Vallejo Transportation and Mare Island Access Study
Multimodal Facility Location and Design Study

Final Report

Prepared by

Korve Engineering

Prepared for

City of Vallejo

January 2001

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1 INTRODUCTION

BACKGROUND AND INCEPTION OF STUDY

The Mare Island Access Study and Multimodal Facility Location and Design Study has been commissioned by the City of Vallejo to develop a city-wide comprehensive plan intended to ease the integration of Mare Island, as a civilian housing and employment center, into an integral part of the City of Vallejo. Additionally, the study considers the waterfront development plan and proposed downtown redevelopment in conjunction with the Mare Island needs, in establishing a comprehensive transportation plan for the City of Vallejo.

The study is a follow-on to a transportation evaluation conducted during the process of closing Mare Island as a military facility and its transfer to the City for reuse. The study focuses on short-range (5 years) and longer range (20 years and beyond) needs and opportunities for enhancing transportation services on and to the island as well as to the development of the waterfront and downtown areas.

The need for this planning process evolved from a variety of issues and interests:

- Vallejo's location immediately north of the Carquinez Strait places it at a pivotal location for intercepting regional travel in a variety of corridors - most important is the Interstate 80 corridor, however, Highway 29 and Route 37 are becoming increasingly important;
- The City has identified economic development as a top priority and needs to understand how major transportation investment choices impact land development opportunities, both from a positive as well as negative perspective;
- Vallejo is looking at expansion of the sub-regional transportation network through initiatives like the ferry service and express bus, and is also increasingly optimistic about its role as an employment center realized through redevelopment efforts such as the Reuse Plan and Waterfront Plan;
- Previous transportation planning efforts identified that full build-out of the Mare Island Reuse Plan would not be feasible without additional transportation infrastructure;
- A new long-span bridge facility, the "Southern Crossing" had been suggested as a solution for the Mare Island access, but the need for this facility was uncertain and the cost of such a structure would far exceed local funding capabilities;
- Vallejo has identified that the various proposed transportation improvements are inter-related and of potential City-wide impact - for instance, construction of a new "Southern Crossing" bridge to Mare Island may require access roadway improvements as far away as Interstate 80;
- The City believes that there is a need to understand the relationships between sub-regional transportation demands, proposed land development/redevelopment, and the cost and benefit of additional transportation infrastructure.

For the above reasons, the City has accomplished a comprehensive transportation planning process which is multi-modal and sub-regional in scope, as well as integrated into the local land use and economic development.

Finally, given the desire to move forward with design and construction of required improvements in conjunction with imminent development proposals, the City included a major emphasis on implementation, looking both at the need and sequencing of projects. The implementation plan considers all available funding sources, including both local and outside funds.

STUDY OBJECTIVES

At the outset of the study, the following objectives were identified:

- ❑ Define Transportation Infrastructure Needed to Support Economic Development – The study defines all of the transportation infrastructure needed to support the development objectives of the City. The study also considers the inter-relationship between the costs and benefits of transportation improvements and land development.

- ❑ Evaluate Access and Circulation Options for Mare Island – Prior studies of Mare Island re-use identified the need for a "Southern Crossing" bridge connection between the southern portion of Mare Island and Vallejo proper. The study evaluates the need for such a facility as well as the overall access capacity of the existing network, resulting is specific recommendations with regard to the Route 37 interchange, the Mare Island Causeway and its approaches.

- ❑ Evaluate Waterfront Roadway Network Including Mare Island Way Alignment and Configuration – The study examined a wide range of options for Mare Island Way, including two and four through lanes, curved and straight alignments, and accommodation of transit, parking and pedestrian needs.

- ❑ Develop Multimodal Transportation Plan – The study addresses sites for expanded ferry services as well as alternatives to the existing downtown local bus timed transfer center. The study also addresses issues and needs for rail service to Mare Island and truck access.

- ❑ Identify Implementation Plan with Funding Strategy – The study provides an implementation plan with a companion funding strategy. The implementation plan addresses the need and timing of the proposed improvements, along with possible funding sources and the recommended environmental clearance process.

STUDY PROCESS

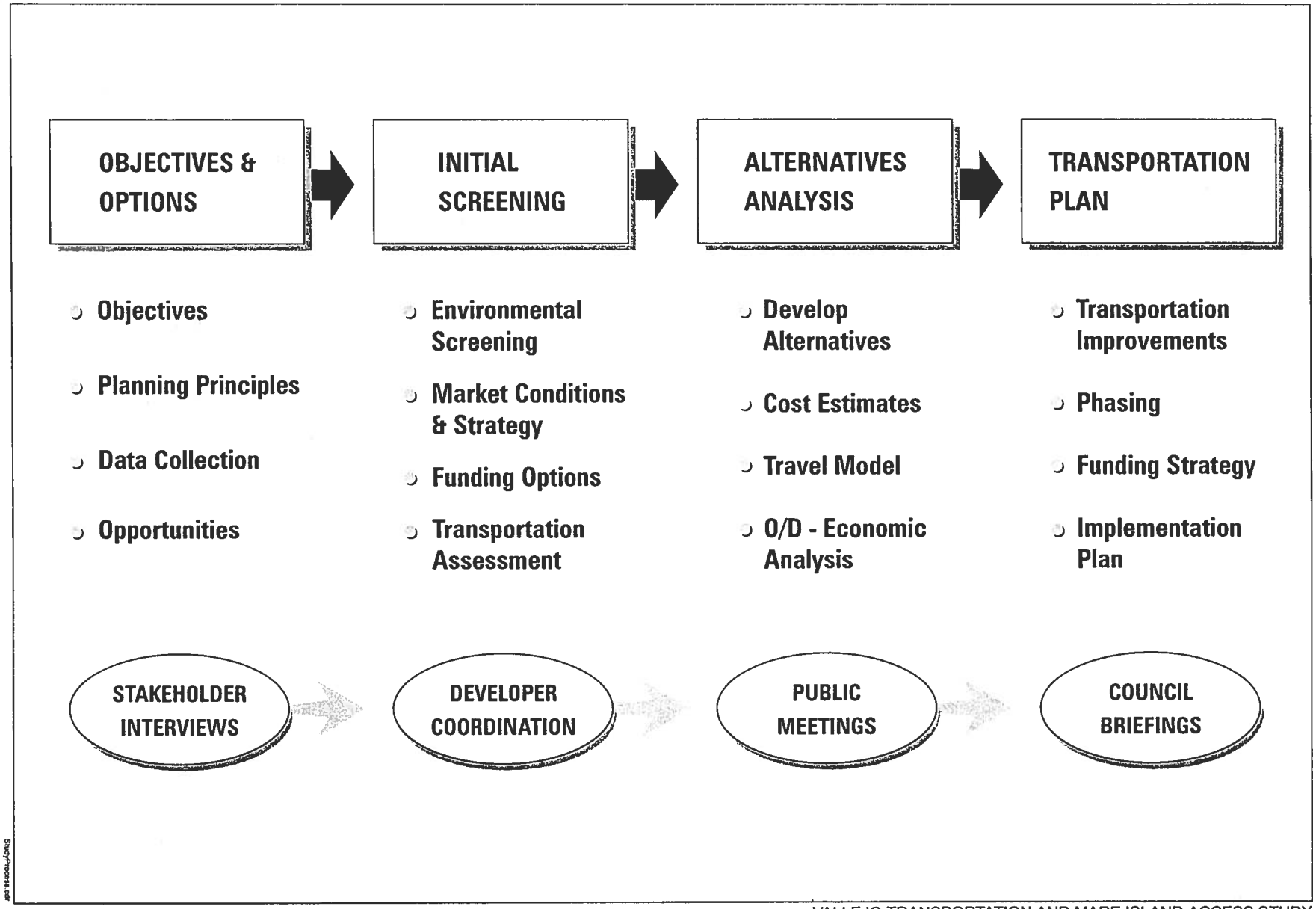
In order to respond to all of the planning requirements, a four step planning process was utilized (See Figure 1). The four major planning activities were accomplished in parallel with a major public outreach effort which included "stakeholder" meetings, developer coordination, public meetings, and Planning Commission / City Council study sessions. The specifics of this study process are as follows:

- Objectives & Options – At the study inception, study objectives and planning principles were identified. Study objectives identified decisions to be made or information to be provided as a result of the planning process. The planning principles, identified in conjunction with the study objectives comprised a set of rules for developing and evaluating the transportation alternatives which were studied. Data collection was accomplished to provide a basis for commencing the planning effort. Finally, transportation opportunities were identified. The opportunities represented, in the context of the transportation issues and concerns, possible solutions or strategies for addressing the transportation needs. These were developed as design options, site options, or operational strategies for transportation improvements.

- Initial Screening – The initial screening was accomplished to focus the transportation planning effort on the most promising options and strategies. The first step in the screening process was developing the candidate solutions. For physical options, this meant preparing conceptual design drawings which would verify the feasibility and fundamental characteristics of the proposed solutions. For candidate sites, this meant locating the sites, establishing the available area for improvements, and determining available access points. For operational strategies, the initial definition was comprised of a description of the proposed operation. As the options were developed, they were qualitatively screened based upon a number of considerations including: potential environmental or land use impact, potential relative cost versus possible benefit to adjoining land uses, fundability, and likely transportation service levels. The refinement and screening of the options and strategies was conducted in parallel with "stakeholder" meetings with potentially affected residents and business as well as with developer coordination so that options were discarded, added, or modified subject to on-going input.

- Alternatives Analysis – After the design and operational options were screened and refined, a formal evaluation of the most promising alternatives was accomplished. The alternatives analysis focused on a number of specific quantitative parameters, including: capacity in relationship to projected transportation demand level, travel time and quality of transportation service, capital and operational cost range, and specific environmental issues needing further analysis.[1] As part of the alternatives analysis, a citywide travel demand forecast model, with a sub-regional model zone extending into Solano County was developed. Also as part of the alternatives analysis, a transportation and land use "white paper" was prepared to explore the relationships between sub-regional travel demand,

[1]The initial environmental screening effort which was conducted during the development of the alternatives was used to discard options with potential "fatal flaws"; therefore, it was concluded that remaining environmental issues could be addressed in subsequent, project-specific environmental clearances of proposed projects. For this reason, it was not deemed to be appropriate to specifically score or rank the design options based upon environmental factors.



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VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 1

STUDY PROCESS

possible major transportation investments, and land use benefits. The purpose of the white paper was to determine the extent of land use benefit potential major improvements as well as trade-offs between land use and transportation improvements. As with other phases of the project, the public outreach effort continued during the alternatives analysis phase including a public meeting to present the elements under consideration for the transportation plan as well as initial evaluations of potential plan options.

- Transportation Plan – The transportation plan was comprised of the improvements deemed necessary and appropriate to address the transportation requirements of Vallejo and its proposed future development, specifically in the Waterfront / Downtown zone and on Mare Island. The transportation plan includes all of the principal elements needed to support projected transportation demand to, and in some instances, beyond, the transportation planning study horizon of Year 2020. As the proposed improvements were incorporated into the transportation plan, further input from the public outreach and developer coordination process was addressed, resulting in additional refinement of the proposed options as warranted. In conjunction with the transportation plan, an implementation strategy was developed which considered the relative need and/or phasing (from an overall transportation planning perspective) and funding opportunities for the proposed projects. The transportation plan, in conjunction with the implementation plan, provides a proposed development strategy for realizing the objectives of the transportation plan. The public outreach process continued through the plan development phase, including a large public open house meeting and study sessions with the City Council and Planning Commission.

Also shown in Figure 1 is the extensive public outreach process which was conducted in parallel with the technical analysis. Key activities included:

- "Stakeholder" meetings which were geographically focused to potentially affected or interested residents, businesses and tenants;
- "Open House" meetings which provided opportunities for the entire community to review and comment on transportation improvements and issues;
- "Developer Coordination" meetings which provided interaction with the on-going development proposals;

and;

- Planning Commission and City Council presentations and study sessions.

The consultant team was responsive to input from the public and made modifications to the proposed design options based upon comments received. Additionally, public input was considered in the evaluation of the proposed transportation plan and improvements. Appendix K, "Summary of Community Involvement Activities", describes the outreach process in detail and transmits all of the recorded comments which were received.

Notable areas in which the consultant team received considerable input which was considered in the transportation plan and improvements include:

- Southern Crossing Bridge Alignments
- Route 37 Interchange and Mare Island Roadways
- Ferry Terminal and Bus Transfer Center Sites
- Local Roadway Design Options

Within the overall transportation study process, four major sub-tasks were included:

- Travel Forecast Modeling – KORVE created a citywide travel demand forecast model and developed Year 2020 travel demands. The model was used to evaluate projected future highway and transit demand levels for existing and proposed transportation facilities. A comprehensive traffic count program and land use update was incorporated in the modeling effort. The resulting model includes arterial and collector level detail in the City of Vallejo and also includes the surrounding regional roadway network, based upon input from the Solano Transportation Authority. (The modeling effort is documented in Appendix A, "Travel Demand Forecast and Operational Analysis".)

- Transit Services Operational Analyses – The KORVE team evaluated operational impact as well as capital and operational costs of potential transit improvements. This included route restructuring associated with relocation of the ferry terminal or downtown bus transfer center as well as provision of new or expanded transit services to Mare Island, either by rubber-tired or water-borne modes. (The operational analyses are provided in Appendices F and G, which cover bus operations, Appendix H, which addresses ferry service, and Appendix I, which covers water taxi service.)

- State Route 37 Interchange Project Study Report – KORVE prepared a Project Study Report (PSR) for improvements for the State Route 37 interchange at the north end of Mare Island. The PSR is required by Caltrans to identify and evaluate design options for improvements to the state highway system. The PSR identifies and evaluates three phases of improvements for the interchange, including near-term improvements needed to connect to the proposed Mare Island local roadway system as well as near- and long-term ramp capacity improvements. (The draft PSR is presented in Appendix C.)

- Land Use and Transportation White Paper – As part of the alternatives analysis, a transportation and land use "white paper" was prepared to explore the relationships between sub-regional travel demand, possible major transportation investments, and land use benefits. The white paper identifies the appropriate context for the Southern Crossing bridge and other major improvements. (The paper is included as Appendix M.)

AREAS OF INVESTIGATION

Pursuant to the broadly-stated study objectives and planning principles, the study investigation was focused consider location-specific design options and to answer a number of key questions.

Design Options

This study has investigated a wide range of highway and transit components, both for Mare Island access and circulation, as well as for the waterfront, downtown, and beyond:

Mare Island

- Improvements to State Route 37 Interchange
- Modifications to Causeway Bridge and Approaches
- Improvements to On-Island Roadway System
- Transit Access and Service
- Southern Crossing Bridge
- Rail Service and Goods Movement

Waterfront, Downtown and Beyond

- Extending Roadways to Waterfront
- Modifications to Mare Island Way
- Construction of New Ferry Terminal South of Downtown
- Parking and Bus Facilities for Expanded Ferry Service
- Relocation of Downtown Transit Center
- Interstate 80 Corridor Improvements
- Arterial Roadway Improvements

Key Questions

The following eight questions were addressed during the course of the study, either through the development of specific improvement options or as covered in the general recommendations:

1. Is a "Southern Crossing" bridge connecting between Mare Island and the mainland needed?

2. Should the Ferry Terminal be relocated or should an additional terminal be constructed further south along the waterfront?

3. What is the role of Mare Island Way as an arterial roadway and how should the roadway be configured?

4. What roadway improvements are needed on Mare Island to support the proposed development plans?

5. What type of transit service is appropriate to Mare Island?

6. Is a downtown transit transfer center needed?

7. Should truck routes be modified to serve Mare Island, the Waterfront and Downtown zones?

8. What provisions for pedestrians and bicycles need to be included in proposed transportation improvements?

STUDY PRODUCTS

This study report, including its Executive Summary and Appendices comprise the principal documentation for the study effort. In addition to these products, the study resulted in the preparation of large-scale graphics depicting the proposed transportation improvements, as well as the travel demand forecast model, which is provided in electronically-readable media.

Information on a wide range of topics can be found in the following portions of the study documentation:

Executive Summary

- ❑ Overview of Study Process, Key Issues, Transportation Plan, Study Findings and Implementation Plan – Executive Summary (bound separately)

Study Report

- ❑ Transportation Plan, Listing of Proposed Improvements, Summary Description of Study Findings – Section II of this report
- ❑ Narrative Description of Proposed Improvements – Section III of this report
- ❑ Implementation Plan including Proposed Phasing and Funding of Proposed Projects – Section IV of this report

Eighteen separately bound appendices provide all of the background analyses which were conducted in support of the plan and recommendations:

Appendices

- ❑ Documentation of Travel Demand Forecasting Effort and Traffic Operational Analysis – Appendix A
- ❑ Detailed Description and Evaluation of Alternatives - Appendix B
- ❑ Preliminary Engineering Studies for Route 37 / Mare Island Interchange Alternatives (Project Study Report) – Appendix C

- ❑ Information on Interstate 80 Spot Operational Improvements – Appendix D
- ❑ Assessment of Bus Bay Requirements for Transit Centers – Appendix E
- ❑ Detailed Evaluation of Bus Service Options for Ferry Terminal Sites and Mare Island – Appendices F and G
- ❑ Detailed Evaluation of Ferry Service Terminal Alternatives and Parking Demand – Appendix H
- ❑ Detailed Evaluation of Water Taxi Service – Appendix I
- ❑ Identification of Environmental Issues and Constraints – Appendix J
- ❑ Summary of Stakeholder and Community Meeting Comments – Appendix K
- ❑ Information on Local and Land-Based Funding Sources – Appendix L
- ❑ White Paper on Economics, Land Use and Transportation – Appendix M
- ❑ Data on State and Federal Funding Sources – Appendix N
- ❑ Project-by-Project Planning Level Cost Estimates – Appendix O
- ❑ Detailed Project-by-Project Funding Analysis Worksheets – Appendix P
- ❑ Land Use Data Used for Transportation Model – Appendix Q

II TRANSPORTATION PLAN AND PRINCIPAL STUDY FINDINGS

This section of the report presents a summary description of the improvements identified in the transportation plan, along with a listing of principal study recommendations and rationale.

Also provided in this section is a summary of the citywide transportation demand evaluation conducted using the citywide travel forecast model and operational analysis of the roadway network, a summary of the findings of the transportation and land use "white paper" analysis, and a summary of key points obtained through the public outreach process.

(Refer to Appendix A for a more detailed presentation of the travel demand modeling and operational analyses, including descriptions of all of the travel forecast projections and results which were developed.)

CITYWIDE TRANSPORTATION DEMAND EVALUATION

As part of the evaluation of the need for improvements to Mare Island Access, a transportation demand evaluation was made of the City's street and roadway system.

Land Use Assumptions

The travel demand evaluation is based on an analysis of conditions in the City of Vallejo for the year 2020. A projection of future land use in the City was made by the firm of Economic & Planning Systems as part of the Korve Engineering team for the Mare Island Access Study. The projection is based on control totals for Solano County as a whole as projected by the Association of Bay Area Governments (ABAG); on data from the City of Vallejo; and data from the Mare Island Reuse Plan.

With respect to the Reuse Plan, it is noted that the types of land use quantities included in that plan are more generic than those used within the City's travel forecasting model. For the purposes of preparing the Mare Island Access Study, a decision was taken to translate the generic categories in the Reuse Plan into more specific types and quantities for the travel model analysis.

The land use projections for the Vallejo mainland and for Mare Island are shown in Table 1 below. For Mare Island, the quantities represent one possible interpretation of the conditions set in the reuse plan. They do not represent City policy at the time that this evaluation is written, nor do they represent any form of entitlement. It can be expected that this data will change over time as the Reuse Plan is further refined for actual implementation. Some quantities in Table 1 may thus change, but the changes are not expected to have significant impacts on the conclusions drawn from this evaluation. Further, should major changes in land use intensity be proposed, the travel forecast model is available for further evaluation of transportation infrastructure demand.

The data in Table 1 was used for all of the alternatives evaluated in this study except one: Alternative 12 tested the impacts of an additional 700,000 square feet of office/industrial development in the northern portion of Mare Island. (Refer to Appendix R for a detailed description of the land use data used for the travel forecast model.)

Table 1
Land Use Assumptions for Travel Demand Analysis
Year 2020

Land Use	Units	Mainland	Mare Island	Total
Single Family Dwelling Units	Dwelling Units	34,231	883	35,114
Multiple Family Dwelling Units	Dwelling Units	14,801	523	15,324
Church	KSF[1]	238	0	238
Open Space	Acres	610	0	610
Elementary School	Students	12,774	529	13,303
Junior High School	Students	6,055	0	6,055
High School	Students	7,792	0	7,792
Retail	KSF[2]	3,841	153	3,994
Service	KSF[2]	3,638	789	4,427
Office	KSF[2]	1,397	819	2,216
Auto Sales	KSF[2]	369	0	369
Gas Station	KSF[2]	49	4	53
Warehousing	KSF[2]	1,127	1034	2,161
Industrial	KSF[2]	2,581	2755	5,336
Hotel	KSF[2]	640	0	640
Recreation	KSF[2]	493	159	652
Hospital	KSF[2]	1,916	70	1,986
Marina	KSF[2]	28	0	28
Government	KSF[2]	562	338	900
College	Students	400	4,800	5,200
Special Generators[3]	Trips	1,160	0	1,160

Notes:
(1) KSF = 1,000 Square Feet
(2) KSF = Occupied, 1,000 Square Feet
(3) Special Generators include Marine World/Africa USA Amusement Park and the ferry terminal.

Highway Network Assumptions

The highway network used for the 2020 analysis is a combination of the current (2000) network plus selected improvements contained in networks obtained from the Metropolitan Transportation Commission and from the Solano County Transportation Authority. These improvements may not necessarily yet be programmed (due to the 20 years to the horizon year), but they are generally anticipated to be in place. Major improvements include:

- Widening of I-80 in Solano County between the I-680 interchange and the Yolo/Solano County Line

- Completion of the four-lane freeway on SR37 between Mare Island and I-80
- Addition of one HOV lane in each direction on I-80 from the Carquinez Strait to SR 4
- Widening of SR 4 to freeway standards in western Contra Costa County and in eastern Contra Costa County between SR 242 and SR 160
- Construction of HOV lanes on US 101 in Marin and Sonoma Counties
- Completion of the six lane bridge between Hayward and San Mateo
- Widening of selected roads south of and between Vacaville and Fairfield

Within Vallejo, the only modification to the highway network was the addition of the soon-to-be constructed SR 37 freeway section between Mare Island and Fairgrounds Drive. The analysis tested a number of different improvement concepts for local circulation, as noted below.

Alternatives Evaluated

A total of 14 alternative scenarios were tested as the basis of this analysis. The scenarios include a combination of different roadway improvements, one land use alternatives (Alternative 12) and possible locations for the Vallejo Ferry Terminal.

The travel forecast evaluation indicated that the roadway level of service would generally remain acceptable with projected future land use plan. In other words, while the travel demand forecast for Year 2020 does show increases in traffic, the existing roadway systems generally have enough capacity to accommodate the projected traffic increases without developing unacceptable levels of congestion during the peak period, assuming a number of minor identified in the transportation plan are accomplished. Furthermore, the roadway improvements proposed in the development plans for Mare Island are generally adequate to accommodate the future demand on Mare Island with the identified Mare Island land use plans and the through lane configurations shown in this transportation plan.

Figure 2 indicates existing and future pm peak hour roadway volumes at selected locations which would be affected by the build out of Mare Island and downtown/waterfront development projects. The detailed results of this analysis, including evaluation of the pm peak hour levels of service are presented in Appendix A.

The assessment of transit services confirmed the near term need for a parking structure to accommodate both the planned expansion of ferry services as well as the proposed waterfront developments. Additional transit needs which were identified included provision of improved transit access to Mare Island, and development of a local bus transfer center at an alternative downtown location.

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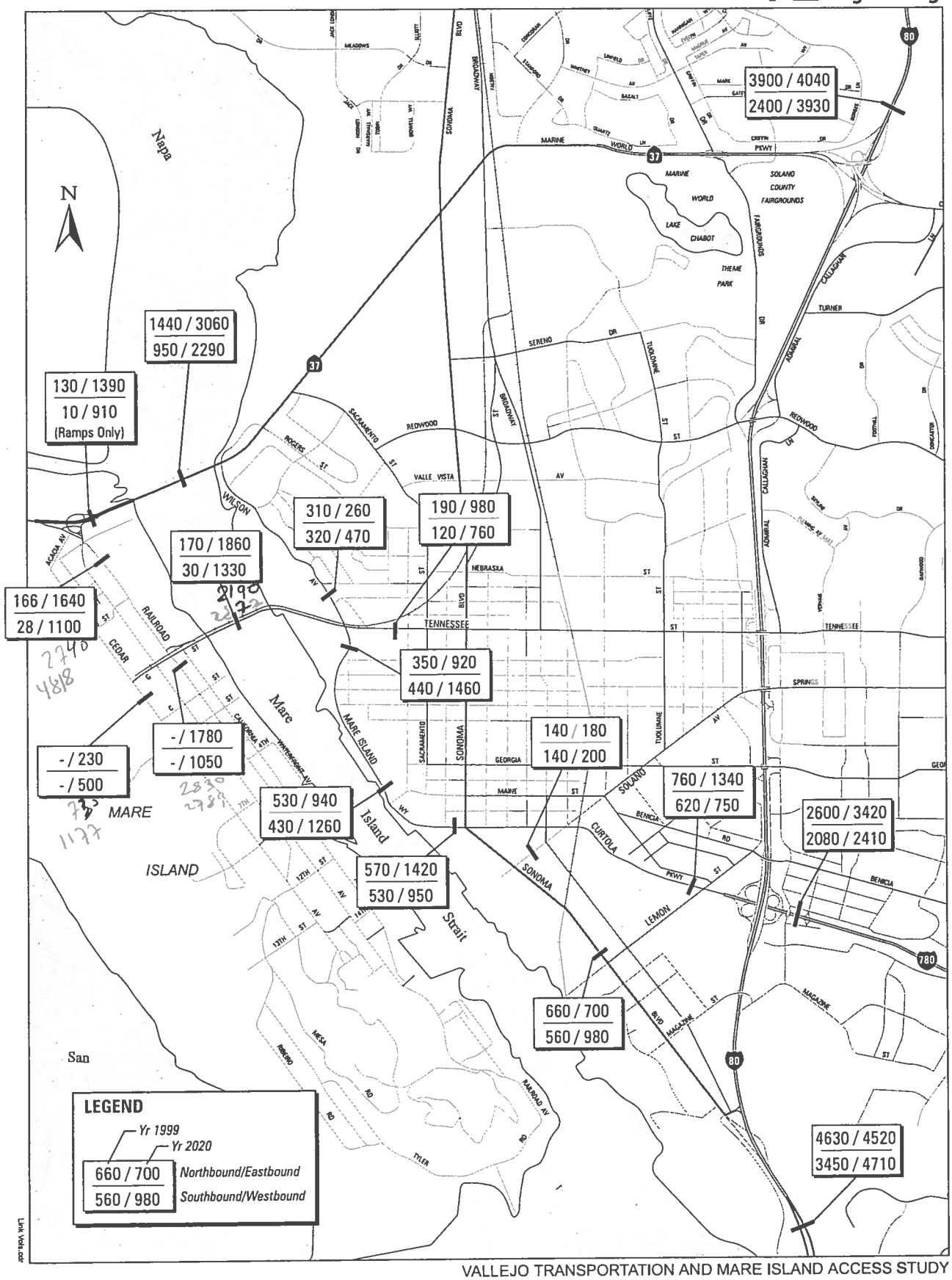

VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 2

SELECTED LINK VOLUMES

1999 Existing / 2020 Projected PM Peak Hour

PROPOSED TRANSPORTATION IMPROVEMENTS

The following specific improvements are identified in the Transportation Plan, as shown in Figures 3A and 3B. These proposals cover a wide range of major highway and transit options which were considered to support the re-use of Mare Island and on-going development of downtown and the waterfront.

Refer to the text in the following section for a brief description of these fifteen items, including their physical and operational elements and estimated cost. Environmental issues associated with each of the proposals is also discussed in a general sense; however, many of these proposals will need additional environmental clearance through a FONSI, Negative Declaration, EIR or EIS (see Section IV, "Implementation Plan", as well as Appendix J, "Identification of Environmental Issues and Constraints" for more details).

More detailed description of these alternatives, including the evaluation of various design options which were considered as well as those which were rejected, is provided in Appendix B with additional studies on specific improvements in other appendices, as noted in the listing below.

Proposed Roadway Improvements

1. State Route 37 Interchange Improvements – Includes provisions to provide satisfactory integration of interchange with proposed on-island roadway system as well as provisions to provide two-lane westbound-off and eastbound-on ramps. (Refer to Appendix C for additional details).

2. Causeway Bridge and Approach Improvements – Includes modifications to lane configuration of causeway and approach roadways, railroad grade crossing improvements and traffic management system to facilitate flow of all modes of travel across causeway.

3. Mare Island Way Modifications – Includes modifications to Mare Island Way to accommodate traffic, parking, bicycles and pedestrians. (See additional discussion in following section regarding "Principal Study Recommendations.)

4. Georgia Street Extension – Extension of principal downtown roadway to connect with Mare Island Way at Waterfront.

5. Capitol Street Extension – Extension of downtown collector roadway to connect with Mare Island Way at Waterfront.

6. Wilson Avenue Improvements – Urban design improvements to collector roadway segment.

7. Railroad Avenue Improvements – Reconfiguration of Mare Island arterial roadway to accommodate increased roadway traffic and retain railway lead track for service to industries.

8. Cedar Avenue Improvements – Reconfiguration of Mare Island arterial roadway to accommodate increased roadway traffic and retain railway lead track for service to industries.

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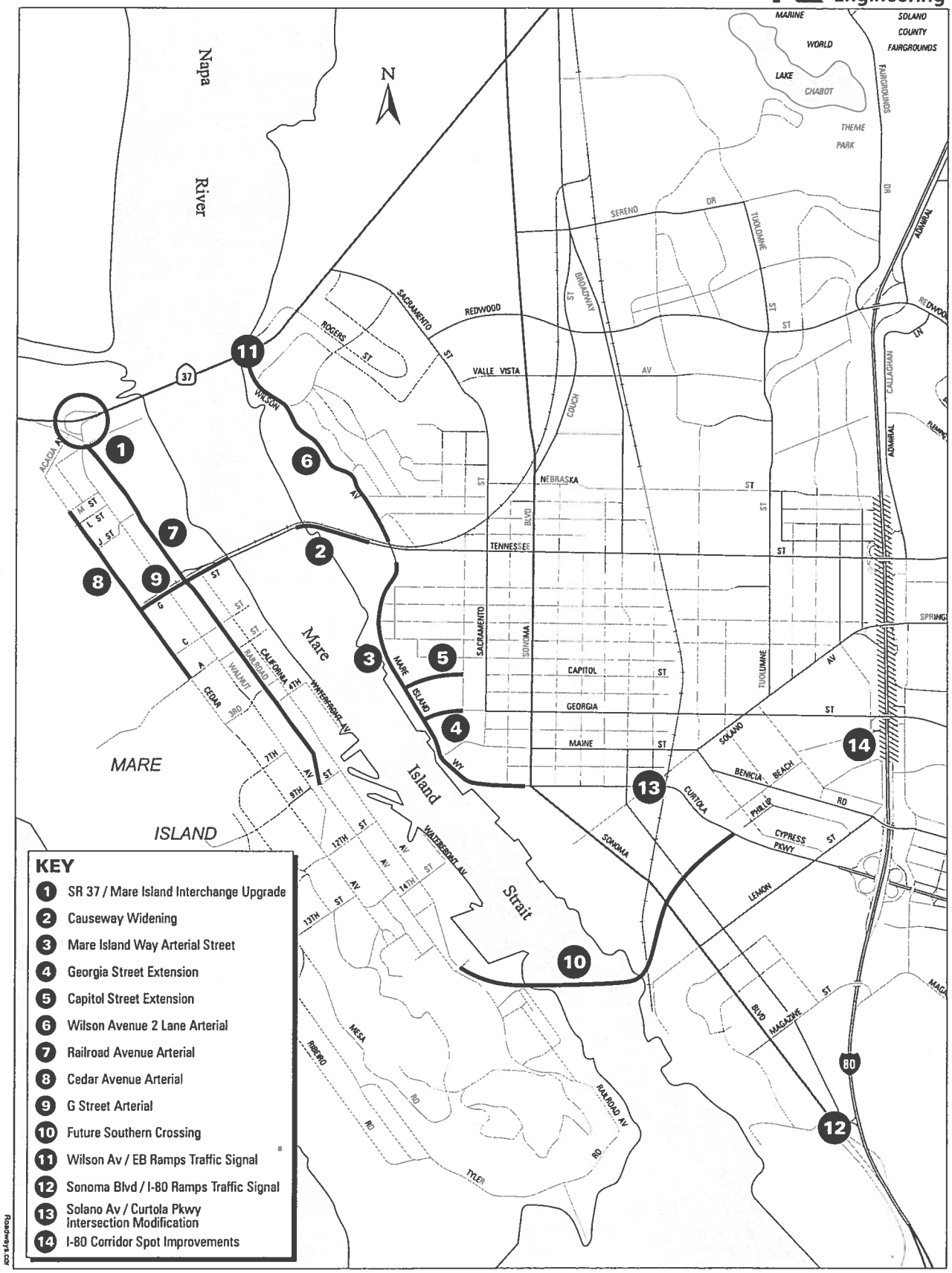

KEY

1. SR 37 / Mare Island Interchange Upgrade
2. Causeway Widening
3. Mare Island Way Arterial Street
4. Georgia Street Extension
5. Capitol Street Extension
6. Wilson Avenue 2 Lane Arterial
7. Railroad Avenue Arterial
8. Cedar Avenue Arterial
9. G Street Arterial
10. Future Southern Crossing
11. Wilson Av / EB Ramps Traffic Signal
12. Sonoma Blvd / I-80 Ramps Traffic Signal
13. Solano Av / Curtola Pkwy Intersection Modification
14. I-80 Corridor Spot Improvements

Roadways.cdr

MARE ISLAND ACCESS STUDY

Figure 3A

PROPOSED ROADWAY IMPROVEMENTS

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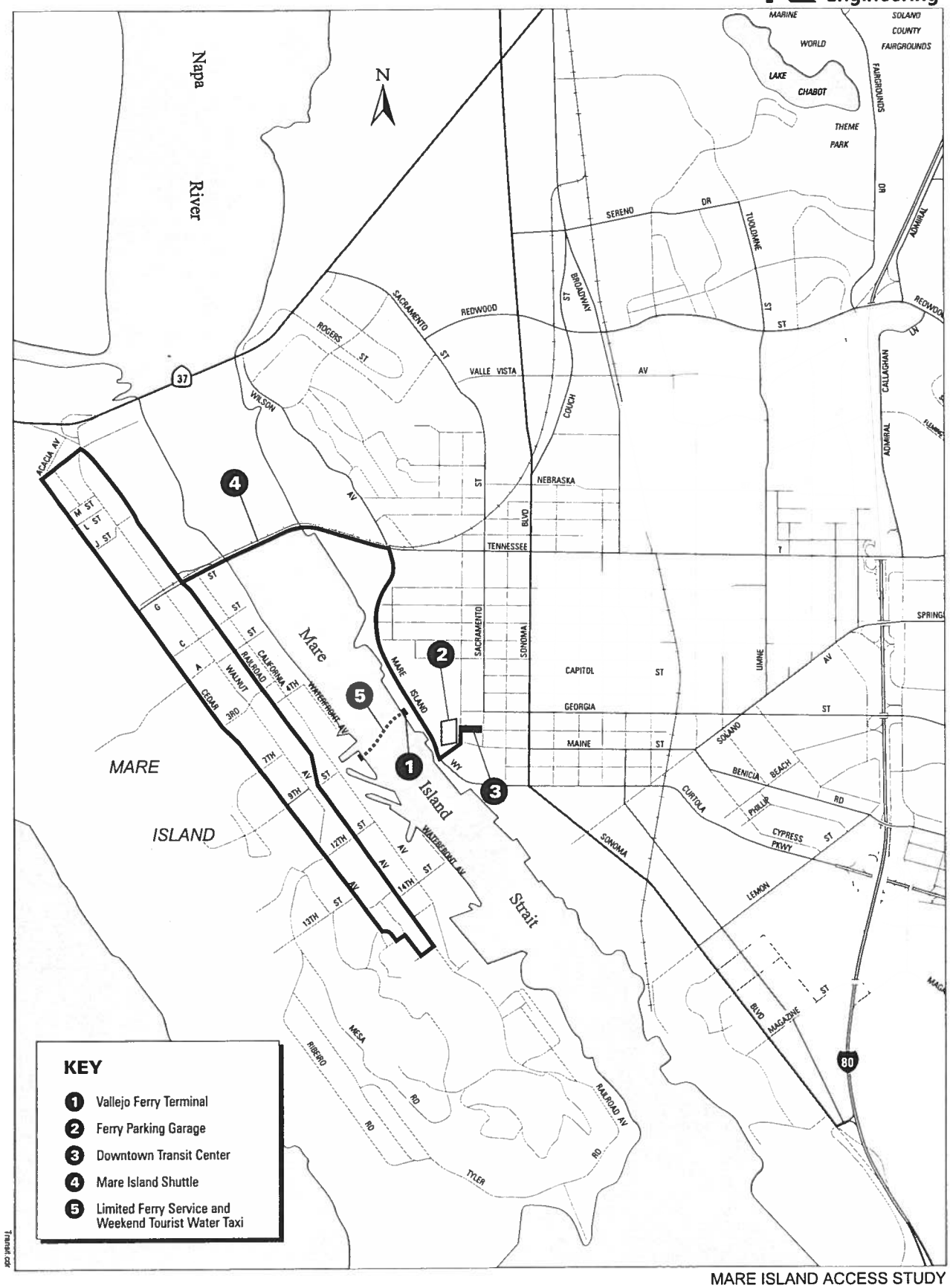


MARE ISLAND ACCESS STUDY

Figure 3B

PROPOSED TRANSIT IMPROVEMENTS

9. G Street Improvements – Reconfiguration of principal East-West island roadway to handle traffic to and from the Causeway bridge.

10. Southern Crossing Bridge – Potential long-term improvement to provide better access to southern portion of Mare Island. (See additional discussion in following section regarding "Principal Study Recommendations".)

11. Wilson Avenue / State Route 37 Eastbound Ramps Traffic Signal – Traffic signal required over the long term to maintain adequate level of service

12. Solano Avenue / Interstate 80 Ramps Traffic Signal – Traffic signal required over the long term to maintain adequate level of service

13. Solano Avenue / Curtola Parkway Intersection Improvements – Intersection spot improvements needed over the long term to maintain adequate level of service

14. Interstate 80 Corridor Improvements – Near term spot improvements and possible long term improvements to provide better traffic operations along the I-80 corridor. (Refer to Appendix D for additional details.)

Proposed Transit Improvements

1. Existing Ferry Terminal Improvements – Ferry service to remain at existing terminal with acquisition of new vessels; reconfiguration of local roadways to retain regional bus connection. In addition, a permanent maintenance facility is needed to replace the existing temporary facility – refer to Item 5, "Mare Island Ferry and Water Taxi Service". (See additional discussion in following section regarding "Principal Study Recommendations".)

2. Shared Ferry Parking Structure – Parking to serve additional ferry service demand and to create opportunities for Waterfront development provided in conjunction with ferry expansion as multimodal center. (Refer to Appendix H for detailed analysis.)

3. Downtown Bus Transfer Center – Eliminate existing on-street transfer point and provide improved, off-street center within walking radius of Downtown and ferry terminal. (Refer to Appendix E for bus bay requirements, and to Appendices F and G for operational analyses. Also, see additional discussion in following section regarding "Principal Study Recommendations".)

4. Mare Island Bus Service – Provide new route to serve Mare Island connecting to ferry terminal and new Downtown bus center. (Refer to Appendices F and G for detailed analysis.)

5. Mare Island Ferry and Water Taxi Service – Limited service by San Francisco ferry on "back leg" of journey to Mare Island Historic District supplemented by privately-funded weekend tourist water taxi. A site on Mare Island opposite the existing downtown ferry terminal has been identified as a location for a permanent ferry maintenance facility. This facility could also be used as the location for a future staging area for ferry connections to Mare Island. (Refer to Appendix I for an evaluation of water taxi service.)

PRINCIPAL STUDY RECOMMENDATIONS

The following ten key recommendations have been developed:

1. Southern Crossing Bridge – Not Needed until Beyond Year 2020
2. Ferry Terminal – Service Should Remain at the Existing Location
3. State Route 37 Interchange – Improvements Are a High Priority for Mare Island
4. Causeway and Mare Island Roadways – Existing and Proposed Facilities Can Accommodate Re-Use Traffic
5. Mare Island Transit Access – A Local Bus Connection Will Provide the Best Transit Link to Mare Island
6. Mare Island Goods Movements – Maintain Provisions for Rail and Truck Service to Mare Island
7. Mare Island Way Configuration – Provide 4 Peak Hour Lanes with Parking on Mare Island Way by Year 2010
8. Downtown Bus Transfer Center – Consider Relocating to Off Street Location
9. Interstate 80 Interchanges – Do Not Meet Present Standards but Can Accommodate Proposed Development
10. Transportation and Economic Development Linkage – Best Served by Allowing Development Drive Transportation Investment

These recommendations were developed as a result of a comprehensive transportation planning process which included evaluation of long-term transportation demand, engineering feasibility, environmental constraints, and community input.

The rationale leading to each of these recommendations is described below:

- ❑ Southern Crossing Bridge – Not Needed until Beyond Year 2020: The travel forecast model indicated that the two existing Mare Island access points, the causeway and the Route 37 interchange, would be approaching, but would not exceed capacity in the horizon year of 2020. Therefore, while peak period traffic conditions at these two locations would be congested, an additional access point would not be required strictly due to capacity. A new bridge would result in time savings ranging up to ten minutes between points located south of the causeway on Mare Island, especially to destinations south and east of the causeway in Vallejo and beyond, but would not have any significant travel time savings between points on Mare Island and the mainland north of the causeway. A final transportation benefit would be reduction in traffic levels on Mare Island Way, which is the principal local roadway alternative (in conjunction with the causeway) to the Southern Crossing for points to the south.

The study team also considered possible benefits of enhanced economic value of lands in southeast Vallejo and on Mare Island as a result of the improved access and capacity provided by the Southern Crossing (refer to text below regarding the "White Paper"). The conclusion of the economic analysis, however, was that, in order to take advantage of the access and capacity provided by a new bridge, significantly higher land uses would need to be allowed. However, it was decided at the outset of the study that consideration of Mare Island intensities over and above those recognized in prior planning, land use policy and environmental studies would not be factored into the travel demand forecasting effort.

The conclusion reached in the evaluation process was that neither the transportation benefits nor the possible economic benefit of the Southern Crossing would justify its inclusion in the transportation plan as a project to be constructed by the study horizon year of 2020. This finding was consistent with the funding analysis, which indicates that there are numerous other projects which would need to be funded by year 2020, and which would compete against available local and outside sources of funds.

However, since a new bridge would have transportation benefits, and since it is possible that changes could be proposed for Mare Island land uses in the future, the study recommendation is to leave the Southern Crossing in the plan as a long term project, subject to future need and funding opportunity. The study team was successful at identifying two feasible alignments for the bridge, including one which would have minimal land use impact. A two-lane facility would be adequate to serve the land use plan which was considered, and the facility would cost about $75 million.

- Ferry Terminal – Service Should Remain at the Existing Location: The study team considered a range of site locations south of the existing terminal along the Mare Island Strait and also considered splitting the service between the existing terminal and a new terminal further south. It is recommended that the ferry service remain at the downtown location with development of a mixed-use project including parking and ancillary residential and commercial uses for a number of critical reasons:

  Cost of Replacement Terminal – The cost of a new terminal at an alternate site with surface parking sized to meet the needs with the planned service expansion to four boats would be at least $23 million, not including right-of-way. This cost is similar in magnitude to the $26 million which was estimated for construction of both a parking structure and a nearby off-street bus transfer center in the downtown/waterfront area. However, construction of a parking structure at the downtown/waterfront location opposite the existing ferry terminal would free up land for additional development and would also provide a large parking supply to support evening and weekend activities in the downtown area.

  Waterfront Land Utilization – The $23 million estimated for a replacement ferry terminal does not include any amount for right-of-way cost. Although at present time alternative sites such as the "Kaiser" property south of Curtola Parkway may be acquired at low cost, as the waterfront develops allocation of waterfront land for surface parking would no longer be the best and highest use (e.g., the Port of Oakland has an on-going program of replacing surface parking lots in the Jack London Square area with structured parking). Therefore, it is likely that the a parking structure would be required at an alternative ferry site in the longer term,

in which case the investment in surface parking would be lost. In addition, the opportunity for sharing parking at a southern site would be less compared to the existing downtown location where civic attractions such as a performing arts center, government buildings, and other commercial uses with more potential for evening and weekend activity have been proposed.

Trade-off Between Time Savings and Feeder Bus Access for Southern Sites – Studies were conducted of the benefits of moving the ferry terminal to alternative sites immediately south of Curtola (the "Kaiser") site, south of Solano, and in the vicinity of Lemon Street. Analysis of vessel speed indicated that moving the ferry terminal to the Lemon Street location would offer a time advantage of up to 6 or 7 minutes and boost ridership by as much as 10 percent, whereas moving the terminal to a mid-way point near the "Kaiser" site would only save 3 minutes. On the other hand, analysis of the feeder bus requirements indicated that the Lemon site would be more difficult to serve, thereby resulting in increased travel time and operational cost for local transit access. The Lemon Street location was ruled on partly on this basis and also due to significant concerns expressed by the South Vallejo neighborhood that a new ferry terminal should be developed as part of an overall improvement plan, not just as a single use of the waterfront. Although the feeder bus impacts would be marginal at the Kaiser site, the time savings would also be marginal, allowing for a slight improvement in schedule reliability but not reduced scheduled travel times to San Francisco. As a result, it was concluded that deployment of faster boats, which would be possible with advancing vessel technologies would be more effective at addressing travel times compared to moving the terminal location to the Kaiser site.

Split Service Not Viable – Consideration was given to splitting the service with a new terminal dedicated to commuter service developed further south along the Strait and with service to the existing terminal continued primarily for bus and walk access, as well as weekend service. However, there would be a severe impact to the operating plan with a double stop – likely adding 15 minutes of total travel time. Given the longer travel times to San Francisco, patronage from the existing terminal would primarily consist of those transferring from bus or local walk trips: The increase in overall turn-around time would result in longer headways between trips given the same number of vessels, potentially reducing overall patronage well and certainly reducing the hourly capacity of the service to San Francisco.

Proximity to Proposed Permanent Maintenance Base – The temporary Vallejo Baylink maintenance facility located at the north end of Mare Island needs to be replaced with a permanent facility. A site has been identified on Mare Island directly opposite the existing downtown ferry terminal. It is proposed that Building 165 be reconstructed at a cost of $3 million to be used for maintenance, storage, dispatch, administration, and crew headquarters. A total of $5 million will be needed in order to add fuel capacity and a maintenance dock. The new dock could potentially be used as the location of a future staging area for ferry connections to Mare Island, with service directly across the strait to the existing downtown terminal on the "back leg" of operations to and from San Francisco at the beginning and end of each vessel's peak period runs.

For all of the above these reasons, it is recommended that the existing terminal be enhanced with the addition of a parking structure to accommodate the demand associated with the planned fleet expansion.

- State Route 37 Interchange – Improvements Are a High Priority for Mare Island: The study team verified that the Mare Island roadway system proposed by the developers would be adequate to serve the island. However, modifications would be required within the state right-of-way of the Route 37 interchange to direct both north and southbound traffic to Railroad Avenue as shown in the development plans. These improvements are a high priority need, and therefore were developed in a separately-bound Project Study Report (PSR) for submittal to Caltrans.[2] The PSR defines Phase A to include revising the ramp roadways to accommodate a future re-striping (defined as Phase B) to provide the two-lane westbound off and eastbound on ramps, as described further below. The estimated cost of Phase A is $4.2 million.

  However, the study team also determined that the Route 37 ramps to-and-from the east would be approaching capacity with the build out of Mare Island, especially if the higher density level which is allowable under City Council policies is attained. Since it would be unwise to allow currently approved development to use up all of the available interchange capacity, it is recommended that the City pursue two-lane eastbound-on and westbound-off ramps. The Project Study Report identifies as Phase B a $100 thousand re-striping project which could be accomplished after Phase A is completed.[3] This improvement should be pursued now since it is packaged as an add-on to the near term improvement.

  Finally, there is a long-term project which could provide two-lane ramps which would be compatible with a future widening of Route 37 between Mare Island and Marin County.[4] This project is not recommended for near term implementation, but has been included in the plan as a possible future project, subject to development of high ramp volumes in conjunction with widening of Route 37. This project, which is designated as Phase C in the PSR, would cost about $36 million.

- Causeway and Mare Island Roadways – Existing and Proposed Facilities Can Accommodate Re-Use Traffic: The peak hour volumes forecast on the Causeway would approach, but not exceed the mid-block capacity of a single lane (1,800 - 2,000 vehicles per hour). Additionally, the intersections at Railroad Avenue and Tennessee Street on either end of the Causeway would operate at LOS C or D with the improvements proposed at Route 37, even without a Southern Crossing bridge. Therefore, no additional capacity would be required in the vicinity of the Causeway to serve Mare Island.

  The "pro forma" analysis of the Causeway (refer to the following page) as a free-flowing link running at capacity with signalized intersections at either end demonstrates that the Causeway, with one through lane in each direction would be in capacity balance with signalized intersections configured with two through lanes plus supplemental left and right

[2]Refer to Appendix C, Alternative 2, Phase A (Figure 1).

[3]Refer to Appendix C, Alternative 2, Phase B (Figure 2).

[4]Refer to Appendix C, Alternative 2, Phase C (Figure 3).

Roadway – Intersection Pro Forma

Evaluation of Peak Flow Direction

- Assume 2,000 veh/hr on the approach (equivalent to one free-flowing lane at capacity)
- Assume 60% / 40% peak period directional split (e.g., opposing flow is 1,333 vehicles)
- Assume 60% of green time allocated to major arterial (with 40% of green time allocated to cross street traffic or to satisfy minimum pedestrian green times)

Typical Turn Percentages and Optimal Geometry

- 80% through traffic with 20% turning traffic (left and right)
- Two through lanes with exclusive right turn bay in peak flow direction
- Opposing left turn volume is 100 veh/hr, per lane, maximum

Calculation of Approach Capacity for Peak Direction

- Critical volume is 800 veh/hr per lane in through direction plus 100 veh/hr per lane in opposing left turn equals 900 vehicles / hour
- Effective capacity with 1,800 veh/hr per lane saturation flow is 1,800 x .85 (effective green efficiency) x .60 (effective green proportion on major route) equals 920 veh/hr
- Intersection loading is 900 / 920 equals 98% of capacity (LOS E/F condition)

❖ *Conclusion #1 – Two lane free-flowing roadway carrying 2,000 veh/hr is in balance with four lane signalized intersections with supplemental turning bays*

Calculation of Daily Flows

- Peak period flow with highly directional flow (e.g. 60% peak / 40% reverse peak directional split) is 2,000 plus 1,333, which totals to 3,333 veh/hr
- Peak period flow with balanced directional split (e.g. 55% peak / 45% reverse peak) is 2,000 plus 1,636, which totals to 3,636 veh/hr
- Daily flow with sharp peaking (e.g., 11% peak hour to daily flow ratio) and highly directional flow is 3,333 / 0.l11, which equals 30,000 daily vehicles
- Daily flow with sharp peaking (e.g., 11% peak hour to daily flow ratio) and balanced directional flow (e.g., 55% peak / 45% reverse peak) is 3,636 / .11, which equals 33,000 vehicles per day
- Daily flow with extended peak period (e.g., 8.5% peak to daily flow ratio corresponding to 2+ hours of peak traffic level) and highly directional flow is 3,333 / .085, which equals 40,000 daily vehicles
- Daily flow with extended peak period (8.5% peak to daily flow ratio) and balanced directional flow is 3,636 / .085, which equals 43,000 vehicles per day

❖ *Conclusion #2 – Roadways with balanced directional flows accommodate 10% more traffic with the same number of lanes*

❖ *Conclusion #3 – Roadways operating with extended peak periods can accommodate 33% more traffic on a daily basis compared to roadways with sharp peaking*

❖ *Conclusion #4 – Roadways with balanced directional flows and extended peak periods can accommodate 40% more traffic on a daily basis compared to roadways with highly directional flows and sharp peak periods*

turn bays. Therefore, special treatments such as a reversible center lane would not effectively increase the capacity of the connection. Specifically with regard to Mare Island, the pro-forma analysis indicates that the Causeway could carry up to 40% more traffic on a daily basis compared to a typical arterial with a sharp peak period and highly directional flow if an extended peak period with balanced in-and-out flows results from the mix of uses proposed on Mare Island, from implementation of "flextime" programs by large employers, and/or as a result of general congestion in the regional roadway system affecting inbound traffic in the am peak period as well as localized congestion in the vicinity of the Route 37 interchange and Causeway connection during the pm peak period.

Operation with the current configuration in which the rail track occupies a central reversible travel lane is problematic: When a train is present, it crosses the westbound lanes at the east approach and the eastbound lanes at the west approach, effectively interrupting vehicular service in both directions. At the same time, when a train is not present, the two outside lanes provide inadequate "shy distance" from the bridge curb and the central reversible lane does not add to the effective capacity, which is governed more by the approach roadway intersections than the two directional lanes on the bridge. The recommended solution is to re-stripe the bridge to provide two 15-foot wide lanes. These lanes would be wide enough to increase driver comfort and allow cars to pass bicycles which could remain on-street across the causeway. (The sidewalk would remain for pedestrian traffic and cyclists not choosing to use the roadway, which would improve pedestrian conditions.)

Three management strategies are proposed to maximize the utility of the bridge:

- Railroad operations should be prohibited during peak traffic hours (7-9AM, 11AM-1PM and 4-6PM); It is further recommended that a traffic management system consisting of changeable message signs be installed along approach routes to advise motorists to use alternate routes when trains would be detected approaching the Causeway during times of scheduled train operation.

- Large trucks should also be prohibited during peak traffic hours. Trucks can use the SR 37/Mare Island interchange during the peak.

- An agreement should be reached with the Coast Guard to prohibit raising the bridge during peak hours. Other key bridges in the Bay Area, such as the High St. and Fruitvale Ave. bridges in Alameda are protected by such an agreement.

The KORVE study team evaluated various roadway options for Mare Island and determined that the roadway systems proposed by the developers could function adequately to serve the projected traffic levels. This would include provision of 6 lanes plus a center turn lane on Railroad Avenue north of the Causeway, reconfiguration of Railroad Avenue to five lanes with a railroad spur shared with a center turn lane from the Causeway to south of the Historic District, and provision of four through lanes on Cedar and G Streets.[5]

[5] A proposed roundabout at Railroad and G Street was found inadequate and has been withdrawn from further consideration.

As the development plans are finalized, the island roadways should be refined with respect to specific intersection locations and supplemental turn bay requirements. Major, full access driveways and intersections should be located a minimum of 400 feet apart (preferably 600 feet), with partial access driveways and intersections generally located at about one half of this distance.

- Mare Island Transit Access – A Local Bus Connection Will Provide the Best Transit Link to Mare Island: The study team considered a variety of means of providing transit service to Mare Island and concluded that provision of a new bus route from the Downtown transit center, with stops at the ferry terminal, would be the best solution. The new route is proposed as a two-way loop on Mare Island: The two-way loop would provide for bi-directional on-island circulation along Cedar and Railroad, providing bus transit coverage for both access and circulation for most of the developed areas of the island.

  Water-based access was not recommended for commute and recurrent trips since an island shuttle bus or circulator would still be required, resulting in an additional transfer and longer travel times. (However, a water taxi serving the historic district and other selected points along either side of the Waterfront could be feasible as a private-sector, tourist-oriented service.)

  The Mare Island transit service was proposed with two phases of service expansion and the capital cost of the phase one bus facilities was included in the implementation plan: phase one, to be implemented by Year 2005, would provide fifteen-minute headways, and phase two, to be implemented by Year 2010, would provide bus service with 8 minute headways. Unfortunately, no new revenue source was identified to defray the operational cost of the service. The annual operating subsidy required was estimated at $640,000 for phase one and $1.6-million for a phase two service plan. In addition, no funding was identified for the phase two capital cost of $860,000.

- Mare Island Goods Movements – Maintain Provisions for Rail and Truck Service to Mare Island: Mare Island has an existing rail network which is used by a number of shippers. Rail access is especially suitable for moving large and heavy shipments, and bulk goods. However, most goods movement will be by truck – especially smaller shipments, and goods which are bound for local destinations or which must be moved on a time-critical basis. The study team identified improvements to the on-island rail lines to be made in conjunction with reconfiguration of the causeway, its approaches, and island roadways to accommodate on-going rail access with minimal impact to traffic. These would include shifting the rail track along Railroad Avenue to a median location north of the historic district, shifting the track to the west side of Cedar, and providing "run around" tracks at either end of the island, in addition to the previously-mentioned Causeway traffic improvements. (Refer to Section III of the report for a more detailed description of the proposed improvements.)

  Trucks service can presently be provided via the Route 37 interchange or the Causeway. The increase in lane widths on the Causeway will facilitate truck flow across this link. On Mare Island, Railroad Avenue, G Street and Cedar north of G Street will become the principal truck routes. Other roadways will primarily be used for local access by trucks. Truck movements, especially traffic between points south and east of the Causeway in Vallejo and beyond in the I-80 and I-780 corridors, are presently accommodated along

Mare Island Way, which is a designated truck route. Retention of this route will provide the most direct truck connection between Mare Island and locations in Downtown Vallejo and beyond. The percentage of trucks on an arterial such as Mare Island Way would typically be in the five to ten percent range; of these, a small proportion are the larger multiple-unit "semi trailer" type of vehicles. If the City decides to limit trucks on Mare Island Way, one method would be to limit its use to vehicles which exceed 5 tons. This would allow the smaller "delivery van" type of trucks and other commercial vehicles which would otherwise potentially impact Sonoma and Tennessee to access Mare Island via the Causeway or Route 37 interchange.

- Mare Island Way Configuration – Provide 4 Peak Hour Lanes on Mare Island Way by Year 2010: Considerable attention was given to the configuration of Mare Island Way during the course of the study. Although the Waterfront plan indicated a curved alignment, this was later withdrawn. A straight alignment would result in a larger "triangle parcel" between Mare Island Way, the Georgia extension and Maine, where parking for the ferry terminal and other uses would be provided. With the roadway remaining largely in place along its existing alignment, consideration was given for re-configuring the roadway within the existing curbs as well as other options involving additional reconstruction.

  The travel forecast model indicated that Year 2020 peak hour volumes would approach 1,500 vehicles/hour, which would require a facility with four through lanes for good operation.

  Construction of the Southern Crossing (not recommended for construction prior to Year 2020 nor included in the funding strategy) would reduce the volume to about 1,000 vehicles/hour, which would require provision of four through lanes at all signalized intersections and which would be subject to stop and go conditions if on-street parking was allowed.

  A travel forecast model run with a two-lane Mare Island Way indicated that more than 900 vehicles/hour would be attracted to the facility even with a narrowed roadway, which would result in poor traffic operation both at the intersections as well as at mid-block locations if parking were allowed. In addition, the shift in traffic would push intersections along Tennessee at Mare Island Way and Sonoma to beyond 90% of capacity, resulting in significant congestion which could potentially divert through traffic onto parallel neighborhood roadways.

  These studies indicate that Mare Island Way is a critical access link to Mare Island and it is recommended in the interest of economic development that the existing facility be re-striped within the existing curb-to-curb dimension to provide a wide outside lane to accommodate occasional on-street bicycles, and the shoulder could be striped to accommodate right-turn lanes or bus stops at the intersections, with a parking a parking zone mid-block. This utilization of the existing street would allow the construction of additional signalized intersections to accommodate increased pedestrian activity along the waterfront as well as parking and bicycles without severely impacting the ability to accommodate the long term traffic need.

  On street parking along Mare Island Way can help reduce the number of costly structured parking stalls needed to support the expansion of the ferry service. Wider sidewalks for

an enhanced pedestrian environment can be provided by expanding into existing right-of-way to the outside.

In the near term, Mare Island Way could operate with two through lanes, although four lanes should be provided south of the entrance to the ferry parking. Given the existing volume level, it is likely that the four peak hour lane threshold will be attained by Year 2010, assuming continuous development. It is also likely that, by year 2020, four peak hour lanes would be needed mid-day as well, since mid-day volumes can be sixty to seventy percent of the peak hour level in locations with retail and commercial traffic.

- Relocate the Downtown Bus Transfer Center: The existing bus transfer center at York and Marin Streets, which serves some 3,500 to 5,000 Vallejoans each day, has a dual purpose: It allows for patrons to transfer between intercity and local routes in the southeast and central portions of Vallejo easily since many buses arrive and depart at the same time ("pulse mode") and it also provides convenient access to downtown and waterfront destinations. (Vallejo's current bus headways are such that it is not practical for a patron to make more than one transfer between routes on a single trip between two points.)

  The current transfer center at Marin and York Streets utilizes the public sidewalk for loading and waiting for buses. The existing site is also a long distance by foot from the ferry terminal. The study team identified a mid-block location between Santa Clara and Sacramento Streets, along what would be a westerly extension of York Street, where an off-street transfer center could be constructed through existing public parking areas. An off-street center at this location would be closer to the ferry while remaining on the edge of Downtown, and it could be designed as an attractive, safe and secure facility. In conjunction with a pedestrian connection to the ferry parking through or alongside the parking structure, all the elements, including ferry terminal, regional bus stops, parking and local bus transfer center could operate as a multimodal center serving Downtown and the Waterfront.

- Interstate 80 Interchanges – Do Not Meet Present Standards But Can Accommodate Proposed Development: The study team evaluated the interchanges along I-80, with a focus on the area from Tennessee to Georgia, which serves the heart of the Downtown area. The capacity analysis indicated that, excepting main line levels of congestion, the local roadway intersections at the freeway ramps have adequate capacity to accommodate all of the development projected for Mare Island and the balance of the City of Vallejo through to the horizon year of 2020. Furthermore, there was very little impact to the freeway or freeway ramps of any of the fourteen different transportation and land use scenarios which were tested.

  However, evaluation of design standards at these interchanges indicated that there were many geometric conditions which would not meet today's design standards. The study team developed a number of possible options for reconfiguring the interchanges, however, it was concluded that these alternatives would have a major land use impact along the freeway corridor due to the greater spacing, length and radius required for ramps which would meet present-day standards. In the absence of demonstrated need for additional capacity, major improvements have not been included in the transportation plan.

The study team did identify some low-cost "spot" improvements which can be made to improve operations and safety at the ramps. In addition, the team is recommending that the City encourage Caltrans to do a comprehensive study of all of the Vallejo interchanges, from SR-29 just north of the Carquinez Bridge to the Route 37 / I-80 interchange.

- ❑ Transportation and Economic Development Linkage – Continue to Develop Transportation In Support of Economic Development: Investment in transportation capacity can, in the long run, allow for much greater development intensities than might be accommodated by existing facilities and in that context is considered a prudent investment. However, transportation improvements, as with any required infrastructure, represent a cost to development and do not in and of themselves enhance the financial feasibility or projected cash flows. Therefore, the City is encouraged to allow the maximum amount of development at each phase of development, with commensurate transportation improvements. This study identified that the proposed Mare Island land use plan was approximately in balance with the access capacity to the island. As the island build-out occurs, a variety of techniques can be considered to allow deferment of transportation investments and/or higher land use intensities than previously considered. These techniques include, but are not limited to: provision of higher levels of transit services, application of Transportation Demand Management techniques (TDM) such as flextime, car- and van-pooling, and re-evaluation of actual traffic levels and trip generation characteristics of the existing land uses. To this end, it is recommended that the City establish a "traffic monitoring" program for the island to provide a baseline for assessing an on-going review of travel demand and appropriate responses. This could either consist of regularly-scheduled manual counts of traffic on-and-off of the island, or could be accomplished by installing permanent traffic counting loops into the pavement (since there are only a limited number of lanes on and off the island.)

FINDINGS OF TRANSPORTATION AND LAND USE ECONOMICS WHITE PAPER

The consultant prepared a "White Paper" analysis of transportation and land use economics for Vallejo which looked at the development opportunities within Vallejo in the context of regional conditions in Solano County and the Bay Area as a whole (refer to Appendix M.) The White Paper specifically looked at the economic background conditions for development in Vallejo and the relationship between the costs and benefits of proposed transportation improvements in this context.

The findings provided in the White Paper were considered in the evaluation of the alternatives as well as in the development of the proposed project phasing and funding plan.

Key findings were as follows:

Economic Context

- ❑ Residential Growth – Vallejo is the largest city in Solano County, which is anticipated to be the fastest growing county in the nine-county Bay Area through Year 2020. This translates into a growth of 7,520 households from 1995 to 2020 with more than half of this growth expected to occur by the year 2010.

- New Residential Construction – A majority of the new homes currently being constructed and sold are single family units located in the "New Vallejo" area outside of the downtown and east of Interstate 80. According to sales representatives within the "New Vallejo" area, the strong demand for single family homes comes primarily from the "move up" homebuyer market segment that is moving out of more expensive parts of the Bay Area (e.g., Oakland, Alameda, San Francisco, and Marin) to Vallejo. The homebuyers are frequently dual-income households where one spouse commutes to one Bay Area location (e.g., San Francisco) and the other spouse will commute to a different Bay Area location (e.g., Vacaville). The central location of Vallejo, with its easy access to freeways, BART, and the ferry, make the split commute more attractive.

- Employment – In the years 2000 to 2020, Solano County is projected by the Association of Bay Area Governments (ABAG) to experience the largest percentage increase (nearly 63 percent) in employment of any of the Bay Area counties, with Vallejo anticipated to contribute a significant amount to the future expansion. Solano County jobs are projected to reach 210,780 by 2020, with 53,260 of these in Vallejo. Measured from 1990, preceding the Mare Island base closure, Vallejo's projected job growth to 2020 would be over 38 percent, with some 14,710 net new jobs.

- Commute Patterns – The majority of Vallejo and Solano County workers will remain out-commuters, in the absence of major changes in existing growth patterns. Despite the overall numbers, the addition, within Vallejo, of more jobs than employed residents will afford at least some currently out-commuting residents opportunities for finding work closer to home. "Bringing home" an additional share of Vallejo's workforce would benefit sales by local retain and personal service outlets, because many workers shop at midday and on their way to and from their worksites.

Local Competitive Attributes

- Economic Spillover – Economic activity emanating from San Francisco and Silicon Valley is expanding into peripheral markets in the Bay Area to take advantage of lower cost land and labor. Solano County is particularly well positioned to benefit due to the fact that it is a relatively short commute to some of these destinations. Vallejo's location along Interstate 80 makes it well positioned in the region. The Vacaville/Fairfield area in central Solano County is already capturing an increasing proportion of the Bay Area's economic growth. Industry sectors represented include high technology, financial services, wholesale distribution, and retail. Markets in Contra Costa and Alameda Counties that first benefitted from the San Francisco and Silicon Valley spillover are themselves becoming increasingly built out, presenting a clear opportunity for Vallejo and other communities in Solano County.

- Vallejo's Competitive Attributes – If well-developed and integrated with the rest of the City and region, the Mare Island and Waterfront/Downtown areas stand to significantly benefit from the strategic location in Solano County and the Bay Area. In many ways, Mare Island and the Waterfront/Downtown areas are equally if not better positioned geographically than the County's existing growth areas, offering benefits such as a more temperate climate, unique geographical environment with opportunities for water views, historical setting, and closer proximity to inner Bay Area locations. Vallejo has kept rather than razed many of its old downtown buildings. Consequently, the Waterfront/Downtown area

maintains a historical architectural form with the potential to be redeveloped into an appealing commercial and business district. In addition to highly desirable attributes for residential development, Mare Island and the Waterfront/Downtown are also well situated for a variety of office, research and development, and industrial uses.

- Vallejo's Liabilities – Due to Vallejo's historic reliance on Mare Island, the city had a relatively more difficult time climbing out of the 1990 recession. The depressed climate made businesses and developers more reluctant to invest in Vallejo, given abundant opportunities elsewhere. Also, Vallejo has had a relatively poor image within the region, especially with regard to crime and schools. A final liability has to do with the shortage of flat, vacant and easily developable land. For example, acquisition of large developable sites in the Downtown/Waterfront area will require assembly of parcels, public sector land swaps, demolition and possible environmental remediation. On Mare Island, with the exception of the north end of the island, where a large scale development is planned, many of the existing buildings were not designed to accommodate modern businesses and commercial activities.

Role of Transportation Improvements

- Existing Conditions and Strategy – Traffic congestion and accessibility are not currently major impediments to economic development on Mare Island or in the Waterfront/Downtown zone; if anything, current transportation conditions are an advantage. Given this condition, major transportation improvements alone are not likely to transform the area's development patterns in the short term. Rather, immediate transportation investment should focus on allowing for the development of particular sites and target areas. (In the long term, as Mare Island and the Waterfront/Downtown areas become more developed, the economic logic of major improvements may become more compelling.) The biggest challenge will be to select transportation improvements that provide the biggest "bang for the buck" in the short term without "selling short" the long-term development potential for the area as a whole.

- Southern Crossing – The benefits of a new Southern Crossing bridge between southeast Vallejo and the southern portion of Mare Island include: 1) a connection would encourage higher-level development of the southern portion of the island and southeast Vallejo, 2) a bridge could promote reverse-commute employment on Mare Island, and 3) a new connection would relieve traffic conditions on Mare Island Way, potentially benefitting the Waterfront/Downtown areas. Factors against construction of a Southern Crossing, especially in the near term include: 1) Current land use designations for the southern end of Mare Island do not reflect the type of high-value development which would significantly benefit from, or justify the investment in, a new bridge, 2) traffic projections indicate that the currently allowable development level on Mare Island could be attained without a new bridge connection, 3) it is uncertain, even if a bridge were to be constructed, that the southern end of Mare Island could compete regionally against more attractive business park sites, and 4) future growth in Solano County is located to take advantage of existing connections to the north end of Mare Island via Route 37 and the Causeway.

- Mare Island Way – A two-lane street could reduce the psychological barrier between the Waterfront and Downtown and could be compatible with a wider range of development types than a four-lane arterial. However, as described above, without a Southern Crossing,

Mare Island Way is expected to remain a critical transportation link to Mare Island, making its reduction problematic from a traffic perspective.

- Ferry Terminal – The ferry terminal's current location provides the potential for supporting transit-oriented development in the downtown; office or other commercial tenants may be attracted by the advantages associated with proximity to public transit. Although it does not currently serve this purpose, the ferry terminal could provide a source of demand for downtown businesses, for example, downtown could be a retail or entertainment destination for ferry patrons returning from work or visiting the city for tourism and other purposes.

- Route 37 Interchange – Near term improvements proposed for the Route 37 interchange are relatively low-cost options. In the long term (at or beyond the study horizon year of 2020), higher-cost improvements may be necessary (the detailed conceptual plan is shown in the Route 37 Project Study Report; refer to Appendix C, Alternative 2, Phase C, Figure 3.) Factors which should be considered with regard to the proposed higher cost improvements include: 1) Widening of Route 37 to a four-lane expressway between Mare Island and Marin County, 2) Growth in the outer Bay Area, especially in Napa and Marin Counties, and 3) changes in Mare Island land use policy, especially changes which would allow higher levels of development.

- Interstate 80 Corridor Improvements – The transportation study identified design options for bringing the Tennessee, Solano / Springs and Georgia interchanges up to present design standards. These design studies indicated that the costs will be relatively high in terms of actual development, land acquisition and relocation. The substantial cost and impact of such a project may outweigh the transportation benefit. Furthermore, the impacts would be focused on lands located along the corridor, whereas the benefit would be more diffuse throughout the community, complicating the political feasibility.

III DESCRIPTION OF PROPOSED IMPROVEMENTS

This section describes the proposed improvements which are included in the Transportation Plan.

Refer to Figures 3A and 3B, pages 15 and 16, for the location of the proposed improvements. Also refer to Appendix B, Detailed Description and Evaluation of Alternatives, for more information on the selected options including a discussion of other alternatives which were considered but not included in the plan. Refer to Appendix O for a line item breakdown of the conceptual capital cost estimates which are shown for each proposed project.

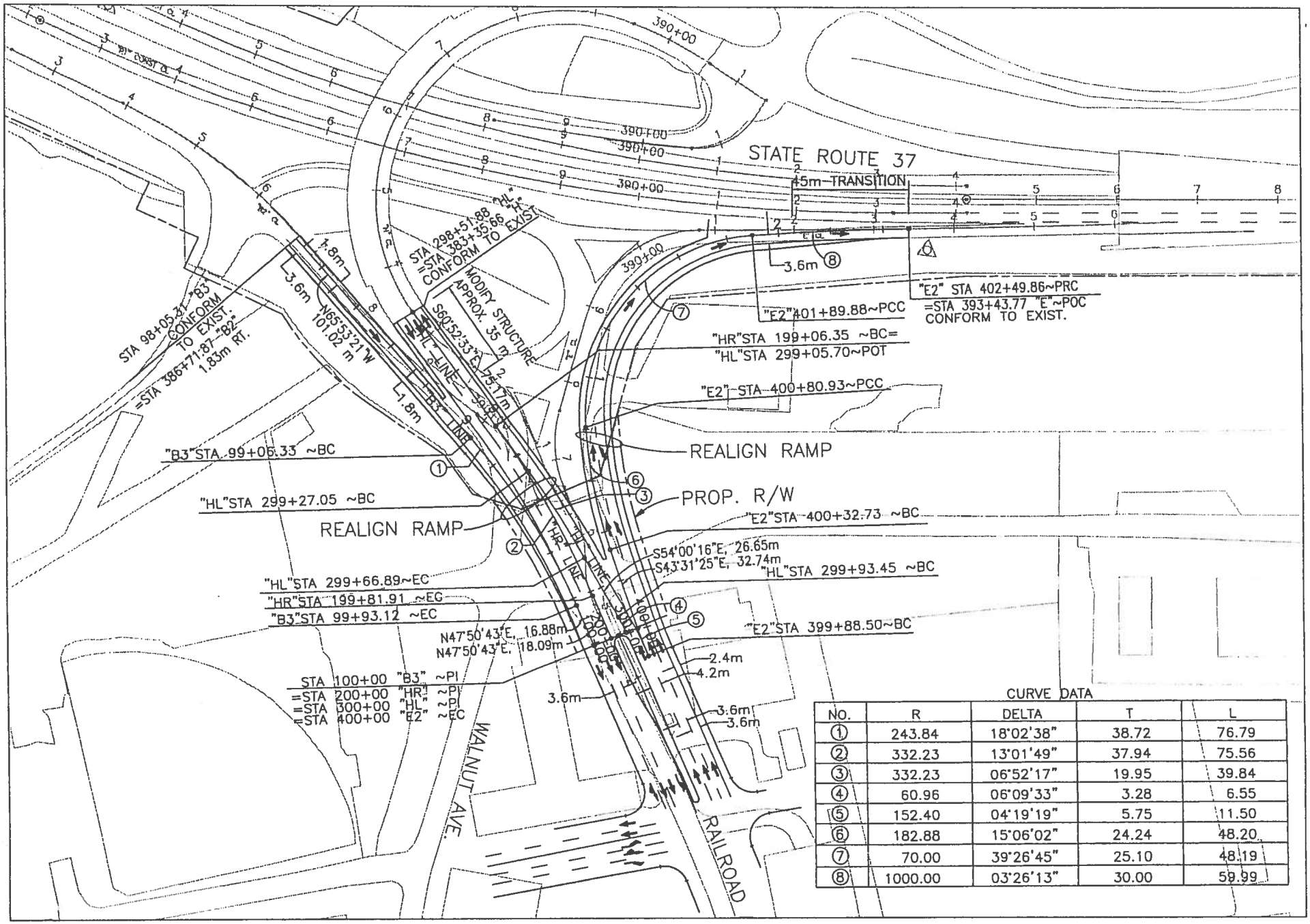
DESCRIPTION OF PROPOSED ROADWAY IMPROVEMENTS

The following roadway improvements have been included in the Transportation Plan

1) State Route 37/Mare Island Interchange Upgrade: This interchange will be a primary access point for Mare Island. Modifications to the interchange within the state right-of-way will be required to create a satisfactory geometrical integration with the roadway system proposed by developers working on the north end of the island; these improvements are designated as a crucial near term need in the Transportation Plan. In addition, it was determined that the re-use of Mare Island would utilize the entire capacity of the ramps to-and-from the east on State Route 37, so a means of expanding these ramps to provide two-lane connections to Route 37 was identified. Two lane ramps could be provided with a low-cost, near term project, if approved by Caltrans. In the event Route 37 were to be widened to a four-lane facility between Mare Island and Marin County (the most likely solution would be construction as a four-lane expressway as shown in the North Bay Corridor Study / Major Investment Study by the Metropolitan Transportation Commission), then a more costly project involving bridge widening would be required to provide the two-lane ramps.

   The work effort included preparation of a Project Study Report (PSR) for this interchange. A PSR is a document required by Caltrans to initiate the design process for significant improvements to the State Highway system. The PSR investigates a range of alternatives including those which are included in the Transportation Plan. The initial phase of improvements required to facilitate the proposed development plan for the north end of Mare Island are shown in the PSR as "Alternative Two, Phase A" (see Figure 4). "Phase B" of this alternative, if approved, would provide a low-cost of developing additional capacity in the near term (see Figure 5). The PSR also defines "Phase C", if necessary due to a subsequent full widening of Route 37 to four lanes (see Figure 6). The implementation plan provided in Section IV of this report identifies thresholds for implementation of each of these phases.

   The estimated cost of the Phase I south end geometrical modifications is $4.2 million. Phase II could then be implemented for a marginal additional cost of about $100 thousand. In the event Phase III were required, the cost would be approximately $36 million. Phase III is not entirely funded; in the event improvements beyond the Phase II level were required, it would be appropriate to re-evaluate the specific traffic demands and proposed Phase III project to confirm that no lower cost alternatives would be feasible.



CURVE DATA

NO.	R	DELTA	T	L
①	243.84	18°02'38"	38.72	76.79
②	332.23	13°01'49"	37.94	75.56
③	332.23	06°52'17"	19.95	39.84
④	60.96	06°09'33"	3.28	6.55
⑤	152.40	04°19'19"	5.75	11.50
⑥	182.88	15°06'02"	24.24	48.20
⑦	70.00	39°26'45"	25.10	48.19
⑧	1000.00	03°26'13"	30.00	59.99

FIGURE 4

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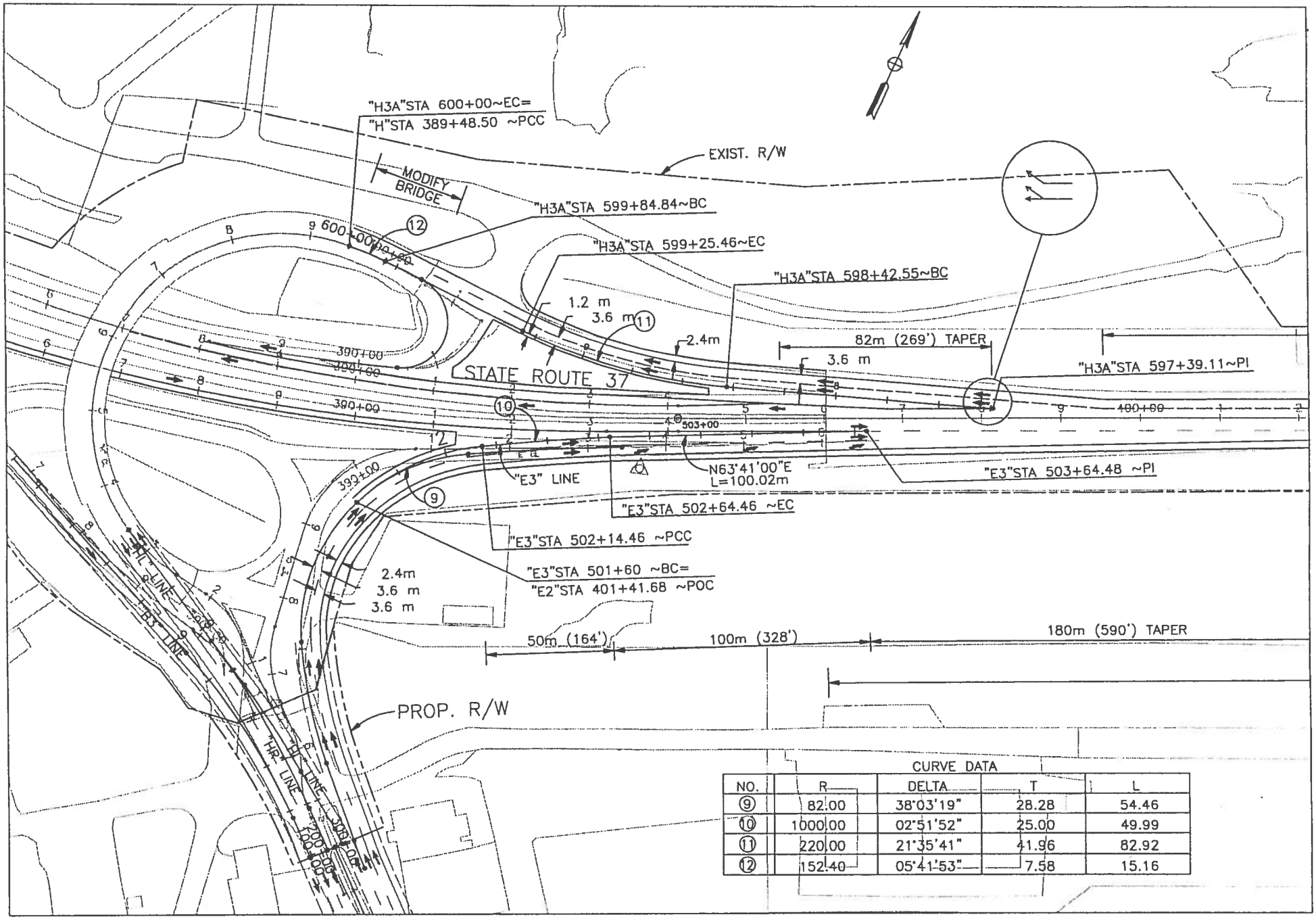
ON-ISLAND INTERSECTION CONFIGURATION

STATE ROUTE 37/MARE ISLAND INTERCHANGE - ALT. 2 - PHASE A



CURVE DATA

NO.	R	DELTA	T	L
⑨	82.00	38°03'19"	28.28	54.46
⑩	1000.00	02°51'52"	25.00	49.99
⑪	220.00	21°35'41"	41.96	82.92
⑫	152.40	05°41'53"	7.58	15.16

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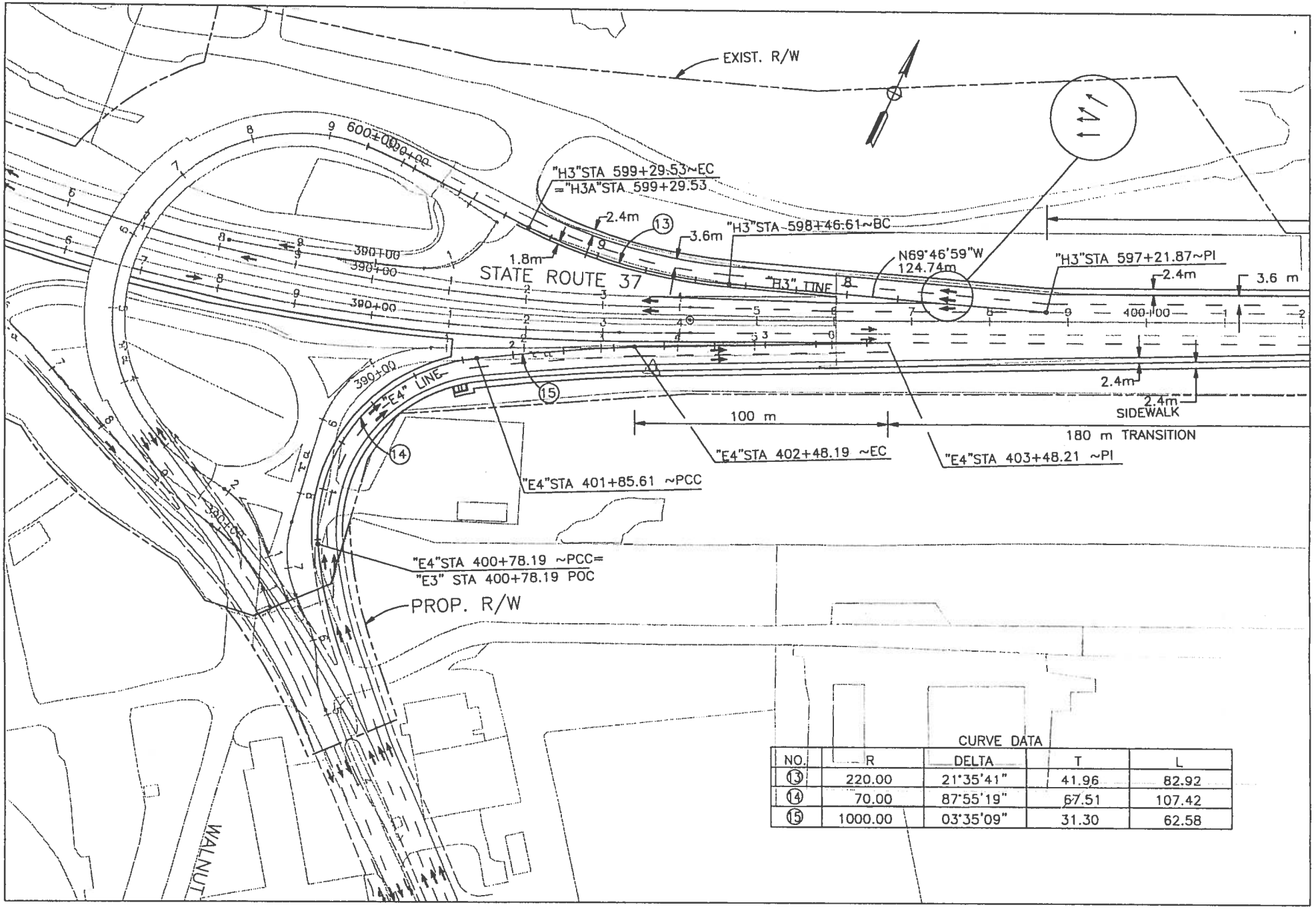
FIGURE 5

2-LANE WB ON-RAMP. ONE THRU LANE ON SR37

STATE ROUTE 37/MARE ISLAND INTERCHANGE - ALT. 2 - PHASE B



CURVE DATA

NO.	R	DELTA	T	L
13	220.00	21°35'41"	41.96	82.92
14	70.00	87°55'19"	67.51	107.42
15	1000.00	03°35'09"	31.30	62.58

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2-LANE EB ON-RAMP WITH BRIDGE WIDENING
STATE ROUTE 37/MARE ISLAND INTERCHANGE - ALT. 2 - PHASE C

FIGURE 6

2) Mare Island Causeway Widening and Management: As noted in Section II of the report, the Causeway with two lanes would be in balance with four-lane approaches at each of the two signalized intersections at either end of the Causeway. It is therefore proposed that the Causeway bridge be re-striped to provide two wider through lanes and that improvements be made to widen restricted sections of the approach roadways on either side of the strait. Specifically, the eastern portion of the approach roadway should be widened to four lanes to eliminate the reduced width portion which presently exists between the end of the Causeway Bridge the existing wider approach to the Mare Island Way/Tennessee intersection, and G Street on Mare Island should also be widened to provide four though lanes as well as supplemental turning bays approaching Railroad Avenue.

Figure 7A identifies the proposed cross-section for the Causeway between the bridge and the approach to Mare Island way, which is already built out to a sufficient five lanes. This project would require fill and/or retaining wall along the southern edge of the roadway as well as elimination of existing landscaping. Since this particular improvement would not be required until Mare Island approaches build out, it would be possible to defer this widening until traffic on the Causeway approaches capacity.

It is proposed that the Causeway bridge be restriped to carry one lane in each direction, with the railroad track being retained in the middle of the bridge. The two-lane concept will provide for the maximum flexibility for serving larger vehicles as well as potential breakdowns on the bridge, and will also allow bicycles to operate on the bridge surface. No marked bicycle lanes are proposed for the bridge; bicycles will be permitted to operate in mixed flow traffic. Figure 7B illustrates the proposed striping and usage for the Causeway bridge.

Added controls will be needed to regulate traffic during those times when a train uses the bridge. Crossing gates will need to be installed at each end of the bridge at the point where the tracks cross from the center to the side of the street. The gates will close upon the approach of the train, and automobiles will be prohibited from being on the bridge while the train is present on the bridge. This is necessary because the bridge is too narrow to accommodate both rail and vehicular traffic at the same time. A follow-up process to this study will be required to gain State Public Utilities Commission (PUC) approval of railroad operations at this location.

Three management strategies are proposed to maximize the utility of the bridge:

- Railroad operations should be prohibited during peak traffic hours (7-9AM, 11AM-1PM and 4-6PM)
- Large trucks should also be prohibited during peak traffic hours. Trucks can use the SR 37/Mare Island interchange during the peak.
- An agreement should be reached with the Coast Guard to prohibit raising the bridge during peak hours. Other key bridges in the Bay Area, such as the High St. and Fruitvale Ave. bridges in Alameda are protected by such an agreement.

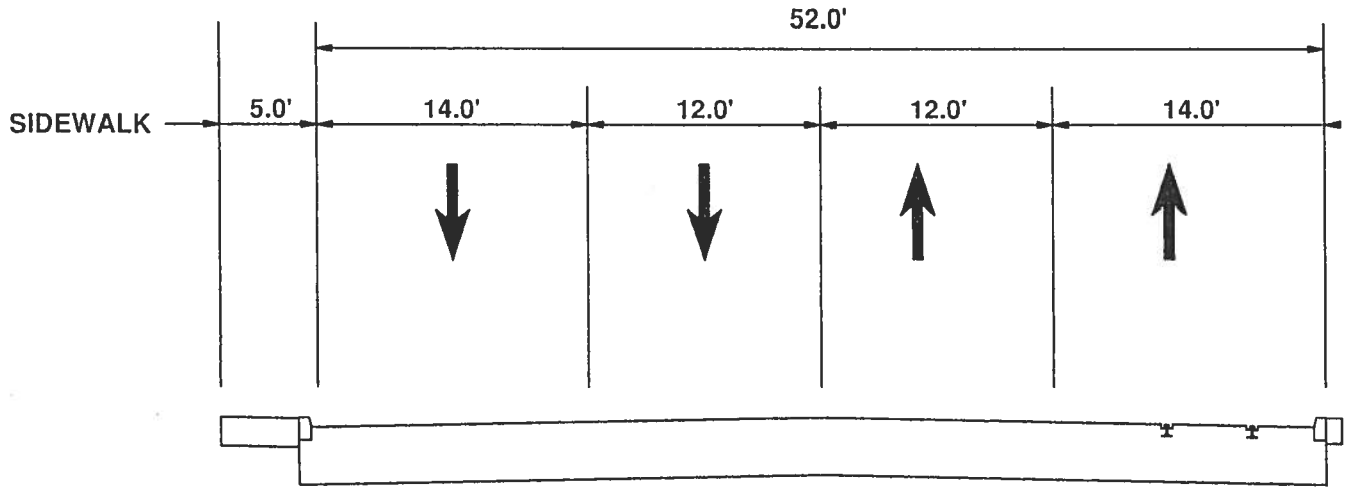

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Figure 7A

Proposed Cross-Section Causeway Between Causeway Bridge and Existing Approach to Mare Island Way

2 LANES (BIKE ROUTE)

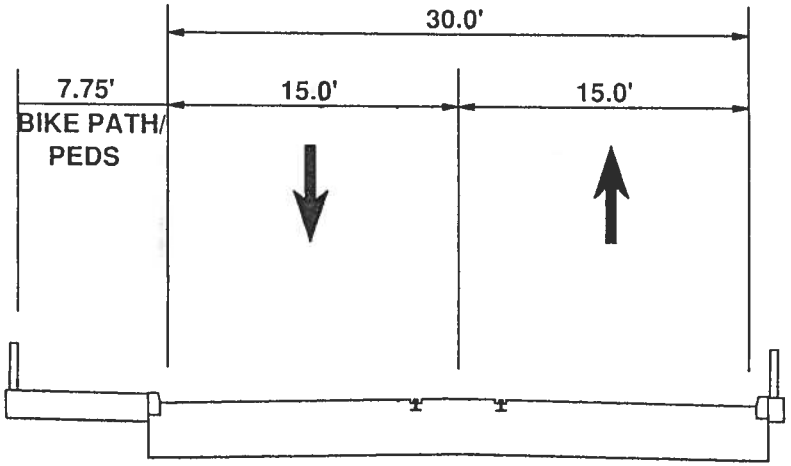

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Figure 7B

Causeway Bridge - Proposed Cross Sections

As part of the widening project, it is proposed that crossing gates be installed at both locations where the railroad crosses into the Causeway/G Street travel way. The City will need to process the crossings through the State Public Utilities Commission to allow for continued train operations.

The estimated cost of the Causeway and G Street widening, including the gated railroad controls, is $5.34 Million (The G Street share is about $1.79 million, the Causeway including the railroad grade crossing gates is about $1.86 million, and the eastern approach is about $1.69 million.)

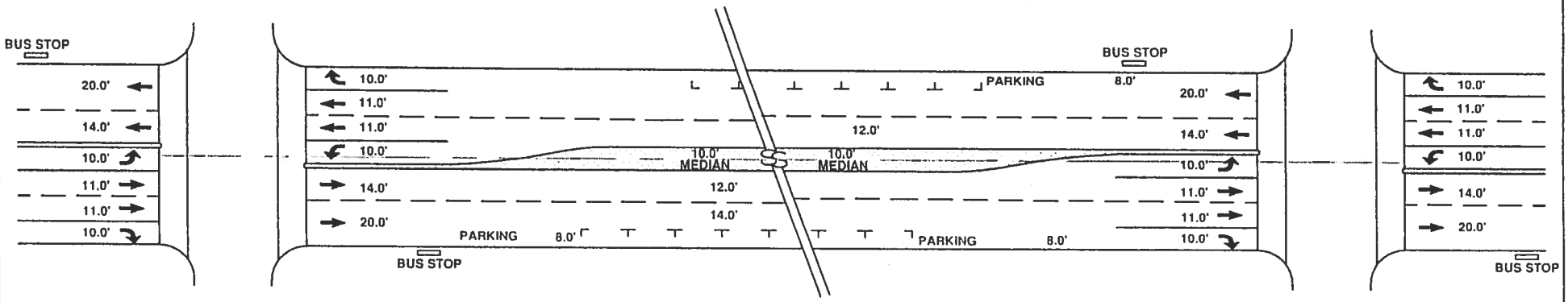
3) Mare Island Way Proposed Geometry and Alignment: Long term (Year 2020) volumes projected for Mare Island Way would be nearly 1,500 vehicles per hour, one-way, in the pm peak hour and possibly as high as sixty to seventy percent of this amount in the weekday mid-day peak. Thus, without a Southern Crossing bridge, it is likely that a four lane facility will ultimately be required, even though two through lanes may be adequate for the near term (up to Year 2010) demand. The existing roadway section is 78 feet curb-to-curb with a 10 foot median near the Civic Center. The existing roadway could be re-striped to accommodate four travel lanes, along with a parking, bus stops and right turn bays along the curb. Wider outside lanes could allow for more safe and convenient bicycle travel (as a Class III bike route), even though there is not enough width to provide a designated Class II bike lane. South of Georgia, four lanes would be desirable to accommodate movements into and out of the parking structure and to accommodate bus operations in the vicinity of on-street bus stops without interfering with through traffic.

For these reasons, it is recommended that the roadway be re-striped within the existing curb-to-curb width to accommodate traffic, bicycles, bus stops and parking as shown in the conceptual plan (Figure 8). Wide sidewalks could be developed by expanding into the public right-of-way to the outside. In the long term, a right-of-way for a single-track rail link between the existing trackage at Tennessee and the Ferry Terminal should be reserved along the west side of the roadway, behind the sidewalk.

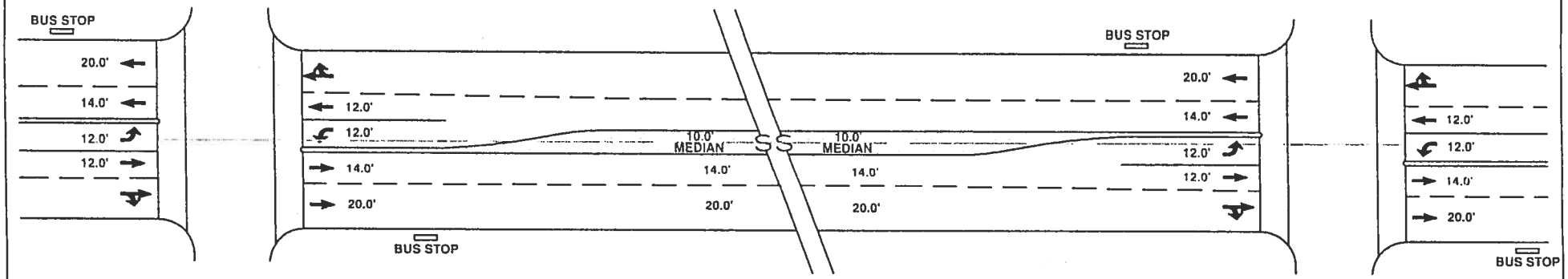
The capital cost for the near-term improvements to Mare Island Way (re-striping and improvements in the vicinity of the proposed multimodal center at the ferry terminal is estimated at approximately $250,000, with an additional $740,000 for subsequent sidewalk improvements. (The addition of rail service could be accommodated in the future but no improvements are currently proposed in the transportation plan.)

4) Georgia Street Extension: It is proposed that Georgia Street be extended from its current terminus at Santa Clara Street to connect to Mare Island Way. The intersection of Mare Island Way and Georgia Street should be controlled by a traffic signal. This extension is vital to development of the Waterfront plan and integrating the waterfront and downtown.

The estimated capital cost for the Georgia Street extension, including streetscape embellishment features consistent with the multimodal terminal is about $1.5 million.



MARE ISLAND WAY - SHORT TERM IMPROVEMENTS



MARE ISLAND WAY - EXISTING CONDITIONS

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Figure 8

Mare Island Way Lane Configuration Alternatives

5) Capitol Street Extension: The extension of Capitol Street from Santa Clara Street to Mare Island Way will assist local circulation needs of the proposed waterfront plan. The street should be designed as a collector street and controlled by four-way stops at all intermediate cross-streets so as to reduce its attractiveness as a neighborhood short-cut. The intersection of Capitol Street and Mare Island Way should be controlled by a traffic signal.

The estimated cost of the Capitol Street extension is about $1.9 million.

6) Wilson Avenue between Tennessee Street and State Route 37: The traffic forecasts for 2020 indicate that Wilson Avenue can be served by a two- or three-lane arterial street (including left turn bays). The City has developed a conceptual design for the street in this configuration, and it is an appropriate starting point for a final design. At some point in the future, a new traffic signal will be required at the intersection of Wilson Avenue and the eastbound SR 37 ramps.

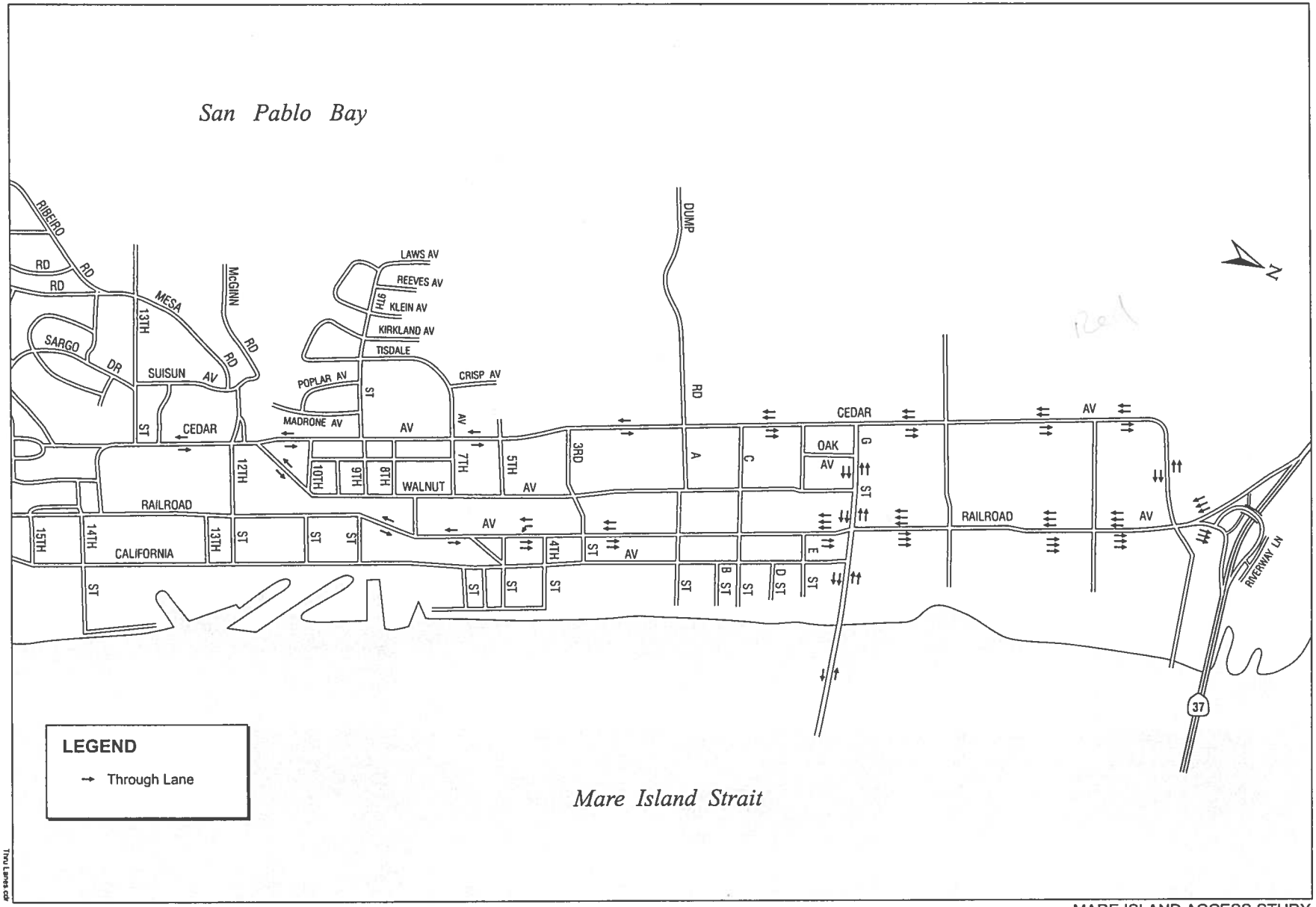
The estimated cost for upgrading Wilson Avenue is $8.75 million.

An evaluation of roadway capacity requirements for Mare Island indicates that G Street, and the northern sections of Cedar Avenue would require four through lanes, and that Railroad Avenue should be widened to provide four through lanes between 3rd Street and G Street, with a further widening to six lanes north of G Street (3rd to 5th Streets would be a transition zone as described further below). These through lane configurations are shown in Figure 9. Additional widening may be required at various locations to provide a center turn lane or median with left turn pockets, and to facilitate through traffic flow in areas where high driveway volumes would be present, and such additional lanes should be evaluated in conjunction with site specific proposed developments. Recommended minimum lane requirements for the principal roadways are identified below.

7) Railroad Avenue on Mare Island: An evaluation of roadway needs on Mare Island indicate that Railroad Avenue should be constructed with three lanes in each direction, plus a median to serve left turns at intersections, between SR 37 and G Street. South of G Street, reduced lane requirements are proposed to minimize the impact to historic buildings and to accommodate the rail lead: Between G Street and 3rd Street, a five-lane section including a wide median for a two-way left-turn lane and rail spur is proposed. South of 5th Street, a single through lane in each direction, along with the center turning lane and rail track, would be sufficient. Figure 10 illustrates these three cross sections. Between 3rd and 5th Streets, a transition section is recommended due to significant right-of-way restrictions: This segment would include two northbound lanes but one of the southbound lanes would be dropped as heavy left turns in to the Historic District parking structure are projected.

An early proposal by the developers of Mare Island was that a traffic circle be created at the intersection of Railroad Avenue and G Street. Operational evaluation of this concept led to the conclusion that the circle would not operate in a satisfactory manner. It is proposed that a standard intersection be created at this location; Figure 11 illustrates a proposed conceptual design.

It is proposed that railroad service be retained on Railroad Avenue south of G Street. The tracks should be relocated into the median lane proposed for Railroad Avenue to minimize traffic interference and to maximize sight distance potential.



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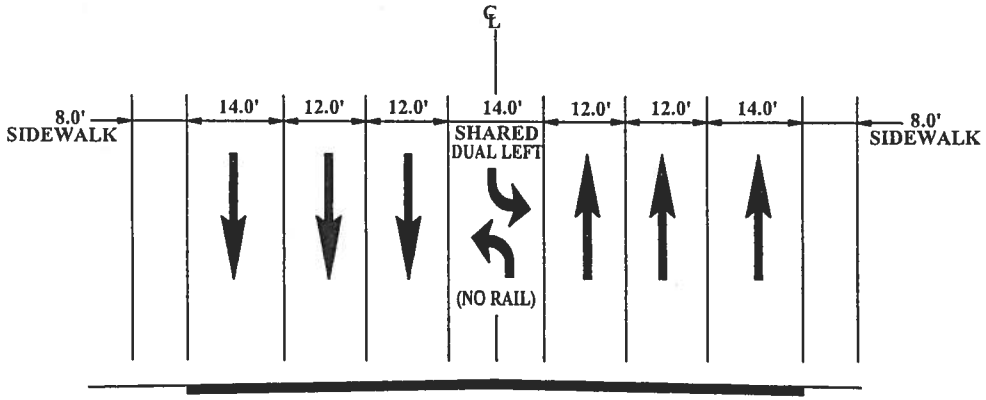
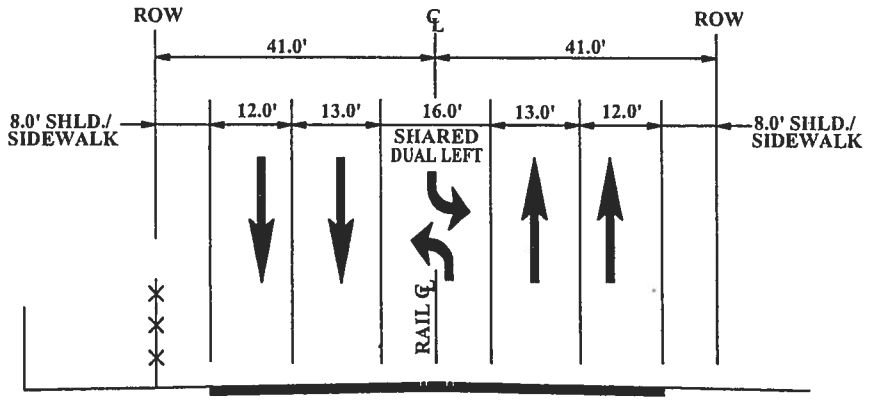
MARE ISLAND ACCESS STUDY

Figure 9

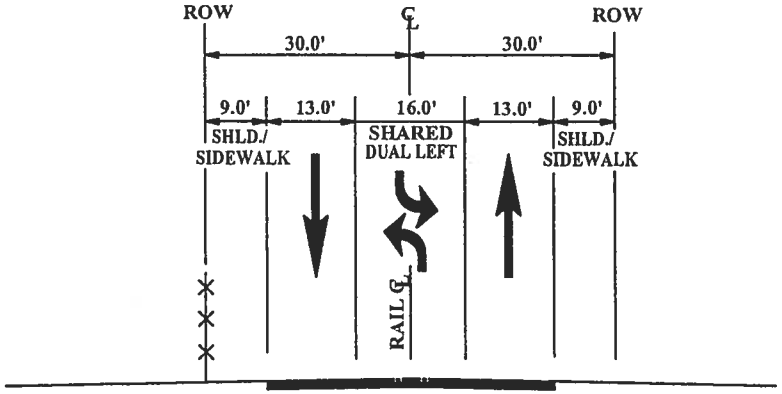
MARE ISLAND - THROUGH LANE REQUIREMENTS ON MAJOR STREETS



RAILROAD AVE. SECTION
G ST. TO SR 37



RAILROAD AVE. SECTION
G ST. TO 3RD ST.



RAILROAD AVE. SECTION (60' WIDTH)
SOUTH OF 5TH ST.

Figure 10
Railroad Avenue Cross Sections

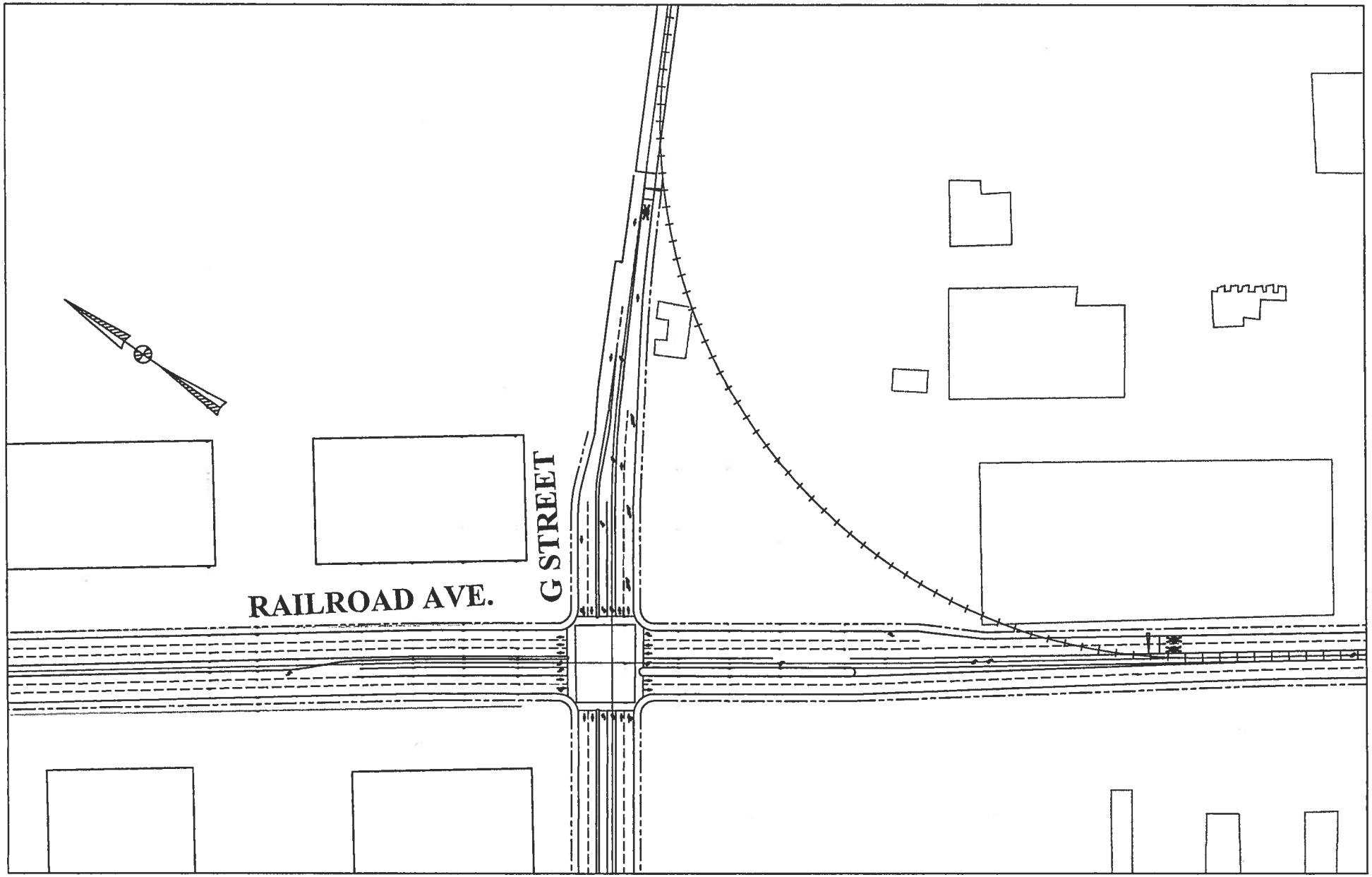


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Figure 11

Railroad Avenue and G Street Proposed Design

The estimated capital cost for Railroad Avenue improvements from G Street north to the Route 37 interchange including traffic signals is about $4.45 million; the cost of the southern portion of Railroad Avenue (down to Lemon Street), including rail relocation, is about $5.13 million.

8) Cedar Avenue on Mare Island: Traffic forecasts made in this study indicate that a three-lane cross-section could operate effectively for the length of Cedar Avenue on Mare Island. However, because some diversion may occur from Railroad Avenue due to periodic congestion, it is recommended that Cedar Avenue be designed with a five-lane section (two through lanes in each direction plus a left-turn median) between the Route 37 interchange and a point south of G Street. Figure 12 illustrates the proposed cross-section. It is recommended that the design for the intersection of Cedar Avenue and G Street remain essentially unchanged from the current design. A proposal by the developer to curve the northbound Cedar Avenue approach to G Street is not recommended due to the fact that it would divert through Cedar Avenue traffic and also create left turn storage bays on a curve.

The cost of the Cedar improvements, from the intersection with Railroad Ave. to a point south of G Street where two through lanes would suffice is $7.9 million, including relocating the existing railroad track to the west.

9) G Street on Mare Island: It is recommended that G Street be designed as a five-lane arterial street between the Causeway and Cedar Avenue with dual left turn lanes at the Railroad Avenue intersection. Immediately west of the Causeway bridge, G Street should be widened to provide the four through lanes, and appropriate tapers should be developed to accommodate the dual left turn lanes at the Railroad Avenue intersection. A left-turn median should be provided between Railroad Avenue and Cedar Avenue to maximize the capacity of this major cross-island facility. Figure 13 illustrates the proposed cross-section, which is the same as Cedar Avenue.

The estimated cost of the G Street improvements is $1.79 million.

10) Future Southern Crossing: The analysis performed in this study indicated that sufficient capacity can be created with the two existing access points to the island; the expense of the proposed southern crossing could not be justified for current land use intensity proposals. However, if conditions change and higher levels of traffic than currently projected occur on the island, a southern crossing bridge might be needed. It is thus retained in this plan as a long-range option, but it is not proposed to be implemented within the 20 year framework of this plan.

If a Southern Crossing were to be constructed, the analysis in this study indicates that the so-called "Railroad alignment" would be preferred over the "Solano Avenue alignment." The "Railroad alignment" would start with a new roadway just to the north of Wilson-Lake Dalwigk Park, connecting Curtola Parkway to Sonoma Avenue. From the Sonoma intersection, the alignment parallels the California Northern Railroad, rising at a 6% grade, crossing over the railroad, then the Mare Island Strait, and landing on Mare Island to the south of Touro University. This alignment, while more costly ($75 million) than the Solano Avenue alternative, creates the lowest level of impact on existing uses and neighborhood activities. Figure 14 documents the suggested alignment.

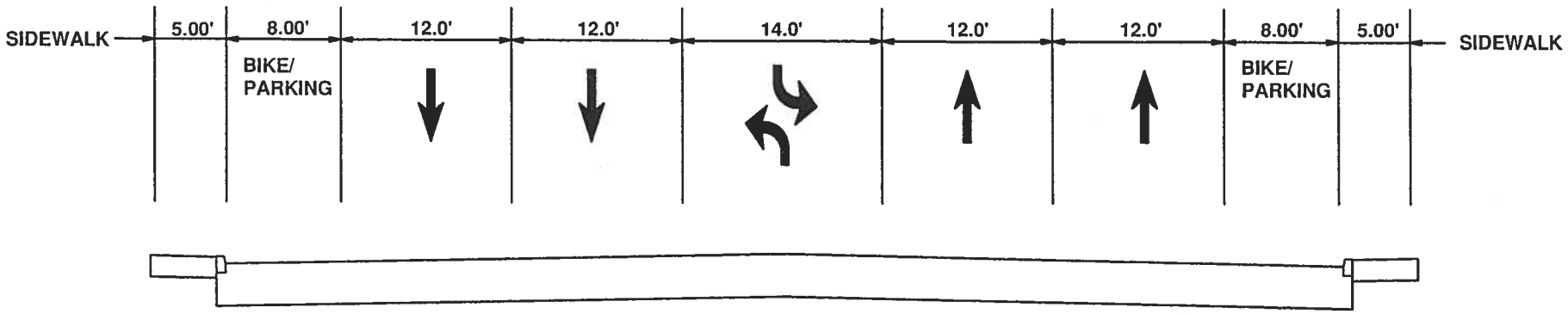

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Figure 12

Proposed Cross-Section of Cedar Street North of G Street

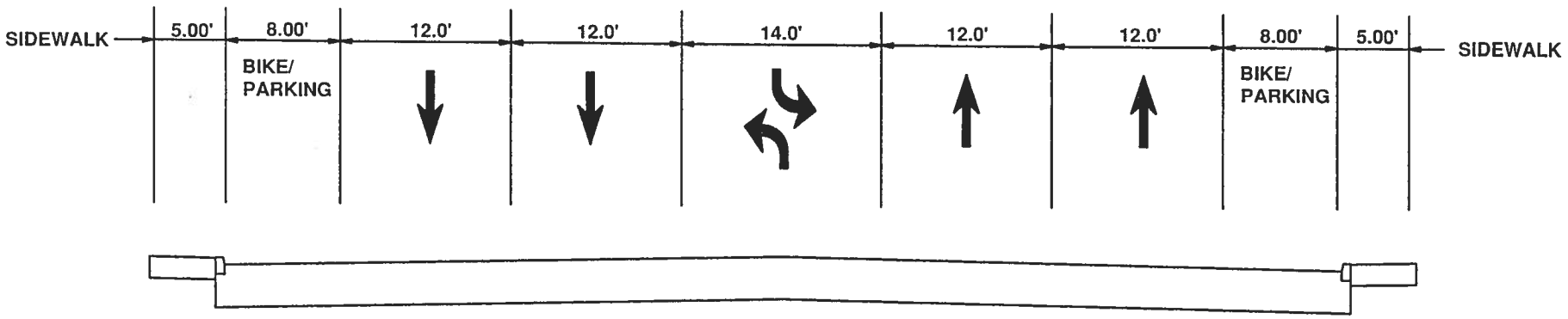

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Figure 13

Proposed Cross-Section of G Street West of Railroad Avenue

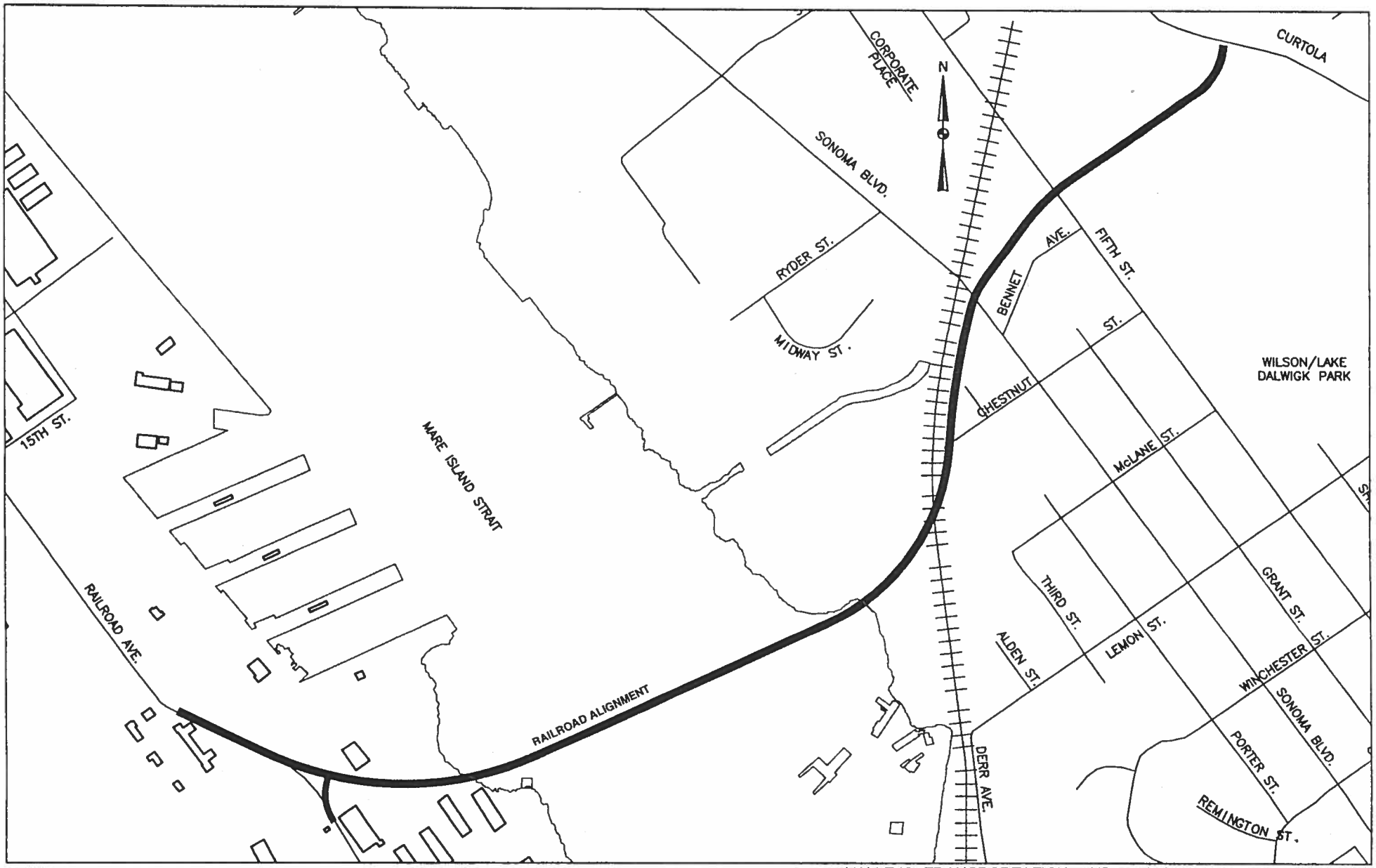

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Figure 14

Southern Crossing Railroad Alignment

11) Wilson Avenue / Eastbound SR 37 Ramps Intersection: In order to maintain adequate service levels, a traffic signal will be needed by Year 2020.

The cost of this signalization project is approximately $190 thousand.

12) Sonoma Boulevard / I-80 Ramps Intersection: In order to maintain adequate service levels, a traffic signal will be needed by Year 2020.

The cost of this signalization project is approximately $310 thousand.

13) Solano Avenue / Curtola Parkway: In order to maintain adequate service levels, improvements will be needed by Year 2020. The recommended improvements are as follows: Improve southwest bound approach of Solano Avenue at Curtola Parkway to provide one left and one through-right lane; make Monterey Street at Curtola Parkway one-way northbound for at least one block. Figure 15 shows the conceptual design.

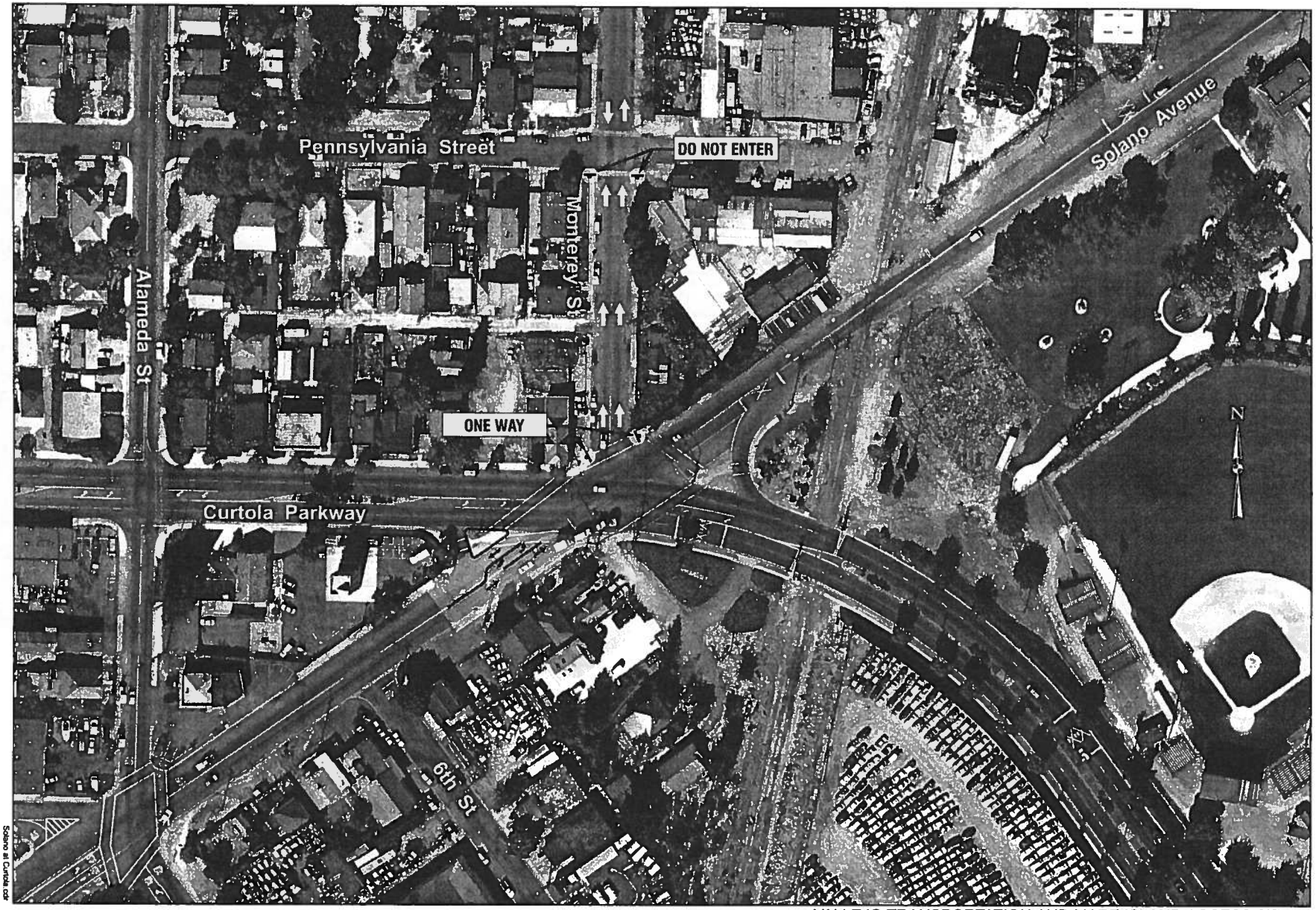
This improvement is estimated at $375,000.

14) Spot Improvements in the I-80 Corridor: A number of small scale improvements have been identified in the I-80 corridor, totaling about $1.8 million. While not strictly required to improve access to Mare Island, these improvements will create a modest improvement in operations in the portion of the corridor between Tennessee Street and Georgia Street. These improvements are not intended to be a substitute for a more comprehensive improvement to the freeway mainline and interchanges in this segment of the I-80 corridor, but can provide interim relief to projected future congestion.

The aggregate cost of all of these spot improvements is estimated at $1.8 million; the specific descriptions are as follows:

Eastbound I-80 Ramps/Springs Road Interchange (see Figure 16)

- Convert the northbound leg of Lincoln Road between Florida Street and Humboldt Avenue to become one-way northbound.
- Convert the southbound leg of Lincoln Road between Florida Street and Miller Avenue (at Webb Street) to become one-way southbound.
- Widen southbound Miller Avenue at Florida Street to add a southbound right-turn lane (this widening would require acquisition of right-of-way currently apparently used for parking)
- Revise the traffic controls at the intersection of Miller Avenue and Florida Street to four-way stop control for a period of 5 years. After that time, consider controlling the approaches of Miller Avenue with stop signs and allowing Florida Street to be uncontrolled. This revision would improve the flow to and from the ramp system one block to the east.



Solano at Curtola.cdr

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VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 15

SOLANO AVENUE / CURTOLA PARKWAY

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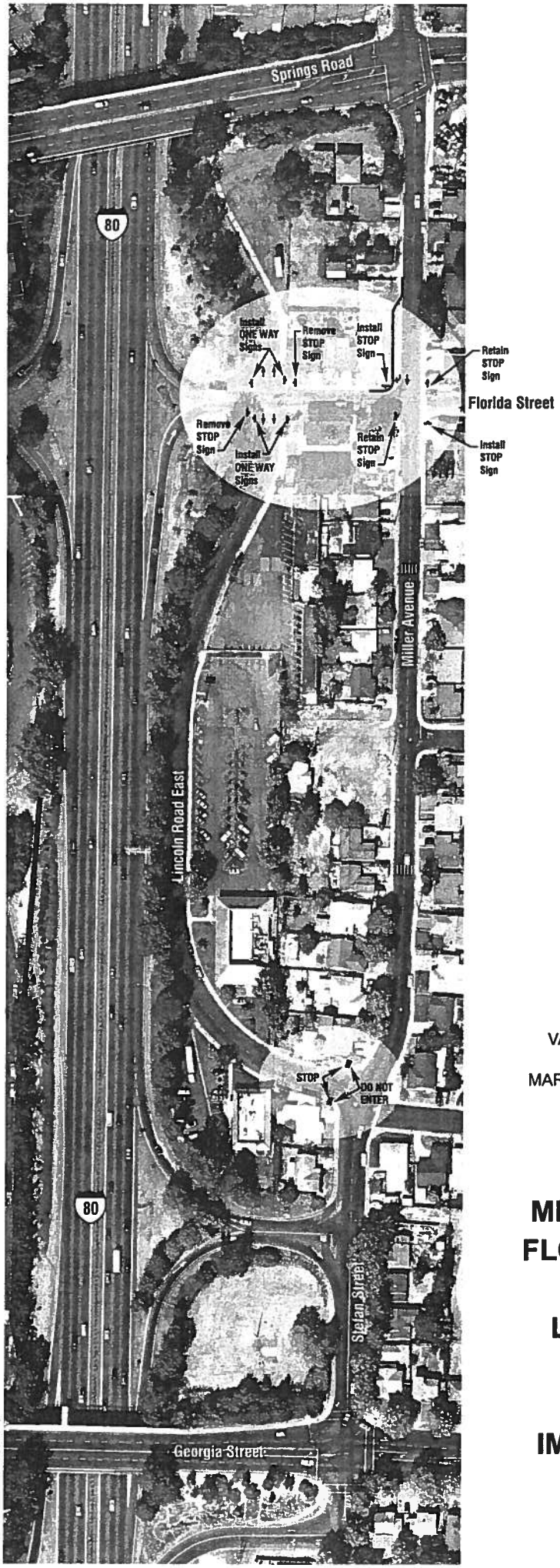

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VALLEJO TRANSPORTATION
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MARE ISLAND ACCESS STUDY

Figure 16

MILLER AVENUE, FLORIDA STREET AND LINCOLN ROAD EAST PROPOSED IMPROVEMENTS

Admiral Callaghan Lane between Tennessee Street and Henry Street

It is suggested that this street be widened in this segment to provide one additional northbound lane. The improvement would allow longer turn lanes into the on-ramp and adjacent land uses to be created. Figure 17 is a conceptual layout of the widening and suggested channelization.

Steffan Street at Georgia Street

A modest improvement in operations would occur if a single left-turn and a single through-right lane were striped instead of the current striping; Figure 18 illustrates this concept.

14th Street at Georgia Street

It is proposed that parking be prohibited (red curb) for 100 feet on the southbound approach, the southbound departure and the northbound departure from the intersection to assure that through traffic can always get through the intersection

Westbound I-80 on-ramp at Campbell Avenue

A driveway to a commercial center is located on this on-ramp. This is a highly non-standard arrangement. It would be desirable in the long range if this driveway were closed.

Westbound I-80 on-ramp from Mariposa Street

There is a right-turn-in/right-turn-out driveway to a large commercial center located on this on-ramp, just before the ramp turns onto the freeway. A low-level channelization project, combined with a "Do not enter"sign, has been erected to discourage people from turning left into the driveway from the off-ramp. This is a highly non-standard and possibly risky design, particularly with respect to off-ramp drivers who may be willing to risk cutting through the channelization. There are two possible solutions:

- Ideally, this driveway should be closed in the name of safety
- If the driveway cannot be closed, the channelization should be enhanced as shown in Figure 19 to ensure that drivers cannot turn left from the off-ramp into the driveway.

Mariposa Street at Tennessee Street

At some time in the future, it may be desirable to prohibit parking and create a left turn lane on both approaches.

Eastbound Auxiliary Lane from Georgia On-Ramp to Springs Road Off-Ramp

There is an existing auxiliary lane but it is not well defined. Minor pavement improvement and restriping would remedy this situation. See Figure 16.

Westbound Auxiliary Lane from Tennessee On-Ramp to Solano Off-Ramp: There is an existing auxiliary lane but it is not well defined. Minor pavement improvement and restriping would remedy this situation. See Figure 20.

Provide Westbound Auxiliary Lane from Solano On-Ramp to Georgia Off-Ramp

There is room along the shoulder to construct an auxiliary lane. This would require grading, incidental drainage, paving as well as signing and striping modifications. See Figure 21.

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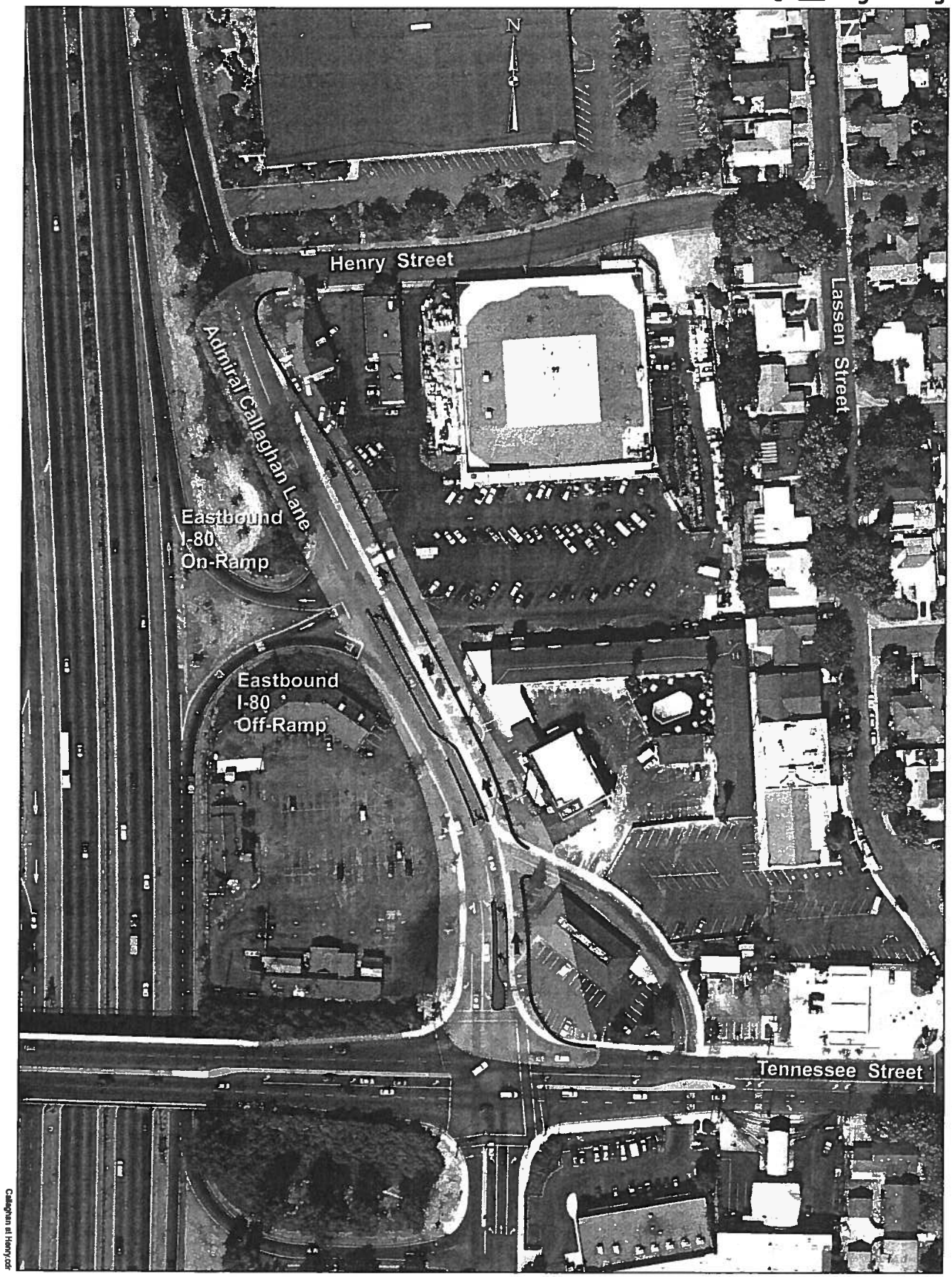

Callaghan at Henry.cdr

VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 17

ADMIRAL CALLAGHAN LANE
TENNESSEE STREET TO HENRY STREET

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VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 18

STEFFAN STREET AT GEORGIA STREET

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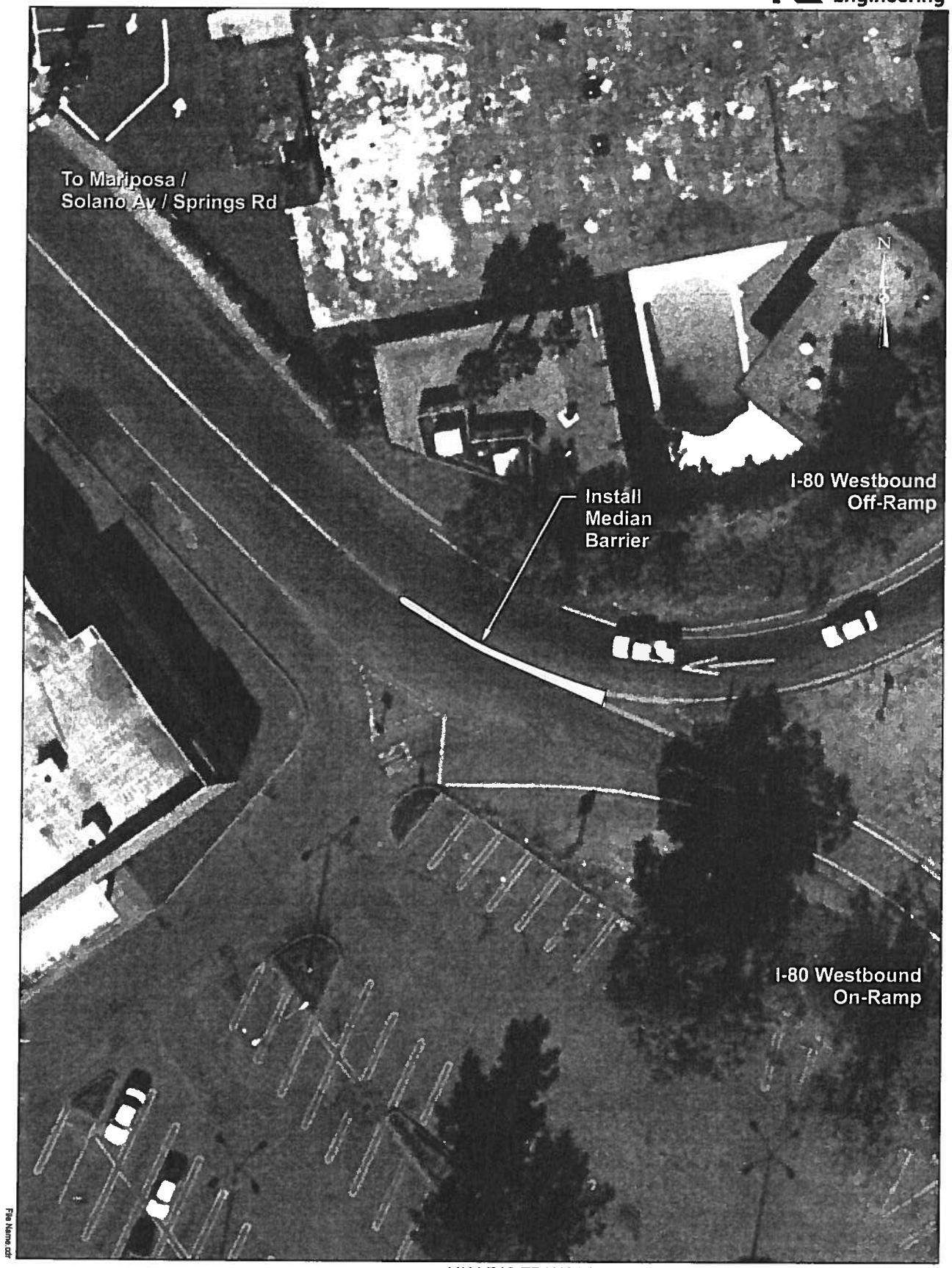

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Figure 19

I-80 RAMPS AT MARIPOSA STREET

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VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 20

WESTBOUND AUXILIARY LANE FROM TENNESSEE STREET ON-RAMP TO SOLANO AVENUE OFF-RAMP

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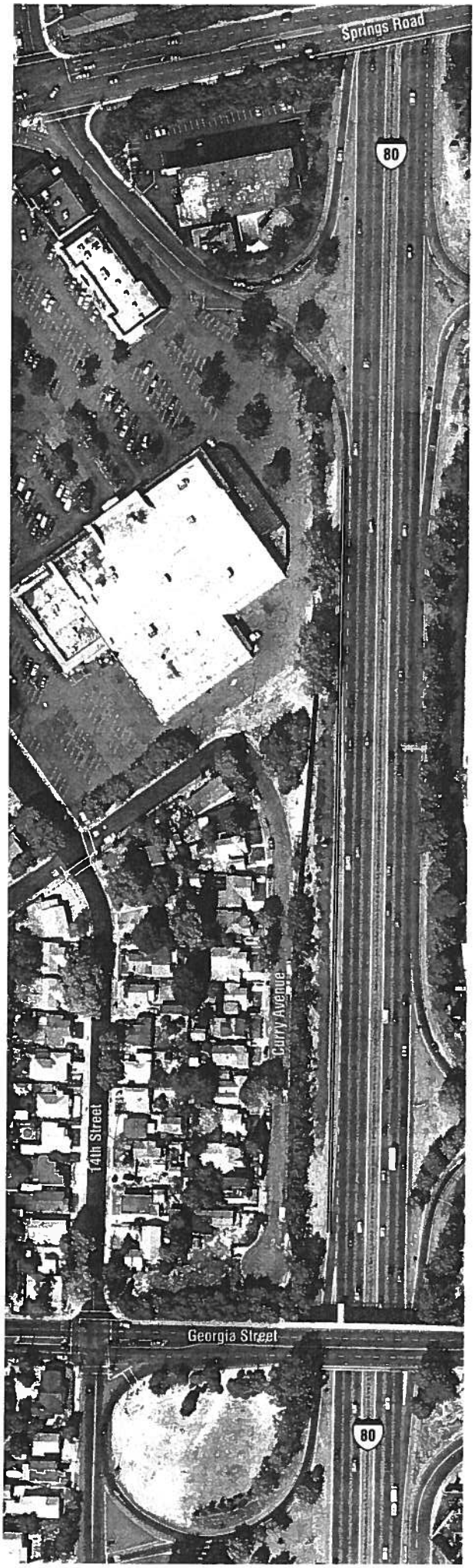

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VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 21

WESTBOUND AUXILIARY LANE FROM SOLANO AVENUE ON-RAMP TO GEORGIA STREET OFF-RAMP

Description of Proposed Transit Improvements

The following five items are the transit components of the plan. The first four items can be implemented in the near-term (5-10 years). The fifth item, water taxi for weekend tourist service, is identified as a potential longer range private initiative subject to demand for tourist services on the island.

The five proposed transit improvements are as follows:

1) Vallejo Ferry Terminal: Vallejo intends to expand the ferry services by adding a third and fourth boat. Currently, the ferry services are experiencing increasing numbers of "sell outs" of key commute runs; with the addition of these vessels, the projected capacity needs for the long term future will be addressed. No additional docking facilities would be needed on the east side of the waterfront, however, minor improvements such as a canopy and automatic fare collection would be implemented. Additional small-scale modifications may occur due to the need to retain stops for regional buses as the parking structure is developed in conjunction with the extension of Georgia Street and possible modification to Mare Island Way. On the west side of the strait, the existing (temporary) fuel depot and maintenance facility which consists of a metal building, dock, and fuel tank, will need to be replaced. An alternate site has been identified on Mare Island directly across from the existing mainland ferry terminal. It is proposed that Building 165 would be reconstructed to accommodate ferry maintenance, storage, dispatch, administration, and crew headquarters. Fuel storage and a dock would be needed for a complete facility.

   Funding in the amount of $20 million for two additional boats and $5 million for the fueling depot has already been secured. The cost of other improvements has been included with the parking garage, described immediately below.

2) Ferry Parking Garage: It is proposed that a joint-use parking garage be constructed on Mare Island Way directly across from the Ferry Terminal. This garage will be required at the time that a fourth boat-in-operation (fifth boat in the fleet) comes on-board; current estimates are that this event would occur around 2008. The garage would also be required if development activities associated with the proposed Waterfront Plan require the use of the existing ferry parking area for development or staging activities. The ferry parking would be provided as part of a mixed-use multimodal center facility which would include the parking, adjacent roadway improvements including accommodation of pedestrian flows, feeder bus stops, and a nearby bus transfer center, as well as a mix of residential, commercial, and civic uses.

   The cost of the transportation elements of the multimodal complex, including a 1,200 stall garage as well as frontage improvements for regional bus stops and a nearby bus transfer center for local buses is estimated at about $26 million. About $19 million of the cost would be for the parking structure.

3) Downtown Transit Transfer Center: A new off-street transit center is proposed to be constructed between Santa Clara Street and Sacramento Street on an alignment that can best be described as an extension of York Street. As shown in Figure 22, this site would accommodate 10 bus stops with a center-platform configuration. This size is considered large enough to serve current and planned levels of local Vallejo transit routes, as well as service from Benecia and Napa County. Regional buses connecting Sacramento, Davis, Vacaville and Fairfield to the Vallejo Ferry would continue to unload and load curbside at the Ferry terminal. Figure 23 illustrates potential bus routing for Vallejo Transit using the new downtown transit center.

The estimated capital cost of the new transit center is estimated at $2 million (which was included in the multimodal center budget).

4) Mare Island Transit Shuttle: A shuttle system is proposed to operate between the downtown transit center and Mare Island, as shown in Figure 24. A two-phase implementation is proposed as follows:

Phase 1 (Beginning of redevelopment to FY 2008)

It is anticipated that during the first phase, redevelopment activity will be limited to commercial establishments at the north end of the island plus some new retail and tourist activity centers near the middle of the island. There will also be a need for a limited amount of transportation to the Touro University campus and the US Forest Service offices on the south end of the island.

Monday thru Friday
- Service every 15 minutes all day

Saturday and Sunday
- Service every 30 minutes all day

Phase 2 (FY 2008 and beyond)

Once the residential construction begins and the island approaches its commercial and retail "build-out", service levels should be increased to high frequency. These are the levels where service becomes so frequent that residents and workers don't have to think about when the next bus is coming because one will be arriving in one direction or the other every few minutes.

Monday thru Friday
- Service every 8 minutes during the peak periods
- Service every 15 minutes at all other times

Saturday and Sunday
- Service every 15 minutes all day

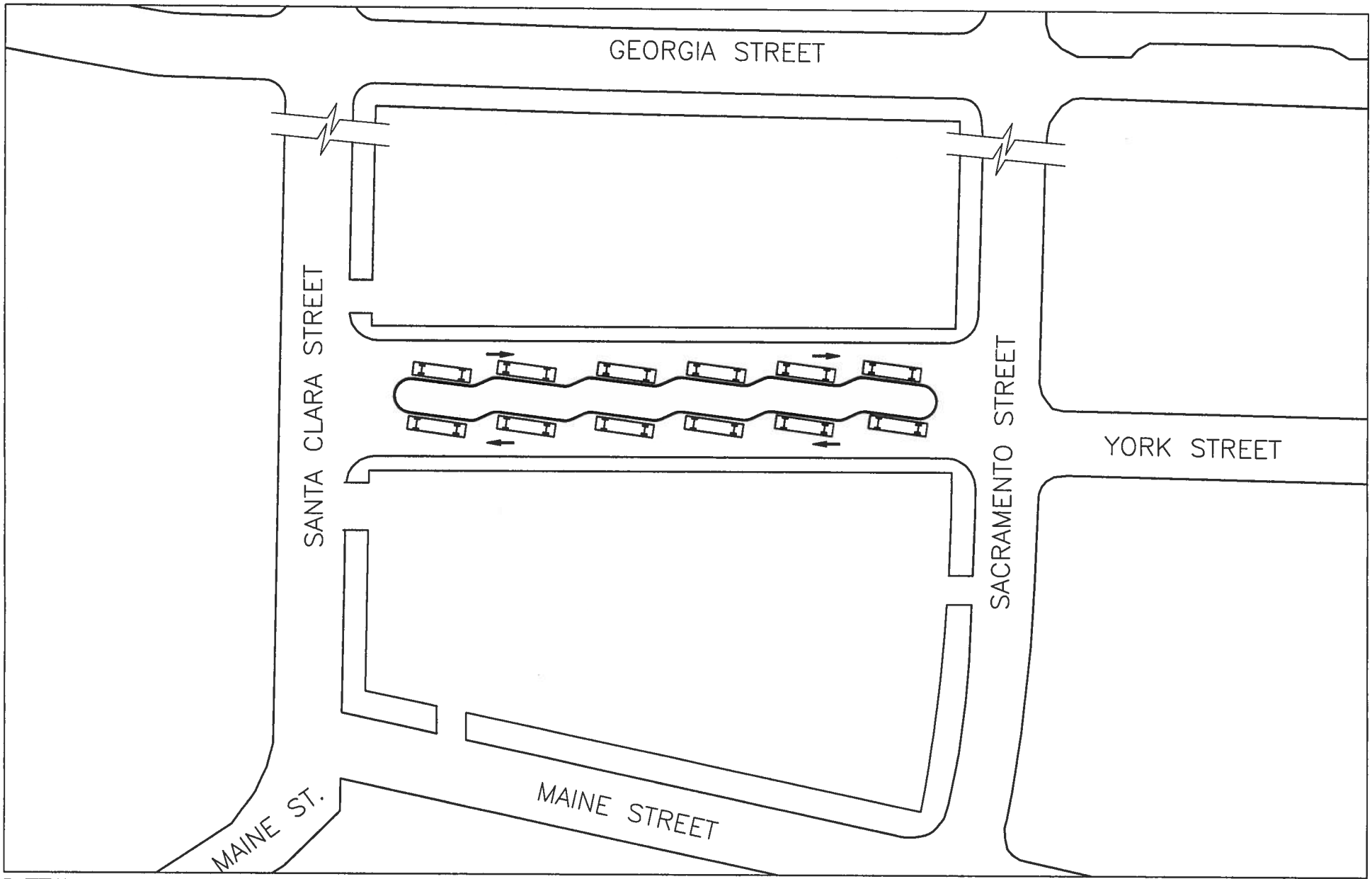

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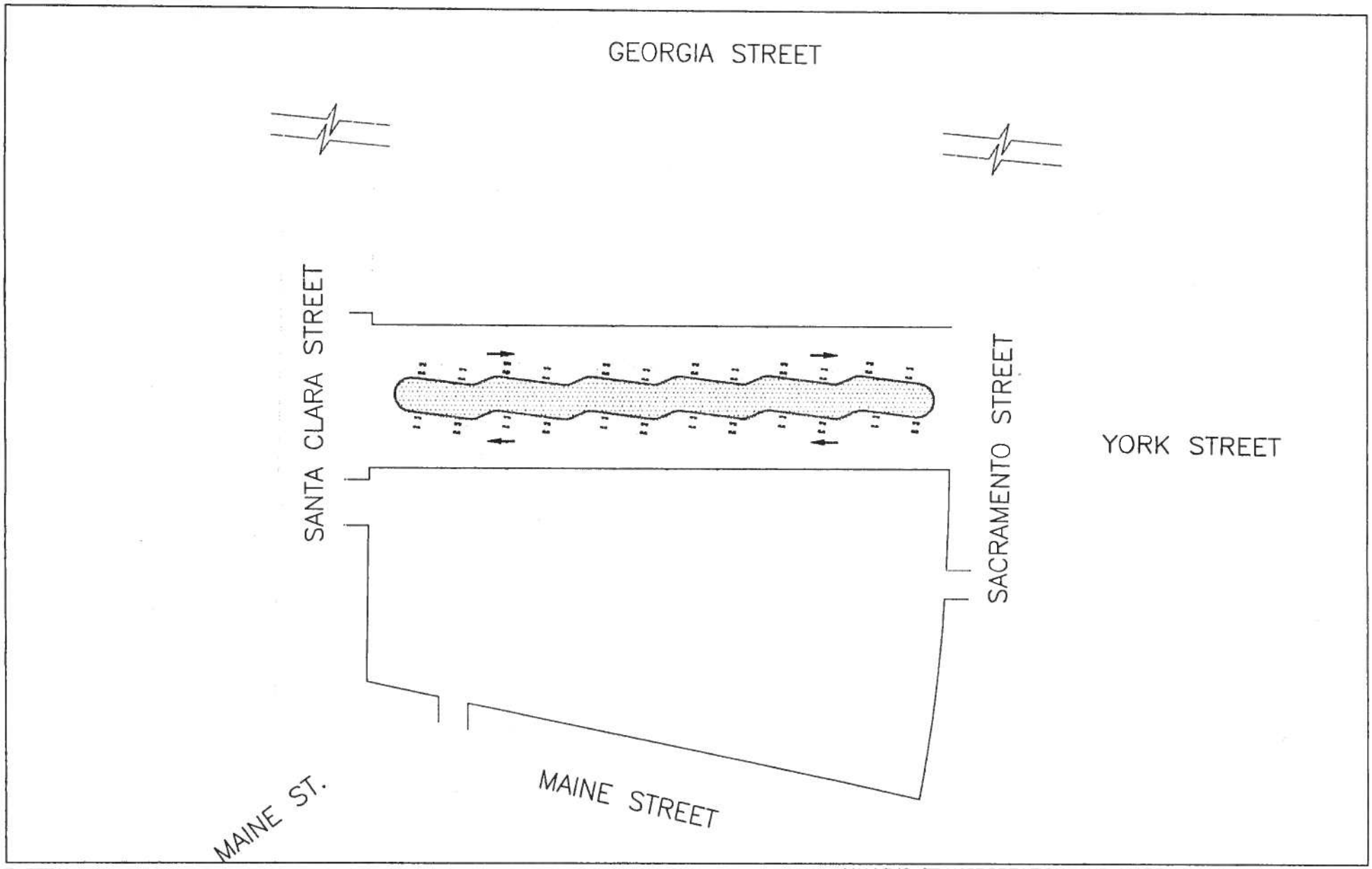
Figure 22

Downtown Transit Center Design



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VALLEJO TRANSPORTATION AND MARE ISLAND ACCESS STUDY

Figure 22

Downtown Transit Center Design

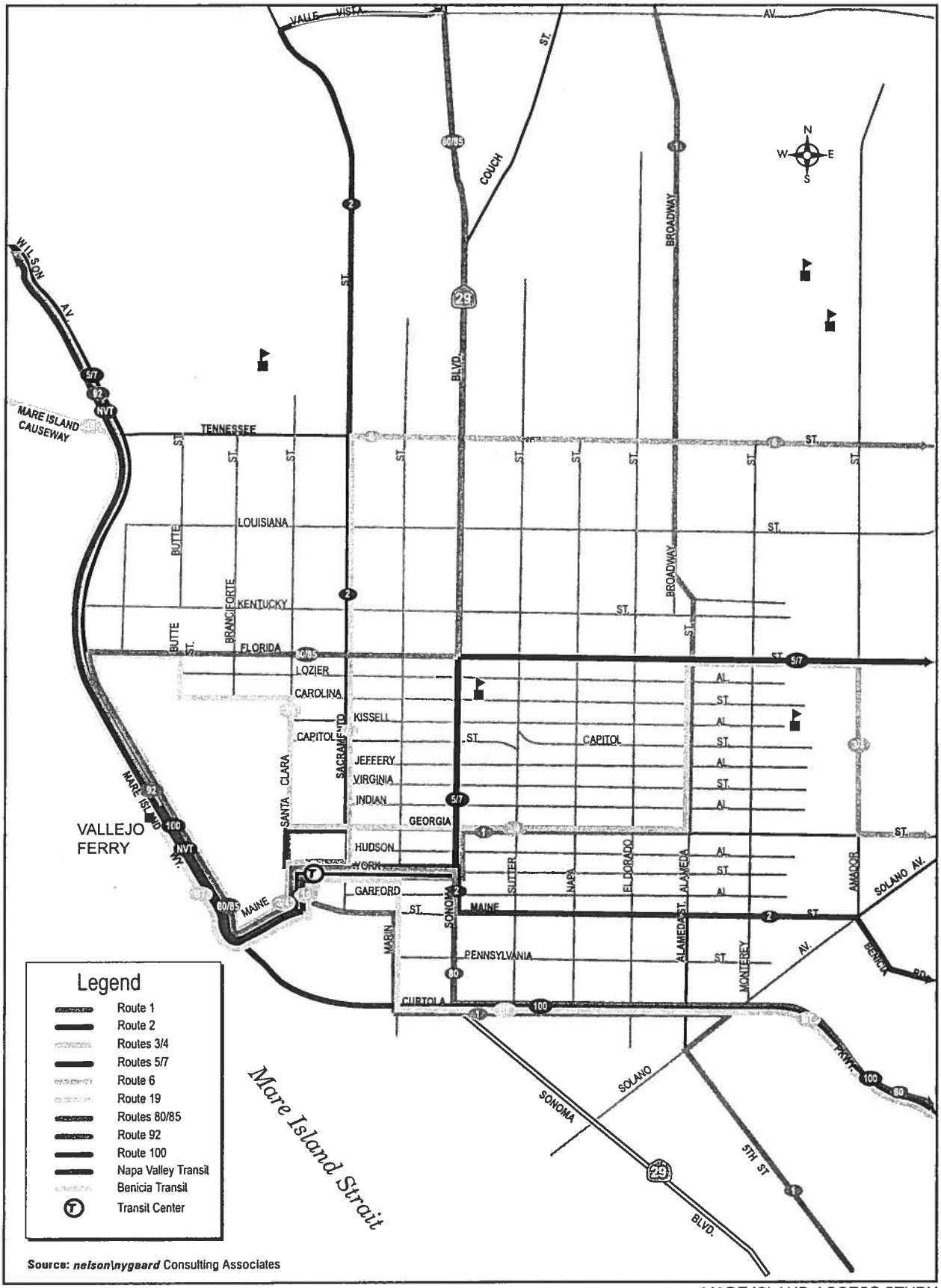

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Figure 23

TRANSIT SERVICE FOR DOWNTOWN TRANSIT CENTER

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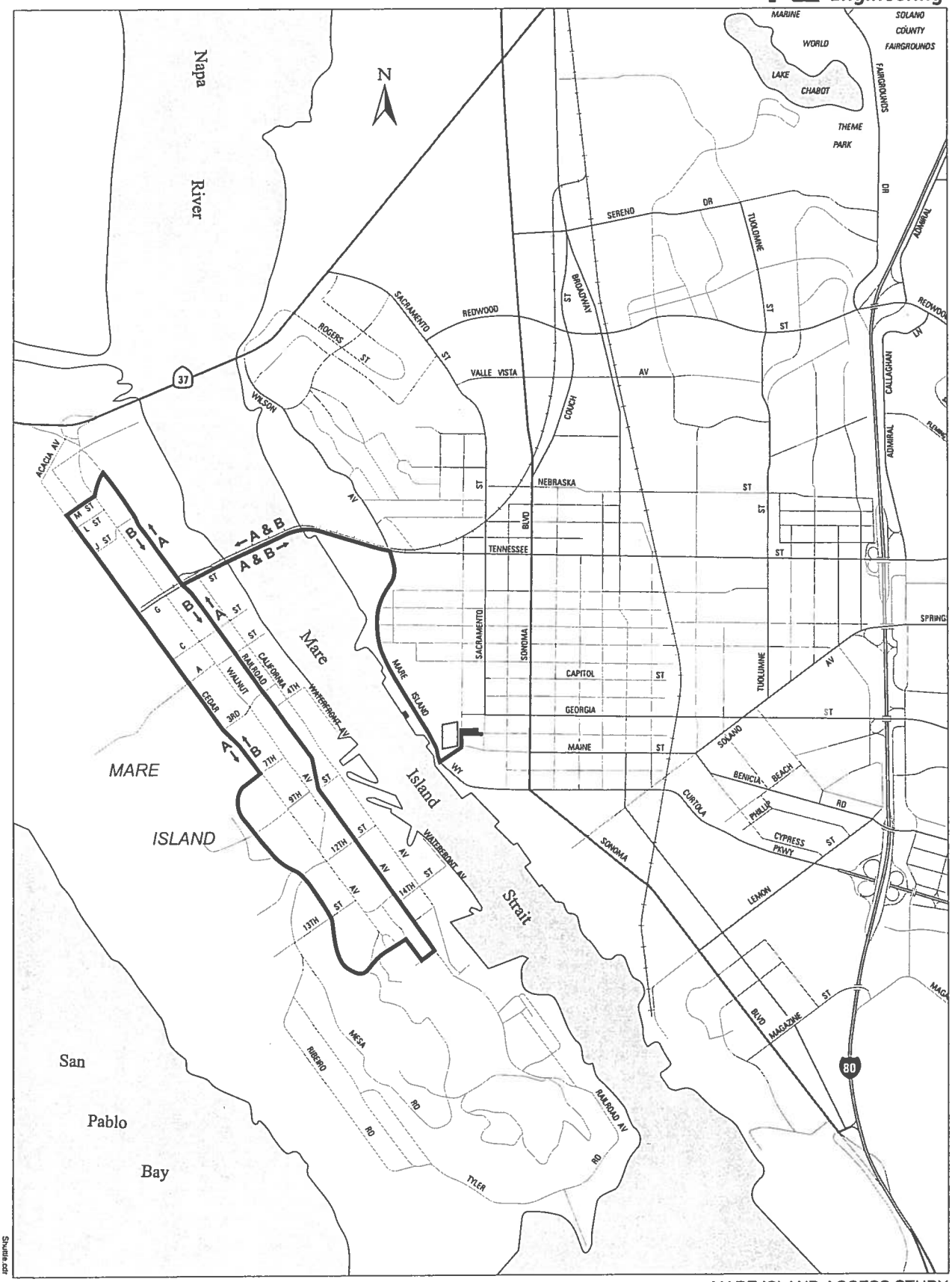

SOURCE: *nelson\nygaard*

MARE ISLAND ACCESS STUDY

Figure 24

PROPOSED MARE ISLAND SHUTTLE ROUTE

Routing

Buses would operate in both directions around a large "T-Loop" as shown in Figure 24. The route would begin at the downtown transit center. From there it would travel west along Maine and north along Mare Island way to the ferry terminal. From the ferry terminal the buses would follow Mare Island Way and then cross the Causeway Bridge to reach the island. Upon reaching the island, alternating buses would proceed in either a clockwise or counter-clockwise direction around a loop. The loop would follow (in the counter-clockwise direction) Railroad, P, Cedar, Tisdale, Club, and 14th before rejoining Railroad for the trip back to the Causeway Bridge. This route provides direct service to all of the major activity centers. Most of the residential areas will be within a 2 to 5 minute walk of a bus stop.

The round-trip cycle time for this route, including layover, is 45 minutes. At "build-out", when service levels have reached their maximum, six (6) buses will be needed to provide service every 8 minutes during the "peak of the peak." Two vehicles will be needed as spares, bringing the total fleet requirement to eight (8) vehicles. It is recommended that 30' low-floor medium-duty buses be used for this service.

Table 2 provides estimates of vehicle and operating costs for the two phases of this proposed project. (A small additional capital investment would be needed for shelters, pavement modifications and signage on the Mare Island roadways.)

Table 2
Estimated Vehicle Fleet and Operating Cost of Mare Island Bus Service

Annual Boardings	Annual Revenue Hours	Annual Operating Costs	Annual Fare Revenue	Annual Operating Subsidy	Misc Capital Costs	Capital Costs (Buses)
Phase 1 (FY 2002 to 2008)						
210,000	14,000	$850,000	$210,000	$640,000	$80,000	$860,000 (4 buses)
Phase 2 (FY 2009 and beyond)						
500,000	35,000	$2,100,000	$500,000	$1,600,000	$0	$860,000 (4 buses)

5) Mare Island Weekend Tourist Water Taxi or Ferry Service: A water taxi service between the mainland and Mare Island was investigated in this study. It is not included formally in the plan as it was found to require too high a subsidy, and it is also likely to compete with the proposed transit system. The concept is retained as a potential for private initiative in the plan, and may have some value as a tourist amenity at such time as the historic park portion of Mare Island reaches maturity as an attraction.

An alternative would be to provide "Limited" ferry service to Mare Island: The first ship could depart from Mare Island and stop at the downtown terminal and the last returning vessel could go on to Mare Island. Additional mid-day runs which do not need to "turn" back to San Francisco could go to and from Mare Island on the back leg of travel. This service could be provided by adding passenger loading to the existing fuel depot relocation project, at marginal additional cost.

Any water access to Mare Island would require on-island shuttle or bus service for access to points beyond the nominal walk radius of the landing.

Description of Other Transportation Mode Improvements

The Mare Island Access Study also investigated needs with regard to pedestrian, bicycle, truck and rail service. This section documents the findings relative to these modes.

1) Bicycle/Pedestrian Service The SWA Group, serving as the design consultant for Lennar Homes, has prepared a conceptual bicycle/pedestrian plan for the major portion of Mare Island as a part of their development proposal. This plan has been slightly modified by extending it across the Causeway and by connecting the Cedar Avenue path to connect to SR 37. The proposed plan is shown in Figure 25. The cost of these facilities is included in the roadway construction cost, for those facilities which would be constructed as on-street bike lanes (e.g., no cost has been included in the plan for off-street trails or bicycle/pedestrian paths, which would most likely be constructed as part of the on-site infrastructure of properties served.)

2) Rail Service: On Mare Island, a decision has been taken by the city and the developers to retain freight rail service to key industries on the island. A conceptual plan has been prepared, as shown in Figure 26, for providing the main services and supporting yard and shunting tracks. Figure 26 indicates that service will continue to be provided in the center of the causeway. From the causeway, the existing trackage that takes the rail into the median of Railroad Avenue south of the causeway would be retained. Service would be provided along the length of Railroad Avenue, including provision of spur tracks on an as-needed basis for those industries requiring service. A "run-around" track would be constructed near the southern end of the island (between 12th and 14th Streets) to allow the motive power unit to pull cars to the end of the line, disengage, connect to the rear of the train, distribute cars to sidings, collect out-going shipments, and then pull loaded cars off the island.

   Another branch would connect from Railroad Avenue and then west on A Street and north on Cedar Avenue to serve industries on the northwest quadrant of the island. A "run-around" track would be built at the end of this line in a manner similar to the description of this track on the south end of the island.

   To meet PUC protection requirements, the plan and financing include the installation of crossing protection, with crossing gates, on both ends of the causeway bridge.

   The cost of implementing the rail trackage changes has been included in the roadway costs for each roadway segment which shares right-of-way with the respective rail trackage portion.

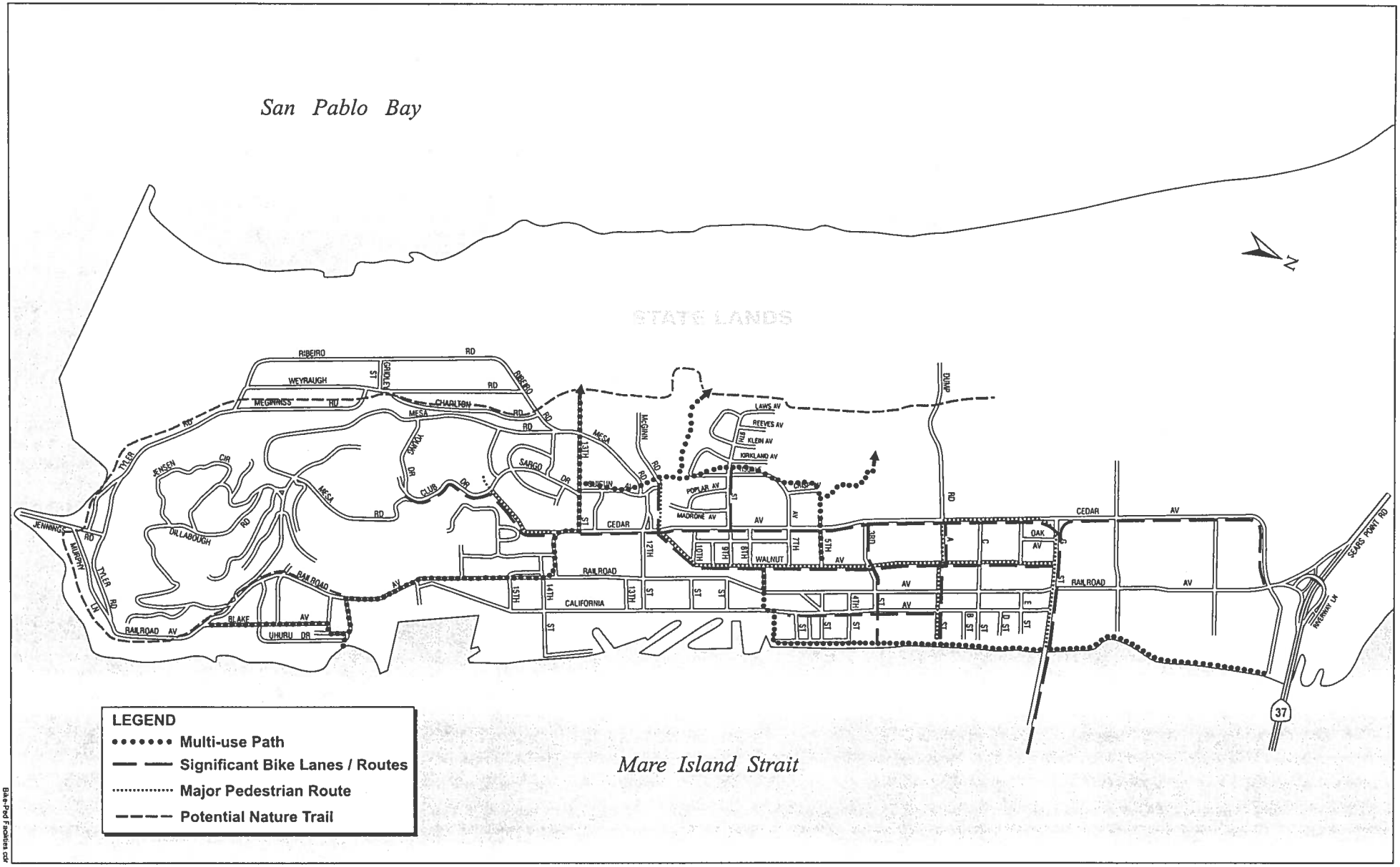

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Figure 25

MARE ISLAND - PROPOSED PEDESTRIAN / BICYCLE FACILITIES

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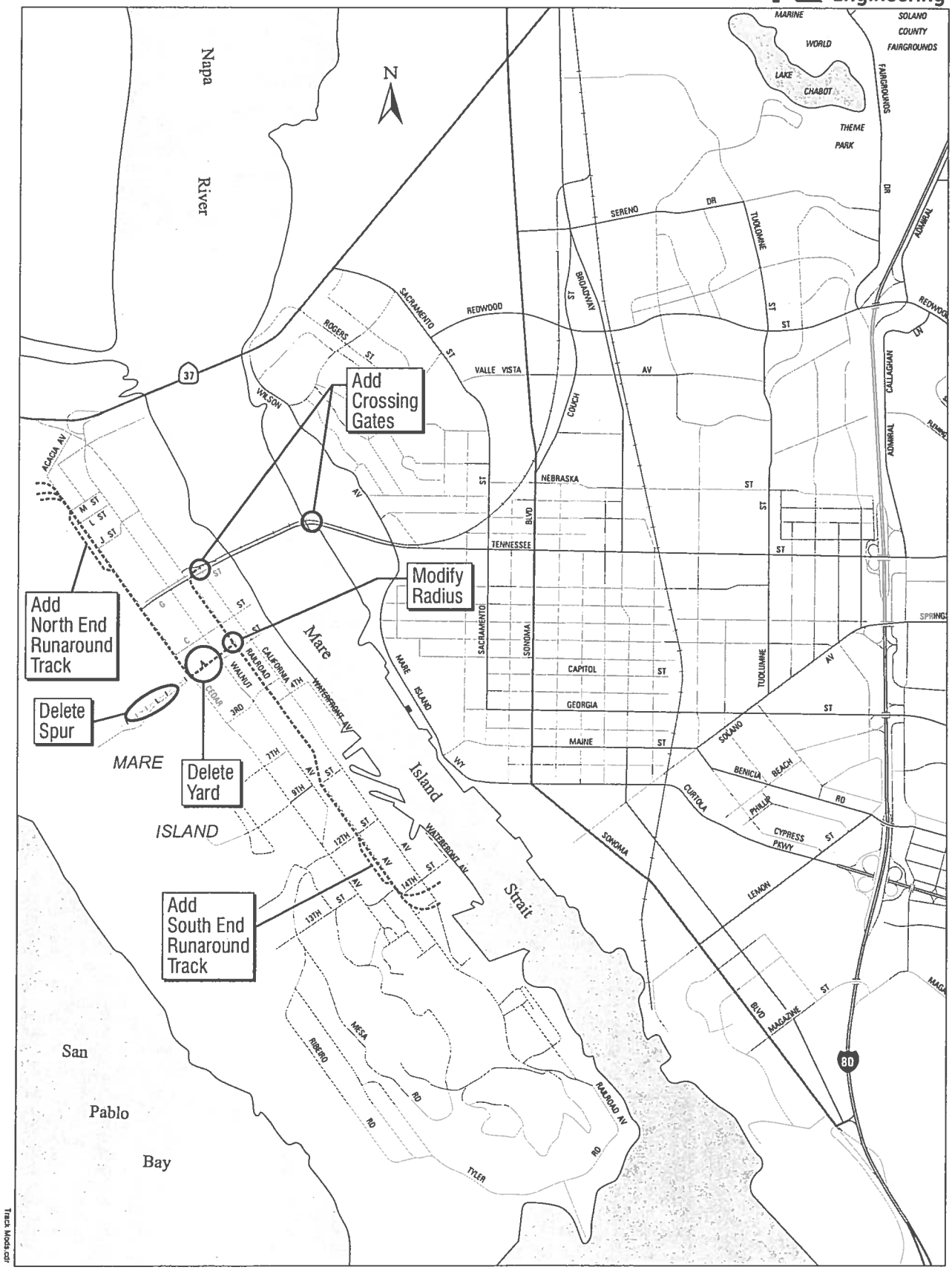


Track Mods.cdr

MARE ISLAND ACCESS STUDY

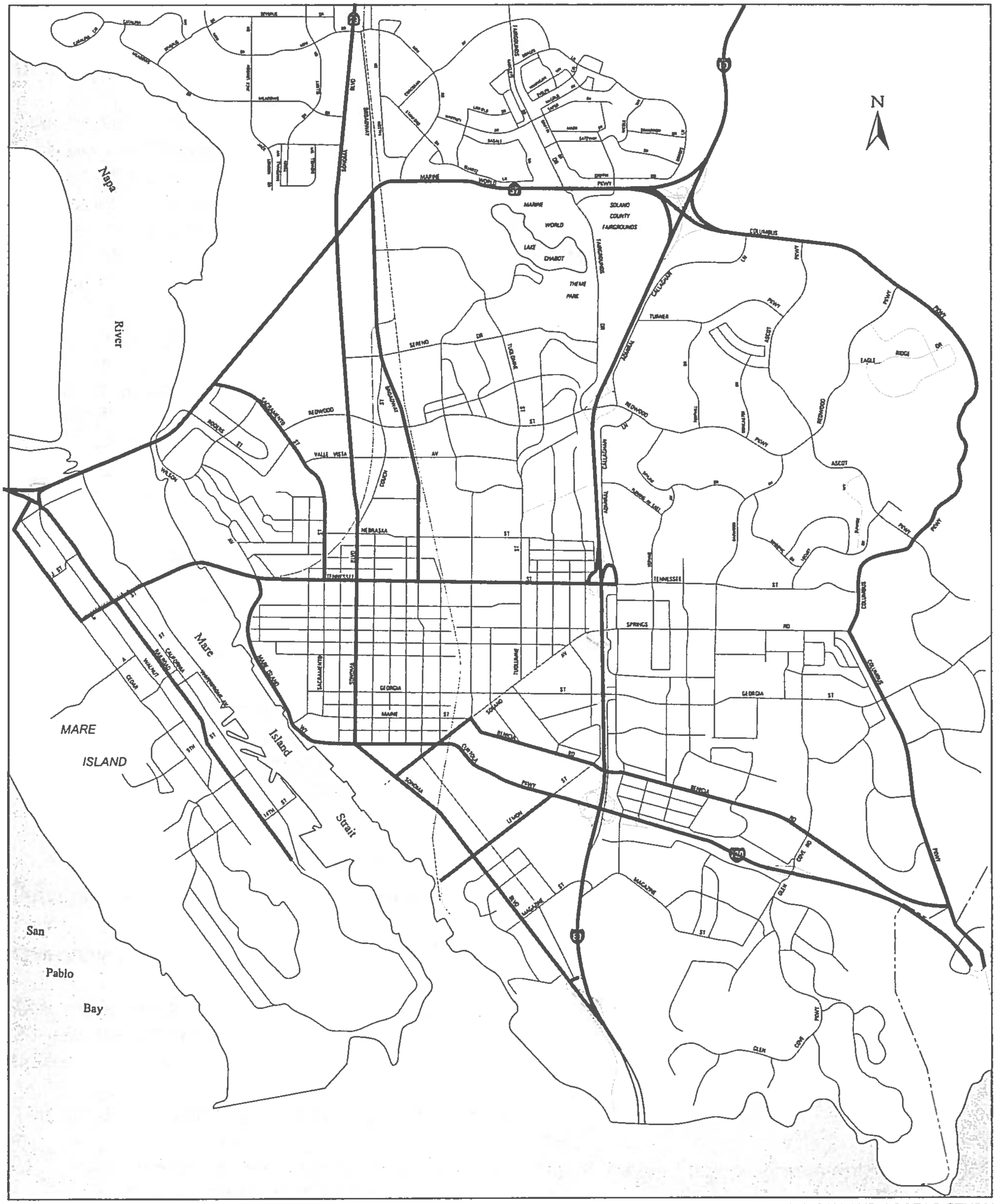
Figure 26

PROPOSED RAILROAD TRACK MODIFICATIONS

3) Truck Routes: It is recommended that Railroad Avenue throughout its length, G Street, the Causeway, and Cedar Avenue between SR 37 and G Street be designated as a truck route. Proposed truck routes city-wide are shown in Figure 27.

The Causeway represents a special case. It should be designated as a truck route, but it is recommended that heavy trucks be prohibited from using the causeway in the peak hours (7-9AM, 11AM-1pm and 4-6PM). This regulation would maximize the efficient use of the causeway at those times when congestion is expected to be at its highest. The regulation does not need to be implemented until such time as the island approaches a buildout condition, or when congestion becomes significant enough to warrant the regulation.

Truck movements, especially traffic between points south and east of the Causeway in Vallejo and beyond in the I-80 and I-780 corridors, are presently accommodated along Mare Island Way, which is a designated truck route. Retention of this route will provide the most direct truck connection between Mare Island and locations in Downtown Vallejo and beyond. The percentage of trucks on an arterial such as Mare Island Way would typically be in the five to ten percent range; of these, a small proportion are the larger multiple-unit "semi trailer" type of vehicles. If the City decides to limit trucks on Mare Island Way, one method would be to limit its use to vehicles which exceed 5 tons. This would allow the smaller "delivery van" type of trucks and other commercial vehicles which would otherwise potentially impact the Sonoma and Tennessee to access Mare Island via the Causeway or Route 37 interchange.



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MARE ISLAND ACCESS STUDY

Figure 27

VALLEJO TRUCK ROUTES

IV IMPLEMENTATION PLAN

INTRODUCTION

This section presents the recommended implementation plan for funding the transportation facilities and improvements prioritized as part of the Vallejo Transportation and Mare Island Access Study. The plan and accompanying funding strategy are intended to guide future actions regarding the development of projects and sources and uses of funds for specific transportation projects serving the Waterfront/Downtown and Mare Island. The plan and funding strategy incorporate input and analysis provided by the consultant team, City staff, project area developers, and the community for the following interrelated areas:

- Project Selection and Phasing – The range and timing of transportation improvements included in the implementation strategy is based on an analysis of the travel demand characteristics of the land use programs anticipated for the Waterfront/Downtown and Mare Island. The list of priority transportation projects also incorporates input from the City and community regarding overall development and transportation objectives. The project list is consistent with project priorities specified in the City of Vallejo's Five-Year Capital Improvement Program (Fiscal Years 2000-01 through 2004-05).

- Project Costs – The cost estimates for the prioritized transportation projects reflect engineering analysis performed by the consultant team based on the best information available at the time, and includes the cost of engineering work plus a contingency amount. This cost analysis has also influenced the selection and phasing of the transportation projects.

- Funding Availability – The financing strategy presented in this paper is based on an analysis of the scope and availability of revenue sources typically used to finance transportation improvements. The analysis has considered the full range of potential funding opportunities including City, State, and Federal sources, as well as developer and land-based financing.

PROJECT SELECTION AND PHASING

Overview

The implementation plan encompasses 22 projects which are proposed for construction over a 20-year period. Most of the work is planned for the short to mid-range time period as described below.

The need and desire for these projects is based on:

- An analysis of the travel demand characteristics of the land use programs anticipated for the Waterfront/Downtown and Mare Island

  and;

- ❑ City and community input on overall development and transportation objectives.

One project of special note, the Southern Crossing, is evaluated in the transportation plan portion of this study but is not considered as part of the implementation strategy because the projected land uses and associated traffic demand do not warrant a new channel crossing until some time after the year 2020. The cost of the Crossing is roughly $75 million, and in order to substantiate that level of financial commitment the following advantages would need to become a higher priority:

- Travel time savings – southern end of Mare Island and points in south Vallejo and beyond;
- Higher land use levels allowable on Mare Island and in south Vallejo;

and;

- Reduced vehicular through traffic on Mare Island Way and Tennessee.

As a summary, the total project costs for each time period are roughly as follows:

- ❑ Short Range (2000-2005) - $67 million
- ❑ Mid-Range (2006-2010) - $36 million
- ❑ Long Range (2011-2020) - $37 million

Projects by Area

The following list describes improvements which are included in the implementation plan by area (Waterfront/Downtown, Mare Island or Interstate 80 Corridor). Improvements have been phased into a series of projects, as described in the subsequent text on phasing.

Waterfront / Downtown Projects

- ❑ Georgia Street Extension – Extension from current terminus at Santa Clara Street to connect to Mare Island Way
- ❑ Mare Island Way Improvements (Phase 1) – Re-striping of existing roadway from Marin to Tennessee with associated traffic control and construction of bus pads
- ❑ Wilson Avenue Improvements – Landscaping and Urban design improvements to two-lane roadway with left turn bays between Hichborn Street and State Route 37
- ❑ Ferry Service Expansion (Phase 1) – Expansion of ferry service with third ferry boat in revenue service

- ❑ Intermodal Parking Structure and Bus Transfer Center – Construction of a joint-use parking garage on Mare Island Way directly across from the Ferry Terminal. Includes construction of new off-street transit center between Santa Clara Street and Sacramento Street on an extension of the York Street alignment. (The facility will serve local and regional buses in the vicinity of the parking structure and ferry terminal.)

- ❑ Capitol Street Extension – Extension from Santa Clara Street to Mare Island Way to provide for local circulation

- ❑ Mare Island Way Improvements (Phase 2) – Construction of 20 wide sidewalks along Mare Island Way from Marin to Tennessee with associated signage

- ❑ Ferry Service Expansion (Phase 2) – Expansion of ferry service with fourth ferry boat in revenue service

- ❑ Intersection Spot Improvements at Solano Avenue/Curtola Parkway - Provide one left lane and one through-right lane to SB approach of Solano Avenue to Curtola Parkway; make Montgomery Street at Curtola Parkway one-way northbound for at least one block

- ❑ Traffic Signal at Wilson Avenue/Rt. 37 EB Ramps – A new traffic signal would be installed by the year 2020 to maintain adequate service levels

Mare Island Projects

- ❑ Route 37/Mare Island Interchange (Phase A) – Reconfigure interchange to conform to proposed on-island roadway system and modify existing eastbound-on and westbound-off ramps to accommodate future striping as two lane ramps (without widening of Napa River bridge)

- ❑ Causeway Bridge and Approach Roadway Improvements – Widening of G Street to four-lanes between Cedar Avenue and the Causeway; re-striping causeway bridge to carry one lane in each direction; and widening of approach roadway from Causeway to Mare Island Way to four lanes, retaining the five-lane approach to Mare Island Way

- ❑ Causeway Railroad Grade Crossing Improvements – Providing railroad grade crossing improvements on the Causeway and traffic management system on approach roadways to control traffic and provide motorist advisories

- ❑ Mare Island Arterials (Phase 1) - Widen Railroad Avenue to 6 lanes between Route 37 interchange and Causeway / G Street intersection, improve & signalize Railroad/Causeway/G Street intersection, improve & signalize Cedar/Railroad intersection

- ❑ Mare Island Bus Service (Phase 1) – Four buses, shelters, signing and bus pads to provide 15-minute headways on a new Mare Island - downtown bus route

- ❑ Ferry Maintenance Facility on Mare Island – Accommodation of a full-scale maintenance facility for at least a four boat (plus back-up boat) ferry service

- Mare Island Arterials (Phase 2) - Widen Railroad to 4 through lanes with railroad track in median left turn lane between Causeway and 3rd Street and to 2 through lanes with railroad track in median left turn lane between 3rd Street and Lemon Street; widen Cedar to 5 lanes from Railroad to 500 feet south of G Street; relocate side-running railroad track to west of Cedar; provide off-street rail yard and run-around trackage

- Route 37/Mare Island Interchange (Phase B) – Re-stripe ramps widened in Phase A to provide two lane eastbound-on and westbound-off ramps

- Mare Island Bus Service (Phase 2) – Addition of four buses for expanded local service every 8 minutes on Mare Island - downtown bus route with provisions for additional stops including bus signs and poles, shelters, and pads

- Route 37/Mare Island Interchange (Phase C) – Modifications to the Route 37 interchange ramps including widening of Napa River Bridge to accommodate two-lane westbound-off and eastbound-on ramps with an ultimate 4-lane Route 37 expressway facility extending west to Marin County

I-80 Corridor Projects

- Interstate 80 Spot Improvements – Minor modification of various ramps and approach streets

- Traffic Signal at Sonoma Boulevard/I-80 WB Ramps - A new traffic signal will be installed by the year 2020 to maintain adequate service levels

Project Phasing

In recognition of the total cost of the improvements, the projects have been phased based upon the logical sequence of project development and in accordance with the anticipated timing of need. Table 3 highlights the desired construction timing of the 22 previously specified transportation projects. The table is intended to show the project priorities over a 20-year period by location within the Vallejo area. This proposed phasing represents the ideal case. Obtaining funding for each of these projects will be critical to achieving the desired construction phasing.

Project Thresholds

The future need and timing for project improvements is based on traffic projections from existing and approved development. The projects shown in the phasing plan address needs associated with all currently approved development. If land use intensities are increased, future traffic projections will also increase, and required project improvements may change in scope, number, and timing based on the increased demand, potentially resulting in higher infrastructure cost and need for additional funding.

It should be noted that the roadway capacity assessment which was used to assess the adequacy and need for proposed improvements was primarily based upon evaluation of the roadway Level of Service (LOS) at key intersections and selected mid-block segments or freeway on-ramps resulting under projected Year 2020 pm peak hour traffic conditions.

Table 3
Project Costs and Recommended Phasing
Cost in $ 1,000's

Time Period	Projects by Vallejo Area				
	Waterfront/Downtown		Mare Island		I-80 Corridor
	Roadway	Transit	Roadway	Transit	Roadway
Short Range (2000- 2005) **$66,806**	▸ Georgia Street Extension $1,538 ▸ Mare Island Way Improvements (Phase 1) $253 ▸ Wilson Avenue Improvements $8,750	▸ Ferry Service Expansion (Phase 1) $10,000* ▸ Intermodal Parking Structure and Bus Transfer Center $25,735	▸ Rt. 37/Mare Island Interchange (Phase A) $4,206 ▸ Causeway Bridge and Approach Roadway Improvements $3,589 ▸ Causeway Railroad Grade Crossing Improvements $1,750 ▸ Mare Island Arterials (Phase 1) $5,045	▸ Mare Island Bus Service (Phase 1) $940** ▸ Ferry Maintenance Facility on Mare Island $5,000	
Mid Range (2006- 2010) **$35,739**	▸ Capitol Street Extension $1,864 ▸ Mare Island Way Improvements (Phase 2) $740	▸ Ferry Service Expansion (Phase 2) $10,000*	▸ Mare Island Arterials (Phase 2) $20,371 ▸ Rt. 37/Mare Island Interchange (Phase B) $104	▸ Mare Island Bus Service (Phase 2) $860**	▸ I-80 Spot Improvements $1,800
Long Range (2011- 2020) **$37,270**	▸ Intersection spot Improvements at Solano Ave./ Curtola Parkway $375 ▸ Traffic Signal at Wilson Ave./ Rt. 37 EB Ramps $187.5		▸ Rt. 37/Mare Island Interchange (Phase C) $36,395		▸ Traffic Signal at Sonoma Blvd./I-80 WB Ramps $312.5

Factors which affect the LOS assessment include:

- Land Uses – Additional development would result in higher traffic levels and greater levels of congestion

- Employee Densities and Specific Development Prototypes – The trip generation rates were based upon standard employee densities for trip attractors such as office uses, and nominal trip rates for residential and retail uses; higher or lower employee densities, different types of retail, or different residential building types could result in higher or lower trip rates per square foot than the rates incorporated in the travel forecast model.

- Level of Transit and Ridesharing – The trip generation rates incorporates a mode split (e.g. percentage of trips by transit, carpools and van pools) similar to the existing Vallejo trip-making pattern. The proposed Mare Island bus service and on-going development of regional high-occupancy vehicles facilities would be adequate to maintain or somewhat exceed the existing mode split in the long range. However, specific Traffic Demand Management (TDM) initiatives applied through large employer programs targeted at developments on Mare Island, for example, could result in lower levels of auto trip generation compared to the assumptions incorporated into the travel forecast model. TDM programs range from basic programs which primarily disseminate information to encourage use of ridesharing and transit to those which are very pro-active and include specific employee incentives such as subsidized transit passes, preferential parking for carpools and van pools, as well as management assistance in establishing carpools and van pools. These programs are ordinarily implemented by large employers, although Cities may be involved in reviewing the program effectiveness.

- Extension of the Peak Travel Period – The travel analysis was based upon comparison of peak hour traffic levels to the roadway capacities. As a result of regional roadway congestion, or as a result of flexible work times and/or scheduling of shift workers, the peak period may be spread out over a longer duration than one hour. In addition, certain land use types such as hotels, medical facilities, and facilities with large numbers of visitor trips tend to generate trips more evenly over the day with correspondingly lower peak hour trip rates. With a longer peak period, a given roadway facility may carry 33 percent more daily traffic compared to a facility with a sharp peak. This effect is most likely to occur as existing facilities reach capacity. Due to the previously-described factors, it is possible that higher levels of development can be attained on Mare Island and in the downtown and waterfront development zones. As more specific development proposals become available, especially for those involving increased intensity of land use, Vallejo should re-evaluate the critical capacity thresholds to determine whether higher levels of development can be approved.

A variety of techniques can be considered to allow deferment of transportation investments and/or higher land use intensities than previously considered. These techniques include, but are not limited to: provision of higher levels of transit services, application of Transportation Demand Management techniques (TDM) such as flextime, car- and van-pooling, and re-evaluation of actual traffic levels and trip generation characteristics of the existing land uses.

Another option which Vallejo should consider, especially with regard to Mare Island, is implementing a regular trip monitoring activity. This could be accomplished either by conducting

traffic counts in spring and fall, or by using loop counters located in each of the traffic entry and exit lanes at the Causeway and Route 37 interchange. This information would be most useful if data were maintained on residential and employee populations on the island as well as participation levels in transit and ridesharing (which could be obtained from employer TDM programs). Monitoring could be used to validate on-going travel forecasting for Mare Island traffic and could work in conjunction evaluating future development proposals.

Projects where specific thresholds have been defined include:

- Causeway Bridge and Approach Roadways
- Rt. 37 Mare Island Interchange (Phases B & C)
- Southern Crossing
- Mare Island Bus Service (Phase 2)
- Mare Island Arterials (Phase 2)

Based upon the traffic forecasting effort and operational analysis, the following recommendations are made with regard to specific improvement triggers:

❑ Causeway Bridge and Approach Roadways – The travel forecast and operational analysis indicated that both the Causeway and the roadway approaches would be approaching capacity (with about 1,800 vehicles/hour on the bridge and the Mare Island Way / Tennessee intersection with a volume to capacity ratio of 90%) with the approved land use intensities. Restriping of the Causeway is anticipated as a near term project, and installing automatic gates to control traffic at the railway grade crossings would be near term needs. It is possible that widening of the east approach and improving the Causeway / Railroad intersection could be deferred until traffic volumes warrant (through attainment of Level of Service D/E).

❑ Route 37 Interchange – The travel forecast indicated that the pm peak hour volume on the eastbound on-ramp would exceed 1,900 vehicles/hour with the approved land use intensities. This volume, even if brought on to the freeway in its own lane with the two-lane on-ramp concept, would be essentially at capacity.

It should be noted that the Route 37 interchange improvements were proposed as three separate projects. The following "warrants" have been developed to indicate the need for each phase:

- Phase A (PSR Alternative 2-A) – This improvement is needed in the near term to connect the proposed two-way Railroad Avenue on Mare Island to the interchange, which currently directs traffic to a Railroad/Walnut one-way couplet.

- Phase B (PSR Alternative 2-B) – This improvement would provide a two-lane eastbound on-ramp and westbound off-ramp by shifting the present lane drop which occurs immediately west of the existing interchange into the interchange area. This improvement would be warranted when the ramp volume attains 1,500 vehicles/hour (approximate LOS C) and if the ramp volume exceeds the Route 37 volume west of the interchange.

- Phase C (PSR Alternative 2-C) – This improvement would provide a two-lane eastbound on-ramp and westbound off-ramp with a four-lane configuration of Route 37. This improvement would be warranted in the event the ramp volume attains the 1,900 vehicles/hour (approximate LOS E/F) and if Route 37 were to be widened to a four-lane expressway facility between Mare Island and Marin County.

❑ Southern Crossing – As noted previously, a new bridge is not required to attain build out of Mare Island to the currently allowable levels of intensity. As noted above, both the Causeway and its approaches, as well as the Route 37 interchange are expected to be approaching the capacity threshold with the highest projected build-out traffic levels identified in the travel forecast runs. However, it is possible that higher levels of development could be allowed due to a variety of factors:

- Observed trip generation is lower in the peak period than the trip generation rates used in the travel forecast model, either due to a lower daily trip rate or due to greater spreading of the peak hour traffic over time;

- Auto occupancy factors are greater than originally anticipated, and/or ridesharing programs are established Mare Island traffic generators;

or;

- A greater percentage of trips are made by transit, both due to development of transit options for Mare Island and promoting their use in conjunction with ridesharing programs.

It is possible that the factors listed above could reduce the effective trip rates by up to 25 percent. Therefore, it is unlikely that a new bridge would be considered a necessity unless about 50 percent higher intensities were attained. Conversely, if a new bridge were to be built, it would be logical to allow significantly higher levels of development on Mare Island. (Refer to Appendix M, "White Paper" for a discussion of the economic factors.)

❑ Mare Island Bus Service (Phase 2) – The threshold for expansion of the Mare Island bus service would be attainment of load levels comparable to other principal Vallejo Transit routes and/or the need for expanded transit services in conjunction with a Transportation Demand Management (TDM) program for Mare Island.

❑ Mare Island Arterials (Phase 2) – At the time the analysis was accomplished, it was anticipated that the northern portion of Mare Island would develop before the southern end of the island. Accordingly, the recommended staging of Mare Island arterials was to accomplish the north end improvements prior to implementation of improvements on the southern portion of the island. The actual timing will depend upon the rate of development. As a general principle, it may be possible to defer improvements on selected links until such time as the peak hour traffic levels attain 85 percent or more of capacity (Level of Service D/E). This threshold would be evaluated based upon actual traffic counts accomplished as part of a traffic monitoring program.

Environmental Clearance

As part of the technical effort, the consultant team conducted preliminary environmental screening on the proposed projects and design options. Based upon available information, no "fatal flaws" were discovered from an environmental perspective. As the projects are further developed, environmental clearances will need to be obtained. The project list has been divided into two types of project: "major projects" and "minor projects". The recommended means of clearance for the "major projects" is with an Environmental Impact Report (EIR), or Environmental Impact Report/Environmental Impact Statement (EIR/EIS), in the event federal funding is proposed. "Minor" projects would be cleared using a Mitigated Negative Declaration, or Mitigated Negative Declaration with a Finding of No Significant Impact (FONSI), in the event federal funding is involved.

It should be noted that the Mare Island roadways were previously included in the Re Use EIR. Therefore, the recommended procedure is to review the preliminary engineering drawings to determine whether the project as described in the prior environmental document is consistent with the current project description – if so, then a staff-level determination can be made and additional environmental effort would not be required. It is also possible to combine a number of projects in the same area and clear them together. For example, the Downtown / Waterfront roadway extensions and reconfiguration both be cleared under an EIR for the Waterfront Plan.

The two listings below summarize the recommended means of environmental clearance for upcoming approvals:

Mitigated Negative Declaration / Finding of No Significant Impact (FONSI)

- Spot Improvements (Intersections and I-80 Corridor)
- Traffic Signals
- Route 37 Interchange (Phase A and Phase B)
- Bus Service Expansion
- Ferry Service Expansion
- Ferry Maintenance Facility

Environmental Impact Report / Environmental Impact Statement

- Route 37 Interchange (Phase C)

FINANCING STRATEGY

Overview

The overall logic of the financing strategy will need to be further considered and tested on an on-going basis to ensure that it is sound and feasible given the perspective of the involved parties. Additionally, it should be noted that the actual construction of the transportation improvements will depend on a number of issues that have not yet been fully resolved at this time. These include:

1. The precise extent, phasing, and market value of new development that will ultimately be approved and constructed as a part of the Waterfront/Downtown and Mare Island redevelopment plans;

2. The actual costs and phasing of infrastructure, facilities, and required environmental mitigation;

3. The availability of government funding sources to provide money for infrastructure development and an underlying assumption that Vallejo will receive a reasonable share of these funds;

   and;

4. The type and scope of additional infrastructure financing mechanisms which can be established to fund the necessary improvements.

The financing strategy presented here, while not resolving these issues, provides a framework that will support subsequent decisions by policy-makers regarding infrastructure investment, the formation of financing mechanisms, and prioritization of state and federal funding opportunities.

Key Considerations and Findings

The financing strategy considers funding for 22 transportation projects over 20 years with an estimated total cost of approximately $140 million. Approximately one half ($67 million) is anticipated to be incurred within the next five years.

The implementation strategy for the proposed Vallejo area transportation projects recommends not only a large amount of local/land-based funding, but also a variety of State and Federal funding sources. Specifically, approximately 22 percent is proposed to come from State sources, 33 percent from Federal sources, and 45 percent from local or land-based sources. In all cases, actual funding amounts will be based on economic and political factors and policy considerations that cannot be predicted with certainty at this time. For example, County approval of a ½ cent increase in sales taxes would raise an additional $160 million from local sources.

The most expensive items contained in the prioritized project list include the Ferry Service Expansion ($20 million), development of a downtown intermodal parking structure and bus transfer center ($26 million), and the completion of a variety of improvements to Mare Island arterials ($25 million).

State-Level Funding

The principal State revenue source proposed as part of this implementation strategy is the State Transportation Improvement Program (STIP). This source is recommended for a variety of the proposed projects. The STIP process is proposed as a financing source for a number of projects because of an estimated funding capacity of nearly $42 million to the City of Vallejo over a 20-year period. The implementation strategy proposes using roughly 46% of that amount for plan projects, leaving some capacity for other Vallejo project work. An additional opportunity will result from an expanded STIP program period from four to seven years. It is anticipated that this action will be approved by the Legislature and the Governor during this legislative session.

Federal-Level Funding

A number of Federal revenue sources are proposed as part of this implementation strategy, including:

- Surface Transportation Program/Congestion Mitigation & Air Quality
- Transportation for Livable Communities (TLC)
- High Priority (DEMO project)
- Federal Discretionary – Ferry Boat Program
- Federal Grants

We believe that the City can be successful at competing for demonstration project funds and Discretionary Ferry Boat funding.

In addition, Economic Development Administration (EDA) grants have and may continue to be a viable, non-conventional federal funding source for infrastructure improvements related to the economic development of Mare Island. The City has already obtained a grant for design of improvements to the State Route 37/Mare Island interchange and will be pursuing a subsequent grant for construction purposes.

Environmental Protection Agency (EPA) grants provide an additional federal source for area improvements. Specifically, EPA grants have been pursued for sewer and drainage improvements on Mare Island.

Local or Land-Based Funding

Principal sources of local or land-based sources include:

- Developer Financing
- Land-Secured Financing
- City of Vallejo (General Fund) Funding
- City of Vallejo Redevelopment Agency Financing
- Development Impact Fees

The approach incorporated in the funding and financing strategy is that the local revenue sources would be used to cover the revenue shortfall that is projected to exist after state and federal sources have been exhausted.

We have not assumed the availability of revenues from a sales tax program. However, if implemented, the City of Vallejo could anticipate some $160 million over a 20-year period given current projections of $529 million for Solano County over the same period.

SUMMARY OF PROPOSED FUNDING SOURCES

This financing strategy is based on an analysis of the scope and availability of revenue sources typically used to finance transportation improvements. The analysis has considered a wide range of potential funding opportunities including City, State, and Federal sources, as well as developer and land-based financing.

Table 4 is intended to provide a summary of the potential funding sources that could be used to fund the City of Vallejo projects previously specified. The table also includes projections of the amounts expected to be available from the various sources. Some sources are very competitive; thus, the pursuit of funds needs to be strategically planned and the projects well-marketed in terms of potential benefits.

The implementation strategy for the proposed Vallejo area transportation projects recommends not only a large amount of local/land-based funding, but also a variety of State and Federal funding sources. The funding sources identified in this study are based on the assumption that current programs, funding levels, and financing mechanisms will remain in effect over the 20-year projection period. Where dollars are allocated by formula, we have projected existing factors to remain unchanged over the 20-year program period. Estimates of Vallejo share of discretionary programs is based on the assumption of a "fair share" allocation to the City, tied to population.

(Note, however, that the actual distribution of these funds is subject to a competitive countywide prioritization process.)

The recommended funding sources in Table 4 and the associated funding capacities over 20 years are used to assign types of funding and amounts for each project. In some cases, the estimated funding in a specific category could only be shown as a Bay Area or Solano County number. In fact, certain sources are "project specific" and a "funding capacity" amount is not relevant. It should be also noted that the recommended source amounts shown may or may not be available in the time period during which the specific project is intended to be funded.

Each source listed in Table 4 shows the estimated 20-year program amount and the proposed 20-year Vallejo Implementation Strategy amount. Funding amounts are listed in constant dollars. State and federal funding levels were generated from discussions with the Metropolitan Transportation Commission, Solano Transportation Authority, and the City of Vallejo. Specific assumptions for each funding source are highlighted.

A discussion of federal and state funding opportunities as well as a review of local and land based financing options is provided following the table.

Table 4
Summary of Proposed City of Vallejo Funding Sources
Years 2000 - 2020

Federal Sources:				
Type	**20-year program (by County or Bay Area)**	**20-year program (by City of Vallejo)**	**Proposed 20 Year Implementation Strategy Amount**	**Comments/Assumptions**
Surface Transportation Program/Congestion Mitigation & Air Quality (STP/CMAQ)	$80M to Solano Cty.	$24M	$2.55M	Estimate based on FY2000 amount of $4M to Solano County but varies annually. Estimate depends on annual federal appropriation and on MTC's STP/CMAQ distribution policy for that year. Vallejo amount taken from Solano County total based on approximate population % of Solano County (30%). Currently, 75% of this source is directed to maintenance with 25% to Capital improvements.
Transportation Enhancement Activities (TEA)	$5M to Solano County	$1.5M	$0	Estimate based on $1.5M county share over 6 years (1999-2004). Varies annually. Depends on annual federal appropriation and on MTC's TEA distribution policy for that year. Vallejo amount taken from Solano County total based on approximate population % of Solano County (30%).
Federal Demonstration Projects (DEMO)		Project Specific	$18.8M	Based on DEMO project eligibility. Congress selects projects.
Federal Earmark/ Discretionary		Project Specific	$12M	i.e., FTA 1207- Ferries
Federal Transit Act Section 5307- Formula Funds – Buses	$2.4B to SF/Oakland UZA (Urban Area)	$70.5M	$0	Estimate based on FY2001 amount of $120M for the SF/Oak UZA. Eligible Vallejo projects would compete based on project ranking. Vallejo estimate assumes regional funds remain the same. 20 year Vallejo assumptions include: (1) $10M for facilities, (2) $7.5M for Ferry engine replacement, (3) 60 buses @ $300k= $18M, (4) $35M for new Boats

Table 4
Summary of Proposed City of Vallejo Funding Sources
Years 2000 - 2020

Federal Transit Act Section 5309- Fixed Guideway – Rail/Ferry	$1.24B to SF/Oakland UZA	Project Specific	$700,000	Estimate based on FY2001 amount of $62M. Eligible Vallejo projects would compete based on project ranking.
Federal Transit Act Section 5309- Bus	Discretionary		$777,500	
Highway Bridge Replacement and Rehabilitation Program (HBRR)	$280 M to the Bay Area	$5.6 M	$91,000	Potential for Causeway Bridge Improvements. Caltrans allocates the money. Bay Area estimate based on $14M/year. Eligible Vallejo Projects would compete with other Bay Area projects. 2% of Bay Area amount to Vallejo based on population.
Transportation for Livable Communities (TLC)	$180 M to the Bay Area	$3.6 M	$735,000	Based on $9M per year to the Bay Area. Eligible Vallejo Projects would compete with other Bay Area projects. . 2% of Bay Area amount to Vallejo based on population.
EDA grants		Project Specific	$2M	City currently pursuing grants. Opportunity for additional grants in the future.

Table 4
Summary of Proposed City of Vallejo Funding Sources
Years 2000 - 2020

State Sources:

Type	20 year program (by County or Bay Area)	20 year program (by City of Vallejo)	Proposed 20 Year Implementation Strategy Amount	Comments/Assumptions
Governor's Transportation Plan (April, 2000)	$5.2B to the State	$5M	$5M	Baylink Ferry Boat specified in newly released plan.
Regional Improvement Program (RIP) portion of the STIP	$140M to Solano County	$42M	$18.9M	Estimate based on $42M County share over 6 years (1999-2004). Vallejo amount taken from Solano County total based on approximate population % of Solano County (30%). STIP, State Transportation Improvement Program
Interregional Improvement Program (IIP) portion of the STIP	Discretionary-varies annually	Project Specific	$0	Based on interregional project eligibility. STIP, State Transportation Improvement Program
State Infrastructure Bank	$450M Statewide	Project Specific	$0	Loans available on competitive basis through an application process.
State Transit Assistance	$540M $200M to the Bay Area	$1.95M $3.32M	$0	Revenue based and population based. Estimates based on FY2001 Vallejo amounts ($97,303/$166,000). Vallejo currently uses these funds for operating costs and minor capital.
Environmental Enhancement and Mitigation Program (EEMP)	$60M to the Bay Area (avg.)	Project Specific	$240,000	Estimate based on an average of $3M/year to the Bay Area.
Local Share of State Gas Tax	$2.6B to the Bay Area	$40M	$0	Estimate based on $2M/year to Vallejo. Currently, 100% used for road maintenance.
Transportation Development Act, Articles 4 and 8 (TDA)	$5.88B to the Bay Area	$54M	$0	Estimate based on FY2001 Vallejo amount of $2.7M. Vallejo currently uses for bus/ferry operations.
Transportation Development Act, Article 3 (TDA)	$4M to Solano County	$1.2 M	$0	Estimate based on FY2001 amount of $200k. For Capital Bike Projects- project specific. Vallejo amount based on 30% population of Solano County.
Bridge Tolls	$2.7B to the	$25M	$0	For Ferry Operation. Based on $1.2M

Table 4
Summary of Proposed City of Vallejo Funding Sources
Years 2000 - 2020

	Bay Area			per year to Vallejo in prior years.
AB 1012 Loan		Project Specific	$0	Short Term loan programs from State Highway Account.
Discretionary Budget Request		Project Specific	$0	One time allocations via state budget requests by Legislators.
State Highway Operations and Protection Program (SHOPP)	$1B to Bay Area	$20 M	$850,500	Project Specific – Caltrans selects appropriate projects. Estimate based on $50M/year to the Bay Area. . 2% of Bay Area amount to Vallejo based on population.

Table 4
Summary of Proposed City of Vallejo Funding Sources
Years 2000 - 2020

City Sources:				
Type	**20 year program (by County or Bay Area)**	**20 year program (by City of Vallejo)**	**Proposed 20 Year Implementation Strategy Amount**	**Comments/Assumptions**
General Fund Reserve			$0	See specific project worksheets for proposed funding mix.
Mare Island Working Capital Account			$0	See specific project worksheets for proposed funding mix.
Other City Fund			$3,650,000	City staff to determine which City fund to use to complete the Wilson Ave. project.
Excise Tax			$0	See specific project worksheets for proposed funding mix.
Redevelopment Agency Financing:				
Type	**20 year program (by County or Bay Area)**	**20 year program (by City of Vallejo)**	**Proposed 20 Year Implementation Strategy Amount**	**Comments/Assumptions**
Tax Increment Bond			$0	See specific project worksheets for proposed funding mix.
Project Area Capital Funds on Hand			$5.8M	See specific project worksheets for proposed funding mix.
Developer/Land Based Financing:				
Type	**20 year program (by County or Bay Area)**	**20 year program (by City of Vallejo)**	**Proposed 20 Year Implementation Strategy Amount**	**Comments/Assumptions**
Existing City Impact Fee	N/A	5,100,000	$5,100,000	This is the City's Transportation Impact Mitigation Fee (TIMF) which currently has only $5.1M available.
Citywide Impact Fee (Mare Island)		$10.6M	$7,182,000	All cost allocations to be determined at a later date following an AB1600 Nexus study. See specific project worksheets for proposed funding mix. This Transportation Impact Mitigation Fee (TIMF) would replace the existing fee (existing fee would have to be updated). 20 year program amount assumed to be 15% higher than 20 year projection of $9.2M which is based on the current fee structure. This figure is shown in a

Table 4
Summary of Proposed City of Vallejo Funding Sources
Years 2000 - 2020

				subsequent table in the Development Impact Fees Section.
Mello Roos Bond			$0	None specified at this time.
Mare Island Developers			$27.2M	Lennar's and Legacy's financing plans show them paying for all their in-tract improvements. Installation of infrastructure will be pursuant to development agreements with Lennar and Legacy. See specific project worksheets for proposed funding mix.
Waterfront Developer			$1,864,000	Covers all costs for Capitol Street Extension.
Other:				
Type	**20 year program (by County or Bay Area)**	**20 year program (by City of Vallejo)**	**Proposed 20 Year Implementation Strategy Amount**	**Comments/Assumptions**
Bay Area Air Quality Management District (BAAQMD)			$162,500	
Future County Sales Tax for Transportation	$529 M	$150 M	$0	i.e., ½ cent over 20 years. Need 2/3 county voter approval. Vallejo amount based on 30% population of Solano County.

Table 4
Summary of Proposed City of Vallejo Funding Sources
Years 2000 - 2020

Total for all Sources:				
	20 year program (by County, Bay Area, SF/Oak UZA, or State)	**20 year program (by City of Vallejo)**	**Proposed 20 Year Implementation Strategy Amount**	**Comments/Assumptions**
	$229 M (by County) $13.5 B (by Bay Area) $3.6 B (by SF/Oak UZA) $5.6 B (by State)	$502.9M	$113.5M	Total taken from all relevant sources listed above.

Note: All amounts listed are in constant dollars. State/Federal amounts were generated from discussions with the Metropolitan Transportation Commission, Solano Transportation Authority, and the City of Vallejo.

BACKGROUND ON FUNDING OPPORTUNITIES

Assumptions Regarding State and Federal Funding[6]

The state and federal funding sources shown in Table 4 are recommended as viable streams of revenue for the proposed Vallejo area projects. The table shows each recommended source and an anticipated amount of funding expected for the City of Vallejo over 20 years. Several of the 20-year Vallejo program amounts are estimated with Vallejo's population, as it relates to a percentage of Solano County (Vallejo's population is roughly 30 percent of Solano County). Also, several 20-year program amounts are only listed by the Bay Area. For numerous funding sources, Vallejo's size compared to the greater Bay Area directly effects how money will be distributed to Vallejo area projects. For example, Vallejo's population percentage relative to the total number of people living in the Bay Area is two percent. Therefore, for discretionary funding available to MTC, we have assumed that Vallejo will capture at least two percent of the total. For discretionary dollars available to Solano County, we are assuming that 30 percent will be available to the City based on the relative proportion of Vallejo's population to the County's total population.

Notes on State Funding

At this time, state transportation funding is provided to local jurisdictions through a variety of sources. Local gas tax revenue and Transportation Development Act Funds are distributed by formula, and 75 percent of the funding through the State Transportation Improvement Program (STIP) is available to regional and local agencies on a county share basis, with 25 percent allocated by the State to interregional projects on a discretionary basis. The county share is a population-based factor. We project that current STIP funding levels provided through major fund sources will remain fairly constant over the next 20 years. Any increases in state transportation funding will likely be directed at maintenance and rehabilitation activities, transit operating expenses, or State discretionary programs. In addition, we may see a shift in the percentage split between county shares and the interregional program. Finally, increases in the amount of "off-the-top" expenditures, such as administration and State operational and safety projects, may tilt the balance of available funds.

The bottom line is that while State funding for transportation will likely increase over the next 20 years, the portion guaranteed to Solano County and the City of Vallejo will probably shrink. This means that operating programs will continue to grow at the expense of guaranteed capital funding. Discretionary capital programs, however, requiring competition with other projects will also likely see an increase in funding.

The State's current economic position does provide a significant opportunity to take advantage of increased funding for transportation as the City begins to develop a viable funding strategy for the Waterfront/Downtown and Mare Island improvements. With a budget surplus for the 2000-2001 fiscal year now estimated at nearly $13 billion, there will definitely be an influx of new State revenue for transportation work. The Governor's transportation program currently under consideration by the Legislature will augment transportation spending by $3.0 million in General

[6] A previous report, "State and Federal Government Funding Sources", prepared by Smith & Kempton for the City of Vallejo in October, 1999, was intended to provide the City with an overview of the variety of funding opportunities that could help formulate an ultimate strategic transportation funding strategy. For your reference, this report is included as Appendix N to this report.

Fund money in addition to $2.2 billion in bond proceeds if the Legislature agrees to place a bond measure on the ballot and the State's electorate approves the measure. These numbers may increase as the program undergoes legislative review.

Out of these new monies, the City of Vallejo will receive $5 million towards purchase of a third ferry boat. In addition, there may be some increase in funding for maintenance and rehabilitation of city streets. Perhaps the biggest opportunity for more money from the Governor's transportation initiative, however, comes from an expanded STIP program period. While only a one-time benefit, the proposal being considered by the Legislature would extend the STIP programming period from four to seven years. This has the benefit of providing an opportunity to program an additional $3.5 billion statewide for transportation projects. Solano County will receive a "fair share" of these dollars, and the City will be in a position to compete for this additional funding.

Notes on Federal Funding

At the Federal level, we are basing our projections on the assumption that current funding levels and programs will continue of the next 20 years. This is consistent with assumptions the State makes in calculating the Federal dollars available for the State Transportation Improvement Program. More recent funding sources such as Surface Transportation Program/Congestion Mitigation Air Quality funding and Transportation for Livable Communities dollars provide expanded opportunities for Federal funding. However, STP funding in Solano County is directed toward maintenance and rehabilitation of city streets and county roads. We have suggested the possibility of a small portion of the Solano County share of these funds go to Waterfront roadway improvements.

In our judgment, the biggest opportunity for the City of Vallejo from Federal funding will come through two existing programs: the discretionary ferry boat program and high priority project (or demonstration project) funding. We have included funding from both of these sources in the proposed implementation strategy. In terms of the so-called demonstration projects funding, there may be several opportunities for dipping into this source given the clout of our local Congressional delegation and the fact that the 20-year program period for this study will encompass several transportation program authorization bills. Major federal programs are "reauthorized" every five to six years, and the bills to accomplish that reauthorization have become the vehicles for programming these "special" project expenditures.

Table 5 highlights the annual submittal timeline for state and federal grant type funding which was previously mentioned in Table 4.

Table 5
Annual Timeline for Grant Type Funding

Grant Type	Submittal Deadline
Federal EDA	Ongoing
Federal DEMO	Federal authorizing legislation (2003)
Environmental Enhancement and Mitigation Program (EEMP)	November 17, 2000* (draft deadline)
State Infrastructure Bank (Revolving Fund Program)	August 14, 2000 (round 2)* November 13, 2000 (round 3)*
State AB 1012 Loan	Ongoing

* Deadline for submitting application

Possible Local Sales Tax Program

Of longer term importance to the City is the potential ability to implement a transportation sales tax program in Solano County. Over a 20-year period, Solano County could expect to raise more than $500 million if a ½ cent sales tax was imposed for transportation purposes. This is not a State source of funding, and the dollars raised could be applied to local streets and roads, transit operating expenses, or capital improvements on any transportation system. Some key Vallejo projects that could be funded in a timely manner with this source include: a fourth ferry boat; elements of the downtown intermodal facility; transit operating expenses for the new Mare Island Bus Service, and other Waterfront/Downtown or Mare Island related transportation improvements. The City of Vallejo could reasonably expect to receive in the neighborhood of $160 million from this funding source based on a return to source calculation. As a result of such funds coming to the City, delivery of key Vallejo projects could be advanced by several years.

Local and Land-based Financing

Local and land-based financing refers to revenue sources derived from area developers, property owners, and local taxpayers. Generally, these revenues will be collected and distributed by the City of Vallejo or made available through financing mechanisms secured directly or indirectly by the value of the land. As with the State and Federal sources described above, the amount of funding available from local and land-based sources cannot be determined with certainty at this time.

A number of local and land-based financing resources have been identified as appropriate for the transportation projects identified in the previous Project Selection and Phasing Section. These sources include the following:

- Developer Financing
- Land-Secured Financing
- Citywide Sources

- Redevelopment Agency Financing
- Development Impact Fees

Financing mechanisms in each of these categories and their applicability to the Waterfront/Downtown and Mare Island are described further below. (Refer to Appendix L, "Local and Land-Based Financing Mechanisms, and Appendix M, "Economics and Land Use White Paper", for more details.)

Developer Financing

Under the Subdivision Map Act, developers can be required to dedicate improvements or land or to make cash payments for public facilities required or affected by their project (e.g., road right-of-way fronting individual properties). It is expected that all three of the land use plans for Mare Island and the Waterfront/Downtown will be approved pursuant to a development agreement between the City and a Master Developer (e.g., Lennar, Legacy, or Callahan/DeSilva). In each case, the development agreement will articulate the commitment from various parties with regard to financing, phasing, and other elements of project implementation.

For Mare Island, the existing development agreements provide a mechanism for funding all the required in-tract transportation improvements. However, these agreements do not specify the financial commitment that may be required for off-site transportation improvements. The development agreement for the Waterfront/Downtown will require developer financing for the Capital Street Extension. The precise amount paid for by Callahan/DeSilva will be determined by subsequent negotiations and analysis.

The amount of developer financing required to ensure successful project implementation may significantly exceed the amounts proposed for the various transportation projects, especially considering the high degree of uncertainty of state and federal funding sources. Developer financing will help serve a leverage role and can be used as matching funds to increase the amount of state and federal money for the projects.

Land-Based Financing

It is anticipated that a Mello-Roos Community Facilities Districts will be formed on both Mare Island and in the Waterfront/Downtown project area to help pay for required public improvements. In each case the CFD will be authorized to levy a special tax and issue tax-exempt bonds, which will ultimately be secured by the developed land. For Mare Island the total bonding amount is projected in the developers financing plan to be about at $22.3 million over 11 years. It is expected that a portion of these bond proceeds will be used to cover the costs associated with on-site transportation improvements (no bond proceeds have been allocated to off-site improvements). Although it is anticipated that a Mello-Roos CFD bond will also be issued as part of the Waterfront/Downtown plan, the timing and size of this issuance has not yet been estimated.

For both the Waterfront/Downtown and Mare Island, the actual bonding capacity and amount available for transportation-related expenses will be a function of the total infrastructure costs relative to total developed value. In each case, the actual bond issuance will be based on further deliberations and analysis involving City staff, property owners, developers, bond counsel, underwriters, and finance experts.

Citywide Sources

The City of Vallejo's objectives regarding the sources and uses of its transportation-related funds are expressed in the Capital Improvement Plan. For the most part, these funds have already been allocated to specific transportation projects other than those prioritized as part of this Study. Although in some cases additional flexibility may be available, this analysis assumes only minimal funding from City sources. For example, existing impact fee revenue is expected to pay for planned improvements to Wilson Avenue. In addition, the City will contribute some revenue to various Mare Island in-tract infrastructure projects, as outlined in the Mare Island Development Agreements. In general it is the City's goal to keep General Fund expenditures on transportation-related capital projects to a minimum, as these funds will be required for on-going operations and maintenance activities.

Redevelopment Agency Financing

Portions of the Waterfront/Downtown are currently designated as a redevelopment area, and the City is currently considering establishing another redevelopment area on Mare Island. In both cases it is anticipated that the increased property values generated by the land use programs will be the basis for issuing a tax increment revenue bond. The financing plan for the Legacy project on Mare Island anticipates a $6.6 million RDA bond issued in 2004, a portion of which may be available for on-site transportation-related improvements. An estimate of the bonding capacity in the Waterfront/Downtown area has not yet been provided. However, the Waterfront/Downtown redevelopment area has approximately $2 million in accumulated cash-on-hand, which may be available for transportation-related projects (e.g., Georgia Street extension). The RDA may also use revenue generated from land sales to fund specific transportation projects.

As with the Mello-Roos CFD, the actual RDA bonding capacity in the Waterfront/Downtown area and on Mare Island and the amount available for transportation-related expenses will be a function of the total infrastructure costs relative to total developed value. Actual bond issuance will be based on further deliberations and analysis involving City staff, property owners, developers, bond counsel, underwriters, and finance experts.

Development Impact Fees

Development impact fees impose a one-time charge on new construction on a per unit basis (e.g., per square foot of new development) at the point building permits are issued. The revenues generated can be used to fund public improvements, such as transportation facilities, that are designed to serve the development from which the fees are collected. State law requires that impact fees be shown to have a "rational nexus" or relationship between costs and the impact or demand caused by the new development.[7] In other words, impact fees must be directly related to the benefits received. They do not create a lien against property but must be paid in full as a condition of approval for a particular project. Impact fees are enacted or updated by a legislative body (i.e., city or county) through adoption of an ordinance. Although public hearings are required prior to approval, a vote among effected landowners, or the public at large, is not necessary.

[7]The conditions for imposition of impact fees were formalized by the passage of AB1600 (Government Code Section 66000), which institutionalized prior case law on the subject (e.g., Nollan).

The City of Vallejo has an existing Transportation Impact Mitigation Fee (TIMF). An estimate of the total revenue generated by the land uses on Mare Island from the City's TIMF is shown in Table 6. As shown, the Mare Island land uses would generate about $9.2 million for transportation improvements at Mare Island and in the Waterfront/Downtown area given existing fee levels.

The City is currently in the process of up-dating its TIMF to reflect the new transportation improvements planned as part of Mare Island and Waterfront/Downtown developments. This analysis assumes that the revenue generated from such an update would be available to help finance a proportion of the transportation improvements described in the previous Project Selection and Phasing Section. For example, it is expected that the following transportation improvements will be paid in part or in full by impact fees:

- Route 37/Mare Island Interchange
- Causeway Bridge and Approach Improvements
- I-80 Spot Improvements
- Mare Island Way Phase 2 Improvements
- Wilson Avenue Improvements

According to City staff, the updated TIMF is likely to increase due to the larger set of transportation improvements it will be designed to cover. However, the amount of transportation impact fee revenue generated for the improvements cited above cannot be projected with certainty until the TIMF update has been completed. Even with a 10 to 15 percent increase, the Vallejo TIMF would remain consistent with similar fees charged by other growing Bay Area communities. Assuming a 15 percent increase in impact fee revenues generated as a result of the TIMF update, a total of $10.6 million could be generated from this revenues source, as calculated in Table 6.

An update to the existing City TIMF would not preclude future developers from participating in one of the other financing mechanisms discussed above in lieu of paying an impact fee. In addition, reimbursement agreements can be established whereby developers who elect to "front" the cost of required transportation improvements are re-paid as additional impact fee revenue is collected. It is likely that a fee credit or reimbursement mechanism of this sort will be applied in the Waterfront/Downtown area and on Mare Island. Ultimately, the impact fee obligation to area developers will be determined based on their relative contribution to regional traffic demand, as determined by a transportation engineering report.

It should be noted that impact fees contain several caveats as they relate to funding transportation improvements for the Waterfront/Downtown and Mare Island. First impact fees are typically collected over time as development occurs. To the extent that funding is needed "up front" for a particular facility, impact fee revenue may not be sufficient. Additionally, programmed or expected development that does not occur when expected, or never occurs, exacerbates the initial problem.

Finally, since impact fees are generally charged to new development, it may be difficult to use this mechanism for the rehabilitation of existing structures, as is contemplated on Mare Island. However, such a fee could be justified for a significant use change that provides a clear impact on the demand for additional transportation facilities. Further legal consultation may be required to determine exactly how much of the development on Mare Island will be subject to impact fee collection.

Table 6
Twenty Year Projection for Mare Island Impact Fees

Land Use	Units	Mare Island Amount	Current City Fee Structure (TIMF) $'s/Unit	Total Amount of Fee Generated
Residential				
Single Family	dwelling units	883	$3,043	$2,686,969
Multiple Family	dwelling units	523	$1,711	$894,853
Commercial				
Retail	square feet	153,000	$1.48	$226,440
Service	square feet	789,000	$1.48	$1,167,720
Office	square feet	819,000	$1.48	$1,212,120
Gas Station	square feet	4,000	$1.48	$5,920
Industrial				
Warehouse	square feet	1,034,000	$0.80	$827,200
Industrial	square feet	2,755,000	$0.80	$2,204,000
Total 20 Year fee Projection				$9,225,222
*20 Year Fee Projection Assuming TIMF Update **				$10,609,000

* - Assumes TIMF update will increase impact fee revenue by 15 percent over current levels. Given an increase of this magnitude, the Vallejo TIMF would remain in the range of similar fees charged in other Bay Area communities.

DETAILED FUNDING PLAN

In order to show how the project costs and funding/financing are spread out over the 20-year implementation plan period, a summary of expenditure and proposed funding by project is provided in Table 7, which shows the cost and revenues anticipated for each project. The 20-year time frame is divided in accordance with the project phasing plan into three periods: Short Range (2000-2005), Mid Range (2006-2010), and Long Range (2011-2020). The proposed funding sources for each project represent

The proposed funding sources for each project indicates the proposed strategy for obtaining the needed funds. Use of the proposed sources is intended to be flexible and the estimated amount provided by each source is based on reasonable shares which could be pursued by the City of Vallejo.

The total unfunded balance of $26,255,000 is associated with two projects: Mare Island Bus Service (phase 2) ($860,000) is projected to be unfunded and Route 37, Mare Island interchange Phase C ($36,395,000) is projected to have only $11M in funding.

Appendix P provides project-by-project worksheets which indicate the recommended funding mix of government sources and local/land-based sources. All funding details and assumptions are defined in these worksheets. For short range projects, other possible funding sources are listed in the worksheets to provide alternatives for backup funding plans. The funding scenarios in the project worksheets are only proposed plans and should not be considered as absolute. Some of the proposed funds can be very competitive and unpredictable.

Table 7
Project Cost and Funding Summary by Time Period

Project	Time Period: Short Range	Mid-Range	Long Range	Total
Waterfront/Downtown Projects				
Georgia Street Extension				
Cost	$ (1,538,000)			
Funding				
RDA	$ 1,538,000			
Subtotal	$ 1,538,000			
Unfunded Balance	$ 0			
Mare Island Way Improvements (Phase1)				
Cost	$ (253,000)			
Funding				
RDA	$ 253,000			
Subtotal	$ 253,000			
Unfunded Balance	$ 0			
Wilson Avenue Improvements				
Cost	$ (8,750,000)			
Funding				
City	$ 3,650,000			
Developer/Land Based	$ 5,100,000			
Subtotal	$ 8,750,000			
Unfunded Balance	$ 0			
Ferry Service Expansion (Phase I)				
Cost	$ (10,000,000)			
Funding				
Federal	$ 5,000,000			
State	$ 5,000,000			
Subtotal	$ 10,000,000			
Unfunded Balance	$ 0			

Table 7
Project Cost and Funding Summary by Time Period

Project	Time Period: Short Range	Mid-Range	Long Range	Total
Intermodal Parking Structure and Bus Transfer Center				
Cost	$ (25,735,000)			
Funding				
Federal	$ 12,735,000			
State	$ 9,000,000			
RDA	$ 4,000,000			
Subtotal	$ 25,735,000			
Unfunded Balance	$ 0			
Capitol Street Extension				
Cost		$ (1,864,000)		
Funding				
Developers/Land Based		$ 1,864,000		
Subtotal		$ 1,864,000		
Unfunded Balance		$ 0		
Mare Island Way Improvements (Phase 2)				
Cost		$ (740,000)		
Funding				
Federal		$ 250,000		
State		$ 240,000		
Developers/Land Based		$ 250,000		
Subtotal		$ 740,000		
Unfunded Balance		$ 0		
Ferry Service Expansion (Phase 2)				
Cost		$ (10,000,000)		
Funding				
Federal		$ 5,000,000		
State		$ 5,000,000		
Subtotal		$ 10,000,000		
Unfunded Balance		$ 0		

Table 7
Project Cost and Funding Summary by Time Period

Project	Time Period: Short Range	Mid-Range	Long Range	Total
Intersection Spot Improvements at Solano Ave./Curtola Parkway				
Cost			$ (375,000)	
Funding				
Developer/Land Based			$ 375,000	
Subtotal			$ 375,000	
Unfunded Balance			$ 0	
Traffic Signal at Wilson Ave./Rt. 37 EB Ramps				
Cost			$ (187,500)	
Funding				
State			$ 93,750	
Developer/Land Based			$ 93,750	
Subtotal			$ 187,500	
Unfunded Balance			$ 0	

Waterfront/Downtown Totals

	Short Range	Mid-Range	Long Range	Total
Project Costs	$ (46,276,000)	$ (12,604,000)	$ (562,500)	$ (59,442,500)
Funding	$ 46,276,000	$ 12,604,000	$ 562,500	$ 59,442,500
Unfunded Balance	$ 0	$ 0	$ 0	0

Mare Island Projects

Rt. 37/Mare Island Interchange (Phase A)	
Cost	$ (4,206,000)
Funding	
Federal	$ 1,992,000
Developed Land/Based	$ 2,214,000
Subtotal	$ 4,206,000
Unfunded Balance	$ 0

Table 7
Project Cost and Funding Summary by Time Period

Project	Time Period: Short Range	Mid-Range	Long Range	Total
Causeway Bridge and Approach Roadway				
Cost	$ (3,589,000)			
Funding				
Federal	$ 91,000			
Developer/Land Based	$ 3,498,000			
Subtotal	$ 3,589,000			
Unfunded Balance	$ 0			
Causeway Railroad Grade Crossing Improvements				
Cost	$ (1,750,000)			
Funding				
Developer/Land Based	$ 1,750,000			
Subtotal	$ 1,750,000			
Unfunded Balance	$ 0			
Mare Island Arterials (Phase 1)				
Cost	$ (5,045,000)			
Funding				
Developer/Land Based	$ 5,045,000			
Subtotal	$ 5,045,000			
Unfunded Balance	$ 0			
Mare Island Bus Service (Phase 1)				
Cost	$ (940,000)			
Funding				
Federal	$ 777,500			
Other	$ 162,500			
Subtotal	$ 940,000			
Unfunded Balance	$ 0			

Table 7
Project Cost and Funding Summary by Time Period

Project	Time Period: Short Range	Mid-Range	Long Range	Total
Ferry Maintenance Facility on Mare Island				
Cost	$ (5,000,000)			
Funding				
Federal	$ 3,000,000			
State	$ 2,000,000			
Subtotal	$ 5,000,000			
Unfunded Balance	$ 0			
Mare Island Arterials (Phase 2)				
Cost		$ (20,371,000)		
Funding				
Developer/Land Based		$ 20,371,000		
Subtotal		$ 20,371,000		
Unfunded Balance		$ 0		
Rt. 37/Mare Island Interchange (Phase B)				
Cost		$ (104,500)		
Funding				
State		$ 104,500		
Subtotal		$ 104,500		
Unfunded Balance		$ 0		
Mare Island Bus Service (Phase 2)				
Cost		$ (860,000)		
Funding		$ 0		
Subtotal		$ 0		
Unfunded Balance		$ (860,000)		

Table 7
Project Cost and Funding Summary by Time Period

Project	Time Period: Short Range	Mid-Range	Long Range	Total
Rt. 37/Mare Island Interchange (Phase C)				
Cost			$ (36,395,000)	
Funding				
Federal			$ 8,800,000	
State			$ 2,200,000	
Subtotal			$ 11,000,000	
Unfunded Balance			$ (25,395,000)	
Mare Island Totals				
Project Costs	$ (20,530,000)	$ (21,335,500)	$ (36,395,000)	$ (78,260,500)
Funding	$ 20,530,000	$ 20,475,500	$ 11,000,000	$ 52,005,500
Unfunded Balance	$ 0	$ 860,000	$ 25,395,000	$ 26,255,000
I-80 Corridor Projects				
I-80 Spot Improvements				
Cost		$ (1,800,000)		
Funding				
State		$ 1,200,000		
Developer/Land Based		$ 600,000		
Subtotal		$ 1,800,000		
Unfunded Balance		$ 0		
Traffic Signal at Sonoma				
Cost			$ (312,500)	
Funding				
State			$ 156,250	
Developer/Land Based			$ 156,250	
Subtotal			$ 312,500	
Unfunded Balance			$ 0	

Table 7
Project Cost and Funding Summary by Time Period

Project	Time Period: Short Range	Mid-Range	Long Range	Total
I-80 Corridor Totals				
Project Costs	$ 0	$ (1,800,000)	$ (312,500)	$ (2,112,500)
Funding	$ 0	$ 1,800,000	$ 312,500	$ 2,112,500
Unfunded Balance	$ 0	$ 0	$ 0	$ 0
Total of Project Costs	$ (66,806,000)	$ (35,739,500)	$ (37,270,000)	$ (139,815,500)
Total Project Funds/Revenue	$ 66,806,000	$ 34,879,500	$ 11,875,000	$ 113,560,500
Unfunded Balance, All Projects	$ 0	$ (860,000)	$ (25,395,000)	$ (26,255,000)