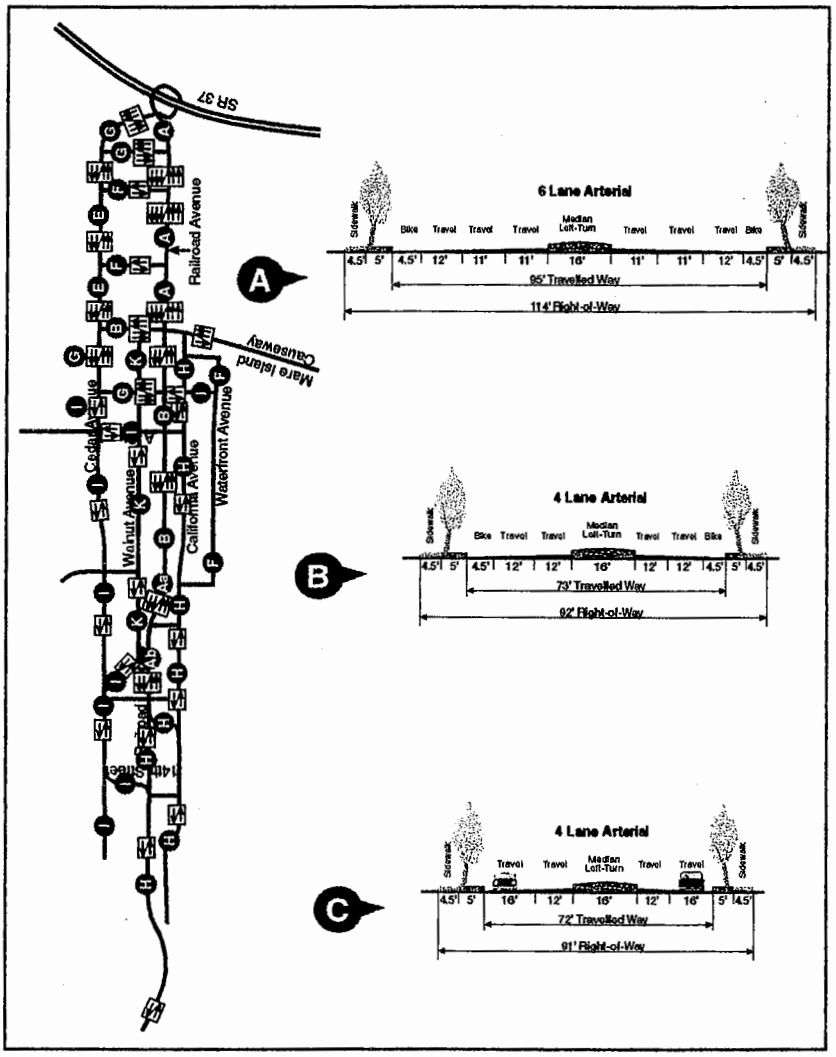
Final Report:

MARE ISLAND TRANSPORTATION PLAN



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SUMMARY OF CONCLUSIONS

- The conceptual street system internal to the island can accommodate traffic generated by buildout of the Mare Island Reuse Plan, except at two key intersections (Railroad/G Street and Railroad/Street #1, see Figure 13 for locations). Peak hour queues at the Railroad/Street #1 intersection will extend into the interchange creating delay and difficult weaving maneuvers.

- Significant capacity constraints occur at the two access points to the island (Causeway and SR 37 interchange). Traffic demand external to the island exceeds the collective capacity of the access points when development of projected land uses reaches 72% of buildout (access operates at LOS D) or when it reaches 92% of buildout (access operates at LOS E/F).

- Walnut Avenue is eliminated in the North Industrial Area (NIA). The remainder of Walnut Avenue's length is designated as a low volume pedestrian, bicycle, and transit oriented street serving local traffic only.

- Modifying the SR 37 interchange provides an increment of additional capacity and safety through channelizing traffic, widening on-ramp lanes, and providing direct access to Cedar Avenue, relieving traffic demand on Railroad Avenue.

- Additional access capacity is required at approximately 92% buildout of the Mare Island Reuse Plan to maintain LOS E/F operations at the access points, or at 72% of buildout to maintain LOS D operations. Additional access capacity can be provided by:

  - providing eastbound and westbound auxiliary lanes on the SR 37 bridge over Mare Island Strait, and
  - constructing a four lane southern crossing, or
  - constructing a four lane drawbridge parallel to the Mare Island Causeway

- While it is undesirable from a traffic operations and safety perspective, buildout traffic projections require use of a reversible lane on the Mare Island Causeway in the peak hours and peak direction until additional access capacity can be provided. The reversible lane will need to be implemented at 46% of buildout of the reuse plan to maintain LOS E/F operations, or at 43% of buildout to maintain LOS D operations.

- Existing buildings and infrastructure along Railroad Avenue in the southern part of the island (within the Historic District and Heavy Industry zones) constrain the right-of-way for typical four lane arterial cross-sections. The Transportation Plan provides optional "minimum right-of-way" cross-sections for Railroad Avenue through the constrained areas.

- Street widening requirements, particularly in the southern part of the island, will occur over time. Widening improvements can be phased concurrently with development proposals. Within the constrained right-of-way areas of Railroad Avenue. building demolition or replacement is an opportunity to reserve necessary right-of-way.

- Railroad freight service will be provided to industrial uses on the island. Rail service on the existing track system conflicts with vehicular, pedestrian, and bicycle traffic requiring the following:

  - closure of the Causeway to automobiles during rail operations
  - restriction of rail service to late night operations
  - removal or relocation of some track segments from the center or edges of streets
  - installation of standard crossing gates at some at-grade crossings

  The City of Vallejo is working with the California Public Utilities Commission (PUC) to identify and implement the specific traffic safety measures for all railroad crossings.

- Widening Cedar Avenue and extending it to connect to the eastbound SR 37 off-ramp provides an alternative north-south route for traffic travelling to and from the west on SR 37, relieving some of the traffic demand on Railroad Avenue.

- Potential Mitigation Measures to Reduce Demand at Island Access

- Increase public transit use by providing more frequent service and express buses, and encouraging employers to subsidize fares for employees.

- Encourage employers to provide flexible work schedules and tele-commute options for employees.

- Provide strategically located carpool parking lots throughout the island for residents and "casual carpooling" employees (in addition to the Caltrans Carpool lot at the north end of the island).

- Provide a small craft Ferry Shuttle system between the Vallejo Ferry Terminal and Mare Island (with frequent headways to encourage its use), and increase the parking capacity of the mainland terminal.

Realistically, these measures have the potential to reduce the island's peak hour external demand between 15% to 25%, not fully mitigating the access capacity deficiencies but reducing congestion and its duration in the peak hours.

I. INTRODUCTION

A. Purpose

The Mare Island Transportation Plan (MITP) was prepared to develop an island-wide transportation strategy to accommodate the estimated traffic generated by buildout of the Mare Island Reuse Plan. The MITP was initiated, in part, because recent development plans for the North Industrial Area require a long-range evaluation of capacity needs and consistency in street classifications, right-of-way requirements, and transitions between the northern and southern portions of the island.

B. Scope of Work

The MITP provides detailed evaluation and recommendations for transportation facilities in the North Industrial Area (NIA) and a coarser, more general evaluation and recommendations in the southern development zones (south of the Mare Island Causeway). The development proposal for the NIA permits detailed planning and design of transportation facilities and site access. Until development plans for the remainder of the island are submitted, the MITP provides a general overall transportation strategy to identify major streets and rights-of-way, and define a cohesive circulation system. The MITP provides the following information:

- A description of the existing Mare Island street and railroad system, and external access points.
- A discussion of the travel demand forecasting method, modal choice assumptions, and estimated traffic generation.
- An island-wide conceptual transportation plan including major street classifications and locations with right-of-way constraints.
- Design standards defining typical street cross-sections, geometric design standards, and special design elements for transitways and streets within constrained rights-of-way.
- Specific planning and design elements for the North Industrial Area including:

  -Site access
  -Intersection design and operations
  -Transit and pedestrian/bicycle plans
  -City property access and circulation
  -Railroad operations
  -Island access capacity improvements including Cedar Street extension and connection to the SR 37 eastbound off-ramp to Railroad Ave.

II. EXISTING CONSTRAINTS

A. Existing Street System

Description of Street System

Figure 1 shows the existing primary Mare Island street system. The primary street system consists of an informal hierarchy of arterials and collectors. The major streets travel north-south (Cedar, Walnut, Railroad, and California Avenue) with east-west minor street connections (A, C, G, L, M, 5th and 12th Streets) providing cross access. The Mare Island Causeway (G Street) is the primary east-west connection with the City of Vallejo. Walnut and Railroad Avenue comprise a major street one-way couplet connecting to the SR 37 interchange at the north end of the island.

The North gate located south of the SR 37 interchange and north of the confluence of Walnut and Railroad Avenues, is channelized into one inbound and two outbound lanes. The Main gate, located west of the intersection of Wilson/Tennessee/Mare Island Way, is channelized into one inbound and one outbound lane with a control point between the lanes. The Mare Island Causeway consists of three lanes with the center lane historically serving as a reversible lane during the peak hours of base operations. Currently, two lanes on the Mare Island Causeway are designated inbound and one lane outbound.

Summary of Street System Constraints

The following require improvement to the extent feasible as reuse of the island occurs. These conditions affect traffic operations and capacity, and traffic safety:

- Substandard setback of trees and buildings and limited line of sight along some roadways Constrained right-of-way along arterial corridors where widening is desirable.
- Lack of protected railroad crossings. Multiple railroad spurs within the streets without separation from vehicles. However, the City of Vallejo is currently working with the California Public Utilities Commission (PUC) to identify and implement the required traffic safety measures for all railroad crossings.
- Poor intersection geometries, lack of street definition and inconsistent or non-existent traffic control devices at many intersections.
- Lack of roadway and intersection capacity to accommodate anticipated levels of development and reuse. Variable and inconsistent lane widths and lack of lane and edgeline striping.

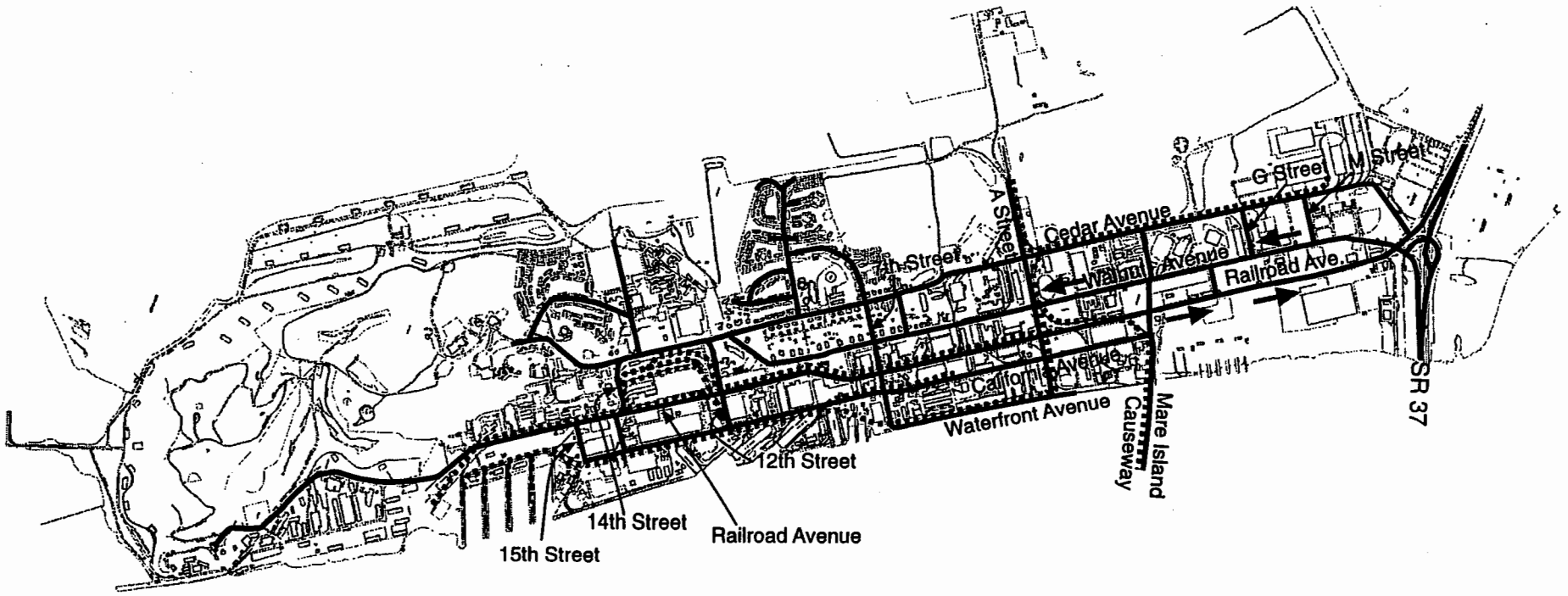

Figure 1
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EXISTING STREET AND RAILROAD SYSTEM

- Limited street lighting.
- Lack of curb and gutter (less than 30% of streets on island have standard curbs and gutters). Many streets lack sidewalks or any form of bicycle facilities.
- Limited number of lanes (and reversible center lane) on Mare Island Causeway as well as railroad tracks within the center lane.

B. Existing Railroad System

Description of Railroad System

Figure 1 shows the existing primary Mare Island railroad system, an elaborate network of tracks designed to serve heavy shipyard operations. At the time of the base closure there were 22 miles of active track. Mainline track systems are (1) a line which connects to the Southern Pacific Railroad mainline, crossing the Mare Island Strait on the Causeway and curving to parallel Cedar Avenue, (2) the Railroad Avenue mainline with numerous spurs serving industrial areas and for storage of cars, and (3) the Waterfront mainline with spurs serving shipyard and drydock operations. The Causeway line does not connect directly to the Railroad Avenue line, but does provide a connection with the Waterfront line. The City of Vallejo is assessing the existing track system to determine which tracks will remain active, and which will be removed or abandoned.

Summary of Railroad System Constraints

The following relate to either future railroad operations or street operations:

- The Causeway line utilizes one of the lanes on the bridge requiring prohibition of vehicle traffic when trains are on the line.
- Lack of protected railroad crossing devices at numerous at-grade crossings and railroad tracks not separated from streets. However, as stated in the summary of street constraints, the City is working with the PUC to implement all required traffic safety measures at railroad crossings.
- Specific locations with track curvature or clearances that cannot accommodate 75 foot long test cars, indicating possible problems for future commercial rail freight service.

C. Island Access

SR 37 Interchange

Figure 1 shows the two primary access points to Mare Island, (1) the SR 37 interchange and, (2) the Causeway crossing. The SR 37 interchange provides access to and from the northern end of the island. SR 37 connects Highway 101 to the west with Highway 29 and Interstate 80 to the east. A substantial amount of the island's projected traffic will utilize the interchange to travel to and from the east on SR 37. The interchange is not a standard configuration, consisting of a combination of diagonal and loop ramps, indirect connections, and an

unsignalized and unchannelized intersection at the confluence of the ramps.

Mare Island Causeway

The Causeway provides access to the island from the City of Vallejo across the Mare Island Strait. The Causeway is an extension of Tennessee Street leading west from the signalized five-leg intersection of Tennessee/Wilson/Butte/Mare Island Way. This intersection is presently being reconstructed to create a four-leg intersection. The Causeway consists of three lanes which, during base operations, the reversible center lane was switched to accommodate peak ingress or egress demand. Presently, the center lane is designated as a westbound lane. The rail line utilizing the Causeway travels along the east side of the Causeway until several hundred feet prior to the bridge at which point it transitions into the center lane of the bridge. At the west end of the bridge, the rail line transitions south onto Railroad Avenue.

Summary of Existing Island Access Constraints

Traffic demand on two of the SR 37 interchange ramps will exceed capacity with buildout of the Mare Island Reuse Plan. Without capacity improvements, the eastbound on-ramp merge demand during the evening peak hour will exceed capacity. Similarly, without capacity improvements the westbound off-ramp diverge demand will nearly exceed capacity in the morning peak.

Railroad Avenue, proposed as a major six lane arterial providing direct access to the interchange, is itself a capacity constraint. Even with six lanes, parallel capacity is necessary to ensure that Railroad Avenue operates acceptably. To provide parallel capacity, Cedar Avenue is proposed as a four lane industrial collector, with a connection to the SR 37 interchange to remove a portion of the traffic from Railroad Avenue.

- Capacity constraints within the SR 37 interchange will occur at the westbound loop off-ramp diverge due to high demand. and at the eastbound diagonal on-ramp merge due to high demand and the upward grade over the Mare Island Strait bridge.

- The confluence of ramps with Railroad Avenue at the unsignalized and unchannelized intersection reduces capacity and safety.

- Capacity constraints on the Causeway include the absence of two lanes in the eastbound direction and the rail line which cannot be simultaneously operated with vehicle traffic.

- Overall island access capacity is limited. Projected demand for external access to the island will exceed available capacity prior to buildout of the Mare Island Reuse Plan.

III. PLANNING ASSUMPTIONS

Table 1 summarizes the assumptions used in developing the MITP. The assumptions address planning horizons, sources of data, land use and traffic projections. modal splits. distribution of traffic, and street capacities.

Table 1
MARE ISLAND TRANSPORTATION PLAN PLANNING ASSUMPTIONS

Planning Horizon	• Buildout of Mare Island Reuse Plan. Year not specified, but estimated between 10 and 20 years from now
Source of Land Use Data	• Final Mare Island Reuse Infrastructure Study, Reimer & Associates, March 1997
Population and Employment Projections at Buildout	• 4,400 residents • 21,100 employees • 1,449 residential units, live-work units, and dormitory beds • 7.5 million square feet of industrial, retail, office, and educational facilities • 750 acres of civic, recreational, and open spaces uses
Trip Generation Rates	• Institute of Transportation Engineers Trip Generation, 5th Edition, adjusted for internalization and projected modal splits
Projected Modal Splits	• Trips external to Mare Island - 80% -Single Occupant Vehicle (85%) -Transit (5%) -Carpool (10%) • Trips internal to Mare Island - 20% -Automobile (60%) -Island Shuttle (25%) -Walk/bike (15%)
Projected Trip Generation at Buildout	• Typical weekday - 98,500 trips • AM peak hour - 7,950 trips • PM peak hour - 8,400 trips
Trip Distribution Assumptions	• Distribution derived from the Solano 37 Travel Demand Forecasting Model (Caltrans District 10) reflecting year 2020 [1] -To/from west on SR 37 - 12% -To/from east on SR 37 - 52% -To/from east on Causeway - 36%
SR 37 Mainline Projections	Solano 37 Travel Demand Forecasting Model (Caltrans District 10) reflecting year 2020
Per Lane Capacity of Mare Island Street Classifications	• Arterial- 900 vehicles per hour per lane (vphpl) • Industrial Collector - 700-800 vphpl • Residential Collector- 700 vphpl • Industrial Local - 700 vphpl • Residential Local - 600 vphpl • Walnut Avenue Transitway - 300 vphpl • Mare Island Causeway - 900 vphpl

1) In 1988, with Naval operations, 57% of the p.m. peak hour traffic used the Causeway access and 43% used the SR 37 access. The model's shift in macro distribution of island traffic may be the result of capacity restraints at the access points and significant changes in regional population and employment distribution in the year 2020.

IV. TRAVEL DEMAND FORECASTING AND CAPACITY ANALYSES

A. Buildout of Mare Island Reuse Plan

Traffic projections used to develop the MITP reflect recent refinements to the buildout land use assumptions of the Mare Island Reuse Plan.[1] Buildout of the island is anticipated to accommodate a residential population of about 4,400 persons, and a daytime population of about 21,100 employees.[2] Population and employment projections are based on plans for:

- Nearly 1,500 residential dwelling units, live-work units, or dormitory beds
- Over 7.5 million square feet of industrial, office, retail, and educational facilities
- Over 750 acres of civic, recreational, and open space uses

These projections include assume development of the City-owned property located at the northwest portion of the island. While this property was not originally included in the Mare Island Reuse Plan, the type and intensity of development similar to the North Industrial area was used in developing the plan.

B. Modal Split Assumptions

Because Mare Island is isolated from a transportation perspective and has limited access capacity, development of the island offers an opportunity to maximize the use of alternative modes of travel including carpools, transit, intra-island shuttle, ferries, and walking and bicycling.

Table 2 illustrates the modal split assumptions for trips external and internal to Mare Island. The majority of trips (80%) travel external to Mare Island, with modal splits similar to those in the nine county Bay Area metropolitan region. 85% by single occupant vehicle, 5% by transit, and 10% by carpool. Transit mode share assumes regional transit will access and circulate on the island. Ferry/Shuttle service between the mainland and the island may be a feasible transit option, but was not assumed in the estimation of transit usage.

Trips internal to the island (20%) travel by single occupant automobile (60%), island shuttle (25%), and walking or bicycling (15%). An island-wide shuttle system (small van-type vehicles) was assumed to provide off-peak and peak hour service throughout the island, augmenting peak hour regional transit service. Mare Island, with its compact development pattern, provides excellent walking and bicycling opportunities if adequate and continuous non-motorized facilities are provided.

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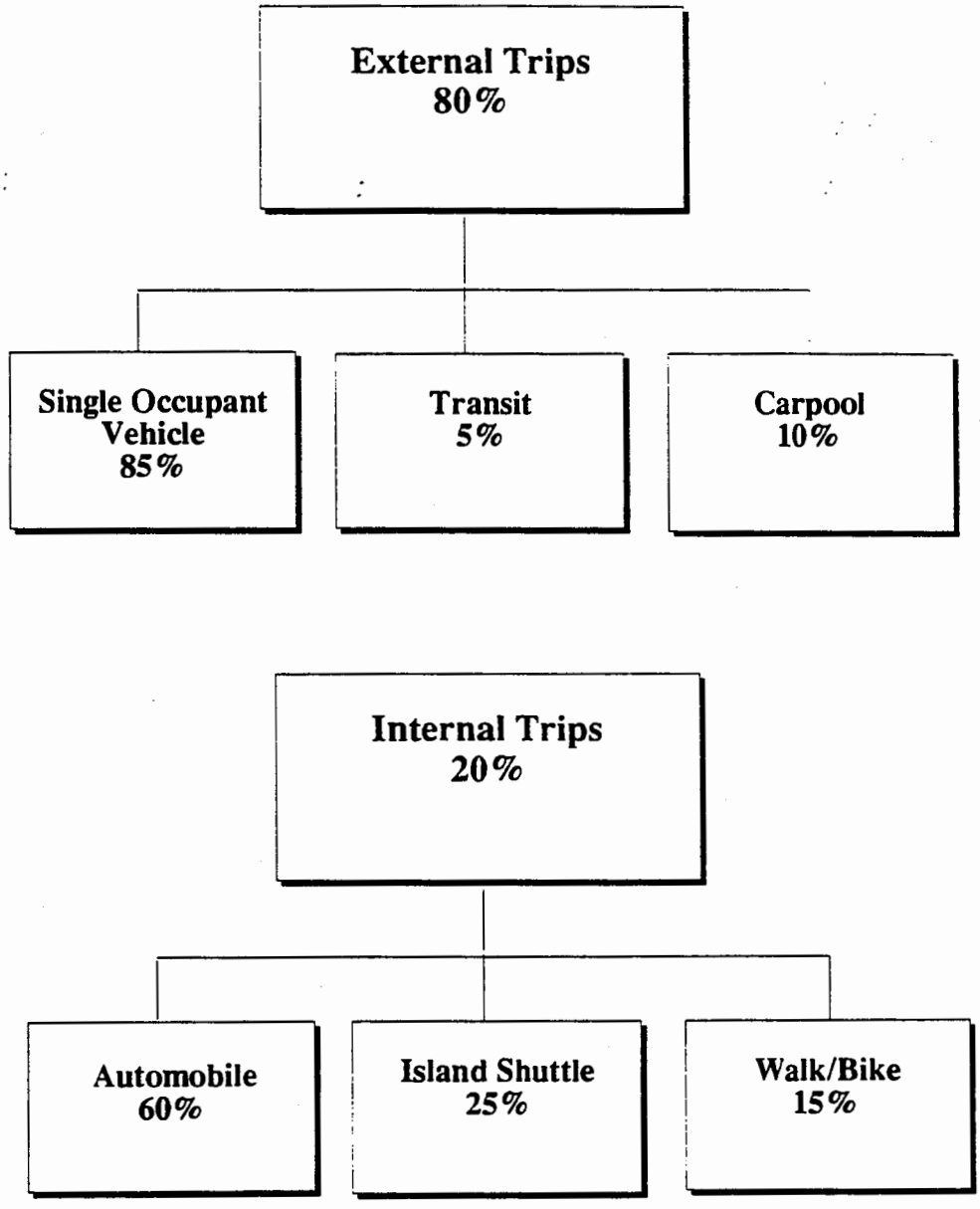
1 Reimer Associates, Infrastrategy Analysis, March 1997.

2 Daytime population based on employee per square foot factors in Reimer report (March 1997). Daytime population figures presented in this report are for information only. Traffic projections are based on land coverage (square footage, acres, dwelling units, etc.)

Table 2
MARE ISLAND TRANSPORTATION PLAN
MODAL SPLIT ASSUMPTIONS



C. Trip Generation Estimates

Table 3 summarizes the buildout land uses and estimated trip generation by traffic analysis zone (TAZ). TAZ's correspond to the thirteen development zones formed for the Reuse Plan.

See Appendix for Reuse Plan zone boundaries. The North Industrial Area (NIA) zone was disaggregated into twelve zones to provide maximum detail for modelling traffic in this area. Trip generation estimates are derived from Institute of Transportation Engineers' rates[3] and adjusted based on the modal split assumptions described above.

Table 3 shows the island, at buildout, will generate nearly 100,000 trips on a typical weekday, with about 8,000 trips in the morning peak hour and about 8,500 trips in the evening peak hour. The majority of these trips are commute trips which travel external to the island.

D. Projected Traffic Volumes

Figures 2 and 3 present the morning and evening peak hour link volume projections at buildout of the Mare Island Reuse Plan. Traffic volumes at the lightly developed southern end of the island are relatively low, increasing with the intensity of development within the central portion and reaching the highest volumes at the northern end of the island. Figures 4 and 5 present the morning and evening peak hour turning movement volumes at intersections within the NIA.

E. Screenline Capacity Analysis

A screenline[4] capacity analysis is used to determine if the MITP's lane recommendations accommodate buildout traffic volumes. The intent of the analysis is to identify the number of lanes required on mid-block street segments, not at intersections which typically need additional lanes for turning movements. The result of this analysis is the Street Classification Plan (Figure 8) and the Buildout Lane Requirements (Figure 10) located in Chapters V and VI of this report.

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3 Institute of Transportation Engineers Trip Generation manual. 5th Edition.

4 Screenline are lines drawn east-west across the island intersecting all north-south streets. The capacity of a screenline is the sum of the per lane capacity times number of lanes traveling north-south across the line.

Table 3
MARE ISLAND TRANSPORTATION PLAN
BUILDOUT LAND USE ASSUMPTIONS AND ESTIMATED TRIP GENERATION

TAZ [1]	Zone Name	Land Use	Size	Units	Trip Generation Rates			Trip Generation		
					AM Peak	PM Peak	Daily	AM Peak	PM Peak	Daily
North Industrial Area										
1	R&D Campus 3	Office	237.60	KSF	1.44	1.18	11.42	341	280	2,713
2	R&D Campus 2	Office	195.50	KSF	1.44	1.18	11.42	281	230	2,233
3	R&D Campus 1	Office	200.90	KSF	1.44	1.18	11.42	288	237	2,294
4	Manufacturing 3	Lt. Industrial	66.00	KSF	0.72	0.76	6.97	47	50	460
5	Warehouse 5	Warehousing	294.10	KSF	0.44	0.58	4.88	131	170	1,435
6	Warehouse 1	Warehousing	180.00	KSF	0.44	0.58	4.88	80	104	878
7	Manufacturing 1	Lt. Industrial	94.20	KSF	0.72	0.76	6.97	68	72	657
8	Warehouse 2	Warehousing	439.70	KSF	0.44	0.58	4.88	195	254	2,146
9	Warehouse 4	Warehousing	286.00	KSF	0.44	0.58	4.88	127	165	1,396
10	Manufacturing 2	Lt. Industrial	120.50	KSF	0.72	0.76	6.97	86	92	840
11	R&D Campus 4	Office	207.60	KSF	1.44	1.18	11.42	298	245	2,371
12	Incubator Retail	Retail	108.30	KSF	1.68	6.58	91.65	182	713	9,926
Subtotal								2,125	2,611	27,348
Neighborhood Center Area										
13	Neighborhood Center	Office	445.40	KSF	1.44	1.18	11.42	639	525	5,086
13	Neighborhood Center	Civic/Recreational	143.90	KSF	0.84	1.08	13.80	121	155	1,986
13	Neighborhood Center	Developed Recreation	53.90	ACRES	0.45	0.47	5.00	24	25	270
13	Neighborhood Center	Lt. Industrial	118.15	KSF	0.72	0.76	6.97	85	90	824
13	Neighborhood Center	Educational	11.30	KSF	1.72	0.83	12.87	19	9	145
13	Neighborhood Center	Residential-Live Work	19.00	DUS	0.36	0.48	4.80	7	9	91
Subtotal								896	813	8,402
Mixed Use: Office/Lt. Industrial Area										
14	Mixed Use	Lt. Industrial	440.70	KSF	0.72	0.76	6.97	316	337	3,072
14	Mixed Use	Office	679.60	KSF	1.44	1.18	11.42	975	800	7,761
14	Mixed Use	Developed Recreation	54.50	ACRES	0.45	0.47	5.00	25	26	273
14	Mixed Use	Heavy Industrial	95.00	KSF	0.40	0.15	1.50	38	14	143
14	Mixed Use	Education	1.70	KSF	1.72	0.83	12.87	3	1	22
Subtotal								1,357	1,178	11,270
Historic District Area										
15	Historic District	Lt. Industrial	339.90	KSF	0.72	0.76	6.97	244	260	2,369
15	Historic District	Heavy Industrial	106.40	KSF	0.40	0.15	1.50	42	16	160
15	Historic District	Office	151.70	KSF	1.44	1.18	11.42	218	179	1,732
15	Historic District	Civic/Recreational	3.60	KSF	0.84	1.08	13.80	3	4	50
15	Historic District	Developed Recreation	13.90	ACRES	0.45	0.47	5.00	6	7	70
15	Historic District	Residential	18.00	DUS	0.40	0.48	7.44	7	9	134
Subtotal								520	473	4,514
Heavy Industrial Area										
16	Heavy Industrial	Lt. Industrial	225.10	KSF	0.72	0.76	6.97	162	171	1,569
16	Heavy Industrial	Heavy Industrial	1170.30	KSF	0.40	0.15	1.50	466	173	1,755
16	Heavy Industrial	Office	89.60	KSF	1.44	1.18	11.42	129	106	1,023
16	Heavy Industrial	Retail	5.00	KSF	1.68	6.58	91.65	8	33	458
16	Heavy Industrial	Developed Recreation	13.10	ACRES	0.45	0.47	5.00	6	6	66
Subtotal								771	489	4,871
Farragut Village Area										
17	Farragut Village	Educational	36.20	KSF	1.72	0.83	12.87	62	30	466
17	Farragut Village	Civic/Recreational	3.20	KSF	0.84	1.08	13.80	3	3	44
17	Farragut Village	Developed Recreation	41.10	ACRES	0.45	0.47	5.00	19	19	206
17	Farragut Village	Residential	399.00	DUS	0.40	0.48	7.44	159	193	2,969
Subtotal								242	246	3,684
Developed Recreation Area										
18	Developed Recreation	Developed Recreation	42.70	ACRES	0.45	0.47	5.00	19	20	214
18	Developed Recreation	Civic/Recreational	20.40	KSF	0.84	1.08	13.80	17	22	282
Subtotal								37	42	495

1) Traffic Analysis Zones (TAZs) 1 through 12 and zone 32 are detailed to reflect the specific development proposed in the North Industrial A and potential development of City owned property. The appendix contains a TAZ map showing the zone boundaries. TAZs 13 through 22 correspond precisely to the Mare Island Reuse Planning areas. The appendix also contains maps showing the planning area boundaries.

Table 3
MARE ISLAND TRANSPORTATION PLAN
BUILDOUT LAND USE ASSUMPTIONS AND ESTIMATED TRIP GENERATION

TAZ	Zone Name	Land Use	Size	Units	Trip Generation Rates			Trip Generation		
					AM Peak	PM Peak	Daily	AM Peak	PM Peak	Daily
Coral Sea Village										
19	Coral Sea Village	Retail	73.20	KSF	1.68	6.58	91.65	123	482	6,709
19	Coral Sea Village	Developed Recreation	29.90	ACRES	0.45	0.47	5.00	14	14	150
19	Coral Sea Village	Lt. Industrial	0.06	KSF	0.72	0.76	6.97	0	0	0
19	Coral Sea Village	Office	10.80	KSF	1.44	1.18	11.42	16	13	123
19	Coral Sea Village	Residential	202.00	DUS	0.40	0.48	7.44	80	98	1,503
19	Coral Sea Village	Residential-Live Work	40.00	DUS	0.36	0.48	4.80	14	19	192
19	Coral Sea Village	Residential-Dormitory	242.00	BEDS	0.04	0.06	4.80	9	15	1,162
Subtotal								257	640	9,839
Education Area										
20	Education	Lt. Industrial	106.80	KSF	0.72	0.76	6.97	77	82	744
20	Education	Office	113.50	KSF	1.44	1.18	11.42	163	134	1,296
20	Education	Education	388.00	KSF	1.72	0.83	12.87	669	321	4,994
20	Education	Retail	54.40	KSF	1.68	6.58	91.65	92	358	4,986
20	Education	Developed Recreation	33.50	ACRES	0.45	0.47	5.00	15	16	168
20	Education	Civic/Recreational	84.20	KSF	0.84	1.08	13.80	71	91	1,162
20	Education	Residential-Dormitory	500.00	BEDS	0.04	0.06	4.80	20	31	2,400
Subtotal								1,106	1,032	15,749
Marina Area										
21	Marina	Retail	42.70	KSF	1.68	6.58	91.65	72	281	3,913
21	Marina	Marina	100.00	BERTHS	0.06	0.15	2.96	6	15	296
21	Marina	Developed Recreation	6.50	KSF	0.45	0.47	5.00	3	3	33
21	Marina	Lt. Industrial	5.20	KSF	0.72	0.76	6.97	4	4	36
21	Marina	Office	9.00	KSF	1.44	1.18	11.42	13	11	103
21	Marina	Residential	800.00	DUS	0.40	0.48	7.44	318	387	5,952
Subtotal								416	701	10,333
Golf Course Area										
22	Golf Course	Golf Course	121.40	ACRES	0.27	0.39	8.33	33	47	1,011
22	Golf Course	Civic/Recreational	27.90	KSF	0.84	1.08	13.80	24	30	385
Subtotal								24	30	385
City Owned Property										
32	City Owned Property	Lt. Industrial	241.40	KSF	0.72	0.76	6.97	173	185	1,683
32	City Owned Property	Warehouse	116.30	KSF	0.44	0.58	4.88	52	67	568
Subtotal								225	252	2,250
Grand Total								7,974	8,507	99,140

Source: Updated land use information provided by Reimer Associates, March 1997.

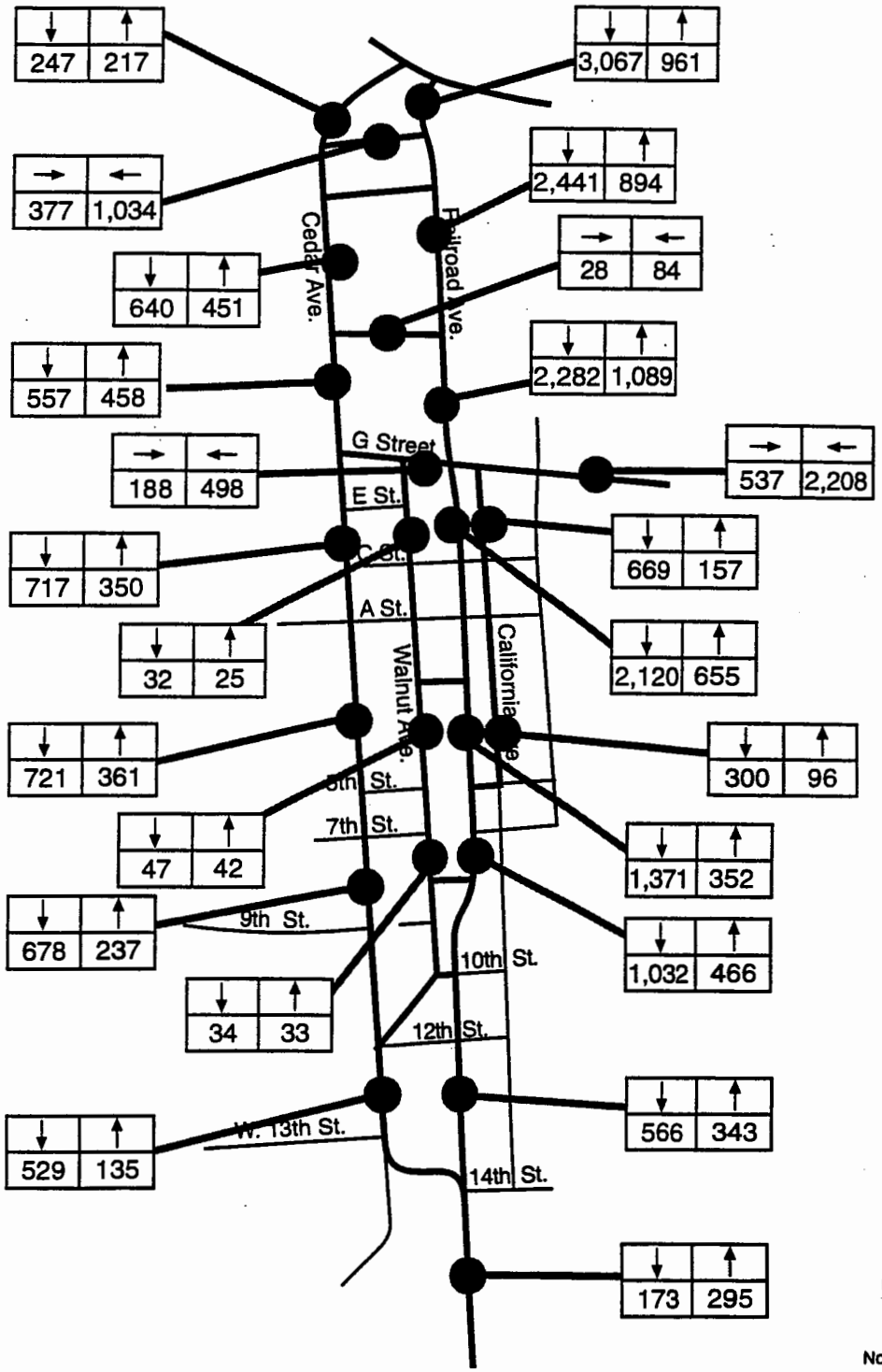

Figure 2 — **AM PEAK HOUR LINK VOLUMES**

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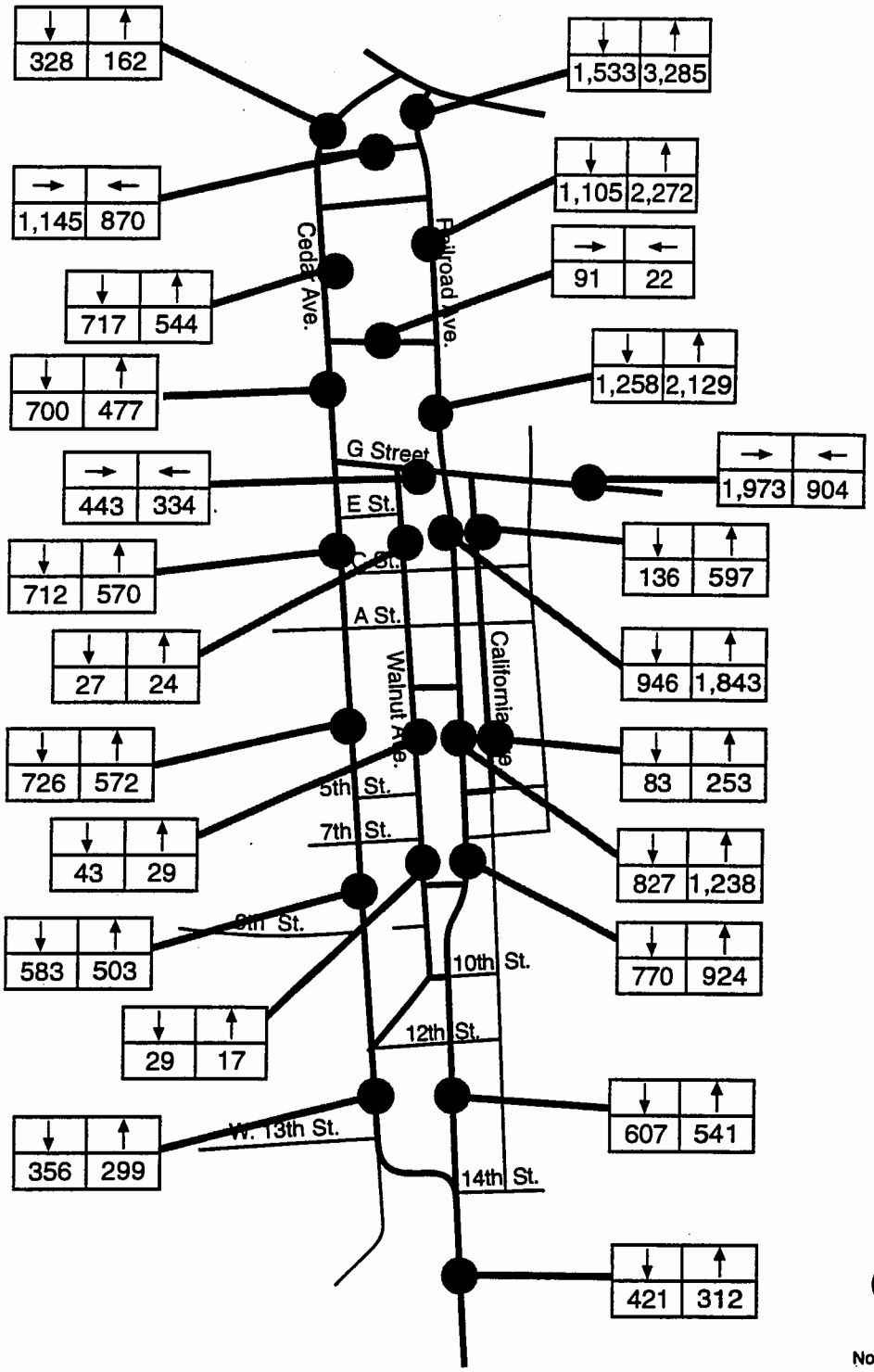


Figure 3 — **PM PEAK HOUR LINK VOLUMES**

1009-64-03

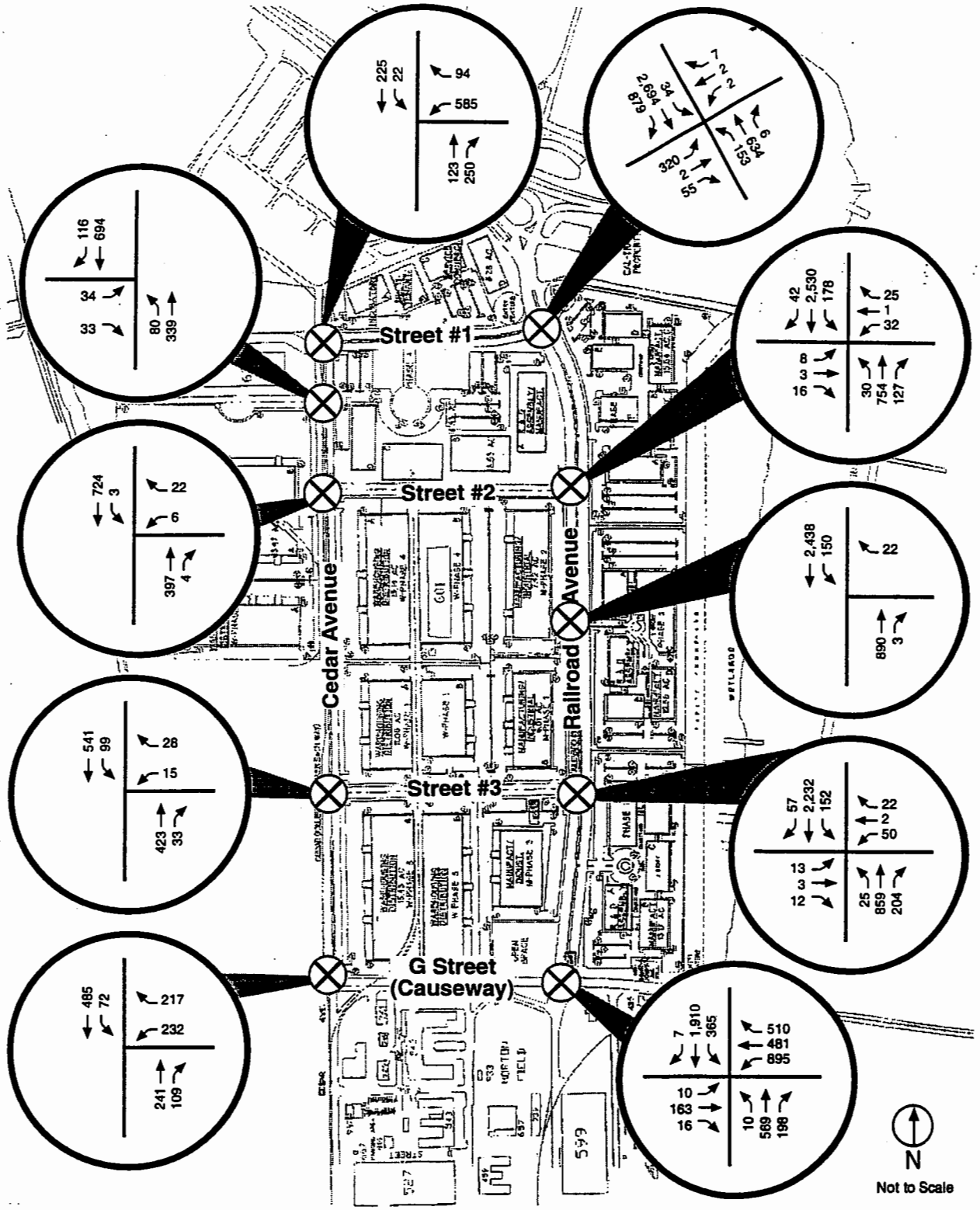


Figure 4	AM PEAK HOUR TURNING MOVEMENTS NORTH INDUSTRIAL AREA	fp
1009-112-04		

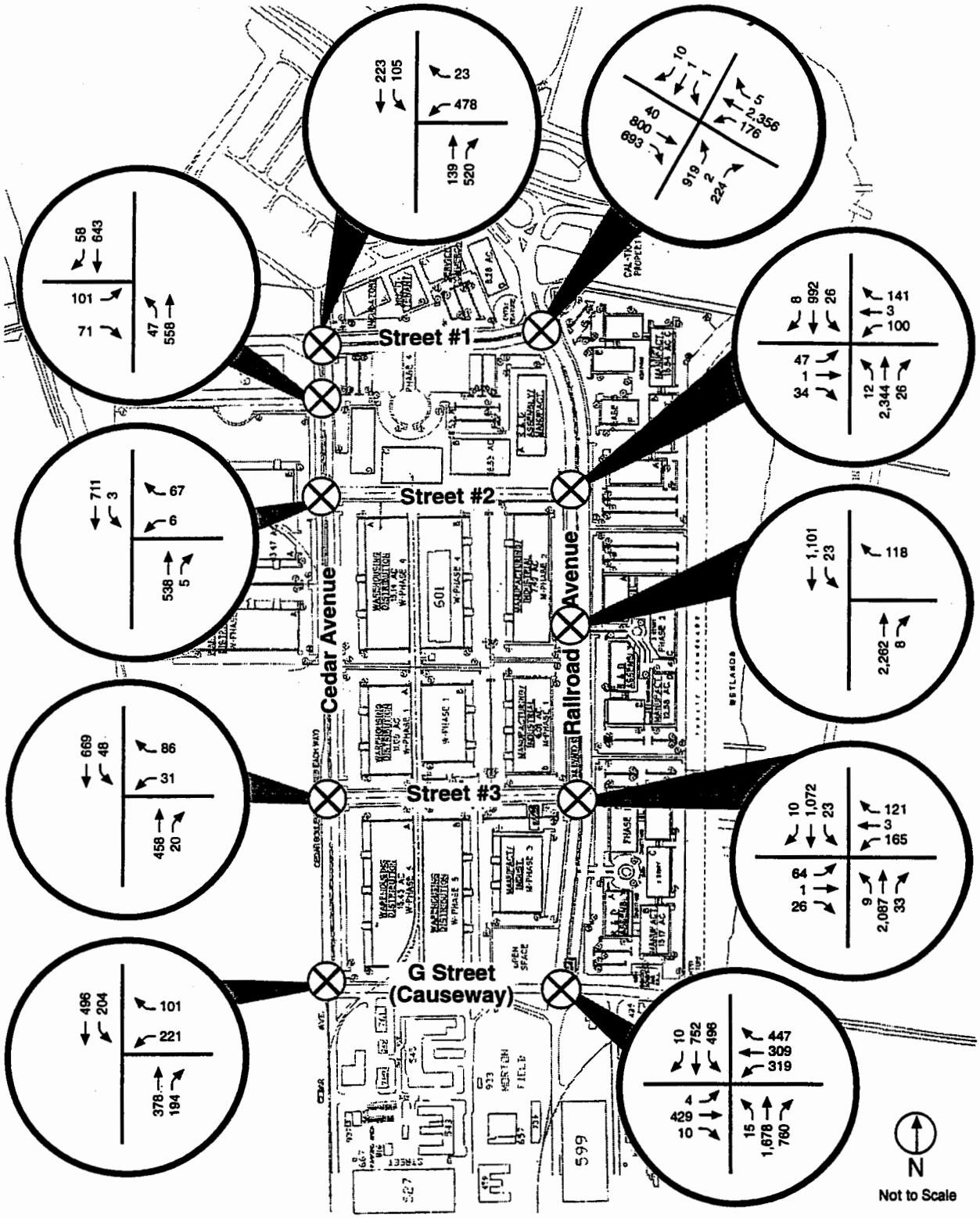


Figure 5	PM PEAK HOUR TURNING MOVEMENTS NORTH INDUSTRIAL AREA	
1009-113-04		

Figure 6 shows the morning peak hour screenline capacity analysis with the proposed street system and number of lanes shown in Figure 10. Traffic demand exceeds capacity at only one screenline, the southbound screenline south of the Causeway (Screenline #4) indicating the need to widen Cedar Avenue to four lanes between G Street and A Street. The remaining screenlines operate under 80% of the proposed capacity. Screenline #6 evaluates two alternative widening schemes 1) four lanes on Railroad Avenue and two lanes on Cedar Avenue, 2) two lanes on Railroad Avenue and four lanes on Cedar Avenue due to right-of-way constraints on Railroad Avenue through the Historic District. Both widening schemes can accommodate peak traffic projections. The evening peak hour screenline capacity analysis shown in Figure 7 shows that all of the screenlines operate under 90% of the proposed capacity.

Summary of Screenline Capacity Analysis

- The lane recommendations in the MITP accommodate buildout traffic projections.
- Demand exceeds capacity at one screenline (south of Causeway) indicating the need to widen Cedar Avenue to four lanes between G Street and A Street.

F. Island Access Capacity Analysis

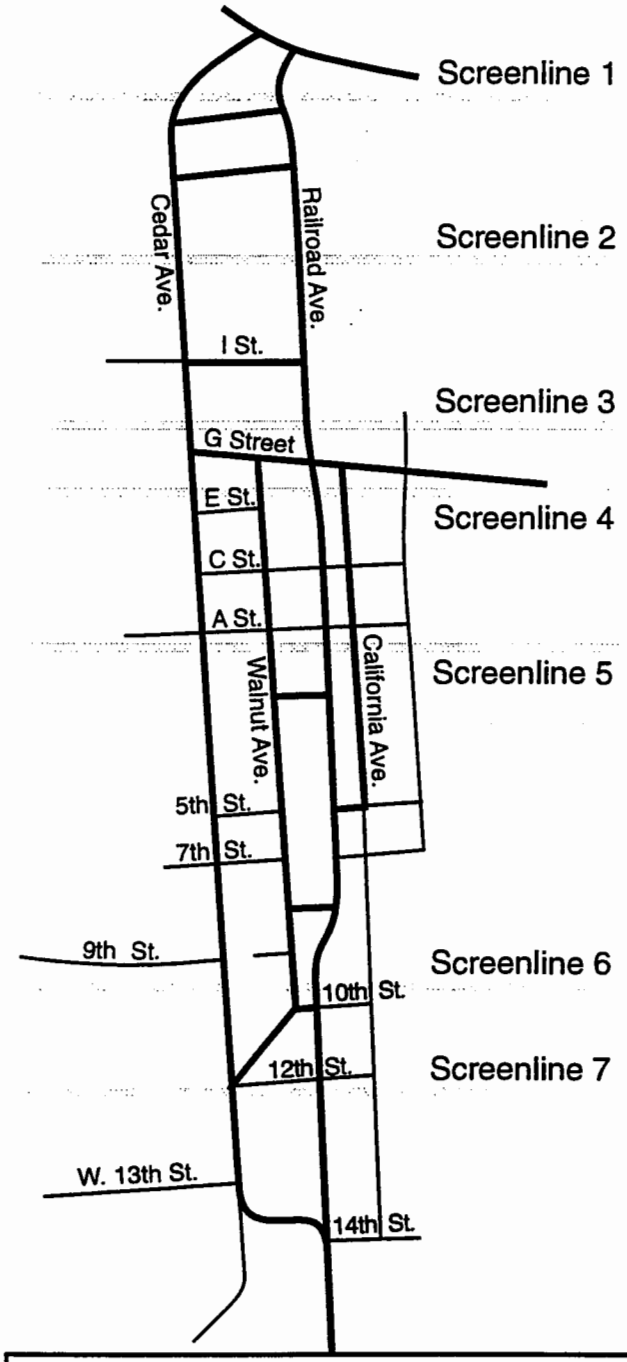
Because it is an island, access to Mare Island is constrained by the capacity of the connections to the regional transportation system. This section discusses the capacity analysis of the island access based on buildout traffic projections.

1. SR 37 Interchange Capacity Analysis

The capacity of the interchange is limited by three components, the ramp roadways, the ramp junction merge/diverge points with the mainline, and the freeway segments upstream and downstream of the ramp junctions. Table 4 presents an analysis of each component. The analyses reflect future conditions with buildout of the Mare Island Reuse Plan and year 2020 projections on SR 37, but without any capacity improvements to the interchange.

Ramp Capacity Analysis

The peak directions of travel are inbound to Mare Island in the morning peak hour and outbound from Mare Island in the evening peak hour, as shown in Table 4. The highest demand occurs on the westbound loop off-ramp in the morning (about 3,070 vph) and the eastbound diagonal on-ramp in the afternoon (about 2,770 vph). The capacity of each ramp is determined by the number of lanes and the design speed of the ramp. The highest capacity ramps are the two lane westbound loop off-ramp and eastbound diagonal on-ramp. However, the capacity of these ramps are limited by the single lane junctions with SR 37, resulting in a lower capacity than that for a standard two lane ramp (3,800 vph). The westbound off-ramp capacity is 2,200 vph, while the eastbound on-ramp capacity is further reduced to 1,900 vph due to the upward grade of the ramp. The lowest capacity ramp is the single lane westbound loop on-ramp (1,100 vph) due to its small radius loop and low design speed.



1	Volume	Capacity[1]	V/C Ratio
NB	1,178	4,300	0.27
SB	3,314	4,300	0.77
Total	4,492	8,600	0.52

2	Volume	Capacity[1]	V/C Ratio
NB	1,345	4,300	0.31
SB	3,081	4,300	0.72
Total	4,426	8,600	0.52

3	Volume	Capacity[1]	V/C Ratio
NB	1,547	4,300	0.36
SB	2,839	4,300	0.66
Total	4,386	8,600	0.51

4	Volume	Capacity[1]	V/C Ratio
NB	1,187	3,500	0.34
SB	3,538	3,500	1.01
Total	4,725	7,000	0.68

5	Volume	Capacity[1]	V/C Ratio
NB	1,031	3,500	0.30
SB	2,439	3,500	0.70
Total	3,470	7,000	0.50

6A[2]	Volume	Capacity[1]	V/C Ratio
NB	736	3,500	0.21
SB	1,744	3,500	0.50
Total	2,480	7,000	0.35

6B[2]	Volume	Capacity[1]	V/C Ratio
NB	736	3,300	0.22
SB	1,744	3,300	0.53
Total	2,480	6,600	0.38

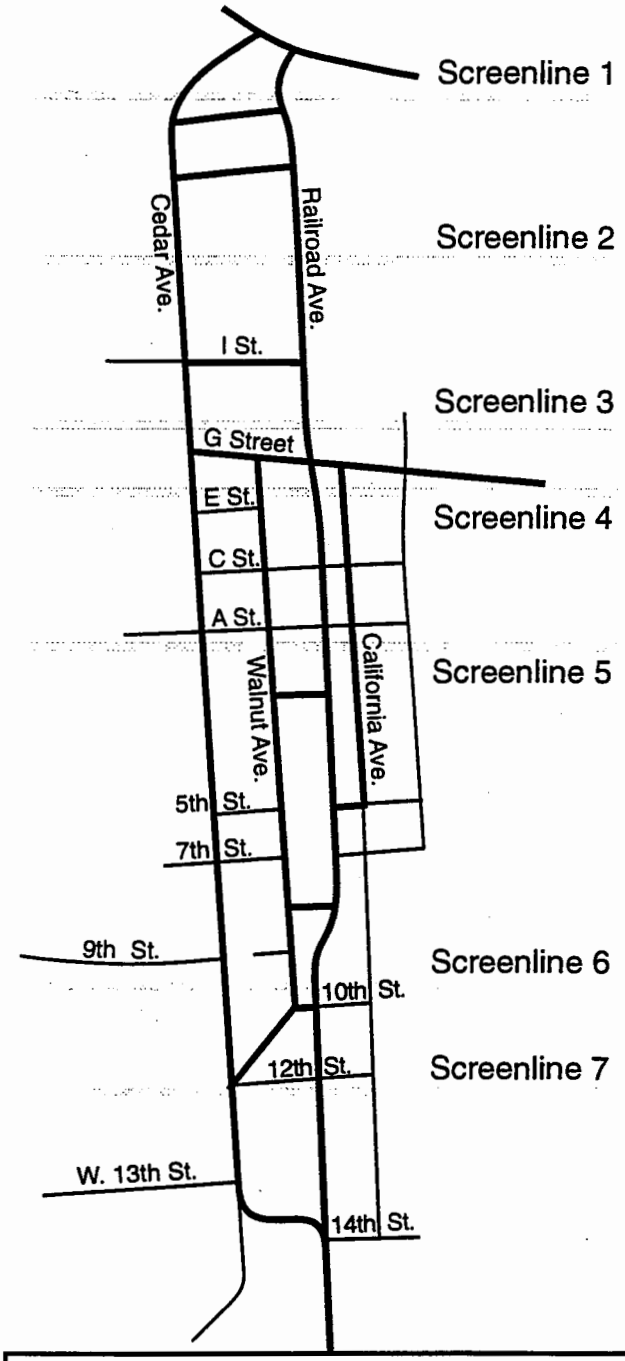
7	Volume	Capacity[1]	V/C Ratio
NB	479	2,100	0.23
SB	1,095	2,100	0.52
Total	1,574	4,200	0.38

Note:
1. Vehicles per hour summed across all proposed lanes in each direction
2. Screenline 6A and 6B represent conditions with Cedar Avenue as a 4-lane and 2-lane roadway, respectively

N
Not to Scale

Figure 6 — **SCREENLINE TRAFFIC VOLUMES- AM PEAK HOUR**

1009-62-03



1	Volume	Capacity[1]	V/C Ratio
NB	3,447	4,300	0.80
SB	1,861	4,300	0.43
Total	5,308	8,600	0.62

2	Volume	Capacity[1]	V/C Ratio
NB	2,816	4,300	0.66
SB	1,822	4,300	0.42
Total	4,638	8,600	0.54

3	Volume	Capacity[1]	V/C Ratio
NB	2,606	4,300	0.61
SB	1,958	4,300	0.46
Total	4,564	8,600	0.53

4	Volume	Capacity[1]	V/C Ratio
NB	3,034	3,500	0.87
SB	1,821	3,500	0.52
Total	4,855	7,000	0.70

5	Volume	Capacity[1]	V/C Ratio
NB	2,092	3,500	0.60
SB	1,679	3,500	0.48
Total	3,771	7,000	0.54

6A[2]	Volume	Capacity[1]	V/C Ratio
NB	1,444	3,500	0.41
SB	1,382	3,500	0.40
Total	2,826	7,000	0.40
6B[2]	**Volume**	**Capacity[1]**	**V/C Ratio**
NB	1,444	3,300	0.44
SB	1,382	3,300	0.42
Total	2,826	6,600	0.43

7	Volume	Capacity[1]	V/C Ratio
NB	840	2,100	0.40
SB	963	2,100	0.46
Total	1,803	4,200	0.43

Note:
1. Vehicles per hour summed across all proposed lanes in each direction
2. Screenline 6A and 6B represent conditions with Cedar Avenue as a 4-lane and 2-lane roadway, respectively

N
Not to Scale

Figure 7 — **SCREENLINE TRAFFIC VOLUMES- PM PEAK HOUR**

1009-61-03

Table 4
MARE ISLAND TRANSPORTATION PLAN
SR 37 INTERCHANGE CAPACITY ANALYSIS
(Buildout of Mare Island Reuse Plan)

Ramp Capacity Analysis

Ramp	Ramp Volume		Ramp Capacity (vph)	V/C Ratio	
	AM Peak	PM Peak		AM Peak	PM Peak
Westbound Loop Off-Ramp	3069	1334	2200	1.40	0.61
Eastbound Diagonal On-Ramp	825	2766	1900	0.43	1.46
Westbound Loop On-Ramp	185	646	1100	0.17	0.59
Eastbound Diagonal Off-Ramp	720	305	2200	0.33	0.14

Merge/Diverge Analysis

Ramp	Ramp Volume		Junction Area Density [2]	Merge/Diverge LOS	
	AM Peak	PM Peak		AM Peak	PM Peak
Westbound Loop Off-Ramp Diverge	3069	1334	41/29	E	D
Eastbound Diagonal On-Ramp Merge [1]	826	2766	20/[3]	B	F
Westbound Loop On-Ramp Merge	185	646	14/20	B	C
Eastbound Diagonal Off-Ramp Diverge	720	305	14/19	B	B

Freeway Segment Analysis

Ramp Adjacent to Segment	Freeway Segment	Service Flow Rate (vphpl)		Segment LOS	
		AM Peak	PM Peak	AM Peak	PM Peak
Westbound Loop Off-Ramp	Before Ramp	2162	1411	E	C
	After Ramp	589	727	A	B
Eastbound Diagonal On-Ramp	Before Ramp	1053	1114	A	C
	After Ramp	630	2532	C	F
Westbound Loop On-Ramp	Before Ramp	589	727	A	B
	After Ramp	684	1058	B	C
Eastbound Diagonal Off-Ramp	Before Ramp	999	1270	B	C
	After Ramp	630	1114	A	C

[1] PM peak hour demand exceeds capacity of merge by 540 vph, which will cause queuing on freeway and the on-ramp.

[2] Merge or diverge area density measured in passenger cars/mile/lane.

[3] Ramp junction operating at capacity, density exceeds 50 pc/mile/lane.

WB loop off-ramp capacity based on single lane with 40 mph speed. Ramp widens to two lanes after diverge junction, but capacity is constrained to the single lane junction with SR 37.

EB diagonal on-ramp capacity based on single lane with 30 mph. Low design speed due to upward grade at merge. Ramp contains two lanes, but merge into a single lane prior to ramp merge with SR 37.

Sources:

Service levels based on methods in the 1994 Highway Capacity Manual.

SR 37 demand reflects year 2020 conditions. Source: Solano 37 Travel Demand Forecasting Model, Caltrans.

At buildout, demand will exceed capacity at the westbound loop off-ramp in the morning peak hour and the eastbound diagonal on-ramp in the evening peak hour. These ramps will operate with demand 50% higher than capacity. This will result in slower speeds though the interchange (both on the ramps and the mainline), and a high density of vehicles which creates difficulty in changing lanes. Some stopping and queuing may occur prior to the ramp junction during peak hours. During the non peak-direction time periods, and at the other ramps, the demand does not exceed capacity.

Merge/Diverge Analysis

The ramp junction merge and diverge points define the capacity of the interchange because most interactions between vehicles occur at the junctions. As shown in Table 4, in the morning peak hour, the westbound loop off-ramp demand nearly equals the diverge capacity, operating at LOS E. This condition will result in slower traffic through the interchange, but not failure conditions. In the evening peak hour, the eastbound on-ramp demand exceeds the merge capacity by about 540 vph which will cause queuing on the on-ramp and on the mainline prior to the merge.

Freeway Segment Analysis

Table 4 shows the results of the freeway segment analyses before and after the ramp junctions. These analyses support the capacity problems identified at the westbound loop off-ramp in the morning peak hour, and the eastbound diagonal on-ramp in the evening peak hour with segments operating at LOS E and LOS F.

2. Causeway Crossing Capacity Analysis

Table 5 shows demand exceeds the capacity of the Mare Island Causeway at buildout of the island, westbound during both peak hours and eastbound during the evening peak hour. The capacity analysis assumes a per lane capacity of 900 vph and a reversible center lane providing two lanes in the peak direction. The reversible lane will need to be implemented at 46% of buildout of the reuse plan to maintain LOS E/F operations, or at 43% of buildout to maintain LOS D operations.

Summary of Island Access Capacity Analysis

- At buildout of the Mare Island Reuse Plan, the existing access capacity cannot accommodate the projected demand. Congestion and poor service levels at the access points will result in a "spreading" of the peak hour, increasing the length of the peak period of demand into the hours adjacent to the peak hour. The reversible lane on the Causeway will need to be implemented at 46% of buildout of the reuse plan to maintain LOS E/F operations, or at 43% of buildout to maintain LOS D operations.

Table 5
MARE ISLAND TRANSPORTATION PLAN
CAUSEWAY CAPACITY ANALYSIS
(Buildout of Mare Island Reuse Plan)

Direction	Volume		Per Lane	AM Peak Hour		PM Peak Hour	
	AM Peak	PM Peak	Capacity (vph) [1]	V/C Ratio	LOS	V/C Ratio	LOS
Westbound	2208	904	900	1.23	F	1.00	F
Eastbound	537	1973	900	0.60	B	1.10	F

[1] Capacity assumes reversible lanes on Causeway with 900 vph per lane with two lanes in the peak direction (WB in AM, EB in PM) and one lane in the non peak direction.

Potential Mitigation Measures to Reduce Demand at Island Access

The traffic generation estimates assume conservative use of transit (5%) and carpooling (10%) for travel external to the island. The assumption of 85% of external travel by Single Occupant Vehicles (SOV's) is consistent with current Bay Area travel characteristics. However, there are Transportation Demand Measures and public transportation facilities which could be implemented to reduce automobile demand at the access points. These are:

- Increase public transit use by providing more frequent service and express buses, and encouraging employers to subsidize fares for employees.
- Encourage employers to provide flexible work schedules and tele-commute options for employees.
- Provide strategically located carpool parking lots throughout the island for residents and "casual carpool" employees (in addition to the Caltrans carpool lot at the north end of the island).
- Provide a small craft Ferry Shuttle system between the Vallejo Ferry Terminal and Mare Island (with frequent headways to encourage its use), and increase the parking capacity of the mainland terminal.

Realistically, these measures have the potential to reduce the island's peak hour external demand between 15% to 25%, not fully mitigating the access capacity deficiencies but reducing congestion and its duration in the peak hours.

V. CONCEPTUAL TRANSPORTATION PLAN

A. Street Classifications

The Mare Island Transportation Plan specifies a hierarchy of arterial, collector, and local streets as well as a central transitway. The street classifications are consistent with the land uses the streets pass through and the traffic demand they accommodate. Figure 8 illustrates the Street Classification Plan for the primary streets on the island.

1. Arterial Streets

Railroad Avenue serves as the island's spine road providing a continuous multi-lane arterial from the SR 37 interchange to 12th Street. South of 12th Street, Railroad Avenue reduces to a residential collector. The Mare Island Causeway is the island's only east-west arterial providing vehicular and railroad access to the island and connections with the key north-south streets.

2. Industrial Collector Streets

Cedar Avenue serves as the primary north-south industrial collector providing access to the industrial uses in the NIA. Cedar Avenue provides an alternative north-south route relieving some of the demand on Railroad Avenue, particularly from the eastbound SR 37 off-ramp. Cedar Avenue connects to this ramp via an extension through the City owned property.

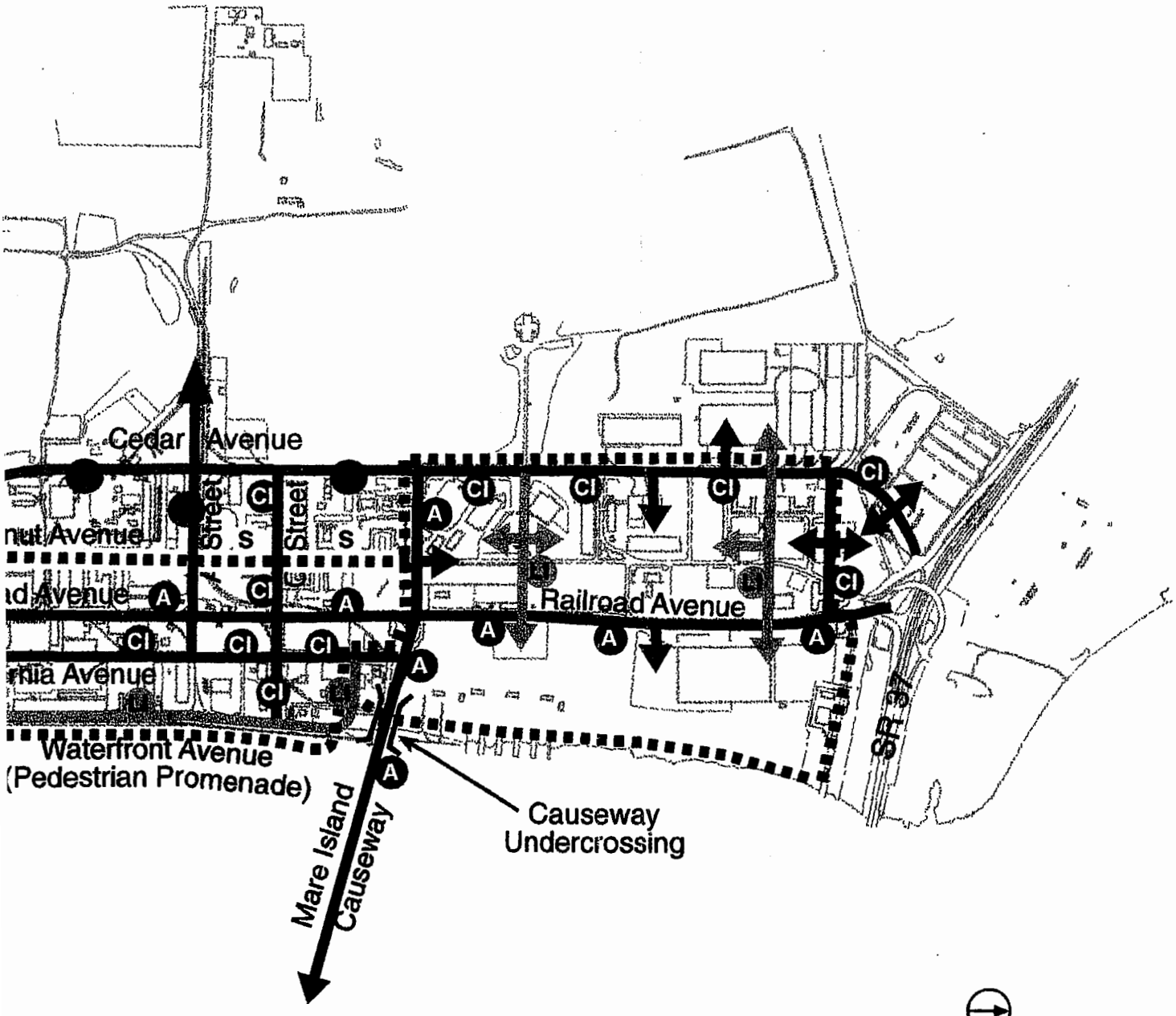
Additional industrial collectors in the NIA connect Railroad and Cedar Avenues and provide access to adjacent properties. South of the Mare Island Causeway, California Avenue is classified as an industrial collector serving the heavy industrial uses near the waterfront. Additional east-west industrial collectors include C Street, portions of A and 12th Streets, and 14th and 15th Streets.

3. Residential Collector Streets

Cedar Avenue south of the Mare Island Causeway is the primary residential collector street. Cedar Avenue distributes traffic from the Causeway and SR 37 to other residential collectors (A Street and 7th Street) and to local streets which connect directly to Cedar Avenue.

4. Residential and Industrial Local Streets

The Street Classification Plan does not identify the local residential streets which wind through the island primarily west of Cedar Avenue. The primary local industrial street is Waterfront Avenue serving the industrial and mixed uses along the waterfront. This street will be designed to discourage traffic and may serve primarily as a pedestrian promenade. Additional east-west local industrial streets in the NIA connect Railroad and Cedar Avenues and provide access to industrial uses.


Cedar Avenue
Railroad Avenue
Waterfront Avenue
(Pedestrian Promenade)
Mare Island Causeway
Causeway Undercrossing
CI
A
N
Not to Scale

5. Transit/Bikeway

Walnut Avenue is designated a local low volume street for transit and shuttle vehicles, bicycles, pedestrians, and local auto traffic. The transitway connects mixed-use areas with employment and residential areas, and is intended as the primary transportation spine for short non-motorized trips on the island. Walnut Avenue will connect to a transit/shuttle route and on-street bicycle route system which serves the entire island.

B. Right-of-Way Constraints

Figure 9 illustrates sections of Railroad Avenue with right-of-way constraints in the Heavy Industry and Historic District zones. Existing infrastructure and valuable buildings reduce the available width for street improvements to as little as 30 feet. The available width along the constrained segments of Railroad Avenue ranges from 30 to 90 feet. Some of the constraints are due to concrete bomb shelters directly adjacent to Railroad Avenue. While expensive to remove, these structures are not considered valuable and could be demolished to provide additional width.

The right-of-way constraints are important because Railroad Avenue is designated as the primary spine arterial requiring four lanes between G Street and 12th Street. Acknowledging these constraints, the MITP provides "reduced right-of-way" cross-sections for four lane arterials which fit within the constrained areas with minimal impact to existing buildings, as shown in Figure 9.

C. Transit/Shuttle Transportation System

The island-wide transit and shuttle transportation system (see Figure 8) consists of the following elements:

- A transitway along Walnut Avenue between G Street and Cedar Avenue, designed as a low volume local street shared by shuttle buses, pedestrians, bicyclists, and vehicles accessing adjacent property. The transitway provides shuttle, pedestrian and bicycle connections to other parts of the island.

- A Transit Center, located south of the Causeway between Railroad and California Avenues, connects the shuttle system and the regional public transit system, accessible by vehicle, pedestrians, and bicyclists.

- Regional public transit service to circulate throughout the island throughout the day possibly with increased frequency during the peak hours on a loop route utilizing Cedar and Railroad Avenues. Shuttle service to circulate throughout the island during the midday and peak hours on Cedar, Railroad, the Walnut Avenue transitway, and the Waterfront promenade.

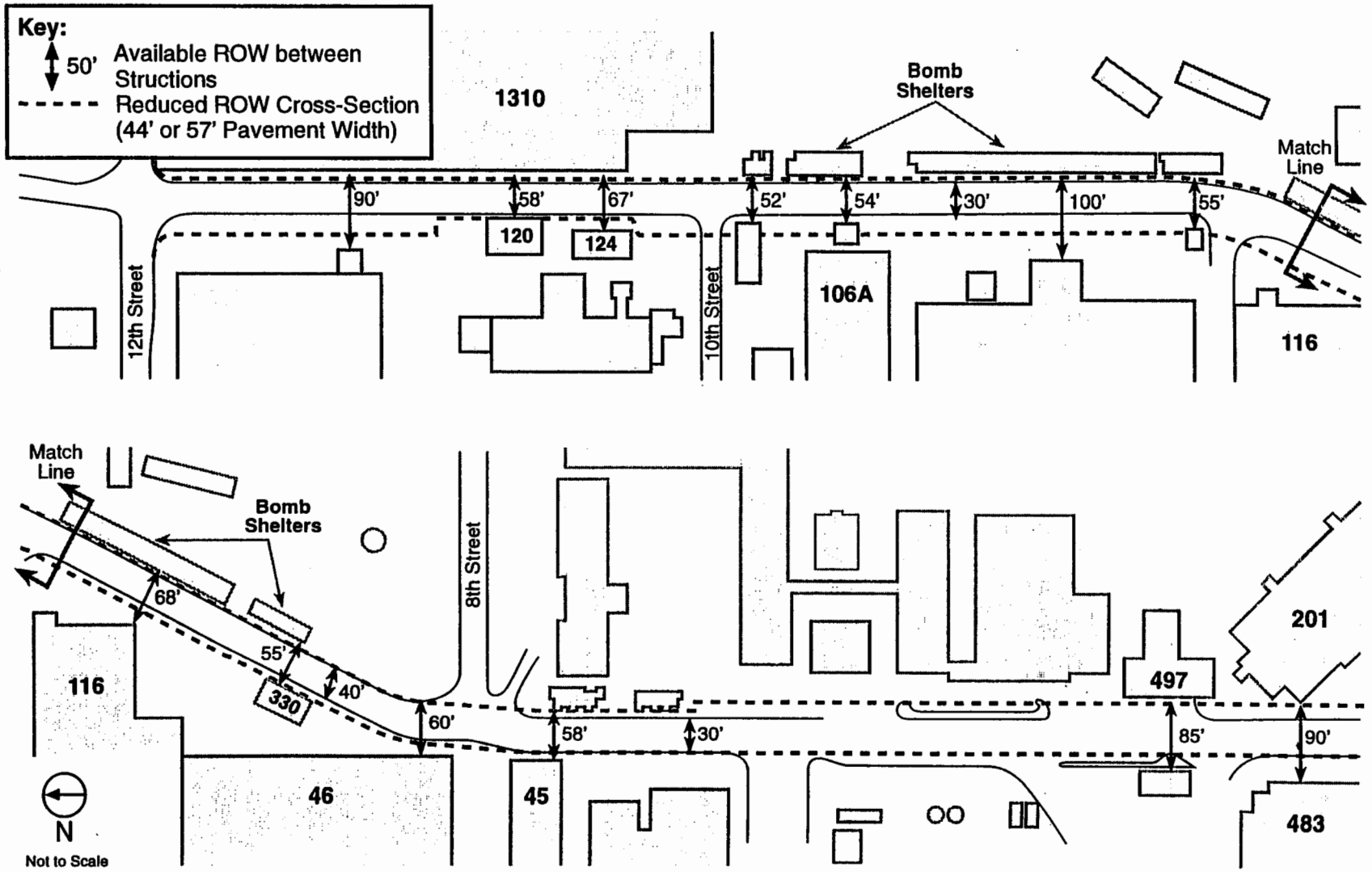


Figure 9
1009-142-01

CONSTRAINED RIGHT-OF-WAY LOCATIONS ON RAILROAD AVENUE

D. Pedestrian/Bicycle Transportation System

The island-wide pedestrian and bicycle transportation system consists of the following elements:

- Sidewalks in the street cross-section standards, including the reduced right-of-way sections for use in constrained areas. It is envisioned that eventually all of the primary streets on the island will be reconstructed to MITP standards and provide sidewalks. The wider arterial and collector cross-section standards include bike lanes. Residential and industrial collectors and local streets provide outside lanes wide enough for Class III bicycle routes.

- A transitway along Walnut Avenue provides a centralized spine for pedestrians and bicyclists connecting mixed use and residential areas with employment and educational areas.

- A pedestrian promenade on Waterfront Avenue allowing local traffic for adjacent property access and the shuttle system.

VI. STREET DESIGN STANDARDS

A. Street Cross-Section Standards and Lane Requirements

Figure 10 identifies the number of lanes required to accommodate buildout of the Mare Island Reuse Plan. Most lane capacity occurs at the northern end of the island including a six lane Railroad Avenue arterial, and a four lane Cedar Avenue industrial collector. Figure 10 identifies the various cross-sections proposed on each section of the street classification plan.

Figures 11A, 11B, and 11C detail the street cross-sections located in Figure 10. The cross-sections include alternative sections for each street classification. Alternative sections differ due the provision of on-street parking or bike lanes, or median turn lanes. The standards include alternative reduced right-of-way cross-sections for four lane arterials, to be used in areas with right-of-way constraints such as Railroad Avenue through the Historic District and Heavy Industry zones. Cross-section standards are consistent with the City Vallejo's current standards for similar types of streets.

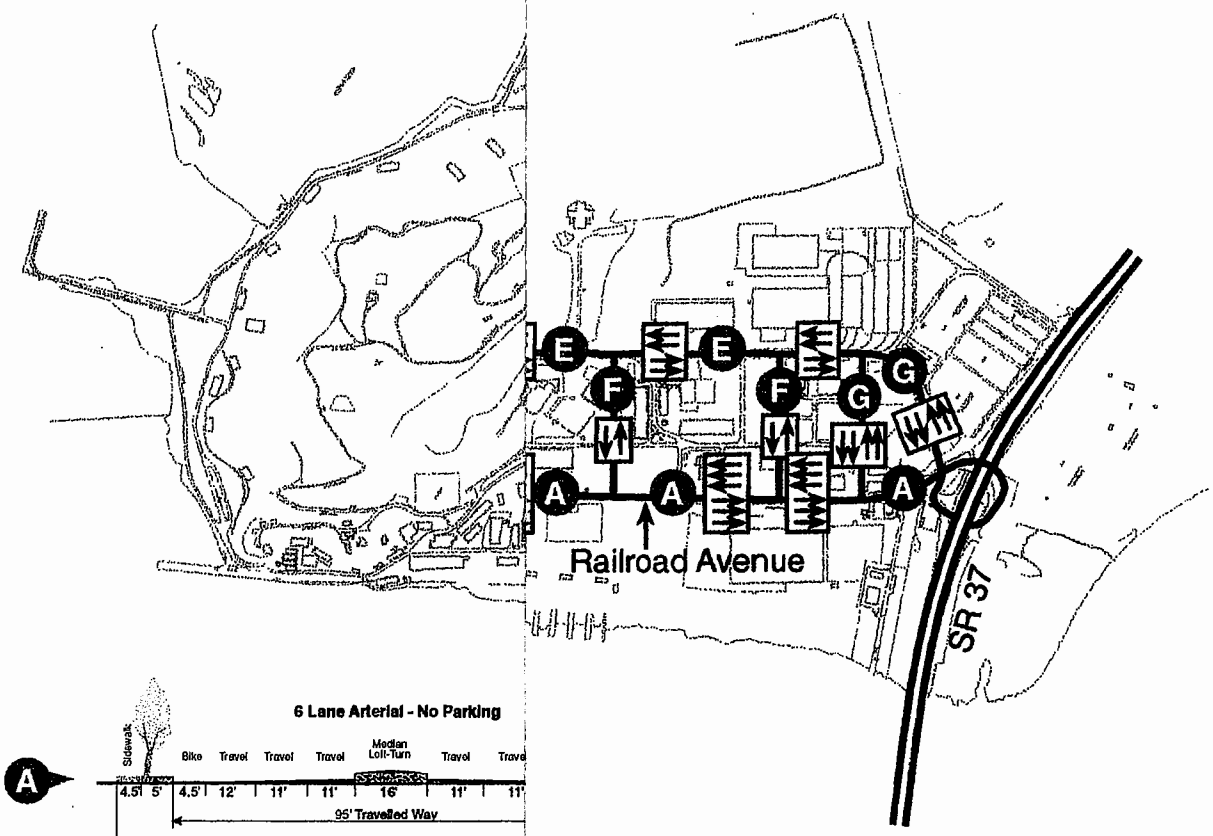
B. Roadway Design Standards

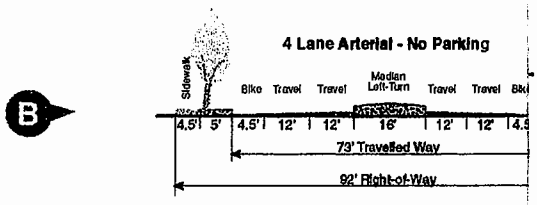
Figure 12 presents general geometric design standards for the street cross-sections. The standards include number of travel lanes and their width, curb return radii, design speed, minimum horizontal curvature and ideal signalized intersection spacing. These standards are derived from nationally adopted sources including AASHTO, ITE, and USDOT. The arterial and industrial collector and local street standards reflect the truck generating nature of the Mare Island Reuse Plan and provide standards consistent with the needs of larger vehicles.

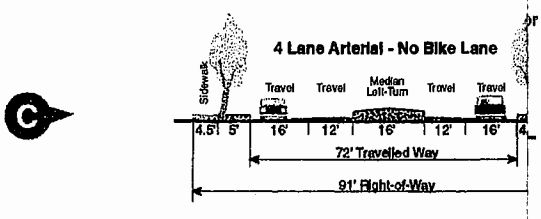
C. Transitway Design Standards

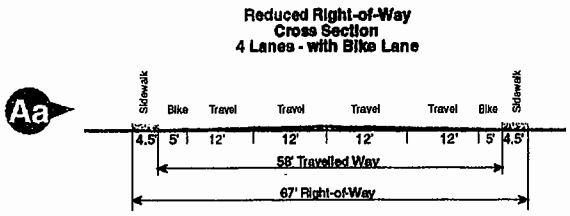
Figure 11C includes a cross-section standard for the Walnut Avenue transitway. This is an intentionally narrow street intended for low vehicular volumes, shuttle buses, pedestrians, and bicyclists. The travel lanes are narrowed to 10 feet to permit 5 foot wide bicycle lanes within a 30 foot curb to curb width. Sidewalks and a landscaping strip are provided adjacent to the street. The narrow street gives a pedestrian scale to the corridor, effectively slows traffic, and reduces pedestrian crossing widths.

Design standards for the transitway reflect the lower volume and speeds including a 35 mph design speed, 25 foot curb-return radii, short intersection spacing, and allowance of smaller radius curves, as shown in Figure 12.









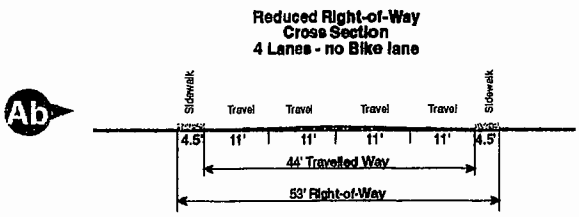


Figure 10

1009-91-03

BUILDO STREET

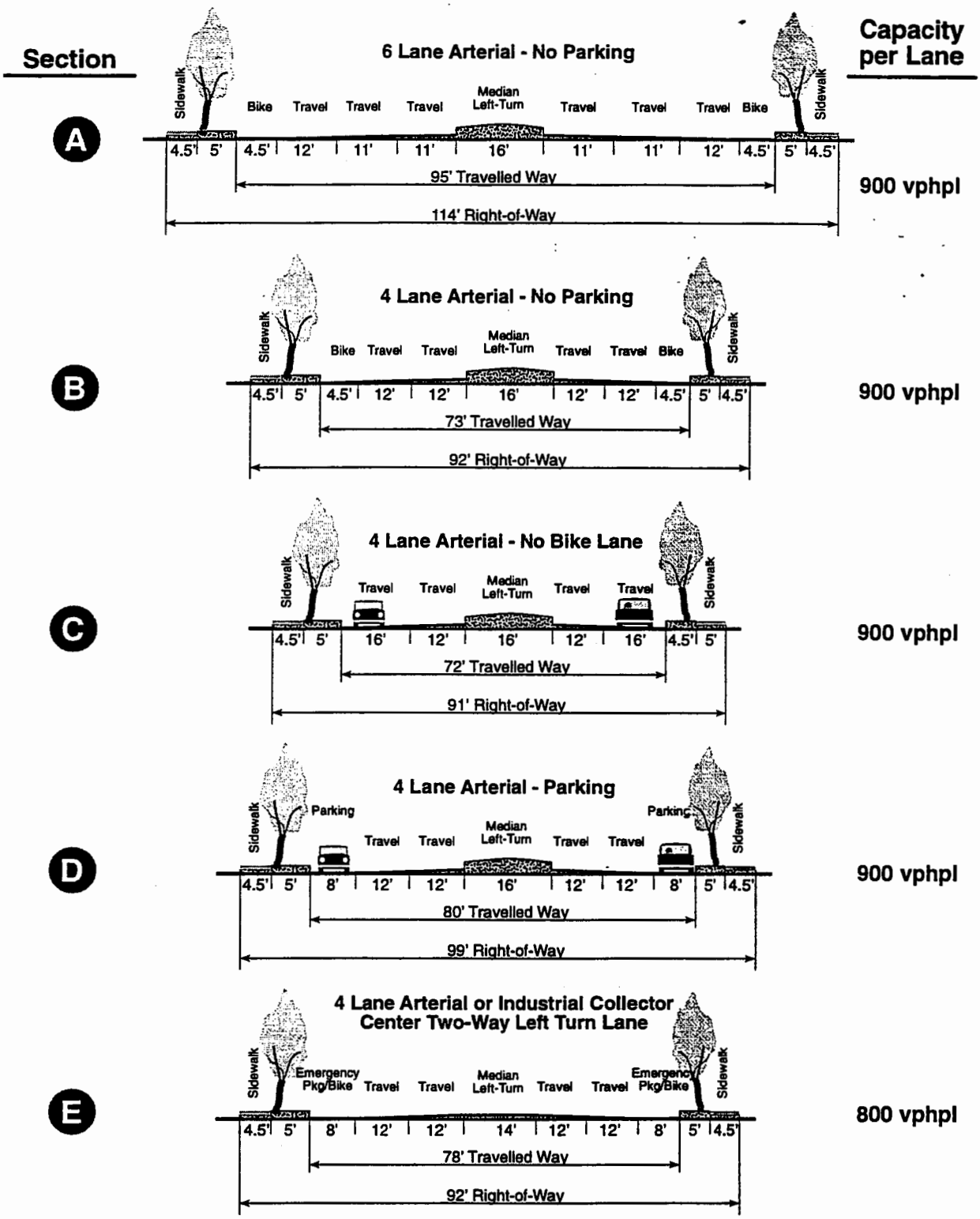


Figure 11A
1009-31-02

MARE ISLAND TRANSPORTATION PLAN
STREET DESIGN STANDARDS

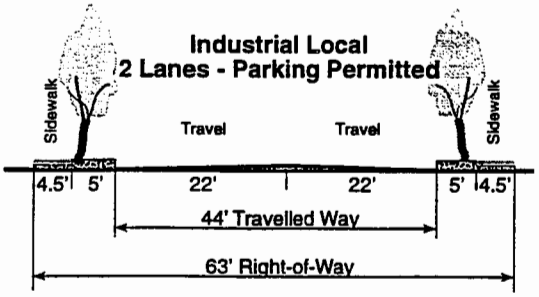
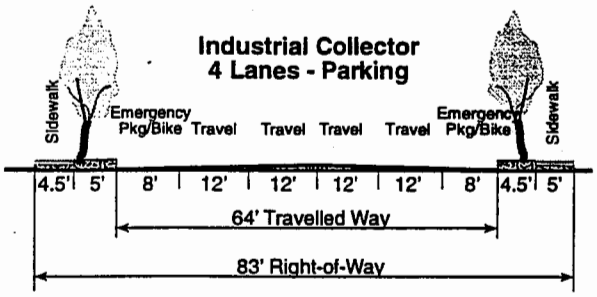
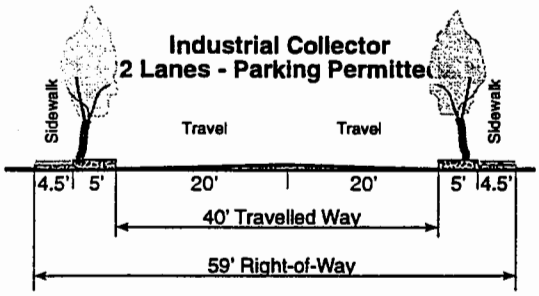
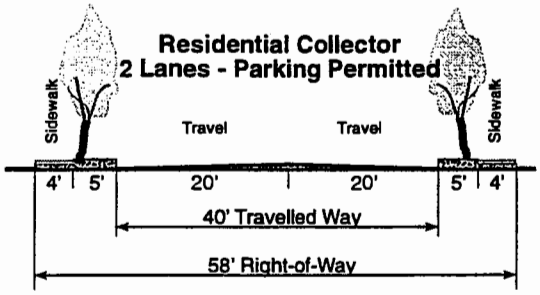
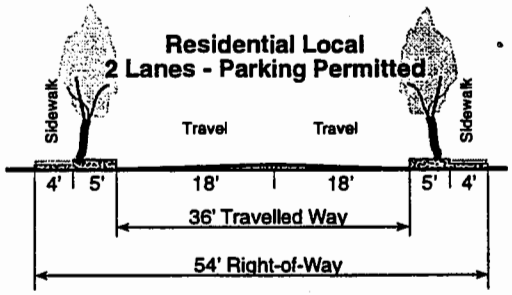
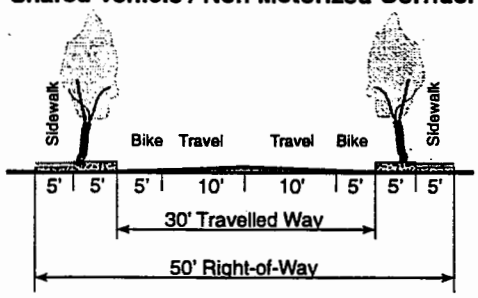
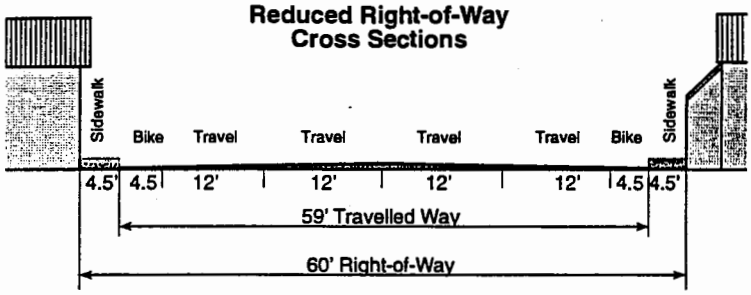
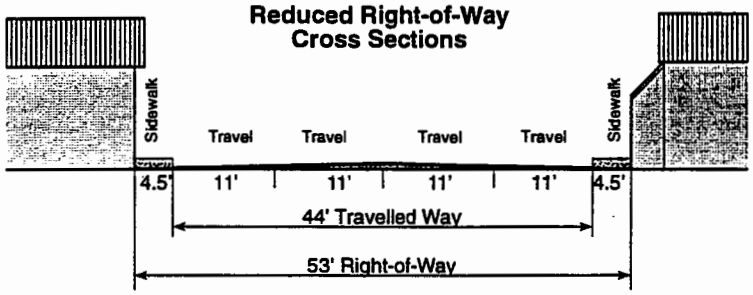
Section		Capacity per Lane
F		700 vphpl
G		700 vphpl
H		700 vphpl
I		700 vphpl
J		600 vphpl

Figure 11B 1009-32-02	MARE ISLAND TRANSPORTATION PLAN STREET DESIGN STANDARDS	

Section		Capacity per Lane
K		300 vphpl
Aa		900 vphpl
Ab		900 vphpl

Reduced Right-of-Way cross sections for 4 lane arterials in areas with building constraints

Figure 11C 1009-33-03	MARE ISLAND TRANSPORTATION PLAN STREET DESIGN STANDARDS	

Cross-Section Type	Travel Lanes	Lane Widths	Curb-Return Radius	Minimum Horizontal Radius	Design Speed	Signalized Intersection Spacing
A	6	11-12'	40'	1,190'	55 mph	1,000' min.
B	4	12'	40'	1,190'	55 mph	660' min.
C	4	12-16'	40'	1,190'	55 mph	660' min.
D	4	12'	40'	1,190	55 mph	660' min.
E	4	12'	40'	950'	50 mph	660' min.
F	2	22'*	35'	570'	40 mph	660' min.
G	4	12'	35'	730'	45 mph	660' min.
H	2	20'*	35'	730'	45 mph	660' min.
I	2	20'*	25'	570'	40 mph	660' min.
J	2	18'*	25'	150'	35 mph	660' min.
K	2	10'	25'	150'	35 mph	660' min.

* Parking permitted

Figure 12
1009-151-01

ROADWAY DESIGN STANDARDS
GEOMETRIC ELEMENTS

VII. ACCESS AND CIRCULATION IN NORTH INDUSTRIAL AREA

A. Site Access and Circulation

The development proposal for the North Industrial Area (NIA) is an opportunity to apply the street classifications and design standards presented in the MITP. Figure 13 details the street classification plan and site access locations in the NIA. The circulation plan in the NIA is sensitive to intersection spacing, because of the volume of traffic on the six lane Railroad Avenue arterial. Site access from Railroad Avenue occurs at signalized intersections, or is restricted to a limited number of movements. Most of the proposed facilities in the NIA gain access from local industrial streets and inter-connecting driveways.

The proposed research and development campuses located east of Railroad Avenue need to be designed to share signalized access intersections, and with internal connections for circulation between campuses without using Railroad Avenue.

The proposed service commercial and research and development campus located west of Railroad Avenue need to gain access from two streets to distribute the traffic load. The campus should have access from Street #1 and Street #2, while the service commercial site should have access from Street #1 and the extension of Cedar Avenue.

B. Transit and Shuttle Transportation Plan

Figure 14 shows the MITP's public transit and shuttle transportation system in the NIA. Public transit needs to be provided at least during the peak commute periods and loop throughout the island and the proposed transit center. The public transit route uses a one-way loop as shown in Figure 14. Bus stops should be located on the far sides of intersections, serving key locations within the NIA.

The regional transit / shuttle system should provide service throughout the day and augment the local public transit service. The shuttle system utilizes a broader loop than the bus system, taking advantage of a planned pedestrian promenade along the NIA waterfront.

C. Pedestrian and Bicycle Transportation Plan

Figure 15 shows the pedestrian and bicycle transportation plan for the NIA. Arterials and industrial collectors in the plan contain bicycle lanes as part of the design standards. The local street sections are wide enough, and with low enough volumes, to provide for bicyclists on Class III bike routes (without striped lanes). The street section standards include sidewalks, and the plan provides pedestrian links throughout the NIA. Signalized intersections provide protected crossings of major streets. The planned waterfront promenade east of the research and development campuses is a pedestrian and bicycle path directly connecting to the transit center. The Walnut Avenue transitway is accessed via sidewalks and bicycle lanes on G Street.

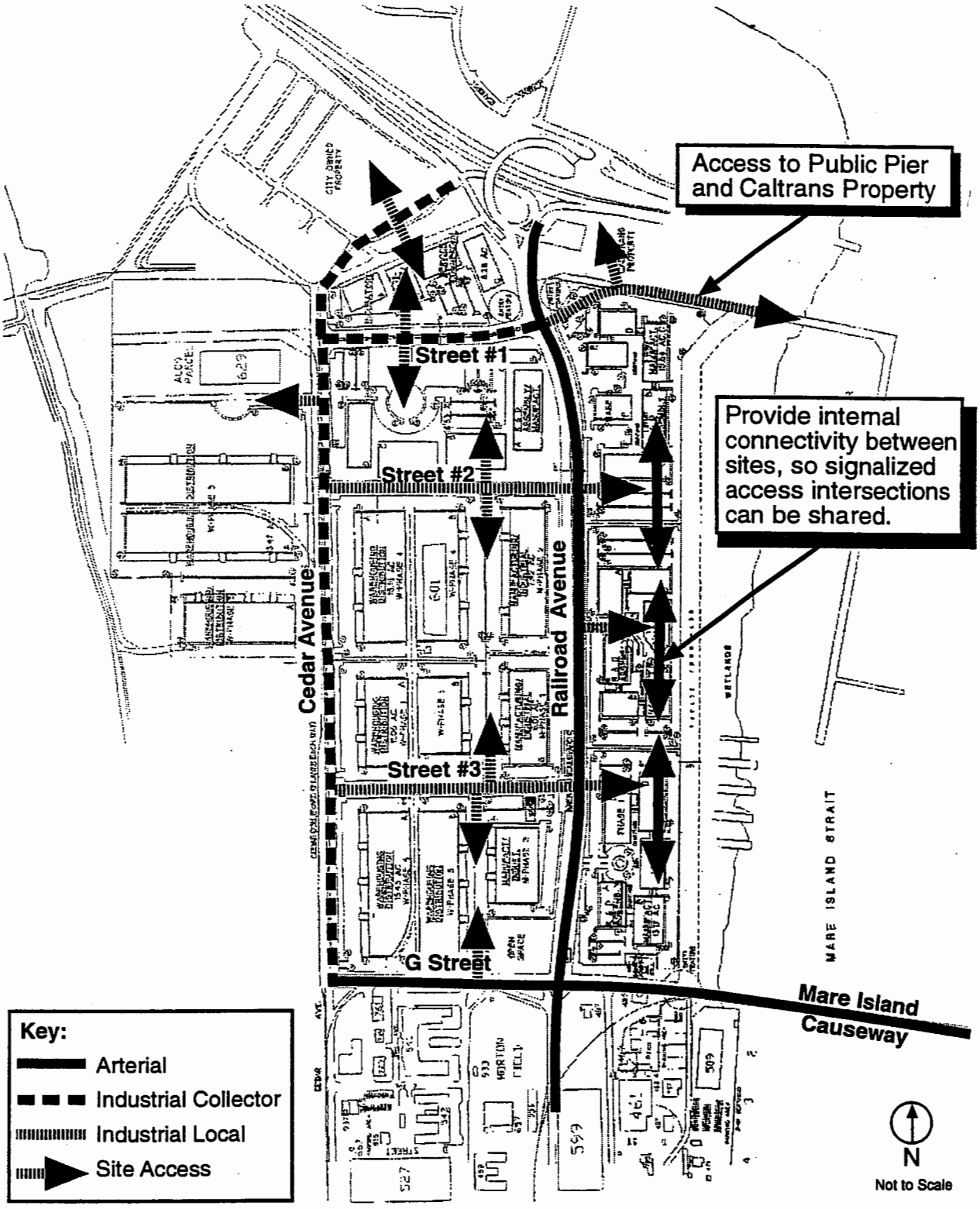


Figure 13
1009-53-03

STREET CLASSIFICATION PLAN
NORTH INDUSTRIAL AREA

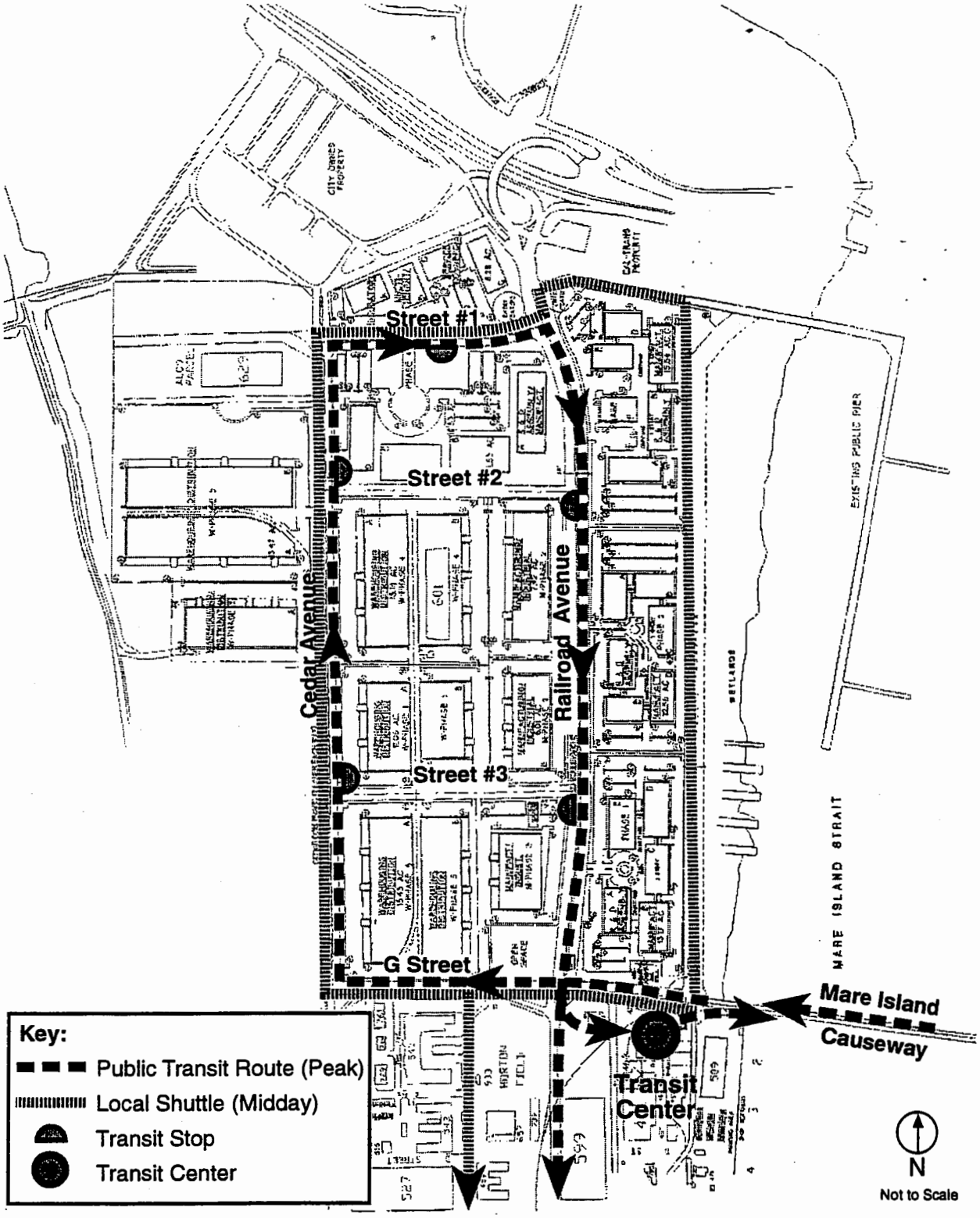


Figure 14
1009-52-03

TRANSIT / SHUTTLE TRANSPORTATION PLAN
NORTH INDUSTRIAL AREA

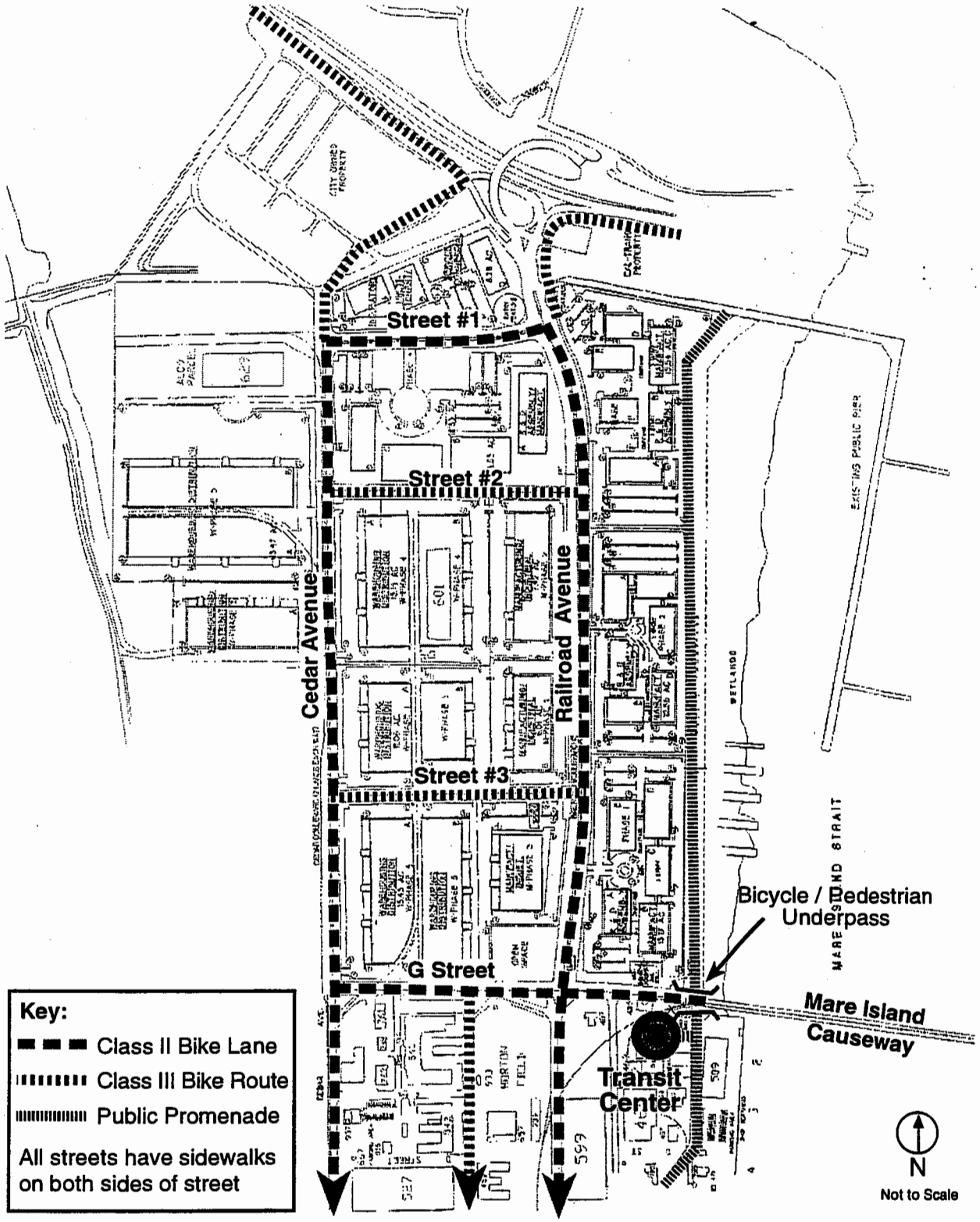


Figure 15
1009-51-03

PEDESTRIAN AND BICYCLE TRANSPORTATION PLAN NORTH INDUSTRIAL AREA

Bicycle travel on SR 37 can utilize NIA surface streets to bypass the interchange in the eastbound direction. as shown in Figure 15. However. the interchange lacks a bicycle connection between the eastbound and westbound directions of SR 37. Bicyclists wishing to change directions are required to use the shoulders of the loop ramp system to access SR 37.

D. Intersection Design and Operations

Figure 16 shows the recommended intersection configuration and traffic control to accommodate buildout of the Mare Island Reuse Plan. Intersections on Railroad Avenue are relatively evenly spaced (1,000+ feet) for optimum progression and signal coordination. Four of the Railroad Avenue intersections meet peak hour volume signalization warrants (Street #1, Street #2, Street #3, and G Street). One unsignalized intersection on Railroad Avenue, accessing the central research and development campus, is limited to right in/right out and left in movements only. No other intersections or driveways are permitted on Railroad Avenue.

Only one of the intersections on Cedar Avenue meets peak hour volume signal warrants, Cedar/G Street. The remaining intersections are side-street stop controlled with left turn bays on Cedar Avenue. Additional driveway intersections can be permitted on Cedar Avenue to serve adjacent property.

Table 6 shows the peak hour intersection service levels at the signalized intersections on Railroad and Cedar Avenues. Two of the intersections will operate at or above capacity, Railroad at Street #1 and Railroad at G Street. The Railroad/G Street intersection will operate substantially over capacity due to the confluence of Causeway and Railroad Avenue traffic volumes[5]. The Railroad/Street #1 intersection will operate at borderline capacity. Southbound vehicle queues at this intersection will extend into the interchange loop ramp creating congestion and difficult weaving maneuvers. This intersection can be mitigated by eliminating of turning movements, but results in reduced access to sites on Street #1.

E. City Property Access and Circulation

The City of Vallejo owns 28 acres of property northwest of the NIA. Present access to the site is via an unimproved street extending from Cedar Avenue. While the property has some minor environmental constraints, it can be developed at a level of use and intensity similar to the NIA. The MITP proposes extending Cedar Avenue to access this property. The four lane Cedar Avenue extension to the SR 37 eastbound off-ramp not only provides access to the City owned property, but also serves to relieve demand on Railroad Avenue.

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5 Mitigation of this intersection to operate at LOS D or better requires grade-separation of the major through volumes, an improvement which requires substantial right-of-way and may interfere with the alignment of the Causeway railroad line. This improvement would be required if a new bridge parallel to the Causeway were built to add access capacity. A preferred mitigation would be to construct a southern crossing which would remove a substantial amount of traffic from this intersection.

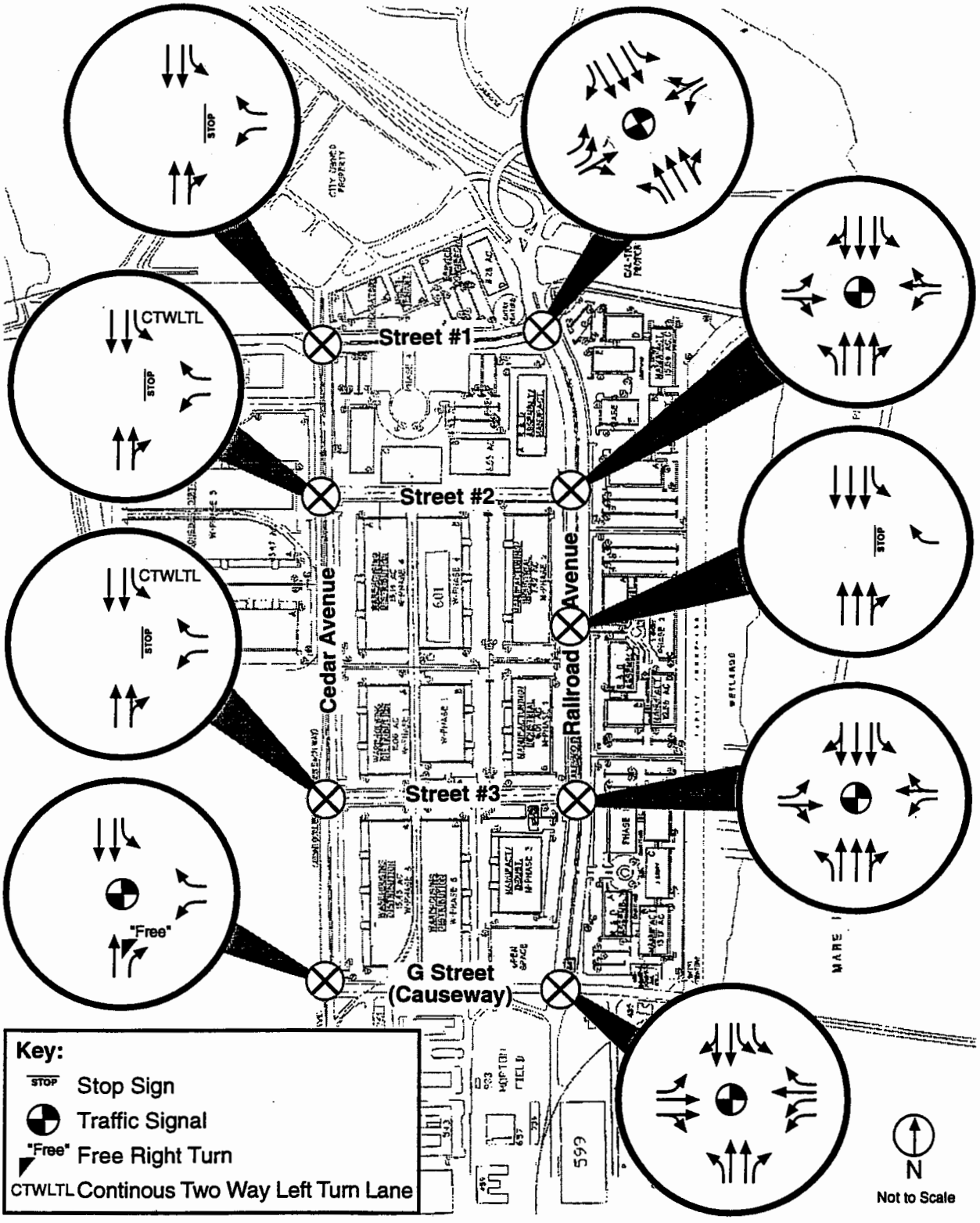


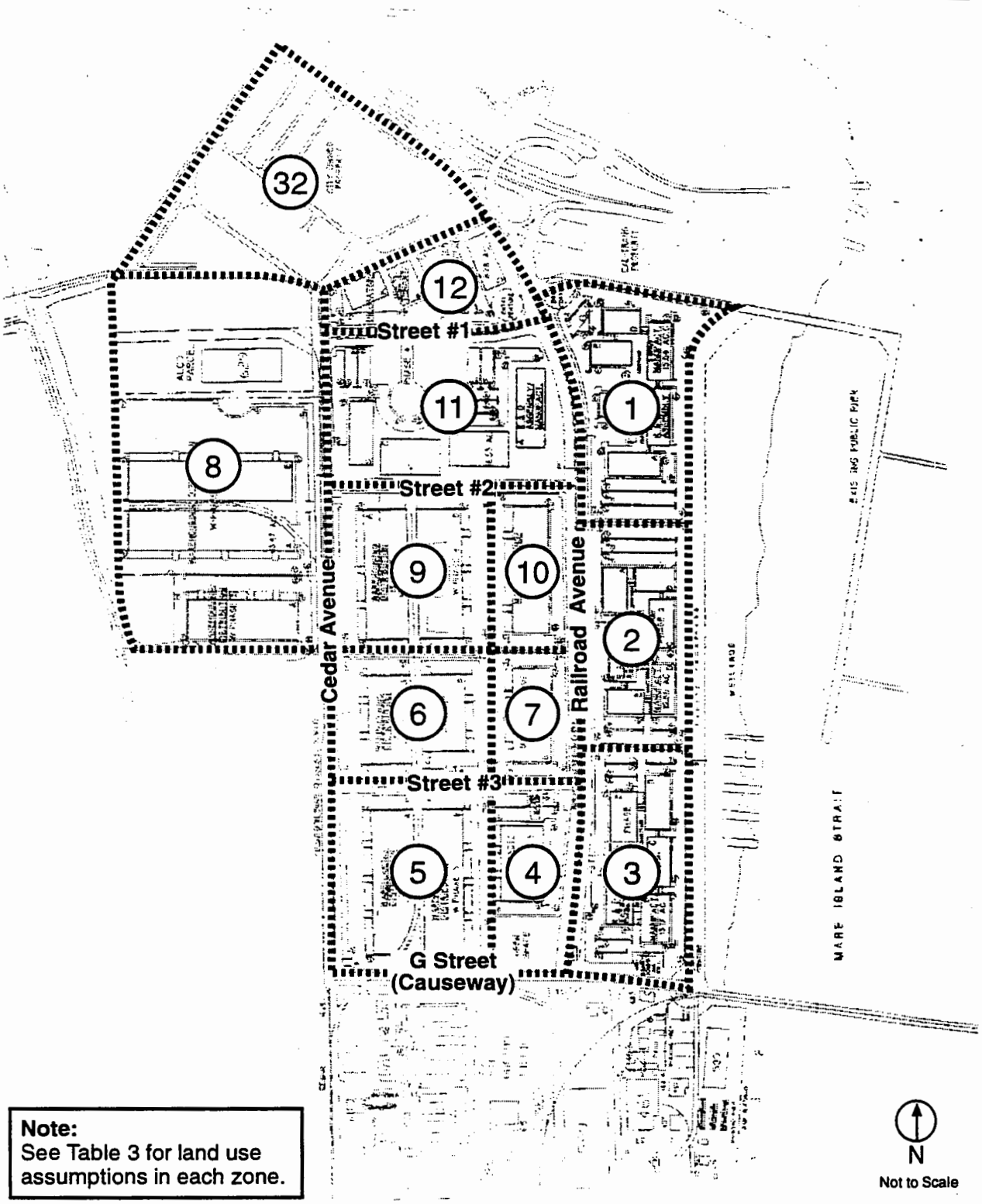
Figure 16
1008-111-04

INTERSECTION CONFIGURATION
NORTH INDUSTRIAL AREA

APPENDIX
Traffic Analysis Zone Maps

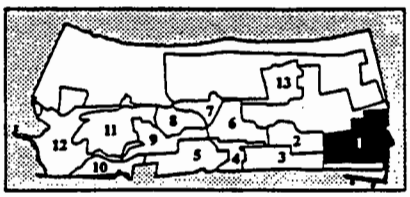
North Industrial Area Traffic Analysis Zones 1 through 12 and 32

Mare Island Reuse Plan Planning Zones Corresponding to Traffic Analysis Zones 13 through 22



Note:
See Table 3 for land use assumptions in each zone.

Appendix	NORTH INDUSTRIAL AREA TRAFFIC ANALYSIS ZONE MAP	



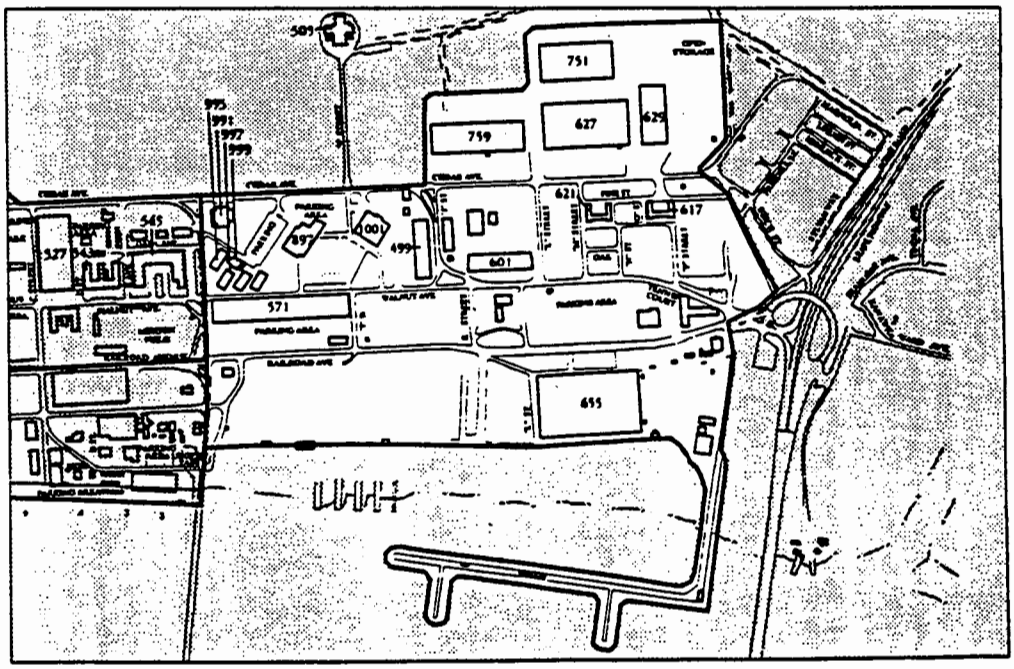
1. *North Light Industry*

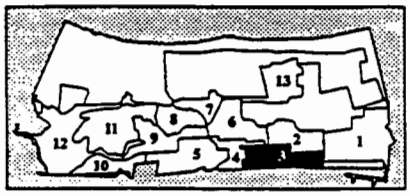
Located in the northern-most part of the Island, this zone lies between Highway 37 and Gate #2 to the north and G Street to the south. Wetlands border the area to the east and west and an active dredge pond lies westerly of Building 751.

The area is characterized by concentrations of buildings surrounded by vast areas of open space either paved, covered with ornamental grasses, or disturbed open field grasslands. This part of the Island is visually and spatially distinct because of the greater amounts of open space overall and between buildings. In contrast to the historic and industrial core of the Island, the northern industrial area more closely mirrors typical suburban industrial parks found in other Bay Area cities.

The predominant use is warehouse activity with lesser amounts of light industrial, retail, office, residential, and recreation uses. Buildings 751, 627, 759, and 655 are examples of the large warehouse structures available in this area. These buildings are located on the western periphery of the zone bordering the wetland sites.

A concentration of smaller buildings is located between Cedar and Walnut Avenues, north of G Street. Several retail buildings occur between G and J Streets. The Commissary (Building 1001), houses the base grocery store and the Navy Exchange (Building 897) contains several retail outlets including a barber shop, clothing store, and fast food restaurant. The Commissary could be reused for light industrial purposes, and the retail shops





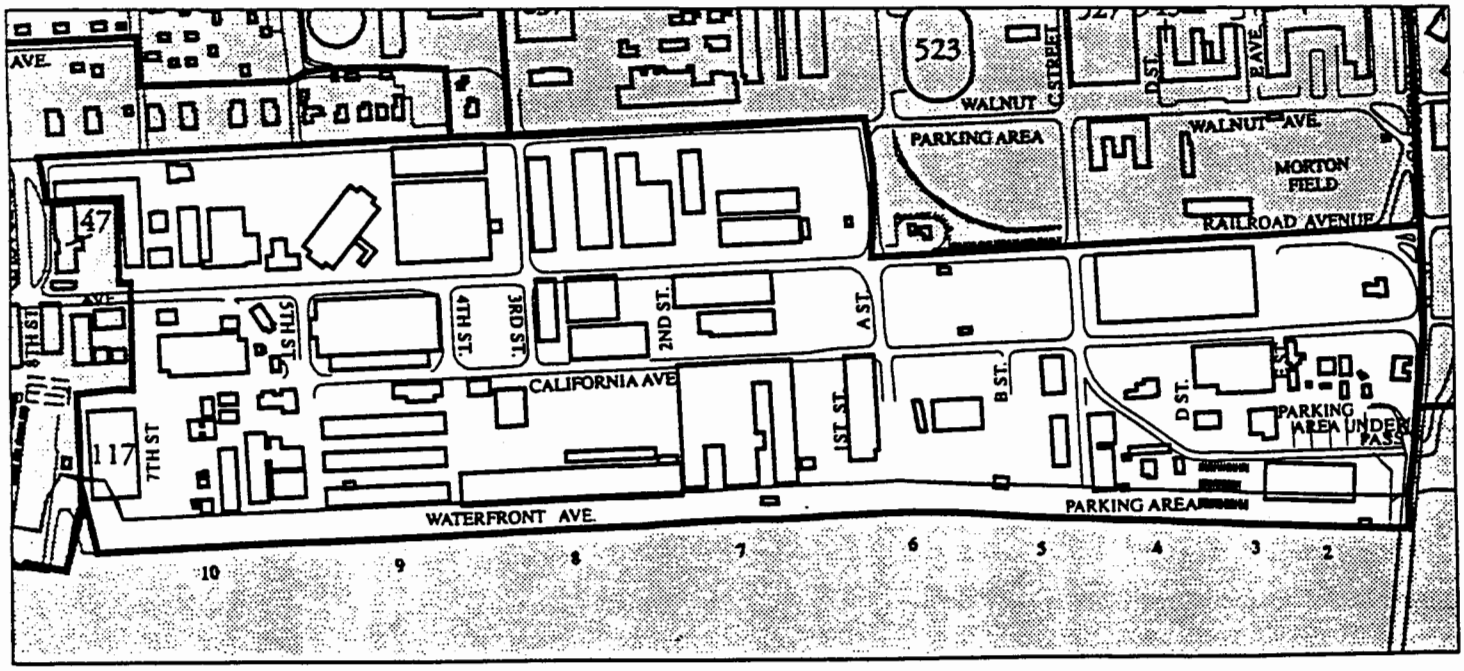
3. *Mixed Use: Office/Light Industry*

Located east of the Neighborhood Center, this zone spans approximately 3900 feet between the Historic District and the Causeway. Bounded by the Causeway to the north, Building 117 to the south, the Mare Island Strait to the east and Railroad and Walnut Avenues to the west, the reuse of this portion of the Island will be the most challenging. Following a detailed structural analysis of the buildings of Mare Island, removal of many sub-standard structures may be necessary.

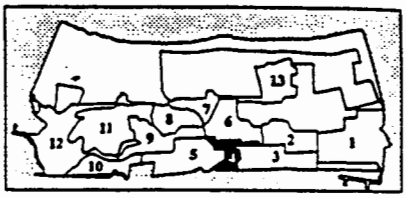
The character of this zone is defined by clusters of industrial and office buildings and large open expanses of paved surfaces used for parking, lay-down storage and miscellaneous uses. Included within the zone are several historic buildings and the medical dispensary.

The opportunity to focus building and site orientation on the waterfront exists in this zone. Through extension of the grid street network to the water edge, parcels can be created that allow for access in the east-west direction, with frontage created along the waterfront. Possible reuse of the existing structures include development of a small business incubation complex, and creation of loft spaces by subdividing both the historic and non-historic structures.

A waterfront promenade is proposed to extend the entire length of Zone 3, and landscape treatments that enhance pedestrian linkages from the promenade to the neighborhood center and historic district would be developed.



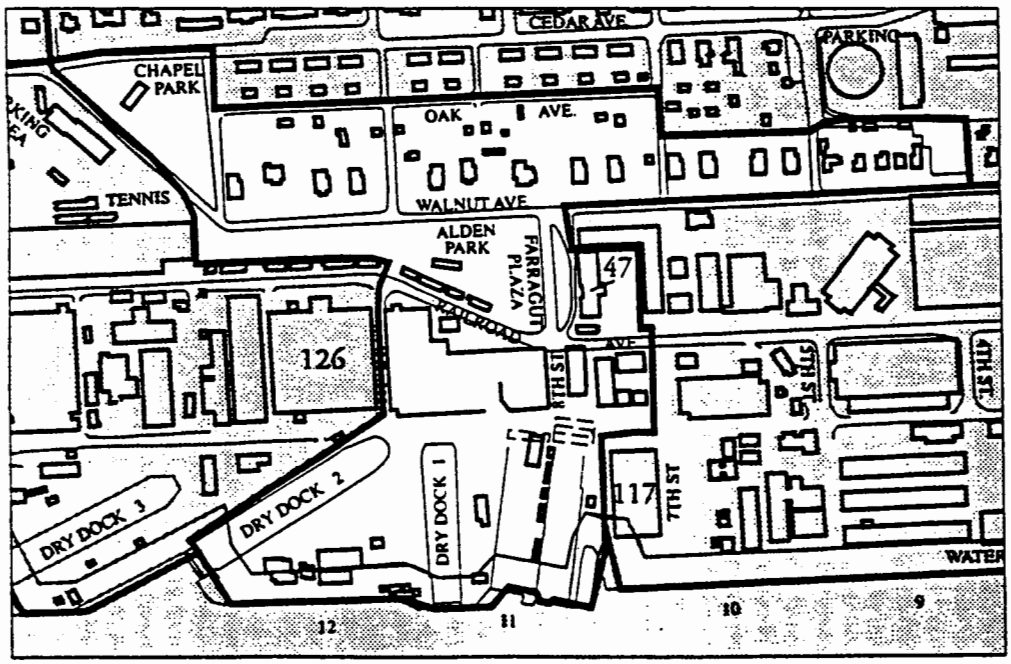
4. *Historic District*



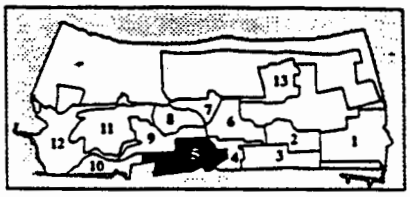
The central core of Mare Island is the Historic District which includes National Historic Landmarks such as Alden Park, St. Peter's Chapel and the Classic Revival houses along Captains Row. Located centrally on the island and fronting the waterfront, the boundaries on the north and south are adjoined by large industrial buildings (#117 and #126 respectively); the western boundary is Oak Avenue.

The Historic District is well defined by virtue of having been the ceremonial heart of Mare Island since the mid 1850's. Building 47 has been the administrative core and headquarters center since the beginning of the Mare Island mission. Development of the historic residences and arboretum within Alden Park have given this area an ambience and character unequaled in many Bay Area neighborhoods. Adding to the historical heritage is dry dock #1, the oldest drydock on the west coast and a significant component of the Mare Island story.

The opportunities for reuse in this area are exciting, both from a working waterfront perspective and as a visitor attraction. An overlay of a historic seaport district allows for maintaining of historic vessels, training in ship restoration, and preserving the history of Naval shipbuilding on the west coast. The Historic District could be either a National or State Park, and allow for private companies to operate in historical buildings subject to preservation regulations. The 21 historic residences could be sold as private residences or offices, operated by small non-profit organizations or used as guest lodging to complement the historic park. Showcasing the arboretum



5. *Heavy Industry*

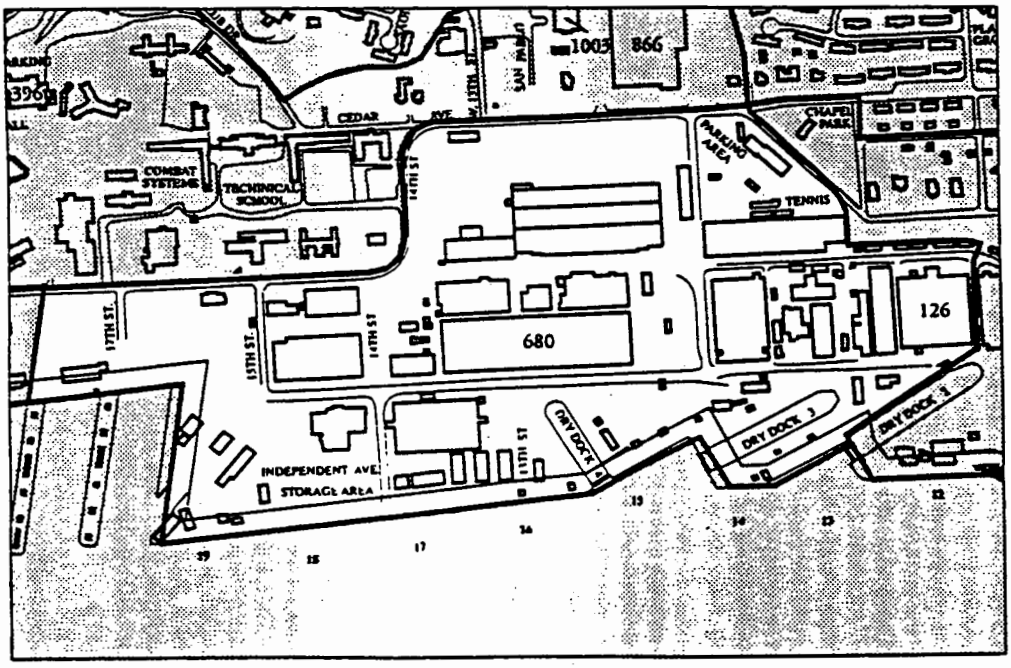


Throughout the last century, Mare Island has developed capabilities in ship building, maintenance, and repair. The industrial infrastructure required to perform those capabilities is immense, as evidenced by the numerous equipment shops, overhead cranes, and industrial machinery found on the site. The zone south of the Historic District from ninth Street south to Fifteenth Street, and from the waterfront west to Cedar Avenue encompasses large machine shops and industrial equipment of all types.

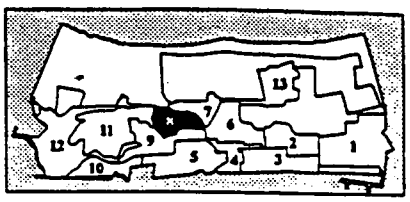
The character of the area is defined by some of the largest buildings on the island, two working dry docks, and several overhead cranes. Rail freight service is available—lines currently traverse both Railroad and California Avenues. Several historic structures are within this zone, including the machine shop (Building 680), a facility of over 250,000 square feet. Most of the historic buildings are large brick facade shops, and resemble the headquarters building (Building 47).

The opportunities to reuse the existing shops, either with their highly specialized equipment or as "shells" is dependent upon the market response and acceptance of Mare Island as a suitable place to do business. The likelihood of using the area for the manufacturing of large goods such as ships or rail cars is not considered strong, however, the manufacturing of smaller items such as scientific instruments, metal processing/fabrication, and chemical/biotechnology testing is possible.

This part of the Island contains an elaborate infrastructure system that was necessary to provide services for shipbuilding. Streets and areas between



8. *Coral Sea Village*



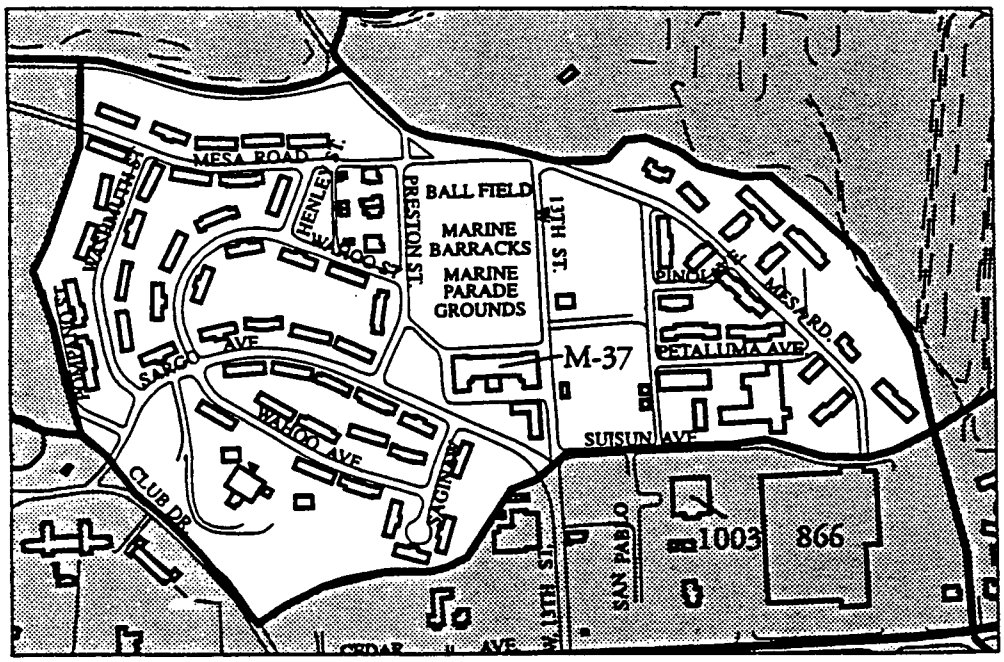
The Coral Sea housing area is located south of the rifle range and is higher in elevation than Farragut Village. The area is bounded by Mesa Drive to the north and west, Club Drive to the south, and Building 866 to the east.

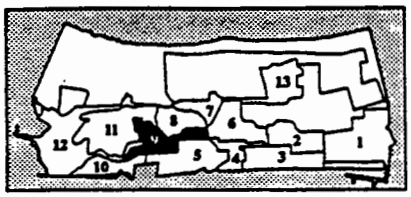
The residential housing type is predominately duplex units similar to those found in Farragut Village. Topographical differences define the character of this zone due to its elevation above the Historic Core, and there are views available to the wetland areas and San Pablo Bay.

The central core of the Village is the Marine Barracks (Building M-37) and parade grounds located between 13th Street and Preston Street. This handsome building and grounds provide a central focus within the housing areas.

Similar to Farragut Village, the Air Force has expressed interest in retaining the single family duplex units. The Marine Barracks and other smaller multi-family housing units could be converted to market rate apartment units or condominiums. The parade ground could be redeveloped for recreation purposes with the possible addition of both active and passive play areas.

Infill of residential uses is possible north of 13th Street between the Marine Barracks and the multi-family housing units. Residential densities should mirror those found in the multi-family units fronting Mesa Drive.





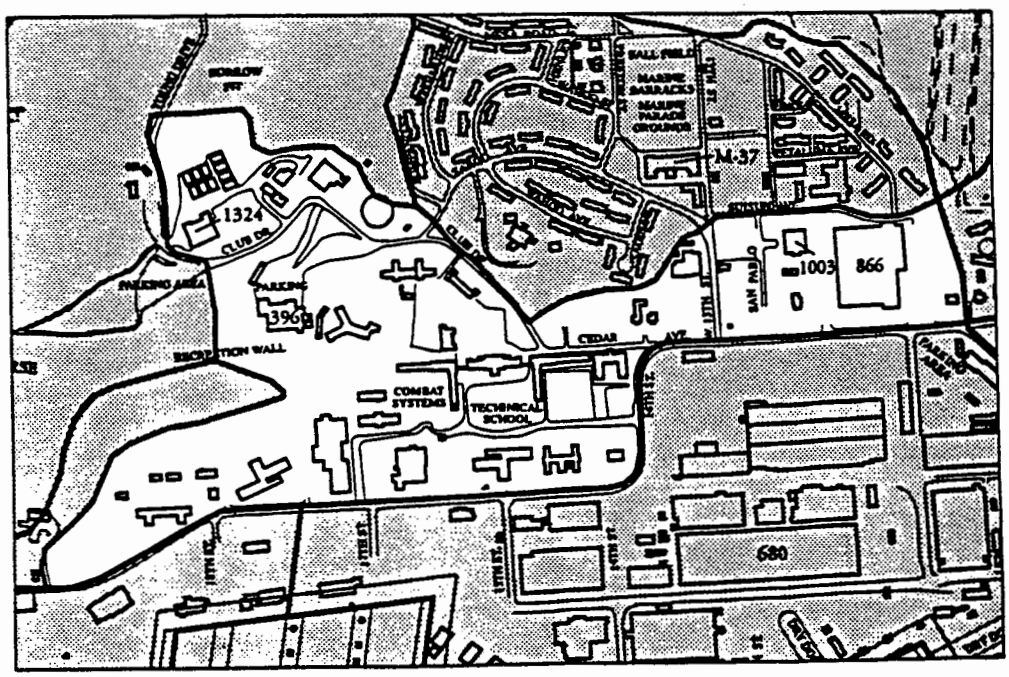
9. *Education/Office*

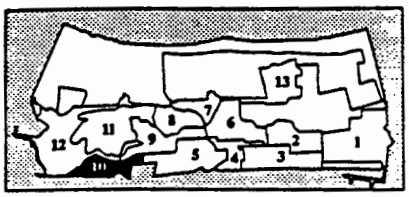
Mare Island has been the home of the Navy's Combat Systems Technical School, a campus of both modern and historic structures located south of the Heavy Industry area. The campus is located south of 14th Street, east of Club Drive and west of Railroad Avenue. Additional lands that provide a similar office/classroom function are located west of Cedar Avenue in the vicinity of 11th Street and west of Club Drive overlooking the Golf Course.

The central core of the campus is defined by the structures that line both sides of the main entry between Railroad Avenue and Cedar Avenue. Landscaped courtyards and formal open spaces provide the character which defines this unique area of Mare Island. Parking for the campus buildings tends to be on the periphery, accessed from Club Drive, further reinforcing a pedestrian orientation. Dormitory buildings for students are located south of the gymnasium (Building H-86).

Located up the slope from the campus is the Officers Club (Building 396) and Building 1324, a modern 113,000 square foot office building. Both of these structures are stand alone facilities with their own parking. They are included within the campus zone because of the special nature of their facilities which would lend themselves well to teaching/training and special event functions.

Additional facilities of significance are the Child Care Development Center (Building 1003), and Electrical Shop (Building 866). Although the functions that currently take place in the Electrical Shop have more in common





10. Marina Residential

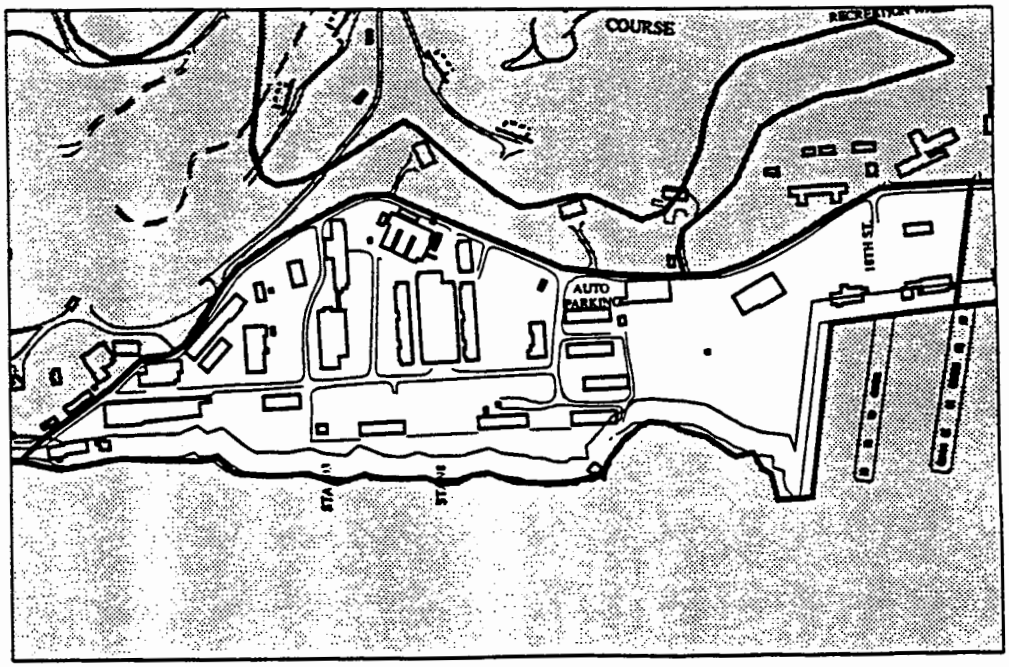
Facing the waterfront south of the Heavy Industry area is a section of Mare Island that is surrounded by hillsides with potential for water orientation and recreation. Views of the Mare Island Strait, downtown Vallejo, and San Pablo Bay are possible in the southern portion of the Island. The zone is bounded by a proposed regional park to the south and golf course to the west.

Three finger piers between 17th and 18th Streets are potentially viable as a new small marina of up to 80 berths. Pending clean-up operations of the area and development of the housing market, this part of the Island could be ideal for new residential construction, particularly multi-family housing at a slightly higher density than typical suburban subdivisions. Housing densities of 8-15 dwelling units to the acre should be marketable. The opportunity exists to "step" the housing into the hillside offering view possibilities for some units.

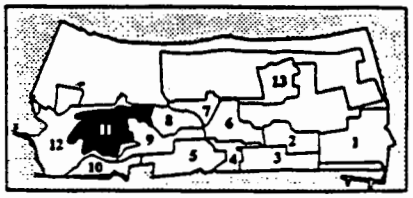
The character of this zone may be impacted by the potential future southern bridge crossing. Land will be reserved for this crossing pending further studies; however, the exact location would be determined at a future date. Should the crossing occur, access to the units and marina would be excellent; however, trade-offs in terms of visual quality and noise must be addressed as planning proceeds.

The waterfront promenade could be less formal and natural in this zone or more highly developed similar to the Marina Green in San Francisco.

Due to the extent of building demolition and environmental clean-up required in this area, the new housing and marina are considered long-term developments.



11. Golf Course

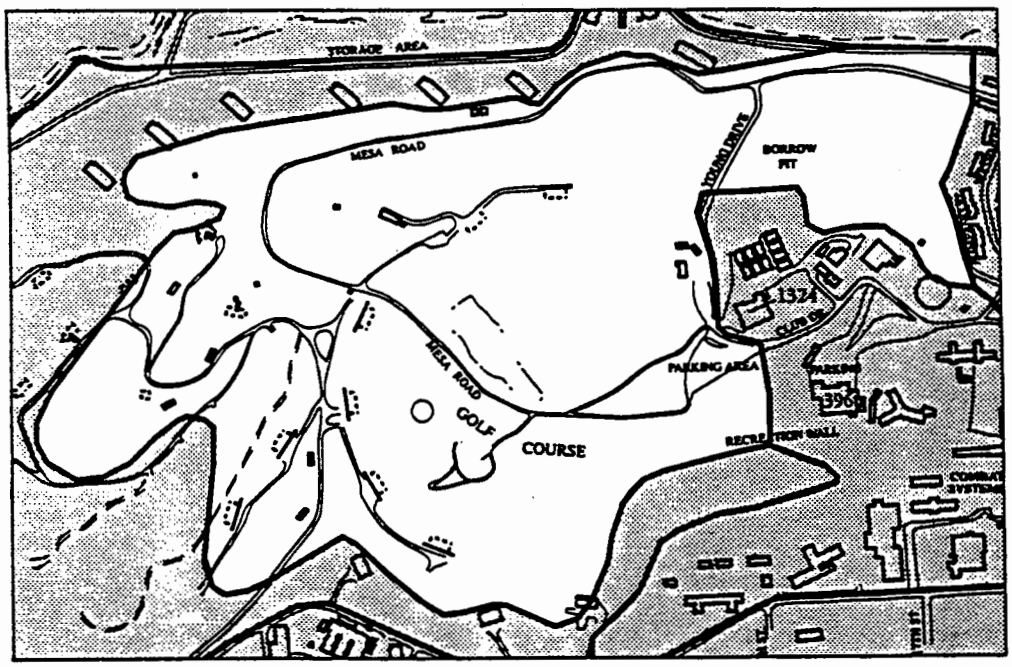


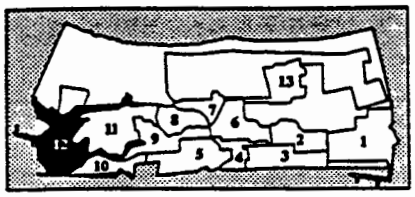
Mare Island has an existing nine-hole golf course and small clubhouse facility accessed from Club Drive, south of the Education/Office area. The course is very popular and levels of use exceed 40,000 rounds per year. Included in the clubhouse is a small kitchen food service and retail sales of clothing and equipment. Expansion of the course to 18 holes would necessitate an enlargement of the clubhouse and parking areas.

The addition of nine holes has been tested and proven feasible. There are only two directions for the expansion, northward from Young Drive to the edge of the Coral Sea Village and possibly into the existing rifle range area, and south into the sloped region that has been historically used for ammunition bunkers. The benefit of providing golf to the range site is the increased value that would be placed on the housing sites of both residential villages.

Parking for the course is now limited to a small lot in front of the clubhouse and up-slope in the lot adjacent to Building 1324. The addition of nine holes and increased access to the course will necessitate evaluating alternative parking solutions.

The market demand for a public golf course on Mare Island is strong, and expansion could occur in an early phase of the Reuse Plan.



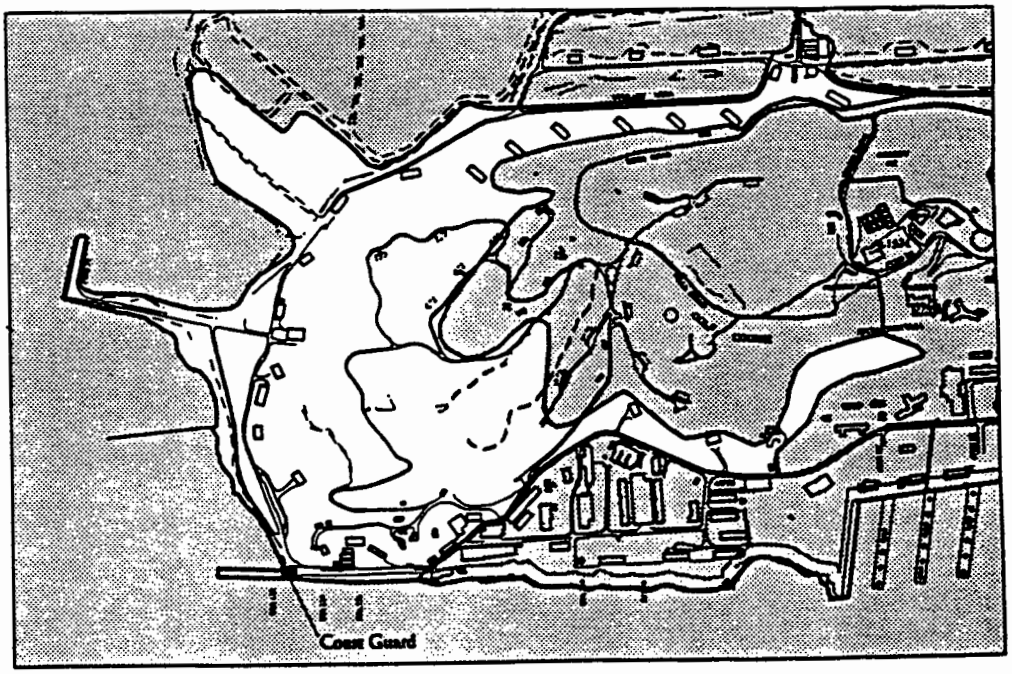


12. Regional Park

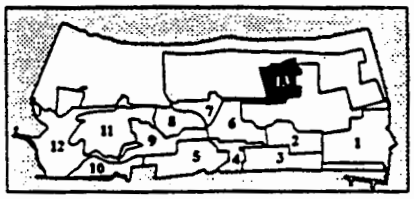
The southernmost portion of the Island is proposed to be a regional park. The highest point on the site and surrounding hillside areas would be reserved for open space assuring views of the City and San Pablo Bay for generations to come. Access to the shoreline for hiking and cycling and piers for fishing would be reserved. The Coast Guard will maintain its current station at the southeastern corner of the area (i.e., at Pier 34).

The character of this part of the Island is markedly different from the lands adjacent to Highway 37. The open, grassland zone is defined by the original hill that extends several hundred feet above sea level. Slope areas exceed 25% in some locations precluding traditional development. A large portion of the regional park and golf course would occur on lands between 8 and 15%. Exposed to the winds from the Bay, the forces of nature are more present on the southern tip of Mare Island.

Opportunities for public recreation that is more passive in nature makes this part of the Island unique. Walking, cycling, and equestrian trails would be linked to other areas as appropriate, particularly the wetland/dredge pond system and waterfront promenade. The equestrian facility that is existing in the wetland/dredge pond area could be relocated to the Regional Park. The character of the promenade should be natural looking on this end of the Island, and the surface of the trail should be different from sections in the more heavily used portions of the Island.



13. Recreation/Open Space



Located on a landfill site between active dredge ponds and non-tidal wetlands, this area is west of the Neighborhood Center accessed via a dirt road extension of A Street. Due to its distance from the other more developed portions of the Island, this land is proposed for recreation and/or open space purposes.

Pursuant to environmental clean-up operations, the area would have potential for both passive and active recreation purposes. The final determination of its long-term intended use should be based on an Island-wide Specific Plan study of all recreation resources.