in the development of deficiency plans where LOS standards have been or are expected to be exceeded. Future improvements to the I-880 corridor will include ramp metering. Ramp metering is a Transportation System Management strategy that has been demonstrated to improve traffic operations on mainline freeway sections.

3. Internal Access and Circulation

Mitigation 4-14: Additional analysis of traffic operations at the intersection of internal Project roadways should be performed to establish the ultimate design of these intersections. Because it may not be possible to thoroughly assess the long-term design requirements of in the internal Project roadways until additional information regarding the characteristics of the development and the location and size of buildings, sufficient right-of-way should be provided at the intersections of internal Project roadways to ensure that additional turning lanes can be provided in the future. If potential impacts are found to be significant, it should be possible to incorporate technical modifications in order to reduce these impacts to a level of *less than significant.*

The analysis should include the evaluation of Streets "A" and "B" adjacent to the retail areas and Street "C" through the Auto Mall. The access requirements for existing Auto Mall development should be considered when the design of Street "C" is developed. Additional analysis of operations on Street "F" may be warranted when the precise uses being developed on the adjacent parcels are known. The additional analyses of Streets "A" and "B" adjacent to the retail areas and Street "C" through the Auto Mall should evaluate intersection/driveway spacing, travel lane requirements, traffic control requirements, left-turn lane requirements, queue lengths on the approaches of Streets "A", "B" and "C" to Auto Mall Parkway, and queuing on the approaches of the retail area exit driveways to Streets "A" and "B". Until these studies are completed, the ultimate design for Streets "A", "B" and "C" adjacent to the retail areas and the Auto Mall should not be established.

To promote efficient traffic flows on all Project roadways, the Project developer should work with the City of Fremont in the development of access management guidelines for the internal roadways. These guidelines should establish typical roadway cross-sections, minimum spacing between intersections and driveways, minimum spacing between median openings, where relevant and conceptual access plans for individual parcels, including potential inter-parcel connections. Access management on Street "C" is particularly important given that this roadway will not only provide access to adjacent parcels, but serve as a major north-south arterial and will provide an alternative to I-880.

If the internal intersections, including intersections on Streets "A", "B" and "C" at the retail areas and Auto Mall, are designed to maintain LOS D operations, *there will be no significant impacts.*

V. PUBLIC SERVICES AND FACILITIES

A. TRANSIT AND ROAD MAINTENANCE

1. Setting

AC Transit Route 235 currently provides AM and PM peak period service to the area located north of Auto Mall Parkway. Route 235 provides service to Silicon Valley College, BART Fremont, Stevenson Boulevard, Albrae Street, Christy Street, Stewart Avenue and Boyce Road.

While BART plans to extend BART to the Warm Springs area of Fremont, the construction of the extension is not fully funded.

At present, the only paved roads at the Project site are those leading to the auto mall and the southern extension of Christy Street which provides access to Christy Concrete.

2. Impacts

The Project site is not currently served by public transit. However, the development of employment based uses on the site would increase the potential public transit demand. Based on 1990 Census Journey to Work figures, approximately 2.7 percent of the persons working in Fremont use some type of transit for work trips. Based on an estimated employment level of 21,200 people, the proposed Project would generate a transit demand of 572 people.

Impact 5-1: The proposed Project will increase the demand for transit at a location that is not currently served by commuter rail service or transit service. This is considered a *significant impact.*

The proposed Project would add several miles of arterial streets as well as additional collector and minor streets to the City's road network. The initial on-site street improvements would be financed by the Project developer. The City's street maintenance costs would be likely to increase with the need to provide routine maintenance of the new streets at the Project site, and with the need to provide additional maintenance on streets in the vicinity of the Project site which would be subject to additional Project-related traffic. However, the Project developer will be responsible for meeting the City's roadbed quality standards as development of individual portions of the Project site is completed, and those doing business at the Project site would contribute to the costs associated with road maintenance through their tax payments. Therefore, this would not represent a significant impact associated with Project development.

3. Mitigation Measures

Because AC Transit is reducing its service systemwide at the present time, it is not likely that transit service will be provided to the Project site without outside assistance. It is uncertain at this time whether sufficient support will be provided by the Project applicant to assist AC Transit in providing service to the Project area.

Mitigation 5-1: The Project developer should assist AC Transit with the extension of bus service the Project site. Purchasing transit passes in bulk for distribution as a component of a TDM program is one means of assisting AC Transit with system expansion. Bus service to the Project site should be provided on 30 minute headways or on headways consistent with CMP transit performance standards and AC Transit service standards. Transit service to the Project site should include linkage with BART. The location of transit stops shall be coordinated with AC Transit and the City of Fremont as additional information concerning the location of buildings becomes known. The transit stops shall be clearly marked with route and schedule information. Adequate support of public transit operations would reduce the impact to a level of *less than significant.*

B. STORM DRAINAGE, FLOODING AND WATER QUALITY

1. Setting

Topography and Climate

Most of the Project site is characterized as generally flat grassland, with elevations ranging from approximately twenty feet (MSL) in the higher northern areas at Auto Mall Parkway to five feet (MSL) in the southern portion of the site. The land gently slopes to the south toward San Francisco Bay.

The climate of the region is characterized as Mediterranean, with wet winters and dry summers. The region's "rainy" season extends between the winter months of November and April, with relatively dry conditions for the remainder of the year. Average annual rainfall within the watershed typically ranges from 14 to 18 inches at the higher elevations, with the Project site receiving approximately 16 inches (Ref. 1). Temperatures may range from below freezing at night in the winter to above 100 degrees Fahrenheit during the summer months.

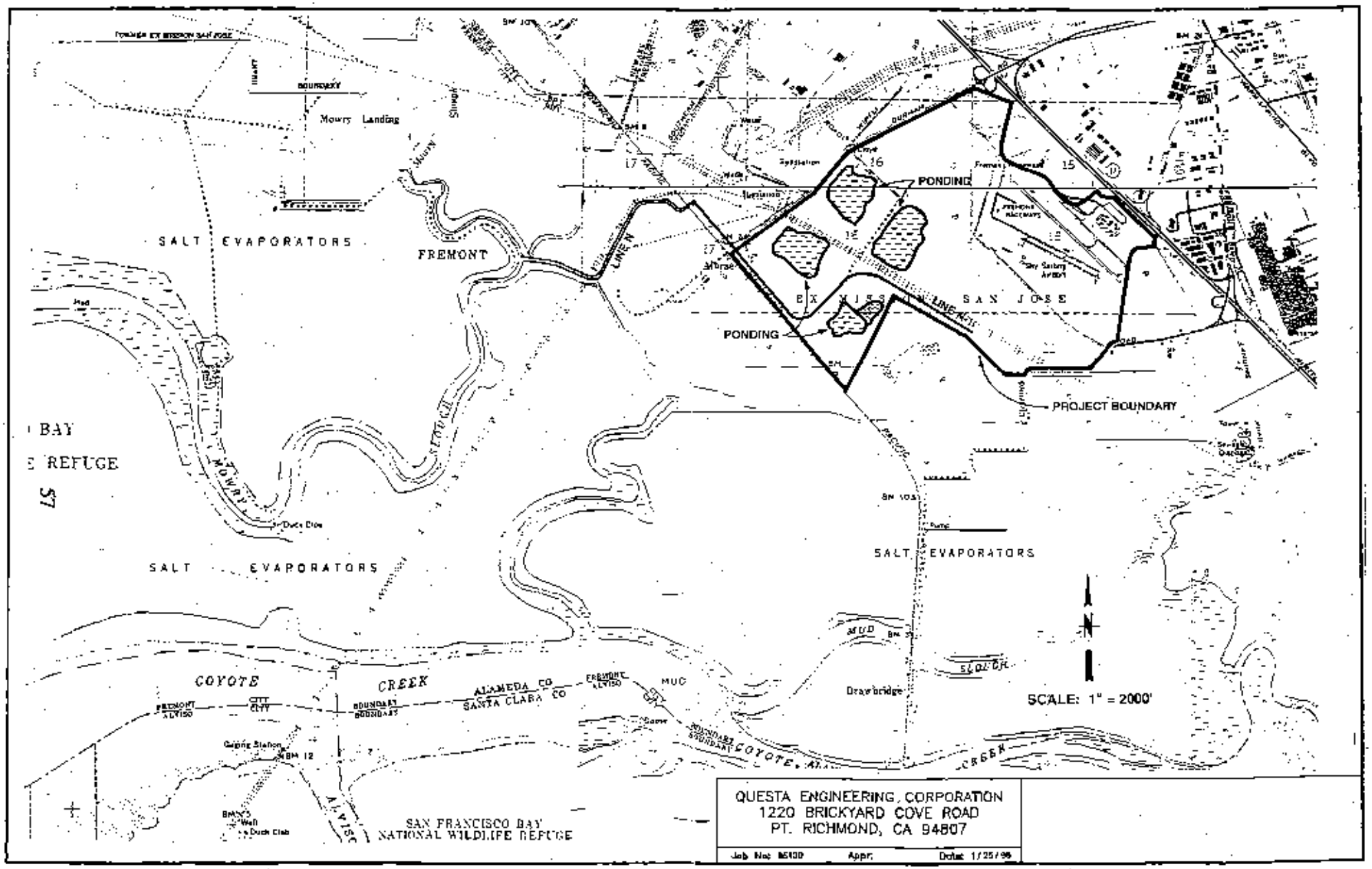
Regional Surface Hydrology

The Project site is located within the Mowry Slough watershed. Mowry Slough receives surface runoff from the Newark and Fremont areas. Mowry Slough traverses the San Francisco Bay National Wildlife Refuge and discharges into San Francisco Bay (see **Figure 25**). Many ACFCWCD drainage lines and channels discharge directly into the Slough. These channels are typical of the San Francisco Bay area streams with storm events producing high flows, and late spring and summer flows representing urban runoff. The ACFCWCD assumes that Mowry Slough is part of San Francisco Bay and associated tidal fluxes, and therefore, there are no records of discharge analyses for Mowry Slough (Personal communication with Andrew Otsuka, Alameda County Flood Control and Water Conservation District in January, 1996).

Surface Drainage Characteristics

The Project site is located in the Zone 6, Line N, watershed. The total watershed of Line N is approximately 4.2 square miles, and receives storm runoff from five different storm systems. The ACFCWCD maintains Line N and its tributary channels.

Figure 25
DRAINAGE FLOWPATH OF SURFACE RUNOFF
FOR THE PROJECT SITE AREA
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



V. PUBLIC SERVICES AND FACILITIES

The natural drainage of the Project site has been altered through the construction of open earth drainage channels. All runoff from the Project site either ponds or enters the drainage channel Line N-1 through a series of small ditches, drainages and culverts. Line N-1 discharges into Line N, and Line N drains to Mowry Slough. The sub-watershed of Line N-1 occupies approximately 1.9 square miles, 45 percent of the total Line N watershed. Line N-1 is an earth-lined trapezoidal channel with leveled banks that runs parallel to the southwest perimeter or the Project site (see **Figure 25**).

All drainage channels within the watershed of Zone 6 have been sized to ACFCWCD criteria and can safely accommodate a five-year storm coincident with a 100-year tide, or a 15-year storm coincident with a moderately high tide. Prior to the construction of Line N-1, hydraulic calculations assumed that the Project site would be entirely developed as an industrial complex. Line N-1 was designed and constructed to accommodate 205 cubic feet per second (cfs), the discharge associated with the five-year storm coincident with a 100-year tide. Both lines N and N-1 are capable of handling increased flow rates associated with the industrial/commercial development of the Project site (Personal communication with Andrew Otsuka, Alameda County Flood Control and Water Conservation District in January 1996).

Flooding

Historically, ponding of storm runoff has occurred in many low-lying areas of the western portion of the Project site (see **Figure 26**). The majority of the Project site occupies areas of minimal flooding, as indicated on the 1987 FEMA Flood Insurance Rate Maps. Approximately 32 percent of the Project site (285 acres) is located in an area that is designated Flood Zone A1. Flood Zone A1 refers to the areas of the 100-year flood where base flood elevations and flood hazard factors have been determined. This flood zone area is located on the western side of the Project site and encompasses the upper reach and downstream region of the drainage channel of Line N-1. The upper reach of Line N-1 and the area southeast of the Project site are within the Flood Zone A1 with base flood elevations of nine feet, National Geodetic Vertical Datum (NGVD). The downstream section of Line N-1 and the area southwest of the Project site, including the junction of Line N-1 and Line N are also designated as Flood Zone A1 with base flood elevations of eight feet NGVD. The ACFCWCD has identified Lines N-1 and N as having adequate capacities to handles the 15-year or greater magnitude storm (Personal communication with Andrew Otsuka, Alameda County Flood Control and Water Conservation District in January 1996).

Soils

The Project site is located on an alluvial apron that extends from Mission Peak Ridge to the east to San Francisco Bay to the west. Grading has occurred in portions of the northwestern section of the Project site, with excavated material placed as compacted fill in the southern portion of the site.

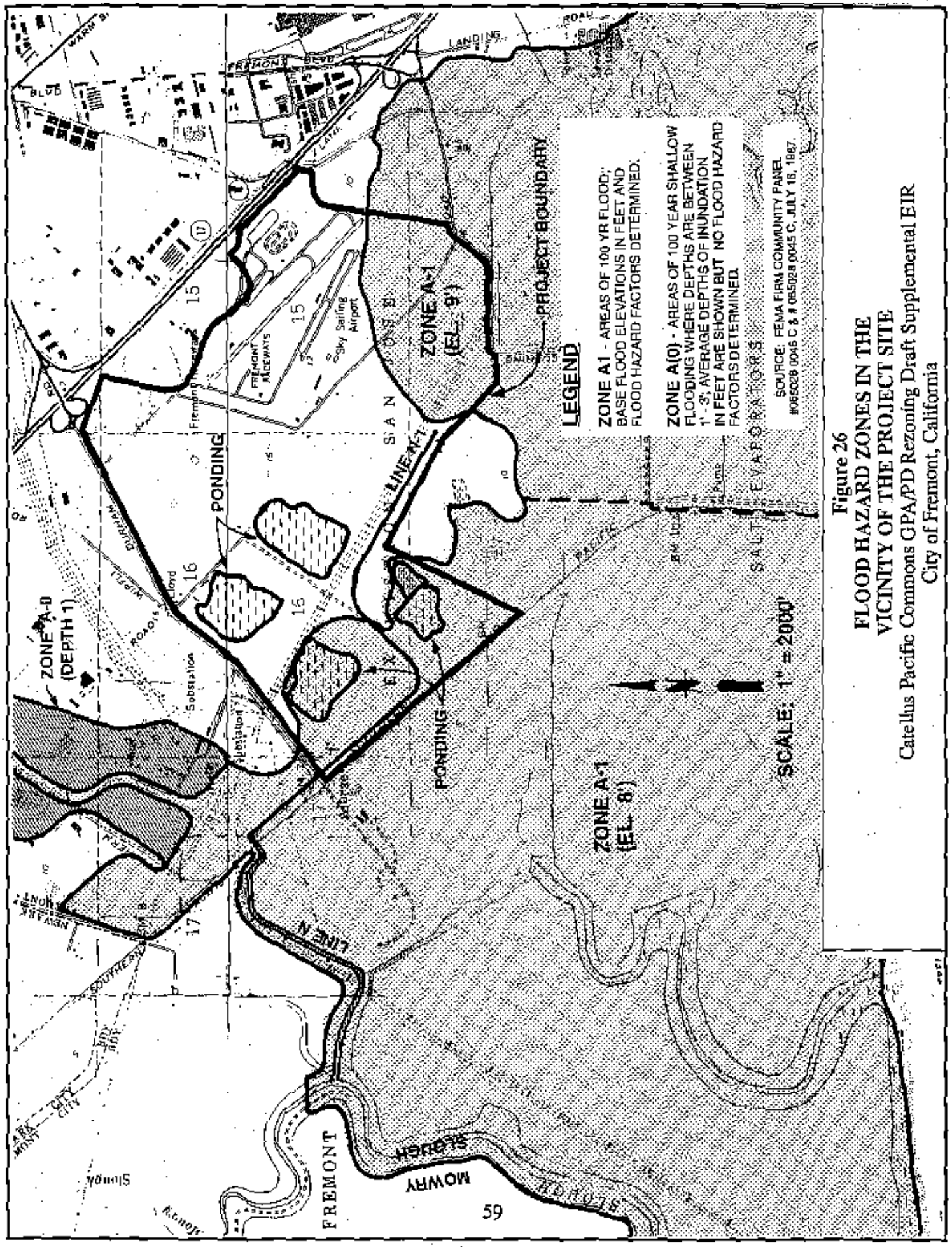


Figure 26
FLOOD HAZARD ZONES IN THE VICINITY OF THE PROJECT SITE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Bedrock underlying the Project site at depth is presumed to be the Franciscan formation, which consists of sandstone, shale, chert, and extrusive and metamorphic rocks. The bedrock is probably greater than 75 to 100 feet below the surface. Overlying the Franciscan rocks are (unnamed) thick alluvial and fluvial materials of the Tertiary to Quatenary age. These sediments consist of sand, silts and clays which are interbedded with gravel deposits ranging in thickness to 100 feet or more. The uppermost gravel-bearing deposit in the area is known as the Newark aquifer. The Newark aquifer is overlain by the sediments of the Alameda formation which consists of silty clays, clayey silts and occasional lenticular layers of fine sands, all of varying thickness. Some researchers have described the silty clays as Bay mud deposits (Ref. 23).

Groundwater

The Project site us located in the area of the Niles Cone groundwater basin. This serves as a significant source of water supply to the surrounding areas of southern Alameda County. The Newark aquifer is the uppermost aquifer in the Niles Cone groundwater basin. The Newark aquifer begins below the Newark aquiclude and roughly follows the surface topography. Its lower limit is generally flat at an elevation near 120 feet below mean sea level (MSL). The Centerville and Fremont aquifers are found below the Newark aquifer at depths ranging from 140 to 290 feet below MSL. Below the Centerville-Fremont aquifers, deeper unnamed aquifers capable of high production have good quality, although few water wells extend to the deeper aquifers.

Efforts by the Alameda County Water District (ACWD) to halt saltwater intrusion into the Newark aquifer have been on-going since 1949. Initial efforts were limited to artificial recharge of groundwater to restore the depressed groundwater levels. Once the groundwater levels were restored in the 1970s, the ACWD began a salinity barrier project to extract the degraded groundwater in addition to retaining some groundwater recharge areas. The ACWD operates 140 extraction wells as part of the salinity barrier project. These extraction wells are generally located between San Francisco Bay and I-880, and extend through the Newark aquifer. Extraction from the wells creates a trough along their alignment which keeps the saltier groundwater to the west from mixing with better quality groundwater to the east.

Water supplies are generally obtained from aquifers below a depth of 100 feet which are overlain by a layer of silty clay, called the Newark aquiclude. In the vicinity of the Project site, this aquiclude is sufficiently thick to prevent the infiltration of surface waters to the underlying aquifers. Rain water infiltrating on the Project site perches on this aquiclude resulting in locally raised groundwater levels. During the Project applicant's geotechnical study, groundwater was encountered between 4 and 14 feet below the surface. This shallow groundwater is not generally suitable for water supply.

Sea Level Rise

The proximity of the Project site to San Francisco Bay makes it susceptible to impacts resulting from any fluctuation in the relative sea level. The relative sea level change is the combined effect of the global sea level change and any local change in land elevation. In the San Francisco Bay Area, data from tide-recording stations indicate that the relative sea level is rising, as a result of a global rise in the sea level and local land subsidence. Estimates for the rate of the relative increase vary due to differences in assumptions and in the interpretation of data. In addition, specific areas around San Francisco Bay differ in relative mean sea level change due to different degrees of land subsidence.

In the vicinity of the Project site, one study estimated the rate of the relative sea level rise at the Dumbarton Bridge to be 0.0226 feet per year (Ref. 29). This estimated rate equates to an increase of nearly one foot in 50 years. While many scientists expect that the rate of global sea level rise will accelerate, land subsidence in the vicinity of the Project site may not. Land subsidence in the vicinity of the Project site is responsible for nearly 70 percent of the estimated relative sea level change. Land subsidence in this area is attributed primarily to the withdrawal of groundwater, with the settlement of bay muds and tectonic activity also contributing.

Water Quality

Currently, surface runoff from the Project site is diverted through multiple storm drainage channels into Drainage Line N and directly into Mowry Slough. The type of pollutants produced by the area is highly variable and dependent upon the land use, rainfall intensity and periods or drought prior to rainfall events. According to the ACFCWCD, there are no recent studies concerning the quality of water discharged from Line N into Mowry Slough or of the discharge from Mowry Slough into San Francisco Bay (Personal communication with Jim Scanlin, Alameda County Flood Control and water Conservation District, Water Resources Department on January 23, 1996).

There are no studies existing of the water quality of the surface water upstream in Line N-1. Specific water quality data for the Project site surface water and groundwater are not available. Give the current land use and adjacent areas, the quality of the storm water runoff from the Project site would be expected to be typical of agricultural and urban watersheds. The drainage ditches and stream channels in the Project site would contain varying amounts of pollutants associated with the nearby land uses, i.e. sediments, pesticides, fertilizers, heavy metals, street contaminants, oil and grease, and other petroleum products. As such, the quality of surface water leaving the site and surrounding area is primarily affected by non-point source pollutants.

Non-point source pollution consists of materials and chemicals that are washed from the watershed areas into the storm drainage system from a variety of sources. These pollutant sources are the freeways, streets, commercial zones, residential areas, construction sites, industrial areas and parking lots. Single point sources such as factories and sewage treatment plants contribute pollutants to the storm runoff. Urban pollutants enter the drainage system through a variety of sources such as household products, maintenance supplies, landscape materials and products (pesticides, herbicides and fertilizers), oil and grease from automobiles, heavy metals found in exhaust, weathered paint, tires, spilled industrial chemicals and other constituents that accompany the land use in Fremont. The storm runoff carrying urban pollutants travels through the storm drainage Line N-1 into Line N into Mowry Slough and finally discharges into San Francisco Bay.

Existing County and City Programs and Regulations

Fremont is currently involved with complying with National Clean Water Act regulations regarding the reduction of non-point source pollutants. This compliance is mandated by National Pollutant Discharge Elimination System (NPDES) permit regulations (Final Rule, November 1990). The City of Fremont adopted NPDES Ordinance #2012 under Chapter 11 of the Municipal Code under Title VIII on June 16, 1992 (Personal communication with Forest Frasier, Clean Water Program, Public Works Department, City of Fremont on January 23, 1996). The

ordinance is derived from the common management plan of Alameda County. Under this County-wide permit, the City has individual program and permit responsibilities to address storm water quality problems within the city limits. Generally, the City will have responsibility to conduct public education programs, institute or enhance programs such as street sweeping, storm drain maintenance and erosion control projects, identify illicit pollutant discharges to the storm drain system, and require new development and industrial discharge controls. The City will likely exercise regulatory authority to enforce NPDES permit conditions by passing new ordinances. These ordinances will mandate that water quality concerns be addressed in new construction, redevelopment or industrial areas.

The City of Fremont requires the following:

NPDES Permit. Fremont requires large contributors to non-point runoff pollution to establish Best Management Practices to minimize the potential for pollution. The developer is responsible for schedules of activities, development of appropriate safety strategies, maintenance procedures, and other management practices to prevent or reduce the pollution of downstream waters. Typical elements of such a program would include addressing the use of oil and grease traps and other techniques in order to avoid pollutants entering Line N-1 and thus San Francisco Bay.

Stormwater Utility Charge. Fremont requires a clean stormwater fee associated with development depending upon land use and size of the property. Industrial and commercial development coincides with a clean water fee of $108.00 per acre. The fire station, if privately owned, has a clean water fee of $81.00 per acre. The clean water fees of the Project plazas will be determined by the Building Department of the City of Fremont depending upon the property owner of the plazas (Personal communication with Forest Frasier, Clean Water Program, Public Works Department, City of Fremont on January 23, 1996).

2. Impacts

Significance Criteria

According to CEQA Guidelines, implementation of the proposed Project would have significant adverse impacts if it would cause: (1) substantial flooding; (2) the substantial degradation of surface or groundwater quality; or (3) substantial interference with groundwater recharge. Groundwater recharge in the area is not an issue since the Project does not serve as a major recharge source to the Niles groundwater basin in the area and the shallow groundwater supplies of the Newark aquiclude are not currently utilized for water supply. Therefore, the impact analysis will focus on the Project's impacts on current flooding characteristics and quality of storm water runoff.

The development of the Project site could have two types of impacts: (1) it will change the rate and volume of stormwater runoff leaving the site; and (2) urbanization of the area could degrade local runoff quality.

Proposed Project Drainage Plan

Impact 5-2: The Project site does not have an adequate drainage plan. This is a *potentially significant impact.*

The Project development plans indicate the construction of a drainage system that will augment stormwater runoff into the drainage channel of Line N-1. In order to anticipate specific on- and off-site impacts as well as conformance with City and County drainage standards, a drainage plan is needed.

Runoff Impacts

The Project will increase the total stormwater runoff volume and peak discharge coming from the Project site, but this is considered to be a *less than significant impact.*

The ACFCWCD states that the drainage channels Lines N-1 and N have the capacity to accommodate the increased runoff flows associated with the proposed Project. Existing conditions on-site are such that stormwater runoff is detained in many of the low-lying areas. This detention is largely responsible for relatively low peak discharges from the Project site. Development of the Project site, with its corresponding improvements in the minor drainage facilities, will eliminate most of this detention.

When a predominantly open grassland watershed is converted to commercial and industrial uses, several changes in the watershed hydrology occur. The runoff from the watershed increases because impervious surfaces such as roof tops, roads and parking lots are added to the watershed. This reduces the amount of ground surface which would otherwise be available for absorption and infiltration of rainfall. When less rainfall is absorbed into the soil, more water runs off into the local drainages. The increased runoff can cause two primary impacts: (1) the total stormwater runoff volume from the watershed increases; and (2) the peak discharge of the watershed increases. Increased runoff may also create secondary impacts such as increased flood frequency and duration, and channel erosion. These impacts can occur on and downstream of the Project location.

The impervious surfaces of the proposed commercial and industrial development will prohibit underlying soils from absorbing surface runoff and covey surface runoff directly into a subterrainian storm drainage system. The Project will increase the total stormwater runoff volume and peak discharge coming from the Project site into Line N-1. The Project will also increase the flow rates downstream in the drainage channel Line N.

The ACFCWCD states that District Zone 6 is capable of handling the augmented runoff from the Project site. The current drainage channels of Lines N-1 and N have the capacity to handle a five-year storm recurrence interval coincident with a 100-year high tide, or a 15-year storm coincident with a moderately high tide. Lines N-1 and N were sized to handle the increased flows associated with the industrial development of the Project site (Personal communication with Andrew Otsuka, Alameda County Flood Control and Water Conservation District in January 1996).

Flooding

Impact 5-3: Portions of the Project site and adjacent areas occupy areas of the 100-year flood zone. This is considered a *potentially significant impact*.

The development plans for the proposed Project indicate that a drainage system will be constructed to direct runoff into the adjacent Line N-1 drainage channel. There is an identified 100-year flood hazard zone with base flood elevations of 9 feet at the upper reach of Line N-1 and an identified 100-year flood hazard zone with base flood elevations of 8 feet along the downstream portion of Line N (see **Figure 27**). This has two potential implications: (1) portions of the Project site may be susceptible to flood inundation and subsequent structural damage; and (2) increased runoff from the Project site could raise flood elevations downstream in Line N.

Figure 27 shows the proposed development plan under anticipated 100-year flood conditions. The highlighted area could experience one to four feet of flood water inundation during the 100-year storm event. Diking and/or placing structures in this area will constitute floodplain fill and displace minor amounts of flood waters that are currently stored on-site. Because of the dynamics of the floodplain in this location, this displacement should have minimal effects on adjacent properties.

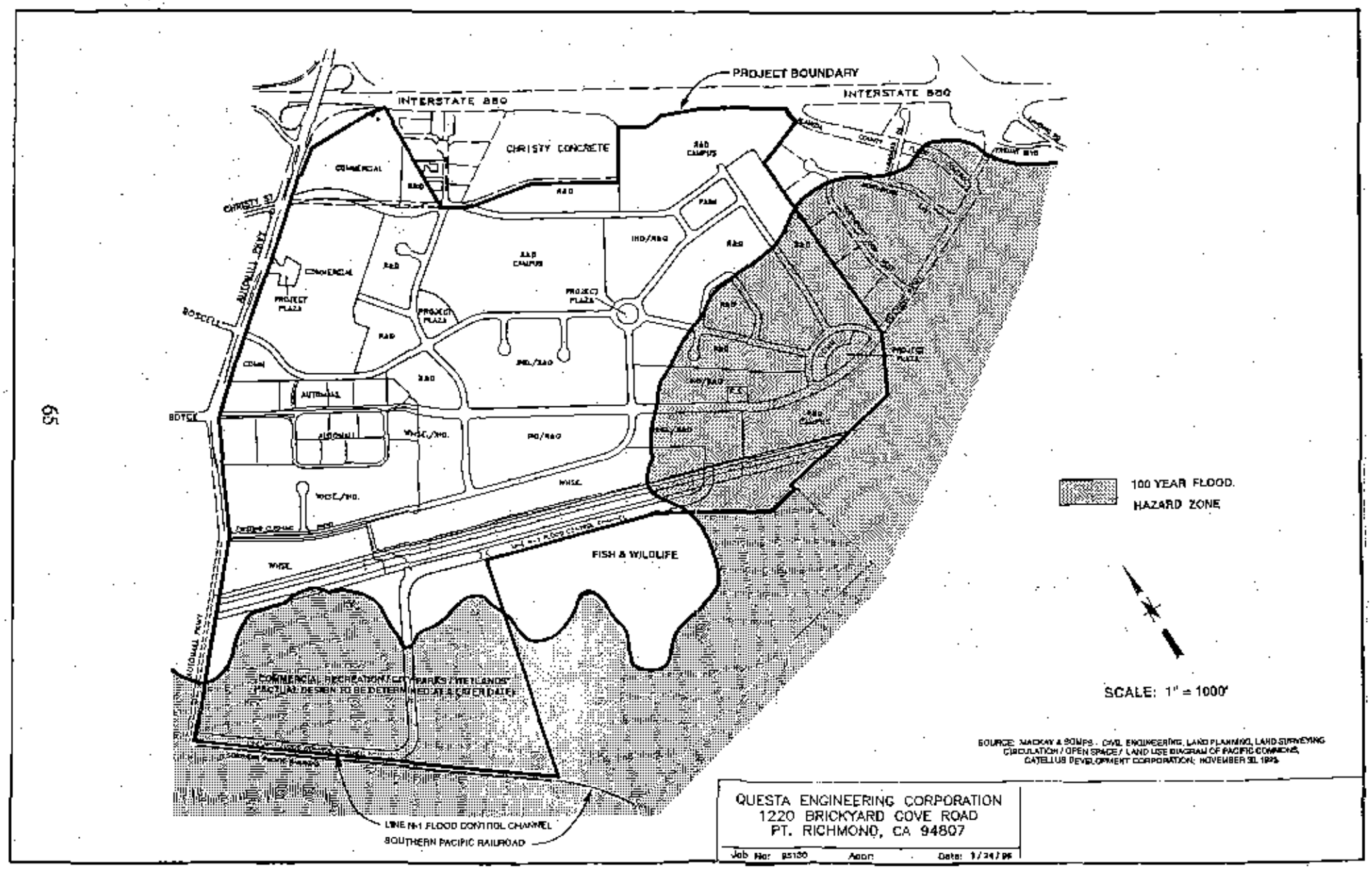
Increased runoff from the Project site could also increase flood elevations in and around Line N. Two factors greatly reduce and Project site runoff impacts: (1) the development is low in the Line N watershed; and (2) the floodplain in this area is widespread and extensive. Because the Project site is low in the watershed, the bulk of the runoff from the Project site will have entered Line N and San Francisco Bay before the bulk of flood waters from the upper watershed arrive in Mowry Slough. The increased volume of water from the Project site will also spread throughout the entire flood plain area causing very minor elevation increases. Also, areas of flood inundation adjacent to Line N and Mowry Slough are primarily unoccupied, diked baylands, with very few structures or people likely to be exposed to these flood hazards.

Erosion

Impact 5-4: Soil erosion during construction at the Project site is considered a *potentially significant impact*.

Development of the Project site will involve earthmoving during the construction period. Although the Project site occupies a gently sloping flat terrain, there is a threat of soil erosion from soil disturbance associated with Project construction because: (1) fill material may require replacement; (2) the susceptibility of exposed unprotected soils to erosion ranges from slight to moderately high; and (3) extensive grading will be required. Alterations in drainage patterns could compound and increase erosion at the Project site by subjecting unprotected areas to the erosional forces of runoff.

Figure 27
100-YEAR FLOOD HAZARD ZONE
AT THE PROJECT SITE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



Soil erosion can cause numerous types of impacts. Eroded soil contains nitrogen, phosphorus and other nutrients. When these are carried into downstream facilities, these nutrients can trigger algal blooms that reduce water clarity, deplete oxygen and create odors. Excessive sediment from construction site erosion could also be deposited in on-site storm drains and the downstream drainage facilities, decreasing the water storage capacity of the adjacent drainage Lines N-1 and N.

Sea Level Rise

Impact 5-5: Future relative sea level rise could result in possible tidal and runoff related flooding at the Project site. This is a *potentially significant impact.*

If the current trend of sea level rise in the vicinity of the Project site continues, the proposed Project will be impacted. There is a range of estimates concerning future relative sea level rise in the southern San Francisco Bay. Any significant rise in the relative sea level will increase the potential for tidal and runoff related flooding at the Project site.

Water Quality

Impact 5-6: Water quality effects on the urban runoff waters entering the District Zone 6 watershed, especially in the reaches of Line N, are considered a *potentially significant impact* associated with Project development.

Adverse impacts on the water quality of the downstream drainage channel of Line N could occur as a result of pollutant runoff from commercial/industrial businesses, streets and parking lots at the Project site. Stormwater runoff from these areas include materials and chemicals that are washed into the storm drain system from a variety of sources. Because storm drains are separate from the sanitary sewer system, these pollutants flow directly into the local drainage Lines N-1 and N, and into the downstream receiving waters of San Francisco Bay.

Rapid runoff during storms, particularly during the first rainfall event or after an extended dry period, may generate :slugs" of polluted water which quickly pass through the storm drain system. Runoff in the wetter months may cause higher suspended sediment concentrations and turbidity as a result of erosion. Consequently, this runoff tends to be higher in concentrations of bacteria, trace metals and nutrients. During dry weather, the quality of surface runoff may be affected by spills or leakage of chemicals, washdown of pavements and leakage of sanitary sewers.

Figure 28 presents a compilation of data collected during urban runoff studies in Fresno, the Santa Clara Valley and for the National Urban Runoff Program. These data are compared to the proposed State Water Resources Control Board (SWRCB) receiving water objectives.

From this compilation, the following general conclusions can be inferred:

- Copper, lead and zinc concentrations in undiluted urban runoff are higher than proposed salt or freshwater receiving water objectives.
- Oxygen demand, frequently overlooked, is a major pollutant of concern in urban runoff.
- Cadmium, chromium, nickel and toxicity may each be problematic, depending on the characteristics of the receiving water.

Figure 28
WATER CHARACTERISTICS OF URBAN RUNOFF
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Pollutant	Percent Sediment Bound	Total Concentration (ppb)[1]	Proposed SWRCB Receiving Water Objective (ppb)[2]
Chemical Oxygen Demand (parts per million)		460 (Ind) 76 (Res)	No Objective
Cadmium	80%	5.5 (Ind) 0.66 (Res)	1.3 / 9.3
Chromium	90%	21 (Ind) 12 (Res)	11 / 55
Copper	80%	68 (Ind) 15 (Res)	6.5 / 2.9 (2.9 = 1 hr. avg.)
Lead	90%	87 (Ind) 140 (Res)	1.3 / 5.6
Mercury	90%	1 (Ind) 0.16 (Res)	No Objective / 25
Nickel	70%	25 (Ind) 12 (Res)	88 / 8.3
Selenium	Not Detected in 109 NURP Samples (Detection Limit = 10 ppb)		5 / 71
Zinc	70%	520 (Ind) 152 (Res)	59 / 86
Hydrocarbons (Solvent Extraction)	60%	600 (Mix)	Established by Individual Compound
Toxicity	100% mortality using Ceriodaphnia (a crustacean). In general, toxicity can vary according to the species, dilution and watershed tested.		

Notes

1. Ind: Median value, Industrial watershed
   Res: Median value, Residential or Commercial watershed
   Mix: Mixed use watershed

2. X / Y = Freshwater / Enclosed Bays and Estuaries Criteria.
   Unless otherwise noted, values are 4-day averages.
   Freshwater values based on hardness of 50 mg/l.

SOURCE: DUNCAN & JONES, ADDENDUM TO THE ENVIRONMENTAL IMPACT REPORT, PACIFIC GREENS PROJECT CATELLUS DEVELOPMENT CORPORATION, AUGUST 12, 1991

A pollutant's effects are receiving-water-dependent. Receiving water objectives generally apply not at the point of discharge, but at some distance downstream, after the effects of dilution in the mixing zone. In a large river, the urban runoff from a small development is unlikely to pose a threat to the aquatic community simply because the effects of the runoff are masked by the available dilution. At the other end of the spectrum, the urban stormwater discharge from a large development discharging into a small creek or dead end slough can have a major effect on the aquatic community there, because the dilution capacity of the receiving water is limited. This latter case is characteristic of urban stormwater discharges into South San Francisco Bay, especially in the area south of the Dumbarton Bridge.

The region of the San Francisco Bay, south of the Dumbarton Bridge, is of special concern because of its limited capacity for pollutant assimilation and the relatively large amounts of pollutants entering this portion of the Bay from sewage treatment plants and stormwater runoff. In the past, municipalities discharged untreated sewage into San Francisco Bay. South of the Dumbarton Bridge, the Bay receives minimal tidal flushing, and anaerobic conditions and foul odors were commonplace in the South Bay. This condition has improved due in large part to stricter regulations governing discharges. The SFRWQCB is the issuing agency for waste discharge permits. The major dischargers in the area are the East Bay Dischargers Authority (EBDA), which discharges treated sewage into the Bay beyond the San Leandro Marina, and the South Bay Dischargers Authority, which discharges near Coyote Creek.

In South San Francisco Bay, stormwater discharges account for 60 percent or more of the metals discharges into these waters (see **Figure 29**). On February 1, 1989, the SWRCB approved the listing of the portion of San Francisco Bay south of the Dumbarton Bridge on the 304(L) list of impaired water bodies for the pollutants cadmium, chromium, copper, lead, mercury, nickel, selenium, silver and zinc, and included the Santa Clara Non-point Source Dischargers on the 304(L) dischargers list.

In 1990, the SFBRWQCB issued an NPDES permit to the Dischargers which places the discharge of stormwater under the permitting authority of the Board. The permit also serves as the Individual Control Strategy for stormwater discharges in this portion of San Francisco Bay.

The susceptibility of South San Francisco Bay to the effects of pollutants indicate limited flushing in these receiving waters. Prior to the advent of winter storms and subsequent flushing by Delta outflows, residence times in South San Francisco Bay may approach five months. The problem of limited flushing is exacerbated by rainfall/runoff patterns in the area. During the first storms, runoff from rural area is minimized due to soil uptake of water. During this period, the accumulation of metals, especially copper, has been documented in aquatic organisms.

The type of pollutants and the degree of impact produced by an area ultimately depends upon such factors as the land use, rainfall intensity and the number of dry days prior to the rainfall event. The types of pollutants which are likely to be found in greater concentrations as a result of the proposed Project include floating debris, heavy metals (especially copper, lead and zinc) from automobiles, organic chemicals (including hydrocarbons associated with fuels and oil) and industrial/commercial pollutants dependent upon the type of business.

Figure 29
POINT AND NON-POINT SOURCE LOADS OF SOUTH SAN FRANCISCO BAY
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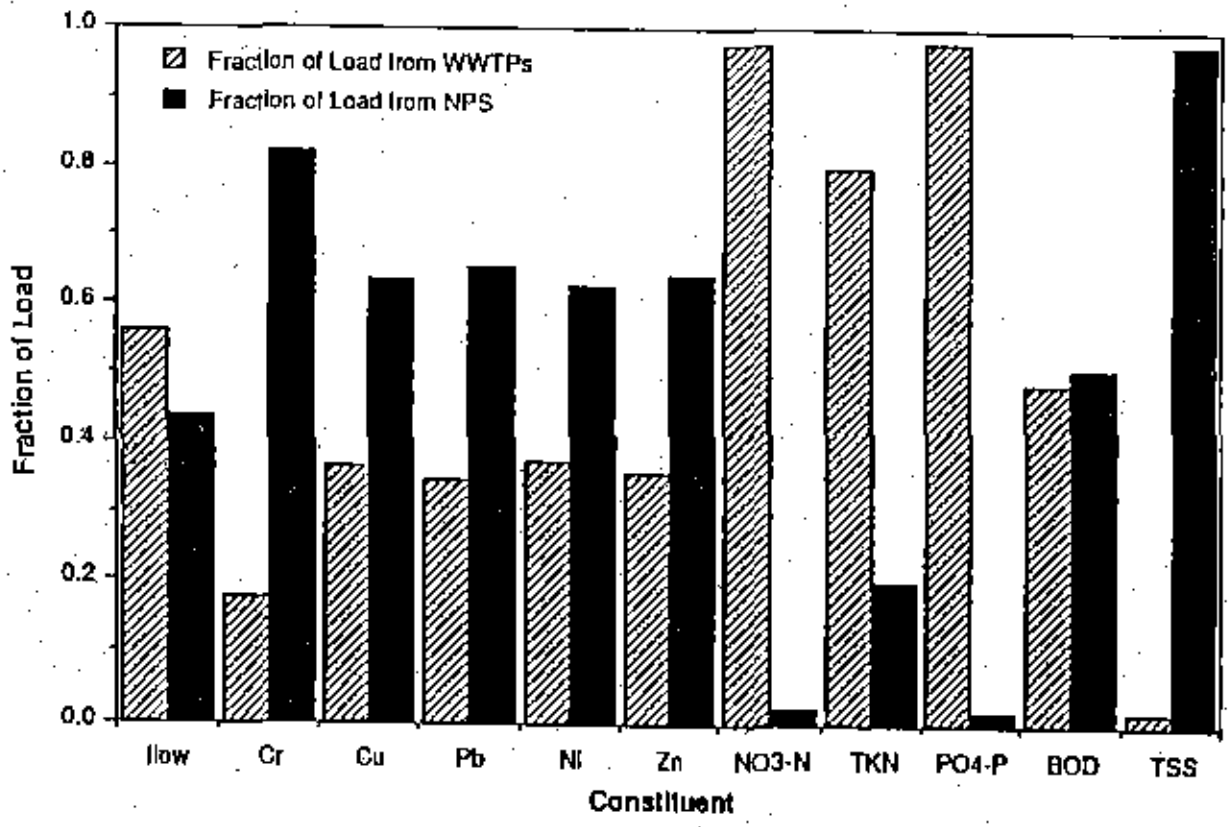
City of Fremont, California



WWTPs = WASTEWATER TREATMENT PLANTS
NPS = NONPOINT SOURCES

SOURCE: SANTA CLARA VALLEY NONPOINT SOURCE STUDY, VOL. 1: LOADS AND ASSESSMENT REPORT. SANTA CLARA VALLEY WATER DISTRICT AND WOODWARD-CLYDE CONSULTANTS, 1990

3. Mitigation Measures

The following mitigation measures shall be implemented in order to reduce identified flooding and water quality related impacts due to the increased runoff potential resulting from Project development.

Proposed Project Drainage Plan

Mitigation 5-2: On-site drainage improvements are required to collect runoff and convey it into Line N-1. All on-site drainage facilities must be designed to handle the runoff associated with the 15-year storm design as determined by the Alameda County Flood Control and Water Conservation District, and all drainage plans and calculations shall be submitted to the District for approval. The development of satisfactory drainage plans and the subsequent completion of the required on-site drainage improvements would reduce the impact to a level of *less than significant*.

Flooding

Mitigation 5-3: The Project applicant shall comply with the following mitigations to address potential on-site flooding impacts.

All structures located within the 100-year flood zone shall be constructed at least one foot above the elevations identified within the 100-year flood hazard zone, as specified by the current FEMA Flood Insurance Rate Map.

or

Project design shall incorporate levees so that the southern portion of the Project site will be removed from the designated flood plain. These levees shall be designed with the approval of the Alameda County Flood Control and Water Conservation District.

Implementation of either of these mitigation alternatives would reduce the impact to a level of *less than significant*.

Erosion

Construction-related erosion and sedimentation impacts within Line N-1 may be mitigated by the implementation of the following measures:

Mitigation 5-4A: Grading occurring on an area greater than five acres requires an erosion control plan. The Project grading plan shall include a City-approved drainage and erosion control plan in order to minimize the impacts from erosion and sedimentation during construction. This plan, at a minimum, shall incorporate: (1) restricting grading to the dry season; (2) protecting downstream storm drainage facilities from sedimentation; and (3) using silt fencing to retain sediment on the Project site.

Mitigation 5-4B: Upon completion of the proposed Project, Line N-1 shall be inspected for accumulated sediments, The Project applicant is responsible for the clearing of accumulated debris and sediment within these channels.

Mitigation 5-4C: The Project applicant shall apply for and obtain an NPDES Grading Permit from the regional Water Quality Control Board through the City of Fremont.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

Sea Level Rise

Mitigation 5-5: The design of the proposed business development shall be made based upon the knowledge that the south San Francisco Bay will likely experience a significant relative sea level rise during the life of the Project. This would reduce the impact to a level of *less than significant.*

Water Quality

The following mitigation measures address the issues associated with urban development.

Mitigation 5-6A: The Project applicant shall apply for and obtain an NPDES Permit. A comprehensive urban runoff control program will be needed to mitigate the non-point source water quality effects of the Project during construction. To achieve this, the Project applicant shall develop specific stormwater management plans for each major sub-area of the Project. At a minimum, the plan(s) shall: (1) identify the specific types and sources of stormwater pollutants; (2) determine the location and nature of potential impact; and (3) specify appropriate control measures to eliminate any potentially significant impacts to receiving water quality from stormwater runoff. Control measures may include "water quality" detention and retention basins, site development restrictions, subsurface disposal, grass-lined drainage ditches, street sweeping and other design or source control management practices, as appropriate, to mitigate potential water quality effects.

Mitigation 5-6B: Water quality control and protection measures during construction shall conform to the City's pollution prevention requirements for construction contracts, which may include the following:

- Performing major vehicle maintenance, repair jobs and equipment washing off-site;
- Maintaining all vehicles and heavy equipment and inspecting frequently for leaks;
- Designating one area of the construction site, well away from any streams or storm drain inlets, for auto and equipment parking and routine vehicle and equipment maintenance;

- Cleaning up spilled dry materials immediately. Do not "wash them away" with water, or bury them;
- Using only minimal water for dust control;
- Cleaning up liquid spills in paved or impermeable surfaces using "dry" cleanup methods (i.e., absorbent materials, cat litter and/or rags);
- Cleaning up spills on dirt areas by removing and properly disposing of contaminated soil;
- Reporting significant spills to the appropriate spill response agencies;
- Storing stockpiled materials, wastes, containers and dumpsters under a temporary roof or secured plastic sheeting;
- Properly storing containers of paints, chemicals, solvents and other hazardous materials in garages or sheds with double containment during rainy periods;
- Placing dumpsters under roofs or covering them with plastic sheeting at the end of each work day and during rainy weather;
- Washing out concrete mixers only in designated wash-out areas where the water will flow into settling ponds or onto stockpiles of aggregate base or sand. Whenever possible, recycling washout by pumping back into mixers for reuse. Never disposing of washout into the street, storm drains, drainage ditches or streams;
- Applying concrete, asphalt and seal coat during dry weather. Keeping contaminants from fresh concrete and asphalt out of the storm drains and creeks by scheduling paving jobs during periods of dry weather, allowing new pavement to cure before stormwater flows across it;
- Covering catch basins and manholes when applying seal coat, slurry seal, fog seal, etc.; and,
- Always parking pavers over drip pans or absorbent materials, since they tend to drip continuously.

Mitigation 5-6C: Impacts to water quality from potential spills of hazardous or toxic materials can be prevented by strict adherence to applicable regulations and guidelines. City of Fremont Ordinance 1946 is one such set of regulations which must be followed by all industries and businesses storing or handling hazardous or toxic materials.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

C. WASTEWATER COLLECTION, TREATMENT AND DISPOSAL

1. Setting

Sewage collection and treatment in the Project area is provided by the Union Sanitary District (USD) which serves the tri-city area of Fremont, Newark, and Union City. The USD service area covers an area of approximately 125 square miles and serves a population of over 286,000. An existing 36- to 39-inch gravity sewer line runs through the Project site along the extension of Boyce Road and Cushing Parkway. **Figure 30** illustrates the existing sewage facilities in the Project area. Transportation through this line is aided by means of the Boyce Road Lift Station northwest of the Project site and the Irvington Pump Station located southeast (downstream) of the Project site.

Sewage treatment is provided by the Alvarado Treatment Plant in Union City. Extensive upgrading of this plant, which was completed in 1988, increased the capacity from 19.5 to 26 million gallons per day (mgd). Currently the plant is operating at capacity, with an average daily flow of 26 mgd. An additional upgrading of the treatment plant to be completed in April 1996 will increase the operating capacity from 26 to 35 mgd (Personal communication with Tom Foley, Alvarado Treatment Plant on January 25, 1996).

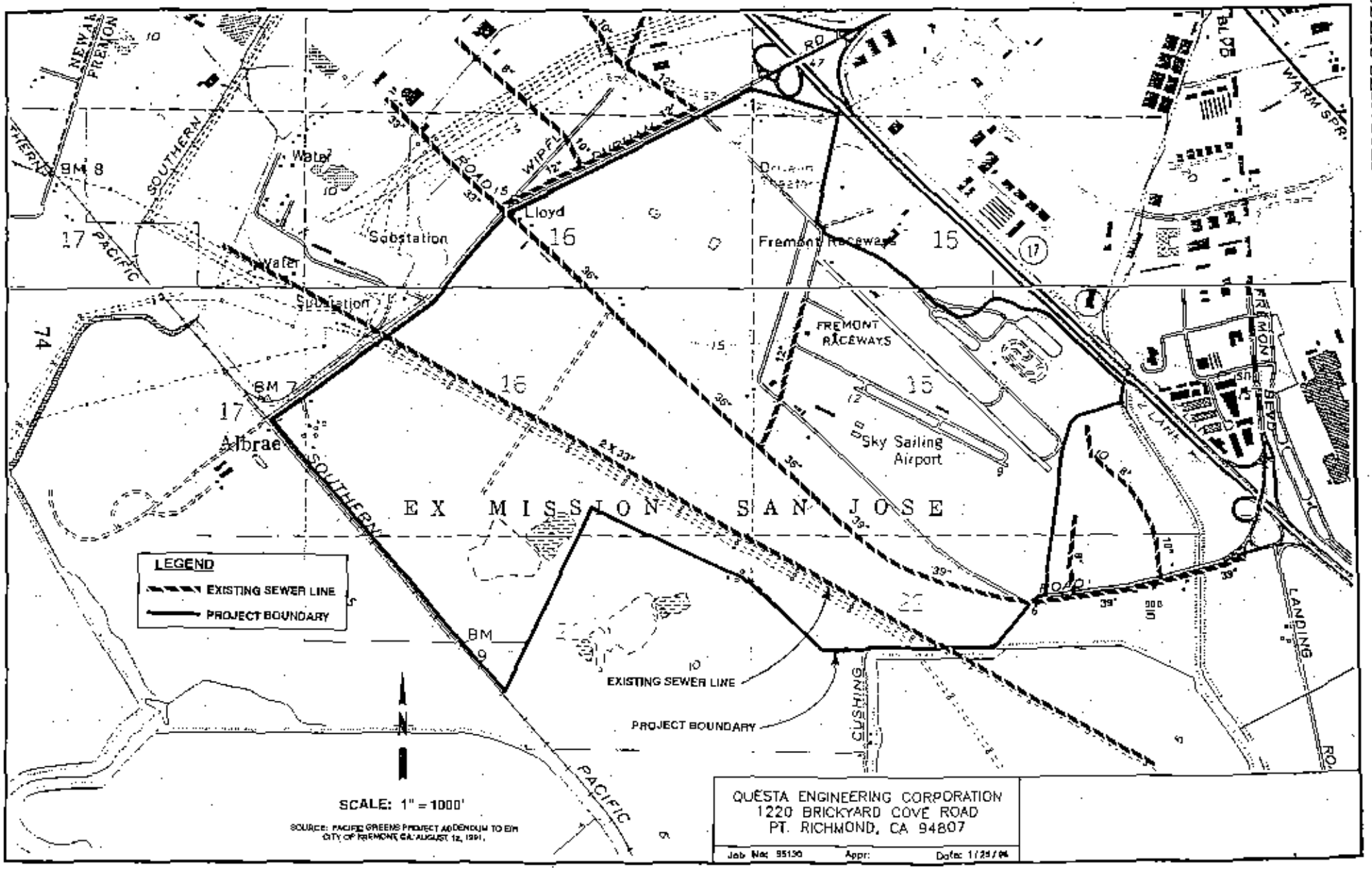
Following chlorination, the secondary treated effluent from this plant enters facilities operated by the East Bay Dischargers Authority (EBDA). At the San Leandro Marina an EDBA dechlorination facility receives treated sewage from seven treatment plants throughout the southern and eastern Alameda County region, including the Union Sanitary District (Personal communication with Chuck Weir, East Bay Dischargers Authority on January 26, 1996). The deep water outfall location is in the San Francisco Bay approximately three miles west of the dechlorination facility.

Until the 1950s, municipalities discharged untreated sewage into the Bay. South of the Dumbarton Bridge, the Bay receives minimal tidal flushing and anaerobic conditions and foul odors were commonplace in the South Bay. This condition has improved due largely to stricter regulations governing discharges. The San Francisco Regional Water Quality Control Board (SFRWQCB) is the issuing agency for waste discharge permits.

<u>Existing Wastewater Capacity Charges</u>

Individual users locating at the Project site will be assessed sewer connection fees by the Union Sanitary District (USD) according to Article III of Ordinance 35. Ordinance Number 35.03 establishes domestic and industrial capacity fees and was adopted by the Board of Directors of the USD on June 27, 1994. The capacity charge of domestic wastewater is based upon the proposed use of the property to be served, the number of proposed units, and the volume of wastewater generated. Industrial wastewater dischargers will be charged a capacity charge in addition to the domestic wastewater capacity charge. The capacity charge of industrial wastewater is based upon the volume of wastewater generated, the chemical oxygen demand loading of the discharge, and the suspended solids loading of the discharge. The USD will be updating these capacity fees in June of 1996 (Personal communication with Kent Steffens, Union Sanitary District on January 28, 1996).

Figure 30
EXISTING SEWAGE FACILITIES IN THE VICINITY OF THE PROJECT SITE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



2. Impacts

Project Site Wastewater Facilities

Individual areas of the Project site will need trunk lines and individual laterals to carry wastewater to the existing main. Most of the proposed wastewater development will flow to the existing 36- to 39-inch gravity sewer main. The USD lift station serving the Project site is the Irvington Pump Station located on Fremont Boulevard between Landing Parkway and West Warren Avenue. The District also operates a force main which passes through the Project site adjacent to the Pacific Gas and Electric transmission lines. This twin 33-inch twin force main would not be utilized by the Project.

Significance Criteria

The significance of the Project's impact on the sewer infrastructure is based upon the ability of the Union Sanitary District (USD) to supply sewer service to the proposed development.

> *Less-Than-Significant*: Impacts to the sewer system will be considered less-than-significant if the USD has adequate existing capacity to provide sewer service to the project development.
>
> *Potentially Significant*: The Project's impacts will be potentially significant if it could exceed the ability of the USD to provide sewer service utilizing the existing or planned improvements, and/or require minor improvements to its overall capacity.
>
> *Significant*: The Project will have significant impacts on the sewer infrastructure if it will result in the inability of the USD to supply sewer service to the Project development area with the existing and future facilities. Significant impacts require the implementation of major improvements to the system's overall capacity.

Increased Sewage Flows Associated with the Project Site

The industrial and commercial development at the Project site will generate increased sewage flows to the local sanitation services provided by the Union Sanitary District. This is a *less-than-significant impact*.

Development of the Project site as proposed is expected to generate sewage at a rate of 1.9 mgd. This anticipated sewage flow is based on land use within the development (see **Figure 31**).

The existing 36- to 39-inch sewer main along the Boyce Road-Cushing Parkway extension is expected to be sufficient to serve the Project site. These facilities were originally sized to accommodate the anticipated sewage flows from industrial/commercial development on the Project site. Upon completion of the expansion to the Alvarado Treatment Plant, USD will have adequate capacity to accommodate the Project's wastewater flow. Review of the Irvington Basin Master Plan states that the USD facilities has or will have adequate capacity to serve the proposed development (Letter from Luis Wong, Union Sanitary District, February 7, 1996).

Figure 31
ESTIMATED PROJECT WASTEWATER FLOWS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Land Use	Area (acres)	Sewage Rate* (gallons/day/acre)	Sewage Flow (gpd)
Research & Development	125.6	2950	370,520
Commercial	78	2950	230,100
Industrial/Research & Development	118.7	2950	350,165
Warehouse/Industrial	50.8	2950	149,860
Warehouse	86	2950	253,700
Fire Station	1	2950	2,950
Automall	40.6	2950	119,770
Campus Research & Development	127.8	2950	377,010
Parks/project Plazas	14.1	950	13,395
Streets	40.6	0	0
Open Space	155	0	0
			1,867,470
	Total 877		
			= 1.87 mgd

* Sewage flow rates include peak factors and infiltration rates.
Source: Union Sanitary District, Irvington Master Basin Plan, 1995.

Union Sanitary District Annexation

Impact 5-7: Portions of the Project site lie beyond the boundaries of the Union Sanitary District Service. This is a *potentially significant impact.*

One portion of the Project site, shown as warehouse, commercial, and recreation/city parks on **Figure 3** on page 9), is currently not a part of the USD (**Figure 32**). In order for the USD to accept sewage from this area, it must be annexed into current district boundaries.

Industrial Wastewater

Impact 5-8: Industrial development at the Project site will result in an increase of wastewater generated through industrial processes. This is a *potentially significant impact.*

The Project applicant's plan for the Project site proposes a development consisting of predominantly industrial land uses. The proposed development could include industries operating with hazardous materials or toxic chemicals in their production processes. Industrial production wastewater can contain toxic chemicals and hazardous material byproducts. These substances are discharged with sewage and are delivered to USD sanitation facilities. This can cause problems at USD treatment facilities because they are not designed to treat contaminated industrial wastewater. Wastewater generated by on-site industries must not exceed the industrial wastewater strength limitations established by the USD.

High Groundwater Levels within the Project Site

Impact 5-9: High groundwater levels at the Project site could cause water to infiltrate into the wastewater discharge system. Inflow and infiltration of groundwater into the sewer lines of the Project site is considered a *potentially significant impact.*

The Project will require the installation of a network of new sewer lines. Because of high groundwater on the Project site, the new sewer lines may be susceptible to the inflow and infiltration of groundwater. Additional water leaking into the sewer lines will increase the sewage flow from the Project site, causing USD to treat a higher flow volume. Increases in wastewater flow due to groundwater seepage could have a negative impact on USD wastewater facilities.

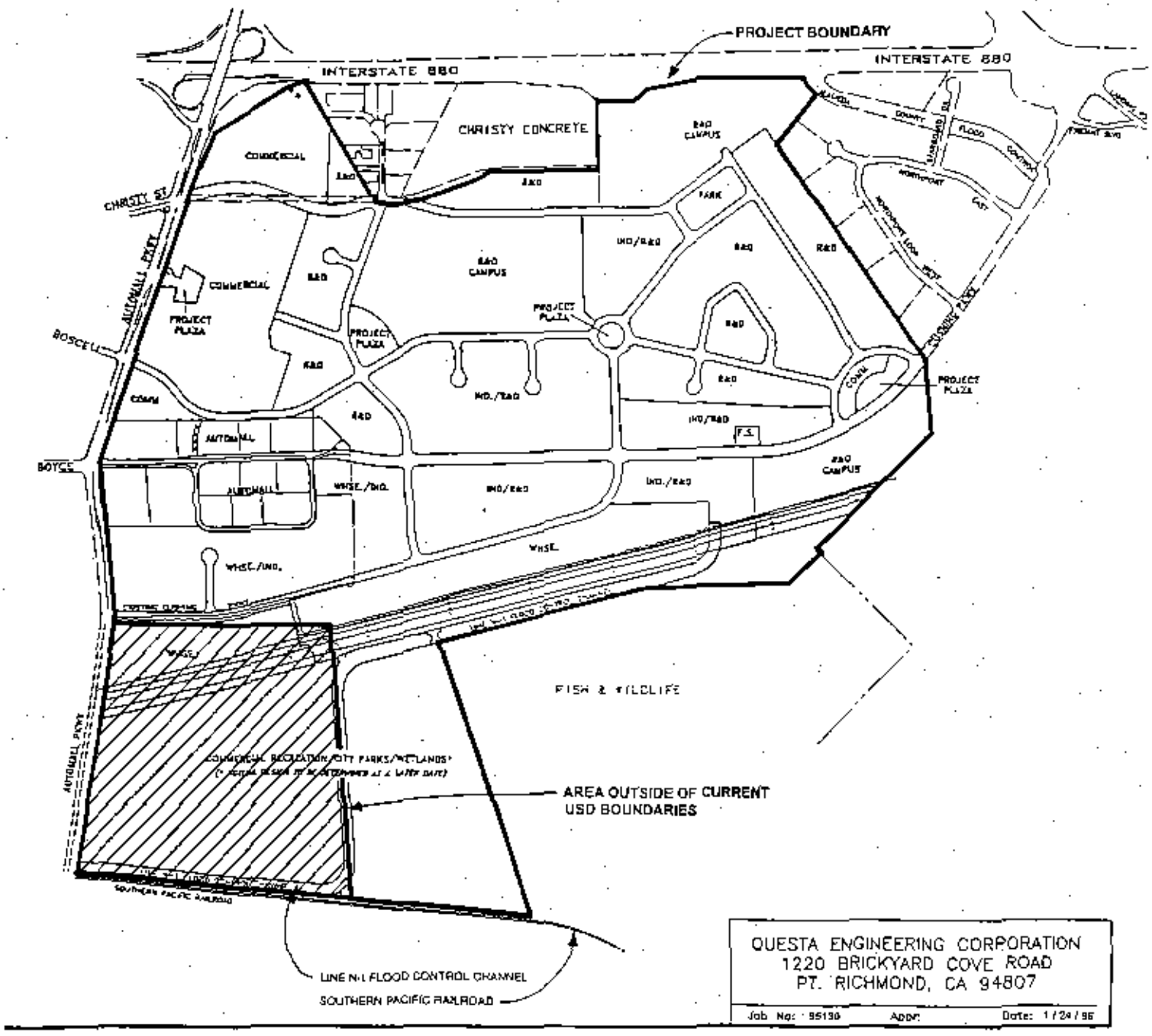
3. Mitigation Measures

Union Sanitary District Annexation

The proposed project will require sewer service extension areas within the site to be annexed in USD boundaries.

Mitigation 5-7A: Annexation will be required for the USD to serve this area. The annexation of the property requires the approval of the Board of Directors. All extensions of service area boundaries may be subject to CEQA review.

Figure 32
PORTIONS OF THE PROJECT SITE OUTSIDE OF CURRENT UNION SANITARY DISTRICT BOUNDARIES
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



Mitigation 5-7B: The area outside the USD service area shown as commercial recreation/city parks in **Figure** 3 (page 9) will also require further study to determine how flows will be conveyed to the USD's facilities. Additional pump stations may be required.

Mitigation 5-7C: Final plans for the sewer system extensions must be reviewed and approved by the USD.

Mitigation 5-7D: Funding for all new wastewater collection facilities needed to serve the Project will be provided by the applicant.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

Industrial Wastewater

Mitigation 5-8: Industries locating at the Project site will be required to comply with the USD Waste Source Control Program and, if necessary, obtain a Waste Discharge Permit from the USD Waste Source Control Division. An Industrial Waste Discharge Permit will be needed by any industries that could be categorized as potential dischargers of either prohibited wastes or toxic pollutants. Industries discharging prohibited or toxic wastes in excess of Federal, State or District standards will be required to pre-treat the waste before discharge to the USD collection system. The pre-treatment costs will be met by each industry. Industries will be required to monitor and test their own waste discharges, with additional periodic sampling being conducted by the USD Waste Source Control Division for verification. Industrial wastewater connection fees and annual charges will be based on the quantity and strength of wastewater to be generated. Implementation of this mitigation measure would reduce the impact to a level of *less than significant.*

High Groundwater Levels within the Project Site

Mitigation 5-9: The Project applicant shall follow appropriate construction guidelines requiring all sewer trunk lines and laterals to minimize the potential of infiltration and inflow of groundwater. Implementation of this mitigation measure would reduce the impact to a level of *less than significant.*

D. WATER SUPPLY

1. Setting

Water service for the City of Fremont and the Project area is provided by the Alameda County Water District (ACWD). The District obtains its water from three sources: (1) the South Bay Aqueduct (State Water Project); (2) the Hetch Hetchy Aqueduct; and, (3) local groundwater basins. In 1995 the average ACWD water supply was 43 million gallons. Approximately 30 percent of the ACWD water supply is supplied by wells: 45 percent comes from the State Water

Project and 25 percent from Hetch Hetchy (Personal communication with Ted Lynch, Alameda County Water District in January and February 1996). The Hetch Hetchy water is purchased from the San Francisco Water Department, and is taken from the Hetch Hetchy aqueduct at several locations within the District. Water from the State Water Project is diverted through Alameda Creek to percolation ponds in the Niles District. This water is used to supplement runoff in re-charging local water supply aquifers.

Two water treatment plants, located in the Mission San Jose District, treat the State Water Project Water. Treatment processes include disinfection, clarification, filtration, pH adjustment and fluoridation. In addition, the well water is blended with Hetch Hetchy and treatment facility water at the Peralta-Tyson Blending Facility in the Niles District. A combination of storage tanks and reservoirs provide a total storage capacity of about 85 million gallons. Most of these storage facilities are scattered around the hills to the east of the Fremont urban area, at elevations of between 200 and 700 feet (Personal communication with Ted Lynch, Alameda County Water District in January and February 1996).

Service areas served by ACWD are divided into four pressure zones, depending on elevation. Because the Project site is located along the bay margin, it is entirely within Zone 1. Alameda Reservoir supplies water to the Project site and is maintained at elevation 210 feet NGVD (Personal communication with Ted Lynch, Alameda County Water District in January and February 1996).

The quality of water supplied by ACWD is generally very good. **Figure 33** provides water quality data for treated water from all three sources. Water available to the Project site would likely be a mixture of South Bay Aqueduct water from the Mission San Jose Water Treatment Plant and Hetch Hetchy water.

The existing water system distribution lines in the immediate Project area are shown on **Figure 34**. Additional water lines in the area are in various stages of planning or construction through Local Improvement District No. 22.

2. Impacts

Significance Criteria

The CEQA guidelines indicate that a substantial depletion of water supply sources will normally be considered a significant adverse impact. For the purposes of this Supplemental EIR, the potential significance of the proposed Project will be defined as:

> *Less-Than-Significant:* Impacts to the water supply will be considered less-than-significant if the Project results in no increase in water consumption or an increase in water consumption that does not exceed ACWD's ability to supply water.
>
> *Potentially Significant*: The Project's impact on water supply will be potentially significant if it would result in an increase in water consumption potentially beyond the ability of ACWD to supply.
>
> *Significant*: The Project will have significant impacts on the water supply if it will result in a water demand that the ACWD is unable to supply.

Figure 33
QUALITY OF FINISHED WATER FOR ALAMEDA COUNTY WATER DISTRICT SOURCES

Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

INORGANIC CHEMICALS

Parameter	Maximum Contaminant Level		State Project Water		San Francisco Water		Groundwater	
	State	Federal	Range	Avg	Range	Avg	Range	Avg
Aluminum	1.0	—	ND-0.10	0.07	0.04-0.07	0.06	ND	ND
Arsenic	0.05	0.05	ND	ND	ND	ND	ND	ND
Asbestos (MFL) [3]	—	7	ND	ND	ND	ND	ND	ND
Barium	1	2	ND-0.10	0.03	ND	ND	ND-0.10	0.10
Cadmium	0.010	0.005	ND	ND	ND	ND	ND	ND
Chromium	0.05	0.1	ND	ND	ND	ND	ND	ND
Fluoride	1.5 [4]	4.0	System-wide Average: 0.91					
Lead	—	0.015 [5]	ND	ND	ND	ND	ND	ND
Mercury	0.002	0.002	ND	ND	ND	ND	ND	ND
Nitrate (NO3)	45	45	3.0-5.0	4.0	2.0	2.0	4.0-7.0	5.0
Selenium	0.01	0.05	ND	ND	ND	ND	ND	ND
Silver	0.05	0.05	ND	ND	ND	ND	ND	ND
Radioactivity								
Measured in picoCuries per liter (pCi/L)								
Gross Alpha	15	—	ND	ND	ND	ND	ND	ND
Gross Beta	50	—	3	3	ND	ND	ND-3	1
Radium (226,228 Combined)	5	—	ND	ND	ND	ND	ND	ND
Strontium-90	8	—	ND	ND	ND	ND	ND	ND
Tritium	20,000	—	ND	ND	ND	ND	ND	ND
Uranium	20	—	0.06	0.06	0.4	0.4	0.3-1.5	0.9

SECONDARY STANDARDS

Parameter	Maximum Contaminant Level		State Project Water		San Francisco Water		Groundwater		Blended Water	
	State	Federal	Range	Avg	Range	Avg	Range	Avg	Range	Avg
Chloride	500	250	59-147	103	2-18	8	103-122	112	62-79	70
Color (units)	15	15	0	0	0	0	0	0	0	0
Copper	1.0	1.3 [5]	ND	ND	ND	ND	ND	ND	ND	ND
Foaming Agents	0.5	0.5	ND	ND	ND	ND	ND	ND	ND	ND
Iron	0.3	0.3	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	0.05	0.05	ND	ND	ND	ND	ND	ND	ND	ND
Odor-Threshold (units)	3	3	0-3	1	0-3	1	0-3	1	0-3	1
Sulfate	500	250	31-92	62	2-15	7	71-77	74	38-56	46
Total Dissolved Solids	1000	500	252-515	391	49-108	66	477-580	530	313-519	395
Zinc (mg/l)	5	5	ND	ND	ND	ND	ND	ND	ND	ND

ADDITIONAL CONSTITUENTS ANALYZED

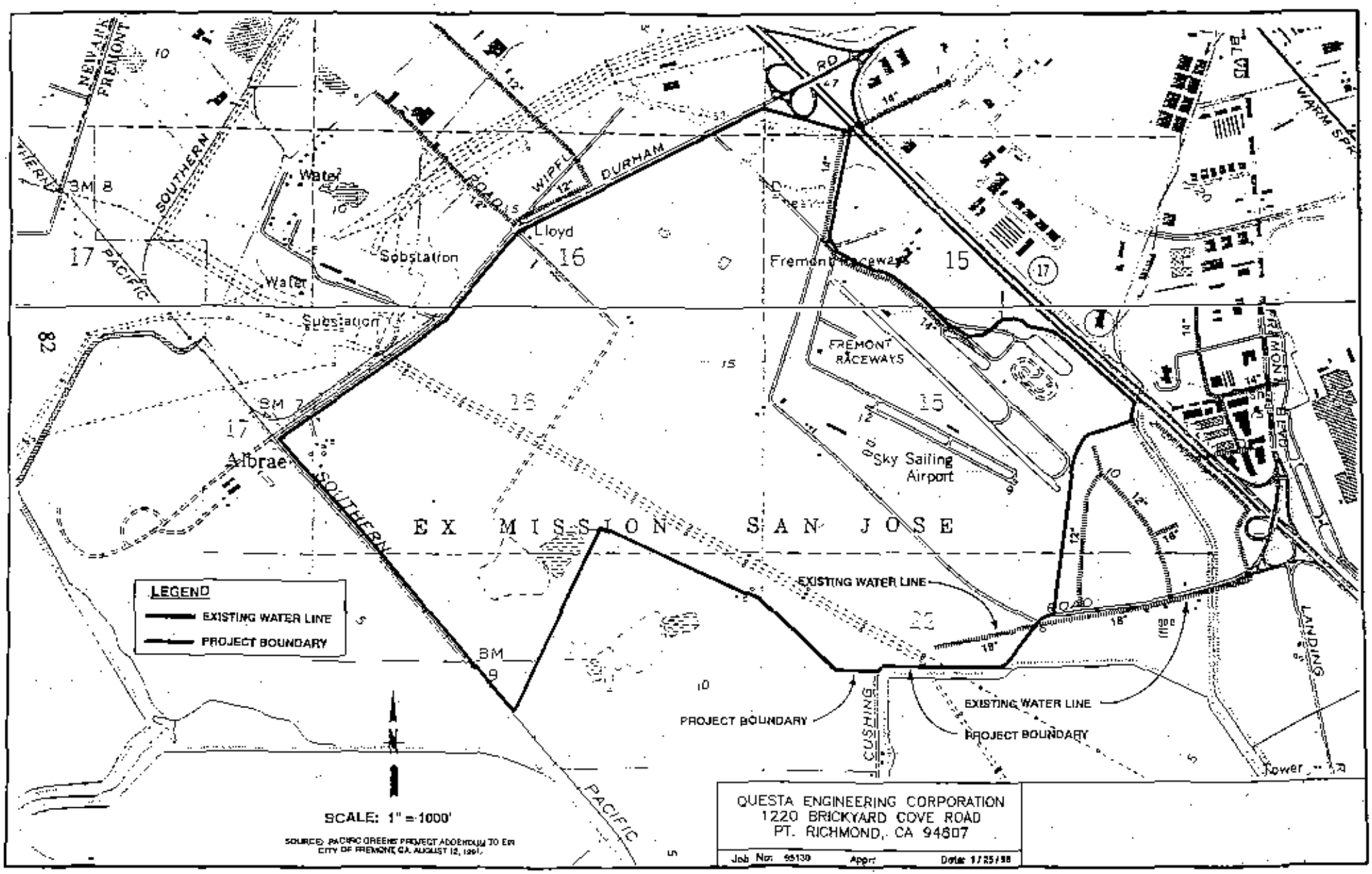
Parameter	Maximum Contaminant Level		State Project Water		San Francisco Water		Groundwater		Blended Water	
	State	Federal	Range	Avg	Range	Avg	Range	Avg	Range	Avg
Calcium	—	—	12-16	14	8-15	12	68-75	72	44-50	47
Hardness	—	—	92-104	98	11-62	34	265-298	292	174-187	182
Magnesium	—	—	8-16	13	3-4	4	28-44	36	15-25	20
pH (units)	—	6.5-8.5	8.1-8.6	8.3	8.8-9.5	9.1	7.6-7.9	7.8	7.7-8.5	8.0
Sodium	—	—	52-79	68	3-14	9	72-74	73	39-60	50

[3] Million fibers per liter
[4] Based on annual average of maximum daily air temperature.
[5] Action Level

In addition to the above constituents, ACWD conducts monitoring for additional organic chemicals for which the California Department of Health Services and/or USEPA have not yet set a standard and all results were below detection levels. Substances in water are measured in milligrams per liter (which is equal to one part per million or ppm), or micrograms per liter (which is equal to one part per billion or ppb). To put these amounts in perspective, one part per million can be compared to one cent in ten thousand dollars, and one ppb to one cent in ten million dollars, or one second in 32 years. All results are shown for samples collected and analyzed in 1994. For additional water quality data, contact Michael Lanier at (510) 659-1970 extension 520

SOURCE: ALAMEDA COUNTY WATER DISTRICT WATERGRAM, 1994 WATER QUALITY REPORT

Figure 34
EXISTING WATER SUPPLY FACILITIES IN THE VICINITY OF THE PROJECT SITE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



The water consumption issues are related not to ACWD's ability to distribute water to the Project area, but to the potential of the proposed development to increase the demand for water within the ACWD water service area.

Increased Water Usage within the Fremont Area

The proposed Project is not expected to have an adverse impact on the current water supply provided by the ACWD. This is a *less-than-significant impact.*

The estimated water needs for the Project are approximately 1.47 mgd. **Figure 35** provides estimated Project water needs based on proposed land uses at the Project site. Based on a factor of 1.8 x nominal use, it is estimated that the maximum daily use for the Project will not exceed 2.65 mgd. Based on available information, the proposed project is not expected to impact the current water supply system. The ACWD states that the Catellus property complies with the California Public Resources Code 21151.9 (Senate Bill 901), and is in the Water Demand Investigation and Forecast prepared by ACWD in July 1993 (Personal communication with Leasa Cleland, Alameda County Water District on February 6, 1996). A letter from ACWD confirming water supply for the Project is included as Appendix B.

Proposed Project Water Supply Network

Impact 5-10: The proposed Project does not contain adequate plans for the water supply infrastructure. This is considered a *potentially significant impact.*

Although the available water supply system is expected to be adequate to serve the Project site, service extensions within the Project site will be necessary. Development of the Project site will require further transmission and distribution lines to serve the various users. Fire protection flow requirements for the Project site are expected to be satisfied by existing and planned water mains. The ACWD has sized the existing water mains in the immediate Project area for industrial development which typically require higher flows than the proposed mixed land use.

The quality of the existing water supply and water pressure is expected to be adequate for all needs.

Long-Term Water Supply

Impact 5-11: The ACWD currently has the capability to meet Project water demands. However, these demands represent a net increase in water consumption. This is considered a *potentially significant impact.*

The proposed Project consists of primarily commercial and industrial development. Industrial and commercial land uses are defined as large water users. Given the uncertainties of the long-term water supply associated with possible droughts, increasing population and wildlife requirements, the increased water consumption of the proposed development represents a net increase in overall water consumption. The proposed development does not contain provisions or guidelines to reduce and conserve the amount of water that will be used within the Project area.

Figure 35
ESTIMATED PROJECT WATER NEEDS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Land Use	Total Area (acres)	Building Area (acres)	Water Flow (gpd)
Research & Development	125.6	37.7	296,000
Commercial	78	19.5	220,000
Industrial/Research & Development	118.7	35.6	280,000
Warehouse/Industrial	50.8	20.3	108,000
Warehouse	86	34.4	180,000
Fire Station	1	1.0	2,800
Automall	40.6	5.1	60,000
Campus Research & Development	127.8	38.3	301,000
Streets	40.6	0.0	0
Parks/Project Plazas	14.1	14.1	17,625
Open Space	155	0.0	0
Total 877			**1,465,425** **= 1.47 mgd**

NOTES
1. Water flow for Parks/Project Plazas is based upon a 1,250 gallons/day/acre value obtained from the Duncan and Jones, Draft EIR, Pacific Greens Project Catellus Development Corporation, 1987.
2. The water flow calculations are derived by the Alameda County Water District, Water Demand Investigation and Forecast, July 1993.
3. The building area acreages are based upon floor area ratios related to type of land use as determined by Duncan and Jones, January 1996.

3. Mitigation Measures

The following mitigation measures can be implemented in order to reduce identified water supply related impacts due to the increased water consumption demand of the development Project.

Proposed Project Water Supply Network

Mitigation 5-10A: Any industries requiring improved quality or higher pressure will have to take appropriate measures such as filters or booster pumps.

Mitigation 5-10B: The Project applicant shall provide the funding for all extensions to the water distribution system within the Project site.

Mitigation 5-10C: Final plans for the water distribution system must be approved by the ACWD and the City of Fremont Fire Department.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

Long-Term Water Supply

To efficiently use and/or reduce the amount of water that is consumed at the Project site, the following mitigations should be completed:

Mitigation 5-11A: The Project developer shall promote water conservation among the Project occupants. This could entail promoting the use of reclaimed wastewater or on-site recycling in occupant production processes.

Mitigation 5-11B: All commercial landscape areas at the Project site shall use drought tolerant plantings.

Mitigation 5-11C: Future industrial and commercial businesses at the Project site shall be required to institute water conservation measures. These measures may include the installation of low flow pumping fixtures, and industrial water conservation devices such as low flow dishwashers and other appliances.

Mitigation 5-11D: The possibility of using reclaimed wastewater for park turf grass irrigation shall be investigated.

Taken together, these mitigation measures would reduce the impact to a level of *less than significant.*

E. SOLID WASTE DISPOSAL

1. Setting

The City of Fremont has a contract with Browning-Ferris Industries (BFI) for the collection of solid waste within the Fremont city limits. Under the terms of this agreement, BFI collects garbage, recyclable materials and yard waste from single-family residential units, garbage and recyclable materials from multiple-family residential units, and garbage from non-residential facilities. A number of vendors compete for the opportunity to collect recyclable materials and yard waste from non-residential facilities in Fremont (Telephone conversation with Larry Adams, Administrative Analyst, Environmental Services-Integrated Waste Management, City of Fremont on December 13, 1995). BFI takes recyclable materials to the firm's recycling facility on Dixon Landing Road in Milpitas, while garbage is taken to the Tri-Cities Landfill at the western end of Auto Mall Parkway in Fremont (Telephone conversation with Shawna Holmes, Customer Services Manager, Browning-Ferris Industries on December 13, 1995).

The Tri-Cities Landfill has an estimated remaining lifespan of four to six years, depending on the success of recycling efforts in reducing the volume of materials to be landfilled. Following the eventual closure of the landfill, a materials recovery and transfer station may be developed (either on the site of the existing landfill or elsewhere), with residual materials being trucked to Altamont or other landfill facilities with available capacity (Telephone conversation with Rick King, Site Engineer, Tri-Cities Waste Management on December 13, 1995).

2. Impacts

Development of the Project site as proposed would result in the generation of an increased volume of solid waste. Solid waste collection services are expected to expand as necessary to keep pace with growth in the Fremont area, and BFI would have no difficulty in serving the proposed Project (Telephone conversation with Shawna Holmes, Customer Service Manager, Browning-Ferris Industries on December 13, 1995). A number of vendors would be expected to compete for the opportunity to collect recyclable materials in the waste stream generated at the Project site (including paper, cardboard, aluminum, glass and plastics), while garbage would be taken to the Tri-Cities Landfill for disposal until that facility is eventually closed. Since this landfill currently serves the City of Fremont as well as Union City and Newark, waste generated by the proposed Project would be expected to have only a minimal impact on the rate of fill.

3. Mitigation Measures

No mitigation measures appear to be necessary.

F. FIRE PROTECTION SERVICES

1. Setting

Fire protection services in the vicinity of the Project site are provided by the City of Fremont Fire Department. It is the City's policy to maintain the capability to respond to 95 percent of all emergency calls within five minutes of notification. The Fremont Fire Department currently has

160 uniformed firefighters, including 18 trained hazardous materials technicians. In the event of an incident involving hazardous materials, these technicians would be on duty at Station #1 on Mowry Avenue (Telephone conversation with Penny Starr, Business Manager, Fremont Fire Department on January 3, 1996).

Fire Station #7, located at South Grimmer Boulevard and Auto Mall Parkway, is the closest station to the northern portion of the Project site, and is currently equipped with one fire engine and one fire truck. A minimum of six firefighters are on duty at this station on a 24-hour basis, and response time from this station to the Project site has been estimated to be in excess of five minutes, given the worsening traffic conditions in the area. The secondary response station in the event of a fire at the northern portion of the Project site would be Station #3, located at 40700 Chapel Way (off Fremont Boulevard). In the event of a fire at the southern portion of the Project site, the first firefighters to respond would be expected to come from Station #5, located at Warm Springs Boulevard and Hackamore Lane, which has one fire engine and three firefighters on duty on a 24-hour basis. The response time to the Project site from this fire station is estimated to be in excess of five minutes, given the current traffic conditions. The secondary response station in the event of a fire at the southern portion of the Project site would be Station #4, located at Pine Street and Paseo Padre Parkway. These response patterns should be regarded as those generally to be expected in the absence of concurrent fire calls in other portions of the city, in which case units responding to a fire call at the Project site would be dispatched from those fire stations which would be in the best position to respond (Telephone conversation with Penny Starr, Business Manager, Fremont Fire Department on January 3, 1996).

2. Impacts

Impact 5-12: The proposed Project would have a significant impact on fire protection services by substantially increasing the need for these services in the area west of I-880. The increased demand for fire protection represents a *significant impact* associated with Project development.

The Planned District Development Conceptual Plan (see **Figure 3** on page 9) includes a one-acre site for a future fire station. Commercial and industrial development at the Project site could take place before the proposed fire station becomes operational, although such development would probably be beyond the five-minute emergency response times of existing fire stations while the new fire station is under construction. A staff of 12 would be required to man a three-person engine company on a 24-hour basis at the Project site. As indicated in the discussion of signalization in Chapter IV, the Fremont Fire Department may require some degree of control over traffic signals in the vicinity of the proposed fire station in order to ensure prompt response times. A network of fire hydrants would have to be established throughout the Project site with the proposed development, with hydrants generally spaced at 300-foot intervals in all developed areas (although hydrant spacing may need to be adjusted as required by the Fremont Fire Department). Fire hydrants are currently in place to serve existing uses along Brandin Court and the Northport Loop near the Project site. The final location and placement of *individual* fire hydrants at the Project site would be determined at the Plan Check stage of the proposed development.

3. Mitigation Measures

The Fremont Fire Department has indicated that a new fire station and engine company would be required to serve the Project and adjacent areas. The Project developer would be expected to contribute toward site acquisition, construction and equipment of the new station.

Mitigation 5-12A: A one-acre site for a fire station at the Project site has been designated by the Project applicant, and the proposed Development Agreement proposes to locate a fire station on this site as early as practicable in the development schedule.

Mitigation 5-12B: The Project applicant shall comply with fire impact fees in effect at the time such fees are levied.

Mitigation 5-12C: Development at the Project site shall comply with all standard City requirements for fire protection and suppression (e.g. Fire Department review of precise development plans; hydrant, fire flow, water pressure and sprinkler requirements).

These measures would reduce the identified impact to a level of *less than significant*.

G. POLICE PROTECTION SERVICES

1. Setting

The Project site is currently located within Fremont Police Sector 6, although the boundaries of the existing police sectors are being reorganized, and new sector boundaries are expected to be in force early in 1996. The Fremont Police Department currently has 190 sworn officers. The response goal for Priority 1 emergency calls is within five minutes of notification, while non-emergency responses related to major crimes (not in progress) generally get a response within 20 minutes (Telephone conversation with Joni Pattillo, Administrative Analyst, Fremont Police Department on December 14, 1995).

2. Impacts

Impact 5-13: The Project would result in a significant increase in demand for police services in the vicinity of the Project site. This would represent a *significant impact* associated with Project development.

3. Mitigation Measures

Police Department services are paid for out of the City of Fremont's General Fund, to which sales tax and other revenue from the proposed Project would contribute.

Mitigation 5-13A: Development plans for any portion of the Project site shall be reviewed by the Crime Prevention Division of the Police Department.

Mitigation 5-13B: Operators of commercial facilities at the Project site should be encouraged to supplement Police Department services by providing private security guards and crime prevention equipment.

These measures would reduce the identified impact to a level of *less than significant*.

H. EMERGENCY MEDICAL SERVICES

1. Setting

Currently, all fire stations in the City of Fremont provide paramedic services. Staff levels are maintained at one or two paramedics per engine company on a 24-hour basis. The City's standard for paramedic response time is the same as the standard for fire protection services (a five-minute response to 95 percent of calls received in any area of the City (Telephone conversation with Penny Starr, Business Manager, Fremont Fire Department on January 3, 1996).

Emergency medical services for the City of Fremont are currently provided by Washington Hospital (2000 Mowry Avenue), and, on a walk-in basis, at the Readi-Care Center (43490 Grimmer Boulevard). Ambulance services in Fremont are provided by American Medical Response West.

2. Impacts

Impact 5-14: Although the proposed development of the Project site would require less in the way of emergency medical services than the currently approved development plans for the area, it would still have a significant impact on emergency medical services by substantially increasing the need for these services in the area west of I-880. The increased demand for emergency medical services represents a *significant impact* associated with Project development.

Development of the Project site as proposed would result in a significant increase in the amount of industrial and retail activity in the vicinity of the Project site, with a corresponding increase in the number of emergency medical calls to the Fremont Fire Department (emergency medical calls represent approximately 60 percent of all emergency calls to the Fire Department). The increased traffic associated with the proposed development of the Project site would also increase the demand for emergency medical services. As noted in the Fire Protection Services section of this EIR (Chapter V [F]), the proposed Project would necessitate construction of a new fire station west of the Nimitz Freeway. Until the new fire station is fully operational (tentatively scheduled for July 1, 1997), commercial and industrial activity at the Project site would probably be beyond the five-minute emergency response times of existing fire stations.

V. PUBLIC SERVICES AND FACILITIES

3. Mitigation Measures

Mitigation 5-14: A one-acre site for a fire station at the Project site has been designated by the Project applicant. At least one paramedic would be assigned to the engine company at this station on a 24-hour basis, and firefighters and paramedics would generally be able to respond to respond to medical emergencies at the Project site within five minutes or less. This would reduce the identified impact to a level of *less than significant.*

I. SCHOOLS AND DAY CARE

1. Setting

The Fremont Unified School District currently levies a school impact fee of $0.26 per square foot of non-residential floor space, which is payable when the permits for construction are pulled. This fee may be used for land acquisition and the actual construction of new schools.

In general, child care for infants and preschool-age children in Fremont is provided through private centers and homes. Day-care services for school-age children, including playground supervision and arts and recreational classes, are provided primarily by the YMCA and Community Services Department.

2. Impacts

The proposed Project includes no residential component, so no students would be coming from any housing units at the Project site. The Project developers would be expected to pay any and all school impact fees associated with non-residential development in effect at the time such fees are levied.

The proposed Project would increase the demand for on-site child care, but this would probably not be considered a significant environmental impact.

3. Mitigation Measures

Beyond full payment of the appropriate school impact fee, no mitigation measures are necessary. The Project developers and the City of Fremont could consider accommodating child care at the Project site if there is adequate demand by industrial/commercial establishments there.

J. PARKS AND RECREATION

1. Setting

The City currently maintains a total of approximately 1,021 acres of land within its park system, including 11 citywide parks, 8 historic parks, 19 neighborhood parks, and 12 mini parks. Although the Project site once had a glider port and a drag strip, today there are no active recreational facilities in the vicinity of the Project site west of I-880. The nearest parks are Rix Park, Marshall Park and Irvington Park, all located at least two miles away, east of I-880.

2. Impacts

The Planned District Development Conceptual Plan for the proposed Project (MacKay & Somps, March 29, 1996) includes a total of 155 acres of land for community recreation facilities, parks and wetlands. **As there is no standard in the Fremont General Plan which formally links the provision of parkland to non-residential development, there would be no significant Project-related environmental impact associated with the provision of parks and recreational facilities.**

3. Mitigation Measures

No mitigation measures are necessary.

K. PUBLIC UTILITIES AND ENERGY CONSERVATION

1. Setting

The Pacific Gas and Electric Company (PG&E) currently provides electricity and gas in the vicinity of the Project site. Existing electric power distribution lines are located along Christy Street, and extend into the Project site as far as the location of the former Baylands Raceway Park. The nearest gas lines are located on Brandin Court, immediately adjacent to the eastern boundary of the Project site. PG&E offers a number of financial incentives to its industrial and commercial customers to promote energy conservation, including rebates for use of thermal energy storage systems, process management (i.e. shifting electrical load to non-peak hours), and advanced gas and electric technologies.

Pacific Bell telephone lines have been installed in the vicinity of the Project site.

2. Impacts

The proposed Project would result in increased demand for gas, electricity, and telephone services. The costs of providing these service facilities and improvements would be absorbed by PG&E, Pacific Bell, and the Project developers. PG&E would be responsible for making all off-site improvements required to provide gas and electrical service for the proposed Project, while the Project developers would be responsible for providing a joint utility trench on the Project site. Pacific Bell would make any needed improvements to off-site telephone lines, the Project developers would be responsible for providing trenches for underground cables on-site, and Pacific Bell would then make the necessary installations both in the trenches and above ground.

3. Mitigation Measures

Although no mitigation measures appear to be necessary, in the interest of conservation operators of commercial and industrial facilities at the Project site should be encouraged to participate in any appropriate PG&E energy conservation programs.

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VI. OTHER CONSIDERATIONS

A. HAZARDOUS/TOXIC MATERIALS

1. Setting

Previous Reports and Investigations

Hazardous materials and hazardous waste issues were identified and discussed in detail as a component of a previous EIR on the earlier proposed Master Plan/General Plan Amendment on the subject property. Since submittal and certification of the Final EIR (Ref. 19) in January 1988, additional environmental studies and remediation efforts have been completed on the Project site and surrounding areas. These include a Phase I evaluation by Earth Systems Environmental, Incorporated (ESS) and Blaine Technical Services (BTS) in May 1989 (Ref. 24), and detailed Phase II and Phase III Hazardous Waste Site Characterization studies by McLaren/Hart Engineers in December 1989 and March 1990, which involved intensive sampling and clean-up procedures. Additional investigations were conducted by McLaren/Hart on the Project site in response to comments by the Alameda County Water District and the Regional Water Quality Control Board on the technical reports submitted by ESS and McLaren/Hart. These reports describe in detail the results of an extensive soil, soil-vapor, and groundwater sampling and laboratory analysis program for various portions of the Project site. The results of these investigations are summarized below, although the reader is encouraged to refer to the original technical reports by McLaren/Hart and ESS on file with the City of Fremont Planning Department, the Alameda County Health Department and the San Francisco Bay Regional Water Quality Control Board for further information.

During the July 1989 site visit by BTS, the Project site was being vacated in preparation for the proposed development. The remaining occupants of the Project site were in the process of leaving and initiating the removal of hazardous materials and stored hazardous wastes. Subsequent to vacating the premises and completion of site cleanup efforts by the tenants, the property owner and Project proponent contracted for additional site demolition and surface cleanup activities.

To assess what potentially hazardous materials remained on the Project site, McLaren/Hart staff revisited the site with ESS on November 29 and December 3, 1990. According to their site investigations, during the revisit the site was checked for the presence of hazardous materials noted as present in the ESS report of July 1989. McLaren/Hart concluded that most of the hazardous materials noted in the 1989 ESS report (and in the January 1988 EIR) appeared to have been removed. Areas of stained soils and spills noted in previous work areas have also been investigated by McLaren/Hart in Phase II and III investigations, which included soil sampling and laboratory analysis.

Historic On-Site Sources of Hazardous Materials

The January 1988 EIR, the 1989 Preliminary Environmental Site Assessment conducted by ESS and the July 1989 site inspection by BTS reported five locations within the Project site which pose the potential to expose future occupants to hazardous materials. These areas of concern are: (1) Bailey Farm; (2) Sky Sailing Airport; (3) Shell/Southern Pacific Pipeline; (4) PG&E

transmission lines; and (5) Baylands Raceway Park. Small quantities of hazardous materials were stored on the Bailey Farm site, the Sky Sailing Airport and Baylands Raceway Park (see **Figure 36**). Hazardous materials that were identified included: 55-gallon drums of waste oil and lubricants; acetylene and propane tanks; paints; gasoline storage tanks (both above ground and underground); and containers (sizes unidentified) of industrial solvents and chemicals (xylenes, methanol, acetone).

Bailey Farm

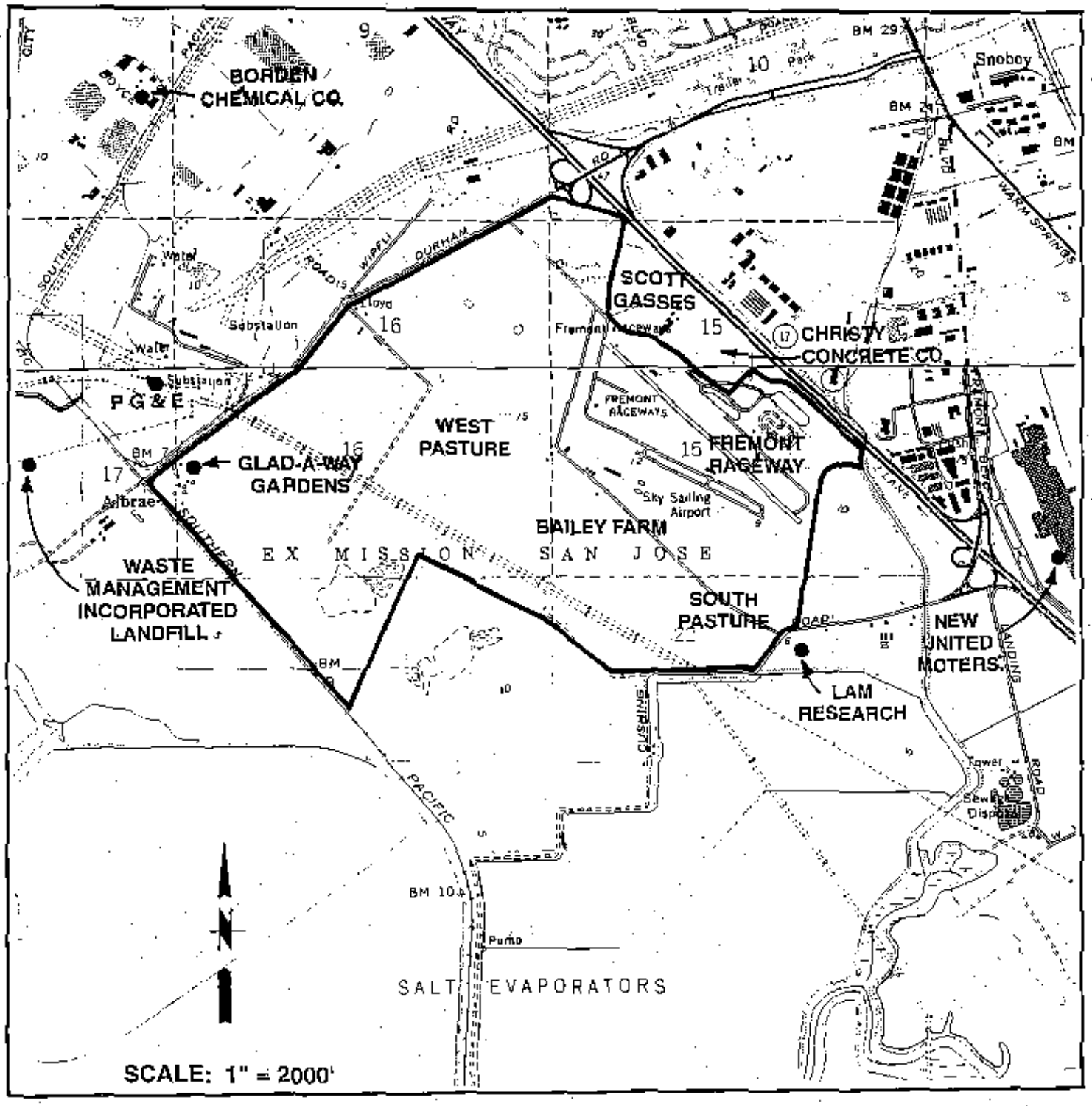
The December 1989 Phase II Site Characterization competed by McLaren Hart reported "low levels of pesticides (less than State hazardous waste levels)" in several soil samples, as well as detectable levels of volatile organic compounds (in soil vapor samples) in the Bailey Farm pastures. Low levels of pesticides (less than State hazardous waste levels) were detected in a few of the soil samples analyzed. The pesticides DDE and DDT were detected in the southern portions of the west and south pasture areas of the site (see **Figure 36**), where the Baileys attempted to grow alfalfa in the 1960s. DDE and DDT are very persistent pesticides which were banned by the end of the 1960s and may have been used during this time period. The California Code of regulations Title 22 states that the total threshold unit of concentration for DDE and DDT is 1 part per million (PPM).

The sampling plan and analytic methods utilized by McLaren/Hart may not have been adequate to characterize with a high degree of certainty the presence or absence of these persistent pesticides and/or other pesticide compounds in the previously farmed area. Originally, McLaren/Hart used incomplete pesticide screenings and did not sample frequently enough. Further sampling and analytical work has been conducted by McLaren/Hart according to the 1991 Addendum to the EIR (Ref. 14), and for the purposes of this Supplemental EIR it appears that no serious pesticide contamination problems exist. However, if serious problems are found to occur, then the Project sponsor will be required to clean up the Project site prior to development under the direction of state and local agencies.

Sky Sailing Airport

Serious soil and groundwater contamination by aviation fuels was identified in the Sky Sailing Airport area in the Phase II and Phase III investigations by McLaren/Hart. Further investigations were conducted by McLaren.Hart to identify the full scope and magnitude of the contamination problems and to plan site remediation activities (Ref. 28). After McLaren/Hart and the Alameda County Water District (ACWD) completed extensive investigations and cleanup of hydrocarbon pollution originating from the two underground storage tanks at the airport, the ACWD recommended that the case be closed and the California Regional Water Quality Control Board (RWQCB) concurred (Letter from RWQCB, March 10, 1993). On June 22, 1994, five monitoring wells located near the 5,000 gallon aviation fuel tank at the Project site were drilled out and abandoned in accordance with ACWD standards (Ref. 28).

Figure 36
AREAS CONTAINING HAZARDOUS MATERIALS IN THE VICINITY OF THE PROJECT SITE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



VI. OTHER CONSIDERATIONS

Shell/Southern Pacific Pipeline

An abandoned 8-inch high pressure petroleum pipeline traverses the southern portion of the Bailey Farm, from Boyce Road to Cushing Parkway. Use of the pipeline, which was operated by Southern Pacific Pipelines, Incorporated (SPPL) and owned by Shell Oil Company, was discontinued and it was abandoned prior to 1988 by SPPL, which rerouted transmission of their products via another pipeline located off-site (Personal communications with Jim Baker, Southern Pacific Pipelines, Incorporated on January 26, 1996). The abandoned pipeline carried refined petroleum products from the Oakland airport area south to San Jose. Field investigations conducted by McLaren/Hart along the pipeline right-of-way did not indicate any serious environmental contamination from leakage of petroleum products.

PG&E High-Voltage Transmission Lines

PG&E also has a right-of-way easement across the southern portion of the Project site for the operation and maintenance of its 250-kV overhead transmission lines. Concerns have been expressed by several researchers and certain segments of the public over possible health effects from continuous or long-term exposure to high energy electromagnetic radiation along similar lines in other areas. A link between exposure to electromagnetic fields and adverse health effects has been investigated, but data and statistical correlations are weak. Although the studies are controversial, establishment of setbacks/buffer zones between high voltage transmission lines and habitable structures are common and prudent precautions (California State Department of Education, 1989).

The City of Fremont and the County of Alameda have no requirements for buffer zones or setbacks from high voltage transmission lines. The City generally recognizes the existing easement width when determining the distance between transmission lines and proposed structures (Personal communications with Roger Shanks, Planning Department, City of Fremont, June 11, 1991)

Baylands Raceway Park

Small quantities of hazardous materials were stored at Baylands Raceway Park before it was completely vacated. When McLaren/Hart revisited the site in 1990, they found that all hazardous materials had been removed from the drag strip. Subsequent investigations also determined that there were no residual hazardous materials left on this portion of the Project site.

Off-Site Sources of Hazardous Materials

There are numerous off-site sources of hazardous materials which could affect the Project site. Generally, the Project site is bounded on three sides by businesses that handle and store hazardous materials.

Directly north of the Project site, across Auto Mall Parkway, are several industrial developments, including a trucking company, and PG&E network substation, a heavy equipment rental yard, an industrial park and the Tri-Cities Landfill, which occupies about 180 acres. To the northwest of the substation is a large undeveloped area, part of which is used as pasture for cattle. Several other businesses line Boyce Road (which runs northwest from the Project site), some of which

have fuel registers on-site and/or hazardous materials placards on their entrance gates. To the north beyond this initial band of development and open lots there are several larger facilities which include the Borden Chemical Company, a Fleming Foods distribution center, a large warehouse facility, and a recently-completed light industrial park occupied by technical assembly firms (see **Figure 36**). Many of these businesses use and store hazardous materials, and a few have documented underground fuel tank leaks, as described below.

The Project site is bounded on the northeast by the Christy Concrete manufacturing plant, I-880 and an industrial park which includes Scott Specialty Gases. The area beyond I-880 to the northeast consists primarily of commercial buildings and warehouses. To the east is the New United Motors Manufacturing, Incorporated (NUMMI) plant.

A recently-constructed industrial park which includes Lam Research is located directly southeast of the Project site (see **Figure 36**). The primary pollutant of concern at the Lam Research facility (as determined by the Risk Management and Prevention Program of the California State Health and Safety Code) is freon. It is unclear whether the facility is a small or large generator of freon, and there is no mention made of any significant violations due to the release of freon at this facility. Beyond this industrial park to the southeast is a large tract of vacant land which has been zoned industrial. The former Union Sanitary District sewage treatment plant is located about one mile to the southeast of the Project site.

Nearby Hazardous Substance Release Sites

Fourteen sites listed on Federal and State environmental databases as having had confirmed releases of hazardous materials are located within the general vicinity of the Project site. The following list has been compiled from information contained in the ESS Phase I Report of May 1989 (Ref. 24), the previous Addendum to the EIR (Ref. 14), information obtained from the San Francisco Bay Regional Water Quality Control Board and the California Department of Health Services, and a computerized data base search conducted for the Project applicant by Environmental Audit, Inc. in April, 1989.

1. Melrose Metals, 44533 Grimmer Boulevard
   (0.25 mile east of Project site)
   Underground Storage Tank (UST) Fuel Leak, Soil and Groundwater.

2. Pacific Lumber, 43962 Fremont Boulevard
   (0.75 mile east of Project site)
   UST Leak, Soil Only.

3. Texaco Service Station, 43600 Fremont Boulevard
   (0.75 mile east of Project site)
   UST Leak, Soil and Groundwater.

4. Unocal Service Station, 43411 Grimmer Boulevard
   (0.25 mile north of Project site)
   UST Leak, Soil and Groundwater.

5. Seven-Eleven Store, 3868 Delaware Street
(1.0 mile north of Project site)
UST Leak Groundwater.

6. Dirty Dunbar Service Station, 44770 Fremont Boulevard
(0.5 mile east of Project site)
UST Leak, Soil and Groundwater.

7. CBI Services, 41777 Boyce Road
(0.5 mile north of Project site)
UST Leak, Soil and Groundwater.

8. Fremont Unified School District Corporation Yard, 43770 Grimmer Boulevard
(0.25 mile northeast of Project site)
UST Leak, Soil and Groundwater.

9. Fleming Foods, 5900 Stewart Avenue
(0.25 mile north of Project site)
UST Leak, Soil and Groundwater.

10. Borden Chemical Company, 41000 Boyce Road
(0.75 mile north of Project site)
UST Leak, Acetone and Hexane, Soil and Groundwater.

11. ARCO Service Station, 43500 Grimmer Boulevard
(0.5 mile north of Project site)
UST Leak, Soil.

12. Econo Line Express, 42600 Boyce Road
(0.25 mile north of Project site)
UST Leak, Soil.

13. California Life Tile, 45111 Industrial Drive
(0.25 mile east of Project site)
UST Leak, Soil and Groundwater.

14. Christy Concrete Company, Brandin Court
(0.1 mile east of Project site)
Suspected UST Leak, Minor Surface Soil Contamination.

The significant sites nearby which use and store hazardous materials, or which have had reported spills or unauthorized releases include: (1) Scott Specialty Gases; (2) New United Motors Manufacturing Incorporated (NUMMI); (3) Tri-Cities Landfill; (4) Glad-a-Way Gardens; and (5) Borden Chemical Company. The activities and histories at each of these companies was addressed in the 1991 Addendum to the EIR (Ref. 14).

New Hazardous Materials Legislation

Two relatively new laws controlling hazardous materials use and storage have recently been passed that may affect some of the industrial facilities in the vicinity of the Project site: (1) the Risk management and Prevention Program (RMPP) of the State Health and Safety Code; and (2) the Connelly Toxic Hot Spots Act (AB 2588). The RMPP is intended to encourage new, modified, and existing facilities which use significant amounts of "Acutely Hazardous Materials" (AHM) to minimize releases of AHM and to protect public health and safety and the environment from releases that do occur. Administering Agencies (in this case, the City of Fremont Environmental Protection Division) are responsible for ensuring the proper conduct of the RMPP (Governor's Office of Emergency Services, 1989). The Connelly Toxic Hot Spots Act is intended to identify high priority toxic air contaminants and develops emission control regulations. A principal component supporting the act is the Health Risk Assessment, which is a procedure for assessing the probability of adverse health effects associated with a given activity. The law pertains to existing businesses and is administered by the Bay Area Air Quality Management District (BAAQMD). The BAAQMD in June 1991 developed a list of 123 facilities in the Bay Area that had a "high priority" for the preparation of a Health Risk Assessment. The Tri-Cities Landfill was the only facility in the vicinity of the Project site included on the high priority list (Personal communication with Bob Nishimura, Public Information Office, Bay Area Air Quality Management District, February 1996). An assessment was made, and when the BAAQMD issued the (revised) high priority list and the medium priority list in August 1991, the facility was no longer on either of them. Neither the Tri-Cities Landfill or any other facility near the Project site are on either of these two lists (Personal communication with Katherine Fortney, Public Information Office, Bay Area Air Quality Management District, February 1996).

2. Impacts

Significance Criteria

Impacts related to public health and safety conditions on the Project site are considered to be significant if there is a toxic release to the environment which would bring the Project site under the jurisdiction of CERCLA (the Federal Comprehensive Environmental Response Compensation Liability Act of 1980), other environmental regulatory agencies such as CAL-EPA (which covers all hazardous waste activity in California) or the RWQCB (which oversees all water quality matters), or if humans may suffer adverse effects from exposure to materials that occurs directly or indirectly as a result of the Project's implementation. The possible routes of exposure for humans to hazardous materials are inhalation, skin contact or absorption, and ingestion.

Exposure to Existing On-Site Hazardous Materials

There are low DDT and DDE pesticide residues contained in on-site soils. Exposure of construction personnel and future occupants of the Project site to DDT and DDE pesticides was considered a minimal risk based on the 1989 Phase II Site Characterization by McLaren/Hart. The McLaren/Hart investigations encountered "low levels of DDT and DDE", assumed to be below required cleanup levels, in the southern portions of the west and south pastures. Based on this information, the Project site should be regarded as having low potential health risks to Project construction personnel and future occupants from residual soil contamination, and this would be considered a *less than significant impact*.

VI. OTHER CONSIDERATIONS

Existing Off-Site Hazardous Materials Releases

Existing nearby off-site facilities which use and store hazardous materials, or which have experienced previous spills or unauthorized releases of hazardous or toxic compounds may present a potential health risk to construction personnel and future occupants of the Project site. In general, these facilities can be divided into two groups for discussion purposes: (1) facilities with the potential for air contamination; and (2) facilities which have records of previous spills or unauthorized releases contaminating the local groundwater.

Air Contamination

There is a possibility of air contamination due to accidental spills or releases from toxic gas storage facilities adjacent to the Project site. However, exposure to construction personnel and future occupants of the Project site is considered a *less than significant impact.*

Prevailing winds in the vicinity of the Project site are from the west and west-northwest (see **Figure 37**). Winds from the north, northeast and east occur during relatively brief times during the year, generally from November to February (see **Figure 38**). Winds from the east and southeast (during which Lam Research would be upwind from the Project site) occur a relatively small portion of the year, most frequently during December and January. The wind rose in **Figure 37** indicates that the prevailing wind direction during the year is generally from the west and west-northwest. These winds occur most commonly during the late spring, summer and early fall months. Scott Specialty Gases and Christy Concrete, which are of the greatest concern for air releases, are usually downwind of the northwestern perimeter of the Project site. Therefore, there is a relatively low chance that a release of toxic gases from these facilities would impact the Project site.

Although the Scott Specialty Gases facility has been constructed and is managed to greatly minimize the possibility and seriousness of any accidental spill or releases, to suppress and contain the incident, and to quickly notify authorities for emergency evacuation of the neighboring area, a small, unpredictable possibility of a release of toxic or flammable gases does exist. While dispersion prediction models of the accidental releases of deadly gases have not been completed with these facilities in mind, considering the relatively small volume of gases stored and the distances to these facilities, a highly dangerous situation is unlikely.

The wind rose (**Figure 37**) shows in general that prevailing winds direct any emissions from the Tri-Cities Landfill toward the Project site. However, because the landfill is approximately one mile from the Project site, potentially greater attenuation of toxic gases would occur compared to the Lam Research, Scott and Christy facilities.

The proposed land uses at the Project site would expose fewer people to accidental gas releases than would be the case in a residential setting. Scott Specialty gases operates only during the day, although operations at the plant sometimes continue to approximately 7:00 PM. Lam research normally operates only during the day, although there is sometimes a swing shift from 4:00 PM to midnight. The logistics of evacuating an industrial/commercial area are much easier than evacuation of a residential community, especially at night when emergency response and evacuation may be more difficult.

Figure 37
PREVAILING WINDS IN THE VICINITY OF THE PROJECT SITE
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

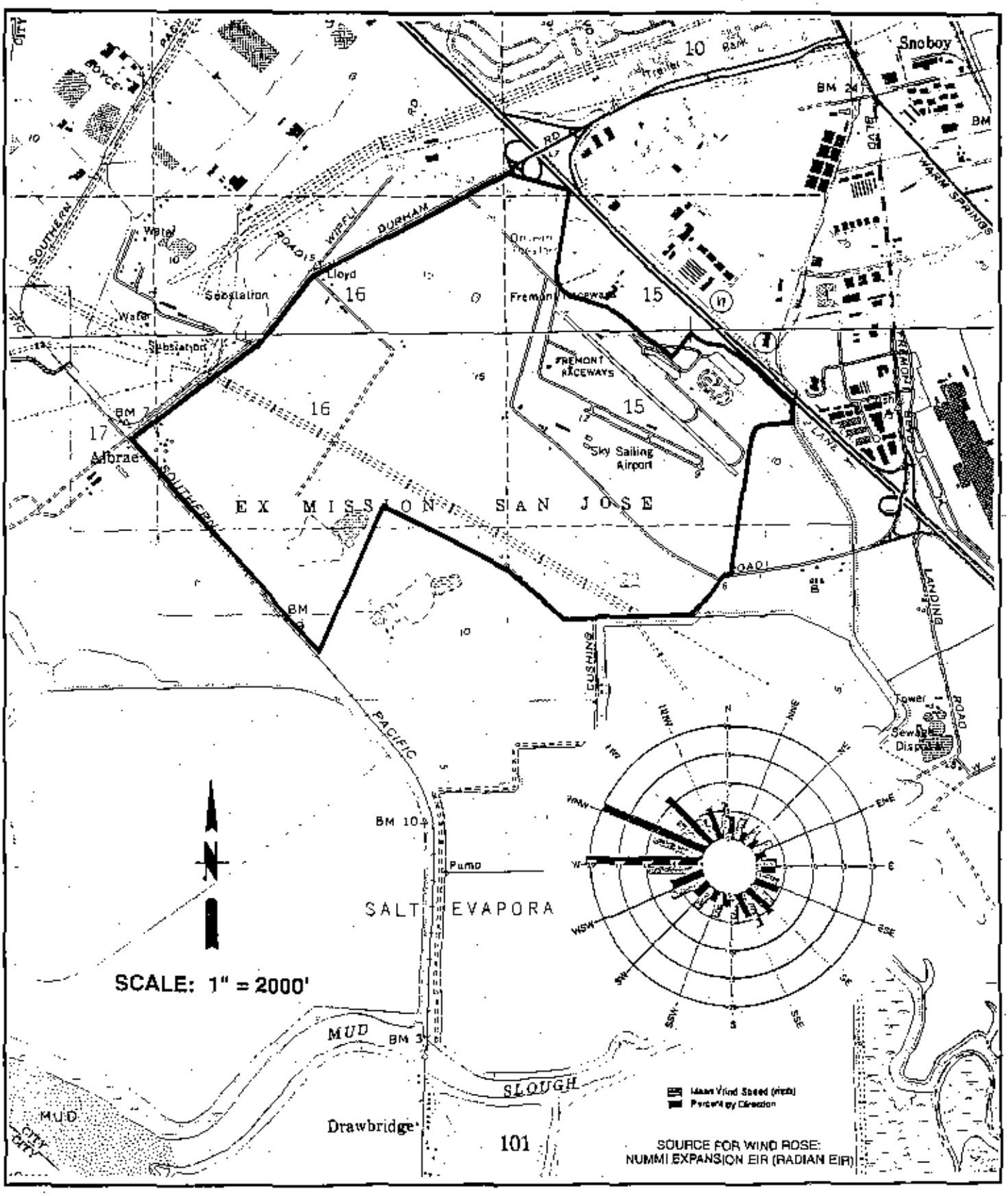


Figure 38
PERCENT MONTHLY OCCURRENCE OF SELECTED WIND PATTERNS, FREMONT AREA
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Wind Type Designation	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly Average
N	6.0	9.0	8.3	2.3	2.0	0.2	0.0	0.2	0.4	4.8	4.4	4.2	3.5
NE	6.8	9.2	4.1	0.6	0.2	0.0	0.0	0.0	0.2	1.8	4.6	12.4	3.4
E	6.7	2.7	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.3	6.4	1.5
SE	13.0	3.7	6.4	2.4	0.0	0.8	0.0	0.4	0.0	1.6	6.3	14.5	4.2
S	13.8	6.8	6.2	7.4	2.4	4.5	0.2	2.6	3.7	4.6	6.3	13.5	6.1
SW	6.4	4.8	7.0	9.9	5.2	6.4	6.4	5.2	7.2	7.1	1.9	2.0	5.7
W	7.1	10.5	26.2	33.3	42.0	54.9	65.3	65.4	43.6	22.9	9.0	7.4	31.8
NW	6.2	17.1	20.3	25.5	31.7	24.7	19.7	20.7	21.2	23.5	10.8	10.5	19.1
Light, Var. or Misc.	33.7	36.1	20.9	18.5	16.5	8.4	8.5	5.4	22.9	33.9	55.3	28.9	24.6

Source: (Adapted from) A Survey of Air Flow Patterns in the San Francisco Bay Region, 1932-1955: Bay Area Air Pollution Control District.

Groundwater Contamination

Impact 6-1: Project construction personnel may be exposed to hazardous chemicals that may be present in local groundwater during dewatering for construction. Since a complete and absolute site assessment is not feasible, the possibility exists for construction personnel to encounter hazardous materials due to the past history of on-site hazardous materials storage. This is considered a *potentially significant impact.*

The greatest number of facilities in the vicinity of the Project site with records of spills or unauthorized releases of hazardous materials are those with underground fuel storage tanks which have leaked, releasing petroleum hydrocarbons to the soil and the shallow groundwater body. Because of the large number of such facilities in the vicinity of the Project site, and the suspected continuity of the shallow groundwater body and its general direction of flow (roughly westward toward San Francisco Bay), some impact to the groundwater at the Project site conceivable may have occurred.

Generally, groundwater moves very slowly through clayey materials, typically less than ten feet per year. Although a thorough study of the groundwater at the Project site has not been completed, the studies conducted to date do not indicate site groundwater contamination from off-site facilities. Each of the facilities identified below have been required to develop and implement a remediation program, controlling the further spread of contaminated groundwater and treating the identified impacted water bodies.

Facilities located in areas near the Project site with documented groundwater contamination are:

- Melrose Metals
- Texaco Service Station
- Unocal Service Station
- Seven-Eleven Store
- Dirty Dunbar Service Station
- CBI Services
- Fremont Unified School District Corporation Yard
- Fleming Foods
- Borden Chemical Company
- California Life Tile

Although there is documentation of groundwater contamination resulting from the above off-site facilities, there are no public water wells in the area, and it is extremely unlikely that the groundwater beneath the Project site could be developed into a potable water supply. Future occupants are unlikely to have exposure groundwater resources and, therefore, impacts to future occupants from groundwater contamination are considered *less than significant.*

Exposure to Future On-Site Hazardous Materials

Impact 6-2: It is likely that hazardous materials will be used on, or transported to, the Project site. This represents a *potentially significant impact.*

VI. OTHER CONSIDERATIONS

The types of potential on-site hazardous/toxic material impacts associated with a future developed Project site stem from:

- The nature of the commercial-industrial activities to be located at the Project site;
- The overall size of commercial-industrial activities as a function of the volume of materials handled;
- Proximity of commercial-industrial activities to recreational areas, parks, and surface water features; and
- The patterns of traffic servicing the commercial-industrial areas.

Depending on the nature of the industrial and commercial businesses that may locate at the Project site, various types of hazardous/toxic materials may be used there. Such use may involve the storage of these materials either above or below ground, and would be required to comply with all pertinent environmental permitting requirements including the City of Fremont's Hazardous Materials Ordinance (No. 1632). Even so, potentially significant impacts on surface and/or groundwater quality could result from accidents or equipment malfunction. Since the Project does not depend on groundwater as a water source, health risks associated with the potential impact of contaminated groundwater are not anticipated.

Figures 39 and **40** list the potential businesses and the kinds of associated hazardous/toxic materials that may be in use at the Project site with development of the proposed Project. These lists are not intended to account for all possible land use designations and associated hazardous/toxic materials. Rather, the lists are intended as indications of some of the likely possibilities given certain assumptions, which include the establishment of businesses similar to those already in existence in the general area and the use of materials known to be common to them. Not included are indications of the amounts of these materials that may be in transport, storage or use.

Quantities of hazardous materials involved will depend on the size of the respective operations that may locate on the developed Project site. Although some materials likely to be used may be highly toxic, they may be used in such small quantities as to pose no significant environmental hazard. Generally, the larger the amount of toxic/hazardous materials that is transported, stored and utilized, the higher will be the potentially significant environmental impact, because of the higher probability of spill or leaks in transport or storage. Because of the various kinds of businesses that are already located in the vicinity of the Project site, continued development involving similar types of operations would lead to a cumulative increase in the transport, storage and use of hazardous/toxic materials.

Businesses associated with the semiconductor/electronics industry are currently located in the Fremont area, including the immediate vicinity of the Project site (e.g., at the Northport Loop Office-Industrial Park). It is a reasonable assumption that semiconductor/electronics firms might locate on the industrial portions of the Project site. Despite the perception of these businesses as "clean" industries, hazardous/toxic materials are routinely used in the fabrication and manufacturing processes conducted by these types of firms.

Figure 41 lists examples of the chemicals and substances that are commonly used in the semiconductor industry. The use of these materials, including their transport and storage, constitutes a potential risk and could have a significant impact if released to the environment.

Figure 39
POTENTIAL RESEARCH AND DEVELOPMENT TECHNOLOGIC INDUSTRIES AND ASSOCIATED HAZARDOUS MATERIALS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Technologic Industries	Potential Toxic Materials
Aerospace Research and Design	organic gases radioactive materials compressed flammable gases
Electronics/Computers/Semi-conductors	pyrophoric gases toxic gases corrosive gases flammable gases corrosive/caustic liquids radioactive materials irritants heavy metals solvents "dopants" acids
Genetics (Bio-technology)	radioactive materials acids/bases solvents reactive compounds flammable materials
Telecommunication	see above under "Electronics, etc"
Robotics	solvents compressed flammable gases caustics
Pharmaceuticals	acids/bases solvents flammable materials

Sources: Duncan & Jones, Questa Engineering Corporation, U.S. Environmental Agency, California Department of Industrial Relations, Division of Occupational Safety & Health.

Figure 40
POTENTIAL ASSEMBLY AND PRODUCTION BUSINESSES AND ASSOCIATED HAZARDOUS MATERIALS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Assembly and Production	Potential Toxic Materials
Containers	solvents paints corrosives petroleum-based products
Plastics Products	solvents flammable materials petroleum-based products acids/bases reactive materials compressed gases
Electronic Products	see above sections
Automotive Products	solvents petroleum-based products caustics paints flammable materials compressed gaseous products corrosives acids/bases
Construction Materials	acids/bases flammable materials solvents caustics petroleum-based products wood preservatives paints

Sources: Duncan & Jones, Questa Engineering Corporation, U.S. Environmental Agency, California Department of Industrial Relations, Division of Occupational Safety & Health.

Figure 41
HAZARDOUS CHEMICALS AND SUBSTANCES COMMONLY USED IN THE SEMI-CONDUCTOR INDUSTRY
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Potential Hazards	Chemicals
Irritants Which Can Cause Local Dermal Effects	Acetic Acid, Chromic Acid, Formic Acid, Hydrochloric Acid, Hydrofluoric Acid, Phosphoric Acid, Nitric Acid, Sulfuric Acid, Ammonium Hydroxide, Potassium Hydroxide, Sodium Hydroxide, Arsenic Trioxide, Chromium Trioxide, Mercury, Nickel, Acetone, Toluene, Xylene and Carbon Tetrachloride
Irritants To Mucous Membranes	Ammonia, Chromic Acid, Hydrogen Chloride, Hydrogen Fluoride, Sulfur Dioxide, Dichlorosilane, Silicon Tetrachloride, Trichlorosilane, Bromine, Chlorine, Phosphorus Tribromide, Phosphorus Pentafluoride, Arsenic Trichloride and Nitrogen Dioxide
Systemic Poisons Upon Exposure Above Permitted Exposure Level	Antimony Compounds, Arsenic Compounds, Carbon Monoxide, Carbon Tetrachloride, Carbon Tetrafluoride, Catechol, Cellosolve Acetate, Chromic Acid, Cyanide, Lead, Mercury, Methanol, Phenol, Toluene, 1,1,1-Trichloroethane (methyl chloroform), Trichloroethylene and Xylene
Respiratory Irritants	Acetic Acid, Acetone, Ammonia, Ammonium Chloride, Antimony, Antimony Trioxide, Arsenic Trioxide, Arsine, Boron Tribromide, Boron Trifluoride, Butyl Acetate, Cellosolve Acetate, Chlorine, Diborane, Epoxy Resin, Ethyl Acetate, Ethylenediamine, Ethylene Glycol, Formic Acid, Hydrochloric Acid (Hydrogen Chloride), Hydrofluoric Acid, Methylene Chloride (Dichloromethane), Morpholine, Nitric Acid, Nitric Oxide, Nitrogen Dioxide, Nitrosyl Chloride, Ozone, Perchloroethylene (Tetrachloroethylene), Phosphine, Phosphoric Acid, Phosphorus Oxychloride, Phosphorus Pentafluoride, Phosphorus Pentoxide, Phosphorus Tribromide, White Phosphorus, Potassium Hydroxide, 2-Propanol (isopropanol), Silane, Silicon Dioxide, Silicon Tetrachloride, Silicon Tetrafluoride, S-oddard Solvent, Sulfur Dioxide, Sulfuric Acid, Toluene, 1,1,1-Trichloroethane (Methylchloroform), Trichloroethylene, Trichlorosilane, Turpentine and Xylene
Animal and Human Carcinogens	Arsenic Compounds, Asbestos, Beryllium and its Compounds, Carbon Tetrachloride, Chromium and Nickel

Source: California Department of Industrial Relations, Division of Occupational Safety and Health.

Regardless of the ultimate form of the Project, the development would result in increased vehicular traffic. This would result in increased concentration and mass emission of related pollutants (metals, benzene and other hydrocarbon vapors, etc.), and potential for accidental spillage and/or release of transported materials. Releases of hazardous/toxic materials can be expected to have a significant impact on downwind areas, generally located east of I-880. The risk of such significant impacts would be directly related to the increased amount of vehicular traffic generated by the development. Surface drainages, including Line N, Mowry Slough and, ultimately, San Francisco Bay, would experience a similar impact. Depending on the nature and location of the release, Project business areas may be affected by either surface runoff or downwind migration of these materials, or both.

Although based on studies conducted from 1952 and 1955, a report by the Bay Area Pollution Control District (1957) remains useful in considering wind patterns over the greater Bay Area, and as applied to the Fremont Area (see **Figure 38**). The summer months (June, July and August) are when the Bay Area is least likely to experience stagnant or very light wind conditions. The winter months, November through February, are when such conditions are most likely.

The wind-type designations as shown in **Figure 39** illustrates on-shore air flow in the Fremont area. The balance of the wind-type data involves flow of air essentially offshore and away from Fremont. In the case of summer generated wind patterns, on-shore winds would result in airborne pollutants, generated by the Project's activities, being carried inland. In the latter case of winter generated wind patterns, offshore winds would carry such pollutants beyond the Project site, but would also be expected to carry pollutants from I-880 and the areas to the east into and passed the Project site. The data indicate that the statistically-significant wind patterns are those that flow on-shore, especially during the summer months (see **Figure 38**), and thus would carry pollutants inland away from the Project site.

In addition, the Project may result in some potential impacts due to the placement of recreational areas in proximity to the PG&E transmission lines that traverse the western portion of the Project site. Recent studies gave indicated a possible, although not yet proven, link between the electromagnetic fields generated by transmission lines and increased incidence of cancer, particularly in children. However, the proposed setback from the transmission line easement to the park/recreational areas appears to be more than adequate to offset any potential adverse effects, based on existing information and State Department of Education guidelines regarding public safety.

3. Mitigation Measures

The following measures will reduce the identified health and safety impacts associated with possible hazardous materials in Project site soils, air and groundwater to levels of *less than significant*.

Mitigation 6-1: In order to reduce exposure of construction personnel to contaminated groundwater, the following procedure shall be followed. All construction of utility trenches and/or structure foundations (around areas of known potential contamination) which encounter groundwater during construction shall be investigated. This includes testing the local groundwater for hazardous materials,

including gasoline and related substances. If groundwater contamination is found, then appropriate cleanup procedures shall be followed under the regulatory auspices of the Regional Water Quality Control Board, the California Department of Toxic Substances Control (DTSC) and the City of Fremont. These measures will reduce the identified potential health and safety impacts associated with possible hazardous materials in groundwater at the Project site to levels of *less than significant*.

Mitigation 6-2: The most effective way to limit any potentially significant environmental impact from hazardous/toxic materials would be to exclude those businesses that handle such materials from locating at the Project site. However, since businesses that use, transport and store hazardous/toxic materials already exist in the vicinity of the Project site, this alternative would not totally eliminate potential risks to future occupants on the site. Such restrictions may also have the effect of forcing certain otherwise desirable businesses to locate elsewhere, possibly in neighboring cities.

Short of these measures, impact minimization could include prohibition of certain materials (e.g., those that are extremely hazardous and/or toxic) or regulation of the quantities of materials transported, stored or utilized. Examples of extremely hazardous materials and/or toxic materials are listed in **Figure 41** under the categories "Systemic Poisons Upon Exposure Above Permitted Exposure Levels" and "Animal and Human Carcinogens". At this stage in the review of the proposed Project, however, determinations cannot reasonably be made regarding types or quantities of materials that would be unacceptable for use, storage or transport at the Project site. Some businesses may use extremely hazardous materials in quantities small enough to pose only a minimal risk. Others may use large quantities of a hazardous/toxic material, but may have adequate procedures to minimize the risk involved.

Accordingly, it is required by California law that businesses involved with the utilization of hazardous materials must be reviewed on a case-by-case basis through the permit procedures of the City's Hazardous Materials Ordinance No. 1946 under Chapter 12 of Title 3 of the Fremont Municipal Code. The Hazardous Materials Ordinance encompasses Chapter 6.95 of the California Health and Safety Code. The ordinance incorporates state and federal regulations, and imposes restrictions on activities that would involve the potential for hazardous materials release, contamination or other impact on future occupants of the Project site. The regulation of industrial hazardous materials usage in the City of Fremont is supervised by the Hazardous Materials Division of the Fremont Fire Department. Businesses using hazardous materials must go through a standard review procedure and mandates the preparation of a Hazardous Materials Management Plan (HMMP). The Hazardous Materials Division reviews the HMMP, notifies the City Planning Department, and issues appropriate permits. The Hazardous Materials Ordinance includes a provision where the City Planning Department Manager has the final decision on business permits involving the use of hazardous materials. These procedures determine whether a proposed business is an appropriate use for the site based on the nature of its operation, proximity to

recreational and park areas, likelihood of an accidental spill or release of hazardous/toxic materials, and other factors. The permitting procedure could include a requirement for a focused environmental assessment of individual developments at the Project site, perhaps as part of the HMMP required by the Hazardous Materials Ordinance. As part of the environmental assessment, specific mitigation measures could be defined to offset the hazardous materials impacts of the proposed development.

If feasible, businesses and related traffic with the highest potentially significant environmental impact, including light industry, R&D and possibly warehousing, shall be located away from recreational areas, parks and major drainages. As previously recommended in the City of Fremont Hazardous Materials Management Study, buffer zones between these operations and the recreational and park areas shall be included in the development. Buffer zones and locations of proposed hazardous materials operations would be determined by the City Planning Department Manager. In any event, all sections of the City of Fremont's Hazardous Materials Ordinance (No. 1946), contingency planning in particular, shall be strictly enforced. Further mitigation measures may stem from zoning, use and design criteria, and CC&R restrictions on the components of the approved Project.

Businesses that use hazardous/toxic materials shall be required to have spill and accidental release emergency response procedures. All spills and/or accidental releases shall be cleaned up immediately to reduce the possibility of being washed into local drainages and, ultimately, the sloughs and San Francisco Bay. Spill and release containment facilities or devices shall be required and shall meet the standards of the State's Department of Health Services.

The City of Fremont shall continue to increase public awareness and knowledge of potentially hazardous/toxic materials and their associated impacts. The future occupants and visitors at the Project site shall be made aware of the emergency procedures that would be required in the event of an accident involving such materials. The Fremont Fire Department currently provides to the public, free of charge, handouts and other forms of information dealing with the handling and disposal of hazardous and toxic materials. This practice shall be continued through the proposed on-site fire station.

The measures above will reduce the identified health and safety impacts associated with possible hazardous materials in Project site soils, air and groundwater to levels of *less than significant*.

B. VEGETATION AND WILDLIFE

1. Setting

This section of the Supplemental EIR examines the current biotic setting, including an assessment of the functions and values of wetland resources identified on the Project site, and evaluates the impacts of the proposed Project as amended. The amended project includes the addition of two parcels to the proposed development site, identified for purposes of this Supplemental EIR as the "Robbins" and "Stem" parcels. These parcels were not reviewed in prior environmental documents prepared for this Project. When necessary to distinguish the three properties which now comprise the Project site, they are separately referred to in this section as the "main Catellus site", "Robbins" and "Stem" parcels.

This section also addresses proposed mitigation for Project impacts to wetland resources. This mitigation may include all or a portion of the Stem parcel and/or an approximately 56-acre property owned by the Project applicant in Fremont, located west of the Project site and south of Boyce Road, between Stevenson Boulevard and Weber Road.

Methods

Zentner and Zentner Reconnaissance

For purposes of this Supplemental EIR, a reconnaissance of the Project site was performed on October 13, 16 and 17, and December 13, 1995; and on January 4, 5 and 15, 1996. This reconnaissance consisted of walking the Project site to map vegetation, including wetland resources, noting vegetative cover (a measure of the amount of ground covered by plants) and species richness (a measurement of the diversity of plants in an area) in a 10-foot by 10-foot sample area; and to generally assess the potential of site habitats to support special status species. Common wildlife observed during these surveys also were noted.

It is City of Fremont practice to use the Clean Water Act (CWA) Section 404 definition of wetlands and the U.S. Army Corps of Engineers (COE) methodology for delineating wetland boundaries in evaluating biotic resources on a proposed project site. CWA Section 404 implementing regulations define wetlands as "[t]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." The Corps of Engineers Wetlands Delineation Manual (1987) (Delineation Manual) contains procedures for identifying wetlands for purposes of Section 404. The Delineation Manual was used as a reference to identify wetland resources for this reconnaissance. Areas exhibiting a predominance of hydrophytic vegetation, and evidence of hydric soils and wetland hydrology indicators were generally considered wetlands.

ENTRIX Mapping of Wetland Resources

The Project applicant's wetland consultant, ENTRIX, further evaluated the Project site during a series of visits made between December 7, 1995 and January 13, 1996, to map the extent of wetland resources on the site. The methodology used by ENTRIX to analyze the normal circumstances for the Project site and map actual wetland boundaries is contained in Appendix C. Wetland mapping performed by ENTRIX represents a refinement of the Zentner and Zentner work and is used for purposes of defining the extent of wetland resources for this Supplemental EIR.

VI. OTHER CONSIDERATIONS

Vegetation and Wildlife Use

Prior environmental review by the City for Project development proposals during 1987 - 1991 identified approximately 24 acres of wetlands, as defined in that review (Ref. 18, pages 104-109 and Ref. 19, page 105), on the southern portion of the main Catellus site. No special status species were found to inhabit the site, although portions of the site were identified as potentially providing suitable habitat for the salt marsh vagrant shrew (*Sorex Vagrans halicoetes*), burrowing owl (*Athene cunicularia*), Point Reyes bird's- beak (*Cordylanthus maritimus* ssp. *palustris*), and Delta tule-pea (*Lathyrus jepsonii* var. *jepsonii*). On the west coast, burrowing owl (*Athene cunicularia*) and western burrowing owl (*Athene cunicularia hypugea*) are recognized as the same species. Additionally, *Speotyto cunicularia*, the species name used by the California Department of Fish and Game (CDFG) also refers to the same bird.

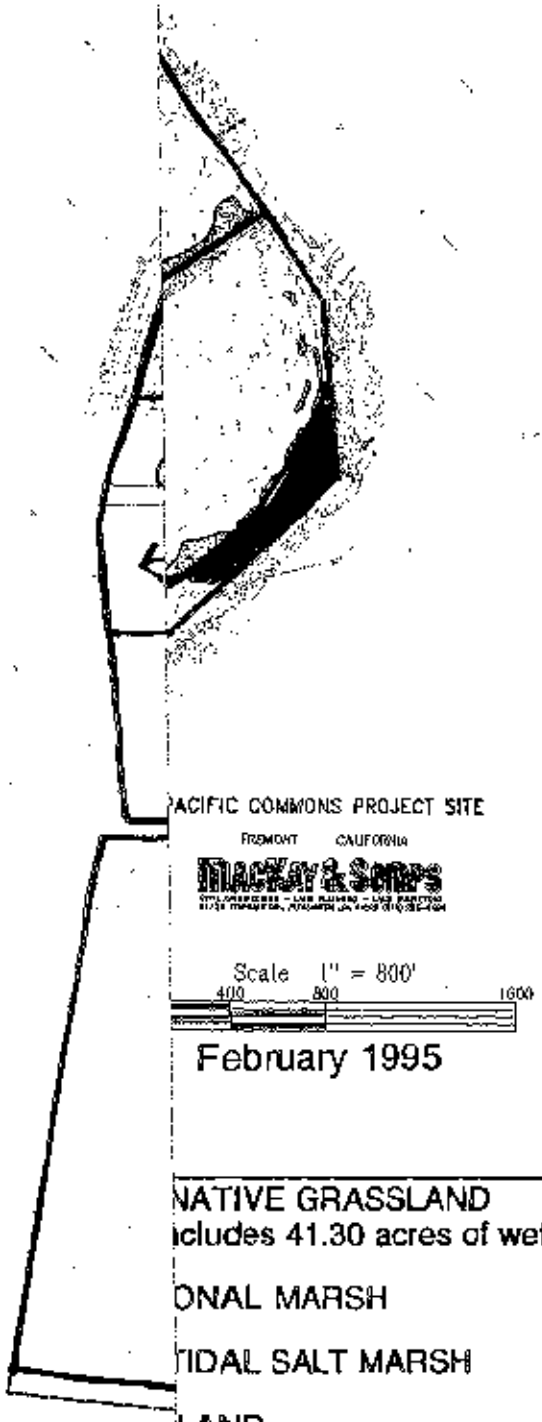
Presently, all but the northeast corner of the Project site (which is being farmed) is used as rangeland for cattle and horses, with grazing that ranges from very heavy on the Robbins parcel, to moderate on the Stem parcel and portions of the main Catellus site near the Auto Mall, to light to very light on the remainder of the main Catellus site. A majority of the Project site has been leveled and farmed in the recent past (most within the last two to ten years). The Stem parcel appears to have been fallow for the last fifteen years or more. Farming practices have included considerable irrigation and drainage maintenance, resulting in substantial modification of the topography. The Robbins parcel appears to have been intensively farmed in the very recent past (with gladiolus as the predominant crop), but is now heavily grazed.

Mounds of soil (most likely created by past grading activities) and berms (remnants of irrigated fields) are scattered throughout the main Catellus site. Additionally, the density of the vegetation on the main Catellus site has increased and thatch has accumulated, thereby increasing cover for small mammals and potentially improving conditions for foraging raptors over those noted in 1991 (see Ref. 14, page 27).

Based on vegetative composition, the Project site is comprised of the following habitats: non-native grassland consisting of upland habitat and scattered patches of wet meadow habitat; cropland; non-tidal salt marsh; and seasonal marsh. **Figure 42** identifies Project site vegetation. Wetland resources on the Project site include the non-tidal salt marsh, seasonal marsh and wet meadow habitats.

A wet meadow is a type of wetland that is "saturated" as contrasted with "inundated". Saturated wetlands are those with limited standing water, if any (during the wettest periods, these areas may accumulate an inch or two of water), where the soil remains saturated for several weeks or months at a time. An inundated wetland, such as a seasonal marsh, exhibits obviously ponded water and, unlike a saturated wetland, remains ponded between storms during the rainy season. The non-native grassland on the Project site contains widely scattered areas of wet meadow habitat (they exhibit hydrophytic vegetation and wetland hydrology as evidenced by detailed sampling performed by ENTRIX). These areas, however, are barely distinguishable from the surrounding upland habitat.

The following discussion examines the vegetation and wildlife use of Project site habitats. The acreages presented below are approximations based on the reconnaissance performed by Zentner and Zentner and the more detailed wetland resource mapping performed by ENTRIX.



NATIVE GRASSLAND	751.90 Acres
ncludes 41.30 acres of wet meadow habitat)	
ONAL MARSH	56.70 Acres
TIDAL SALT MARSH	2.30 Acres
LAND	23.40 Acres

Figure 42
EGETATION AT THE PROJECT SITE
Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

ZENTNER
ZENTNER

/jobs/10560/bat.11x17bm2 jonf 1-30-96

Non-Native Grassland

Vegetation

The grassland on the Project site, which totals approximately 751.90 acres, is dominated by non-native annual grasses and weeds, with a sprinkling of native grasses widely scattered as individuals and small patches. It also contains small, isolated patches of wet meadow habitat. All plants observed in the non-native grassland are relatively common and are listed in Appendix D. The dominant plant species are listed in **Figure 43** below. Dominant plant species are "those that contribute more to the character of a plant community than other species present" (Delineation Manual, page 16). For purposes of this report, species classified as dominant generally comprised more than five percent of the total plant cover of the particular habitat.

Figure 43
DOMINANT PLANT SPECIES OF THE NON-NATIVE GRASSLAND
OCTOBER 1995
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Ripgut Grass	*Bromus diandrus*
Italian Ryegrass	*Lolium multiflorum*
Soft Chess	*Bromus hordeaceus*
Bur Clover	*Medicago polymorpha*
Prickly Lettuce	*Lactuca serriola*
Hare Barley	*Hordeum leporinum*

Vegetative cover is generally at or very near 100 percent. Species richness varies from 5 to 7 species in a sample, generally including 3 to 5 of the dominant species. Previous studies recorded roughly 2 to 12 species in 100-meter-square samples shortly after abandonment from farming, and 8 to 19 species one or two years later (see Ref. 14, page 26). Since that time the vegetation has matured, thatch has accumulated, and the more aggressive species have greatly reduced or eliminated the weediest species (which thrive on disturbance and the reduced competition that typically results).

Wet Meadow

Areas of wet meadow on the Project site, which comprise approximately 41.30 acres (or five percent of the non-native grassland), appear as isolated pockets within a matrix of upland grassland and are scattered throughout the main Catellus site. These areas apparently become saturated to the surface and remain saturated for one to three months during the winter and spring. This typically results in the development of anoxic (i.e., oxygenless) conditions in the root zone, which limits the presence of upland species that typically require soil oxygen for survival.

Because of the size of the Project site and the difficulty in establishing distinct boundaries between the wet meadow areas and the uplands in which they are interspersed (this habitat on the Project site typically is expressed as a mosaic of wet and dry areas), wet meadow areas were not individually mapped. The estimate of wet meadow acreage on the Project site was derived from sample points which exhibited a predominance of hydrophytic vegetation and surface hydrologic indicators such as water- or algae-matted mulch, algal crusts, and dispersed and redeposited sediments (see Appendix E).

The vegetation of the wet meadows is generally heavily dominated by the non- native Italian ryegrass and Mediterranean barley, with lesser amounts of prickly lettuce and curly dock. Upland species common in the non-native grassland of the Project site, particularly soft chess, ripgut grass and wild oats, are noticeably absent or very sparse in these wet meadow areas.

Wet meadow vegetation ranges from sparse (roughly five percent cover) to dense (at or near 100 percent cover). Species richness varies from 3 to 9 species in a sample, and generally includes Italian ryegrass, Mediterranean barley, and one or more of the other dominants listed in **Figure 44** below. Five of 19 plant species recorded in the wet meadow areas are native.

Figure 44
DOMINANT PLANT SPECIES OF THE WET MEADOW AREAS
OCTOBER 1995
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
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Italian Ryegrass	*Lolium multiflorum*
Mediterranean Barley	*Hordeum marinum*
Prickly Lettuce	*Lactuca serriola*
Salt Grass	*Distichlis spicata*[N]
Alkali Heath	*Frankenia grandifolia*[N]
Fiddle Dock	*Rumex pulcher*
Broadleaf Pepperweed	*Lepidium latifolium*
Dooryard Knotweed	*Polygonum aviculare*
Hyssop Loosestrife	*Lythrum hyssopifolium*
Alkali Mallow	*Malvella leprosa*[N]
Heliotrope	*Heliotropium curassavicum*[N]
Alkali Weed	*Cressa truxilensis*[N]

[N] Native Species

Wildlife

Wildlife use of the Project site grasslands is influenced by the high plant cover and abundant seed production by several of the dominant species; predominance of annual grasses; and low plant diversity and forb cover. The plant cover and seed production are favorable to granivores such as voles, mice and sparrows. These species are prey for red fox and domestic cats. The grasses support grasshoppers which, together with the mice, provide forage for kestrels, burrowing owls and skunks. The low diversity and very low proportion of native plant species,

however, greatly limit the diversity of native invertebrates (a good food source for larger species).

Portions of the Project site, particularly some of the mounded soil areas, continue to support ground squirrel populations, which in turn improve conditions for foxes and burrowing owls (providing both food and burrows), and larger raptors (particularly red-tailed hawks). However, increasing grass cover on the main Catellus site (as portions of the site have remained fallow) has reduced the extent of habitat favorable to ground squirrels and jack rabbits, both of which thrive on relatively bare grasslands and the associated abundance of weedy forbs. Jack rabbits are more commonly seen on the Robbins and Stem parcels, where more intensive grazing occurs than on the main Catellus site.

All wildlife species observed on the Project site grasslands during the three-day reconnaissance in October are common species, excepting the burrowing owl (a special status species discussed below). These common species are listed in **Figure 45** below.

Figure 45
COMMON WILDLIFE SPECIES OF THE NON-NATIVE GRASSLAND OBSERVED IN OCTOBER 1995
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
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American Kestrel	*Falco sparverius*
European Starling	*Sturnus vulgaris*
Brewer's Blackbird	*Euphagus cyanocephalus*
Red-Winged Blackbird	*Agelaius phoeniceus*
Black Phoebe	*Sayornis saya*
Ring-Necked Pheasant	*Phasianum colchicus*
California Ground Squirrel	*Spermophilus beecheyi*
Black-Tailed Hare	*Lepus californicus*
Brush Rabbit	*Sylvilagus bachmani*
Western Meadow Lark	*Sturnella neglecta*
Turkey Vulture	*Cathartes aura*
Red-Tailed Hawk	*Buteo jamaicensis*
Killdeer	*Charadrius vociferus*
Rock Dove	*Columba livia*
Mourning Dove	*Zenaida macroura*
Common Barn Owl	*Tyto alba*
White-Crowned sparrow	*Zonotrichia leucophrys*

Cropland

Vegetation

The northeast corner of the Project site (east of Christy Street), approximately 23.40 acres, is actively farmed. The crop appears to have been a combination of oat (*Avena* sp.) and vetch

(*Vicia sativa*). Based on remnant vegetation, the most common weeds within this field are beet (*Beta vulgaris*) and pigweed (*Amaranthus* sp.). Other common species include: ripgut grass (*Bromus diandrus*); black mustard (*Brassica nigra*); shortpod mustard (*Hirschfeldia incana*); Italian ryegrass (*Lolium multiflorum*); Russian thistle (*Salsola tragus*); and dooryard knotweed (*Polygonum aviculare*).

All plants observed in the cropland habitat are non-native common crop species and agricultural weeds. The occurrence of special status plants within this habitat is unlikely given the intensive land use history of this area, particularly long-term farming which has included discing this year and irrigation in prior years. Due to discing, the cover and diversity of plants within the farmed portion of the Project site was not recorded.

Wildlife

Wildlife usage of the cropland on the Project site is limited, and is restricted largely to species that regularly use farmlands. It was particularly low at the time of field observations due to recent discing. Species observed in this portion of the Project site included: mourning dove; rock dove; European starling; and Brewer's blackbird.

Non-Tidal Salt Marsh

Non-tidal salt marsh on the Project site occurs only at the extreme southeast corner of the main Catellus site and totals approximately 2.30 acres. This area apparently stays wet much of the year, with at least some of the summer water provided by irrigation from nearby ornamental landscapes.

Vegetation

The non-tidal salt marsh is nearly bare, with cover estimated at less than five percent. The predominant species, which provides a majority of this cover, is pickleweed (*Salicornia virginica*). Other species include: fat-hen (*Atriplex triangularis*); alkali heath (*Frankenia grandifolia*); salt grass (*Distichlis spicata*); brass buttons (*Cotula coronopifolia*); and Australian saltbush (*Atriplex semibaccata*). As with most non-tidal salt marshes, diversity is low because very few species can tolerate the fluctuations in salinity and moisture typical of such habitats. These conditions are exaggerated on this site by the added influence of occasional irrigation runoff. The most prominent species (pickleweed, fat-hen, alkali heath and salt grass) are native.

Wildlife

The small size of the non-tidal salt marsh, coupled with the high chain-link fence along the south and west sides, significantly restricts wildlife use. Despite these conditions, the area had numerous bird tracks suggesting some value as a foraging site for shorebirds. The close proximity of the fence to the marsh, however, most likely prevents all but very rare use by ducks, most other water and shorebirds, and most other wildlife. Wildlife use generally is limited by the lack of cover resulting from high salinity (and the fluctuations in salinity due to the occasional flushes of fresh water from nearby irrigated landscapes) and site disturbance.

Seasonal Marsh

Areas of seasonal marsh are scattered throughout the Project site and total approximately 56.70 acres. Seasonal marsh includes several areas within the cropland in the northeast corner; low areas excavated for development of building pads adjacent to the Auto Mall site; portions of many "crop cells" (apparent on aerials) where drainage is restricted by berms and dense soils; areas in the vicinity of the former Baylands Raceway Park and the Sky Sailing Airport in the eastern portion of the Project site; and depressions within the Stem parcel. These areas apparently hold water during the winter and spring rainy season and slowly dry down during the late spring and early summer. Inundation usually ranges from 2 to mostly 6 to 18 inches deep when these "basins" are full. Evidence of winter/spring inundation is commonly expressed in both a high proportion of obligate wetland species (ones that almost always occur in wetlands) and by matted detritus and algal mats that have become stranded on the vegetation as water levels recede in the late spring and early summer.

Vegetation

Seasonal marsh vegetation ranges from sparse (roughly five percent cover) to dense (at or near 100 percent cover). Diversity generally is low, but tends to be greatest in the basins with the most topographic variation. Species richness varies from 3 to 7 species in a sample, and generally includes Italian ryegrass, Mediterranean barley, and rabbitfoot grass.

All plants observed in the seasonal marshes are relatively common. A majority of plant species recorded in the seasonal marshes (13 of 25) are native, including 8 of the dominants. The dominant plant species in the seasonal marsh areas are listed in **Figure 46** below. A list of all plant species observed in this habitat is included in Appendix D.

Wildlife

Wildlife usage of the seasonal marshes during the dry season (the time of the field survey) was not significantly different from that observed in the adjacent non-native grassland, excepting an increased use of the larger bare areas by jack rabbits. During the winter and spring, however, some use of the seasonal marshes by waterfowl, shorebirds, common amphibians, and common aquatic invertebrates, such as dragonflies, gnats, mosquitoes, and diving beetles, is expected.

Habitat Evaluation

Wetlands represent transition zones between uplands and aquatic habitats. Transition zones are ecologically important, since plant and wildlife diversity are almost always greater in these areas than in adjoining habitat. Wetlands also may purify waterways by trapping and transforming pollutants, store storm and flood waters, reduce erosion, and provide nutrients for fish and shellfish in nearby waters. An evaluation of project site wetland resources (and the non-native grassland) is contained in Appendix E.

Figure 46
DOMINANT PLANT SPECIES OF THE SEASONAL MARSHES
OCTOBER 1995
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Common Dominants	
Rabbitfoot Grass	*Polypogon monspeliensis*
Italian Ryegrass	*Lolium multiflorum*
Mediterranean Barley	*Hordeum marinum*
Common Spikerush	*Eleocharis macrostachya*[N]
Broad-Leaved Pepperweed	*Lepidium latifolium*
Swamp Timothy	*Crypsis schoenoides*
Hyssop Loosestrife	*Lythrum hyssopifolium*
Dooryard Knotweed	*Polygonum aviculare*
Occasional Dominants*	
Salt Grass	*Distichlis spicata*[N]
California Coyote Thistle	*Eryngium aristulatum*[N]
Curly Dock	*Rumex crispus*
Tuberous Bulrush	*Scripus tuberosus*
Bermuda Grass	*Cynodon dactylon*
Alkali Mallow	*Malvella leprosa*[N]
Bristly Ox-Tongue	*Picris echioides*
Heliotrope	*Heliotropium curassavicum*[N]
Alkali Heath	*Frankenia grandifolia*[N]
Fat-Hen	*Atriplex triangularis*[N]
Spike Primrose	*Boisduvalia glabella*[N]

[N] Native Species
* Occasional domiants are species that are dominant within patches of the identified habitat.

Project site wetland resources were assessed for performance of the following functions: flood storage and desynchronization; sediment trapping; nutrient retention; food chain support; wildlife habitat; and heritage values (use of wetlands for education, research, preservation of special status species, or other intangible uses). To evaluate these functions, hydroperiod, depth of inundation, plant species richness, native plant cover, native plant species richness, and cover by perennial plant species were rated (see Tables 1 - 3 of Appendix E for the rankings associated with each of these criteria and the results).

Based on this evaluation, the wet meadow areas are of low value due to their artificial (and relatively recent) origins, relatively low cover and native plant species richness, and minimal inundation. The seasonal marsh (which includes the non-tidal salt marsh for purposes of this evaluation) is of moderate value due primarily to its cover by natives and perennials. **Figure 47** below summarizes these results.

Figure 47
SUMMARY OF HABITAT EVALUATION
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Functions and Criteria	Seasonal Marsh	Wet Meadow
Flood Storage	**Moderate**	**Low**
Perennial cover	2*	1
Sediment Trapping	**Moderate**	**Low**
Depth of inundation	3	3
Hydroperiod	2	1
Perennial cover	2	1
Nutrient Retention	**Moderate**	**Moderate**
Species richness	2	2
Food Chain Support	**Moderate**	**Low**
Depth of inundation	3	1
Species richness	2	2
Wildlife Habitat	**Moderate**	**Low**
Depth of inundation	3	1
Hydroperiod	2	1
Species richness	2	2
Native plant cover	2	1
Native plant spp. richness	1	1
Heritage Values	**Low**	**Low**
Native plant cover	2	1
Native plant spp. richness	1	1

* Rankings are: 1 = lowest value; 2 = moderate value; 3 = highest value.

Special Status Species

Special status species are defined for purposes of this Supplemental EIR as species listed as endangered or threatened under the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA); plants designated as rare under the California Native Plant Protection Act (CNPPA); plants or animals proposed for listing under the ESA or candidates for listing under the CESA; plants or animals that are Category 1 or 2 candidates for possible future listing as threatened or endangered under the ESA; plants included on lists 1A, 1B, 2, 3, and 4 of the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants of California (5th ed. 1994); and animals designated by the California Department of Fish and Game (CDFG) as "California Species of Special Concern" (CSC).

Status designations are as follows:

FE	Listed as endangered under the ESA.
FT	Listed as threatened under the ESA.
FPE	Proposed for listing as endangered under the ESA.
FPT	Proposed for listing as threatened under the ESA.
C1	Candidate for listing under the ESA for which the U.S. Fish and Wildlife Service (USFWS) has sufficient data to support a listing as endangered or threatened.
C2	Candidate for listing under the ESA for which the USFWS does not have sufficient data to support a listing as endangered or threatened.
SE	Listed as endangered under the CESA.
ST	Listed as threatened under the CESA.
CSC	CDFG species of special concern which, although not formally listed, are monitored by the CDFG because California breeding populations of these animal species may face extinction in the near future.
CNPS List 1A	Plants presumed extinct in California.
CNPS List 1B	Plants rare, threatened or endangered in California and elsewhere.
CNPS List 2	Plants rare, threatened or endangered in California, but more common elsewhere.
CNPS List 3	Plants about which more information is needed.
CNPS List 4	Plants of limited distribution (a "watch" list).

Listed species are afforded legal protection under the respective federal and California Endangered Species Acts. Certain protections also pertain to species proposed for listing under the ESA, candidate species under the CESA, and CNPPA designated species. Federal candidate species and CSC are not protected under the ESA and CESA, respectively. The same is true of CNPS species that are not otherwise protected under federal or state law.

A list of special status plant and animal species known to occur within the general region was compiled from the most recent listing published by the USFWS for the Milpitas, Niles and Newark U.S.G.S. quadrangles; the California Natural Diversity Data Base (CNDDB) and CNPS electronic data bases; a review of available literature; and communications with USFWS staff at the San Francisco Bay National Wildlife Refuge. This list is presented in Appendix F, along with the current status of these species and general habitat requirements.

Special Status Plants

No special status plant species have been confirmed on-site through reconnaissance surveys, and the occurrence of special status plant species on the main Catellus site and Robbins parcel is unlikely given the intensive land use history of these properties, particularly leveling and irrigation associated with farming activities in the recent past. The Draft EIR (Ref. 18) stated that the Point Reyes bird's-beak and delta tule-pea, both C2 species, may be found in the salt marsh on the main Catellus site. However, due to the degraded and mostly bare nature of the salt marsh, it is unlikely these species occur in this habitat.

It is possible that the seasonally ponded (and relatively undisturbed) areas of the Stem parcel could host the following special status plant species known from similar habitats of the South Bay: alkali milk-vetch (*Astragalus tener* var. *tener*; CNPS 1B); Contra Costa goldfields (*Lasthenia conjugens*; FPE); delta tule-pea; Hoover's button-celery (*Eryngium aristulatum* var. *hooveri*; C1); San Joaquin spearscale (*Atriplex joaquiniana*; C2); and Congdon's tarplant (*Hemizonia parryi* ssp. *congdonii*; C1). Surveys for these species during the appropriate periods would be necessary to confirm their presence or absence on the Project site. Survey periods are as follows:

Alkali milk-vetch	March - June
Contra Costa goldfields	March - June
Delta tule-pea	May - June
Hoover's button celery	July
San Joaquin spearscale	April - September
Congdon's tarplant	June - November

Special Status Animals

The main Catellus site was identified in the Draft EIR (Ref. 18) as potential habitat for the salt marsh vagrant shrew and the burrowing owl, both C2 and CSC species, although neither species was observed on-site during field work performed for purposes of that EIR.

Based on the habitat assessment performed for this Supplemental EIR, it is unlikely the salt marsh vagrant shrew occupies the Project site. This species prefers dense litter or ground cover in wet micro environments such as salt marsh and grassy wet meadows. It also may require close proximity to year-round water (Clothier [Ref. 21] reported that vagrant shrews were not found farther than 180 meters [600 feet] from water). Salt marsh habitat on the Project site does not have sufficient cover or litter, and is not close enough to year-round water to support this species. Undisturbed wet meadows on the Project site may have sufficient cover and ground litter, but also are not sufficiently close to year-round water.

Because the burrowing owl is known to occur in similar habitats within the region (CNDDB, 1995), the Project site was assessed in October 1995 for its potential to support this species. Based on this assessment (Appendix G), the Project site was generally rated high for foraging potential and moderate to very high for nesting potential. One adult owl was observed on the Project site emerging from a mound containing six burrows located near the southeastern corner of the Auto Mall. The owl did not display territorial gestures, such as bobbing, and it could not otherwise be determined whether this owl was inhabiting the burrow from which it emerged.

The Project site potentially provides suitable nesting and foraging habitat for the northern harrier (*Circus cyaneus*; CSC [nesting]). While this species generally nests in emergent wetlands or along rivers or lakes, it also may nest in grasslands and grain fields several miles from water. The northern harrier forages in similar habitats. This species is known from the Project vicinity (CNDDB, 1995).

The Project site potentially may provide suitable foraging habitat for the ferruginous hawk (*Buteo regalis*; C2/CSC). This species winters in California and its known range includes the Project site, although there are no records of occurrences within the vicinity of the Project site

(CNDDB, 1995). It typically forages in large, open grasslands, and will roost on a lone tree or utility pole. Although there are few trees on the Project site, there are trees immediately adjacent to the site.

The salt marsh harvest mouse (*Reithrodontomys raviventris*; FE/SE), whose primary habitat is pickleweed, is known to occur in the region (CNDDB, 1995). The value of pickleweed as habitat for this species increases with its density and its degree of intermixing with fat-hen and alkali heath. The salt marsh habitat on the Project site is highly disturbed and degraded, and although pickleweed, fat-hen and alkali heath are present, their cover is very sparse (five percent). No individuals of this species were observed during the reconnaissance performed by Zentner and Zentner, and it is unlikely this species occurs on the Project site.

The California tiger salamander (*Ambystoma californiense*; C1/CSC) and western spadefoot toad (*Scaphiopus hammondi*; C2/CSC) are both known from the region (USFWS, 1995). These species are found in freshwater seasonal ponds on annual grasslands. It is unlikely the western spadefoot toad inhabits the generally saline and disturbed seasonal wetlands on the Project site because it prefers freshwater ponds and sandy to gravelly soils.

Notwithstanding the apparent lack of preferred habitat on the Project site for the California tiger salamander, this species recently has been reported to occur in the seasonal wetlands on the northern portion of the San Francisco Bay National Wildlife Refuge lands immediately adjacent to the Stem parcel (on the former Carruf property) (USFWS, 1995). It therefore is possible this species may inhabit (i.e., breed in) the seasonal ponds on the Stem parcel. However, it is unlikely the Stem parcel provides upland estivation habitat for the California tiger salamander because the site does not contain trees, berms, or small mammal burrows which provide the roots, cracks and holes used by this species for hibernation.

The vernal pool tadpole shrimp (*Lepidurus packardi*; FE), whose primary habitat is vernal pools, also has been found in great quantities in the old duck ponds and in vernal pools on the former Carruf property (Personal communication with Joy Albertson, USFWS Wildlife Biologist). It therefore is possible this species may be found in the seasonal wetlands on the Stem parcel, even though, based on vegetative composition, these wetlands have been classified as seasonal marsh and not vernal pools (and notwithstanding its lack of inclusion on the USFWS list for the Milpitas and Niles quads, and the lack of CNDDB occurrence records within the vicinity of the Project site).

The Project site does not contain suitable habitat for the other animal species listed in Appendix F.

Mitigation Site

The Project applicant has proposed the use of all or a portion of the Stem parcel and/or a 56-acre property it owns on Stevenson Boulevard (the "Stevenson Boulevard property") in Fremont as potential mitigation sites for impacts to wetland resources on the Project site. A conceptual mitigation plan drafted by ENTRIX is attached at Appendix H. A preliminary assessment by Zentner and Zentner of the suitability of the Stevenson Boulevard property as a mitigation site for the fill of wetlands on the Project site was performed in October 1995. This assessment is attached as Appendix I. Although further evaluation is necessary prior to developing a detailed

mitigation plan, the physical characteristics of the Stem and Stevenson Boulevard properties would support the creation of seasonal wetlands such as those found on the Project site (A COE-verified delineation of existing wetlands on the Stevenson Boulevard property also would be necessary). A similar site (or sites) located in proximity to the Project site also would be acceptable.

The Project applicant's conceptual mitigation plan proposes the construction of seasonally ponded wetlands within a mosaic of a series of depressional areas and intervening uplands. These wetlands will provide habitat for waterfowl, shorebirds, and other water-associated birds during the winter and spring months when these areas are ponded. Top soil from existing ponds on the Project site will be salvaged and used to inoculate the constructed wetlands. Target species for both the wetlands and the uplands will include species presently found on-site, as well as native species. A detailed mitigation plan will be submitted for approval by the City of Fremont after its approval of the conceptual plan.

The goals guiding development of the mitigation wetlands are:

- Seasonally ponded wetland habitat will be created to offset the loss of wetland functions on the Project site.
- The vegetation will include native perennial wetland species, most of which are found on the Project site.
- The relative percent cover by native and perennial species will exceed cover at existing seasonally ponded wetlands on the Project site.

To achieve these goals and establish high value mitigation wetlands, the following performance criteria are proposed:

- The seasonally ponded wetlands will support on average a minimum of eight plant species, including a minimum of five of the following native wetland species: *Atriplex patula hastata*; *Atriplex semibaccata*; *Boisduvalia glabella*; *Cotula coronopifolia*; *Cressa truxillensis*; *Distichlis spicata*; *Eleocharis macrostachya*; *Eryngium aristulatum*; *Frankenia grandifolia*; *Hordeum brachyantherum*; *Salicornia virginica*; *Spergularia marina*.
- On average, the relative percent cover by native plant species will exceed 75 percent and the relative percent cover by perennials will exceed 50 percent.
- The depth of ponding in the wetlands will vary from 6 to 18 inches. The total period of inundation will be a minimum of three months during years of normal rainfall.

The mitigation wetlands will be monitored for five years. Monitoring activities will include ascertaining the duration and measuring the depth of ponding in the wetlands, and recording the vegetation that becomes established in the wetlands and surrounding uplands.

Regulatory Background

This section presents a brief overview of certain potentially applicable federal and state regulations, and is not intended as an exhaustive discussion of all laws and regulations that may affect the Project (e.g., the federal Migratory Bird Treaty Act and other bird protection laws).

VI. OTHER CONSIDERATIONS

Federal

Clean Water Act Section 404

Jurisdictional Delineation

The U.S. Army Corps of Engineers (COE) regulates the discharge of dredged or fill material into "waters of the United States" primarily under Section 404 of the Clean Water Act (CWA). As defined in the implementing regulations, "waters of the U.S." include a broad range of wet environments, such as lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, and wet meadows. "Wetlands" are further defined as:

> "[T]hose areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." 33 C.F.R. Section 328.3(b).

To be designated as a jurisdictional wetland under CWA Section 404, a site generally must have a predominance of wetland plants and evidence of wetland soils and hydrology indicators, all under the "normal circumstances" for the site. The Delineation Manual sets forth the methodologies to be used in determining whether an area is a wetland for purposes of CWA Section 404.

This Supplemental EIR does not determine the jurisdictional status of any of the areas classified as "wetland resources". It is the Project applicant's responsibility to obtain Corps approval of a jurisdictional delineation of the Project site under CWA Section 404.

Section 404 Permit

A CWA Section 404 permit is required for any non-exempt discharge of dredged or fill material into "waters of the U.S." Nationwide permits (NP) exist for regulated activities which have been determined to have minimal impacts on the aquatic environment. If the discharge does not cause the loss of more than ten acres of isolated waters, or waters above the headwaters, the Project may qualify for Nationwide Permit (NP) 26. Prior notification must be submitted to the COE if the discharge will result in the loss of more than one acre of such jurisdictional waters. Mitigation generally is required for fills in excess of one acre, and may be required for less than one-acre discharges. Within thirty days of receipt of this predischarge notification, the COE must determine whether the activity can be authorized under NP 26. During this thirty-day period, the Environmental Protection Agency (EPA), USFWS and CDFG generally comment on the proposed project (acting in an advisory capacity to the COE). Examples of other nationwide permits include: NP 7 (outfall structures); NP 12 (utility lines); NP 13 (bank stabilization); NP 14 (road crossings); and NP 33 (temporary construction access and dewatering).

If the proposed Project does not qualify for a nationwide permit, or if the COE in its discretion determines that the regulated activity will result in more than minor impacts, an individual permit would be required. For an individual permit, the Project applicant must submit a formal application to the COE, along with a mitigation proposal and alternatives analysis. In compliance with CWA Section 404(b)(1) guidelines, the alternatives analysis must demonstrate that there are

no practicable alternative locations or Project designs that would reduce or eliminate the proposed discharge into regulated waters.

An individual permit also involves the distribution of a public notice (generally with a 30-day comment period) to a wide list of potential respondents, and review by the COE under the National Environmental Policy Act to determine whether an Environmental Impact Statement must be prepared. CWA Section 404 regulations also grant to the EPA and the USFWS the authority to object to permit issuance if unacceptable adverse effects to "aquatic resources of national importance" will result. EPA also has the authority to veto a permit, although this veto is rarely exercised. While COE regulations state that a typical individual permit should take sixty days or less to process, the prescribed time limits may be extended for an indefinite period of time. Typically, the process may require nine months to three years to complete from the time of submittal to the Corps of the permit application.

The COE also must comply with Section 106 of the National Historic Preservation Act in issuing permits under CWA Section 404. Information supplied by the Project applicant regarding historic sites within the Project area would be used in this evaluation by the COE.

To ensure the activity authorized under CWA Section 404 does not conflict with state water quality plans, the Project applicant also must obtain either a water quality certification or a certification waiver from the Regional Water Quality Control Board pursuant to CWA Section 401(a).

ESA

The ESA prohibits the "taking" of a federally listed endangered or threatened species unless: 1) an opinion has been issued for the proposed project under Section 7 of the ESA that the project will not result in jeopardy to the species (the "biological opinion"); or 2) a Habitat Conservation Plan for the species has been approved in compliance with Section 10(a) of the ESA. "Take" is defined in the ESA as "harass, harm, pursue, hunt, shoot, would, kill, trap, capture, or collect, or attempt to engage in any such behavior". 16 U.S.C. Section 1532(19). Implementing regulations for the ESA further define "harass" as an "intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering." 50 C.F.R. Section 17.3. "Harm" is further defined as an "act which actually kills or injures wildlife...includ[ing] significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering". *Id.* The USFWS is responsible for administering the ESA.

If an activity regulated by the COE may affect a federally listed threatened or endangered species, the COE must initiate consultation with the USFWS under Section 7 of the ESA. The COE may initiate "conferencing" with the USFWS (and proceed informally or follow the procedures for consultation) if the COE determines that a project is likely to jeopardize the continued existence of a species proposed for listing as endangered or threatened. Federal regulations impose the following time limits for conducting a Section 7 consultation: (1) the consultation must conclude within ninety days after its initiation; (2) the USFWS then has forty-five days to issue a biological opinion; and (3) under certain circumstances, a sixty-day extension may be allowed. A "no jeopardy" biological opinion will allow the incidental take of the affected species and must include a statement that:

"(i) Specifies the impact, i.e., the amount or extent, of such incidental taking of the species;

(ii) Specifies those reasonable and prudent measures that the Director considers necessary or appropriate to minimize such impact;

(iii) Sets forth the terms and conditions (including, but not limited to, reporting requirements) that must be complied with by the Federal agency or any applicant to implement the measures specified under (ii) above; . . . ." 50 C.F.R. Section 401.14(I)(1).

In situations in which a project proponent must apply directly to the USFWS for an incidental take permit (a permit which allows an otherwise prohibited "take" of a species which is incidental to the carrying out of an otherwise lawful activity) for impacts to listed species (e.g., if a COE or other federal permit is not required for the project, or if the COE determines that a listed species potentially affected by the project is found outside the COE's impact area), section 10(a) of the ESA governs the application process.

State

CESA

The CESA which is administered by the CDFG, prohibits the taking of state-listed endangered or threatened species. The CESA does not define "take". Generally, the CDFG comments on project impacts to state-listed and candidate species during the CEQA process (and recommends mitigation for such impacts). However, under current CESA practice, it is the responsibility of a project proponent to initiate discussions with the CDFG concerning project impacts to such species. The CDFG may require a management agreement to address impacts to listed and candidate species.

CNPPA

The CNPPA provides certain protections to species of native plants determined by the CDFG to be endangered or rare (Cal. Fish & Game Code Section 1900 et seq.). If a landowner has been notified by the CDFG that a designated endangered or rare native plant is growing on his or her property, the landowner must notify the CDFG at least ten days prior to any change in use of the land to allow for salvage of the plant. If the CDFG does not salvage the plant within ten days of such notification, the landowner may proceed and is not required to preserve, salvage, or otherwise mitigate for loss of the plant.

Fish and Game Code Section 1600 et seq.

The CDFG has jurisdiction under Section 1600 et seq. of the California Fish and Game Code over activities which would "substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by the department." Cal. Fish & Game Code Section 1603. Under Section 1603, a notification of the streambed alteration is filed with the CDFG by the project applicant. The CDFG then has thirty days to negotiate an agreement with the applicant. This agreement generally includes measures for the protection of fish and wildlife affected by the regulated activity.

2. Impacts

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, significant environmental effects on biological resources are defined as:

- Substantial reduction in a population or in critical habitat of special status plant or animal species;
- Substantial interference with the movement of any resident or migratory fish or wildlife species; and
- Substantial reduction in habitat for fish, wildlife or plants.

Although not specifically identified in the CEQA Guidelines as normally having a significant effect on biological resources, impacts to wetland resources are of great concern to jurisdictional agencies due to the regional and national importance of these features (including providing habitat for special status plant and animal species). For purposes of this Supplemental EIR, impacts to wetland resources are considered a significant environmental effect.

Vegetation

Impact 6-3: Project development would eliminate all or a substantial portion of the non-native grassland on the Project site. This plant community is very common and is not considered sensitive (CNDDB, 1995); the vegetation is dominated by non-native species; it generally does not support special status plant or animal species; and the habitat can easily be created or improved. However, because of the potential of the non-native grassland to provide nesting and foraging habitat for the burrowing owl, and nesting habitat for the northern harrier, this loss is considered a *potentially significant impact.*

For purposes of identifying impacts and mitigation measures, the wet meadow habitat is discussed below under "Wetland Resources".

Project development would eliminate all cropland on the Project site, approximately 23.40 acres. The plants observed in this habitat are non-native common crop species and agricultural weeds, and it generally does not support special status plant or animal species. Its loss, therefore, is not considered a significant impact to biotic resources.

Impact 6-4: Based on the surveys performed for purposes of this Supplemental EIR, the Project site contains roughly 100.30 acres of wetland resources as follows: 2.30 acres of non-tidal salt marsh; 56.70 acres of seasonal marsh; and 41.30 acres of wet meadow habitat. The current development plan for the proposed Project will eliminate all wetland resources on the Project site, excepting approximately 4.30 acres of seasonal marsh on the Stem parcel.

Seasonal marsh areas on the Project site (which include the non-tidal salt marsh for evaluation purposes) are considered moderate value due to their cover by native and perennial species. The seasonal wetlands on the Stem parcel are in a relatively undisturbed condition; potentially support special status plant and animal species; and are adjacent to the San Francisco Bay National Wildlife Refuge.

Wet meadow areas are considered low value because of their artificial origins (substantial grading has occurred on portions of the main Catellus site); dominance by non-native plants; and hydrologic isolation which greatly reduces their water quality improvement functions.

Loss of Project site wetland resources is considered a *significant impact.*

Special Status Plant Species

Impact 6-5: Project site development may result in impacts to the following special status plant species which may occur in the seasonal wetlands on the Stem parcel: alkali milk-vetch; delta tule-pea; Hoover's button-celery; Congdon's tarplant; San Joaquin spearscale; and Contra Costa goldfields. Impacts to these species are considered *potentially significant.*

Special Status Animal Species

Impact 6-6: Project site development will result in the elimination of suitable nesting and foraging habitat for the burrowing owl over most of the Project site. Impacts to this species and its habitat are considered *potentially significant.*

Impact 6-7: Project site development will result in the elimination of suitable nesting habitat for the northern harrier over most of the Project site. Impacts to this species and its habitat are considered *potentially significant.*

Impact 6-8: The seasonal wetlands on the Stem parcel may provide breeding habitat for the California tiger salamander. Impacts to this species and its habitat are considered *potentially significant.*

Impact 6-9: The seasonal wetlands on the Stem parcel may provide habitat for the vernal pool tadpole shrimp. Impacts to this species and its habitat are considered *potentially significant.*

Impacts to the salt marsh vagrant shrew, salt marsh harvest mouse, and western spadefoot toad are considered less than significant because of the very low probability of the occurrence of these species on the Project site. Impacts to the ferruginous hawk are considered less than significant because though the Project site may contain potentially suitable foraging habitat (and adjacent sites may provide suitable roosting habitat), there are no records of occurrences of this species within the vicinity and the Project site does not contain nesting or roosting habitat.

3. Mitigation Measures

Vegetation

Mitigation 6-3: Implementation of Mitigation Measures **6-6** and **6-7** below will reduce to *less than significant* the impacts to non-native grassland associated with the loss of suitable burrowing owl and northern harrier habitat.

Mitigation 6-4: Open Space (OS) Goal 2 of the Fremont General Plan states: "Recognition, protection, and enhancement of significant natural areas and wildlife habitats in the city, including Bay tidal, seasonal, and freshwater wetlands, and open meadows and fields." Objective OS 2.2 is the "[p]rotection and enhancement of wetlands within the city." Policy OS 2.2.1 states: "The City shall take an active role in protecting wetlands. There shall be no net loss of wetlands as a result of development in Fremont." Because Project site wetland resources do not represent significant natural areas, no net loss of wetland values is used in establishing appropriate mitigation for loss of wetland resources.

A detailed wetland mitigation plan as described in Appendix H shall be developed for City approval for all or a portion of the Stem parcel and/or the 56-acre Stevenson Boulevard property, or similar site located in proximity to the Project site, to compensate for the loss of wetland resources resulting from Project construction. Using a target of no net loss of wetland values, and based on the low to moderate value of the wetland resources on the Project site, and the relative ease of constructing seasonal wetlands such as those occurring on the Project site, mitigation wetlands could be of a lesser extent than those being filled by Project construction.

Based on the habitat evaluation of Project site wetland resources contained in Appendix E, the seasonal marsh (which for purposes of the evaluation and mitigation includes the non-tidal salt marsh) proposed for fill on the Project site (59 acres) has a value of 2.1, for a rating of 124; the wet meadow habitat (41.30 acres) has a value of 1.2, for a rating of 50. Accordingly, mitigation wetlands must rate a total of 174. Using the performance criteria set forth in Appendix E, it is anticipated that mitigation wetlands will have a value of 3; therefore, a minimum of 58 acres of seasonal wetlands meeting the performance criteria established in Appendix E (and in the subsequently approved detailed mitigation plan) must be created to mitigate for the fill of wetland resources on the Project site.

As stated in Appendix H, the mitigation wetlands will be monitored for five years. If any of the performance criteria are not met at the end of the five-year period, appropriate remedial measures shall be employed and the wetlands monitored for an additional three years. If the performance criteria are not met after the additional three-year monitoring period, the Project applicant shall propose supplemental mitigation (e.g., enhancement or refinement of the approved mitigation) to be approved by the City to achieve no net loss of wetland values.

Implementation of this mitigation measure shall reduce impacts to wetland resources to a level of *less than significant.*

Special Status Plant Species

Mitigation 6-5: Surveys for the special status plant species potentially occurring on the Stem parcel (alkali milk-vetch, delta tule-pea, Hoover's button-celery, Congdon's tarplant, San Joaquin spearscale, and Contra Costa goldfields) shall be performed by a qualified biologist during the appropriate period in any seasonal wetland proposed for fill on this parcel. If any of these plant species are found, mitigation based upon the individual species' horticultural requirements shall be developed by a qualified biologist and approved by the City. This mitigation plan may be incorporated into the wetland mitigation plan required in Mitigation Measure **6-4** above, and shall require, at a minimum, plant density and general distribution similar to existing conditions on the Project site for two successive years after implementation of the mitigation.

Implementation of this mitigation measure shall reduce impacts to special status plant species to a level of *less than significant.*

Special Status Animal Species

Implementation of all of the following mitigation measures shall reduce impacts to special status animal species to levels of *less than significant.*

Mitigation 6-6: A survey for burrowing owls in accordance with CDFG guidelines shall be performed by a qualified biologist no more than six months but at least 45 days prior to commencement of any construction activities in areas of burrowing owl observances and in areas with mounds, berms or other suitable ground-nesting locations. Prior to construction, burrowing owl nesting sites impacted by development shall be relocated in accordance with CDFG guidelines, or as may otherwise be developed by a qualified biologist and approved by the City. Uplands on the wetland mitigation site(s) may be considered for the burrowing owl nesting site relocation. Occupied burrows shall not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist verifies that either: 1) the birds have not begun egg-laying and incubation; or 2) juveniles from the occupied burrows are foraging independently and capable of independent survival. The City shall approve any such request for nest disturbance during the nesting season.

In the alternative, surveys in conformance with applicable CDFG guidelines shall be performed during the breeding (February 1 - August 31) and wintering (generally December 1 - January 31 when wintering owls are most likely to be present) seasons to estimate burrowing owl populations on the Project site. If owl populations are confirmed, and avoidance is not practicable, the extent of impacts to the entire Project site shall be assessed and a comprehensive relocation and mitigation plan shall be developed by a qualified biologist and approved by the City.

Mitigation 6-7: A survey for northern harrier nesting sites shall be performed by a qualified biologist during the breeding season, June - July, prior to any grading or other ground disturbing activities during those months. If nesting sites are found, they shall not be disturbed during the breeding season and protective measures shall be developed by a qualified biologist and approved by the City. A mitigation plan prepared by a qualified biologist and approved by the City shall be developed for those nesting sites that will be disturbed by Project construction after the breeding season. This mitigation plan may be incorporated into the wetland mitigation plan required in Mitigation Measure **6-4** above, and shall provide, at a minimum, for creation of the same number of nesting sites as are disturbed by Project construction. Performance standards shall be developed that require evidence of use by northern harriers of the newly created nesting sites over two succeeding seasons.

In the alternative, a survey of the entire Project site during the breeding season shall be performed by a qualified biologist. If northern harrier nesting sites are found, and avoidance is not practicable, the extent of impacts to the Project site shall be assessed and a comprehensive mitigation plan shall be developed by a qualified biologist and approved by the City.

Mitigation 6-8: A survey for California tiger salamander larvae shall be performed by a qualified biologist during the winter months when the seasonal wetlands are ponded on the Stem parcel if any of these areas are proposed for development. If larvae are found, a mitigation plan shall be developed by a qualified biologist and approved by the City. This mitigation plan may be incorporated into the wetland mitigation plan required in Mitigation Measure **6-4** above, and shall require, at a minimum, evidence of California tiger salamander densities and distribution in the created habitat similar to those found on the Project site for two successive years following implementation of the mitigation plan.

Mitigation 6-9: Surveys for the vernal pool tadpole shrimp in accordance with protocols to be developed by the Project applicant (in consultation with a qualified biologist) and approved by the City, shall be performed by a qualified biologist on any area of the Stem parcel proposed for development which contains seasonal wetlands. If vernal pool tadpole shrimp are found, and avoidance is not practicable, a mitigation plan shall be developed by a qualified biologist and approved by the City. This mitigation plan may be incorporated into the wetland mitigation plan required im Mitigation Measure **6-4** above, and shall require, at a minimum, evidence of densities and distribution of vernal pool tadpole shrimp in the created habitat similar to those found on the Project site for two successive years following implementation of the mitigation plan.

C. AIR QUALITY

1. Setting

Air Pollution Climatology

The Project site is located in the San Francisco Bay Area, a large, shallow air basin ringed by hills, with a number sheltered valleys around the perimeter. Two primary sea-level gaps in the hills exist: the Golden Gate and the Carquinez Straits. These two gaps are important sources of ventilation for the Bay Area.

Northwest winds and westerly winds are most common in Fremont. Winds from these directions carry pollutants released by autos and factories from upwind areas, particularly during the summer months. Winds are lightest on the average in fall and winter. Every year in fall and winter there are periods of several days when winds are very light and local pollutants can build up.

Ambient Standards

The Mulford-Carrell Act of 1969 and the Clean Air Act Amendments of 1970 established state and federal air quality standards for several pollutants. These standards are divided into primary standards, designed to protect the public health, and secondary standards, intended to protect the public welfare from effects such as visibility reduction, soiling, nuisance and other forms of damage. The state and federal standards are summarized in Appendix I.

The air pollutants covered in the above-described legislation are known as "criteria" pollutants, in that their effects are documented in criteria documents which form the basis for federal and state ambient air quality standards.

Another group of substances, known as Toxic Air Contaminants (TACs) are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants.

The Bay Area Air Quality Management District (BAAQMD) has assembled an inventory of toxic emission sources. Several sources of TACs are located within a short distance of the proposed project site (Ref. 10).

The Toxic "Hot Spots" Information and Assessment Act (AB 2588), enacted in 1987, required the Bay Area Air Quality Management District to develop information on TAC emissions and resulting health risks. For priority sources, health risk assessments were prepared. For facilities with the highest risk levels, public notification is required. None of the TAC sources near the Project site were identified as being required under AB 2588 to notify the public regarding health risks (Ref. 11).

Current Air Quality

Air quality is monitored in Fremont on Chapel Way. **Figure 48** shows air quality data for criteria pollutants measured at this site for 1992-1994. **Figure 48** shows that the federal ambient air quality standards for most criteria pollutants are met in Fremont. Concentrations of ozone and PM-10 do, however, exceed the state standards.

Figure 48
SUMMARY OF AIR QUALITY DATA FOR FREMONT
1992-1994
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Pollutant	Standard	Days Above Standard: 1992	1993	1994
Ozone	Federal 1-hour	0	1	0
	State 1-hour	5	5	4
PM-10	Federal 24-hour	0	0	0
	State 24-hour	4	3	3
Carbon Monoxide	Fed./State 8-Hour	0	0	0
Nitrogen Dioxide	State 1-Hour	0	0	0
Sulfur Dioxide	State 1-Hour	0	0	0

Source: Refs. 12, 7.

Regional Air Quality Planning

The federal Clean Air Act and the California Clean Air Act of 1988 require that the State Air Resources Board, based on air quality monitoring data, designate portions of the state where the federal or state ambient air quality standards are not met as "nonattainment areas". Because of the differences between the national and state standards, the designation of nonattainment areas is different under the federal and state legislation.

Federal Air Quality Program

The Bay Area recently was redesignated by the U.S. Environmental Protection Agency as a "maintenance area" for ozone. The "Urbanized Area" of Alameda County is considered nonattainment for carbon monoxide (although a request for redesignation to "maintenance area" has been submitted to the U. S. Environmental Protection Agency). Other portions of the county are either attainment areas or unclassified for all other national ambient air quality standards.

State Air Quality Program

Under the California Clean Air Act, Alameda County is a nonattainment area for ozone and PM-10. The county is either an attainment area or unclassified for other pollutants.

The area-wide plan required by the California Clean Air Act was adopted in 1991 and updated in 1994 (Ref. 9). The Plan proposes the imposition of controls on stationary sources (factories, power plants, industrial sources, etc.) and Transportation Control Measures designed to reduce emissions from automobiles. Since the Plan does not provide for a five percent annual reduction in emissions, it proposes the adoption of "all feasible measures on an expeditious schedule".

2. Impacts

Construction Impacts

Construction activities are a source of organic gas emissions. Solvents in adhesives, non-waterbased paints, thinner, some insulating materials and caulking materials used at the Project site would evaporate into the atmosphere and would participate in the photochemical reaction that creates urban ozone. Asphalt used in paving is also a source of organic gases for a short time after its application.

The major construction air quality impacts would be due to dust generated by equipment and vehicles. Fugitive dust is emitted both during construction activity and as a result of wind erosion of exposed earth surfaces. Clearing and earthmoving activities comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions.

The effects of construction activities would be increased dustfall and locally elevated levels of PM-10 near the of construction activity. Depending on the weather, soil conditions, the amount of activity taking place and nature of dust control efforts these impacts could affect adjacent properties or previously-completed portions of the Project site. Because of this variability, construction dust impacts are considered to be a potentially significant adverse impact.

Impact 6-10: Dust generated during Project construction would represent a *potentially significant adverse environmental impact.*

Local Air Quality Effects

Traffic-Related Impacts

On the local scale, the Project would increase traffic on the local street network, increasing carbon monoxide levels along roadways used by Project-related traffic. Carbon monoxide is an odorless, colorless, poisonous gas. The primary source of carbon monoxide in the Bay Area is automobiles. Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections.

The CALINE-4 computer simulation model was applied to three intersections near the Project site. These intersections were selected as those most affected by Project-generated traffic. The model results were used to predict the maximum 1- and 8-hour concentrations to be expected near these intersections, corresponding to the 1- and 8-hour averaging times specified in the state and federal standards for carbon monoxide. The CALINE-4 program and the assumptions made in its use are described in Appendix J.

Figure 49 shows the results of the intersection analysis for the peak 1-hour and 8-hour traffic periods in parts per million (PPM). Predicted year 2000 1-hour concentrations are to be compared to the state standard of 20 PPM and the federal standard of 35 PPM. Predicted year 2000 8-hour concentrations in **Figure 49** are to be compared to the state and federal standard of 9 PPM.

Figure 49
YEAR 2000 PREDICTED 1-HOUR AND 8-HOUR CARBON MONOXIDE CONCENTRATIONS AT SELECTED INTERSECTIONS, IN PPM
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

	Proposed Project (General Plan Network)		Proposed Project (Proposed Network)	
Intersection	1-Hour	8-Hour	1-Hour	8-Hour
Auto Mall/Christy	12.2	7.6	12.3	8.0
Auto Mall/Boyce	10.0	6.1	10.4	8.0
Cushing/Fremont	13.4	8.5	13.6	8.6

Projected concentrations under worst-case assumptions of traffic and meteorology are below the state and federal standards with either the General Plan roadway network or proposed roadway network. Project impacts on carbon monoxide concentrations are considered to be less-than-significant.

Odor Impacts

The proposed Project would not contain any sensitive receptors for odors. Project odor impacts would be less than significant.

Toxic Air Contaminant Impacts

The proposed Project would not contain any sensitive receptors for Toxic Air Contaminant Emissions. Project TAC impacts would be less than significant.

Regional Impacts

Trips to and from the Project site would result in air pollutant emissions affecting the entire San Francisco Bay air basin. Regional emissions associated with project vehicle use has been calculated using the URBEMIS-5 computer program. The URBEMIS-5 program and the assumptions made in its use are described in Appendix J.

The estimated incremental daily emissions associated with project-related traffic are shown in **Figure 50** below for reactive organic gases and oxides of nitrogen (two precursors of ozone), PM-10 and sulfur dioxide.

Direct Emissions

The proposed Project would be a direct source of pollutants from industrial sources. The industrial portions of the Project could, depending on the nature of the uses, be a source of pollutants from combustion of fuels, evaporation of solvents or other industrial processes.

Figure 50
PROJECT REGIONAL EMISSION IN POUNDS PER DAY
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Source	ROG	NOx	PM-10	SOx
Automobiles	457.7	700.8	123.5	83.0
Industrial Sources	2231.0	23.7	11.9	neg.
Total	2688.7	724.5	135.4	83.0

ROG = Reactive Organic Gases
NOx = Oxides of Nitrogen
PM-10 = Particulate Matter, 10 Micron
SOx = Sulfur Oxides
neg. = negligible

Since the number, type and strength of any eventual new industrial sources that may locate within the Project site is not known, direct industrial emissions have been estimated based upon generalized per-acre emission rates. Industrial uses were assumed to consist equally of semiconductor and electronic component manufacturing. The resulting emissions for industrial uses are shown in **Figure 50**.

Assessment of Regional Impacts

Guidelines for the evaluation of Project impacts issued by the Bay Area Air Quality Management District consider emission increases to be significant if they exceed 150 lbs. per day for any regional pollutant (Ref. 8). Project emissions shown in **Figure 50** exceed this criterion for two regional pollutants, so the Project would have a significant effect on regional air quality.

The Project's impact on regional emission, together with that of cumulative development in the South Bay, would contribute to the continuing ozone problem in the region.

Impact 6-11: The Project would have a *significant adverse impact* on regional air quality, and would contribute to the continuing ozone problem in the region.

3. Mitigation

Construction Impacts

Conditions of approval should require contractors to reduce dust generation. Construction dust impacts can be reduced by the following measures:

Mitigation 6-10A: Suspend earthmoving or other dust-producing activities during periods of high winds when dust control measures are unable to avoid visible dust plumes.

Mitigation 6-10B: Provide equipment and staffing for watering of all exposed or disturbed soil surfaces sufficient to suppress dust plumes, including weekends and holidays. An appropriate dust palliative or suppressant, added to water before application, should be utilized.

Mitigation 6-10C: Water or cover stockpiles of debris, soil, sand or other materials that can be blown by the wind.

Mitigation 6-10D: Sweep construction area and adjacent streets of all mud and debris, since this material can be pulverized and later resuspended by vehicle traffic.

Mitigation 6-10E: Limit the speed of all construction vehicles to 15 miles per hour while travelling on unpaved surfaces.

Mitigation 6-10F: All inactive portions of the site shall be watered with an appropriate dust suppressant, covered or seeded.

The use of watering alone for dust control is estimated to reduce dust emissions by about 50 percent. The combined effect of the above measures, including the use of a dust suppressant, would have a control efficiency of 70 to 80 percent, which would reduce Project impacts to a level of *less than significant*.

The monitoring of construction mitigation measures would be the responsibility of the City of Fremont.

Regional Impacts

Mitigation 6-11A: The City of Fremont should require the Project applicant to develop a TDM (Transportation Demand Management) program for the proposed Project. An aggressive TDM program has the potential to reduce daily trips by approximately 10 to 25 percent, and air quality impacts associated with auto use would be reduced proportionally.

Mitigation 6-11B: When a significant amount of development has been completed, the City of Fremont should require annual surveys documenting the effectiveness of the TDM program in reducing single-occupant commuting.

Although implementation of these two mitigation measures would reduce the regional air quality impacts associated with the proposed Project, these impacts would remain *significant*.

D. NOISE

1. Setting

Existing Noise Environment

The major noise source in the area is vehicular traffic on I-880 and Auto Mall Parkway. The Southern Pacific Railroad operates on tracks approximately 2,500 feet west of the Project site. The Christy Concrete Plant and Specialty Crushing are located along I-880. Christy Concrete is a pre-cast concrete manufacturing plant which produces concrete utility boxes. Specialty Crushing currently breaks down large pieces of concrete, but is a temporary use. Noise from the plants include processing and truck traffic. The Sky Sailing Airport and Baylands Raceway Park no longer operate.

The original noise measurements for the Project were made in 1987 and 1991. In order to update the noise levels for this analysis, supplemental noise measurements were made on November 8 and 9, 1995. **Figure 51** shows the locations of the noise measurements.

Noise from I-880 dominates the eastern portion of the Project site. The noise from I-880 drops off with increasing distance from the roadway but remains clearly audible near the center of the Project site. Noise from Auto Mall parkway is audible in the northern portion of the Project site, but contributes much less to the overall noise environment. **Figure 52** summarizes the noise measurement results. Those readers not familiar with the fundamentals of environmental noise and its measurement are referred to Appendix K.

At site 1, the dominant noise is from the Auto Mall Parkway. Occasional sound from the P.A. system at the Auto Mall was barely audible. At site 2, the dominant noise source was traffic on I-880. At site 3, the dominant noise source was I-880. Noise from some maintenance at the existing offices near site 3 (release of gas which makes a hissing sound) was audible and generated a level of 65 to 69 dBA. The sound of material handling of Christy Concrete was audible but not measurable at site 3.

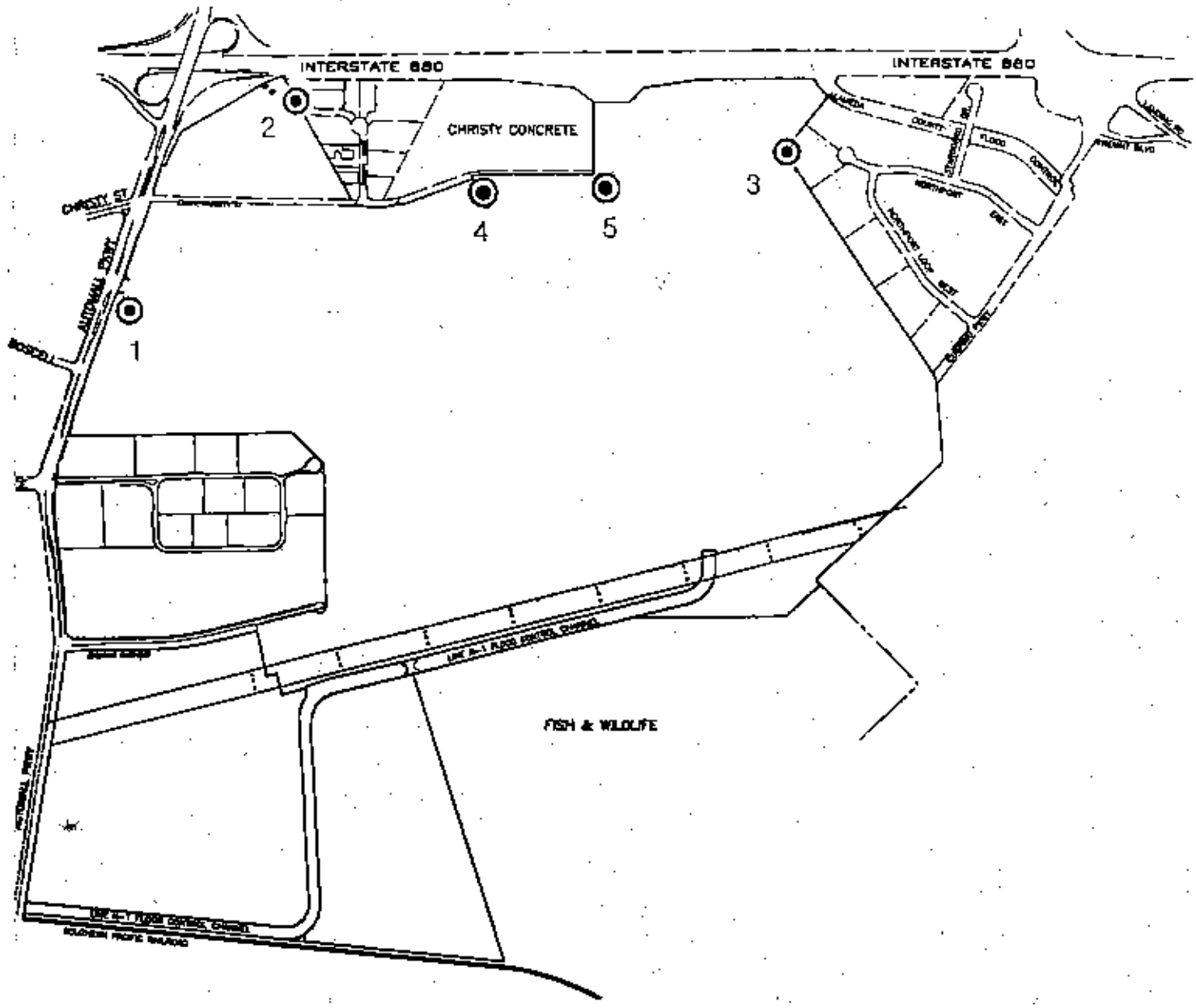
At sites 4 and 5, noise from Christy Concrete was clearly audible. The dominant noise was from a Columbia machine which is used to form the concrete. The Columbia machine operates at sound levels of 54 to 58 dBA on the Project site. Other noise sources include fork lifts and the large mixing tower which generate maximum levels of 52 to 65 dBA. Christy Concrete operates from 7:00 AM to 3:30 PM Monday through Friday.

An average of 12 to 14 trains operate per day on the Southern Pacific railroad tracks along the western boundary of the Project site. Previous studies indicate that the CNEL from the railroad will be less than 53 dB on the Project site.

Existing Noise-Sensitive Receptors

Existing land uses within the Project vicinity are primarily research and development, and offices. There are industrial/office parks south of Auto Mall Parkway near Christy Avenue and north of Cushing Road near I-880. The Fremont Auto Mall is located south of Auto Mall Parkway near the center of the Project site. No residential uses are adjacent to the Project site.

Figure 51
NOISE MEASUREMENT LOCATIONS AT THE PROJECT SITE
NOVEMBER 8-9, 1995 & MARCH 26, 1996
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



Charles M Salter Associates Inc

Figure 52
NOISE MEASUREMENT DATA
NOVEMBER 8-9, 1995 & MARCH 26, 1996
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

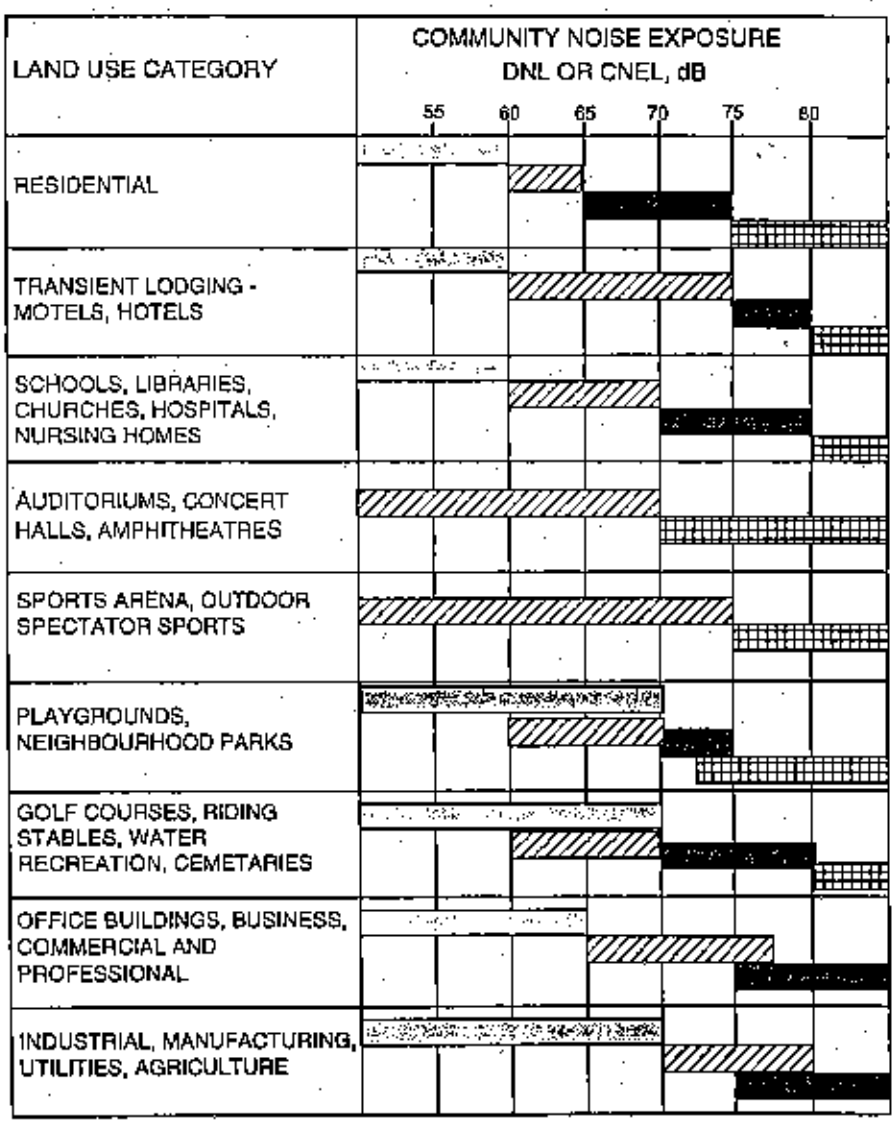
Site	Location	Date/Time	A-Weighted Sound Level (dBA)				
			L_{10}	L_{50}	L_{90}	L_{eq}	DNL
1	75 feet from centerline of Auto Mall Parkway, 8 feet above the roadway	Nov. 8-9, 1995 24 Hours	70	60	51	66	70
2	110 feet west of I-880 r/w fence south of Auto Mall Parkway near existing Building	Nov. 9, 1995 4:35 PM - 4:50 PM	72	70	66	70	73
3	South side of Project site near existing business park	Nov. 9, 1995 3:45 PM - 4:00 PM	65	56	52	60	63
4	West of Christy Street 60 feet from entrance to Christy Concrete	Mar. 26, 1996 9:57 AM - 10:00 AM	---	---	---	54	---
5	Southwest corner of Christy Concrete 220 feet from Columbia machine	Mar. 26, 1996 10:49 AM - 10:54 AM	---	---	---	58	---

Commercial and industrial land uses are typically not considered noise-sensitive receptors. These land uses do, however, have applicable noise compatibility standards. These standards are contained in the Noise Element of the Fremont General Plan.

Noise Standards

The City of Fremont has adopted a health and Safety Element as part of its General Plan. The Health and Safety Element has Land Use Compatibility Guidelines for various land uses. These standards are summarized in **Figure 53**. For industrial uses, a DNL of up to 70 dB is considered "normally acceptable" while a DNL of 70 to 80 dB is considered "conditionally acceptable". For office buildings, business, commercial and professional uses, a DNL of 65 dB or less is "normally acceptable". A DNL of 65 to 77.5 is "conditionally acceptable". **Figure 53** defines the various "acceptability" levels.

Figure 53
CITY OF FREMONT LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California



NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

CLEARLY UNACCEPTABLE
New construction or development clearly should not be undertaken.

For office buildings, Policy HS 8.1.1 of the Fremont General Plan recommends an interior noise level of an L_{eq} of 45 dB or less. For industrial and commercial land uses, Policy HS 8.1.3 of the Fremont General Plan discusses noise created by commercial and industrial sources as they may affect adjacent noise-sensitive (residential) land uses.

The City of Fremont also has a Municipal Code which restricts noise generation at all properties. Section S-21904 of the Municipal Code restricts noise at the property line nearest the source to 70-75 dBA. For industrial or wholesale uses, noise levels are restricted to 65 to 70 dBA adjacent to offices, retail or sensitive industries.

Future Noise Environment

Traffic noise levels have been estimated for various roadways based on year 2010 network traffic volumes supplied by TJKM Transportation Consultants (see Appendix A). The noise predictions assume free flow traffic speed according to the City of Fremont's traffic model, and truck percentages as follows:

Auto Mall Parkway	14 percent
Cushing Road	10 percent
Local Roads	5 percent

Figure 54 shows the predicted future noise levels along the roadways.

Figure 54
PROJECTED FUTURE NOISE LEVELS
Catellus Pacific Commons GPA/PD Rezoning Draft Supplemental EIR
City of Fremont, California

Roadway	DNL @ 100 feet (dB)	Distance in feet to DNL = 65 dB Noise Contour	Distance in feet to DNL = 70 dB Noise Contour
I-880	79	858	398
Auto Mall Parkway			
I-880 to Christy	78	702	326
Christy to Boscell	75	464	215
Boscell to Boyce	72	284	132
Boyce to Cushing	63	---	---
Cushing (Street "C")			
Auto Mall to Street "E"	72	302	140
Street "E" to Street "F"	71	231	108
Street "F" to Northport	74	423	197
Northport to Fremont Blvd.	75	478	222

Industrial uses generate noise from mechanical ventilation systems, repair activities, noisy machinery and truck traffic. The existing Specialty crushing facility will be eliminated as part of the proposed Project. The Christy Concrete facility will remain in operation. Other future uses which will remain in operation include the Auto Mall.

The exact noise level of each future land use can vary widely, depending on the type of use. Noisy maintenance activities and early morning truck traffic can generate maximum sound levels of 85 to 90 dB at 50 feet. Hours of operation of industrial uses can also affect the magnitude of a noise impact, depending on the adjacent land use.

2. Impacts

Compatibility of Project with Existing and Future Noise Environment

The Project as originally proposed included residential land uses within 180 feet of the loop road, and near industrial development. Since the Project being evaluated in this Supplemental EIR no longer includes a residential component, noise impacts associated with such potential land use incompatibilities would be eliminated.

The Project as originally proposed also included a school and residential uses which would be located near the Auto Mall. The Project being evaluated in this Supplemental EIR eliminates the residential and school uses, and would locate commercial, research and development, and warehouse uses near the Auto Mall. The Fremont Municipal Code limits noise from adjacent land uses. Therefore, the Auto Mall and any adjacent land uses would be required to comply with the applicable noise ordinance limits at the adjacent property lines. The most likely source of impact would be from the public address system at the Auto Mall. Compliance with the applicable noise ordinance would minimize any potential impact.

Impact 6-12: Noise along Cushing Parkway (Street "C"), Auto Mall Parkway and along I-880 will exceed a DNL of 65 dB. This represents a *potentially significant impact.*

Commercial and industrial/R&D uses are typically less sensitive to traffic noise than residential uses. For commercial uses, a DNL of 65 to 77 dB is considered "conditionally acceptable". "Conditionally acceptable" means that new construction should be undertaken only after a detailed analysis of the noise reduction requirements is included in the design.

Noise from Christy Concrete is audible at the Project site. Noise-generating activities include materials handling and truck traffic. Future adjacent land uses are industrial, which are considered normally acceptable in noise environments up to a DNL of 70 dB. Since the Christy Concrete plant does not generate noise levels in excess of 70 dB, although the plant will be audible at adjacent uses, the impact of noise from Christy Concrete is less than significant.

Impact of Project on Existing Land Uses

The Project will locate new industrial uses adjacent to the existing Auto Mall and commercial and industrial uses located near the northern and southern portions of the Project site. Potential Project-related noise impacts on adjacent uses will depend on the particular land uses involved. Likely noise sources include mechanical equipment and deliveries. Proposed

industrial/commercial uses must comply with the City of Fremont's Municipal Code and the Industrial/Commercial Guidelines set forth in the Fremont General Plan. Consequently, these impacts would not be considered significant.

Construction Noise

Impact 6-13: Noise during Project construction could have an impact on existing land uses near the northern and southern portions of the Project site or on future land uses at the Project site. The existing land uses are offices, research and development, and the Auto Mall. When construction activities are closest to the existing uses, noise levels could reach maximum levels of 85 to 95 dBA at 50 feet. These noise levels may cause some annoyance or disturbance of occupants within existing structures if windows are left open, and would represent a *potentially significant impact.*

3. Mitigation Measures

Compatibility of Project with Existing and Future Noise Environment

Mitigation 6-12: Commercial retail or industrial developments along Cushing (Street "C"), I-880 and Auto Mall Parkway east of Boyce Road shall be required to control interior noise levels in private offices within these buildings to an L_{eq} of 45 dB as recommended in the Noise Element of the Fremont General Plan. This indoor goal can typically be achieved with sound-rated windows and/or wall construction. Implementation of this mitigation measure would reduce the impact to a level of *less than significant.*

Construction Noise

Mitigation 6-13: Construction at the Project site shall be limited to 7:00 AM to 7:00 PM, Monday through Friday and 9:00 AM to 6:00 PM Saturday and Sunday, in accordance with City policy. However, if pile driving or extremely noisy activities would occur next to existing offices, these noisy tasks may have to be performed after hours to minimize impacts on existing uses. All construction equipment shall be required to be adequately muffled and maintained. Noisy stationery equipment such as compressors shall be required to be located away from adjacent property lines of existing land uses and, if necessary, enclosed in noise-attenuating shrouds to minimize impacts. Implementation of these mitigation measures would reduce the impact to a level of *less than significant.*

E. VISUAL CONSIDERATIONS

1. Setting

The Project site can be seen by motorists travelling on I-880 and on Auto Mall Parkway, Cushing Parkway, and North Port Loop. Although the site is generally flat and grassy, the PG&E transmission lines and towers that traverse the western portion of the site are a prominent visual feature.

From the Project site, immediate views are mainly of undeveloped, semi-rural grassland. Several isolated one- and two-story office/industrial structures are also visible along Boyce Road to the north, Brandin Court to the east, and North Port Loop to the south. More distant views include the Nimitz Freeway (I-880) and Fremont Hills to the east and San Francisco Bay lands, as well as several small hills associated with the landfill, to the west.

The Nimitz Freeway has been designated a Scenic Route by the Fremont General Plan, which calls for heavy screening along the freeway from Auto Mall Parkway to Fremont Boulevard. The degree of screening proposed is dependent on the visual quality of the adjacent land and the existence of significant vistas (Ref. 20).

2. Impacts

The proposed Project would have a substantial effect on the visual setting of the Project site. Grassland views from inland Fremont, I-880 and the streets surrounding the site would largely be replaced by views of commercial and industrial development. One of the major features of the Project is the extensive landscaping planned along Project area streets and the inclusion of a five-acre park, urban plazas, a 40-acre public park and an extensive commercial recreational area. The extent to which distant views (e.g. of the San Francisco Bay National Wildlife Refuge from the Nimitz Freeway) are obstructed would depend to some degree on building heights and design of landscaping and parking areas in the proposed Project. It should be noted that some distant views of the Wildlife Refuge are already obstructed by existing industrial structures and by several PG&E transmission lines located on the Project site and surrounding properties. Views of the Wildlife Refuge and San Francisco Bay from inland Fremont could be impaired by night lighting from the proposed Project. Short-term visual impacts could also be expected during the construction phase of the Project.

From the Project site, the proposed development would irreversibly alter the semi-rural visual character of the area and could disrupt distant views of the San Francisco Bay and Fremont Hills. The existing visual setting of the site would be largely replaced by various types of commercial and industrial development.

Although the visual impacts associated with the proposed development of the Project site could be regarded by some as an improvement on existing visual conditions, others may feel that such development detracts from the present visual characteristics of the area. CEQA indicates that a project will have a significant effect on the environment if it has a substantial, demonstrable negative aesthetic effect.

Impact 6-14: The Project would replace grassland views from inland Fremont, I-880 and surrounding streets with views of commercial and business park development, and would alter semi-rural views from the Project site, possibly disrupting distant views of the San Francisco Bay and the Fremont Hills due to the placement of new structures at the Project site. This would represent a *significant environmental impact.*

3. Mitigation Measures

Mitigation 6-14: Conceptual and detailed landscape plans shall be required at later stages in the development approval process. Project developers shall be required to comply with all regulations related to landscaping, signage, outdoor lighting, screening and site maintenance. Outdoor lighting fixtures to be used at the Project site shall be designed to minimize illumination of the night sky. Although the character of views at the Project site would be changed from rural to urban as a result of Project development, these measures would reduce the impact to a level of *less than significant.*

F. GEOTECHNICAL CONSIDERATIONS

1. Setting

The Project site is located in an area that is subject to seismic activity. The City of Fremont is traversed by the Hayward Fault, which historically has been a major source of seismic activity. In addition, soil and ground water conditions in Fremont make the area subject to strong shaking generated by earthquakes on the San Andreas Fault, which traverses the Santa Clara Valley and the San Francisco Peninsula, and the Calaveras Fault, which lies east of Fremont in the Diablo Range. Liquefaction, where saturated loose soils become liquid when shaken, represents another earthquake-related hazard in the Fremont area.

The Fremont General Plan (Ref. 20, page 10-10, Figure 10-3) indicates that the Project site has a groundshaking potential of "S4" (moderate to high), with a liquefaction potential ranging from "L3" (variable, high to low depending on depth of groundwater) to "L4" (moderate to high).

2. Impacts

Impact 6-15: Development of the Project site would expose a larger number of people to geologic and seismic hazards. The degree of hazard would depend to some extent on the nature of the site development. The greater the density of development on the site, the larger the number of people likely to be exposed to seismic hazards. Increased exposure to seismic impacts represents a *potentially significant environmental impact.*

3. Mitigation Measures

The following measures are recommended to reduce potential geotechnical impacts of Project site development:

Mitigation 6-15A: In accordance with Fremont General Plan Policy HS 2.1.1 (Ref. 20, page 10-47), site-specific soils, geologic and/or geotechnical engineering studies shall be conducted prior to development approval, since the Project site has been identified as having an "S4" groundshaking potential and portions of the Project site have been identified as having an "L4" liquefaction potential. Applicant-submitted geotechnical studies shall be reviewed by a qualified consulting geological engineer reporting to the City of Fremont, and development must conform with the recommendations of the City's consulting engineer.

Mitigation 6-15B: Facilities and structures shall be designed in compliance with seismic requirements of the current Uniform Building Code to minimize earthquake danger to building occupants.

When implemented, these measures would reduce the identified impact to some extent, but it would remain *potentially significant*.

G. ARCHAEOLOGICAL CONSIDERATIONS

1. Setting

A review of records and literature on file at the Northwest Information Center at Sonoma State University indicated that the Project site contains no recorded Native American or historical cultural resources, and no historic properties are located within the boundaries of the Project site. To date, approximately 90 percent of the Project site has been evaluated for potential cultural resources. A report by Lynn Compas, Researcher II at the Historic Resources Information System, Northwest Information Center, is included as Appendix L.

Archaeological sites in the vicinity of the Project site tend to be situated on alluvial flats and historic bay margins near former or existing water courses. The Project site is located in such an area, and given the environmental and historic setting, there is a high potential for Native American sites there, as well as a possibility of historical archaeological sites and structures associated with homesteading.

2. Impacts

Impact 6-16: Development at the Project site could potentially disturb prehistoric and historic cultural resources, although previous field and archival surveys have not conclusively determined that such resources either do or do not exist on the site. Development on the site would bring larger numbers of people to the area, thereby increasing the risk of damage and/or vandalism to any cultural resources which may be found on or surrounding the site. This represents a *potentially significant environmental impact*.

3. Mitigation Measures

Prior to final approval of any development of the Project site, an archival and field survey of the unstudied portion of the Project site shall be completed by a qualified archaeologist. Based on the results of this survey, measures to reduce impacts to any identified cultural resources should be determined.

Although 90 percent of the Project site has been studied for cultural resources with negative results, these areas are still considered sensitive for cultural resources. Past activities at the Project site may have obscured evidence of cultural resources on the surface. A professional archaeologist should be consulted before any earth moving activities take place at the Project site.

VI. OTHER CONSIDERATIONS

In addition, the following measures are recommended during any construction on the Project site:

Mitigation 6-16A: In the event that significant cultural materials (e.g. human skeletal remains, habitation features, artifact concentrations, heat-affected rock or other features) are uncovered during excavation or earthmoving, all grading shall be halted until appropriate mitigation measures are defined.

Mitigation 6-16B: If human remains are found, the County Coroner, Native American Heritage Commission, and representatives of local Native American groups shall be notified pursuant to State law. Further actions shall be coordinated with these agencies.

Mitigation 6-16C: If any historic or cultural resources are discovered, the State Office of Historic Preservation shall be notified pursuant to State law. Identified cultural resources should be recorded on forms DPR 422 (archaeological sites) and/or DPR 523 (historic properties) or similar forms.

The implementation of these measures would reduce the identified impact to a level of *less than significant*.

VII. ALTERNATIVES TO THE PROJECT

In this chapter, several alternatives to the proposed Project are described and considered. Alternative "A", the No Project alternative, is required to be evaluated under the provisions of the CEQA. Based on the assumption that development of the Project site would take place in accordance with the existing land use designations for the Project site, this alternative is defined as the Pacific Greens Project evaluated in the Addendum to the EIR (Ref. 14). Alternative "B", or the No Development alternative, represents a scenario that would maintain the existing land uses at the Project site, as discussed in the original DEIR (Ref. 18, pages 139, 146-148). However, in light of the level of development in the vicinity of the Project site, and the current land use designations in this portion of the City of Fremont's Industrial Planning Area, it may be unrealistic to assume that the Project site will not be developed to some extent in the years ahead. Alternative "C", an earlier "All Industrial" alternative, is defined by the earlier Draft Supplemental EIR (Ref. 16, pages 44-57), while Alternative "D" represents the Project as defined in the original DEIR (Ref. 18).

It should be recognized that there is an almost infinite number of possible alternatives that could be postulated, and that the limited number presented for discussion here are only generally representative of this array of options. In each case, the alternatives evaluated are considered in conceptual land use terms only, without regard to the locational specifics of site planning (e.g. configuration of density allocations within the site, circulation, etc.). Only the most general assessment can be given to these alternatives in view of their hypothetical character.

A. ALTERNATIVE "A" - NO PROJECT

Alternative "A", the No Project Alternative, represents the level of development which would be expected to take place at the Project site under the land use designations currently in force. Development anticipated under the current General Plan would result in a mixture of residential, research and development, commercial and public uses at the Project site, with the following acreage developed in each category:

Land Use	Net Acres
Multi-family	11.1
Condominiums	10.5
Single-family	148.2
Neighborhood Commercial	25.9
Restricted Industrial	118.5
Hotel	5.0
Golf Course/Driving Range	161.9
School/Park	10.0
Park	16.1
Allee	2.5
Fire Station	2.0
Wetlands	26.2
Streets/Open Space	64.3
Auto Mall	88.0
Total	690.2

The environmental impacts associated with this alternative were evaluated in the Addendum to the EIR (Ref. 14). The total number of housing units at the Project site could theoretically range from 1,281 to 1,849, although when the Addendum to the EIR was prepared, it was not expected to exceed 1,400, with fifteen percent of these units affordable to households with very low, low and moderate incomes distributed among the three residential categories.

1. Planning and Policy Context

Development of the Project site under this alternative would be consistent with the Fremont General Plan. Since at least fifteen percent of all housing units to be built at the Project site would be required to be affordable to households with very low, low and moderate incomes, the supply of such housing in Fremont would increase if the Project site were to be developed under Alternative "A".

2. Traffic and Circulation

If the Project site were to be developed under Alternative "A", several intersections would not meet City of Fremont level of service standards: Cherry/Boyce/Stevenson, Auto Mall/Grimmer and Albrae/Stevenson. In addition, the intersection of Auto Mall Parkway and Park Street (and possible other intersections) would require signalization as traffic increases.

3. Transit and Road Maintenance

Under Alternative "A", the demand for transit service and road maintenance would be similar to that anticipated for the proposed Project.

4. Storm Drainage and Flooding

Alternative "A" would result in an increase in stormwater runoff at the Project site, and some portions of the Project site which would be developed under this alternative would be within the 100-year flood zone.

5. Wastewater Collection, Treatment and Disposal

Although development of the Project site under Alternative "A" would generate an estimated 310,000 gallons of sewage per day, facilities currently in place could be handle this increase, while the Project developer would be expected to provide the necessary wastewater collection infrastructure at the Project site.

6. Water Supply

Following development of the Project site under Alternative "A", on-site activities would require an estimated 1,300,000 gallons of water per day, but the existing water supply network would be adequate to meet these needs. The Project developer would be expected to provide the necessary water supply infrastructure at the Project site.

7. Water Quality

Untreated stormwater runoff from the Project site could degrade water quality in the vicinity of the Project site under Alternative "A", but the implementation of an effective stormwater management plan could reduce this impact to a level of less than significant.

8. Solid Waste Disposal

Alternative "A" would increase the demand for solid waste disposal, but the existing facilities could be expected to adequately handle the anticipated increase in solid waste resulting from development of the Project site.

9. Fire Protection Services

Demand for fire protection services would increase under Alternative "A", but this impact could be mitigated by the payment of all fire protection impact fees and the incorporation of sprinklers in all industrial and commercial structures at the Project site. The Project developer would be expected to install a system of fire hydrants to meet City of Fremont requirements.

10. Police Protection Services

Demand for police protection services would increase under Alternative "A". The Fremont Police Department would be expected to review all plans for the Project site to ensure that measures required to facilitate a prompt police response in emergencies are incorporated.

11. Emergency Medical Services

Although development of the Project site under Alternative "A" would result in an increased demand for emergency medical services, emergency medical response is linked to fire protection in Fremont, which should be able to handle the increased demand.

12. Schools and Day Care

Residential development at the Project site under Alternative "A" would result in the addition of an estimated 834 students to the Fremont Unified School District. As evaluated in the Addendum to the EIR (Ref. 14), this alternative included the construction of an elementary school on ten acres at the Project site.

13. Parks and Recreation

Residential development at the Project site under Alternative "A" would bring an increased demand for parks and recreational facilities, and conditions at the Project site currently limit the development of the golf course proposed under this alternative (although the Addendum to the EIR [Ref. 14, pages 34-36] indicated that it would be possible to mitigate soil conditions at the Project site in order to permit the development of a golf course).

14. Public Utilities and Energy Conservation

Development of the Project site under Alternative "A" would result in an increased demand for energy, although providing basic utility linkages would not represent a significant impact associated with this alternative.

15. Hazardous/Toxic Materials

A potential release of hazardous materials from Scott Specialty Gases in the Project vicinity could have an adverse effect on future residential and industrial uses within the Project site.

16. Vegetation and Wildlife

Development-related impacts on vegetation and wildlife at the Project site would be similar under Alternative "A" and the proposed Project.

17. Air Quality

Under Alternative "A", construction at the Project site would generate dust. Those living and working at the Project site might potentially be exposed to odors and Toxic Air Contaminants. Direct and indirect emissions which would be associated with this alternative would contribute to regional ozone and suspended particulate problems.

18. Noise

Noise from construction at the Project site could impact existing land uses or uses proposed for the site under Alternative "A". Under this alternative, residences proposed within 100 feet of Pacific Greens Parkway and within 160 feet of the Cushing Parkway Extension would be exposed to an L_{dn} above 60 dB. The use of mechanical ventilation equipment, heavy machinery and early morning truck deliveries to industrial activities located at the Project site might have an impact on residential areas proposed under Alternative "A". The auto mall might have an adverse noise impact on the proposed school and high density residential units under this alternative. Noise levels along Auto Mall Parkway and I-880 would be expected to exceed an L_{dn} of 65 dB, which would have an adverse effect on proposed commercial operations in the vicinity. New industrial development associated with Alternative "A" would be located near existing industrial operations, which could result in potential noise impacts for the new industrial uses and the existing industrial uses.

19. Visual Considerations

Development of the Project site under Alternative "A" would have the potential to block views in what is currently a large, open area, and would increase the amount of light and glare visible from the Project site.

20. Geotechnical Considerations

Structures built at the Project site under Alternative "A" might be subjected to very strong ground shaking associated with earthquakes, and to damage from seismically-induced

liquefaction. Portions of the Project site may be subject to local areal settlement, to problems associated with shallow groundwater, clay sands, silts and loose sands, to the effects of soil expansion and contraction and to the effects of corrosive soils.

21. Archaeological Considerations

As with the proposed Project, development of the Project site under Alternative "A" could disturb potential prehistoric and historic cultural resources. Increased numbers of people in the area could increase the risk of damage and/or vandalism to potential cultural resources on and in the vicinity of the Project site.

B. ALTERNATIVE "B" - NO DEVELOPMENT

Alternative "B", the No Development alternative, evaluates the environmental impacts associated with allowing the Project site to remain in its current state.

1. Planning and Policy Context

The Fremont General Plan anticipates development of the Project site at some point in the future. While it may be possible for this site to remain undeveloped in the future, this would be inconsistent with the General Plan.

2. Traffic and Circulation

No new traffic would be generated under Alternative "B". Even in the absence of development at the Project site, the Auto Mall Parkway/I-880 northbound off/on ramps interchange would operate at LOS "E" during the AM peak hour, and at LOS "F" during the PM peak hour.

3. Transit and Road Maintenance

With no development at the Project site, there would be no increase in transit demand and no need for any additional road maintenance.

4. Storm Drainage and Flooding

Under Alternative "B", on-site ponding of stormwater runoff would continue. The existing Line N-1 would provide some relief from flooding, but this line could not be fully utilized without minor on-site drainage improvements.

5. Wastewater Collection, Treatment and Disposal

Alternative "B" would not affect the existing wastewater facilities, although the existing gravity sewer line which runs through the Project site would go largely unused.

6. Water Supply

There would be no additional demand for water at the Project site under Alternative "B".

7. Water Quality

The existing land uses at the Project site would contribute fewer contaminants to stormwater runoff in comparison to the proposed Project, while the risks associated with the accidental spills of toxic and hazardous materials which might be used at the Project site if developed as proposed would be eliminated.

8. Solid Waste Disposal

No additional solid waste would be generated under this alternative if the Project site were to remain in its current land uses.

9. Fire Protection Services

Alternative "B" would not result in any increased demand for fire protection services, and a new fire station located westerly of I-880 would not be provided.

10. Police Protection Services

Alternative "B" would not result in any increased demand for police protection services.

11. Emergency Medical Services

Alternative "B" would not result in any increased demand for emergency medical services.

12. Schools and Day Care

Alternative "B" would not result in any increased demand for schools or day care.

13. Parks and Recreation

Alternative "B" would not result in any increased demand for parks or recreational facilities. However, no new parks or recreational facilities would be created at the Project site.

14. Public Utilities and Energy Conservation

Alternative "B" would not result in any increased demand energy, and would not require the expansion of existing public utility networks.

15. Hazardous/Toxic Materials

Under Alternative "B", businesses and industries involved in the transportation, storage and use of hazardous/toxic materials would not locate at the Project site. Thus, the risk of spills, accidental releases or other contaminating events involving such materials would be eliminated.

16. Vegetation and Wildlife

No impacts would occur to vegetation and wildlife at the Project site under Alternative "B"

17. Air Quality

With no development at the Project site, Alternative "B" would not contribute to regional emissions, and there would be no construction-related air quality impacts.

18. Noise

There would be no significant noise impacts associated with Alternative "B".

19. Visual Considerations

Under Alternative "B", the existing visual character of the Project site would be maintained, and views of the Fremont Hills and San Francisco Bay would be preserved.

20. Geotechnical Considerations

With no new structures to be built at the Project site, Alternative "B" would not expose workers at the Project site to any geotechnical hazards.

21. Archaeological Considerations

Archaeological resources at the Project site would remain undisturbed under Alternative "B".

C. ALTERNATIVE "C" - PREVIOUS "ALL INDUSTRIAL" ALTERNATIVE

Alternative "C" represents the level of development which would be anticipated at the Project site if it were to be developed as proposed in the "All Industrial" Alternative presented in the earlier Supplemental EIR on the proposed Project (Ref. 16), with the following acreage developed in each category:

Land Use	Net Acres
Research & Development	252.0
Warehousing	252.0
Auto Center	75.0
Shopping Center	15.0
Hotel	10.0
Creekbed	5.0
Sports Park	10.0
Wetlands	26.0
Fire Station	1.0
Total	646.0

The environmental impacts associated with this alternative were evaluated in the earlier Supplemental EIR (Ref. 16, pages 44-57).

VII. ALTERNATIVES TO THE PROJECT

1. Planning and Policy Context

Since it does not incorporate a residential component, Alternative "C" would be inconsistent with the Fremont General Plan.

2. Traffic and Circulation

Development under Alternative "C" would generate an estimated 8,780 AM peak hour trips and an estimated 10,399 PM peak hour trips. Levels of service at ten intersections in the AM peak hour and 11 intersections in the PM peak hour would exceed or nearly exceed the maximum desirable V/C ratio established by the City of Fremont.

3. Transit and Road Maintenance

Transit and road maintenance impacts associated with Alternative "C" would be similar to those associated with the proposed Project.

4. Storm Drainage and Flooding

Storm drainage and flooding impacts associated with Alternative "C" would be similar to those associated with the proposed Project.

5. Wastewater Collection, Treatment and Disposal

Alternative "C" would be expected to generate volumes of wastewater similar to those associated with the proposed Project.

6. Water Supply

The water demand associated with Alternative "C" would be similar to that associated with the proposed Project.

7. Water Quality

Water quality impacts associated with Alternative "C" would be similar to those associated with the proposed Project.

8. Solid Waste Disposal

Alternative "C" would be expected to generate volumes of solid waste similar to those associated with the proposed Project.

9. Fire Protection Services

The demand for fire protection services under Alternative "C" would be similar to that associated with the proposed Project.

10. Police Protection Services

The demand for police protection services under Alternative "C" would be similar to that associated with the proposed Project.

11. Emergency Medical Services

The demand for emergency medical services under Alternative "C" would be similar to that associated with the proposed Project.

12. Schools and Day Care

With no residential development at the Project site, there would be no increase in the demand for schools under Alternative "C". The demand for day care associated with Alternative "C" would be similar to that associated with the proposed Project.

13. Parks and Recreation

With no residential development at the Project site, there would be no increase in the demand for parks and recreational facilities under Alternative "C", although a ten-acre sports park would be built as part of this alternative.

14. Public Utilities and Energy Conservation

The demand for energy under Alternative "C" would be similar to that associated with the proposed Project, and although it would not be considered a significant impact, expansion of the existing utility networks would be required to serve the Project site.

15. Hazardous/Toxic Materials

Development under Alternative "C" could result in a large volume of hazardous/toxic materials being stored, transported or used at the Project site.

16. Vegetation and Wildlife

Vegetation and wildlife impacts associated with Alternative "C" would be similar to those associated with the proposed Project.

17. Air Quality

Construction-related air quality impacts associated with Alternative "C" would be similar to those associated with the proposed Project. Traffic generated by development under this alternative would have an indirect effect on both local and regional air quality, and the regional air basin would be affected by the direct and indirect emissions generated by Alternative "C".

18. Noise

Alternative "C" would involve few noise-sensitive land uses, and noise impacts associated with this alternative would be similar to those associated with the proposed Project.

19. Visual Considerations

Visual impacts associated with Alternative "C" would be similar to those associated with the proposed Project.

20. Geotechnical Considerations

The geological hazards associated with Alternative "C" would be similar to those associated with the proposed Project.

21. Archaeological Considerations

Potential archaeological impacts associated with Alternative "C" would be similar to those associated with the proposed Project.

D. ALTERNATIVE "D" - THE PROJECT AS DEFINED IN THE ORIGINAL EIR

Alternative "D" represents the level of development which would be anticipated at the Project site if it were to be developed as proposed in the original DEIR (Ref. 18), with the following acreage developed in each category:

Land Use	Net Acres
Community Shopping	13.0
Auto Mall	64.0
Discount Retail	10.5
Restaurant	4.5
Hotel	14.0
Warehouse	100.0
Research & Development	211.0
Apartments	33.0
Condominiums	39.0
Single-family	205.0
Activity Center	2.0
School/Park	14.0
Micro Commercial	2.0
Total	712.0

The environmental impacts associated with this alternative were evaluated in the original DEIR (Ref. 18).

1. Planning and Policy Context

Following the amendment of the Fremont General Plan to accommodate the Pacific Greens project as described in the Addendum to the EIR (Ref. 14), a mixed-use development along the lines of Alternative "D" would be generally consistent with the current General Plan.

2. Traffic and Circulation

Alternative "D" would result in a substantial increase in traffic, generating an average of 96,959 vehicle trips daily. With this alternative completed, none of the critical intersections in the vicinity of the Project site would operate at an acceptable level of service without substantial improvements.

3. Transit and Road Maintenance

Alternative "D" would result in an increased demand for public transit, and would create additional road maintenance costs for the City of Fremont.

4. Storm Drainage and Flooding

Alternative "D" would result in increased peak flows over existing conditions, and would necessitate measures to eliminate flooding potential.

5. Wastewater Collection, Treatment and Disposal

Alternative "D" would be expected to generate sewage at a rate of approximately 1,310,000 gallons per day, and sewer extensions within the Project site would be required.

6. Water Supply

Maximum daily water use at the Project site under Alternative "D" is estimated at 4,660,000 gallons per day, although the current water supply system could meet these needs. The Project developer would be required to provide additional transmission and distribution lines at the Project site.

7. Water Quality

Development of the Project site under Alternative "D" would contribute pollutants and contaminants to stormwater runoff, degrading water quality in downstream receiving waters.

8. Solid Waste Disposal

Although development under Alternative "D" would generate an estimated 64,534 pounds of solid waste daily, existing facilities exist to collect and dispose of this waste.

9. Fire Protection Services

Residential and non-residential development under Alternative "D" would increase the demand for fire protection services at the Project site. This impact could be mitigated by the payment of all fire protection impact fees and the incorporation of sprinklers in all industrial and commercial structures at the Project site. The Project developer would be expected to install a system of fire hydrants to meet City of Fremont requirements.

10. Police Protection Services

Residential and non-residential development under Alternative "D" would increase the demand for police protection services at the Project site, although the Fremont Police Department would be expected to review all plans for the Project site to ensure that measures required to facilitate a prompt police response in emergencies are incorporated.

11. Emergency Medical Services

Although development of the Project site under Alternative "A" would result in an increased demand for emergency medical services, emergency medical response is linked to fire protection in Fremont, which should be able to handle the increased demand.

12. Schools and Day Care

Alternative "D" would generate an estimated 726 elementary school students, 133 junior high school students and 270 high school students. As evaluated in the original DEIR (Ref. 18), this alternative would include a 14-acre parcel for a new elementary school and park. Approximately 3,000 employees at the Project site might be expected to have at least one child needing day care, while approximately 537 children residing at the Project site could also be expected to need day care.

13. Parks and Recreation

Development under Alternative "D" would increase the demand for parks and recreational facilities. As evaluated in the original DEIR (Ref. 18), this alternative would incorporate an activity center and 14-acre site for a school/park.

14. Public Utilities and Energy Conservation

Alternative "D" would increase the demand for gas, electricity and telephone services, although extending the basic utility linkage to provide these services would not represent a significant impact.

15. Hazardous/Toxic Materials

Commercial and industrial development of the Project site under Alternative "D" would be expected to increase the potential for hazardous/toxic material spills or leakages that would affect neighboring residential areas as well as surface waters.

16. Vegetation and Wildlife

Alternative "D" would result in the elimination of wetland habitat, and could result in indirect impacts on nearby wetlands.

17. Air Quality

Alternative "D" would generate significant additional regional emissions from residential, industrial and mobile sources, and development would entail significant adverse construction-related air quality impacts.

18. Noise

Under Alternative "D", noise levels in the vicinity of the Project site would increase. Residential uses placed near roadways or industrial activities might be exposed to noise levels which are unacceptably high.

19. Visual Considerations

Development of the Project site under Alternative "D" would result in a major modification to the visual characteristics of the area, and would disrupt distant views of the Fremont Hills and San Francisco Bay.

20. Geotechnical Considerations

Structures built at the Project site under Alternative "D" might be subjected to very strong ground shaking associated with earthquakes, and to damage from seismically-induced liquefaction. Portions of the Project site may be subject to local areal settlement, to problems associated with shallow groundwater, clay sands, silts and loose sands, to the effects of soil expansion and contraction and to the effects of corrosive soils.

21. Archaeological Considerations

As with the proposed Project, development of the Project site under Alternative "D" could disturb potential prehistoric and historic cultural resources. Increased numbers of people in the area could increase the risk of damage and/or vandalism to potential cultural resources on and in the vicinity of the Project site.

E. EVALUATION OF ALTERNATIVES

The matrix below provides a summary evaluation of the environmental impacts which might be associated with each of the four alternatives relative to those associated with the proposed Project.

Of the five variants (the proposed Project and the four alternatives), Alternative "B" (the No Development alternative) would involve the fewest significant environmental impacts, while Alternatives "A" and "D" would generally involve environmental impacts greater than those associated with the proposed Project or Alternative "C".

	Alternatives			
	A	B	C	D
Planning/Policy Context	Less	Greater	Similar	Less
Traffic/Circulation	Similar	Less	Similar	Similar
Transit/Road Maintenance	Similar	Less	Similar	Similar
Storm Drainage/Flooding	Similar	Less	Similar	Similar
Wastewater	Similar	Less	Similar	Similar
Water Supply	Similar	Less	Similar	Similar
Water Quality	Similar	Less	Similar	Similar
Solid Waste Disposal	Similar	Less	Similar	Similar
Fire Protection	Similar	Less	Similar	Similar
Police Protection	Similar	Less	Similar	Similar
Emergency Medical	Similar	Less	Similar	Similar
Schools/Day Care	Greater	Less	Similar	Greater
Parks/Recreation	Greater	Less	Similar	Greater
Public Utilities/Energy	Similar	Less	Similar	Similar
Hazardous/Toxic Materials	Greater	Less	Similar	Greater
Vegetation/Wildlife	Similar	Less	Similar	Similar
Air Quality	Similar	Less	Similar	Similar
Noise	Greater	Less	Similar	Greater
Visual Considerations	Similar	Less	Similar	Similar
Geotechnical Considerations	Similar	Less	Similar	Similar
Archaeological Considerations	Similar	Less	Similar	Similar

Based on the evaluation of possible environmental impacts alone, Alternative "B" would be considered to be the environmentally superior alternative. However, this alternative is inconsistent with the Fremont General Plan (which calls for the eventual development of the Project site), and would meet none of the development goals or objectives of the proposed Project.

Those environmental impacts associated with Alternatives "A" and "D" which would be greater than those associated with the proposed Project or Alternative "C" are generally related to the incorporation of housing units at the Project site, consistent with the Fremont General Plan. These relate to the increased demand for schools and recreational facilities associated with residential development, the potential noise impacts associated with industrial activity in proximity to residences, and the potential hazards which may be associated with the transportation, storage and use of hazardous/toxic materials in proximity to residential units. Without residential units at the Project site (as under Alternative "C" or the proposed Project), these impacts would either be eliminated or significantly reduced.

VIII. OVERVIEW OF EVALUATION

In this Chapter, the effects of the Project are examined under three general categories from which some of the overall salient conclusions of the evaluation can be derived.

A. UNAVOIDABLE ADVERSE EFFECTS/ IRREVERSIBLE ENVIRONMENTAL CHANGES

The following adverse effects appear to be unavoidable if the Project, as identified in this document, is implemented. Each effect has its own varying degree of impact. These assessments of impacts assume that identified feasible mitigation measures under the control of the Project developer will be implemented. Other measures that would further mitigate these effects have been identified as being within the jurisdiction of public agencies or other private entities, and therefore are not within the direct control of the developer.

- Project development would result in ***significant, unmitigable traffic impacts*** at the following intersections and roadway segments:
  - I-880 SB Off-Ramp and Stevenson Boulevard;
  - I-880 NB Ramps and Fremont Boulevard;
  - I-880 SB Ramps and Auto Mall Parkway;
  - Grimmer Boulevard and Auto Mall Parkway;
  - Southbound I-680 between Washington Boulevard and Durham Road;
  - Southbound I-880 between SR 84 and Thornton;
  - Southbound I-880 between Mowry and Stevenson;
  - Southbound I-880 between Stevenson and Auto Mall;
  - Northbound I-880 between Mowry and Thornton; and
  - Northbound I-880 between Thornton and SR 84.
- The Project would have a ***significant, unmitigable adverse impact*** on regional air quality, and would contribute to the continuing ozone problem in the region.
- Development of the Project site would expose a larger number of people to geologic and seismic hazards. The degree of hazard would depend to some extent on the nature of the site development. The greater the density of development on the site, the larger the number of people likely to be exposed to seismic hazards. Increased exposure to seismic impacts represents a ***potentially significant, unmitigable environmental impact***.

- Irreversible environmental changes would include:
  - Consumption of construction materials.
  - A change in the drainage pattern in the vicinity of the Project site.
  - Improved vehicular access to the Project site and surrounding, largely undeveloped areas.

B. GROWTH-INDUCING IMPACTS

The proposed Project may have growth-inducing impacts on the entire Fremont Industrial Redevelopment Area. Although most of the land west of the Nimitz Freeway and in the vicinity of the Project site is already developed, the proposed Project could induce some additional industrial development in the surrounding areas, which would be in accordance with the City's General Plan.

The proposed Project may also have growth-inducing effects at the citywide level. To some extent, the nature of these effects would depend on the phasing of development on the Project site. Commercial and industrial uses on the site could generate a demand for housing elsewhere in the City. Project development would be likely to increase the citywide demand for retail commercial uses and other services, especially those not available on the Project site.

C. CUMULATIVE IMPACTS

Cumulative impacts are defined as two or more separate impacts which, when considered together, are considerable, or which compound or increase other environmental impacts (CEQA Guidelines, Section 15355). Cumulative impacts can result from individually minor but collectively significant projects taking place over time in different but spatially related locations.

The analysis of traffic, noise, and air quality impacts in this Supplemental EIR provides quantified estimates of cumulative impacts associated with the proposed Project, combined with future development in the surrounding area. These estimates are based on a series of assumptions regarding the type and intensity of various land uses at build-out of the City's existing General Plan. The assumptions have been incorporated into the City's traffic model (see discussion in Appendix A), which in turn has provided much of the basic data for this Supplemental EIR.

Potential cumulative impacts resulting from the proposed Project may be summarized as follows:

- The effects of the Project, with particular respect to traffic, drainage, and sewage, may combine with those resulting from other urbanization and growth in the City to produce still larger impacts. Since the Project and other anticipated development would occur over time, these impacts are not likely to emerge suddenly, and the pace of anticipated cumulative development may enable appropriate and effective mitigation measures to be implemented.

- The Project would produce a number of increased demands on the public service sector, including fire, police and emergency services. Each of these impacts individually is relatively minor. In aggregate, however, the cumulative effect may be considerable. This impact cannot be rated as highly significant or adverse, however. It may be offset or mitigated by requirements placed upon the Project applicant in the form of development fees or required infrastructure improvements, or by revenues generated by the Project in the form of taxes benefiting local service-providing agencies.

- Cumulative development in the City can be expected to result in additional degradation of the noise environment, air quality and water quality.

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APPENDIX A

TRAFFIC IMPACT STUDY
FOR THE PROPOSED
PACIFIC COMMONS PROJECT

PREPARED BY TJKM
TRANSPORTATION CONSULTANTS

Traffic Impact Study for the Proposed Pacific Commons Development

In the City of Fremont

April 16, 1996

Prepared by
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INTRODUCTION

Purpose

The purpose of this analysis is to supplement information previously presented in the Addendum to the Environmental Impact Report (August 1991) for the Pacific Greens Project, now known as Pacific Commons. The previously proposed plan primarily contained a mix of residential, industrial and commercial uses. The current plan contains no residential component, and is primarily composed of industrial uses, with a large commercial component at its northern end.

Setting

Figure 1 shows the project site and its vicinity. The project site is essentially bordered to the north by Auto Mall Parkway, to the south by Cushing Parkway, to the east by I-880, and to the west by the Southern Pacific Railroad right-of-way. Some of the undeveloped parcels that are currently part of the Fremont Auto Mall will be converted to warehouse/R&D uses by the project.

Methodology

Intersection Analysis

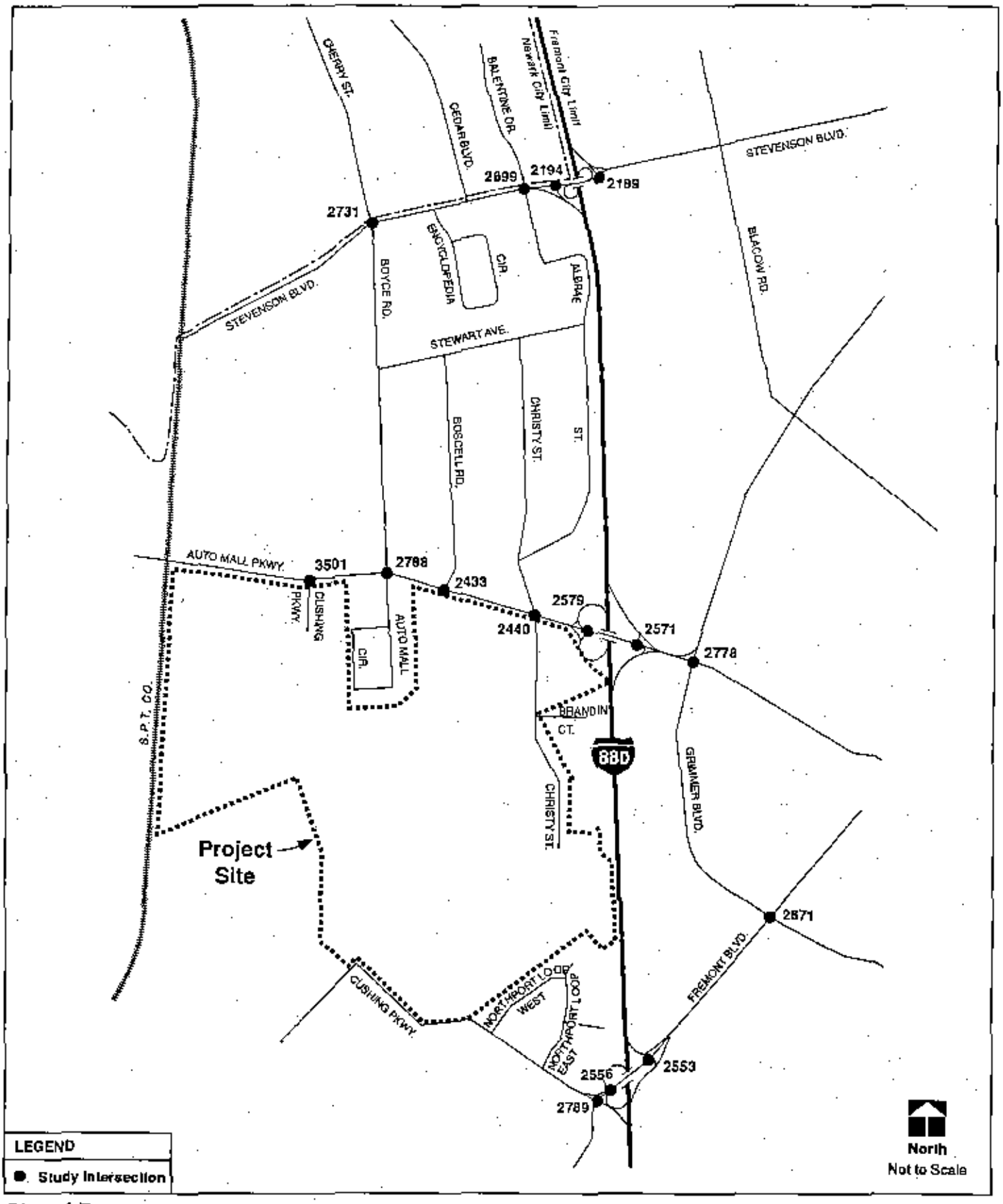
Signalized intersection performance for this analysis was measured using the Intersection Capacity Utilization (ICU) method. A description of the methodology is contained in Appendix A. Peak hour intersection conditions are reported in terms of volume-to-capacity (V/C) ratios with corresponding levels of service. Level of service ratings, qualitative descriptions of intersection operations, are reported using an A through F rating system to describe travel delay and congestion. Level of Service (LOS) A describes free-flow conditions with little or no delay and LOS F describes jammed conditions with excessive delays and long back-ups. A description of the level of service ratings is also included in Appendix A.

The City of Fremont has established a target intersection V/C ratio of 0.85 (corresponding to mid-range LOS D). Intersections projected to operate at higher V/C ratios should be examined to determine if future mitigation measures are feasible.

The study intersection lane geometrics were taken from the Year 2010 transportation planning network that is maintained by the City. The project will add fourth legs to several existing intersections along Auto Mall Parkway; appropriate geometries were assumed for these approaches as documented in later sections.

Freeway Analysis

To comply with the requirements of the Alameda County Congestion Management Agency (CMA), future level of service analyses were performed for I-880 in the study vicinity. I-880 is a part of the designated roadway system of the County's Congestion Management Program (CMP). Freeway level of service is based on hourly directional freeway volumes. The CMA methodology designates freeway mainline capacity as 2,000 vehicles per hour per lane (vphpl) for mixed flow and auxiliary lanes. For high-occupancy-vehicle (HOV) lanes, a capacity of 1,500 vphpl is used.



City of Fremont
Pacific Commons

Vicinity Map

Figure
1

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The CMA's level of service standard for freeway segments is LOS E, equating to a maximum V/C ratio of 1.00. The CMA monitors all segments of the designated system annually for compliance to this standard. For segments that are found to operate with V/C ratios above 1.00, a deficiency plan must be prepared by the local agency, including action steps to correct the deficiency. (Certain exemptions from this requirement will be discussed in later sections.)

Traffic Forecasting Models

The City of Fremont uses a gravity-based citywide travel demand forecasting model to project long-range traffic conditions for key roadway segments and intersections based on land use input data in the form of square footages. The model produces forecasts for the a.m. and p.m. peak hours as well as daily conditions.[1] The horizon year for this analysis was 2010.

For 2010 freeway analysis, the Alameda County CMA forecasting model was utilized, as required. This forecasting model is also gravity-based, but focuses more on regional impacts of proposed projects on designated key facilities (in the case of this project, I-880). The model uses projected employment patterns as its primary inputs.

[1] Vehicular trip generation forecasts are derived from person-trip forecasts based on survey results compiled by the Metropolitan Transportation Commission (MTC). The surveys indicated an average vehicle occupancy of 1.39 passengers and found approximately 1.4 percent of persons surveyed arrived at their destination by non-automobile modes such as transit.

YEAR 2010 IMPACT COMPARISON

Scenario Descriptions

To analyze the impacts of the current proposal, TJKM compared three scenarios, described below.

Scenario 1 - General Plan Approved Land Use and Network

This scenario is the approved future base against which the proposed project is to be compared. It consists of the project land use and roadway network contained in the previous EIR addendum. Principal features of the roadway network include an extension of Stevenson Boulevard to the south from its current terminus west of Boyce Road, intersecting with existing Auto Mall Parkway and ultimately connecting with the existing Cushing Parkway at the southern end of the project site. The Stevenson Boulevard extension was envisioned as a major north-south arterial parallel to I-880.

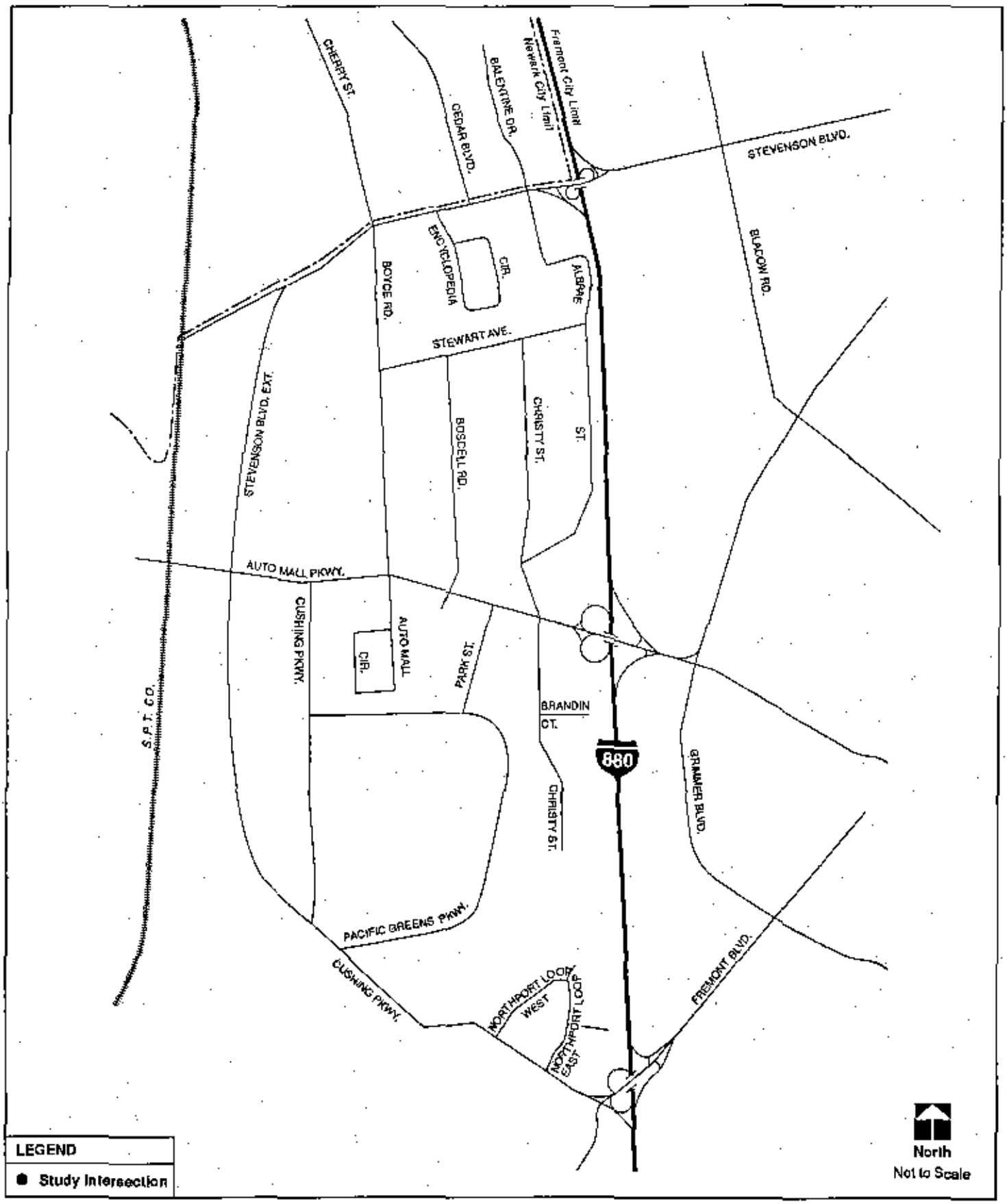
Within the project site, the primary circulation system consisted of a southward extension of Cushing Parkway to intersect with the Stevenson Boulevard extension. A looping collector road (Pacific Greens Parkway) intersected with Cushing Parkway. An additional roadway (Park Street) provided a direct connection between the loop road and Auto Mall Parkway.

The roadway network and land use data used in this scenario are included in the current version of the Year 2010 MINUTP transportation planning model that is used by the City of Fremont. The roadway network in this model is based on the City of Fremont General Plan and considers future roadway improvements that are expected to be completed by the year 2010. The land use data are also based on the City of Fremont General Plan. The previously approved project land use is summarized in the "Trip Generation" section of this report. Figure 2 illustrates the current General Plan roadway network in the vicinity of the project site.

Scenario 2 - Proposed Land Use with General Plan Network

For this scenario, the external roadway network assumptions are identical to that used in Scenario 1, including the Stevenson Boulevard extension. Within the project site, a new conceptual roadway network has been developed by the project applicant. Its principal features include southward extensions of Christy Street, Boscell Road, and Cushing Parkway to serve as major on-site collectors, as well as development of two major east-west collectors through the industrial portions of the project.

Project land use is based on the most recent project site plan and reflects a significant change from the land use specified in the General Plan. The current land use proposal is broken down by land use type and acreage in Table I.



City of Fremont
Pacific Commons

General Plan Roadway Network

Figure **2**

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Table I

Project Land Use Acreage Proposal

Use	Size (Acres)
Commercial	77.7
Industrial	21.7
Warehouse	136.2
R&D	213.1
Campus	134.0
Fire Station	1.0
Parks/Plazas	14.4
Robbins-Stem (multiple uses)	159.1
TOTAL	**757.2**

Scenario 3 - Proposed Land Use with Proposed Network

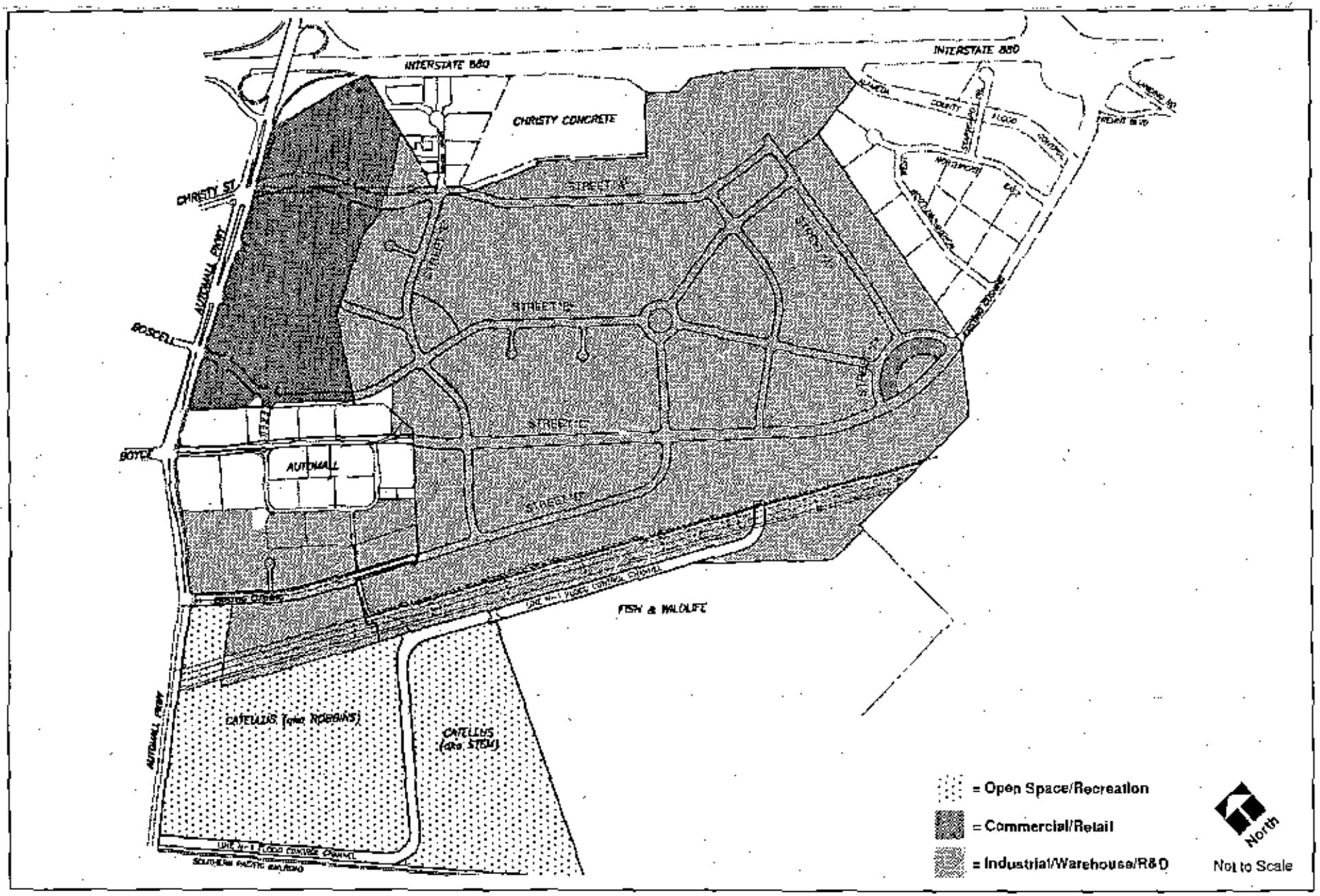
This scenario assumes the same land use as Scenario 2 but assumes a different roadway network. The principal feature of the network is the replacement of the Stevenson Boulevard extension with a southward extension of Boyce Road as a four-lane arterial through the existing Auto Mall and the remainder of the project site, connecting with the existing Cushing Parkway (which is planned by the City to be widened to six lanes from the project boundary to Fremont Boulevard). This extension would result in a continuous major north/south arterial west of I-880 between the Cities of Fremont and Newark, providing a circulation system superior to that resulting from the Stevenson Boulevard extension. Boyce Road (known as Cherry Road north of the city limits) would function as a reliever for I-880.

Figure 3 illustrates the proposed circulation system for this scenario as well as a preliminary land use layout.

Trip Generation

General Plan Land Use

Table II summarizes the expected 2010 trip generation in the project vicinity with the General Plan land use assumptions. The areas summarized in the table would generate approximately 8,670 vehicular trips during the a.m. peak hour and 11,558 during the p.m. peak hour under this scenario.



City of Fremont
Pacific Commons

Proposed Site Plan

Figure
3

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Table II

Area Trip Generation - Current General Plan Land Use

Use	Size		Daily Trip Ends		A.M. Peak Hour					P.M. Peak Hour				
			Rate per Unit	Total	Rate per Unit	In: Out	Vehicle Trip Ends			Rate per Unit	In: Out	Vehicle Trip Ends		
							In	Out	Total			In	Out	Total
Previous Pacific Greens														
Retail	305	ksf	65.889	20,096	1.876	69:31	395	177	572	6.658	43:57	873	1,158	2,031
R&D	2,058	ksf	9.049	18,623	1.079	85:15	1,887	333	2,220	1.083	18:82	401	1,828	2,229
Golf Course	170	acres	8.000	1,360	0.480	80:20	66	16	82	0.720	30:70	37	85	122
Hotel	350	rooms	7.342	2,570	0.278	72:28	70	27	97	0.478	39:61	38	59	97
Park	10	acres	12.79	128	0.440	65:35	3	1	4	0.890	45:55	4	5	9
Single-Family	944	DU	8.635	8,151	0.836	19:81	150	639	789	0.894	72:28	608	236	844
Multi-Family	427	DU	6.441	2,750	0.609	20:80	52	208	260	0.669	71:29	203	83	286
School	420	pupils	1.169	491	0.228	72:28	69	27	96	0.077	34:66	11	21	32
Robbins-Stem (now Catellus)														
Manufacturing	842	ksf	4.033	3,396	0.649	86:14	470	76	546	0.643	18:82	97	444	541
Warehouse	2,682	ksf	4.501	12,072	0.572	70:30	1,074	460	1,534	0.642	16:84	276	1,446	1,722
Auto Mall														
Auto Retail	87	acres	—	22,200	28.4	61:39	1,507	963	2,470	41.9	40:60	1,458	2,187	3,645
TOTAL				91,837			5,743	2,927	8,670			4,006	7,552	11,558

Source: *Pacific Greens - Addendum to Environmental Impact Report*, Duncan & Jones, August, 1991.

Proposed Land Use

The project applicant has proposed a land use plan that establishes acreage and delineates general areas for various land use types. To incorporate the proposed land plan into the Fremont traffic model, it was necessary to estimate probable square footage for each land use type. The applicant supplied a potential build-out scenario involving specific building sizes; these uses were modeled to analyze the Proposed Land Use scenarios. It is important to note that these square footages constitute a reasonable assumption for potential site build-out but should not be construed as the definitive specific layout for the site.

In addition to the changes in land use type, two key boundary changes accompany the proposed project. The Robbins-Stern parcels on the west end will be included in the project, encompassing approximately 133.1 acres of entertainment/recreation uses, 20 acres of warehouse uses, and 32 acres of wetlands. The project will also incorporate approximately 46 undeveloped acres, currently included in the Fremont Auto Mall, as warehouse uses.

Table III summarizes the expected 2010 trip generation in the project vicinity with the currently proposed land use assumptions. The area described in the previous section would generate approximately 8,260 vehicular trips during the a.m. peak hour and 10,524 during the p.m. peak hour. In comparison with the trip generation of the General Plan land use, this generation constitutes a decrease of five percent during the a.m. peak hour and a decrease of nine percent during the p.m. peak hour.

Trip Assignment

Project trips were assigned to the City of Fremont roadway network using the City traffic forecasting model. Table IV contains a comparison of the projected daily traffic volumes on key roadway segments for the three study scenarios. The data in the "GP Land Use, GP Network" column is taken from the previous Addendum to the Environmental Impact Report. Figures 4 and 5 illustrate projected traffic volumes on proposed project streets as well as the local roadway segments. Figure 4, labeled "Stevenson Alternative," represents the General Plan network that extends Stevenson Boulevard. Figure 5, labeled "Boyce Alternative," represents the preferred alternative, which extends Boyce Road to connect with Cushing Parkway.

Impacts

Intersections

Although all the study intersections currently exist (however, many are assumed reconfigured under the 2010 scenario), the project will create new southern legs at several study intersections along Auto Mall Parkway. Appropriate configurations were assumed for those legs as part of the 2010 base geometrics.

Table V summarizes the results of the intersection analyses for the three study scenarios. Detailed calculations are contained in Appendices B and C. The following intersections are projected to operate above the target level of service (v/c ratio = 0.85) under one or more of the study scenarios.

Table III

Area Trip Generation - Expected Development plus Potential Build-Out of Proposed Project

Use	Size[1]		Daily Trip Ends		A.M. Peak Hour					P.M. Peak Hour				
			Rate per Unit[2]	Total	Rate per Unit[2]	In:Out	Vehicle Trip Ends			Rate per Unit[2]	In:Out	Vehicle Trip Ends		
							In	Out	Total			In	Out	Total
Proposed Pacific Commons														
Warehouse[3]	1,966	ksf	4.501	8,849	0.572	70:30	788	337	1,125	0.642	16:84	202	1,060	1,262
Office	150	ksf	9.049	1,357	1.079	85:15	138	24	162	1.083	18:82	29	133	162
Industrial	347	ksf	4.033	1,399	0.649	86:14	194	31	225	0.643	18:82	40	183	223
Restaurant	21	ksf	187.925	3,946	9.627	66:34	133	69	202	9.165	43:57	83	109	192
Retail > 100 ksf	676	ksf	39.752	26,872	0.438	74:26	199	70	269	3.081	41:59	854	1,229	2,083
Retail < 100 ksf	25	ksf	65.889	1,647	1.876	69:31	32	15	47	6.658	43:57	71	95	166
R&D	4,640	ksf	9.049	41,987	1.079	85:15	4,256	751	5,007	1.083	18:82	905	4,120	5,025
Manufacturing[4]	515	ksf	4.033	2,077	0.649	86:14	287	47	334	0.643	18:82	60	271	331
Golf Course[5]	9	holes	40.00	360	3.220	83:17	24	5	29	3.360	52:48	16	14	30
Public Park[5,6]	45	acres	12.79	576	0.440	65:35	13	7	20	0.890	45:55	18	22	40
Auto Mall														
Auto Retail	45	acres	—	11,200	—	—	510	330	840	—	—	400	610	1,010
TOTAL				100,270			6,574	1,686	8,260		31,888	2,678	7,846	10,524

Notes:

1. Square footages are based on estimated build-out potential as supplied by the applicant.
2. City of Fremont standard rates based on *San Diego Trip Generators*, San Diego Association of Governments.
3. 20 acres of the proposed warehouse site will be located on the Robbins-Stern parcels. Approximately 36 acres are to be located on the Fremont Auto Mall site.
4. Manufacturing is part of the Campus use.
5. These uses to be located on the Robbins-Stern parcels.
6. The park is located on the Robbins-Stern parcels. Smaller parks and plazas within the Pacific Commons project site will be primarily for internal use on weekdays and public use during the weekends. Therefore, they will not generate any new external weekday peak hour trips.

Table IV

Comparison of Average Daily Traffic

Roadway	Segment	GP Land Use, GP Network[1]	Proposed Land Use, GP Network	Proposed Land Use, Proposed Network
Stevenson Blvd.	I-880 to Albrae	54,200	61,800	62,700
Stevenson Blvd.	Albrae to Cedar	38,900	38,700	39,500
Stevenson Blvd.	Cedar to Boyce	25,400	23,800	24,600
Stevenson Blvd.	West of Boyce	9,100	9,700c	6,000
Stevenson Extension	Stevenson to Auto Mall	22,000	6,300	2,200
Stevenson Extension	Auto Mall to Cushing	13,200	4,400	---
Auto Mall Parkway	I-880 to Christy	53,400	62,000	58,600
Auto Mall Parkway	Christy to Project entrance	43,100	31,100	27,800
Auto Mall Parkway	Project entrance to Boscell	21,200	30,100	26,800
Auto Mall Parkway	Boscell to Boyce	20,900	15,300	13,400
Auto Mall Parkway	Boyce to Street "D" (existing Cushing)	8,700	1,800	2,100
Auto Mall Parkway	West of Street "D" (existing Cushing)	8,800	2,000	2,200
Cushing Parkway	Fremont to Northport Loop	34,400	38,000	40,700
Cushing Parkway	Street "F" to Street "D"	3,500	13,800	17,700
Cushing Parkway	Street "E" to Auto Mall	2,500	2,600	2,500

Notes:

1 Source: *Addendum to the Environmental Impact Report - Pacific Greens Project*, Duncan & Jones, August 1991. New model runs were conducted for remaining scenarios.

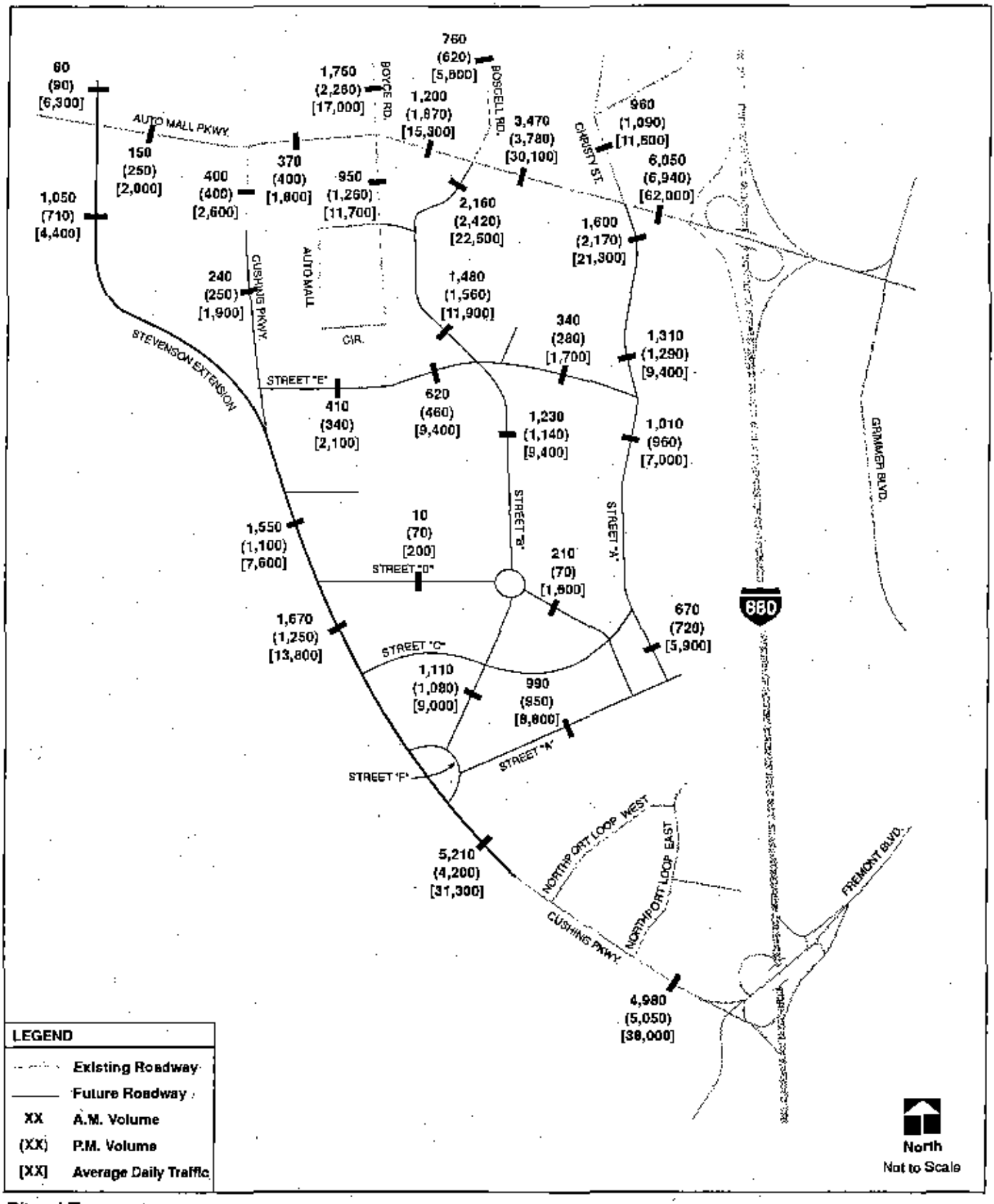

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Figure 4

2010 Roadway Segment Traffic Volumes - Stevenson Alternative

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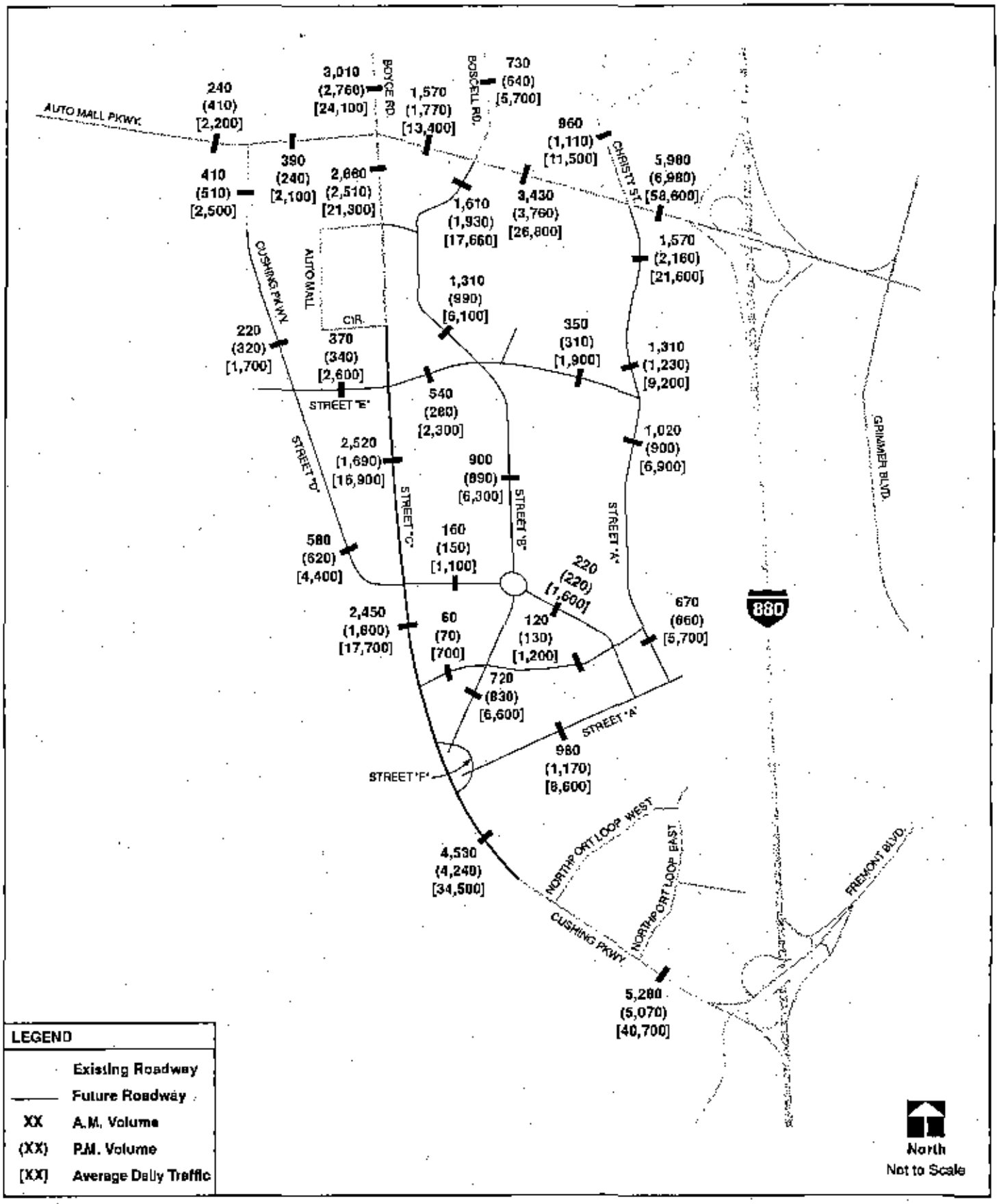

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Figure 5

2010 Roadway Segment Traffic Volumes - Boyce Alternative

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Table V

Results of the Intersection Level of Service Analysis - 2010 Conditions

ID	Intersection	Peak Hour	GP Land Use, GP Network*		Proposed Land Use, GP Network		Proposed Land Use, Proposed Network			
							Unmitigated		Mitigated	
			V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
2189	I-880 NB Off-Ramp/ Stevenson Boulevard	A.M.	0.53	A	0.66	B	0.67	B		
		P.M.	0.78	C	0.79	C	0.81	D		
2194	I-880 SB Off-Ramp/ Stevenson Boulevard	A.M.	0.78	C	0.92	E	0.94	E		
		P.M.	0.76	C	0.90	D	0.89	D		
2433	Boscell Road/ Auto Mall Parkway	A.M.	0.59	A	0.76	C	0.66	B		
		P.M.	0.76	C	0.81	D	0.81	D		
2440	Christy Street/ Auto Mall Parkway	A.M.	0.74	C	0.74	C	0.71	C	0.69	B
		P.M.	0.73	C	0.94	E	0.95	E	0.87	D
2553	I-880 NB Ramps/ Fremont Boulevard	A.M.	0.60	A	0.88	D	0.92	E		
		P.M.	0.44	A	0.44	A	0.42	A		
2556	I-880 SB Off-Ramp/ Fremont Boulevard	A.M.	0.59	A	0.80	C	0.82	D		
		P.M.	0.46	A	0.54	A	0.52	A		
2571	I-880 NB Ramps/ Auto Mall Parkway	A.M.	0.81	D	0.84	D	0.82	D		
		P.M.	0.73	C	0.68	B	0.64	B		
2579	I-880 SB Ramps/ Auto Mall Parkway	A.M.	0.83	D	1.22	F	1.25	F		
		P.M.	0.71	C	0.82	D	0.83	D		
2671	Fremont Boulevard/ Grimmer Boulevard	A.M.	0.67	B	0.75	C	0.76	C		
		P.M.	0.47	A	0.65	B	0.66	B		
2731	Cherry/Boyce/ Stevenson Boulevard	A.M.	1.11	F	0.83	D	0.98	E	0.84	D
		P.M.	0.82	D	1.11	F	1.02	F	0.85	D
2778	Grimmer Boulevard/ Auto Mall Parkway	A.M.	0.93	E	1.14	F	1.13	F		
		P.M.	0.98	E	1.33	F	1.34	F		
2788	Boyce Road/ Auto Mall Parkway	A.M.	0.63	B	0.54	A	0.82	D	0.84	D
		P.M.	0.85	D	0.85	D	1.05	F	0.84	D
2789	Fremont Boulevard/ Cushing Parkway	A.M.	0.84	D	0.74	C	0.81	D		
		P.M.	0.76	C	0.89	D	0.89	D		
2899	Albrae Street/ Stevenson Boulevard	A.M.	0.65	B	0.74	C	0.77	C		
		P.M.	1.05	F	1.00	E	0.99	E		
3375	Stevenson Boulevard/ Auto Mall Parkway	A.M.	0.60	A	0.42	A	0.27	A		
		P.M.	0.81	D	0.40	A	0.37	A		
3501	Cushing Parkway/ Auto Mall Parkway	A.M.	0.25	A	0.30	A	0.33	A		
		P.M.	0.49	A	0.32	A	0.39	A		

* Source = *Pacific Greens EIR*, Duncan & Jones, August 1991.

I-880 Southbound Ramps/Stevenson Boulevard: The intersection is projected to operate above the target V/C ratio (0.85) during both peak hours under both "Proposed Land Use" scenarios. During the a.m. peak hour, the intersection is projected to operate at LOS E under both scenarios.

Christy Street/Auto Mall Parkway: The intersection is projected to operate at LOS E during the p.m. peak hour under both the "Proposed Land Use" scenarios.

I-880 Northbound Ramps/Fremont Boulevard: Under the "Proposed Land Use/General Plan Network" scenario, the intersection is projected to operate at LOS D (V/C = 0.88) during the a.m. peak hour. Under the "Proposed Land Use/Proposed Network" scenario, the intersection is projected to operate at LOS E (V/C = 0.92) during the a.m. peak hour.

I-880 Southbound Ramps/Auto Mall Parkway: The intersection is projected to operate at LOS F during the a.m. peak hour under both "Proposed Land Use" scenarios.

Cherry Street/Boyce Street/Stevenson Boulevard: The intersection is projected to operate at LOS D (V/C = 0.89) during the p.m. peak hour under both "Proposed Land Use" scenarios. It should be noted that under both scenarios, the volume on the southbound right-turn movement exceeds its capacity during the a.m. peak period. Since this movement is a "free" right turn, the intersection level of service is not affected.

Grimmer Boulevard/Auto Mall Parkway: The intersection is projected to operate at LOS E or worse during both peak hours under all three study scenarios.

Boyce Road/Auto Mall Parkway: The intersection is projected to operate at LOS F (V/C = 1.05) during the p.m. peak hour under the "Proposed Land Use/Proposed Network" scenario.

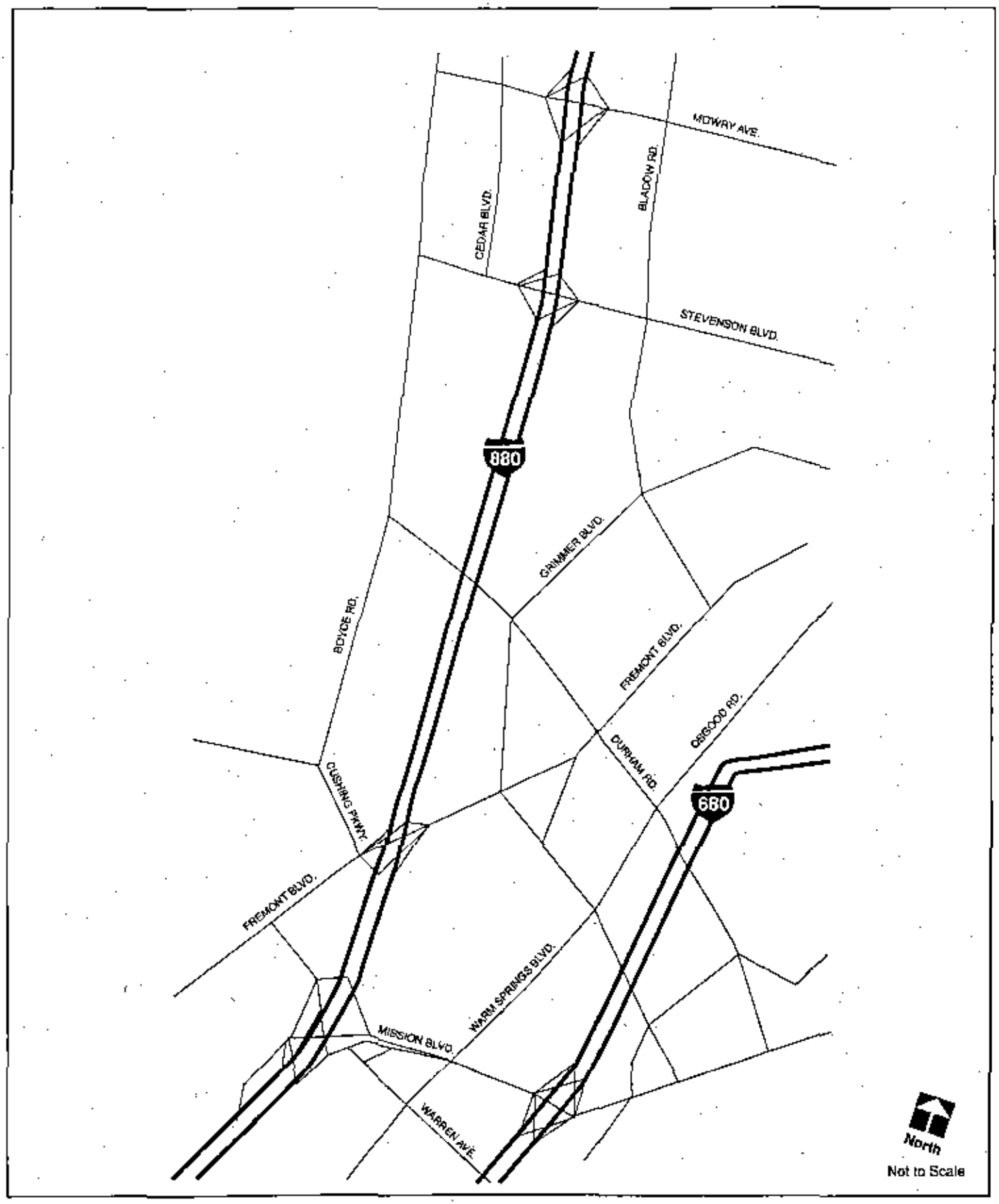
Fremont Boulevard/Cushing Parkway/I-880 Southbound On-Ramp: Under the "Proposed Land Use/ General Plan Network" scenario, the intersection is projected to operate with V/C ratios exceeding 0.85 during both peak hours. Under the "Proposed Land Use/Proposed Network" scenario, the intersection is projected to operate with a V/C ratio of 0.89 during the p.m. peak hour. It should be noted that under both scenarios, the volume of the southbound right-turn movement exceeds its capacity during the a.m. peak period. Since this movement is a "free" right turn, the intersection level of service is not affected.

Albrae Street/Stevenson Boulevard: The intersection is projected to operate at LOS E or worse during the p.m. peak hour under all three study scenarios.

Freeway

The Alameda County CMA traffic model was used to compare 2010 freeway conditions under the Existing General Plan with those resulting from the development of the proposed project. (Figure 6 illustrates the CMA model roadway network in the vicinity of the proposed project.) These two scenarios contain differing networks as well as differing land uses. The primary difference between the two networks is the Boyce Road extension. The land use differences are related to the replacement of the General Plan land use with the proposed project.

The results of the CMA facility analysis are summarized in Table VI.



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CMA Network

Figure
6

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Table VI

2010 CMA Analysis

Segment	Dir	A.M. Peak Hour				P.M. Peak Hour			
		Existing General Plan		Proposed Project		Existing General Plan		Proposed Project	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
State Route 84									
Paseo Padre to Ardenwood	EB	0.25	A	0.24	A	0.50	A	0.48	A
	WB	0.58	A	0.57	A	0.32	A	0.33	A
Ardenwood to I-880	EB	0.50	A	0.48	A	0.72	C	0.70	B
	WB	0.76	C	0.74	C	0.63	B	0.63	B
State Route 238									
I-680 to Driscoll	NB	0.70	B	0.79	C	1.19	F	1.06	F
	SB	0.81	D	0.76	C	0.57	A	0.61	B
Washington to I-680	NB	0.90	D	0.88	D	1.28	F	1.26	F
	SB	1.44	F	1.40	F	0.94	E	0.93	E
Durham to Washington	NB	0.57	A	0.55	A	1.25	F	1.22	F
	SB	1.41	F	1.34	F	0.87	D	0.86	D
I-680									
Washington to Mission (238)	NB	0.68	B	0.67	B	1.08	F	1.10	F
	SB	1.07	F	1.10	F	0.73	C	0.73	C
Washington to Durham	NB	0.56	A	0.56	A	1.04	F	1.07	F
	SB	0.97	E	1.03	F	0.63	B	0.62	B
Durham to Mission	NB	0.52	A	0.51	A	0.89	D	0.90	D
	SB	0.88	D	0.87	D	0.61	B	0.58	A
I-880									
S.R. 84 to Thornton	NB	0.83	D	0.81	D	0.97	E	1.02	F
	SB	0.97	E	1.01	F	0.86	D	0.85	D
Thornton to Mowry	NB	0.75	C	0.74	C	0.98	E	1.01	F
	SB	1.06	F	1.11	F	0.90	D	0.90	D
Mowry to Stevenson	NB	0.67	B	0.63	B	1.01	F	1.01	F
	SB	0.98	E	1.01	F	0.74	C	0.73	C
Stevenson to Auto Mall	NB	0.69	B	0.64	B	1.05	F	1.05	F
	SB	1.00	E	1.02	F	0.72	C	0.72	C
Auto Mall to Fremont	NB	0.63	B	0.57	A	0.95	E	0.94	E
	SB	0.94	E	0.91	E	0.64	B	0.64	B
Fremont to Mission	NB	0.59	A	0.70	B	0.82	D	0.82	D
	SB	0.75	C	0.69	B	0.60	A	0.68	B

Source: Alameda County Congestion Management Agency

CIRCULATION AND ACCESS

Description of Internal Roadways

Based on 2010 traffic volumes projected by the City traffic model, the following lane configurations are recommended for the Pacific Commons internal streets (these configurations are for segments; additional turn lanes may be required at intersections):

Street "A" (Christy Street Extension)

- Auto Mall Parkway to southern boundary of commercial center: four lanes plus median
- Street "E" to Street "F": three lanes (one lane in each direction plus a center turn lane)

Street "B" (Boscell Road Extension)

- Auto Mall Parkway to southern boundary of commercial center: four lanes plus median
- Street "E" to Street "F": three lanes

Street "C" (Boyce Road Extension)

- Auto Mall Parkway to Street "F": four lanes plus median
- Street "F" to Fremont Boulevard: six lanes plus median

Street "D" (Extension of north Cushing Parkway)

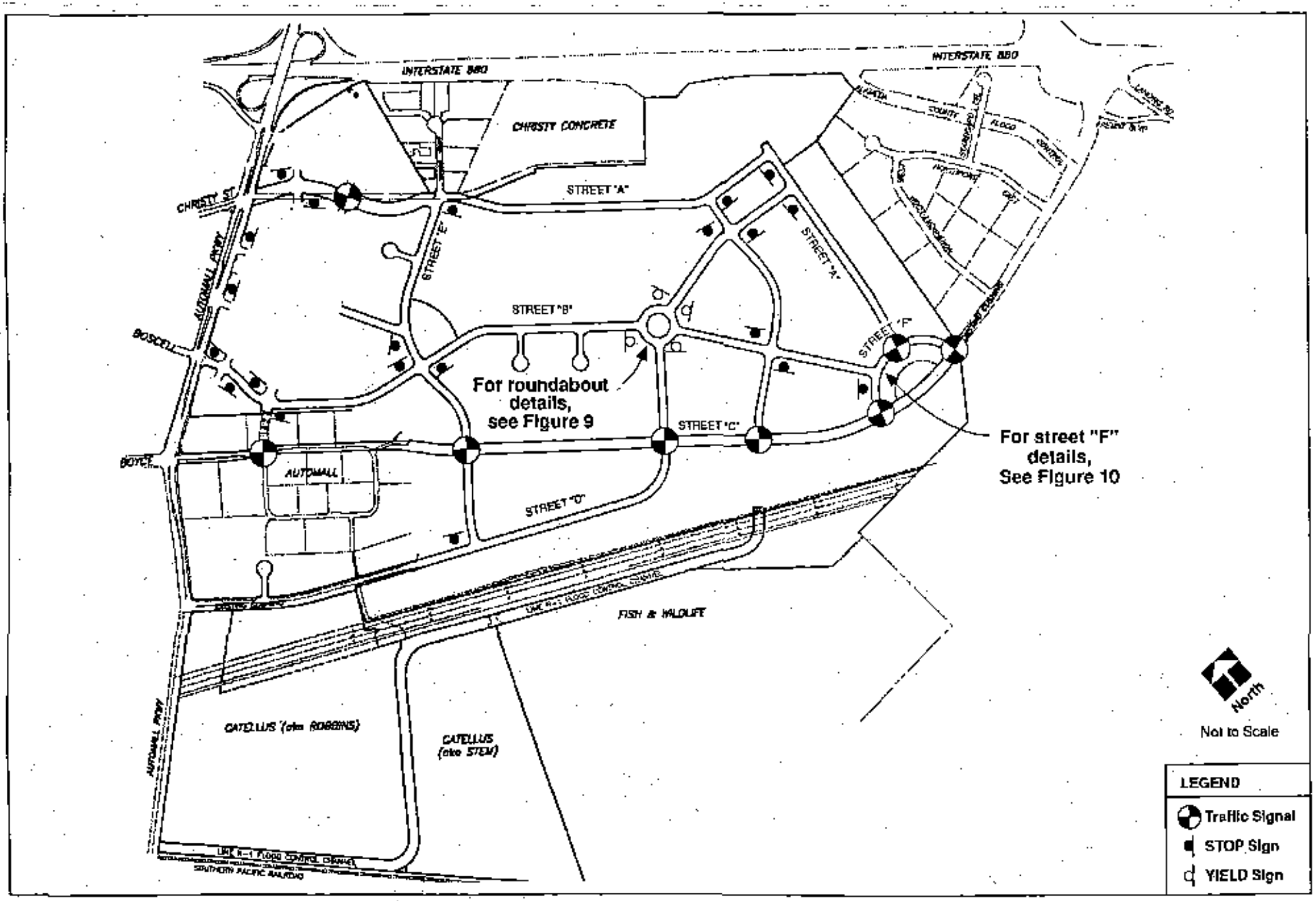
- Auto Mall Parkway to Street "A": three lanes

Street "E"

- Street "D" to Street "A": three lanes

Internal Intersection Control Recommendations

In general, due to the high traffic volumes on Street "C" (the Boyce Road-Cushing Parkway connector), signals may be necessary at all major intersections between Boyce Road and the project's southern boundary. On most other internal streets, STOP-sign control should be adequate, except where noted in the following sections. Figure 7 illustrates potential internal intersection control schemes.



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Potential Intersection Conrol - Internal Roadways

Figure 7

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Commercial Driveways

The commercial center on the north end of the project (adjacent to Auto Mall Parkway) will be primarily served by southward extensions of Christy Street (Street "A") and Boscell Street (Street "B"). The project applicant proposes two full-access driveways along each of these streets to serve the commercial center. Initially, all of these driveways will function adequately with STOP-sign control on the minor streets because much of the industrial/warehouse R&D sections of the project will not have been built. As the southern portions of the project are built out and internal north-south connections are constructed, mainline traffic on Streets "A" and "B" will increase. It is recommended that the City monitor the driveways as the project develops to determine if more suitable controls, such as all-way STOP signs or traffic signalization, will be warranted. It is likely that a signal will eventually be warranted at the intersection of Street "A" with the "main" access fronting the proposed commercial center. The center should be designed to accommodate the possibility of future signalization.

Roundabout

The applicants propose to configure the junction of Street "B" and Street "D" as a roundabout. The principal features of roundabouts include the following:

- One-way, counter-clockwise traffic flow around a solid central circular island.
- YIELD control on all approaches, giving priority to vehicles circulating within the roundabout. (Once a vehicle has entered the roundabout, it is no longer required to stop.)

Roundabouts are typically applied on low-volume residential streets to allow vehicles to flow efficiently through an intersection. (They have been successfully applied at many other types of locations, such as collector street intersections and freeway interchanges.) Often, motorists do not need to stop or yield before entering a roundabout because there is no opposing traffic. Therefore, the roundabout can provide substantially lower delays (for appropriate volumes levels) than those observed at STOP-controlled or signal-controlled intersections. Roundabouts also can exhibit lower accident rates than standard intersections, due to a reduced number of conflict points (4 at a four-way roundabout versus 32 at a standard four-way intersection) and slower speeds near and through the roundabout.

The intersection of Street "B" and Street "D" is expected to carry approximately 822 vehicles during the a.m. peak hour and 859 during the p.m. peak hour. Figure 8 illustrates the projected peak hour volumes at the intersection. Given these volumes, a one-lane roundabout would operate at an acceptable level of service, according to capacity data published by the National Association of Australian State Road Authorities[2]. Detailed calculations are attached.

The proposed center island is approximately 236 feet in diameter. At this size, vehicles will be able to circulate through the roundabout at 15 to 20 miles per hour (mph). It is recommended that the circulating lane be at least 18 feet wide. To facilitate smooth entering and exiting movements, it is recommended that the possibility of flaring the approach and exit lanes near the intersection be investigated (especially for Street "B," which will carry higher volumes than Street "D"). This will allow vehicles to enter the circle nearly on a tangent, rather than at a right angle. In addition to YIELD signs on each approach, pictorial roundabout warning signs should be placed in advance of the

[2] *Roundabouts: A Design Guide*, NAASRA, 1986.

intersection on each approach. "ONE WAY" signs should also be installed facing each approach. It is recommended that vertical features on the central island be set back far enough into the circle to allow entering motorists to clearly see vehicles approaching at least 220 feet away (measured along the roadway centerline). This will provide safe stopping distance for 20 mph. It is also recommended that parking be prohibited within the roundabout.

Figure 9 illustrates the recommended geometrics for the proposed roundabout.

Street "F": Half-Roundabout

Street "F" is essentially a large semi-roundabout, approximately 1,400 feet long, whose "spokes" are Street "A," Street "B," and Street "C." As proposed, the radius of Street "F" is approximately 470 feet, equating to a design speed of approximately 35 mph. Three acres of commercial uses are proposed along the inner circumference of Street "F". The currently proposed layout provides the following approximate separation distances between major intersections along Street "F": Street "C" to Street "A" - 600 feet, Street "A" to Street "B" - 400 feet, Street "B" to Street "C" - 400 feet.

The two intersections of Street "F" with Street "C" are likely to ultimately warrant signalization. Along Street "F," it may ultimately be necessary to signalize the intersection with Street "A" to accommodate a heavy southbound left-turn demand (bound for I-880 from Street "A" via Street "F"). The intersection with Street "B" may not need to be signalized if southbound right turns are encouraged via the provision of a free right-turn lane. Figure 8 illustrates the projected volumes at intersections along Street "F."

Although a three-lane road section is recommended for Street "F," wider sections will be needed on the approaches to the two intersections with Street "C." At the eastern intersection (closest to I-880), two southbound lanes are recommended: one exclusive left-turn lane and one shared left- and right-turn lane (the shared lane can also be adapted to accommodate southbound through movements in conjunction with the development of the proposed corporate campus). At the western intersection, three southbound lanes are also recommended: two exclusive left-turn lanes and one exclusive right-turn lane (that can be modified to accommodate southbound through movements when necessary). The outside lane should be continued from the free right-turn lane created at the intersection of Street "F" and Street "B."

Figure 10 illustrates the recommended geometrics for Street "F."

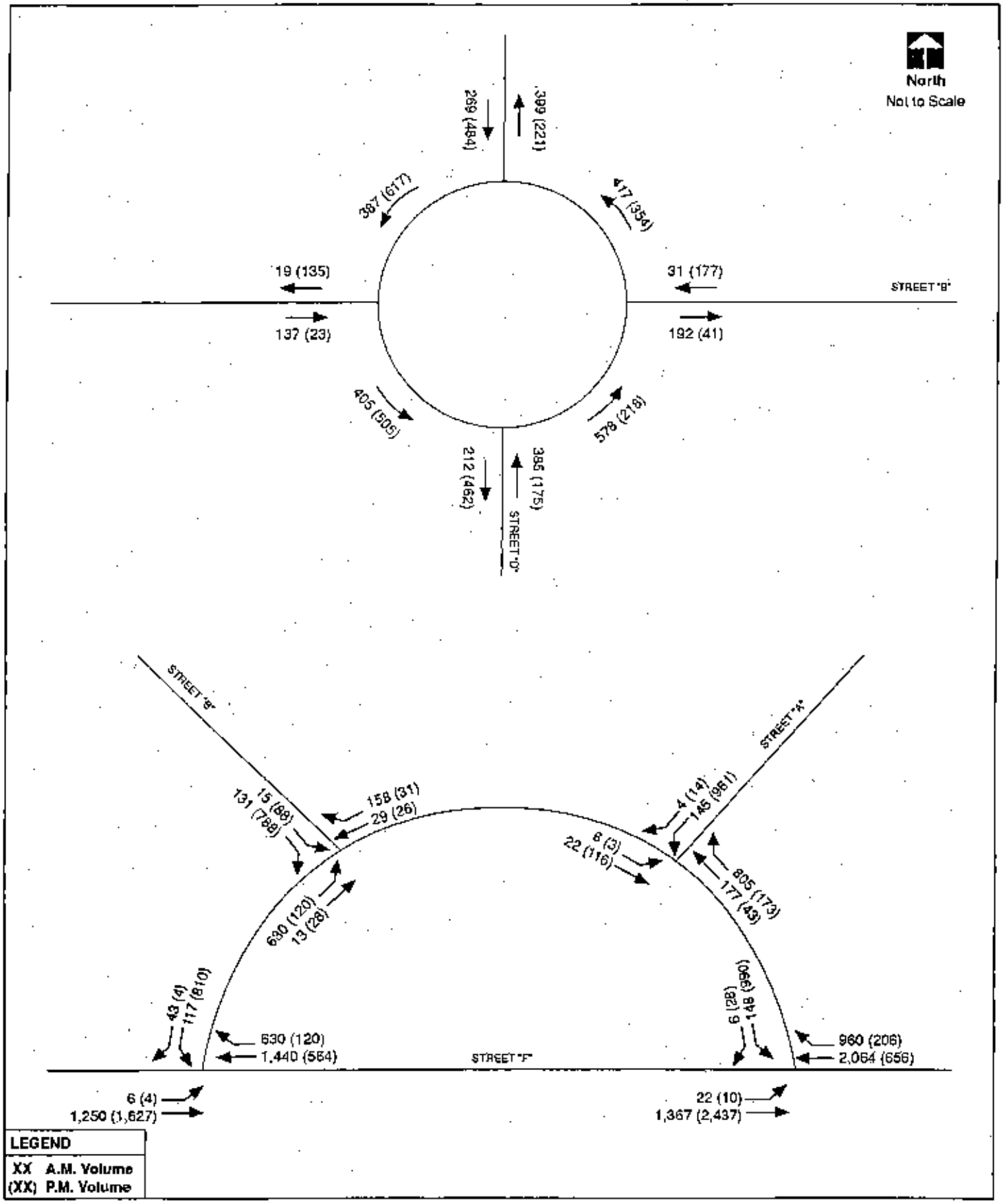

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Figure 8

Roundabout/Crescent Peak Hour Turning Movement Volumes

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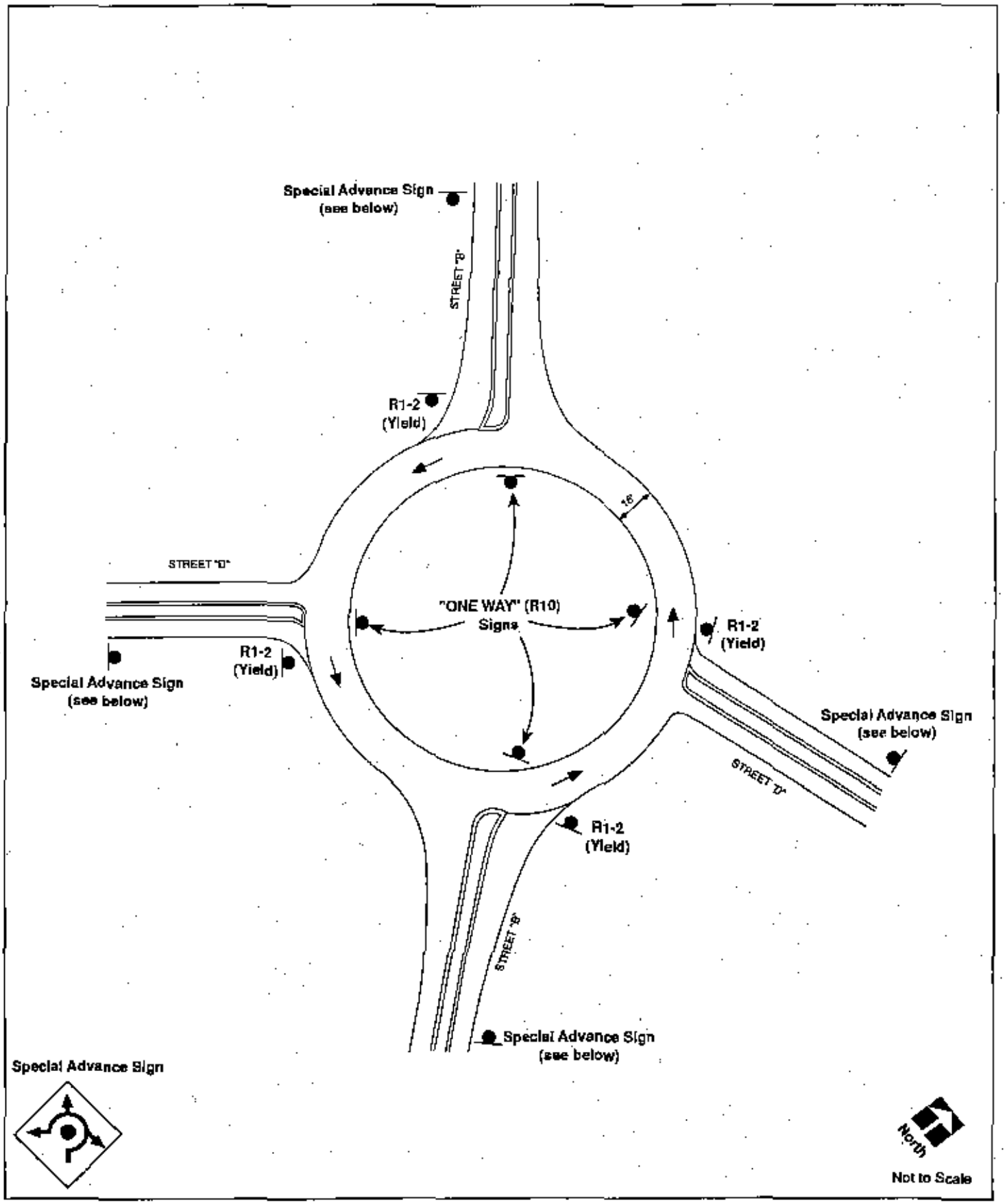

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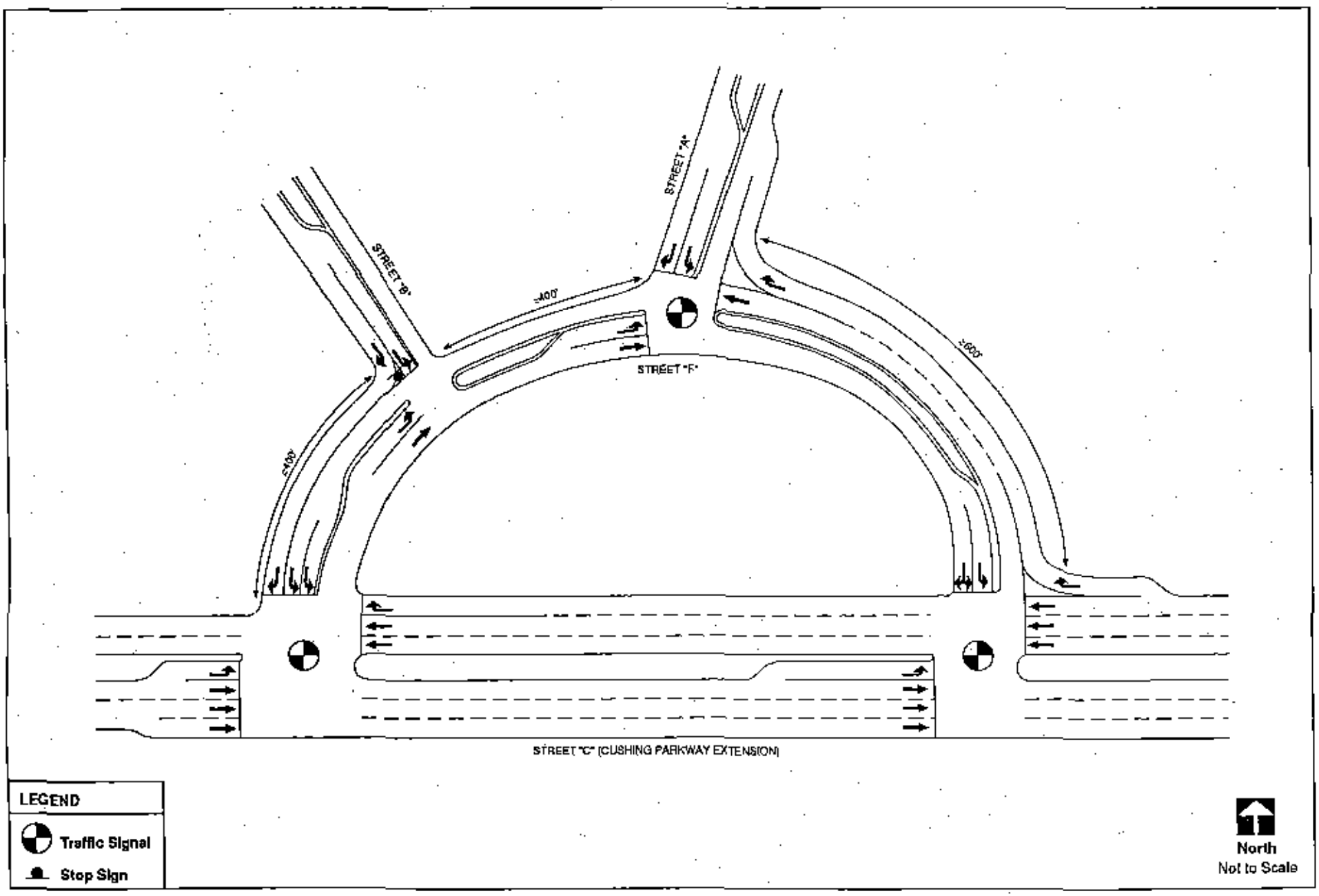
Conceptual Roundabout Geometrics

Figure
9

TJKM

4-209 - 12/95 - K2



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Street "F" Geometrics

Figure
10

TJKM

MITIGATION MEASURES

The Addendum to the previous Environmental Impact Report summarized the Project applicant's responsibility to contribute toward future roadway improvements:

> *The Project developer will be held responsible for payment of a pro-rata share of the costs of street improvement projects in the area of development. If a Citywide Traffic Impact Fee is approved by the City Council, these new fees will supersede any pro-rata exactions for street improvements.*

Intersections

Based on expected 2010 conditions identified in previous sections, improvements to intersection levels of service are described below. The effects of the mitigations are described for the "Proposed Land Use/Proposed Network" scenario, which is the preferred alternative.

I-880 Southbound Ramps/Stevenson Boulevard: Additional mitigation measures beyond expected improvements are not feasible.

Christy Street/Auto Mall Parkway: Restriping the southbound approach to provide two exclusive left-turn lanes and one shared through, left- and right-turn lane would improve the intersection V/C ratio to 0.87 during the p.m peak hour. The traffic signal would need to continue to operate with split phasing on the north and south approaches in conjunction with this improvement.

I-880 Northbound Ramps/Fremont Boulevard: Additional improvements to this intersection are not feasible due to right-of-way constraints.

I-880 Southbound Ramps/Auto Mall Parkway: Widening to provide a two-lane southbound on-ramp to I-880 would reduce eastbound weaving conflicts on the short section of Auto Mall Parkway between Christy Street and the ramp.

Cherry Street/Boyce Street/Stevenson Boulevard: Signalization, coupled with improvements to three legs of the intersection, would improve the intersection's V/C ratio to 0.84 during the a.m. peak hour and 0.85 during the p.m. peak hour. Improvements on the westbound approach consist of widening to provide two exclusive left-turn lanes, one exclusive through lane, and one exclusive right-turn lane. Improvements on the eastbound approach consist of restriping to provide one exclusive left-turn lane, one exclusive through lane, and one shared through and right-turn lane. Improvements on the northbound approach consist of reconfiguring the southeast corner (and widening the east leg) to provide a northbound free right-turn lane. Some of these long-term improvements are already assumed by the City of Fremont.

Grimmer Boulevard/Auto Mall Parkway: Poor projected levels of service at this intersection are primarily due to high volumes on key movements (eastbound right turns during the a.m. peak hour and northbound and eastbound left turns during the p.m. peak hour). These model-projected volumes would likely be diverted to other routes if this intersection became a constraint point due to congestion. The improvements necessary to accommodate the project volumes are unlikely due to right-of-way constraints. Therefore, no additional mitigation measures are feasible at this intersection.

Boyce Road/Auto Mall Parkway: Reconfiguring the southbound approach to provide two exclusive left-turn lanes, two exclusive through lanes, and one "free" right-turn lane would improve the intersection V/C ratio to 0.84 during the p.m. peak hour. This improvement can be accomplished by narrowing the median on the southbound approach.

Due to the elimination of the Stevenson Boulevard extension, the lane requirements on the eastbound approach to the Boyce Road/Auto Mall Parkway can be greatly reduced over those presented in the previous Addendum to the EIR. At a minimum, the eastbound approach could provide one exclusive left-turn lane and one shared through and right-turn lane and still function at acceptable levels of service during both peak hours.

Fremont Boulevard/Cushing Parkway/I-880 Southbound On-Ramps: This intersection is projected to operate with a V/C ratio of 0.89, slightly above the City standard threshold. No additional mitigation measures are feasible at this intersection.

Albrae Street/Stevenson Boulevard: As the previous EIR stated, no additional mitigation measures are feasible for this intersection. It should be noted that the intersection is projected to function at a better p.m. peak hour level of service with the Proposed land use than it is with the General Plan land use.

Figure 11 illustrates the recommended study intersection mitigation measures.

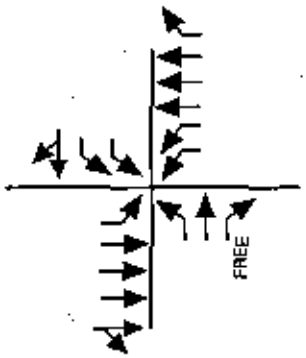
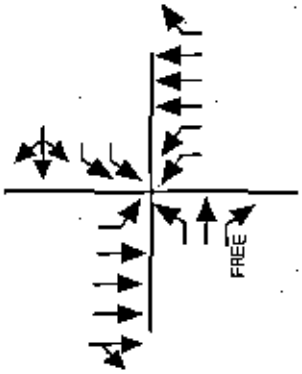
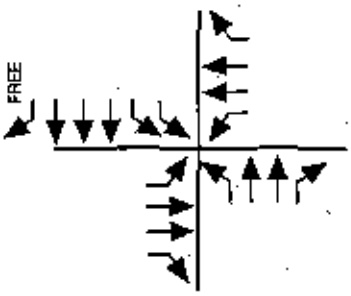
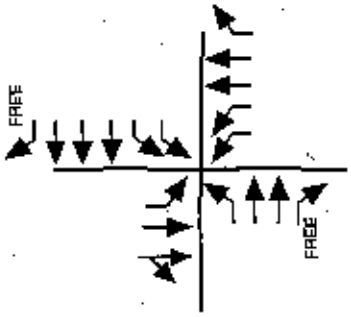
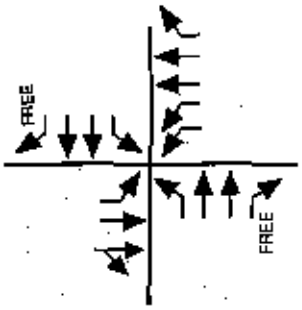
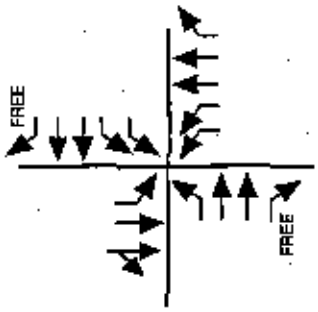
Auto Mall Parkway Geometric Requirements

Figures 12 and 13 illustrate the conceptual geometrics for Auto Mall Parkway between I-880 and existing Cushing Parkway. The lane requirements are derived from the analysis described above.

The improvements will require widening in two areas:

- Between Christy Street and I-880 southbound, one additional eastbound lane will be required, and the on-ramp will need to be widened to accept it.

- Between Boscell Road and the western commercial driveway, a small amount of widening may be necessary to accommodate four eastbound through lanes plus six eastbound lanes (including two left-turn lanes) and a median. Assuming 12-foot through lanes, 11-foot left-turn lanes and 13-foot through lanes next to medians and sidewalks, an additional 5 feet of paved width may be necessary on the south side of Auto Mall Parkway and 8 feet on the north side. These widths would taper to zero near the proposed driveway. If lane widths could be reduced to 11 feet, no widening would be necessary on the south side and only a small 4-foot section would be necessary on the north side. The widening requirement on the north side will extend a few hundred feet west of Boscell Road.

Intersection	Base Geometry (2010)	Recommended Geometry
#2440 Christy/Auto Mall		
#2731 Cherry/Boyce/Stevenson		
#2788 Boyce/Auto Mall		

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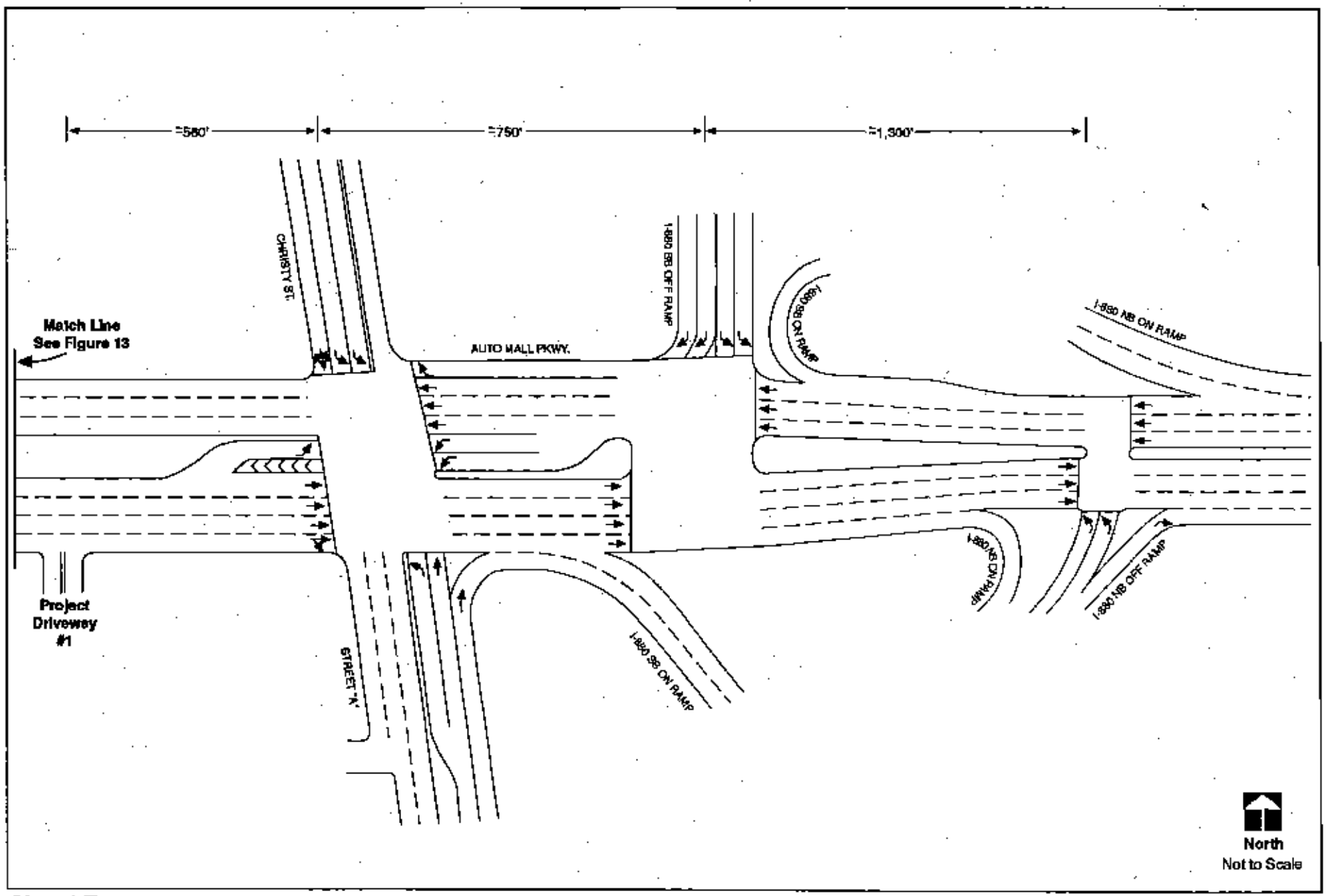
Recommended Intersection Mitigation Measures

Figure **11**

TJKM

4-209 - 1/98 - K2



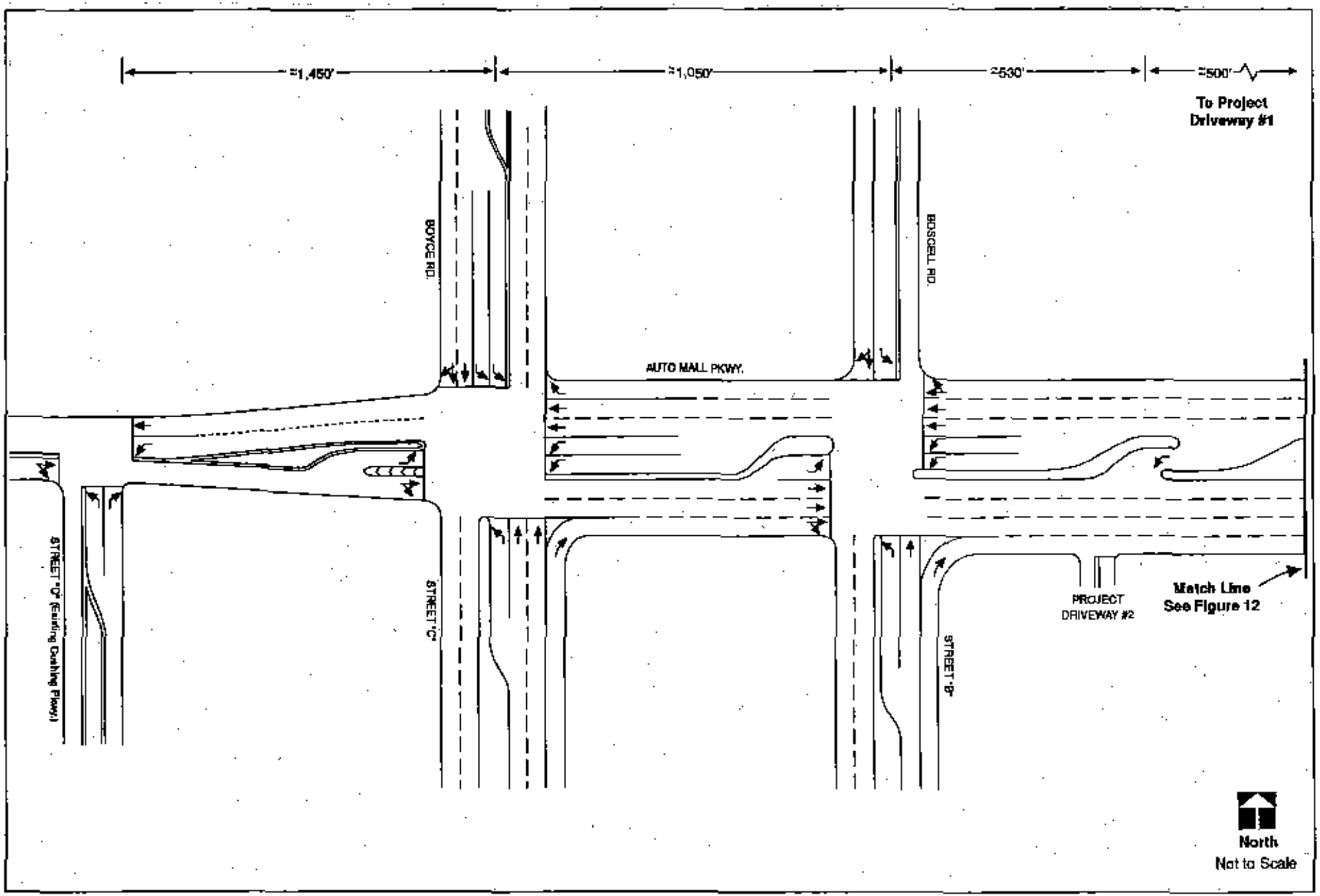
City of Fremont
Pacific Commons

Auto Mall Parkway Conceptual Lane Requirements - 2010

Figure
12

TJKM

4-209 - 10/96 - 10/95



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Auto Mall Parkway Conceptual Lane Requirements - 2010

Figure **13**

TJKM

4-209 - 10/95 - 10/95

Analysis was performed to determine left-turn storage requirements at intersections along Auto Mall Parkway. The following minimum left-turn storage lengths are recommended along Auto Mall Parkway (entering the project, westbound-to-southbound):

- Christy Street: 1,200 feet (two lanes at 600 feet each)
- Limited Access Project driveway (between Christy Street & Boscell Road): 200 feet
- Boscell Road: 1,000 feet (two lanes at 500 feet each)
- Boyce Road: 500 feet (two lanes at 250 feet each)

As Figure 13 illustrates, the left-turn lane at Cushing Parkway will extend all the way back to Boyce Road as a "trap" lane.

APPENDIX A

Description of the Level of Service Methodology

DESCRIPTION OF SIGNALIZED INTERSECTION CAPACITY ANALYSIS TJKM METHODOLOGY

Background

TJKM utilizes a method of intersection capacity analysis known as the Intersection Capacity Utilization (ICU) method. A variation of the TJKM method, known as the critical movement analysis, is described in Interim Materials on Highway Capacity, Transportation Research Circular 212, January 1980, published by the Transportation Research Board of the National Academy of Sciences. The TJKM method is similar to the planning applications method of Signalized Intersection analysis described in Circular 212. This method addresses the capacity of intersections as a whole. It simulates the operation of an actuated signalized intersection.

The method determines the critical movement by approach. The critical movements are determined by identifying the conflicting movements on the north-south and east-west approaches. The critical movement on an approach with split phase operation is the movement with the highest volume-to-capacity ratio since it has no conflicting movements. The method then sums the volume-to-capacity ratio of each critical movement at an intersection to produce an overall intersection volume-to-capacity ratio. When the ratio of volume to capacity reaches unity (1.00), the intersection is "at capacity" and is described as operating at Level of Service E and approaching Level of Service F conditions. If an existing intersection is found to have a volume-to-capacity ratio greater than 1.0, this indicates that the actual lane capacities are greater than those assumed in the methodology.

The advantages of this type of capacity calculation is its direct relationship to actual intersection operations and the ease with which changes in traffic volumes or intersection capacity (i.e. intersection lane configuration) or both can be analyzed. The level of accuracy of this method is comparable to that of the traffic projection processes used to determine future traffic volumes.

Level of Service

The volume-to-capacity ratio is related to the level of service. The relationship of volume-to-capacity ratio to level of service is a scale with a range of LOS A through LOS F. The table "Levels of Service for Intersections" depicts the relationship between the level of service rating and volume-to-capacity ratio.

Input Data

The input data necessary to use this methodology are:

- Lane geometrics
- Turning movement volumes
- Split phasing information

The lane configuration for the study intersections is indicated with a special nomenclature for the TJKM intersection capacity analysis. This nomenclature is explained on the attached "Description of Lane Configuration Format."

Sample

A sample calculation is shown on the accompanying computer print-out "TJKM Intersection Capacity Analysis." This example describes a hypothetical intersection of A Street and B Street, which is regulated by three phase traffic signals. The following three steps for this example demonstrates how opposing approaches to the traffic signals are analyzed individually in the first two steps, and the third step computes totals for the intersection.

Step 1 — The first phase is for southbound traffic only and contains three lanes. Right-turn movements in the right lane (189 vehicles) have a smaller per lane volume than in the two remaining lanes (226 vehicles). Therefore, the length of the signal phase is governed by the traffic in the two left lanes. The capacity of Phase 1 is 3,000 vehicles per hour of green, the volume is 452 vehicles and the resulting volume-to-capacity ratio is 0.1507. Phase 2, the northbound movements, has two lanes and a volume-to-capacity ratio of 0.1738.

Step 2 — For Phase 3, the westbound through plus right traffic cannot proceed through the intersection at the same time as the eastbound left-turn movement, even though they are on the same signal phase. Practically, the left turning vehicles and opposing through traffic alternate as gaps in traffic allow. The total Phase 3 capacity requirement is the sum of the westbound through and right combined, 0.2045, and the eastbound left, 0.0833.

Step 3 — The four critical movement volume-to-capacity ratios are summed, then rounded to two decimal places. An allowance for yellow time (assumed to be lost time for vehicle movement) is added to obtain the overall intersection volume-to-capacity rating. In the example, the intersection rating of 0.71 equates to a Level of Service C designation.

TJKM INTERSECTION CAPACITY ANALYSIS 5/6/93

INTERSECTION 1 A STREET and B STREET ANYTOWN
COUNT DATE/TIME: 6/5/00 4:00-6:00 PM PEAK HOUR: 4:30-5:30 PM
CONDITION : P.M. PEAK HOUR - EXISTING FILE sample.i

```
                    RIGHT  THRU  LEFT
                     189   225   227
                      |     |     |                          ^
                      |     |     |                          |
                      <-----  v  ----->                      NORTH
LEFT   135 ---- 1.0   1.0   1.1   2.1   1.1 ---- 45  RIGHT
                                                   STREET NAME:
THRU   623 ----> 2.0  (NO. OF LANES)   2.1<---- 644  THRU   B STREET
RIGHT   15 ---- 1.0   1.1   2.2   1.1   1.0 ---- 11  LEFT   SPLIT PHASE?
                      <-----  ^  ----->                       N
                      |     |     |
                      |     |     |
                       30   518   15
                      LEFT THRU RIGHT
```

SAMPLE

STREET NAME: A STREET SPLIT PHASE? Y

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	15	15	1620	0.0093	
	THRU (T)	518	518	3240	0.1599	
	LEFT (L)	30	30	1620	0.0185	
	T + R		533	3240	0.1645	
	T + L		548	3240	0.1691	
	T + R + L		563	3240	0.1738	0.1738
SB	RIGHT (R)	189	62 *	1620	0.0383	
	THRU (T)	225	225	1620	0.1389	
	LEFT (L)	227	227	3000	0.0757	
	T + L		452	3000	0.1507	0.1507
EB	RIGHT (R)	15	0 *	1620	0.0000	
	THRU (T)	623	623	3500	0.1780	
	LEFT (L)	135	135	1620	0.0833	0.0833
WB	RIGHT (R)	45	45	1620	0.0278	
	THRU (T)	644	644	3370	0.1911	
	LEFT (L)	11	11	1620	0.0068	
	T + R		689	3370	0.2045	0.2045

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.61
ADJUSTMENT FOR LOST YELLOW TIME: 0.10

TOTAL VOLUME-TO-CAPACITY RATIO: 0.71
INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED

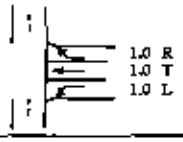
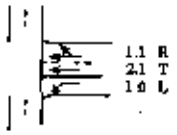
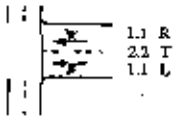
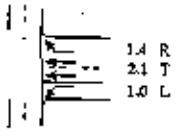
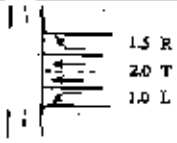
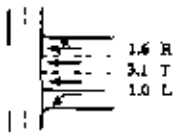
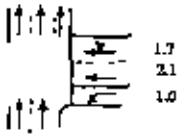
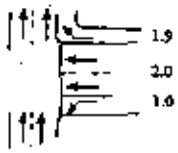
Developed by TJKM Transportation Consultants, Pleasanton, CA, 1991 YY

DESCRIPTION OF LANE CONFIGURATION FORMAT

The number of lanes and the use of the lanes is denoted with a special nomenclature described below:

Lane Nomenclature

X.Y Where X Denotes the total number of lanes available for a particular movement.
Y Denotes how the lanes are used.

When Y is . . .	. . . The following applies:
0 	A lane used exclusively for a particular movement (i.e. exclusive left-turn lane).
1 	A lane which is shared, that is, either of two different movements can be made from a particular lane (i.e. a lane which is shared by through and right-turn traffic).
2 	Denotes two or more through lanes in which two lanes are shared, one with left-turn traffic, the other with right-turn traffic.
3	Denotes an expressway through movement.
4 	Denotes a right-turn movement from a wide outside lane where right-turn vehicles can bypass through traffic sharing the lane to make a right-turn on red.
5 	Denotes a right-turn movement from an exclusive right-turn lane with a right-turn arrow and prohibition on the conflicting U-turn movement.
6 	Denotes a right-turn movement from a shared lane with a right-turn arrow and prohibition on the conflicting U-turn movement.
7,8,9	Denotes a turning movement which has a separate lane to turn into, as shown below:
7 	Turn lane which is shared with a through lane or left-turn lane and under signal control, and which has its own lane to turn into. There must be at least two through lanes.
8	Exclusive turn lane which is under signal control, and which has its own lane to turn into.
9 	Exclusive turn lane **not** under signal control and which has an exclusive lane to turn into, often referred to as a "free" turn. Since the volumes in this lane do not conflict with other intersection movements, the V/C ratio of the free right-turn movement is not included in the sum of critical V/C ratios.

FACTORS FOR TJKM METHODOLOGY

Lane Capacities
(12' or wider lanes)

Designation	Through Capacity	Turn Capacity[1]
1.0	1,750	1,620
1.1	1,630	1,620
2.0	3,500	3,000
2.1	3,370	3,000
2.2	3,240	n/a
3.0	5,250	4,500
3.1	5,120	4,500
4.0	7,000	n/a
4.1	6,870	n/a

Note: 1. 11' wide lanes 97% of listed capacity.
2. 10' wide lanes 93% of listed capacity.

Yellow Time Adjustment

Green Time	Add Yellow (Lost) Time
0.71	0.10
0.72	0.09
0.73	0.09
0.74	0.08
0.75	0.08
0.76	0.07
0.77	0.07
0.78	0.06
0.79	0.06
0.80 or greater	0.05

Level of Service for Signalized Intersections

Level of Service	Type of Flow	Delay	Maneuverability	V/C Ratio
A	Stable Flow	Very slight or no delay. If signalized, conditions are such that no approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.	Turning movements are easily made, and nearly all drivers find freedom of operation.	0.00-0.60
B	Stable Flow	Slight delay. If signalized, an occasional approach phase is fully utilized.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	0.61-0.70
C	Stable Flow	Acceptable delay. If signalized, a few drivers arriving at the end of a queue may occasionally have to wait through one signal cycle.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted.	0.71-0.80
D	Approaching Unstable Flow	Tolerable delay. Delays may be substantial during short periods, but excessive back ups do not occur.	Maneuverability is severely limited during short periods due to temporary back ups.	0.81-0.90
E	Unstable Flow	Intolerable delay. Delay may be great—up to several signal cycles.	There are typically long queues of vehicles waiting upstream of the intersection.	0.91-1.00
F	Forced Flow	Excessive delay	Jammed conditions. Back ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	Varies[1]

Notes: 1. In general, volume-to-capacity ratios cannot be greater than 1.00, unless the lane capacity assumptions are too low. Also, if future demand projections are considered for analytical purposes, a ratio greater than 1.00 might be obtained, indicating that the projected demand would exceed the capacity.

References: *Highway Capacity Manual, Special Report No. 209*, Transportation Research Board, 1985.
Highway Capacity Manual, Special Report No. 87, Highway Research Board, 1965.
TJKM.

los_desc.tab

APPENDIX B

Results of the Level of Service Analysis
2010 plus Proposed Project
Existing General Plan Network

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2194 I-880 SB OFF/STEVENSON BL. NEWARK
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           1680    0  595

                        |     |    |
                        <---  v    --->        | Split? N
LEFT     0 ---  0.0   2.0   0.0   2.0   0.0 ---    0  RIGHT
                                                        STREET NAME:
THRU  1071 ---> 3.0  (NO. OF LANES)   3.0<--- 1757  THRU  STEVENSON BL.

RIGHT    0 ---  0.0   0.0   0.0   0.0   0.0 ---    0  LEFT
                      <---   ^    --->
                        |     |    |
                        v                 v
  N                                                     SIG WARRANTS:
W + E                   0     0    0                      Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 SB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	1680	1620 *	3000	0.5400	0.5400
LEFT (L)	595	595	3000	0.1983	
EB THRU (T)	1071	1071	5250	0.2040	
WB THRU (T)	1757	1757	5250	0.3347	0.3347

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.87
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.92
INTERSECTION LEVEL OF SERVICE: E

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2194 I-880 SB OFF/STEVENSON BL. NEWARK
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           771    0  581

                        |     |    |
                        <---  v    --->        | Split? N
LEFT     0 ---  0.0   2.0   0.0   2.0   0.0 ---    0  RIGHT
                                                        STREET NAME:
THRU  3216 ---> 3.0  (NO. OF LANES)   3.0<--- 1204  THRU  STEVENSON BL.

RIGHT    0 ---  0.0   0.0   0.0   0.0   0.0 ---    0  LEFT
                      <---   ^    --->
                        |     |    |
                        v                 v
  N                                                     SIG WARRANTS:
W + E                   0     0    0                      Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 SB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	771	711 *	3000	0.2370	0.2370
LEFT (L)	581	581	3000	0.1937	
EB THRU (T)	3216	3216	5250	0.6126	0.6126
WB THRU (T)	1204	1204	5250	0.2293	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.85
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.90
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2433 BOSCELL RD./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            34   40   72
                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT    17 --- 1.0   1.4  1.1  1.0   1.1 ---  500  RIGHT
                                                          STREET NAME:
THRU   323 ---> 3.1  (NO. OF LANES)   3.1<---  658  THRU  AUTO MALL PW

RIGHT   78 --- 1.4   1.0  1.0  1.9   2.0 --- 1504  LEFT
            |         <---   ^   --->        |
            v                |    |          v
  N                          |    |                      SIG WARRANTS:
W + E                       90   93  417                  Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: BOSCELL RD.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	417	417	1650	0.2527	
	THRU (T)	93	93	1750	0.0531	0.0531
	LEFT (L)	90	90	1620	0.0556	
SB	RIGHT (R)	34	0 *	1620	0.0000	
	THRU (T)	40	40	1620	0.0247	
	LEFT (L)	72	72	1620	0.0444	0.0444
	T + R		40	1620	0.0247	
EB	RIGHT (R)	78	0 *	1620	0.0000	
	THRU (T)	323	323	5120	0.0631	0.0631
	LEFT (L)	17	17	1620	0.0105	
	T + R		323	5120	0.0631	
WB	RIGHT (R)	500	500	1620	0.3086	
	THRU (T)	658	658	5120	0.1285	
	LEFT (L)	1504	1504	3000	0.5013	0.5013
	T + R		1158	5120	0.2262	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.66
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.76
INTERSECTION LEVEL OF SERVICE:	C

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2433 BOSCELL RD./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            23   63  375
                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT    30 --- 1.0   1.4  1.1  1.0   1.1 ---   81  RIGHT
                                                          STREET NAME:
THRU  1060 ---> 3.1  (NO. OF LANES)   3.1<---  306  THRU  AUTO MALL PW

RIGHT  123 --- 1.4   1.0  1.0  1.9   2.0 --- 711  LEFT
            |         <---   ^   --->        |
            v                |    |          v
  N                          |    |                      SIG WARRANTS:
W + E                      329   54 1242                  Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: BOSCELL RD.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1242	1242	1650	0.7527	
	THRU (T)	54	54	1750	0.0309	0.0309
	LEFT (L)	329	329	1620	0.2031	
SB	RIGHT (R)	23	0 *	1620	0.0000	
	THRU (T)	63	63	1620	0.0389	
	LEFT (L)	375	375	1620	0.2315	0.2315
	T + R		63	1620	0.0389	
EB	RIGHT (R)	123	33 *	1620	0.0204	
	THRU (T)	1060	1060	5120	0.2070	
	LEFT (L)	30	30	1620	0.0185	
	T + R		1093	5120	0.2135	0.2135
WB	RIGHT (R)	81	81	1620	0.0500	
	THRU (T)	306	306	5120	0.0598	
	LEFT (L)	711	711	3000	0.2370	0.2370
	T + R		387	5120	0.0756	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.71
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.81
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT;VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2440 CHRISTY ST./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    4  227
                        |    |    |
                        |    |    |
            ^           |    |    |          ^
            |        <---  v   --->         | Split? N
LEFT     1 ---  1.0   1.1  1.1  2.0   1.0 ---  720  RIGHT
                                                        STREET NAME:
THRU   821 ---> 4.1  (NO. OF LANES)   3.0<--- 2696  THRU  AUTO MALL PW

RIGHT    4 ---  1.1   1.0  1.0  1.9   2.0 ---  1316  LEFT
            |        <---  ^   --->         |
            v           |    |    |         v
  N                     |    |    |                      SIG WARRANTS:
W + E                   6    8  268                       Urb=Y, Rur=Y
  S                 LEFT THRU RIGHT Split? Y
```

STREET NAME: CHRISTY ST.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	268	268	1650	0.1624	
	THRU (T)	8	8	1750	0.0046	0.0046
	LEFT (L)	6	6	1620	0.0037	
SB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	4	4	1620	0.0025	
	LEFT (L)	227	227	3000	0.0757	0.0757
	T + R		4	1620	0.0025	
EB	RIGHT (R)	4	4	1620	0.0025	
	THRU (T)	821	821	6870	0.1195	
	LEFT (L)	1	1	1620	0.0006	
	T + R		825	6870	0.1201	0.1201
WB	RIGHT (R)	720	599 *	1620	0.3698	
	THRU (T)	2696	2696	5250	0.5135	
	LEFT (L)	1316	1316	3000	0.4387	0.4387

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.64
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.74
INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F1DK21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2440 CHRISTY ST./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0   11  767
                        |    |    |
                        |    |    |
            ^           |    |    |          ^
            |        <---  v   --->         | Split? N
LEFT     3 ---  1.0   1.1  1.1  2.0   1.0 ---  289  RIGHT
                                                        STREET NAME:
THRU  2692 ---> 4.1  (NO. OF LANES)   3.0<--- 1092  THRU  AUTO MALL PW

RIGHT   16 ---  1.1   1.0  1.0  1.9   2.0 ---  671  LEFT
            |        <---  ^   --->         |
            v           |    |    |         v
  N                     |    |    |                      SIG WARRANTS:
W + E                  22   22 1429                       Urb=Y, Rur=Y
  S                 LEFT THRU RIGHT Split? Y
```

STREET NAME; CHRISTY ST.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1429	1429	1650	0.8661	
	THRU (T)	22	22	1750	0.0126	
	LEFT (L)	22	22	1620	0.0136	0.0136
SB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	11	11	1620	0.0068	
	LEFT (L)	767	767	3000	0.2557	0.2557
	T + R		11	1620	0.0068	
EB	RIGHT (R)	16	16	1620	0.0099	
	THRU (T)	2692	2692	6870	0.3918	
	LEFT (L)	3	3	1620	0.0019	
	T + R		2708	6870	0.3942	0.3942
WB	RIGHT (R)	289	22 *	1620	0.0136	
	THRU (T)	1092	1092	5250	0.2080	
	LEFT (L)	671	671	3000	0.2237	0.2237

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.89
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.94
INTERSECTION LEVEL OF SERVICE: E

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2553 FREMONT BLVD./I-880 NB RAMP FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0  842    0

                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT     0 ---  0.0   0.0  3.0  0.0   1.9 ---  680  RIGHT
                                                        STREET NAME:
THRU     0 ---> 0.0  (NO. OF LANES)   0.0<---    0  THRU  I-880 NB RAMP

RIGHT    0 ---  0.0   0.0  2.0  0.0   2.0 --- 2018  LEFT
            |         <---   ^   --->       |
            v                |    |         v
  N                          |    |                      SIG WARRANTS:
W + E                        0  210    0                   Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB THRU (T)	210	210	3500	0.0600	
SB THRU (T)	842	842	5250	0.1604	0.1604
WB RIGHT (R)	680	680	1650	0.4121	
LEFT (L)	2018	2018	3000	0.6727	0.6727

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.83
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.88
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2553 FREMONT BLVD./I-880 NB RAMP FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0  881    0

                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT     0 ---  0.0   0.0  3.0  0.0   1.9 ---  422  RIGHT
                                                        STREET NAME:
THRU     0 ---> 0.0  (NO. OF LANES)   0.0<---    0  THRU  I-880 NB RAMP

RIGHT    0 ---  0.0   0.0  2.0  0.0   2.0 ---  454  LEFT
            |         <---   ^   --->       |
            v                |    |         v
  N                          |    |                      SIG WARRANTS:
W + E                        0  652    0                   Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB THRU (T)	652	652	3500	0.1863	0.1863
SB THRU (T)	881	881	5250	0.1678	
WB RIGHT (R)	422	422	1650	0.2558	
LEFT (L)	454	454	3000	0.1513	0.1513

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.34
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.44
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2556 I-880 SB OFF/FREMONT BLVD. FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           1537    0    4
                        |    |    |
                        v    v    v
                      <---  ---> --->
LEFT     0 ---  0.0   1.9  0.0  2.0   0.0 ---    0  RIGHT   | Split? N
                                                            STREET NAME:
THRU   817 ---> 3.0  (NO. OF LANES)   2.0<--- 2448  THRU    FREMONT BLVD.

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
                      <---  ---> --->
                        |    |    |
                        v    v    v
  N                                                         SIG WARRANTS:
W + E                   0    0    0                          Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 SB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	1537	1537	1650	0.9315 **	
LEFT (L)	4	4	3000	0.0013	0.0013
EB THRU (T)	817	817	5250	0.1556	
WB THRU (T)	2448	2448	3500	0.6994	0.6994

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.70
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.80
INTERSECTION LEVEL OF SERVICE:	C

* ADJUSTED FOR RIGHT TURN ON RED ** APPROACHING OR EXCEEDING CAPACITY
INT=K.INT,VOL=F10K21T.ANV,CAP=D:..FRENNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2556 I-880 SB OFF/FREMONT BLVD. FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           334    0    0
                        |    |    |
                        v    v    v
                      <---  ---> --->
LEFT     0 ---  0.0   1.9  0.0  2.0   0.0 ---    0  RIGHT   | Split? N
                                                            STREET NAME:
THRU  2330 ---> 3.0  (NO. OF LANES)   2.0<---  696  THRU    FREMONT BLVD.

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
                      <---  ---> --->
                        |    |    |
                        v    v    v
  N                                                         SIG WARRANTS:
W + E                   0    0    0                          Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 SB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	334	334	1650	0.2024	
LEFT (L)	0	0	3000	0.0000	0.0000
EB THRU (T)	2330	2330	5250	0.4438	0.4438
WB THRU (T)	696	696	3500	0.1989	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.44
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.54
INTERSECTION LEVEL OF SERVICE:	A

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FRENNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2571 I-880 NB RAMP/AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0

                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  2105 ---> 3.0  (NO. OF LANES)   3.0<--- 2643  THRU  AUTO MALL PW

RIGHT    0 ---  0.0   2.0  0.0  0.0   0.0 ---    0  LEFT
            |         <---   ^   --->        |
            v                |    |          v
  N                          |    |                       SIG WARRANTS:
W + E                       843   0    0                    Urb=Y, Rur=Y
  S                        LEFT THRU RIGHT Split? N

              STREET NAME: I-880 NB RAMP
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB LEFT (L)	843	843	3000	0.2810	0.2810
EB THRU (T)	2105	2105	5250	0.4010	
WB THRU (T)	2643	2643	5250	0.5034	0.5034

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.78
ADJUSTMENT FOR LOST YELLOW TIME: 0.06
TOTAL VOLUME-TO-CAPACITY RATIO: 0.84
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2571 I-880 NB RAMP/AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0

                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  2340 ---> 3.0  (NO. OF LANES)   3.0<---  823  THRU  AUTO MALL PW

RIGHT    0 ---  0.0   2.0  0.0  0.0   0.0 ---    0  LEFT
            |         <---   ^   --->        |
            v                |    |          v
  N                          |    |                       SIG WARRANTS:
W + E                       399   0    0                    Urb=Y, Rur=Y
  S                        LEFT THRU RIGHT Split? N

              STREET NAME: I-880 NB RAMP
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB LEFT (L)	399	399	3000	0.1330	0.1330
EB THRU (T)	2340	2340	5250	0.4457	0.4457
WB THRU (T)	823	823	5250	0.1568	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.58
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.68
INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2579 I-880 SB RAMP/AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           1993    0 1548

                        |     |     |
                 ^      |     |     |      ^
                 |     <---   v    --->    | Split? N
LEFT      0 ---  0.0   2.5  0.0   2.0  0.0 ---    0  RIGHT
                                                     STREET NAME:
THRU    994 ---> 4.0  (NO. OF LANES)   3.0<--- 2738  THRU  AUTO MALL PW

RIGHT     0 ---  0.0   0.0  0.0   0.0  0.0 ---    0  LEFT
                 |     <---   ^    --->    |
                 v                         v
  N                      |     |     |                    SIG WARRANTS:
W + E                    0     0     0                      Urb=Y, Rur=Y
  S                    LEFT THRU RIGHT Split? N

                STREET NAME: I-880 SB RAMP
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	1993	1933 *	3000	0.6443	0.6443
LEFT (L)	1548	1548	3000	0.5160	
EB THRU (T)	994	994	7000	0.1420	
WB THRU (T)	2738	2738	5250	0.5215	0.5215

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	1.17
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	1.22
INTERSECTION LEVEL OF SERVICE:	F

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.ANV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2579 I-880 SB RAMP/AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           870    0  572

                        |     |     |
                 ^      |     |     |      ^
                 |     <---   v    --->    | Split? N
LEFT      0 ---  0.0   2.5  0.0   2.0  0.0 ---    0  RIGHT
                                                     STREET NAME:
THRU   3246 ---> 4.0  (NO. OF LANES)   3.0<--- 1181  THRU  AUTO MALL PW

RIGHT     0 ---  0.0   0.0  0.0   0.0  0.0 ---    0  LEFT
                 |     <---   ^    --->    |
                 v                         v
  N                      |     |     |                    SIG WARRANTS:
W + E                    0     0     0                      Urb=Y, Rur=Y
  S                    LEFT THRU RIGHT Split? N

                STREET NAME: I-880 SB RAMP
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	870	810 *	3000	0.2700	0.2700
LEFT (L)	572	572	3000	0.1907	
EB THRU (T)	3246	3246	7000	0.4637	0.4637
WB THRU (T)	1181	1181	5250	0.2250	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.73
ADJUSTMENT FOR LOST YELLOW TIME:	0.09
TOTAL VOLUME-TO-CAPACITY RATIO:	0.82
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2671 FREMONT BL./S. GRIMMER BL FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            89  947    9

                        |    |    |
             ^          v    v    v          ^
             |        <---  v  --->         | Split? N
LEFT    63 --- 1.0   1.0  2.0  1.0   1.0 ---   36  RIGHT
                                                          STREET NAME:
THRU   517 ---> 2.0  (NO. OF LANES)   2.0<---  521  THRU  S. GRIMMER BL

RIGHT  534 --- 1.9   2.0  2.0  1.9   1.0 ---  129  LEFT
             |        <---  ^  --->         |
             v                             v
  N                                                       SIG WARRANTS:
W + E                447  319   92                         Urb=Y, Rur=Y
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BL.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	92	92	1650	0.0558	
	THRU (T)	319	319	3500	0.0911	
	LEFT (L)	447	447	3000	0.1490	0.1490
SB	RIGHT (R)	89	0 *	1620	0.0000	
	THRU (T)	947	947	3500	0.2706	0.2706
	LEFT (L)	9	9	1620	0.0056	
EB	RIGHT (R)	534	534	1650	0.3236	
	THRU (T)	517	517	3500	0.1477	0.1477
	LEFT (L)	63	63	1620	0.0389	
WB	RIGHT (R)	36	0 *	1620	0.0000	
	THRU (T)	521	521	3500	0.1489	
	LEFT (L)	129	129	1620	0.0796	0.0796

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.65
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.75
INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2671 FREMONT BL./S. GRIMMER BL FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            60  371   27

                        |    |    |
             ^          v    v    v          ^
             |        <---  v  --->         | Split? N
LEFT   109 --- 1.0   1.0  2.0  1.0   1.0 ---   12  RIGHT
                                                          STREET NAME:
THRU   530 ---> 2.0  (NO. OF LANES)   2.0<---  616  THRU  S. GRIMMER BL

RIGHT  325 --- 1.9   2.0  2.0  1.9   1.0 ---   95  LEFT
             |        <---  ^  --->         |
             v                             v
  N                                                       SIG WARRANTS:
W + E                431 1009  215                         Urb=Y, Rur=Y
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BL.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	215	215	1650	0.1303	
	THRU (T)	1009	1009	3500	0.2883	0.2883
	LEFT (L)	431	431	3000	0.1437	
SB	RIGHT (R)	60	0 *	1620	0.0000	
	THRU (T)	371	371	3500	0.1060	
	LEFT (L)	27	27	1620	0.0167	0.0167
EB	RIGHT (R)	325	325	1650	0.1970	
	THRU (T)	530	530	3500	0.1514	
	LEFT (L)	109	109	1620	0.0673	0.0673
WB	RIGHT (R)	12	0 *	1620	0.0000	
	THRU (T)	616	616	3500	0.1760	0.1760
	LEFT (L)	95	95	1620	0.0586	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.55
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.65
INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2731 CHERRY/BOYCE/STEVENSON BL. FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           1056 1469  151

                        |    |    |
                        <---  v   --->
LEFT    50 ---> 1.0   1.9  3.0  2.0   1.0 ---  525  RIGHT   | Split? N
                                                            STREET NAME:
THRU   115 ---> 2.0  (NO. OF LANES)   2.0<---  460  THRU    STEVENSON BL.

RIGHT    2 ---> 1.0   1.0  2.0  1.0   1.0 ---  700  LEFT
                        <---  ^   --->
                        |    |    |
                        v                                   SIG WARRANTS:
  N                     2  163  208                          Urb=Y, Rur=Y
W + E                 LEFT THRU RIGHT Split? N
  S
```

STREET NAME: CHERRY/BOYCE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	208	0 *	1620	0.0000	
	THRU (T)	163	163	3500	0.0466	
	LEFT (L)	2	2	1620	0.0012	0.0012
SB	RIGHT (R)	1056	1056	1650	0.6400	
	THRU (T)	1469	1469	5250	0.2798	0.2798
	LEFT (L)	151	151	3000	0.0503	
EB	RIGHT (R)	2	0 *	1620	0.0000	
	THRU (T)	115	115	3500	0.0329	0.0329
	LEFT (L)	50	50	1620	0.0309	
WB	RIGHT (R)	525	424 *	1620	0.2617	
	THRU (T)	460	460	3500	0.1314	
	LEFT (L)	700	700	1620	0.4321	0.4321

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.75
ADJUSTMENT FOR LOST YELLOW TIME: 0.08
TOTAL VOLUME-TO-CAPACITY RATIO: 0.83
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2731 CHERRY/BOYCE/STEVENSON BL. FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            68  310  308

                        |    |    |
                        <---  v   --->
LEFT   628 ---> 1.0   1.9  3.0  2.0   1.0 ---  242  RIGHT   | Split? N
                                                            STREET NAME:
THRU   726 ---> 2.0  (NO. OF LANES)   2.0<---  158  THRU    STEVENSON BL.

RIGHT   12 ---> 1.0   1.0  2.0  1.0   1.0 ---  233  LEFT
                        <---  ^   --->
                        |    |    |
                        v                                   SIG WARRANTS:
  N                     1 1182 1001                          Urb=Y, Rur=Y
W + E                 LEFT THRU RIGHT Split? N
  S
```

STREET NAME: CHERRY/BOYCE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1001	825 *	1620	0.5093	0.5093
	THRU (T)	1182	1182	3500	0.3377	
	LEFT (L)	1	1	1620	0.0006	
SB	RIGHT (R)	68	68	1650	0.0412	
	THRU (T)	310	310	5250	0.0590	
	LEFT (L)	308	308	3000	0.1027	0.1027
EB	RIGHT (R)	12	0 *	1620	0.0000	
	THRU (T)	726	726	3500	0.2074	
	LEFT (L)	628	628	1620	0.3877	0.3877
WB	RIGHT (R)	242	99 *	1620	0.0611	0.0611
	THRU (T)	158	158	3500	0.0451	
	LEFT (L)	233	233	1620	0.1438	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 1.06
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 1.11
INTERSECTION LEVEL OF SERVICE: F

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2778 GRIMMER BL./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           1672 1097  169

                        |    |    |
                <---    v    ---> |  Split? N
LEFT   252 ---  2.0   1.9  3.0  2.0   1.5 ---   29  RIGHT
                                                      STREET NAME:
THRU   550 ---> 3.0  (NO. OF LANES)   3.0<---  1482  THRU  AUTO MALL PW

RIGHT 1394 ---  1.5   2.0  2.0  1.9   1.0 ---  100  LEFT
                <---   ^   ---> |
                        |    |    |                     SIG WARRANTS:
  N                                                      Urb=Y, Rur=Y
W + E                  632  102   31
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: GRIMMER BL.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	31	31	1650	0.0188	
	THRU (T)	102	102	3500	0.0291	
	LEFT (L)	632	632	3000	0.2107	0.2107
SB	RIGHT (R)	1672	1672	1650	1.0133 **	
	THRU (T)	1097	1097	5250	0.2090	0.2090
	LEFT (L)	169	169	3000	0.0563	
EB	RIGHT (R)	1394	993 *	1620	0.6130	0.6130
	THRU (T)	550	550	5250	0.1048	
	LEFT (L)	252	252	3000	0.0840	
WB	RIGHT (R)	29	0 *	1620	0.0000	
	THRU (T)	1482	1482	5250	0.2823	
	LEFT (L)	100	100	1620	0.0617	0.0617

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 1.09
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 1.14
INTERSECTION LEVEL OF SERVICE: F

* ADJUSTED FOR RIGHT TURN ON RED ** APPROACHING OR EXCEEDING CAPACITY
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FRENNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2778 GRIMMER BL./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           332  371   68

                        |    |    |
                <---    v    ---> |  Split? N
LEFT  1564 ---  2.0   1.9  3.0  2.0   1.5 ---   86  RIGHT
                                                      STREET NAME:
THRU   894 ---> 3.0  (NO. OF LANES)   3.0<---   869  THRU  AUTO MALL PW

RIGHT  525 ---  1.5   2.0  2.0  1.9   1.0 ---   35  LEFT
                <---   ^   ---> |
                        |    |    |                     SIG WARRANTS:
  N                                                      Urb=Y, Rur=Y
W + E                 1565  640  181
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: GRIMMER BL.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	181	181	1650	0.1097	
	THRU (T)	640	640	3500	0.1829	
	LEFT (L)	1565	1565	3000	0.5217	0.5217
SB	RIGHT (R)	332	332	1650	0.2012	
	THRU (T)	371	371	5250	0.0707	0.0707
	LEFT (L)	68	68	3000	0.0227	
EB	RIGHT (R)	525	0 *	1620	0.0000	
	THRU (T)	894	894	5250	0.1703	
	LEFT (L)	1564	1564	3000	0.5213	0.5213
WB	RIGHT (R)	86	0 *	1620	0.0000	
	THRU (T)	869	869	5250	0.1655	0.1655
	LEFT (L)	35	35	1620	0.0216	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 1.28
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 1.33
INTERSECTION LEVEL OF SERVICE: F

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2788 BOYCE RD./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            49  695  358
                        |    |    |
                        v    v    v
                      <---  ---> | Split? N
LEFT    50 ---  1.0   1.9  2.0  1.0   1.0 ---  483  RIGHT
                                                      STREET NAME:
THRU    60 ---> 2.1  (NO. OF LANES)   2.0<---  186  THRU  AUTO MALL PW

RIGHT   11 ---  1.1   1.0  2.0  1.9   2.0 ---  114  LEFT
                      <---  ^   --->
                        |    |    |
                        v    v    v
  N                                                   SIG WARRANTS:
W + E                    11  118   0                    Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: BOYCE RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	0	0	1650	0.0000	
	THRU (T)	118	118	3500	0.0337	0.0337
	LEFT (L)	11	11	1620	0.0068	
SB	RIGHT (R)	49	49	1650	0.0297	
	THRU (T)	695	695	3500	0.1986	
	LEFT (L)	358	358	1620	0.2210	0.2210
EB	RIGHT (R)	11	11	1620	0.0068	
	THRU (T)	60	60	3370	0.0178	
	LEFT (L)	50	50	1620	0.0309	0.0309
	T + R		71	3370	0.0211	
WB	RIGHT (R)	483	244 *	1620	0.1506	0.1506
	THRU (T)	186	186	3500	0.0531	
	LEFT (L)	114	114	3000	0.0380	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.44
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.54
INTERSECTION LEVEL OF SERVICE:	A

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2788 BOYCE RD./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            57  144  845
                        |    |    |
                        v    v    v
                      <---  ---> | Split? N
LEFT    15 ---  1.0   1.9  2.0  1.0   1.0 ---  469  RIGHT
                                                      STREET NAME:
THRU   113 ---> 2.1  (NO. OF LANES)   2.0<---   89  THRU  AUTO MALL PW

RIGHT    7 ---  1.1   1.0  2.0  1.9   2.0 ---  100  LEFT
                      <---  ^   --->
                        |    |    |
                        v    v    v
  N                                                   SIG WARRANTS:
W + E                     8  748  255                    Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: BOYCE RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	255	255	1650	0.1545	
	THRU (T)	748	748	3500	0.2137	0.2137
	LEFT (L)	8	8	1620	0.0049	
SB	RIGHT (R)	57	57	1650	0.0345	
	THRU (T)	144	144	3500	0.0411	
	LEFT (L)	845	845	1620	0.5216	0.5216
EB	RIGHT (R)	7	7	1620	0.0043	
	THRU (T)	113	113	3370	0.0335	
	LEFT (L)	15	15	1620	0.0093	
	T + R		120	3370	0.0356	0.0356
WB	RIGHT (R)	469	0 *	1620	0.0000	
	THRU (T)	89	89	3500	0.0254	
	LEFT (L)	100	100	3000	0.0333	0.0333

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.80
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	0.85
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2789 FREMONT BLVD./CUSHING PKWY. FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           2781 1204    0

                        |    |    |
                <---    v    --->      | Split? N
LEFT   233 --- 2.0   1.9  3.0  0.0   0.0 ---    0  RIGHT
                                                        STREET NAME:
THRU   388 ---> 2.0  (NO. OF LANES)   0.0<---    0  THRU  CUSHING PKWY.

RIGHT  642 --- 1.5   2.0  4.0  1.0   0.0 ---    0  LEFT
                <---   ^   --->      |
                        |    |    |                       SIG WARRANTS:
  N                                                        Urb=Y, Rur=Y
W + E                904  584  157
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	157	97 *	1620	0.0599	
	THRU (T)	584	584	7000	0.0834	
	LEFT (L)	904	904	3000	0.3013	0.3013
SB	RIGHT (R)	2781	2781	1650	1.6855 **	
	THRU (T)	1204	1204	5250	0.2293	0.2293
EB	RIGHT (R)	642	94 *	1620	0.0580	
	THRU (T)	388	388	3500	0.1109	0.1109
	LEFT (L)	233	233	3000	0.0777	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.64
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.74
INTERSECTION LEVEL OF SERVICE:	C

* ADJUSTED FOR RIGHT TURN ON RED ** APPROACHING OR EXCEEDING CAPACITY
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2789 FREMONT BLVD./CUSHING PKWY. FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------           715  315    0

                        |    |    |
                <---    v    --->      | Split? N
LEFT  1119 --- 2.0   1.9  3.0  0.0   0.0 ---    0  RIGHT
                                                        STREET NAME:
THRU  2319 ---> 2.0  (NO. OF LANES)   0.0<---    0  THRU  CUSHING PKWY.

RIGHT  649 --- 1.5   2.0  4.0  1.0   0.0 ---    0  LEFT
                <---   ^   --->      |
                        |    |    |                       SIG WARRANTS:
  N                                                        Urb=Y, Rur=Y
W + E                200 1211  259
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	259	199 *	1620	0.1228	
	THRU (T)	1211	1211	7000	0.1730	0.1730
	LEFT (L)	200	200	3000	0.0667	
SB	RIGHT (R)	715	715	1650	0.4333	
	THRU (T)	315	315	5250	0.0600	
EB	RIGHT (R)	649	481 *	1620	0.2969	
	THRU (T)	2319	2319	3500	0.6626	0.6626
	LEFT (L)	1119	1119	3000	0.3730	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.84
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	0.89
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2899 ALBRAE/STEVENSON FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            10    3   45

                        |     |    |
                        |     |    |
                 ^      <---  v    --->      ^
                 |                           | Split? N
LEFT    13 ---  1.0    1.1   1.1   3.0   1.0 ---  127  RIGHT
                                                        STREET NAME:
THRU   868 ---> 4.1   (NO. OF LANES)   3.0<---  2049  THRU  STEVENSON

RIGHT  202 ---  1.1    1.1   1.1   2.5   2.0 ---  1263  LEFT
                 |     <---   ^    --->     |
                 v        |     |    |      v
  N                      |     |    |                    SIG WARRANTS:
W + E                    78    4   405                     Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? Y
```

STREET NAME: ALBRAE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	405	0 *	3000	0.0000	
	THRU (T)	4	4	1620	0.0025	
	LEFT (L)	78	78	1620	0.0481	
	T + L		82	1620	0.0506	0.0506
SB	RIGHT (R)	10	10	1620	0.0062	
	THRU (T)	3	3	1620	0.0019	
	LEFT (L)	45	45	4500	0.0100	0.0100
	T + R		13	1620	0.0080	
EB	RIGHT (R)	202	202	1620	0.1247	
	THRU (T)	868	868	6870	0.1263	
	LEFT (L)	13	13	1620	0.0080	
	T + R		1070	6870	0.1557	0.1557
WB	RIGHT (R)	127	59 *	1620	0.0364	
	THRU (T)	2049	2049	5250	0.3903	
	LEFT (L)	1263	1263	3000	0.4210	0.4210

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.64
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.74
INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2899 ALBRAE/STEVENSON FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            20   18  220

                        |     |    |
                        |     |    |
                 ^      <---  v    --->      ^
                 |                           | Split? N
LEFT    23 ---  1.0    1.1   1.1   3.0   1.0 ---  177  RIGHT
                                                        STREET NAME:
THRU  2250 ---> 4.1   (NO. OF LANES)   3.0<---  987  THRU  STEVENSON

RIGHT  195 ---  1.1    1.1   1.1   2.5   2.0 ---  811  LEFT
                 |     <---   ^    --->     |
                 v        |     |    |      v
  N                      |     |    |                    SIG WARRANTS:
W + E                   335   49 1693                     Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? Y
```

STREET NAME: ALBRAE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1693	822 *	3000	0.2740	0.2740
	THRU (T)	49	49	1620	0.0302	
	LEFT (L)	335	335	1620	0.2068	
	T + L		384	1620	0.2370	
SB	RIGHT (R)	20	20	1620	0.0123	
	THRU (T)	18	18	1620	0.0111	
	LEFT (L)	220	220	4500	0.0489	0.0489
	T + R		38	1620	0.0235	
EB	RIGHT (R)	195	195	1620	0.1204	
	THRU (T)	2250	2250	6870	0.3275	
	LEFT (L)	23	23	1620	0.0142	
	T + R		2445	6870	0.3559	0.3559
WB	RIGHT (R)	177	77 *	1620	0.0475	
	THRU (T)	987	987	5250	0.1880	
	LEFT (L)	811	811	3000	0.2703	0.2703

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.95
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 1.00
INTERSECTION LEVEL OF SERVICE: E

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 3375 STEVENSON EXT/AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            25  962  100

                        |    |    |
                        v    v    v
                       <---  v  --->        | Split? N
LEFT    16 ---> 1.1   1.1  2.1  1.0   1.0 ---   16  RIGHT
                                                        STREET NAME:
THRU     9 ---> 1.1  (NO. OF LANES)   1.1<---   19  THRU  AUTO MALL PW

RIGHT    8 ---  1.1   1.0  2.1  1.1   1.1 ---    0  LEFT
                       <---  ^  --->
                        |    |    |
                        v    v    v
  N                                                     SIG WARRANTS:
W + E                    6   72    0                      Urb=N, Rur=N
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: STEVENSON EXT

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	72	72	3370	0.0214	
	LEFT (L)	6	6	1620	0.0037	0.0037
	T + R		72	3370	0.0214	
SB	RIGHT (R)	25	25	1620	0.0154	
	THRU (T)	962	962	3370	0.2855	
	LEFT (L)	100	100	1620	0.0617	
	T + R		987	3370	0.2929	0.2929
EB	RIGHT (R)	8	8	1620	0.0049	
	THRU (T)	9	9	1620	0.0056	
	LEFT (L)	16	16	1620	0.0099	0.0099
	T + R		17	1620	0.0105	
	T + L		25	1620	0.0154	
	T + R + L		33	1620	0.0204	
WB	RIGHT (R)	16	0 *	1620	0.0000	
	THRU (T)	19	19	1620	0.0117	0.0117
	LEFT (L)	0	0	1620	0.0000	
	T + L		19	1620	0.0117	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.32
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.42
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 3375 STEVENSON EXT/AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            21   66   21

                        |    |    |
                        v    v    v
                       <---  v  --->        | Split? N
LEFT    27 ---> 1.1   1.1  2.1  1.0   1.0 ---  199  RIGHT
                                                        STREET NAME:
THRU    17 ---> 1.1  (NO. OF LANES)   1.1<---   10  THRU  AUTO MALL PW

RIGHT    5 ---  1.1   1.0  2.1  1.1   1.1 ---    0  LEFT
                       <---  ^  --->
                        |    |    |
                        v    v    v
  N                                                     SIG WARRANTS:
W + E                    6  638    0                      Urb=N, Rur=N
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: STEVENSON EXT

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	638	638	3370	0.1893	0.1893
	LEFT (L)	6	6	1620	0.0037	
	T + R		638	3370	0.1893	
SB	RIGHT (R)	21	21	1620	0.0130	
	THRU (T)	66	66	3370	0.0196	
	LEFT (L)	21	21	1620	0.0130	0.0130
	T + R		87	3370	0.0258	
EB	RIGHT (R)	5	5	1620	0.0031	
	THRU (T)	17	17	1620	0.0105	
	LEFT (L)	27	27	1620	0.0167	0.0167
	T + R		22	1620	0.0136	
	T + L		44	1620	0.0272	
	T + R + L		49	1620	0.0302	
WB	RIGHT (R)	199	129 *	1620	0.0796	0.0796
	THRU (T)	10	10	1620	0.0062	
	LEFT (L)	0	0	1620	0.0000	
	T + L		10	1620	0.0062	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.30
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.40
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 3501 CUSHIN PW W./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            0    0    0
                       |    |    |
            ^          |    |    |          ^
            |       <---   v   --->       | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU    17 ---> 1.1  (NO. OF LANES)   1.0<---   34  THRU  AUTO MALL PW

RIGHT   79 ---  1.1   1.0  0.0  1.0   1.0 ---  213  LEFT
            |       <---   ^   --->       |
            v                |    |       v
  N                          |    |                       SIG WARRANTS:
W + E                        7    0  105                    Urb=N, Rur=N
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: CUSHIN PW W.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	105	0 *	1620	0.0000	
	LEFT (L)	7	7	1620	0.0043	0.0043
EB	RIGHT (R)	79	79	1620	0.0488	
	THRU (T)	17	17	1620	0.0105	
	T + R		96	1620	0.0593	0.0593
WB	THRU (T)	34	34	1750	0.0194	
	LEFT (L)	213	213	1620	0.1315	0.1315

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.20
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.30
INTERSECTION LEVEL OF SERVICE:	A

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT;VOL=F10K21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 3501 CUSHIN PW W./AUTO MALL PW FREMONT
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------            0    0    0
                       |    |    |
            ^          |    |    |          ^
            |       <---   v   --->       | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU    43 ---> 1.1  (NO. OF LANES)   1.0<---   27  THRU  AUTO MALL PW

RIGHT    6 ---  1.1   1.0  0.0  1.0   1.0 ---  127  LEFT
            |       <---   ^   --->       |
            v                |    |       v
  N                          |    |                       SIG WARRANTS:
W + E                      179    0   93                    Urb=N, Rur=N
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: CUSHIN PW W.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	93	0 *	1620	0.0000	
	LEFT (L)	179	179	1620	0.1105	0.1105
EB	RIGHT (R)	6	6	1620	0.0037	
	THRU (T)	43	43	1620	0.0265	
	T + R		49	1620	0.0302	0.0302
WB	THRU (T)	27	27	1750	0.0154	
	LEFT (L)	127	127	1620	0.0784	0.0784

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.22
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.32
INTERSECTION LEVEL OF SERVICE:	A

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT,VOL=F10K21T.PMV;CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - A.M. Peak Hour 03/28/96

INTERSECTION 2189 I-880 NB OFF/STEVENSON BL. NEWARK
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0
                        |    |    |
                        v    v    v
                       <---  v  --->
                                     | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  1118 ---> 3.0  (NO. OF LANES)   4.0<--- 2539  THRU  STEVENSON BL.

RIGHT    0 ---  0.0   2.0  0.0  2.0   0.0 ---    0  LEFT
                      <---  ^  --->
                        |    |    |      |
                        v    v    v      v
  N                     |    |    |                      SIG WARRANTS:
W + E                  604   0  618                        Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

              STREET NAME: I-880 NB OFF
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	618	558 *	3000	0.1860	
LEFT (L)	604	604	3000	0.2013	0.2013
EB THRU (T)	1118	1118	5250	0.2130	
WB THRU (T)	2539	2539	7000	0.3627	0.3627

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.56
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.66
INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT, VOL=F10K21T.AMV, CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run K - P.M. Peak Hour 03/28/96

INTERSECTION 2189 I-880 NB OFF/STEVENSON BL. NEWARK
Count Date FROM MODEL Time FROM MODEL Peak Hour FROM MODEL

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0
                        |    |    |
                        v    v    v
                       <---  v  --->
                                     | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  2067 ---> 3.0  (NO. OF LANES)   4.0<--- 1297  THRU  STEVENSON BL.

RIGHT    0 ---  0.0   2.0  0.0  2.0   0.0 ---    0  LEFT
                      <---  ^  --->
                        |    |    |      |
                        v    v    v      v
  N                     |    |    |                      SIG WARRANTS:
W + E                  487   0  953                        Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

              STREET NAME: I-880 NB OFF
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	953	893 *	3000	0.2977	0.2977
LEFT (L)	487	487	3000	0.1623	
EB THRU (T)	2067	2067	5250	0.3937	0.3937
WB THRU (T)	1297	1297	7000	0.1853	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.69
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.79
INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED
INT=K.INT, VOL=F10K21T.PMV, CAP=D:..FREMNEW.TAB

APPENDIX C

Results of the Level of Service Analysis
2010 plus Proposed Project
Proposed Network

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2189 I-880 NB OFF/STEVENSON BL. NEWARK
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0

                 ^       |    |    |       ^
                 |     <---   v   --->     | Split? N
LEFT     0 ---  0.0    0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                     STREET NAME:
THRU  1120 ---> 3.0  (NO. OF LANES)    4.0<--- 2591  THRU  STEVENSON BL.

RIGHT    0 ---  0.0    2.0  0.0  2.0   0.0 ---    0  LEFT
                 |     <---   ^   --->     |
                 v       |    |    |       v
  N                      |    |    |                      SIG WARRANTS:
W + E                   612   0  573                       Urb=Y, Rur=Y
  S                    LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 NB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	573	513 *	3000	0.1710	
LEFT (L)	612	612	3000	0.2040	0.2040
EB THRU (T)	1120	1120	5250	0.2133	
WB THRU (T)	2591	2591	7000	0.3701	0.3701

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.57
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.67
INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2189 I-880 NB OFF/STEVENSON BL. NEWARK
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0

                 ^       |    |    |       ^
                 |     <---   v   --->     | Split? N
LEFT     0 ---  0.0    0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                     STREET NAME:
THRU  2023 ---> 3.0  (NO. OF LANES)    4.0<--- 1298  THRU  STEVENSON BL.

RIGHT    0 ---  0.0    2.0  0.0  2.0   0.0 ---    0  LEFT
                 |     <---   ^   --->     |
                 v       |    |    |       v
  N                      |    |    |                      SIG WARRANTS:
W + E                   500   0 1037                       Urb=Y, Rur=Y
  S                    LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 NB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	1037	977 *	3000	0.3257	0.3257
LEFT (L)	500	500	3000	0.1667	
EB THRU (T)	2023	2023	5250	0.3853	0.3853
WB THRU (T)	1298	1298	7000	0.1854	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.71
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.81
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2194 I-880 SB OFF/STEVENSON BL. NEWARK
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           1643    0  587
                        |     |    |
              ^         |     |    |          ^
              |       <---    v   --->        | Split? N
LEFT     0 ---  0.0   2.0   0.0  2.0   0.0 ---     0  RIGHT
                                                        STREET NAME:
THRU  1094 ---> 3.0  (NO. OF LANES)   3.0<--- 1882  THRU  STEVENSON BL.

RIGHT    0 ---  0.0   0.0   0.0  0.0   0.0 ---     0  LEFT
              |       <---   ^    --->       |
              v                |    |        v
  N                            |    |                     SIG WARRANTS:
W + E                          0    0    0                  Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 SB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	1643	1583 *	3000	0.5277	0.5277
LEFT (L)	587	587	3000	0.1957	
EB THRU (T)	1094	1094	5250	0.2084	
WB THRU (T)	1882	1882	5250	0.3585	0.3585

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.89
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.94
INTERSECTION LEVEL OF SERVICE: E

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2194 I-880 SB OFF/STEVENSON BL. NEWARK
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           776    0  598
                        |     |    |
              ^         |     |    |          ^
              |       <---    v   --->        | Split? N
LEFT     0 ---  0.0   2.0   0.0  2.0   0.0 ---     0  RIGHT
                                                        STREET NAME:
THRU  3173 ---> 3.0  (NO. OF LANES)   3.0<--- 1229  THRU  STEVENSON BL.

RIGHT    0 ---  0.0   0.0   0.0  0.0   0.0 ---     0  LEFT
              |       <---   ^    --->       |
              v                |    |        v
  N                            |    |                     SIG WARRANTS:
W + E                          0    0    0                  Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 SB OFF

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	776	716 *	3000	0.2387	0.2387
LEFT (L)	598	598	3000	0.1993	
EB THRU (T)	3173	3173	5250	0.6044	0.6044
WB THRU (T)	1229	1229	5250	0.2341	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.84
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.89
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2433 BOSCELL RD./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            48   28   68

                        |    |    |
                  ^     |   <---  v   --->      ^
                        |                       | Split? N
LEFT    39 ---  1.0   1.4  1.1  1.0   1.1 ---  481  RIGHT
                                                        STREET NAME:
THRU   341 ---> 3.1  (NO. OF LANES)   3.1<---  1051  THRU  AUTO MALL PW

RIGHT   43 ---  1.4   1.0  1.0  1.9   2.0 ---  1238  LEFT
                 |    <---  ^   --->    |
                 v                      v
  N                      |    |    |                      SIG WARRANTS:
W + E                   56   68  237                       Urb=N, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: BOSCELL RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	237	237	1650	0.1436	
	THRU (T)	68	68	1750	0.0389	0.0389
	LEFT (L)	56	56	1620	0.0346	
SB	RIGHT (R)	48	0 *	1620	0.0000	
	THRU (T)	28	28	1620	0.0173	
	LEFT (L)	68	68	1620	0.0420	0.0420
	T + R		28	1620	0.0173	
EB	RIGHT (R)	43	0 *	1620	0.0000	
	THRU (T)	341	341	5120	0.0666	0.0666
	LEFT (L)	39	39	1620	0.0241	
	T + R		341	5120	0.0666	
WB	RIGHT (R)	481	481	1620	0.2969	
	THRU (T)	1051	1051	5120	0.2053	
	LEFT (L)	1238	1238	3000	0.4127	0.4127
	T + R		1532	5120	0.2992	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.56
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.66
INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2433 BOSCELL RD./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            28   58  378

                        |    |    |
                  ^     |   <---  v   --->      ^
                        |                       | Split? N
LEFT    47 ---  1.0   1.4  1.1  1.0   1.1 ---   75  RIGHT
                                                        STREET NAME:
THRU  1233 ---> 3.1  (NO. OF LANES)   3.1<---  352  THRU  AUTO MALL PW

RIGHT   78 ---  1.4   1.0  1.0  1.9   2.0 ---  594  LEFT
                 |    <---  ^   --->    |
                 v                      v
  N                      |    |    |                      SIG WARRANTS:
W + E                   27   61 1127                       Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: BOSCELL RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1127	1127	1650	0.6830	
	THRU (T)	61	61	1750	0.0349	0.0349
	LEFT (L)	27	27	1620	0.0167	
SB	RIGHT (R)	28	0 *	1620	0.0000	
	THRU (T)	58	58	1620	0.0358	
	LEFT (L)	378	378	1620	0.2333	0.2333
	T + R		58	1620	0.0358	
EB	RIGHT (R)	78	0 *	1620	0.0000	
	THRU (T)	1233	1233	5120	0.2408	0.2408
	LEFT (L)	47	47	1620	0.0290	
	T + R		1233	5120	0.2408	
WB	RIGHT (R)	75	75	1620	0.0463	
	THRU (T)	352	352	5120	0.0688	
	LEFT (L)	594	594	3000	0.1980	0.1980
	T + R		427	5120	0.0834	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.71
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.81
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2440 CHRISTY ST./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    4  226
                        |    |    |
                        |    |    |
                  <---  v    v  --->      | Split? N
LEFT     1 ---  1.0   1.1  1.1  2.0   1.0 ---  722  RIGHT
                                                      STREET NAME:
THRU   650 ---> 4.1  (NO. OF LANES)   3.0<--- 2798  THRU  AUTO MALL PW

RIGHT    4 ---  1.1   1.0  1.0  1.9   2.0 ---  1301  LEFT
                  <---  ^    --->
                        |    |    |
                        v    v    v
  N                     |    |    |                       SIG WARRANTS:
W + E                   6    7  285                         Urb=Y, Rur=Y
  S                 LEFT THRU RIGHT Split? Y
```

STREET NAME: CHRISTY ST.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	285	285	1650	0.1727	
	THRU (T)	7	7	1750	0.0040	0.0040
	LEFT (L)	6	6	1620	0.0037	
SB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	4	4	1620	0.0025	
	LEFT (L)	226	226	3000	0.0753	0.0753
	T + R		4	1620	0.0025	
EB	RIGHT (R)	4	4	1620	0.0025	
	THRU (T)	650	650	6870	0.0946	
	LEFT (L)	1	1	1620	0.0006	0.0006
	T + R		654	6870	0.0952	
WB	RIGHT (R)	722	601 *	1620	0.3710	
	THRU (T)	2798	2798	5250	0.5330	0.5330
	LEFT (L)	1301	1301	3000	0.4337	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.61
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.71
INTERSECTION LEVEL OF SERVICE:	C

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2440 CHRISTY ST./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0   11  777
                        |    |    |
                        |    |    |
                  <---  v    v  --->      | Split? N
LEFT     4 ---  1.0   1.1  1.1  2.0   1.0 ---  292  RIGHT
                                                      STREET NAME:
THRU  2751 ---> 4.1  (NO. OF LANES)   3.0<--- 1035  THRU  AUTO MALL PW

RIGHT   18 ---  1.1   1.0  1.0  1.9   2.0 ---  682  LEFT
                  <---  ^    --->
                        |    |    |
                        v    v    v
  N                     |    |    |                       SIG WARRANTS:
W + E                   3   20 1441                         Urb=Y, Rur=Y
  S                 LEFT THRU RIGHT Split? Y
```

STREET NAME: CHRISTY ST.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1441	1441	1650	0.8733	
	THRU (T)	20	20	1750	0.0114	0.0114
	LEFT (L)	3	3	1620	0.0019	
SB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	11	11	1620	0.0068	
	LEFT (L)	777	777	3000	0.2590	0.2590
	T + R		11	1620	0.0068	
EB	RIGHT (R)	18	18	1620	0.0111	
	THRU (T)	2751	2751	6870	0.4004	
	LEFT (L)	4	4	1620	0.0025	
	T + R		2769	6870	0.4031	0.4031
WB	RIGHT (R)	292	22 *	1620	0.0136	
	THRU (T)	1035	1035	5250	0.1971	
	LEFT (L)	682	682	3000	0.2273	0.2273

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.90
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	0.95
INTERSECTION LEVEL OF SERVICE:	E

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 - With Mitigations (AM) 01/18/96

INTERSECTION 2440 CHRISTY ST./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            0    4  226
                       |    |    |
                       |    |    |
                  <---  v    v  --->      | Split? N
LEFT     1 ---  1.0   1.1  1.1  3.1   1.0 ---  722  RIGHT
                                                        STREET NAME:
THRU   650 ---> 4.1  (NO. OF LANES)   3.0<--- 2798  THRU  AUTO MALL PW

RIGHT    4 ---  1.1   1.0  1.0  1.9   2.0 --- 1301  LEFT
                  <---  ^    --->
                       |    |    |
                       v    v    v
  N                    |    |    |                        SIG WARRANTS:
W + E                  6    7  285                         Urb=Y, Rur=Y
  S                LEFT THRU RIGHT Split? Y
```

STREET NAME: CHRISTY ST.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	285	285	1650	0.1727	
	THRU (T)	7	7	1750	0.0040	0.0040
	LEFT (L)	6	6	1620	0.0037	
SB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	4	4	1620	0.0025	
	LEFT (L)	226	226	4500	0.0502	
	T + R		4	1620	0.0025	
	T + L		230	4500	0.0511	0.0511
	T + R + L		230	4500	0.0511	
EB	RIGHT (R)	4	4	1620	0.0025	
	THRU (T)	650	650	6870	0.0946	
	LEFT (L)	1	1	1620	0.0006	0.0006
	T + R		654	6870	0.0952	
WB	RIGHT (R)	722	621 *	1620	0.3833	
	THRU (T)	2798	2798	5250	0.5330	0.5330
	LEFT (L)	1301	1301	3000	0.4337	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.59
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.69
INTERSECTION LEVEL OF SERVICE:	B

* ADJUSTED FOR RIGHT TURN ON RED
INT=JMIT.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 - With Mitigations (PM) 01/18/96

INTERSECTION 2440 CHRISTY ST./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            0   11  777
                       |    |    |
                       |    |    |
                  <---  v    v  --->      | Split? N
LEFT     4 ---  1.0   1.1  1.1  3.1   1.0 ---  292  RIGHT
                                                        STREET NAME:
THRU  2751 ---> 4.1  (NO. OF LANES)   3.0<--- 1035  THRU  AUTO MALL PW

RIGHT   18 ---  1.1   1.0  1.0  1.9   2.0 --- 682  LEFT
                  <---  ^    --->
                       |    |    |
                       v    v    v
  N                    |    |    |                        SIG WARRANTS:
W + E                  3   20 1441                         Urb=Y, Rur=Y
  S                LEFT THRU RIGHT Split? Y
```

STREET NAME: CHRISTY ST.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1441	1441	1650	0.8733	
	THRU (T)	20	20	1750	0.0114	0.0114
	LEFT (L)	3	3	1620	0.0019	
SB	RIGHT (R)	0	0	1620	0.0000	
	THRU (T)	11	11	1620	0.0068	
	LEFT (L)	777	777	4500	0.1727	
	T + R		11	1620	0.0068	
	T + L		788	4500	0.1751	0.1751
	T + R + L		788	4500	0.1751	
EB	RIGHT (R)	18	18	1620	0.0111	
	THRU (T)	2751	2751	6870	0.4004	
	LEFT (L)	4	4	1620	0.0025	
	T + R		2769	6870	0.4031	0.4031
WB	RIGHT (R)	292	92 *	1620	0.0568	
	THRU (T)	1035	1035	5250	0.1971	
	LEFT (L)	682	682	3000	0.2273	0.2273

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.82
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	0.87
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=JMIT.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2553 FREMONT BLVD./I-880 NB RAMP FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0  849    0

                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT     0 ---  0.0   0.0  3.0  0.0   1.9 ---  692  RIGHT
                                                        STREET NAME:
THRU     0 ---> 0.0  (NO. OF LANES)   0.0<---    0  THRU  I-880 NB RAMP

RIGHT    0 ---  0.0   0.0  2.0  0.0   2.0 --- 2119  LEFT
            |         <---   ^   --->        |
            v                |    |          v
  N                          |    |                       SIG WARRANTS:
W + E                        0  259    0                    Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB THRU (T)	259	259	3500	0.0740	
SB THRU (T)	849	849	5250	0.1617	0.1617
WB RIGHT (R)	692	692	1650	0.4194	
LEFT (L)	2119	2119	3000	0.7063	0.7063

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.87
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.92
INTERSECTION LEVEL OF SERVICE: E

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2553 FREMONT BLVD./I-880 NB RAMP FREMONT
Count Date 11/09/94 Time MODEL RUN J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0  839    0

                        |    |    |
            ^           |    |    |          ^
            |         <---   v   --->        | Split? N
LEFT     0 ---  0.0   0.0  3.0  0.0   1.9 ---  438  RIGHT
                                                        STREET NAME:
THRU     0 ---> 0.0  (NO. OF LANES)   0.0<---    0  THRU  I-880 NB RAMP

RIGHT    0 ---  0.0   0.0  2.0  0.0   2.0 --- 472  LEFT
            |         <---   ^   --->        |
            v                |    |          v
  N                          |    |                       SIG WARRANTS:
W + E                        0  583    0                    Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB THRU (T)	583	583	3500	0.1666	0.1666
SB THRU (T)	839	839	5250	0.1598	
WB RIGHT (R)	438	438	1650	0.2655	
LEFT (L)	472	472	3000	0.1573	0.1573

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.32
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.42
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2556 I-880 SB OFF/FREMONT BLVD. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
----------            1281    0   23

                        |     |    |
                 ^      |     |    |        ^
                 |      <---   v    --->    | Split? N
LEFT      0 ---  0.0    1.9  0.0   2.0   0.0 ---    0  RIGHT
                                                      STREET NAME:
THRU    767 ---> 3.0  (NO. OF LANES)   2.0<--- 2537  THRU  FREMONT BLVD.

RIGHT     0 ---  0.0    0.0  0.0   0.0   0.0 ---    0  LEFT
                 |      <---   ^    --->    |
                 v                          v
  N                      |     |    |                    SIG WARRANTS:
W + E                    0     0    0                      Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N

            STREET NAME: I-880 SB OFF
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	1281	1281	1650	0.7764	
LEFT (L)	23	23	3000	0.0077	0.0077
EB THRU (T)	767	767	5250	0.1461	
WB THRU (T)	2537	2537	3500	0.7249	0.7249

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.73
ADJUSTMENT FOR LOST YELLOW TIME:	0.09
TOTAL VOLUME-TO-CAPACITY RATIO:	0.82
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.ANV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2556 I-880 SB OFF/FREMONT BLVD. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
----------            278    0    0

                        |     |    |
                 ^      |     |    |        ^
                 |      <---   v    --->    | Split? N
LEFT      0 ---  0.0    1.9  0.0   2.0   0.0 ---    0  RIGHT
                                                      STREET NAME:
THRU   2195 ---> 3.0  (NO. OF LANES)   2.0<--- 692   THRU  FREMONT BLVD.

RIGHT     0 ---  0.0    0.0  0.0   0.0   0.0 ---    0  LEFT
                 |      <---   ^    --->    |
                 v                          v
  N                      |     |    |                    SIG WARRANTS:
W + E                    0     0    0                      Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N

            STREET NAME: I-880 SB OFF
```

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB RIGHT (R)	278	278	1650	0.1685	
LEFT (L)	0	0	3000	0.0000	0.0000
EB THRU (T)	2195	2195	5250	0.4181	0.4181
WB THRU (T)	692	692	3500	0.1977	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.42
ADJUSTMENT FOR LOST YELLOW TIME:	0.10
TOTAL VOLUME-TO-CAPACITY RATIO:	0.52
INTERSECTION LEVEL OF SERVICE:	A

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2571 I-880 NB RAMP/AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0
                        |    |    |
              ^         |    |    |         ^
              |       <---   v   --->       | Split? N
LEFT     0 --- 0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  2090 ---> 3.0  (NO. OF LANES)   3.0<--- 2456  THRU  AUTO MALL PW

RIGHT    0 --- 0.0   2.0  0.0  0.0   0.0 ---    0  LEFT
              |       <---   ^   --->       |
              v                            v
  N                     |    |    |                      SIG WARRANTS:
W + E                 772   0    0                        Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 NB RAMP

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB LEFT (L)	772	772	3000	0.2573	0.2573
EB THRU (T)	2090	2090	5250	0.3981	
WB THRU (T)	2456	2456	5250	0.4678	0.4678

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.73
ADJUSTMENT FOR LOST YELLOW TIME: 0.09
TOTAL VOLUME-TO-CAPACITY RATIO: 0.82
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2571 I-880 NB RAMP/AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------             0    0    0
                        |    |    |
              ^         |    |    |         ^
              |       <---   v   --->       | Split? N
LEFT     0 --- 0.0   0.0  0.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  2246 ---> 3.0  (NO. OF LANES)   3.0<---  825  THRU  AUTO MALL PW

RIGHT    0 --- 0.0   2.0  0.0  0.0   0.0 ---    0  LEFT
              |       <---   ^   --->       |
              v                            v
  N                     |    |    |                      SIG WARRANTS:
W + E                 337   0    0                        Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: I-880 NB RAMP

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB LEFT (L)	337	337	3000	0.1123	0.1123
EB THRU (T)	2246	2246	5250	0.4278	0.4278
WB THRU (T)	825	825	5250	0.1571	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.54
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.64
INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2579 I-880 SB RAMP/AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           2097    0 1590

                        |     |    |
              ^         |     |    |          ^
              |         <---  v    --->       | Split? N
LEFT     0 --- 0.0      2.5  0.0   2.0   0.0 ---     0  RIGHT
                                                       STREET NAME:
THRU   897 ---> 4.0  (NO. OF LANES)   3.0<--- 2723  THRU  AUTO MALL PW

RIGHT    0 --- 0.0      0.0  0.0   0.0   0.0 ---     0  LEFT
              |         <---  ^    --->       |
              v                                v
  N                       |     |    |                   SIG WARRANTS:
W + E                     0     0    0                     Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

              STREET NAME: I-880 SB RAMP
```

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB	RIGHT (R)	2097	2037 *	3000	0.6790	0.6790
	LEFT (L)	1590	1590	3000	0.5300	
EB	THRU (T)	897	897	7000	0.1281	
WB	THRU (T)	2723	2723	5250	0.5187	0.5187

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	1.20
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	1.25
INTERSECTION LEVEL OF SERVICE:	F

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2579 I-880 SB RAMP/AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           888    0  568

                        |     |    |
              ^         |     |    |          ^
              |         <---  v    --->       | Split? N
LEFT     0 --- 0.0      2.5  0.0   2.0   0.0 ---     0  RIGHT
                                                       STREET NAME:
THRU  3307 ---> 4.0  (NO. OF LANES)   3.0<--- 1120  THRU  AUTO MALL PW

RIGHT    0 --- 0.0      0.0  0.0   0.0   0.0 ---     0  LEFT
              |         <---  ^    --->       |
              v                                v
  N                       |     |    |                   SIG WARRANTS:
W + E                     0     0    0                     Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

              STREET NAME: I-880 SB RAMP
```

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB	RIGHT (R)	888	828 *	3000	0.2760	0.2760
	LEFT (L)	568	568	3000	0.1893	
EB	THRU (T)	3307	3307	7000	0.4724	0.4724
WB	THRU (T)	1120	1120	5250	0.2133	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.75
ADJUSTMENT FOR LOST YELLOW TIME:	0.08
TOTAL VOLUME-TO-CAPACITY RATIO:	0.83
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2671 FREMONT BL./S. GRIMMER BL FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           103  956    8

                        |    |    |
                        <---  v   --->      | Split? N
LEFT    64 --- 1.0   1.0  2.0  1.0   1.0 ---   34  RIGHT
                                                        STREET NAME:
THRU   522 ---> 2.0  (NO. OF LANES)   2.0<---  514  THRU  S. GRIMMER BL

RIGHT  524 --- 1.9   2.0  2.0  1.9   1.0 ---  140  LEFT
                        <---  ^   --->      |
                                            v
  N                                                     SIG WARRANTS:
W + E                  444  306   88                      Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BL.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	88	88	1650	0.0533	
	THRU (T)	306	306	3500	0.0874	
	LEFT (L)	444	444	3000	0.1480	0.1480
SB	RIGHT (R)	103	11 *	1620	0.0068	
	THRU (T)	956	956	3500	0.2731	0.2731
	LEFT (L)	8	8	1620	0.0049	
EB	RIGHT (R)	524	524	1650	0.3176	
	THRU (T)	522	522	3500	0.1491	0.1491
	LEFT (L)	64	64	1620	0.0395	
WB	RIGHT (R)	34	0 *	1620	0.0000	
	THRU (T)	514	514	3500	0.1469	
	LEFT (L)	140	140	1620	0.0864	0.0864

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.66
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.76
INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2671 FREMONT BL./S. GRIMMER BL FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           62  364   24

                        |    |    |
                        <---  v   --->      | Split? N
LEFT   111 --- 1.0   1.0  2.0  1.0   1.0 ---   12  RIGHT
                                                        STREET NAME:
THRU   531 ---> 2.0  (NO. OF LANES)   2.0<---  633  THRU  S. GRIMMER BL

RIGHT  328 --- 1.9   2.0  2.0  1.9   1.0 ---   93  LEFT
                        <---  ^   --->      |
                                            v
  N                                                     SIG WARRANTS:
W + E                  395 1029  191                     Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BL.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	191	191	1650	0.1158	
	THRU (T)	1029	1029	3500	0.2940	0.2940
	LEFT (L)	395	395	3000	0.1317	
SB	RIGHT (R)	62	0 *	1620	0.0000	
	THRU (T)	364	364	3500	0.1040	
	LEFT (L)	24	24	1620	0.0148	0.0148
EB	RIGHT (R)	328	328	1650	0.1988	
	THRU (T)	531	531	3500	0.1517	
	LEFT (L)	111	111	1620	0.0685	0.0685
WB	RIGHT (R)	12	0 *	1620	0.0000	
	THRU (T)	633	633	3500	0.1809	0.1809
	LEFT (L)	93	93	1620	0.0574	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.56
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.66
INTERSECTION LEVEL OF SERVICE: B

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2731 CHERRY/BOYCE/STEVENSON BL. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            184 2402  129

                        |    |    |
                        <---  v   --->        ^
            ^                                 | Split? N
            |
LEFT    33 ---  1.0   1.9  3.0  2.0   1.0 ---  583  RIGHT
                                                        STREET NAME:
THRU   111 ---> 2.0  (NO. OF LANES)   2.0<---  537  THRU  STEVENSON BL.

RIGHT    2 ---  1.0   1.0  2.0  1.0   1.0 ---  719  LEFT
            |        <---   ^   --->      |
            v                             v
  N                      |    |    |                      SIG WARRANTS:
W + E                    2  217  261                        Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: CHERRY/BOYCE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	261	0 *	1620	0.0000	
	THRU (T)	217	217	3500	0.0620	
	LEFT (L)	2	2	1620	0.0012	0.0012
SB	RIGHT (R)	184	184	1650	0.1115	
	THRU (T)	2402	2402	5250	0.4575	0.4575
	LEFT (L)	129	129	3000	0.0430	
EB	RIGHT (R)	2	0 *	1620	0.0000	
	THRU (T)	111	111	3500	0.0317	0.0317
	LEFT (L)	33	33	1620	0.0204	
WB	RIGHT (R)	583	488 *	1620	0.3012	
	THRU (T)	537	537	3500	0.1534	
	LEFT (L)	719	719	1620	0.4438	0.4438

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.93
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	0.98
INTERSECTION LEVEL OF SERVICE:	E

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2731 CHERRY/BOYCE/STEVENSON BL. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           44  340  297

                        |    |    |
                        <---  v   --->        ^
            ^                                 | Split? N
            |
LEFT   388 ---  1.0   1.9  3.0  2.0   1.0 ---  220  RIGHT
                                                        STREET NAME:
THRU   582 ---> 2.0  (NO. OF LANES)   2.0<---  129  THRU  STEVENSON BL.

RIGHT   13 ---  1.0   1.0  2.0  1.0   1.0 ---  275  LEFT
            |        <---   ^   --->      |
            v                             v
  N                      |    |    |                      SIG WARRANTS:
W + E                    1 1408 1059                        Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: CHERRY/BOYCE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1059	862 *	1620	0.5321	0.5321
	THRU (T)	1408	1408	3500	0.4023	
	LEFT (L)	1	1	1620	0.0006	
SB	RIGHT (R)	44	44	1650	0.0267	
	THRU (T)	340	340	5250	0.0648	
	LEFT (L)	297	297	3000	0.0990	0.0990
EB	RIGHT (R)	13	0 *	1620	0.0000	
	THRU (T)	582	582	3500	0.1663	0.1663
	LEFT (L)	388	388	1620	0.2395	
WB	RIGHT (R)	220	80 *	1620	0.0494	
	THRU (T)	129	129	3500	0.0369	
	LEFT (L)	275	275	1620	0.1698	0.1698

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.97
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	1.02
INTERSECTION LEVEL OF SERVICE:	F

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 - With Mitigations (AM) 01/18/96

INTERSECTION 2731 CHERRY/BOYCE/STEVENSON BL. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            184 2402  129

                         |    |    |          ^
             ^           |    |    |          |
             |         <---   v   --->        | Split? N
LEFT    33 --- 1.0   1.9  3.0  2.0   1.0 ---  583  RIGHT
                                                        STREET NAME:
THRU   111 ---> 2.1  (NO. OF LANES)   2.0<---  537  THRU  STEVENSON BL.

RIGHT    2 ---  1.1   1.0  2.0  1.9  2.0 ---  719  LEFT
             |         <---   ^   --->      |
             v                |    |        v
  N                           |    |                     SIG WARRANTS:
W + E                         2  217  261                  Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: CHERRY/BOYCE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	261	261	1650	0.1582	
	THRU (T)	217	217	3500	0.0620	
	LEFT (L)	2	2	1620	0.0012	0.0012
SB	RIGHT (R)	184	184	1650	0.1115	
	THRU (T)	2402	2402	5250	0.4575	0.4575
	LEFT (L)	129	129	3000	0.0430	
EB	RIGHT (R)	2	2	1620	0.0012	
	THRU (T)	111	111	3370	0.0329	
	LEFT (L)	33	33	1620	0.0204	0.0204
	T + R		113	3370	0.0335	
WB	RIGHT (R)	583	488 *	1620	0.3012	0.3012
	THRU (T)	537	537	3500	0.1534	
	LEFT (L)	719	719	3000	0.2397	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.78
ADJUSTMENT FOR LOST YELLOW TIME: 0.06
TOTAL VOLUME-TO-CAPACITY RATIO: 0.84
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=JMIT.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 - With Mitigations (PM) 01/18/96

INTERSECTION 2731 CHERRY/BOYCE/STEVENSON BL. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           44  340  297

                         |    |    |          ^
             ^           |    |    |          |
             |         <---   v   --->        | Split? N
LEFT   388 --- 1.0   1.9  3.0  2.0   1.0 ---  220  RIGHT
                                                        STREET NAME:
THRU   582 ---> 2.1  (NO. OF LANES)   2.0<---  129  THRU  STEVENSON BL.

RIGHT   13 ---  1.1   1.0  2.0  1.9  2.0 ---  275  LEFT
             |         <---   ^   --->      |
             v                |    |        v
  N                           |    |                     SIG WARRANTS:
W + E                         1 1408 1059                  Urb=Y, Rur=Y
  S                       LEFT THRU RIGHT Split? N
```

STREET NAME: CHERRY/BOYCE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1059	1059	1650	0.6418	
	THRU (T)	1408	1408	3500	0.4023	0.4023
	LEFT (L)	1	1	1620	0.0006	
SB	RIGHT (R)	44	44	1650	0.0267	
	THRU (T)	340	340	5250	0.0648	
	LEFT (L)	297	297	3000	0.0990	0.0990
EB	RIGHT (R)	13	13	1620	0.0080	
	THRU (T)	582	582	3370	0.1727	
	LEFT (L)	388	388	1620	0.2395	0.2395
	T + R		595	3370	0.1766	
WB	RIGHT (R)	220	80 *	1620	0.0494	0.0494
	THRU (T)	129	129	3500	0.0369	
	LEFT (L)	275	275	3000	0.0917	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.79
ADJUSTMENT FOR LOST YELLOW TIME: 0.06
TOTAL VOLUME-TO-CAPACITY RATIO: 0.85
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=JMIT.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2778 GRIMMER BL./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           1499  999  156
                        |    |    |
                        v    v    v
                      <---  ---> | Split? N
LEFT   261 ---  2.0   1.9  3.0  2.0   1.5 ---   29  RIGHT
                                                      STREET NAME:
THRU   519 ---> 3.0  (NO. OF LANES)   3.0<---  1462  THRU  AUTO MALL PW

RIGHT 1405 ---  1.5   2.0  2.0  1.9   1.0 ---   95  LEFT
                      <---  ^   --->
                        |    |    |
                        v    v    v
  N                                                   SIG WARRANTS:
W + E                  627  107  29                     Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

              STREET NAME: GRIMMER BL.
```

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	29	29	1650	0.0176	
	THRU (T)	107	107	3500	0.0306	
	LEFT (L)	627	627	3000	0.2090	0.2090
SB	RIGHT (R)	1499	1499	1650	0.9085 **	
	THRU (T)	999	999	5250	0.1903	0.1903
	LEFT (L)	156	156	3000	0.0520	
EB	RIGHT (R)	1405	1006 *	1620	0.6210	0.6210
	THRU (T)	519	519	5250	0.0989	
	LEFT (L)	261	261	3000	0.0870	
WB	RIGHT (R)	29	0 *	1620	0.0000	
	THRU (T)	1462	1462	5250	0.2785	
	LEFT (L)	95	95	1620	0.0586	0.0586

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 1.08
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 1.13
INTERSECTION LEVEL OF SERVICE: F

* ADJUSTED FOR RIGHT TURN ON RED ** APPROACHING OR EXCEEDING CAPACITY
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2778 GRIMMER BL./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           346  369   71
                        |    |    |
                        v    v    v
                      <---  ---> | Split? N
LEFT  1592 ---  2.0   1.9  3.0  2.0   1.5 ---   84  RIGHT
                                                      STREET NAME:
THRU   717 ---> 3.0  (NO. OF LANES)   3.0<---  814  THRU  AUTO MALL PW

RIGHT  531 ---  1.5   2.0  2.0  1.9   1.0 ---   34  LEFT
                      <---  ^   --->
                        |    |    |
                        v    v    v
  N                                                   SIG WARRANTS:
W + E                 1593  624  179                    Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N

              STREET NAME: GRIMMER BL.
```

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	179	179	1650	0.1085	
	THRU (T)	624	624	3500	0.1783	
	LEFT (L)	1593	1593	3000	0.5310	0.5310
SB	RIGHT (R)	346	346	1650	0.2097	
	THRU (T)	369	369	5250	0.0703	0.0703
	LEFT (L)	71	71	3000	0.0237	
EB	RIGHT (R)	531	0 *	1620	0.0000	
	THRU (T)	717	717	5250	0.1366	
	LEFT (L)	1592	1592	3000	0.5307	0.5307
WB	RIGHT (R)	84	0 *	1620	0.0000	
	THRU (T)	814	814	5250	0.1550	0.1550
	LEFT (L)	34	34	1620	0.0210	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 1.29
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 1.34
INTERSECTION LEVEL OF SERVICE: F

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2788 BOYCE RD./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            40 1877  256

                        |    |    |
                        v    v    v
                       <---  v  --->      ^
            ^                            | Split? N
            |          <---  v  --->     |
LEFT    49 ---  1.0   1.9  2.0  1.0   1.0 ---  455  RIGHT
                                                        STREET NAME:
THRU    70 ---> 2.1  (NO. OF LANES)   2.0<---  189  THRU  AUTO MALL PW

RIGHT   34 ---  1.1   1.0  2.0  1.9   2.0 ---  510  LEFT
            |          <---  ^  --->     |
            v                            v

  N                      |    |    |                      SIG WARRANTS:
W + E                    8  337   96                        Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: BOYCE RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	96	96	1650	0.0582	
	THRU (T)	337	337	3500	0.0963	
	LEFT (L)	8	8	1620	0.0049	0.0049
SB	RIGHT (R)	40	40	1650	0.0242	
	THRU (T)	1877	1877	3500	0.5363	0.5363
	LEFT (L)	256	256	1620	0.1580	
EB	RIGHT (R)	34	34	1620	0.0210	
	THRU (T)	70	70	3370	0.0208	
	LEFT (L)	49	49	1620	0.0302	
	T + R		104	3370	0.0309	0.0309
WB	RIGHT (R)	455	267 *	1620	0.1648	
	THRU (T)	189	189	3500	0.0540	
	LEFT (L)	510	510	3000	0.1700	0.1700

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.74
ADJUSTMENT FOR LOST YELLOW TIME:	0.08
TOTAL VOLUME-TO-CAPACITY RATIO:	0.82
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=0:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2788 BOYCE RD./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            46  319  780

                        |    |    |
                        v    v    v
                       <---  v  --->      ^
            ^                            | Split? N
            |          <---  v  --->     |
LEFT     9 ---  1.0   1.9  2.0  1.0   1.0 ---  125  RIGHT
                                                        STREET NAME:
THRU   112 ---> 2.1  (NO. OF LANES)   2.0<---  103  THRU  AUTO MALL PW

RIGHT    7 ---  1.1   1.0  2.0  1.9   2.0 ---  179  LEFT
            |          <---  ^  --->     |
            v                            v

  N                      |    |    |                      SIG WARRANTS:
W + E                   59 1477  467                        Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: BOYCE RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	467	467	1650	0.2830	
	THRU (T)	1477	1477	3500	0.4220	0.4220
	LEFT (L)	59	59	1620	0.0364	
SB	RIGHT (R)	46	46	1650	0.0279	
	THRU (T)	319	319	3500	0.0911	
	LEFT (L)	780	780	1620	0.4815	0.4815
EB	RIGHT (R)	7	7	1620	0.0043	
	THRU (T)	112	112	3370	0.0332	
	LEFT (L)	9	9	1620	0.0056	
	T + R		119	3370	0.0353	0.0353
WB	RIGHT (R)	125	0 *	1620	0.0000	
	THRU (T)	103	103	3500	0.0294	
	LEFT (L)	179	179	3000	0.0597	0.0597

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	1.00
ADJUSTMENT FOR LOST YELLOW TIME:	0.05
TOTAL VOLUME-TO-CAPACITY RATIO:	1.05
INTERSECTION LEVEL OF SERVICE:	F

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=0:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 - With Mitigations (AM) 01/18/96

INTERSECTION 2788 BOYCE RD./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            40 1877  256

                        |    |    |
                        |    |    |
                        <---  v   --->      | Split? N
LEFT    49 --- 1.0   1.9  2.0  2.0   1.0 --- 455  RIGHT
                                                        STREET NAME:
THRU    70 ---> 2.1  (NO. OF LANES)   2.0<---  189  THRU  AUTO MALL PW

RIGHT   34 --- 1.1   1.0  2.0  1.9   2.0 ---  510  LEFT
                     <---  ^   --->
                        |    |    |
                        v    v    v
  N                                                     SIG WARRANTS:
W + E                    8  337   96                      Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: BOYCE RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	96	96	1650	0.0582	
	THRU (T)	337	337	3500	0.0963	
	LEFT (L)	8	8	1620	0.0049	0.0049
SB	RIGHT (R)	40	40	1650	0.0242	
	THRU (T)	1877	1877	3500	0.5363	0.5363
	LEFT (L)	256	256	3000	0.0853	
EB	RIGHT (R)	34	34	1620	0.0210	
	THRU (T)	70	70	3370	0.0208	
	LEFT (L)	49	49	1620	0.0302	0.0302
	T + R		104	3370	0.0309	
WB	RIGHT (R)	455	326 *	1620	0.2012	0.2012
	THRU (T)	189	189	3500	0.0540	
	LEFT (L)	510	510	3000	0.1700	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.77
ADJUSTMENT FOR LOST YELLOW TIME:	0.07
TOTAL VOLUME-TO-CAPACITY RATIO:	0.84
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=JMIT.INT,VOL=F10J21T.AMV,CAP=D:,.FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 - With Mitigations (PM) 01/18/96

INTERSECTION 2788 BOYCE RD./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            46  319  780

                        |    |    |
                        |    |    |
                        <---  v   --->      | Split? N
LEFT     9 --- 1.0   1.9  2.0  2.0   1.0 --- 125  RIGHT
                                                        STREET NAME:
THRU   112 ---> 2.1  (NO. OF LANES)   2.0<---  103  THRU  AUTO MALL PW

RIGHT    7 --- 1.1   1.0  2.0  1.9   2.0 ---  179  LEFT
                     <---  ^   --->
                        |    |    |
                        v    v    v
  N                                                     SIG WARRANTS:
W + E                   59 1477  467                      Urb=Y, Rur=Y
  S                  LEFT THRU RIGHT Split? N
```

STREET NAME: BOYCE RD.

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	467	467	1650	0.2830	
	THRU (T)	1477	1477	3500	0.4220	0.4220
	LEFT (L)	59	59	1620	0.0364	
SB	RIGHT (R)	46	46	1650	0.0279	
	THRU (T)	319	319	3500	0.0911	
	LEFT (L)	780	780	3000	0.2600	0.2600
EB	RIGHT (R)	7	7	1620	0.0043	
	THRU (T)	112	112	3370	0.0332	
	LEFT (L)	9	9	1620	0.0056	
	T + R		119	3370	0.0353	0.0353
WB	RIGHT (R)	125	0 *	1620	0.0000	
	THRU (T)	103	103	3500	0.0294	
	LEFT (L)	179	179	3000	0.0597	0.0597

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION:	0.78
ADJUSTMENT FOR LOST YELLOW TIME:	0.06
TOTAL VOLUME-TO-CAPACITY RATIO:	0.84
INTERSECTION LEVEL OF SERVICE:	D

* ADJUSTED FOR RIGHT TURN ON RED
INT=JMIT.INT,VOL=F10J21T.PMV,CAP=D:,.FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2789 FREMONT BLVD./CUSHING PKWY. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           2815 1003    0
                        |    |    |
              ^         |    |    |        ^
              |       <---   v   --->      | Split? N
LEFT   238 --- 2.0    1.9  3.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU   430 ---> 2.0  (NO. OF LANES)   0.0<---    0  THRU  CUSHING PKWY.

RIGHT  898 --- 1.5    2.0  4.0  1.0   0.0 ---    0  LEFT
              |       <---   ^   --->      |
              v               |    |        v
  N                           |    |                     SIG WARRANTS:
W + E                  853  528  138                      Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	138	78 *	1620	0.0481	
	THRU (T)	528	528	7000	0.0754	
	LEFT (L)	853	853	3000	0.2843	0.2843
SB	RIGHT (R)	2815	2815	1650	1.7061 **	
	THRU (T)	1003	1003	5250	0.1910	0.1910
EB	RIGHT (R)	898	377 *	1620	0.2327	0.2327
	THRU (T)	430	430	3500	0.1229	
	LEFT (L)	238	238	3000	0.0793	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.71
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.81
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED ** APPROACHING OR EXCEEDING CAPACITY
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2789 FREMONT BLVD./CUSHING PKWY. FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------           671  300    0
                        |    |    |
              ^         |    |    |        ^
              |       <---   v   --->      | Split? N
LEFT  1041 --- 2.0    1.9  3.0  0.0   0.0 ---    0  RIGHT
                                                          STREET NAME:
THRU  2372 ---> 2.0  (NO. OF LANES)   0.0<---    0  THRU  CUSHING PKWY.

RIGHT  695 --- 1.5    2.0  4.0  1.0   0.0 ---    0  LEFT
              |       <---   ^   --->      |
              v               |    |        v
  N                           |    |                     SIG WARRANTS:
W + E                  251 1155  259                      Urb=Y, Rur=Y
  S                   LEFT THRU RIGHT Split? N
```

STREET NAME: FREMONT BLVD.

	MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	259	199 *	1620	0.1228	
	THRU (T)	1155	1155	7000	0.1650	0.1650
	LEFT (L)	251	251	3000	0.0837	
SB	RIGHT (R)	671	671	1650	0.4067	
	THRU (T)	300	300	5250	0.0571	
EB	RIGHT (R)	695	499 *	1620	0.3080	
	THRU (T)	2372	2372	3500	0.6777	0.6777
	LEFT (L)	1041	1041	3000	0.3470	

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.84
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.89
INTERSECTION LEVEL OF SERVICE: D

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 2899 ALBRAE/STEVENSON FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            11    4   49

                        |     |    |
                 ^      |     |    |        ^
                 |      <---   v    --->    | Split? N
LEFT    13 ---  1.0    1.1   1.1   3.0   1.0 ---  122  RIGHT
                                                        STREET NAME:
THRU   959 ---> 4.1   (NO. OF LANES)   3.0<--- 2087  THRU  STEVENSON

RIGHT  192 ---  1.1    1.1   1.1   2.5   2.0 --- 1316  LEFT
                 |     <---   ^    --->    |
                 v        |     |    |     v
  N                       |     |    |                   SIG WARRANTS:
W + E                    81     5  404                     Urb=Y, Rur=Y
  S                    LEFT THRU RIGHT Split? Y
```

STREET NAME: ALBRAE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	404	0 *	3000	0.0000	
	THRU (T)	5	5	1620	0.0031	
	LEFT (L)	81	81	1620	0.0500	
	T + L		86	1620	0.0531	0.0531
SB	RIGHT (R)	11	11	1620	0.0068	
	THRU (T)	4	4	1620	0.0025	
	LEFT (L)	49	49	4500	0.0109	0.0109
	T + R		15	1620	0.0093	
EB	RIGHT (R)	192	192	1620	0.1185	
	THRU (T)	959	959	6870	0.1396	
	LEFT (L)	13	13	1620	0.0080	
	T + R		1151	6870	0.1675	0.1675
WB	RIGHT (R)	122	53 *	1620	0.0327	
	THRU (T)	2087	2087	5250	0.3975	
	LEFT (L)	1316	1316	3000	0.4387	0.4387

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.67
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.77
INTERSECTION LEVEL OF SERVICE: C

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 2899 ALBRAE/STEVENSON FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            19   17  207

                        |     |    |
                 ^      |     |    |        ^
                 |      <---   v    --->    | Split? N
LEFT    20 ---  1.0    1.1   1.1   3.0   1.0 ---  161  RIGHT
                                                        STREET NAME:
THRU  2219 ---> 4.1   (NO. OF LANES)   3.0<--- 1025  THRU  STEVENSON

RIGHT  187 ---  1.1    1.1   1.1   2.5   2.0 --- 820  LEFT
                 |     <---   ^    --->    |
                 v        |     |    |     v
  N                       |     |    |                   SIG WARRANTS:
W + E                   334    50 1705                     Urb=Y, Rur=Y
  S                    LEFT THRU RIGHT Split? Y
```

STREET NAME: ALBRAE

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB	RIGHT (R)	1705	825 *	3000	0.2750	0.2750
	THRU (T)	50	50	1620	0.0309	
	LEFT (L)	334	334	1620	0.2062	
	T + L		384	1620	0.2370	
SB	RIGHT (R)	19	19	1620	0.0117	
	THRU (T)	17	17	1620	0.0105	
	LEFT (L)	207	207	4500	0.0460	0.0460
	T + R		36	1620	0.0222	
EB	RIGHT (R)	187	187	1620	0.1154	
	THRU (T)	2219	2219	6870	0.3230	
	LEFT (L)	20	20	1620	0.0123	
	T + R		2406	6870	0.3502	0.3502
WB	RIGHT (R)	161	64 *	1620	0.0395	
	THRU (T)	1025	1025	5250	0.1952	
	LEFT (L)	820	820	3000	0.2733	0.2733

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.94
ADJUSTMENT FOR LOST YELLOW TIME: 0.05
TOTAL VOLUME-TO-CAPACITY RATIO: 0.99
INTERSECTION LEVEL OF SERVICE: E

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 3375 STEVENSON EXT/AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            31   0  181
                        |    |    |
            ^           |    v    |          ^
            |          <---  v  --->         | Split? N
LEFT    18 ---  1.1   1.1  0.0  1.1   1.1 ---   19  RIGHT
                                                        STREET NAME:
THRU    18 ---> 1.1  (NO. OF LANES)   1.1<---   26  THRU  AUTO MALL PW

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
            |          <---  ^  --->         |
            v           |    |    |          v
  N                     |    |    |                     SIG WARRANTS:
W + E                   0    0    0                      Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: STEVENSON EXT

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB	RIGHT (R)	31	31	1620	0.0191	
	LEFT (L)	181	181	1620	0.1117	
	T + R + L		212	1620	0.1309	0.1309
EB	THRU (T)	18	18	1620	0.0111	
	LEFT (L)	18	18	1620	0.0111	0.0111
	T + L		36	1620	0.0222	
WB	RIGHT (R)	19	19	1620	0.0117	
	THRU (T)	26	26	1620	0.0160	
	T + R		45	1620	0.0278	0.0278

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.17
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.27
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=0:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 3375 STEVENSON EXT/AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            23   0   23
                        |    |    |
            ^           |    v    |          ^
            |          <---  v  --->         | Split? N
LEFT    30 ---  1.1   1.1  0.0  1.1   1.1 ---  348  RIGHT
                                                        STREET NAME:
THRU    20 ---> 1.1  (NO. OF LANES)   1.1<---   16  THRU  AUTO MALL PW

RIGHT    0 ---  0.0   0.0  0.0  0.0   0.0 ---    0  LEFT
            |          <---  ^  --->         |
            v           |    |    |          v
  N                     |    |    |                     SIG WARRANTS:
W + E                   0    0    0                      Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: STEVENSON EXT

MOVEMENT		ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
SB	RIGHT (R)	23	23	1620	0.0142	
	LEFT (L)	23	23	1620	0.0142	
	T + R + L		46	1620	0.0284	0.0284
EB	THRU (T)	20	20	1620	0.0123	
	LEFT (L)	30	30	1620	0.0185	0.0185
	T + L		50	1620	0.0309	
WB	RIGHT (R)	348	348	1620	0.2148	
	THRU (T)	16	16	1620	0.0099	
	T + R		364	1620	0.2247	0.2247

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.27
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.37
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=0:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (AM) 01/18/96

INTERSECTION 3501 CUSHIN PW W./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour A.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            0    0    0
                       |    |    |
                 ^     |    |    |     ^
                 |     <---  v   --->   | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0  0.0 ---   0  RIGHT
                                                        STREET NAME:
THRU    60 ---> 1.1  (NO. OF LANES)   1.0<---  50  THRU  AUTO MALL PW

RIGHT  124 ---  1.1   1.0  0.0  1.0  1.0 ---  186  LEFT
                 |     <---  ^   --->   |
                 v       |    |    |     v
  N                      |    |    |                    SIG WARRANTS:
W + E                    6    0   94                     Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: CUSHIN PW W.

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	94	0 *	1620	0.0000	
LEFT (L)	6	6	1620	0.0037	0.0037
EB RIGHT (R)	124	124	1620	0.0765	
THRU (T)	60	60	1620	0.0370	
T + R		184	1620	0.1136	0.1136
WB THRU (T)	50	50	1750	0.0286	
LEFT (L)	186	186	1620	0.1148	0.1148

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.23
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.33
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.AMV,CAP=D:..FREMNEW.TAB

LOS Software by TJKM Transportation Consultants

Condition: Model Run J5 (PM) 01/18/96

INTERSECTION 3501 CUSHIN PW W./AUTO MALL PW FREMONT
Count Date 11/09/94 Time Model Run J5 Peak Hour P.M.

```
TJKM METHOD          RIGHT THRU LEFT
-----------            0    0    0
                       |    |    |
                 ^     |    |    |     ^
                 |     <---  v   --->   | Split? N
LEFT     0 ---  0.0   0.0  0.0  0.0  0.0 ---   0  RIGHT
                                                        STREET NAME:
THRU    39 ---> 1.1  (NO. OF LANES)   1.0<---  75  THRU  AUTO MALL PW

RIGHT    9 ---  1.1   1.0  0.0  1.0  1.0 ---  133  LEFT
                 |     <---  ^   --->   |
                 v       |    |    |     v
  N                      |    |    |                    SIG WARRANTS:
W + E                  284    0   89                     Urb=N, Rur=N
  S                 LEFT THRU RIGHT Split? N
```

STREET NAME: CUSHIN PW W.

MOVEMENT	ORIGINAL VOLUME	ADJUSTED VOLUME*	CAPACITY	V/C RATIO	CRITICAL V/C
NB RIGHT (R)	89	0 *	1620	0.0000	
LEFT (L)	284	284	1620	0.1753	0.1753
EB RIGHT (R)	9	9	1620	0.0056	
THRU (T)	39	39	1620	0.0241	
T + R		48	1620	0.0296	0.0296
WB THRU (T)	75	75	1750	0.0429	
LEFT (L)	133	133	1620	0.0821	0.0821

VOLUME-TO-CAPACITY RATIO FOR THE INTERSECTION: 0.29
ADJUSTMENT FOR LOST YELLOW TIME: 0.10
TOTAL VOLUME-TO-CAPACITY RATIO: 0.39
INTERSECTION LEVEL OF SERVICE: A

* ADJUSTED FOR RIGHT TURN ON RED
INT=J.INT,VOL=F10J21T.PMV,CAP=D:..FREMNEW.TAB

APPENDIX B

LETTER FROM ALAMEDA COUNTY WATER DISTRICT

ACWD
ALAMEDA COUNTY WATER DISTRICT

DIRECTORS
PHIL UTIC
President
JOSEPH C. DAMAS, JR.
JIM GUNTHER
TIM ROLLISSON
JOHN H. WEED

P.O. BOX 5110 • 43885 SOUTH GRIMMER BOULEVARD, FREMONT, CALIFORNIA 94537
PHONE (510) 659-1970 • FAX (510) 770-1793 • E-MAIL acwd@infolane.com

OFFICERS
JAMES D. BEARD
General Manager
RONALD PINO
Treasurer
MARVELL L. HERREN
District Secretary

February 14, 1996

Mr. Matthew Huisman
Questa Engineering Corporation
P. O. Box 356
Point Richmond, CA 94807

Dear Mr. Huisman:

Subject: Water Supply for Pacific Commons, Catellus Development Corp., Fremont, CA

This letter is to inform you that Alameda County Water District has reviewed the land use information and anticipated net area of use per land use classification provided to this office the week of February 2, 1996, and has determined that the Pacific Commons development will contain about 877 acres and have a 1.47 mgd nominal day water demand. The water necessary to meet this demand will be provided by Alameda County Water District from both potable and non-potable sources.

This project was identified in the June 1991 ACWD/USD Water Reuse Survey Study as a potential project to be served USD reclaimed water for certain non-potable uses. At this time, the reclaimed water system that would provide reuse water to this project is still in the planning phase and is not in place. The Water District is currently studying alternative non-potable water sources, but in the interim, has adequate potable sources to serve the project's water needs.

The developer will be required to install the water pipelines and facilities required to serve the development, including any off-site facilities which the District may determine necessary, and to comply with all applicable District procedures and regulations.

If you have any questions regarding the above, please call me at (510)659-1970, Extension 471.

Very truly yours,

Ted Lynch

Ted Lynch
Supervising Development Engineer

bk
cc: Leonard Banda, City of Fremont

APPENDIX C

ENTRIX METHODOLOGY FOR WETLAND MAPPING

METHODS

Field Methods for Determining the Presence and Extent of Wetland Resources

The presence and extent of wetland resources on the Pacific Commons project site was determined using a combination of survey methods. Current and recent aerial photographs were obtained for the property. These photographs include blackline copies of March 29, 1995 photographs flown for the City of Fremont and enlarged to 100-scale (one inch on the photograph representing 100 feet on the ground), 1:36,000 color photographs flown on April 27, 1990, and color infrared photographs flown on July 17, 1985, and June 12, 1990 (unknown scales). Two-hundred-scale and 50-scale topographic maps with one-foot contours and 0.01-ft. spot elevations on a 100-foot grid were also used. In addition, Zentner and Zentner was consulted regarding its reconnaissance of the site to locate possible wetland resources.

The aerial photographs, topographic maps, and preliminary vegetation map prepared by Zentner and Zentner were used in the field to identify potential sample site locations and to determine the shape and boundaries of identified wetland resources. Field work to support the jurisdictional determination was conducted in a series of visits made between December 7 and January 13, 1996. Reconnaissance surveys of the site were conducted on October 27, 1995, and December 7, 1995, to identify the location and extent of possible wetland resources at the site and to design our approach for identifying the extent of wetland resources on the project site.

During their field reconnaissance survey, Zentner and Zentner identified two broad categories of wetlands resources at the project site: (1) seasonally ponded wetlands, and (2) wet meadows (see SEIR text for definition of these wetland resource types). Seasonally ponded wetland resources that could be identified on current and recent aerial photographs were delineated directly on the blackline copies of the March 29, 1995, aerial photographs. These wetlands are depressional features large enough to be visible on the blackline photographs by virtue of their sizes and photographic signatures. The dark signatures indicate the presence of standing water. The locations of their boundaries were determined in the field by pacing from adjacent or nearby cultural or topographic features, often berms, abandoned roads, power poles, ditches, or fences.

On most of the Pacific Commons site the surface topography has been altered. Fill has been placed, small berms have been constructed and local excavations have taken place. The fill has also settled differentially. The result is a scattered distribution of small depressional areas that are not obvious because of the dense vegetation cover throughout most of the site. These areas are identified as wet

meadows by Zentner and Zentner. Wet meadows found in these depressions are typically not deep enough, large enough, or sufficiently different in vegetation composition from surrounding upland habitat to be apparent or distinguishable on the aerial photographs. Because of the size of the property and the difficulty in determining the true plan position of these small isolated wetlands, a different approach was used to determine the acreage of these small, isolated wetlands.

The property was divided into areas (A, B, C, D, etc.) each of which was surveyed independently using a systematic distribution of sample sites (Figure A-1). Systematic sampling is an acceptable approach to estimating wetland area if there are no systematic (linear or periodic) variations that can bias the estimates. Pre-survey observations indicate that no topographic, soil, or hydrologic conditions or past land use practices on the property or in any of the fields affect wetland distribution or would bias estimates of wetland area made using systematic sampling. The ditches may affect local water relations but, given the relatively heavy clay surface soils, their low lateral transmissivity, and the relatively flat topography (in which the subsurface hydraulic gradient is minimal), their zones of influence and their effects on the results were considered minor.

Sample transects were located in each field by establishing a feature (i.e., a ditch, fence, or road) along one side of the field as a baseline, using a compass to determine its azimuth, and then surveying a series of transects with the same azimuth. The transects were set at a predetermined spacing of between 50 ft. and 200 ft., the distance dependent upon the size of the field. Individual sample points were systematically arrayed along each transect, the spacing dependent upon the size of the field. Transect spacing was reduced and sampling intensity was increased in Survey Area AA after the December 7, 1995, reconnaissance survey revealed the "grain or texture" of the upland-wetland mosaic to be relatively fine when compared with the other survey areas.

The dominant and subdominant plant species[1] were identified and the presence and type of surface hydrologic indicators (e.g., presence of matted vegetation, algal crusts, sediment deposited on plant litter) were determined at each sample point (each sample point covered approximately 0.05 square meters). If the dominant plant species were hydrophytic and hydrologic indicators were present, the sample point was classified as being in a wetland. If either the dominant vegetation was not determined to be hydrophytic or hydrologic indicators were not present, the sample point was classified as being in an upland.

---

[1] Dominant vegetation defined as individual species with a percent cover greater than 25% in the sample quadrat; subdominant species were individual species with a percent cover between 10% and 25% in the sample quadrat.

In each survey area, species equally likely to be found in wetlands or uplands (facultative species, Reed 1988)[2], such as perennial ryegrass (*Lolium perenne*), Mediterranean barley (*Hordeum marinum* var. *gussoneanum*), prickly lettuce (*Lactuca serriola*), and bristly ox-tongue (*Picris echioides*) are mixed with upland species such as ripgut brome (*Bromus rigidus*) and soft chess (*Bromus hordaceus*) and halophytes usually found in wetlands, such as alkali heath (*Frankenia grandifolia*). Shifts in dominance occur over short distances in response to variations in microtopography.

The Zentner and Zentner reconnaissance survey and the two ENTRIX reconnaissance surveys found the soils to be relatively dark and uniform in color, with matrix chroma being primarily 1. During the detailed field survey, the soils in the systematically sampled areas were uniform and unmottled with a matrix chroma of 10YR3/1 and, at the time of the field survey, were generally unsaturated in spite of recent and current rainfall.

At a subset of sites, data were collected on soil, vegetation, and hydrologic indicators[3]. Shallow (12 - 18 inches) soil pits were excavated to characterize the soils and determine whether or not visible indicators of hydric soil conditions were present. These pits confirmed a pre-survey assessment that the soils varied little across the property and that potential hydric soil indicators other than low matrix chroma are generally lacking. Soil with a matrix chroma of 1 is usually considered to be hydric. However, the soil matrix color over most of the site did not vary between areas of obvious wetlands and areas of obvious uplands, and was, therefore, not considered to be a reliable indicator of the presence of hydric soils.

Because of the uniformity of the soils and their moderately slow to very slow permeability[4], because the regional water table is considerably below the ground surface (exceeding 4 to 5 feet along the western edge of the site), and because soil moisture within the rooting zone is uninfluenced by capillary rise from the relatively deep water table, the assumption was made that surface hydrologic indicators were necessary for a site to be designated as being in a "wetland." Such indicators included water- or algae-matted mulch, algal crusts, dispersed and redeposited sediments, etc., any combination of which was assumed to indicate ponding in the previous year. Standing water was,

---

[2] Reed (1988) defines the following indicator categories for plant species: Obligate species (OBL) - species that occur almost always (estimated probably > 99%) under natural conditions in wetlands; Facultative Wetland species (FACW) - species that usually occur in wetlands (estimated probably 67% to 99%), but occasionally occur in nonwetlands; Facultative species (FAC) - equally likely to occur in wetlands or nonwetlands (estimated probably 34% to 66%); Facultative Upland species (FACU) - usually occur in nonwetlands (estimated probably 67% to 99%), but occasionally occur in wetlands (estimated probably 1% to 33%); and Obligate Upland species (UPL) - occur almost always in nonwetlands (estimated probably > 99%) under natural conditions.

[3] These data were collected using the routine procedures described in the Corps of Engineers Wetlands Delineation Manual (1987, Environmental Laboratory)

[4] Soil Survey of Alameda County, California, Western Part.

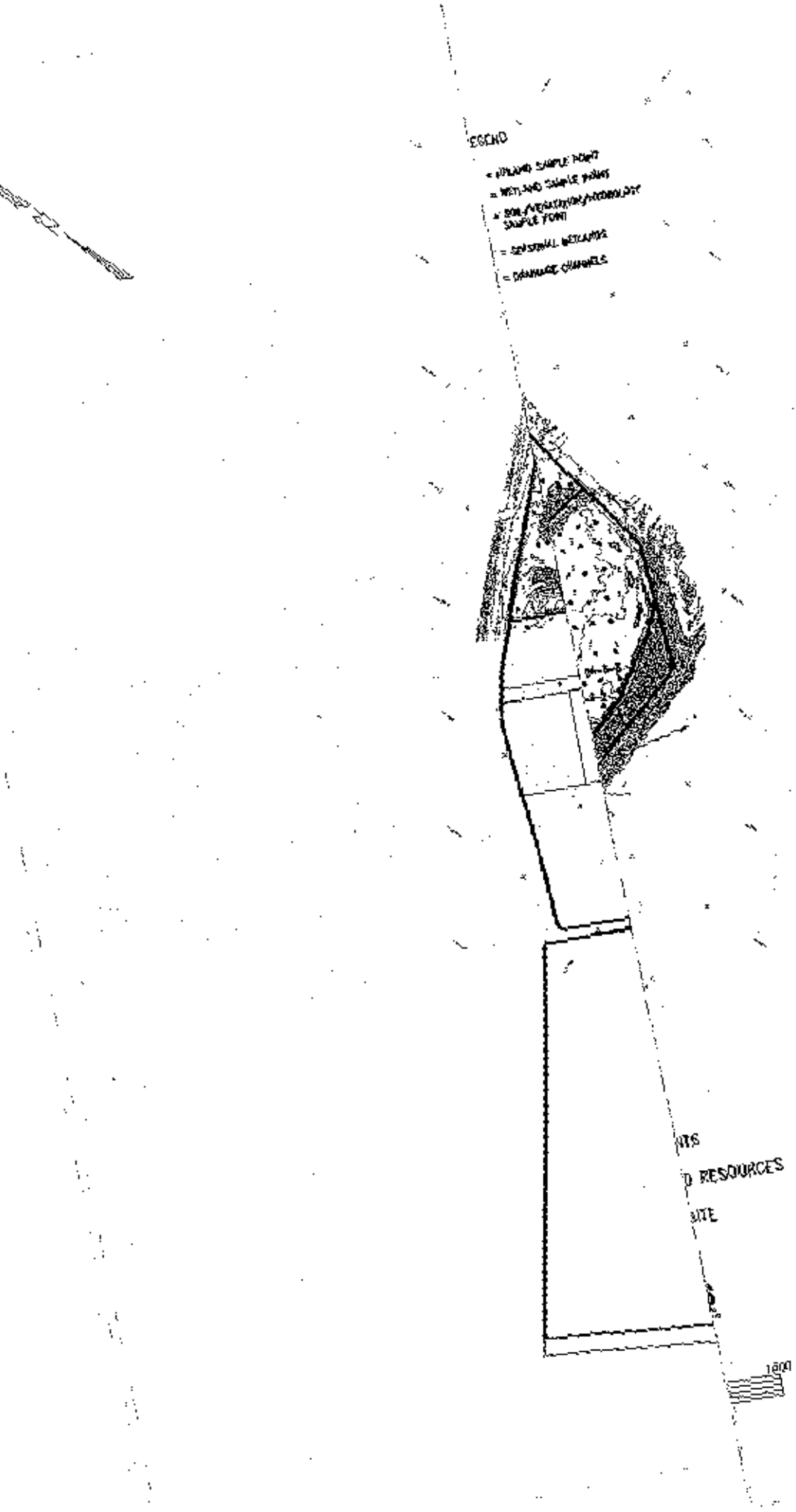
of course, also assumed indicative of wetland hydrologic function when found in conjunction with these other indicators.

An estimate of the area of wetland was obtained independently for each field (Figure A-2). The estimate was obtained by adding the area(s) of the larger wetland(s) mapped on the blackline aerial photographs to the estimate of isolated wetland area obtained using the systematic sampling procedure. The areas of the larger wetlands that were mapped on the blackline aerial photographs were obtained using an electronic digitizer. These areas were estimated in square feet and are presented in 0.1 acre.

The area of the small isolated wetlands in each survey area was estimated by determining the percentage of sample points in each area considered to be wetlands. To illustrate, the estimate of the area of wetlands in a 110-acre field in which 10 acres of large wetlands were mapped on the aerial photographs and for which the remaining 100 acres were sampled with 100 sample sites, the estimate would be obtained as follows:

> the Survey Area (SA) = 110 acres,
> the acreage of mapped wetlands (W) = 10 acres,
> the number of individual sample points (P) = 100, and
> the number of individual sample points determined to be wetlands (WP) = 10,
> then the acreage of small, isolated wetlands (IW) in this survey area would be determined as follows:
>
> IW = (SA - W)*WP/P
>
> In this example, IW = (110 - 10)*10/100 = 10 acres

The total estimated acres of wetlands for this example would be equal to W + IW, or 20 acres.


ESCHO
= UPLAND SAMPLE POINT
= WETLAND SAMPLE POINT
= SOIL/VEGETATION/HYDROLOGY SAMPLE POINT
= SEASONAL WETLANDS
= DRAINAGE CHANNELS
NTS
D RESOURCES
SITE
1800

APPENDIX D

PLANT SPECIES OBSERVED ON THE PROJECT SITE

PLANT SPECIES OBSERVED ON THE PROJECT SITE - OCTOBER 1995

Non-Native Grasslands

Ripgut Grass	*Bromus diandrus*
Italian Ryegrass	*Lolium multiflorum*
Soft Chess	*Bromus hordeaceus*
Bur Clover	*Medicago polymorpha*
Prickly Lettuce	*Lactuca serriola*
Hare Barley	*Hordeum leporinum*
Common Spikeweed	*Hemizonia pungens*[N]
Bermuda Grass	*Cynodon dactylon*
Wild Oat	*Avena* sp.
Beet	*Beta vulgaris*
Coyote Bush	*Baccharis pilularis* var. *consanguinea*[N]
Meadow Barley	*Hordeum brachyantherum*[N]
Salt Grass	*Distichlis spicata*[N]
Harding Grass	*Phalaris arundunacea*
Alkali Heath	*Frankenia grandifolia*[N]
Milk Thistle	*Silybum marianum*
Italian Thistle	*Carduus pycnocephalus*
Bull Thistle	*Cirsium vulgare*
Mediterranean Barley	*Hordeum marinum*
Knapweed	*Centaurea pratensis*
Horseweed	*Conyza canadensis*[N]
Parched Fireweed	*Epilobium paniculatum*[N]
Fiddle Dock	*Rumex pulcher*
Curly Dock	*Rumex crispus*
Broadleaf Pepperweed	*Lepidium latifolium*
Hoary Cress	*Cardaria* sp.
Alkali Mallow	*Malvella leprosa*[N]
Mallow	*Malva* sp.
Dooryard Knotweed	*Polygonum aviculare*
Tumbleweed	*Salsola tragus*
Field Bindweed	*Convolvulus arvensis*
Austalian Saltbush	*Atriplex semibaccata*
Jimson weed	*Datura stramonium*
Hyssop Loosestrife	*Lythrum hyssopifolium*
Heliotrope	*Heliotropium curassavicum*[N]
Alkali Weed	*Cressa truxilensis*[N]
Bristly Ox-Tongue	*Picris echioides*
Rabbitfoot Grass	*Polypogon monspeliensis*
Bird's-foot Trefoil	*Lotus corniculatus*
Willow Lettuce	*Lactuca saligna*

Seasonal Marshes

Rabbitfoot Grass	*Polypogon monspeliensis*
Italian Ryegrass	*Lolium multiflorum*
Mediterranean Barley	*Hordeum marinum*
Common Spikerush	*Eleocharis macrostachya*[N]
Broad-leaved Pepperweed	*Lepidium latifolium*
Swamp Timothy	*Crypsis schoenoides*
Hyssop Loosestrife	*Lythrum hyssopifolium*
Dooryard Knotweed	*Polygonum aviculare*
Salt Grass	*Distichlis spicata*[N]
California Coyote Thistle	*Eryngium aristulatum*[N]
Curly Dock	*Rumex crispus*
Tuberous Bulrush	*Scripus tuberosus*
Bermuda Grass	*Cynodon dactylon*
Alkali Mallow	*Malvella leprosa*[N]
Bristly Ox-Tongue	*Picris echioides*
Heliotrope	*Heliotropium curassavicum*[N]
Alkali Heath	*Frankenia grandifolia*[N]
Fat-hen	*Atriplex triangularis*[N]
Spike Primrose	*Boisduvalia glabella*[N]
Common Spikeweed	*Hemizonia pungens*[N]
Willow Dock	*Rumex salicifolius*[N]
Meadow Barley	*Hordeum brachyantherum*[N]
Prickly Lettuce	*Lactuca serriola*
Creeping Wildrye	*Leymus triticoides*[N]
Tall Flatsedge	*Cyperus eragrostis*[N]

[N] Native Species

APPENDIX E

HABITAT EVALUATION

PACIFIC COMMONS

HABITAT EVALUATION

1. Purpose

The purpose of this analysis is to define the relative values of the habitats on the project site. The setting section of the SEIR provides background information on project site habitats, special status species, and other issues relevant to this analysis; its information and conclusions are incorporated herein by reference and not repeated. This assessment describes the wetland resources on-site and compares their values using a specific set of criteria. In turn, this assessment can be used to define the level of mitigation required for impacts to site wetlands.

2. Background

a. Wetlands and Wetland Values

Wetlands are marshes, vernal pools, swamps, and the vegetated edges of streams, lakes, and rivers[1]. Wetlands occupy the transition zone between always-dry and always-wet soils. Transition zones are ecologically important; plant diversity and wildlife use is almost always greater in these areas than on adjoining land. Additionally, these systems can remove pollutants from flowing or ponded waters, reduce storm waves and coastal erosion, store groundwater, and provide nutrients for fish and shellfish in coastal waters. These functions[2] are the result of the shallow flow or ponding of water across a vegetated or semi-vegetated plain that is characteristic of wetlands. Finally, due to the relative scarcity of pristine wetlands in certain regions, including the San Francisco Bay Area, wetlands dominated by native species or reflective of natural conditions often have importance for educational and scientific uses or as habitat for special status species.

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[1]This analysis assumes that wetlands are identified through use of the *Corps of Engineers Wetlands Delineation Manual* (1987); this methodology is more specifically defined in the setting section of the SEIR.

[2]"Functions" are the physical, biological or other processes that occur in a wetland; "values" are those processes or attributes that are valuable or beneficial to society (Adamus, *et al.*, 1987). As this analysis focuses on functions that have been identified as of value to society, these are described as values in this document.

Wetland values have been recognized in a variety of legislation, including the Federal Clean Water Act (CWA) and the values so recognized have become the basis for wetland evaluation systems. Generally, the legislation recognizes several broad categories of values, including habitat (plant and wildlife use); water quality (pollution reduction, erosion control, groundwater recharge, etc.); and social (rarity, special status species use, education, and recreation) values.

b. Wetland evaluation methods

Several federal agencies have completed detailed studies on methods to describe wetland functions and values. The U.S. Fish and Wildlife Service uses the Habitat Evaluation Procedures (HEP) which employs models of the preferences of target species to define habitat value and mitigation requirements. For example, a site which contained shallow open water and freshwater marsh with sparsely vegetated islands could have a high rating for its suitability for surface-feeding waterfowl. The numeric rating for this value, multiplied by the acreage involved and the time frame over which the value would be expressed, combined with the ratings from other target species, would provide a quantified evaluation of a particular site. This numeric result could then be compared to the results of a similar evaluation of a proposed mitigation site to define the habitat loss or gain resulting from implementation of the mitigation program. HEP's are often used in permit applications but are not technically applicable to wetlands at this time due to the lack of wetland species models. Additionally, HEP examines only habitat values, and not the water quality or social values ascribed to wetlands.

The Federal Highway Administration has prepared a qualitative method for evaluating wetlands based on the values described for wetlands in the CWA. The "Adamus" method, as it was termed originally, or presently "WET" (short for Wetland Evaluation Technique), relies on the evaluation of a large number of factors for each wetland or wetland type. The number of factors or "predictors" examined increases the accuracy of the results which can be used to compare the opportunity and effectiveness of different wetlands for specific values. The results are qualitative in that they are expressed as ratings of high, moderate, or low for each value or function of a particular wetland or wetland system. Values assessed by WET and/or the Adamus technique include groundwater recharge, flood desynchronization, erosion control, sediment storage, nutrient transformation, food chain support, fisheries and wildlife use, and passive and active recreation. Although this technique results in an assessment of the complete range of potential wetland values (unlike HEP), it provides only qualitative ratings for each value, *e.g.*, "high" "moderate", or "low", making a general overview of the wetland or comparing it with another wetland (or with a mitigation site) very difficult.

Most recently, the "hydrogeomorphic" method has been developed as a tool to use

the physical expressions of wetland functions (plant cover, shape and character of a wetland basin, etc.) as an indicator of wetland value. The Adamus/WET technique and, to a lesser extent HEP, both recognize that certain physical or biotic elements of the assessment wetland provide a strong indication of its relative value. However, HEP requires that these be defined in relation to a specific species and developing species models is a difficult and expensive undertaking, while Adamus/WET uses too many indicators and does not conclude with a numeric result. At this time, though, the hydrogeomorphic approach is not suitable for differentiating among similar wetland types and it does not reflect many of the concerns specific to California wetlands, *e.g.* scarcity.

3. Evaluation Method

a. Introduction

Zentner and Zentner has developed an evaluation method specific to California wetlands using the values of wetlands as expressed in national methodologies, such as HEP or WET, regional valuation systems such as those described in Zentner (1982), Wakeman (1982), and CH2MHill (1994), and habitat-specific knowledge. Like the hydrogeomorphic method, the basis for this evaluation technique is a limited number of physical and biotic characteristics. Additionally, the method reflects regional conditions by selecting specific evaluation criteria that correspond to the potential values found within wetlands in the region. For example, in a region where impermeable soils rule out significant groundwater movement, the analysis does not assess groundwater recharge levels.

b. Potential Values

The range of potential values imputed to wetlands is significant. The following section reviews the potential list of values for wetlands developed by several assessment techniques, identifies those relevant to the region[3] of the project site, and, where applicable, identifies the criteria that can be used to assess the level of value provided by the wetland.

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[3]The project region is defined here as the bayfront zone of Alameda County.

i. Water Quality Values

(1) Groundwater Recharge and Discharge

Groundwater recharge and discharge is the movement of surface water or precipitation through a wetland and into the ground water system and/or from the groundwater through a wetland to surface waters. A substantial portion of the output of shallow vegetated wetlands can become groundwater, thereby replenishing underground aquifers pumped for agricultural or domestic use.

Wetlands in this region would have little importance for groundwater recharge or discharge as the underlying soils are relatively impermeable and groundwater where it occurs is brackish and, therefore, not susceptible to use. Accordingly, groundwater recharge and discharge will not be used as an indicator for this assessment.

(2) Flood Storage and Desynchronization

Wetlands can reduce flood hazards by delaying the passage of peak storm flows and by storing flood waters and releasing them more gradually than adjacent uplands. Adamus, *et al.* (1987) found that wetlands in some areas may reduce flood peaks by as much as 60 to 70 percent.

Project site wetlands trap stormwater and other surface runoff through a series of constructed ditches that lead to wetland basins on the project site. Site wetlands can be of value for flood storage where sufficient capacity exists for appreciable storage and where plant cover by perennial species[4] is sufficient to assist in slowing flood flows (Marble 1992).

(3) Shoreline Anchoring and Erosion Control

Wetlands can protect waterway edges through the holding power of the vegetation's fibrous root systems. Marsh vegetation has been found to be capable of holding soil within the root mass even under severe erosive pressure. Wetlands are typically exposed to extreme events and most marsh plants, therefore, can act as erosion control agents.

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[4]Annual species are dormant or non-existent during the winter when flood flows occur; consequently, total plant cover is not a useful indicator for this value.

Water does not flow through the project site to downstream areas. Accordingly, this site has little or no opportunity to provide erosion control that benefits other areas and this function will not be used as an indicator for this assessment.

(4) Sediment Trapping

Wetlands can remove sediment and other suspended solids from agricultural and urban runoff through ponding or slowing of flows which results in suspended materials settling from the water column into the wetland basin. Reduced sediment loads improve downstream water quality and reduce future flood hazards by reducing in-stream sediment deposits which build up bed elevations.

Project site wetlands could be of importance for sediment trapping where inflowing stormwater runoff ponds for a sufficient period for sediment to be deposited. Cover by perennial plants also assists in the provision of this value by helping to slow flowing waters further (Marble 1992). Accordingly, depth of inundation, hydroperiod, and perennial cover are useful indicators of sediment trapping capability.

(5) Nutrient Retention

Wetlands can improve water quality by storing nutrients within wetland plants or sediments or by converting nitrogen nutrients to gas. Marshes are now being constructed throughout the U.S. to act as wastewater treatment centers. The Mountain View marsh (Contra Costa County), for example, removes significant amounts of the ammonia and nitrate entering that system.

Wetlands in this region could be important for this function where sufficient storage and vegetation exist to provide the two indicators of capacity and pollutant transformation. Marble (1992) notes that species richness is an important indicator for this function as this will ensure all nutrient transformation pathways are present.

(6) Food Chain Support

Through their conversion of nutrients into plants and plant detritus, wetlands can convert litter and similar organic matter into food for fungi and small invertebrates which, in turn, are prey for larger organisms such as sportfish or waterfowl. This function has also been described as the "outwelling" of nutrients from coastal marshes in support of commercially important fisheries.

The project site wetlands would have some capability of providing this function where sufficient ponding occurs for nutrient release. A diverse array of species in the ponded area would also ensure a rich mix of nutrients (Marble 1992).

ii. Habitat Values

(1) Fisheries Habitat

Wetlands can provide habitat both for adult fish, for feeding and propagation, and for juveniles, primarily for predator avoidance. A substantial portion of the commercially important fish of the U.S. may utilize wetlands for some portion of their life cycle.

The project site wetlands have little or no importance for fisheries due to the lack of suitable habitat.

(2) Wildlife Habitat

Wetlands are primarily known for their value to wildlife. Wetlands can be important habitats for migratory ducks, shorebirds, game birds such as quail and pheasant, deer, and many other species. Freshwater marshes adjacent to the Bay can form a major portion of the "Pacific Flyway", a broad migratory pathway used by shorebirds and waterfowl to move from Alaska to Mexico during their annual migrations.

Project site wetlands can have important wildlife values where sufficient water and food or prey occur. Accordingly, water depth, hydroperiod, species richness, and cover and species richness by native plants are all important criteria for this value.

iii. Social Values

(1) Active and Passive Recreation

Bay Area wetlands are often used extensively for active and passive recreation (hunting, fishing, bird watching, etc.). However, this site is privately owned and access is not permitted. Accordingly, active recreation is not a value for site wetlands.

(2) Heritage Values

Adamus/WET defines this function as the use of wetlands for education, research, preservation of sensitive species or the other mostly intangible uses.

Project site wetlands could be important for this value due to the relative scarcity of freshwater wetlands around the Bay. Native plant species richness and cover would be significant criteria as systems dominated by natives would be of the greatest importance for this value.

c. Criteria Description

The criteria that will be used for this assessment include hydroperiod, depth of inundation, species richness, native species cover and richness, and cover by perennials. These criteria are derived from the preceding discussion of relevant values.

Hydroperiod is significant for water quality and habitat values. Greater period and depth of inundation do not automatically equate to higher values, however. In fact, hydroperiod-derived values tend to peak when the wetlands are seasonally to semi-permanently flooded. In California, these specific hydrologic regimes equate to a range of from 3 to 9 months with shallow ponding (between 3 to 9 inches) (author's observations). Greater depths or lengthier periods of inundation tend to create aquatic wetlands, dominated by open water and without significant and diverse vegetation. Less inundation or shallower wetlands result in relatively dry systems that closely resemble uplands.

The number of plant species provides an important indicator of the diversity available to support habitat values in any wetland. While monotypic wetlands are not atypical in certain cases (non-tidal salt marshes, for example), greater species richness generally connotes greater potential use by wildlife. Based on Zentner and Zentner samples in a variety of habitats within northern California over the past decade, low species richness is any level below 3 species per 10 ft x 10 ft sample plot with moderate readings in the 3 to 7 species range and high values found where more than 7 species occur.

Especially for wetlands, but to a significant degree for all habitats in California, the presence of significant numbers of species of or cover by native plants provides an important indication of habitat and social value. With few exceptions, terrestrial wildlife in the state, from invertebrates to large mammals, are native. However, many landscapes are dominated by non-native plants. Native wildlife are adapted to and, in some cases, dependent upon native plants. Beyond the wildlife relationship, though, native plants may provide the primary impetus for

preservation of a specific landscape, *e.g.*, native grasslands or vernal pools, due to the relative scarcity of native-dominated habitats. Based on sampling by Zentner and Zentner in a variety of habitats, low values are provided where native cover is less than 25% and less than 2 species of native are found per sample; moderate values occur where native cover is between 25 and 75% and 3 to 4 species per sample; and high values are found where native cover is greater than 75% with more than 5 species per sample plot.

Cover by perennials is important in providing the water quality values of wetlands. The ability of wetlands to slow flowing water or transform nutrients, for example, is dependent upon the extent of plant cover at a site and the ability of that cover to withstand and slow flows. High perennial species cover will increase the ability of a wetland to provide water-quality functions relative to a wetland dominated by annuals. Low values for this function occur where perennial cover is less than 25%, moderate values where cover is between 25 and 50%, and high values where perennial cover is greater than 75%.

Table 1 displays the criteria and associated rankings. Rankings consist of "1" (lowest value), "2" (moderate value), and "3" (highest value).

TABLE 1

Pacific Commons: Habitat Evaluation System

Criteria	Rankings		
	1	2	3
Hydroperiod	1 to 3 months	9 to 12 months	3 to 9 months
Depth of inundation	saturation only	deep (1-3 ft)	shallow (3-9 in)
Species Richness[5]	<3	3 to 7	>7
Native Cover[6]	<25%	25 to 75%	>75%
Native Spp Richness	<3	3 to 4	>4
Perennial Cover[6]	<25%+	25 to 50%	>50%

4. Habitats Evaluated

The system presented here evaluates three habitat types: seasonal marsh; wet meadow; and non-native grassland.

Seasonal marshes are dominated by sedges (*Cyperus* species) and rushes (*Juncus* species) in their native state and hyssop lythrum (*Lythrum hyssopifolia*) and similar species in disturbed conditions such as the project site. These systems occur within the seasonally flooded and saturated zones.

Wet meadows are dominated by graminoids (grasses) and *Juncaceae* under native conditions and non-native grasses such as Italian rye grass (*Lolium multiflorum*) in disturbed sites. These systems occur in the temporarily flooded to intermittently flooded zones.

Non-native grassland is an upland habitat type, included here primarily for comparison with the wetland habitats; it is dominated by a variety of non-native grasses and forbs.

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[5]Species richness is defined as the number of species contained within a 10' x 10' sample plot.

[6]"Cover" refers to relative cover within the sample plot for both the native and perennial cover criteria.

Perennial marsh is dominated by tall reed-like plants such as cattails (*Typha latifolia*) or bulrush (*Scirpus acutus*) and found within the permanently flooded through the semi-permanently flooded zones. Only a small area of created perennial marsh is found on the project site (near the center of the main Catellus site) and this wetland type will be aggregated with the seasonal marshes.

Brackish non-tidal marsh has a similar hydrologic regime to seasonal marsh but is dominated by halophytes, including scattered patches of pickleweed (*Salicornia virginica*), alkali heath (*Frankenia grandifolia*), and salt grass (*Distichlis spicata*). Due to its limited extent on-site, it will be aggregated within the seasonal marsh category for this assessment.

5. Site Evaluation

To define the quality of the habitats at the project site, Zentner and Zentner staff completed sampling during the winter of 1995-96 (raw data are provided in Attachment 1).[7] Data were collected from 10' x 10' sample plots using cover classes as described by Braun-Blanquet. Results are provided in Table 2 using the following abbreviations for each habitat type: "SM" (seasonal marsh); "WM" (wet meadow); and "NNG" (non-native grassland). Four sample plots were located in SM; 14 plots in WM; and 5 plots in NNG.

[7]Data from previous years for prior project EIR's also were reviewed.

TABLE 2

Vegetation and Hydrology Sampling Results

	Results		
Criteria	SM	WM	NNG
Hydroperiod	2 to 4 months	1 month	none
Depth of inundation	3 to 6 in	none	none
Species Richness	6 spp	6 spp	9 spp
Native Cover	60%	5%	17%
Native Spp Richness	2 spp	1 spp	1 spp
Perennial Cover	41%	11%	3%

Based on these results, the seasonal marsh is different in character than the wet meadow or non-native grassland, especially with regards to hydrology and cover by native and perennial plants. The wet meadow and non-native grassland, however, are similar, especially as concerns hydrology and native species richness.

6. Assessment Results

Table 3 translates the sampling results into numeric criteria and compares the three habitat types.

TABLE 3

Habitat Value Analysis

Criteria	SM	WM	NNG
Hydroperiod	2	1	0
Depth of inundation	3	1	0
Species Richness	2	2	3
Native Cover	2	1	1
Native Spp Richness	1	1	1
Perennial Cover	2	1	1
Average	2.1	1.2	1.0
Value	moderate[8]	low	low

Based on this evaluation, the non-native grassland and the wet meadow are of low value. This is due to their artificial (and relatively recent) origins, relatively low cover and species richness of native plants, and minimal amount of inundation. The seasonal marsh is of moderate value due to many of the same factors, although its cover by natives and perennials is higher.

These results should be used in the design and assessment of the mitigation wetlands. For example, the mitigation wetlands could have higher values than the wetlands to be lost by constructing a system with shallow inundation dominated by native perennials. Assuming a target of no net loss of wetland values, mitigation wetlands could be of a lesser extent than the filled wetlands. The extent of wetlands to be lost would be multiplied by the value of these wetlands to reach a "score" that could be compared to the score of the proposed mitigation site. For example, 40 acres of wetlands with a value of 1.5 would have a score of 60. Thirty acres of mitigation wetlands with a value of 2.0 would then compensate for the loss of these wetlands.

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[8]The inclusion of the small area of brackish marsh in the sample may have skewed the results slightly as the brackish marsh has a very high concentration of native perennials compared to any habitat on-site. This factor should be considered when comparing the wetlands to be filled with the proposed mitigation wetlands.

ATTACHMENT 1

Cattelus Vegetation Survey. Performed by D. Self of Zentner & Zentner, January 4-5, 1996

10x10 Sample Plots

Species	Nat.	Per.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Amaranthus retroflexus	n	n															
Anagalis arvensis	n	n													1		
Atriplex rosea	n	n															
Atriplex semibaccata	n	y															
Atriplex triangularis	y	n															
Beta vulgaris	n	y								2.5	7				1	5	
Brassica sp.	n	n															
Bromus diandrus	n	n				2										55	
Bromus hordeaceus	n	n									1	4			1		
Cenaturea calcitrapa	n	n															
Convolvulus arvensis	n	y															
Cotula coronopilia	n	n			1.5												
Cressa truxilensis	y	y															
Crypsis schoenoides	n	n															
Cynodon dactylon	n	y														1	
Distichlis spicata	y	y												2			
Epilobium brachycarpum	y	n															
Epilobium pygmaeum	y	n															1
Erodium cicutarium	n	n													1		
Frankenia salina	y	y						1.5		1					1		
Heliotropium currasavicum	y	y															
Hemizonia pungens	y	n															
Hordeum brachyantherum	y	y					2						1				
Hordeum geniculatum	n	n	1		1	15	5	50	40	50	50	60	10	65	5	10	2
Hordeum leporinum	n	n				20					3	3	4		1	20	
Lactuca serriola	n	n				4		10	5	6	6	15	8		3		
Lepidium latifolium	n	y															
Lolium multiflorum	n	n	3	1	1	40	95	60	70	60	60	40	95	45	95	30	
Lythrum hyssopifolium	n	n	1											1			20
Malva nicaensis	n	n															
Malvella leprosa	y	n															1
Medicago hispida	n	n							1						1		
Picris echioides	n	n															
Plagiobothrys stipitatus	y	n															80
Polygonum arenastrum	n	y													1	1	
Polypogon monspeliensis	n	n												1			
Rumex crispus	n	y											3				
Rumex pulcher	n	y					1										
Salicornia virginica	y	y	21	52	45												
Sonchus oleraceus	n	n															
Stellaria media	n	n															
Xanthus spinosum	n	n															
Unvegetated			75	47	53	0	0	0	0	0	1	0	0	1	1	0	1
Habitat Type			NTSM	NTSM	NTSM	WM	WM	WM	WM	WM	WM	WM	WM	WM	NNG	NNG	NNG
Raw Total Veg Cover			26	53	48.5	81	103	122	116	120	127	122	121	114	111	122	104
Raw Cover By Native			21	52	45	0	2	1.5	0	1	0	0	1	2	1	0	82
Rel. Cover By Native			**0.808**	**0.981**	**0.928**	**0**	**0.02**	**0.01**	**0**	**0.01**	**0**	**0**	**0.01**	**0.02**	**0.01**	**0**	**0.79**
Raw Cover by Peren.			21	52	45	0	3	1.5	0	3.5	7	0	4	2	3	7	0
Rel. Cover by Peren.			**0.808**	**0.981**	**0.928**	**0**	**0.03**	**0.01**	**0**	**0.03**	**0.06**	**0**	**0.03**	**0.02**	**0.03**	**0.06**	**0**
Vegetated			**25**	**53**	**47**	**100**	**100**	**100**	**100**	**100**	**99**	**100**	**100**	**99**	**99**	**100**	**99**
Total # Species			4	2	4	5	4	4	4	5	6	5	6	5	11	7	5
# Native Species			**1**	**1**	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**3**
# Perennial Species			**1**	**1**	**1**	**0**	**2**	**1**	**0**	**2**	**1**	**0**	**2**	**1**	**3**	**3**	**0**

ATTACHMENT 1

Cattelus Vegetation Survey. Performed by D. Self of Zentner & Zentner, January 4-5, 1996

10x10 Sample Plots

Species	Nat.	Per.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Amaranthus retroflexus	n	n															
Anagalis arvensis	n	n															
Atriplex rosea	n	n	50	2	45	1											
Atriplex semibaccata	n	y															
Atriplex triangularis	y	n	40	65	3	1	8										
Beta vulgaris	n	y	3	2			1										
Brassica sp.	n	n										1					
Bromus diandrus	n	n							10								
Bromus hordeaceus	n	n					1				15	15	3	3	2		
Cenaturea calcitrapa	n	n															
Convolvulus arvensis	n	y												1			
Cotula coronopilia	n	n															
Cressa truxilensis	y	y			4									1			
Crypsis schoenoides	n	n			40	30											
Cynodon dactylon	n	y															
Distichlis spicata	y	y						45								1	20
Epilobium brachycarpum	y	n															
Epilobium pygmaeum	y	n															
Erodium cicutarium	n	n						1	1	1	1					1	
Frankenia salina	y	y				3			1	2						1	6
Heliotropium currasavicum	y	y												3	5		
Hemizonia pungens	y	n															
Hordeum brachyantherum	y	y															
Hordeum geniculatum	n	n		3	1		5	1	7	1	1	1		1		8	5
Hordeum leporinum	n	n															
Lactuca serriola	n	n					1										
Lepidium latifolium	n	y							2		40	55	2	1	4		
Lolium multiflorum	n	n	20	40	30	10	95	40	90	95	7	45	98	98	95	90	80
Lythrum hyssopifolium	n	n	8	3	15	1		1									
Malva nicaensis	n	n										1	1				
Malvella leprosa	y	n		15	3												
Medicago hispida	n	n		2					1	5	50	20	1	2	3	5	
Picris echioides	n	n										2		1			
Plagiobothrys stipitatus	y	n				55											
Polygonum arenastrum	n	y															
Polypogon monspeliensis	n	n	10			2											
Rumex crispus	n	y	3	3		3		1			5						1
Rumex pulcher	n	y															
Salicornia virginica	y	y				1											
Sonchus oleraceus	n	n										1			1		
Stellaria media	n	n									3		1		1		
Xanthus spinosum	n	n															
Unvegetated			1	1	1	1	0	14	1	3	2	3	1	1	1	1	0
Habitat Type			SM	SM	SM	SM	WM	WM	NNG	NNG	WM	WM	WM	WM	WM	WM	WM
Raw Total Veg Cover			134	135	141	107	111	89	112	104	122	141	106	111	111	106	112
Raw Cover By Native			40	80	10	60	8	45	1	2	0	0	0	4	5	2	26
Rel. Cover By Native			**0.3**	**0.59**	**0.07**	**0.56**	**0.07**	**0.51**	**0.01**	**0.02**	**0**	**0**	**0**	**0.04**	**0.05**	**0.02**	**0.23**
Raw Cover by Peren.			6	5	4	7	1	46	3	2	45	55	2	6	9	2	27
Rel. Cover by Peren.			**0**	**0.04**	**0.03**	**0.07**	**0.01**	**0.52**	**0.03**	**0.02**	**0.37**	**0.39**	**0.02**	**0.05**	**0.08**	**0.02**	**0.24**
Vegetated			**99**	**99**	**99**	**99**	**100**	**86**	**99**	**97**	**98**	**97**	**99**	**99**	**99**	**99**	**100**
Total # Species			**7**	**9**	**8**	**10**	**6**	**6**	**7**	**5**	**8**	**9**	**6**	**9**	**7**	**6**	**5**
# Native Species			**1**	**2**	**3**	**4**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**2**	**1**	**2**	**2**
# Perennial Species			**2**	**2**	**1**	**3**	**1**	**2**	**2**	**1**	**2**	**1**	**1**	**4**	**2**	**2**	**3**

ATTACHMENT 1

Cattelus Vegetation Survey. Performed by D. Self of Zentner & Zentner, January 4-5, 1996

10x10 Sample Plots

Species	Nat.	Per.	31	32	33	34	35	36	37	38	39	40	41
Amaranthus retroflexus	n	n										1	
Anagalis arvensis	n	n											
Atriplex rosea	n	n											
Atriplex semibaccata	n	y				1							
Atriplex triangularis	y	n											
Beta vulgaris	n	y											
Brassica sp.	n	n		4									
Bromus diandrus	n	n											
Bromus hordeaceus	n	n						3					
Cenaturea calcitrapa	n	n		3									
Convolvulus arvensis	n	y			1								
Cotula coronopilia	n	n											
Cressa truxilensis	y	y											
Crypsis schoenoides	n	n				1			15				
Cynodon dactylon	n	y							15				
Distichlis spicata	y	y					15	50	10	55	15		
Epilobium brachycarpum	y	n										9	3
Epilobium pygmaeum	y	n											
Erodium cicutarium	n	n		1	1	15	1						
Frankenia salina	y	y	1.5		1	1	2	2		45	1		
Heliotropium currasavicum	y	y											
Hemizonia pungens	y	n	5										
Hordeum brachyantherum	y	y				3							2
Hordeum geniculatum	n	n	50		10	70	4				12	5	
Hordeum leporinum	n	n											
Lactuca serriola	n	n											
Lepidium latifolium	n	y				7						25	3
Lolium multiflorum	n	n	50	90	90	5	80	10	0	0	80	15	5
Lythrum hyssopifolium	n	n				5							
Malva nicaensis	n	n											
Malvella leprosa	y	n			1	1							
Medicago hispida	n	n	5	15		2		3	15				1
Picris echioides	n	n											1
Plagiobothrys stipitatus	y	n											
Polygonum arenastrum	n	y		1			1						
Polypogon monspeliensis	n	n				10						70	90
Rumex crispus	n	y		2		1	3		1	4		2	1
Rumex pulcher	n	y							1				
Salicornia virginica	y	y											
Sonchus oleraceus	n	n											
Stellaria media	n	n											
Xanthus spinosum	n	n										1	
Unvegetated			1	1	1	1	0	1	40	2	0	0	1
Habitat Type			WM	WM	WM	SM	WM	WM	SM	SM	WM	SM	SM
Raw Total Veg Cover			112	116	104	122	106	68	57	104	108	128	106
Raw Cover By Native			6.5	0	2	5	17	52	10	100	16	9	5
Rel. Cover By Native			**0.06**	**0**	**0.02**	**0.04**	**0.16**	**0.8**	**0.18**	**1**	**0.15**	**0.07**	**0**
Raw Cover by Peren.			1.5	3	2	13	21	52	27	104	16	27	6
Rel. Cover by Peren.			**0.01**	**0**	**0.02**	**0.11**	**0.2**	**0.8**	**0.47**	**1**	**0.15**	**0.21**	**0.1**
Vegetated			**99**	**99**	**99**	**99**	**100**	**99**	**60**	**98**	**100**	**100**	**99**
Total # Species			5	7	6	13	7	5	7	4	4	8	8
# Native Species			**2**	**0**	**2**	**3**	**2**	**2**	**1**	**2**	**2**	**1**	**2**
# Perennial Species			**1**	**2**	**2**	**4**	**4**	**2**	**4**	**3**	**2**	**2**	**3**

LEGEND:

NNG: Non-native Grassland

NTSM: Non-tidal Saltmarsh

SM: Seasonal Marsh

WM: Wet Meadow

APPENDIX F

SPECIAL STATUS SPECIES

APPENDIX F

Special Status Species List

Common Name	Species Name	Status*	Habitat Requirements
ANIMALS			
salt marsh harvest mouse	*Reithrodontomys raviventris*	FE/SE	Dense pickleweed
San Joaquin kit fox	*Vulpes macrotis mutica*	FE/ST	Open, shrubby vegetation, San Joaquin Valley
American peregrine falcon	*Falco pereggrinus anatum*	FE/SE	Cliffs, tall buildings
California clapper rail	*Rallus lingirostris obsoletus*	FE/SE	Dense emergent marsh vegetation
California least tern	*Sterna antillarum browni*	FE/SE	Open, sandy, gravelly shores near estuaries
bald eagle	*Haliaeetus leucocephalus*	FT/SE	Large, old-growth trees
western snowy plover	*Charadrius alexandrinus nivosus*	FT/CSC	Beaches, salt ponds
delta smelt	*Hypomesus leucocephalus*	FT	Estuarine
vernal pool tadpole shrimp	*Lepidurus packardi*	FE	Vernal pools
vernal pool fairy shrimp	*Branchinecta lynchi*	FT	Vernal pools
bay checkerspot butterfly	*Euphydryas editha bayensis*	FT	Foothill grassland
Alameda whipsnake	*Masticophis lateralis euryxanthus*	FPE/ST	Coastal scrub, rocky outcrops
California red-legged frog	*Rana aurora draytoni*	FPE/CSC	Perennial freshwater ponds
Coho salmon	*Oncorhynchus kisutch*	FPT	Bay, rivers, streams
Sacramento splittail	*Pogonichthys macrolepidotus*	FPT	fresh water marsh, delta backwaters
riparian brush rabbit	*Sylvilagus bachmani riparius*	C1/SE	Dense riparian vegetation
greater western mastiff-bat	*Eumops perotis californicus*	C2	Rock outcrops
small-footed myotis bat	*Myotis ciliolabrum*	C2	Riparian forests, woodlands, brushy vegetation
long-eared myotis bat	*Myotis evotis*	C2	Rock crevices
fringed myotis bat	*Myotis thysanodes*	C2	Streams, lakes, ponds
long-legged myotis bat	*Myotis volans*	C2	Dense woodlands and forests
Yuma myotis bat	*Myotis yumanensis*	C2	Caves, rock crevices, bodies of water
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	C2/CSC	forests
San Joaquin Valley woodrat	*Neotoma fuscipes riparia*	C1/CSC	forests
Pacific western big-eared bat	*Plecotus townsendii townsendii*	C2	Caves, trees, brush
salt marsh vagrant shrew	*Sorex vagrans halicoetes*	C2/CSC	Dense saltmarsh or wet meadow vegetation
California black rail	*Laterallus jamaicensis coturniculu*	C2/ST	Tidal saltmarsh
tricolored blackbird	*Agelaius tricolor*	C2/CSC	Perennial marsh vegetation
Bell's sage sparrow	*Amphispiza belli belli*	C2/CSC	Chaparral, desert scrub
western burrowing owl	*Athene cunicularia hypugea*	C2/CSC	Open grasslands with burrows
ferruginous hawk	*Buteo regalis*	C2/CSC	Open grasslands with trees or buildings
little willow flycatcher	*Empidonax traillii brewsteri*	C2/SE	Dense willow thickets
salt marsh common yellowthroat	*Geothlypis trichas sinuosa*	C2/CSC	Low, dense vegetation near water
Alameda song sparrow	*Melospiza melodia maxillaris*	C2/CSC	Riparian thickets or perennial marsh

APPENDIX F continued

Common Name	Species Name	Status*	Habitat Requirements
northern harrier	*Circus cyaneus*	CSC	emergent marsh vegetation, grasslands
silvery legless lizard	*Anniella pulchra pulchra*	C2/CSC	Sandy, loose organic soils with leaf litter
northwestern pond turtle	*Clemmys marmorata marmorata*	C2/CSC	Perennial ponded freshwater
southwestern pond turtle	*Clemmys marmorata pallida*	C2/CSC	Perennial ponded freshwater
California horned lizard	*Phrynosoma coronatum frontale*	C2/CSC	Sandy, rocky washes
California tiger salamander	*Ambystoma californiense*	C1/CSC	Seasonal freshwater ponding
foothill yellow-legged frog	*Rana boylii*	C2/CSC	Rocky streams
western spadefoot toad	*Scaphiopus hammondi*	C2/CSC	Grasslands with seasonal freshwater pools
Opler's longhorn moth	*Adella operella*	C2	grasslands dense with wildflowers
Ricksecker's water scavenger beetle	*Hydrochara ricksecker*	C2	freshwater ponds in coastal mountains
mimic tryonia	*Tyonia imitator*	C2	estuaries
PLANTS			
Contra Costa goldfields	*Lasthenia conjugens*	FPE	Vernal pools, alkaline meadows
Hoover's button-celery	*Eryngium aristulatum var. hooveri*	C1	Seasonal marshes, vernal pools
Congdon's tarplant	*Hemizonia parryi ssp. congdonii*	C1	Valley and foothill grasslands
San Joaquin spearscale	*Atriplex joaquiniana*	C2	Alkaline scrub, valley and foothill grassland
Point Reyes bird's-beak	*Cordylanthus maritimus ssp. palus*	C2	Coastal saltmarsh
South Bay clarkia	*Clarkia concinna ssp. automixa*	C2	Cismontane woodland
Delta tule-pea	*Lathryus jepsonii var. jepsonii*	C2	Brackish and freshwater marsh
most beautiful jewel-flower	*Streptanthus albidus ssp. peramoe*	C1	Chaparral, valley and foothill grasslands
alkali milk-vetch	*Astragalus tener var. tener*	CNPS 1B	Vernally-moist meadows, alkaline flats
Choris's popcorn-flower	*Plagiobothrys chorisianus var. cho*	CNPS 3	Chaparral, coastal scrub, coastal prairie

*Status Categories

FE: Federally listed as endangered
FT: Federally listed as threatened
FPE: Proposed for federal listing as endangered
FPT: Proposed for federal listing as threatened
C1: Federal candidate, Category 1: Enough data available to support federal listing
C2: Federal candidate, Category 2: Insuffcent data to support federal listing
SE: State listed as endangered
ST: State listed as threatened
CSC: California Department of Fish and Game species of special concern
CNPS 1B: California Native Plant Society, List 1B Species: plants rare, threatened, or endangered in California and elsewhere
CNPS 3: California Native Plant Society, List 3 Species: plants about which we need more information.

APPENDIX G

BURROWING OWL HABITAT ASSESSMENT

Catellus Fremont Property
Burrowing Owl Habitat Assessment

Prepared by
Zentner and Zentner

Lafayette
Sacramento

Prepared for:
Duncan and Jones

October 16, 1995

Purpose

An assessment of the properties totaling approximately 834 acres in Fremont, California was performed to determine the likelihood of utilization by burrowing owls (*Athene cunicularia*), a California "species of special concern." The results of this reconnaissance-level survey are adequate to identify areas of the subject properties with potential to serve as foraging and/or nesting habitat for burrowing owls.

Burrowing Owl Habitat and Species Description

Burrowing owl habitat can be found in annual and perennial grasslands characterized by low-growing vegetation (Zarn, 1974). Suitable owl habitat may also include trees and shrubs if the canopy covers less than 30 % of the ground surface. Burrows are the essential component of burrowing owl habitat. Both natural and artificial burrows provide protection, shelter, and nests for burrowing owls (Henry and Blus, 1981). Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use man-made structures such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement.

Burrowing owl nesting season begins as early as February 1 and continues through August 31 (Thomsen 1971, Zarn, 1974). The latitude and climactic conditions of the study area make it suitable for breeding birds, winter residents, and year-round residents. Most burrowing owls in the Fremont vicinity are year-round residents (Trulio, pers. comm.).

Survey Methods

A search of historic sightings of burrowing owls in the Fremont and Newark area was performed using the California Department of Fish and Game's (CDFG) California Natural Diversity Database (CNDDB) prior to field assessment.

A one-day walking assessment of the three parcels within the study area -- Main Catellus, Stem, and Robbins -- was conducted on October 13, 1995, between 10 a.m. and 5:00 p.m. The surveyor looked for suitable foraging, nesting and resting areas for owls. Because burrowing owls are primarily dependent on burrowing rodents to dig out the burrows which they typically inhabit, this assessment also surveyed to determine whether burrowing rodents or burrows of a size suitable for owl use were present. If suitable burrows were identified, they were inspected for indicators of present or past usage by owls such as moulted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance or

nearby perching areas. If pellets were found they were inspected for mammalian skeletal remains and insect parts. During the site assessment, each parcel was assigned to a foraging potential category (based on vegetative cover and topography) and a nesting potential category (based presence of burrowing rodents, presence of burrows suitable for usage by owls, indicators of owl usage, and proximity to foraging habitat).

The categories for foraging habitat were:

High	Open tracts greater than 10-acres, vegetated with low growing grasses and forbs. This category includes grazed grasslands.
Moderate	Open tracts that are primarily grassland but are interspersed with areas that are wet, unvegetated, or have a tree canopy with ground cover greater than 30%.
Low	Tracts where wetlands, buildings, dense trees, or other factors which reduce the foraging potential or prey base.

The categories for nesting habitat were:

Very high	Suitable burrows identified on-site with owl utilization or possible indicators of owl utilization observed at burrows; site is within 500 feet of moderate or better foraging habitat.
High	Suitable burrows identified on-site; site is within 500 feet of moderate or better foraging habitat
Moderate	Topography and vegetation capable of supporting burrows; burrowing rodents observed on-site; site is within 500 feet of moderate or better foraging habitat
Limited	Topography and vegetation capable of supporting burrows; burrowing rodents not observed on site; site is within 500 feet of moderate or better foraging habitat.
Low	Topography and vegetation likely to impede the construction of burrows; burrowing rodents not observed on-site.

If owls were observed, location and proximity to burrows was noted.

Site Description

The approximately 834-acre study area consists primarily of flat pasture land with scattered elevated mounds and berms and less common depressed areas. Portions of the study area are currently grazed and the remainder of the site has been used historically for grazing.

"Main Catellus"

For the purposes of this assessment, the 645-acre Main Catellus parcel was divided into three smaller study areas.

Area 1: From the eastern boundary of the property west to the extension of the eastern limit of the Stem Property to Interstate 880. This area comprises over half of the Main Catellus property. It is predominantly former pasture land with elevational changes between 5 and 10 feet. The area is densely (60% - 80%) vegetated by ruderal grassland species. The area of land closest to the Fish and Wildlife Preserve, approximately two acres in size, displays wetland characteristics.

Area 2: From the northern north-east boundary of the Automall Parcel to Interstate 880. This area show varying topography with many berms and exposed faces. Vegetative cover here is estimated to average between 30% and 50% cover by non-native grasses.

Area 3: Area south of the Automall Parcel to the Robbins Parcel, limited to the east by the northern extension of the Robbins Parcel eastern limit. This area is estimated to average between 40% and 60% cover by non-native grasses. Between 10 and 20 berms and mounds between two and ten feet high are scattered throughout this area.

"Stem"

The Stem parcel is a flat, grazed pasture with a few small fenced (none larger than 5' x 5') areas which grow thick with ruderal grasses. Five small debris piles approximately 4 feet high comprised of concrete, corrugated metal and wood stand in the western half of the site.

"Robbins"

The approximately 113-acre Robbins site is a flat pasture which has been heavily grazed; it is devoid of vegetation taller than six inches. Three triplets of power line towers are spaced on the north-south axis on the eastern portion of the property. Each of the nine power line towers has 4 concrete footings.

Results

The CNDDB search showed that no sightings were recorded for the study area. Nearby nesting locations included earthen mounds in over-grazed pastures.

"Main Catellus"

Area 1

This area has grassland vegetation suitable for foraging. No burrows were observed; however, the site contains earthen berms and mounds that are capable of supporting burrows. Ground squirrels were observed at the southwestern portion of the site near the access road. No grazing occurs in this area.

Foraging Potential: High Nesting Potential: Moderate

Area 2

This area has grassland vegetation suitable for foraging. Suitable burrows were observed in the unvegetated mounds of compacted dirt near Automall Parkway.

Foraging Potential: High Nesting Potential: High

Area 3

This area has grassland vegetation suitable for foraging. A fence separates it from the adjacent grazing area. One adult owl, unknown sex, was observed emerging from a mound containing 6 burrows. The owl perched on top of the mound. The owl did not display territorial gestures such as head bobbing.

Foraging Potential: High Nesting Potential: Very High

"Stem"

The site provides suitable foraging habitat for burrowing owls. The debris piles provide the nesting and resting habitat preferred by owls. Egested pellets on top of a mound contained small bones and insect parts, fecal matter ("white wash") was found around several of the piles. These are possible indicators of burrowing owl use. Ground squirrels were observed on-site. Red fox, which are common predators of burrowing owls, were also observed on-site.

Foraging Potential: High Nesting Potential: Very High

"Robbins"

Although the site is heavily grazed, it provides suitable foraging habitat for burrowing owls. More than 20 suitable burrows were observed around the footings of the power line towers. Feathers were observed around the opening of one burrow. A three-foot-high wooden post is located in the center of the power tower. White wash was observed on the perch. Ground squirrels were observed in this area in around the bases of telephone poles on site.

Foraging Potential: High Nesting Potential: Very High

Existing Regulations

As a CSC, the burrowing owl is monitored by the CDFG. CDFG publishes mitigation guidelines (September 13, 1994, Draft) which define impacts to this species, and include survey protocols, and relocation and mitigation recommendations. These guidelines, as well as consultation with CDFG, should be used in defining project impacts and developing appropriate mitigation for these impacts.

APPENDIX H

CONCEPTUAL MITIGATION PLAN

CONCEPTUAL MITIGATION PLAN

Description of Conceptual Mitigation Plan

Mitigation for wetland resources (wetlands) impacted by construction of the Pacific Commons project will consist of excavation of shallow depressional areas that will pond water seasonally. These seasonally ponded wetlands will provide habitat for waterfowl, shorebirds, and other water-associated birds in the winter and spring months when water is present. The size of the individual wetlands will depend on local topography and soil conditions, but will generally range in size from about 0.1 acres up to approximately 2 acres.

Wetland Design. The constructed seasonally ponded wetland mosaic will consist of a series of depressional areas and intervening upland areas. Depending on the number of mitigation wetlands to be constructed, the percentage of the mitigation site to remain as uplands will be between 15 and 25 percent. The surfaces of the wetlands will be between six inches and eighteen inches below the surrounding (upland) grade with relatively flat side slopes, generally exceeding 10:1. As necessary, the bottoms will be compacted to 90% relative compaction to retain rain water and to reduce the loss of water through percolation.

The final finish grade elevation, shape, size, and location of each depressional area will be determined following detailed topographic surveys and design work completed prior to construction. The degree to which soils in each depressional area are to be treated (e.g., compacted) will be determined after completion of laboratory tests of the soils to determine individual soil properties.

The gradient of the side slopes will depend on the size and depth of the individual ponds, but the goal is to make the side slopes as flat as possible to provide a natural hydrologic and vegetational transitions and to provide a more natural appearance to the mitigation site. The upland areas surrounding each depressional area will be mounded slightly. Because of the nature of the heavy clay soils at the mitigation sites, this should encourage runoff to move from the upland areas to the nearby depressional areas.

The uplands surrounding each depressional area will be treated with salt to reduce the establishment of undesirable annual grasses and herbaceous species (e.g., *Lepidium latifolium*), and encourage establishment of low growing halophytic vegetation such as *Salicornia virginica, Frankenia grandifolia,* and *Distichlis spicata*. Top soil from existing ponds on the site will be salvaged and used to inoculate the constructed seasonally ponded wetlands. The target species for the seasonally ponded wetlands include the following species, all of which are found in the wetlands that will be affected by the project:

- *Atriplex patula hastata* (Halberd-leaf saltbush)
- *Atriplex semibaccata* (Australian saltbush)
- *Boisduvalia glabella* (spike primrose)
- *Cotula coronopifolia* (brass buttons)
- *Cressa truxillensis* (alkali weed)
- *Distichlis spicata* (salt grass)
- *Eleocharis macrostachya* (spikerush)
- *Eryngium aristulatum* (California coyote thistle)
- *Frankenia grandifolia* (alkali heath)
- *Hordeum brachyantherum* (meadow barley)
- *Salicornia virginica* (pickleweed)
- *Spergularia marina* (saltmarsh sand spurrey)

The upland areas will be seeded with several native species, including the following:

- *Danthonia californica* (oat grass)
- *Deschampsia caespitosa* (hair grass)
- *Distichlis spicata* (salt grass)
- *Elymus glaucus* (blue wild rye)
- *Elymus triticoides* (creeping wild rye)
- *Melica ssp. (M. californica, M. imperfecta)* (melicgrass)
- *Sporobolus airoides* (alkali sacton)
- *Stipa sp.* (needle grass)

Pre-Construction Surveys, Plans, and Specifications. Detailed topographic maps will be developed for the mitigation sites. These maps will have one-foot contours with spot elevations at 100-foot intervals. The topographic maps will be used to determine the location and size of each seasonally ponded wetland. Laboratory tests will determine the permeability of the soils and the level of compaction that will be necessary to reduce vertical losses and increase the duration of ponding.

After approval of the conceptual mitigation plan by the City of Fremont, a detailed mitigation plan will be developed. The detailed mitigation plan will include a map on a topographic base showing the location and size of each wetland. The mitigation plan will also provide details on short- and long-term maintenance (including responsibilities), the performance criteria and the methods to be employed in monitoring, and the manner in which any remediation will be conducted. For example, seeding of the ponds with seeds from the desired target species may occur in those ponds that fail to develop the desired species of plants.

Accompanying grading plans will also show the location and sizes of the wetlands, as well as the rough (cut) and final (following topsoil reapplication and inoculation) bottom elevations and areas where the wetland bottom soils will be compacted, the side slope lengths and gradients, mound locations and contours, topsoil and seed salvage areas, temporary stockpile locations, and disposal sites (for excess soils not placed into mounds). Sensitive biological areas in which construction equipment cannot be operated will be identified on the grading plans. Construction specifications will include a schedule of the design parameters (rough and final bottom grade, any outlet elevation, depth of topsoil replacement, etc.) and will specify the manner in which (1) soils and seed will be salvaged and stockpiled, (2) earthwork (including soil compaction and finish grading) will proceed in both the wetlands and the surrounding uplands, and (3) the site will be winterized to reduce erosion of exposed bare ground.

Wetland Construction. Construction of the wetlands will take place as follows:

- Site Preparation,
- Grade Staking and Flagging of Wetland Boundaries, and Salvage and Disposal Areas,
- Excavation of Wetlands,
- Shaping of Wetlands and Uplands,
- Preparation of Soils in Wetlands (e.g., compaction of soil, if necessary),
- Application of Top Soil from Existing Wetlands (Inoculation of Wetlands), and Final Grading, and
- Implementation of Erosion Control Measures if necessary to combat wind erosion).

Mitigation Sites

There are two known possible sites that may be used to mitigate the loss of wetland resources: (1) the Stem Site (65.4 acres), located at the southwestern end of the project site, and (2) the Stevenson Site (55.6 acres), located approximately one-half mile north of the project site in the City of Fremont. The Stevenson Site is bounded on the north by Stevenson Boulevard, on the west by the Southern Pacific Railroad, and on the south by the PG&E substation. The property to the north of Stevenson Boulevard is owned by Best Blocks, Inc. The Stem Site contains 4.3 acres of seasonally ponded wetlands and the Stevenson Site 5.7 acres of seasonally ponded wetlands. Other appropriate sites will be identified and used, as needed.

Performance Standards

The performance standards will be related to the functional capacity of the wetland resources that will be affected by construction of the Pacific Commons project. There are two types of wetland resources identified on the project site: (1) seasonally ponded wetlands (54.2 acres, not including the Stem Site), and (2) wet meadows (41.3 acres). The functions of the seasonally ponded wetland resources at the project site are limited. With the possible exception of the seasonally ponded wetland at the southern end of the site (non-tidal salt marsh, Area DA), the seasonally ponded wetlands are the result of various land use activities, including filling for construction of pads, construction of duck ponds for duck clubs, construction of stormwater detention basins, agricultural activities, and placement of the United Sewer District pipeline. Most of the seasonally ponded wetlands are regularly disturbed by cattle and horse grazing. The depth and duration of ponding in these seasonally ponded wetlands are variable.

The functions of the wet meadow habitat are more limited than the functional capacity of seasonally ponded wetlands due to the presence of dense vegetation cover and the limited extent of surface water. From the surface, there is little perceptible difference in vegetation structure between the non-native grass lands (nonwetlands) and the wet meadow areas. The depth and duration of ponding in the wet meadow areas are probably limited and short-term (days vs. weeks to months in the seasonally ponded wetlands). As a result of these factors, the functional capacity of the wet meadow habitat is low and not much different from the adjacent non-native grasses.

In general, the following goals will guide development of the mitigation wetlands:

1. Seasonally ponded wetland habitat will be created to offset the loss of wetlands functions at the project site.

2. The vegetation will include native perennial wetland species, most of which are found at the project site.

3. The relative percent cover by native species and perennial species will exceed cover at existing seasonally ponded wetlands on the project site.

4. The duration of ponding will be similar to that occurring in seasonally ponded wetlands on the project site.

The specific performance criteria for each of these goals are summarized below.

Goal: ***Seasonally ponded wetland habitat will be created to offset the loss of wetlands functions at the project site.***

Performance Criterion: ***Depressional areas will be constructed that will seasonally pond water and develop characteristics of wetlands, including hydrophytic vegetation, hydric soils, and wetland hydrology.***

Goal: ***The vegetation will include native perennial wetland species, most of which are found at the project site.***

Performance Criterion: ***The seasonally ponded wetlands will support on average a minimum of eight plant species, including a minimum of five of the following native wetland species:***

- *Atriplex patula hastata* (Halberd-leaf saltbush)
- *Atriplex semibaccata* (Australian saltbush)
- *Boisduvalia glabella* (spike primrose)
- *Cotula coronopifolia* (brass buttons)
- *Cressa truxillensis* (alkali weed)
- *Distichlis spicata* (salt grass)
- *Eleocharis macrostachya* (spikerush)
- *Eryngium aristulatum* (California coyote thistle)
- *Frankenia grandifolia* (alkali heath)
- *Hordeum brachyantherum* (meadow barley)
- *Salicornia virginica* (pickleweed)
- *Spergularia marina* (saltmarsh sand spurrey)

Goal: ***The relative percent cover by native species and perennial species will exceed cover at existing seasonally ponded wetlands on the project site.***

Performance Criterion: ***On average, the relative percent cover by native plant species will exceed 75% and the relative percent cover by perennials will exceed 50%.***

Goal: ***The duration of ponding will be similar to that occurring in seasonally ponded wetlands on the project site.***

Performance Criterion: ***The depth of ponding in the seasonally ponded wetland habitat will vary from 6 to 18 inches. The total period of inundation will be a minimum of three months during years of normal rainfall.***

Mitigation Monitoring Plan

The five-year monitoring plan will consist of two main activities: (1) monitoring the duration and depth of ponding in the wetlands; and (2) determination of the vegetation that becomes established in the wetlands and surrounding uplands. The detailed monitoring plan will be developed after approval of the conceptual mitigation plan by the City of Fremont, but will be designed to measure the performance of the mitigation wetlands relative to the performance criteria developed for the mitigation project. The following discussion provides the framework within which the detailed mitigation monitoring plan will be developed.

Monitoring Duration and Depth of Ponding. The purpose of this program will be to document the depth of ponding and the duration of ponding in selected ponds. The ponds to be surveyed will be selected randomly. Wetlands will first be stratified based on six inch depth increments. For example, if the range of depth for the wetlands is from six to eighteen inches, the constructed wetlands would be stratified into two classes: (1) six to twelve inches; and (2) twelve to eighteen inches. The wetlands in each stratum would be numbered and a subset of wetlands selected randomly. This subset would be monitored during the five-year monitoring period.

The water levels will be monitored monthly from the time of the first substantial rainfall (November or December) until the late spring (May or June) or until water is no longer present in the wetlands. Staff gauges, marked in 0.1-foot increments, will be placed in each wetland to be monitored and used to determine the depth of water. The extent of ponding will be determined by flagging the waters edge during each monitoring survey. The location of each flag will be determined using a global positioning (GPS) system and the data transferred to a map of the mitigation site.

Vegetation of Constructed Wetlands and Uplands. The purpose of this program will be to determine the type of vegetation colonizing the constructed wetlands and uplands and the rate of establishment. Vegetation species composition and percent cover will be determined along randomly located transects running from the adjacent upland area through the pond onto the adjacent upland area. The ponds to be monitored will be the same subjected to water depth and ponding duration monitoring. One-meter-square quadrats (or larger) will be established randomly along each transect and the cover by species determined. Additionally, the entire mitigation site, including upland areas, will be surveyed for the occurrence of undesirable species in the late spring or early summer. The location of undesirable species will be mapped and this map used to determine maintenance activities to remove these species.

Maintenance of Mitigation Wetlands

During the first year following construction, the water levels in the ponds will be monitored. If the ponds fail to hold water for sufficient duration, based on comparison with similar ponds in the area (e.g., the refuge wetlands), then actions will be taken during the following summer and fall to increase the water holding capacity of the subject pond(s). This could include additional tests on the nature of the soil and digging of soil pits to determine the soil type throughout the wetland. These data would be used to define actions to increase the duration of ponding. These activities could include compacting the soils to a greater density or adding a clay liner to seal the pond bottom.

Other maintenance activities could include removal of undesirable vegetation, such as ice plant and broadleaf peppergrass. The presence of these and other undesirable species will be identified during routine monitoring surveys and the appropriate removal activities implemented. In most instances, this will include removal of these species by hand. If the vegetation is present in large, dense patches or is difficult to pull by hand, it may be necessary to use an approved herbicide, such as Rodeo.

APPENDIX I

MITIGATION SITE ASSESSMENT

Wetland Mitigation Assessment:
Catellus Stevenson Boulevard Site

Purpose

This report presents a preliminary assessment of the suitability as a mitigation site of the Catellus Stevenson Boulevard property in Fremont (hereafter the "site"). The mitigation is required for fill of wetland resources on the proposed Pacific Commons development site (which includes the approximately 700-acre main Catellus site and adjoining Robbins and Stem parcels; hereafter collectively the "development site"). The development site has been proposed for a variety of uses and the final site plan has not yet been completed. Accordingly, this analysis focuses on the physical capability of the site to support wetlands such as are known to occur on the development site.

Site Conditions

The site consists of approximately 56 acres bounded by, on the north, a railroad spur, on the west, by railroad tracks, on the south, by Weber Road and, on the east, by existing industrial uses (Figure A-3). The site is relatively flat with a gentle slope to the west and has been used for oat hay production in the past as indicated by evidence of discing and cultivated varieties of oat hay on the site.

This site was reviewed for the presence of wetlands by Huffman and Associates (HA) in 1993. HA determined that approximately 4.5 acres of the site along the western border were wetlands but that all but 0.18 acres of these were exempt from regulation as they were artificially created. If not already approved, this determination must be reviewed and verified by the Corps. A visual inspection completed by Zentner and Zentner indicates that site conditions today appear similar to those identified by HA in 1993.

The site also was reviewed for the potential presence of special status species[1] by ESA (1992). ESA concluded that much of the site was habitat for the burrowing owl

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[1]"Special status species" are defined in the ESA report as: species listed as endangered or threatened under the federal Endangered Species Act ("ESA") and the California Endangered Species Act ("CESA"); plants designated as rare under the California Native Plant Protection Act; plants or animals proposed for listing under the ESA or CESA; plants or animals that are Category 1 or 2 candidates for possible future listing as threatened or endangered under the ESA ("C1" and "C2", respectively) ; plants included on lists 1A, 1B, and 2 of the California Native Plant Society's ("CNPS") *Inventory of Rare and Endangered Vascular Plants of California*; and animals designated by the California Department of Fish and Game as "Species of Special Concern" ("CSC").

(*Athene cunicularia*), a CSC; and portions of the site were suitable habitat for the California tiger salamander (*Ambystoma californiense*), a C1 and CSC, Contra Costa goldfields (*Lasthenia conjugens*), a species proposed for listing as endangered under the federal Endangered Species Act, and hairless popcorn-flower (*Plagiobothrys glaber*), a CNPS List 1A species. Later surveys by HA for these last three species did not disclose their presence on-site.

Mitigation Assessment

Mitigation Site Suitability

Wetlands proposed for fill on the development site primarily consist of seasonal marsh and wet meadow. Both types of wetlands are shallow, seasonally inundated or saturated basins. The Catellus wetlands support a variety of mostly non-native wetland species adapted to seasonal saturation and short periods of inundation. Although presently influenced by horse and cattle grazing, the Stem wetlands are more well-defined and probably support longer periods of inundation and saturation. Additionally, these wetlands include a variety of native plants.

Due to the relatively impermeable soils, it is likely that site wetlands are supported almost entirely by direct rainfall with very little input by groundwater. Rainfall in the winter and spring in this area is sufficient to cause saturation and then ponding in shallow basins due to the high clay content of the soil. Accordingly, assuming that in-kind mitigation is appropriate[2], the proposed mitigation project would consist of shallow ponds that provide sufficient ponding and saturation to support wetland plants such as those found on the development site.

The site consists primarily of Omni series soils, a series dominated by clays that are highly suitable for reservoir or pond construction. Direct rainfall on the site averages 20 inches per year, concentrated between November and March. January, February, and March typically have 4 to 5 inches of rainfall per month. Evapotranspiration ("ET") during these months is relatively low, less than 1.0 inches. Approximately 4 to 5 inches of rainfall under these conditions will completely saturate site soils. Accordingly, in an average year, by January 1, basins on the site would be saturated and the remaining 15 to 16 inches of rainfall, less approximately 1 inch per month loss to ET, would be available to support ponding. Accordingly, the site is physically capable of supporting habitats similar to those that would be lost on the development site.

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[2]Because the site probably contained seasonal wetlands in pre-Columbian times and due to the concerns of the Federal and State regulatory agencies for in-kind mitigation, and general concerns for the disappearance of seasonal wetlands, seasonal wetlands should be the type constructed.

Defining the Extent of Created Habitat

The extent of habitat to be constructed will be determined based upon the extent of habitat to be lost on the development site and the selection of an appropriate mitigation ratio and buffer requirement. The mitigation ratio is typically a result of several factors including the value of the resources to be lost and the difficulty in constructing the replacement habitat.

On the main Catellus site, the wetlands are of moderate to low value. These wetlands are of artificial origin, are dominated mostly by non-native plants, and are hydrologically isolated, greatly reducing their water quality improvement functions. However, the development site is significant in its extent and proximity to Bay wetlands. Existing data, based on a reconnaissance of the development site during the dry season, suggest limited to moderate use by wildlife (which in part is reflective of the current grazed condition of most of the development site).[3] These factors support the conclusion that development site wetlands are of moderate to low value.

The wetlands on the Stem parcel are of moderate value, however, due to their relatively natural origin, the patches of native plants with high cover, and their relatively high level of definition. These wetlands exhibit characteristics similar to those of adjacent wetlands (formerly the Carruf property), an area determined to be of high value by the U.S. Fish and Wildlife Service which now is part of the San Francisco Bay National Wetlands Refuge.

The wetlands to be constructed are relatively simple to build. They will consist of shallow, seasonally ponded wetlands that nearly duplicate existing conditions on the development site (although an attempt should be made to increase the dominance of native plants in the created wetlands).

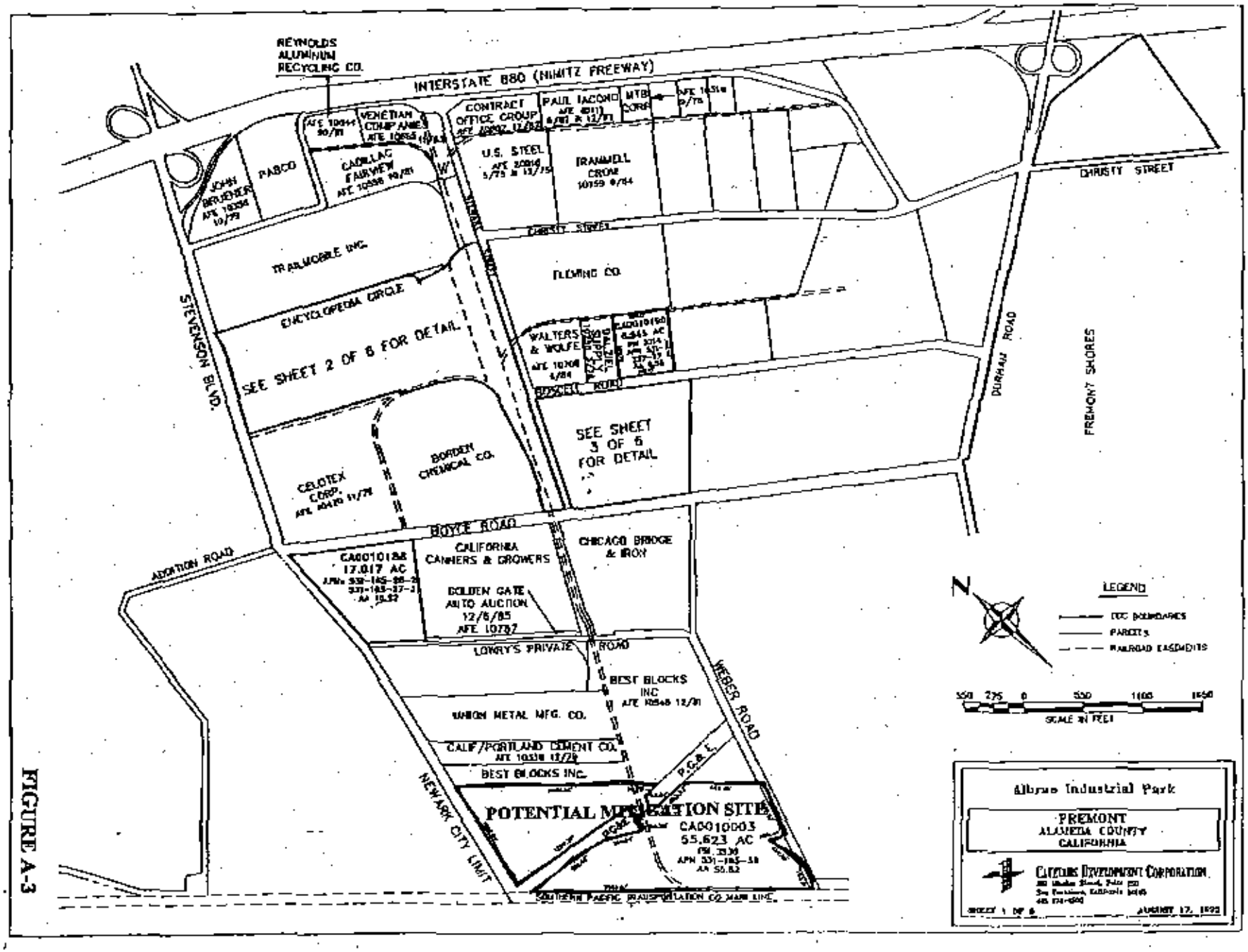
In addition to the construction of wetlands, an area of buffer and intervening uplands will be required. The buffer should be a minimum of 50 feet of constructed native uplands around the perimeter of the wetland construction zone. Approximately 20% of the total habitat construction area (not including the perimeter buffer) should be upland to simulate the assemblage of uplands and wetlands now found on the development site and to provide for sufficient high water refuge for wetland-related wildlife.

---

[3]For purposes of this assessment, a presumption exists that the development site is used by wildlife due to its size, proximity to other wetlands, and potential for use as refuge during high water events.

Defining the Constructed Wetlands

Prior to approval of a wetland construction program, the applicant should submit a detailed mitigation plan to the City. As an example, this plan could use the San Francisco District Corps of Engineers *Habitat Mitigation and Monitoring Proposal Guidelines* for this purpose. The goal of the plan should be to provide similar or higher value habitats than those lost. This would involve geomorphologically similar wetlands with a higher proportion and diversity of native plants.



POTENTIAL MITIGATION SITE

FIGURE A-3

APPENDIX J

AIR QUALITY METHODOLOGY AND ASSUMPTIONS

A. AIR QUALITY STANDARDS

FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour	0.12 PPM	0.09 PPM
Carbon Monoxide	8-Hour	9.3 PPM	9.0 PPM
	1-Hour	35.0 PPM	20.0 PPM
Nitrogen Dioxide	Annual	0.05 PPM	---
	1-Hour	---	0.25 PPM
Sulfur Dioxide	Annual	0.03 PPM	---
	24-Hour	0.14 PPM	0.04 PPM
	1-Hour	---	0.25 PPM
Particulates	Annual	50 ug/m3	30 ug/m3
	24-Hour	150 ug/m3	50 ug/m3
Lead	30-Day Average	---	1.5 ug/m3
	3-Month Average	1.5 ug/m3	---

PPM = Parts Per Million
ug/m3 = Micrograms Per Cubic Meter

B. CALINE-4 MODELING

The CALINE-4 model is a fourth-generation line source air quality model that is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. Given source strength, meteorology, site geometry and site characteristics, the model predicts pollutant concentrations for receptors located within 150 meters of the roadway.

The CALINE-4 model allows roadways to be broken into multiple links that can vary in traffic volume, emission rates, height, width, etc.. The intersection mode of the model was employed, which distributes emissions along each leg of the intersection for free- flow traffic, idling traffic and accelerating and decelerating traffic.

The worst-case mode of the CALINE-4 model was employed. In this mode, the wind direction is varied to determine which wind direction results in the highest concentration for each receptor. Emission factors were derived from the California Air Resources Board EMFAC-7F computer model (Version 1.1).

Receptors (locations where the model calculates concentrations) were located at distance of 20 feet from the roadway edge for all four corners of the intersection and at locations 50 feet in either direction, for a total of 12 receptors. Figure 1 is a schematic diagram showing the location of receptors.

The computation of carbon monoxide levels assumed the following worst-case meteorological conditions:

Windspeed: 1 mps
Stability: F Category
Mixing Height: 1000 meters
Surface Roughness: 100 cm
Standard Deviation of Wind Direction: 10 degrees

The CALINE-4 model calculates the local contribution of nearby roads to the total concentration. The other contribution is the background level attributed to more distant traffic. The 1-hour background level was calculated as 5.6 PPM and the 8-hour background level was calculated as 3.0 PPM in the analysis year of 2000. These background concentrations were calculated using base year 1992 isopleths of carbon monoxide concentration and correction factors prepared by the Bay Area Air Quality Management District.

To calculate 8-hour concentrations from the 1-hour output of the CALINE-4 model, a persistence factor of 0.70 was employed.

C. URBEMIS-5

Estimates of regional emissions generated by Project traffic were made using a program called URBEMIS-5*. URBEMIS-5 is a program which estimates the emissions that result from various land use development projects. Land use projects can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. URBEMIS-5 contains default values for much of the information needed to calculate emissions.However, project-specific, user-supplied information can also be used when it is available.

Inputs to the URBEMIS-5 program include trip generation rates, vehicle mix, average trip length by trip type and average speed. Trip generation rates for Project land uses and land uses removed by the Project were provided by the Project transportation consultant. Average trip lengths for Fremont and Alameda County were used. Average speed for all types of trips was assumed to be 25 MPH.

The URBEMIS-5 runs assumed summertime conditions. The URBEMIS-5 program provides emission rates for Total Organic Gases (TOG). The TOG emission was multiplied by 0.914 to estimate Reactive Organic Gases (ROG).

*California Air Resources Board, URBEMIS-5 Computer Program Version 5.0 User Guide, July 1995.

APPENDIX K

FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL NOISE

FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL NOISE

This section provides background information to aid in understanding the technical aspects of this report.

Three dimensions of environmental noise are important in determining subjective response. These are:

a) The intensity or level of the sound;
b) The frequency spectrum of the sound;
c) The time-varying character of the sound.

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB), with 0 dB corresponding roughly to the threshold of hearing.

The "frequency" of a sound refers to the number of complete pressure fluctuations per second in the sound. The unit of measurement is the cycle per second (cps) or hertz (Hz). Most of the sounds which we hear in the environment do not consist of a single frequency, but of a broad band of frequencies, differing in level. The name of the frequency and level content of a sound is its sound spectrum. A sound spectrum for engineering purposes is typically described in terms of octave bands which separate the audible frequency range (for human beings, from about 20 to 20,000 Hz) into ten segments.

Many rating methods have been devised to permit comparisons of sounds having quite different spectra. Surprisingly, the simplest method correlates with human response practically as well as the more complex methods. This method consists of evaluating all of the frequencies of a sound in accordance with a weighting that progressively de-emphasizes the importance of frequency components below 1000 Hz and above 5000 Hz. This frequency weighting reflects the fact that human hearing is less sensitive at low frequencies and at extreme high frequencies relative to the mid-range.

The weighting system described above is called "A"-weighting, and the level so measured is called the "A-weighted sound level" or "A-weighted noise level." The unit of A-weighted sound level is sometimes abbreviated "dBA." In practice, the sound level is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting characteristic. All U.S. and international standard sound level meters include such a filter. Typical sound levels found in the environment and in industry are shown in Figure A-1.

Although a single sound level value may adequately describe environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise is a conglomeration of distant noise sources which results in a relatively steady background noise having no identifiable source. These distant sources may include traffic, wind in trees, industrial activities, etc. and are relatively constant from moment to moment. As natural forces change or as human activity follows its daily cycle, the sound level may vary slowly from hour to hour. Superimposed on this slowly varying background is a succession of identifiable noisy events of brief duration. These may include nearby activities such as single vehicle passbys, aircraft flyovers, etc. which cause the environmental noise level to vary from instant to instant.

To describe the time-varying character of environmental noise, statistical noise descriptors were developed. "L_{10}" is the A-weighted sound level equaled or exceeded during 10 percent of a stated time period. The L_{10} is considered a good measure of the maximum sound levels caused by discrete noise events. "L_{50}" is the A-weighted sound level that is equaled or exceeded 50 percent of a stated time period; it represents the median sound level. The "L_{90}" is the A-weighted sound level equaled or exceeded during 90 percent of a stated time period and is used to describe the background noise.

As it is often cumbersome to quantify the noise environment with a set of statistical descriptors, a single number called the average sound level or "L_{eq}" is now widely used. The term "L_{eq}" originated from the concept of a so-called equivalent sound level which contains the same acoustical energy as a varying sound level during the same time period. In simple but accurate technical language, the L_{eq} is the average A-weighted sound level in a stated time period. The L_{eq} is particularly useful in describing the subjective change in an environment where the source of noise remains the same but there is change in the level of activity. Widening roads and/or increasing traffic are examples of this kind of situation.

In determining the daily measure of environmental noise, it is important to account for the different response of people to daytime and nighttime noise. During the nighttime, exterior background noise levels are generally lower than in the daytime; however, most household noise also decreases at night, thus exterior noise intrusions again become noticeable. Further, most people trying to sleep at night are more sensitive to noise.

To account for human sensitivity to nighttime noise levels, a special descriptor was developed. The descriptor is called the DNL or L_{dn} (Day/Night Average Sound Level) which represents the 24-hour average sound level with a penalty for noise occurring at night. The DNL computation divides the 24-hour day into two periods: daytime (7:00 am to 10:00 pm) and nighttime (10:00 pm to 7:00 am). The nighttime sound levels are assigned a 10 dB penalty prior to averaging with daytime hourly sound levels. For highway noise environments, the average noise level during the peak hour traffic volume is approximately equal to the DNL.

The effects of noise on people can be listed in three general categories:

a) Subjective effects of annoyance, nuisance, dissatisfaction;
b) Interference with activities such as speech, sleep, and learning;
c) Physiological effects such as startle, hearing loss.

The sound levels associated with environmental noise usually produce effects only in the first two categories. Unfortunately, there has never been a completely predictable measure for the subjective effects of noise nor of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over time.

Thus, an important factor in assessing a person's subjective reaction is to compare the new noise environment to the existing noise environment. In general, the more a new noise exceeds the existing, the less acceptable the new noise will be judged.

With regard to increases in noise level, knowledge of the following relationships will be helpful in understanding the quantitative sections of this report:

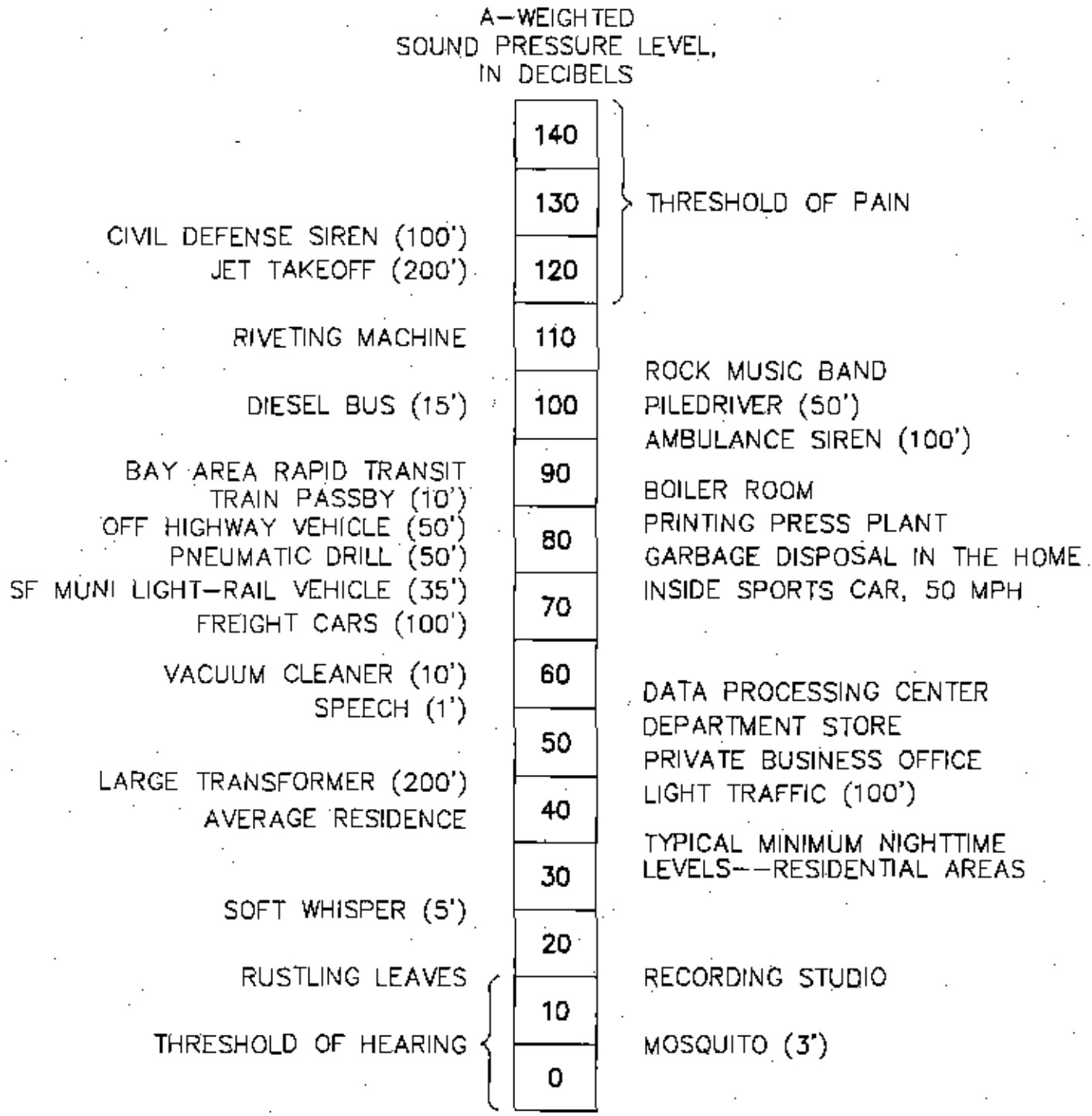
a) Except in carefully controlled laboratory experiments, a change of only 1 dB in sound level cannot be perceived.

b) Outside of the laboratory, a 3 dB change is considered a just-noticeable difference.

c) A change in level of at least 5 dB is required before any noticeable change in community response would be expected.

d) A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse community response.

FDdnlldn
November 1990



TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

FIGURE A1

1107 C

Charles M Salter Associates Inc 130 Sutter Street San Francisco California 94104 Tel: 415 397 0442 Fax. 415 397 0454

APPENDIX L

ARCHAEOLOGICAL EVALUATION

Historical Resources Information System

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLARA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Foundation Center, Bldg. 300
Sonoma State University
1801 East Cotati Avenue
Rohnert Park, California 94928-3609
(707) 664-2494 • Fax (707) 664-3947

RECEIVED
JAN 12 1996
DUNCAN & JONES

January 10, 1996

File No: 95-456

Douglas H.S. Duncan, AICP
Duncan and Jones
2161 Shattuck Ave.
Berkeley, CA 94704

re: Archaeological Record Search for Pacific Commons, an 880-acre parcel, SEIR for the City of Fremont

Dear Mr. Duncan:

Review of records and literature on file at this office indicates that the proposed project area contains no recorded Native American or historic cultural resources listed with the Northwest Information Center. State and federal inventories list no historic properties within the project area. Our records indicate that approximately 90% of the project area has been studied for cultural resources (Archaeological Resources Management 1989; and Cartier 1989).

At Euroamerican contact the Native Americans that lived in the area spoke Chochenyo, a version of the Costanoan language (levy 1978:485). Native American (including prehistoric) archaeological sites in this portion of Alameda County tend to be situated on alluvial flats and historic bay margins near former and existing water courses. The project area is located on an alluvial flat close the historic bay margins (Nicholls and Wright 1971). The 1866 General Land Office Survey Plat depicts a creek running near the eastern margin of the project area. Soil survey maps indicate that the soils in the project area range from seasonally saturated fine grained alluvium to unconsolidated alluvium both of which are known to contain aboriginal artifacts and skeletal remains (Helly 1972:22-23).

Historically the project area is located within the land holdings of Mission San Jose. This portion of the land holdings may have been used for agriculture or ranching. Native American labor was used to tend to the crops and cattle during the mission period. Quite often the laborers would set up small camps near mission farm and ranch lands because it was too far to travel back and fourth to the mission on a daily basis. Given the environmental and historic setting of the project area there is a high potential for Native American sites in the project area.

Review of historic literature and maps on file in this office further indicated that there were homesteads in the vicinity of the project area (GLO 1866). With this in mind there is a possibility of historic archaeological sites and structures associated with homesteading in the project area.

RECOMMENDATIONS:

1) There is a high possibility of Native American and Historic archaeological sites in the project area. Further archival study and field survey by an archaeologist is recommended for the unstudied portion of the project area.

2) Though 90% of the project area has been studied for cultural resources with negative results these areas are still considered sensitive for cultural resources. This property has been used in many ways in the past including an airstrip, race track, and agriculture. These activities may have obscured evidence of cultural resources on the surface. Due to these factors, it is our recommendation that a professional archaeologist be consulted before any earth moving activities take place in the project area. The archaeologist will provide you with further recommendations, such as monitoring, depending on what the project entails. This may be done on a project specific basis, especially if the entire property will not be affected by a single project.

3) Review for possible historic structures has included only those sources listed in the attached bibliography and should not be considered comprehensive with respect to architecture. The Office of Historic Preservation has determined that buildings and structures 45 years or older may be of historic value. If the project area contains such properties, they should be evaluated, prior to commencement of project activities.

4) If cultural resources are encountered **during the project**, avoid altering the materials and their context until a cultural resource consultant has evaluated the situation. Project personnel should not collect cultural resources. Prehistoric resources include chert or obsidian flakes, projectile points, mortars, and pestles; and dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic resources include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits, often in old wells and privies.

5) Identified cultural resources should be recorded on forms DPR 422 (archaeological sites) and/or DPR 523 (historic properties) or similar forms.

Thank you for using our services. Please contact our office if you have any questions, (707) 664-2494.

Sincerely,

Lynn Compas

Lynn Compas
Researcher II

LITERATURE REVIEWED

In addition to archaeological maps and site records on file at the Northwest Information Center, California Archaeological Inventory, the following literature was reviewed:

Archaeological Resources Management
1989 Cultural Resources Evaluation for the Fremont Shores Project on Durham Road in the City of Fremont, County of Alameda. On file at the Northwest Information Center, file #S-11970.

Cartier, Robert
1987 Cultural Resources Evaluation of a Parcel at the Terminus of Durham Road in the City of Fremont, County of Alameda. On file at the Northwest Information Center, File #S-8959.

Cook, S.F.
1957 The Aboriginal Population of Alameda and Contra Costa Counties. *University of California Anthropological Records* 16(4):131-156. Berkeley and Los Angeles.

General Land Office
1866 Survey Plat for Township 6 South/Range 1 West.

1917 Survey Plat for Township 6 South/Range 1 West.

Gudde, Erwin G.
1969 *California Place Names: The Origin and Etymology of Current Geographical Names.* Third Edition. University of California Press, Berkeley and Los Angeles.

Helley, E.J., K.R. Lajole, W.E. Spangle, and M.L. Blair
1979 Flatland Deposits of the San Francisco Bay Region - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning. *Geological Survey Professional Paper 943.* United States Geological Survey and Department of Housing and Urban Development.

Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, revised by William N. Abeloe
1966 *Historic Spots in California.* Third Edition. Stanford University Press, Stanford.

Hoover, Mildred Brooke, Hero Eugene Rensch, and Ethel Rensch, William N. Abeloe, revised by Douglas E. Kyle
1990 *Historic Spots in California.* Fourth Edition. Stanford University Press, Stanford.

Kroeber, A.L.
1976 *Handbook of the Indians of California.* Bureau of American Ethnology, Bulletin 78, (1925) Smithsonian Institution, Washington, D.C. (Reprint by Dover Publications, Inc., New York).

Levy, Richard
1978 Costanoan. In *California*, edited by Robert F. Heizer, pp. 485-495. Handbook of North American Indians, vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

National Park Service (compiler)
1993a *National Register of Historic Places Index by Property Location: Listed Properties* (Computer Listing for 1966 through 29 September 1995). National Park Service, United States Department of the Interior, Washington, D.C.

1993b *National Register of Historic Places Index by Property Location: Determined Eligible Properties* (Computer Listing for 1966 through 29 September 1995). National Park Service, United States Department of the Interior, Washington, D.C.

Nelson, N.C.
1909 Shellmounds of the San Francisco Bay Region. *University of California Publications in American Archaeology and Ethnology* 7(4):309-356. Berkeley. (Reprint by Kraus Reprint Corporation, New York, 1964)

Nichols, Donald R., and Nancy A. Wright
1971 *Preliminary Map of Historic Margins of Marshland, San Francisco Bay, California.* U.S. Geological Survey Open File Map. U.S. Department of the Interior, Geological Survey in cooperation with the U.S. Department of Housing and Urban Development, Washington, D.C.

State of California Department of Parks and Recreation
1976 *California Inventory of Historic Resources.* State of California Department of Parks and Recreation, Sacramento.

State of California Office of Historic Preservation
1995 *Historic Properties Directory.* Listing by City (through 29 September 1995). State of California Office of Historic Preservation, Sacramento.