

FORA FEE REALLOCATION STUDY

April 15, 2005

**Prepared for
Fort Ord Reuse Authority**

Adopted by FORA Board of Directors April 8, 2005

Adopted by TAMC Board of Directors March 23, 2005

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EXECUTIVE SUMMARY

PURPOSE OF THE STUDY

The 2003 FORA Capital Improvement Program (CIP) acknowledges the need to revisit the 1997 TAMC Fort Ord Transportation Study to assess the validity of FORA-listed transportation obligations required by the Fort Ord Base Reuse Plan (BRP). The reasons for the review and reassessment of FORA's obligations as determined in the 1997 TAMC study are as follows:

- The previously defined FORA transportation obligations may no longer be consistent with the projects included in the Regional Transportation Plan (RTP).
- Current City and County plans may no longer include certain projects that were part of the 1997 FORA obligations.
- Current specific plans for development at former Fort Ord may not include the same land use patterns or local road networks assumed in the prior study.

The present study addresses these concerns by running a new traffic analysis with current land use and road network data and projections. The study results in a proposed reallocation of projected FORA fee revenue for use in implementing transportation improvement projects that are better able to mitigate future traffic conditions at former Fort Ord and in the surrounding region.

STUDY METHODOLOGY

The study uses the recently updated AMBAG Travel Demand Model and reflects current land use planning efforts by the jurisdictions at former Fort Ord. The Travel Demand Model, which was updated in 2004, includes more recent travel survey data to document travel demand and existing traffic conditions throughout the region, including not only the three

AMBAG counties, but Santa Clara County as well. The model also incorporates an updated economic forecast for the region.

Specific to former Fort Ord, the study includes the most current Master Plan for CSUMB as well as the specific plans for Marina Heights, Cypress Knolls, Seaside Highlands and East Garrison. Overall, the growth projections are consistent with AMBAG's current land use forecast, and are also consistent with the Fort Ord Base Reuse Plan for the former Fort Ord area. However, within the total development envelope under the Base Reuse Plan, the study reflects the current pattern of development and the actual road networks included in the specific plans and other City and County plans.

The study uses 2000 as the base years and then constructs a future No-Build scenario for the year 2030¹. This scenario includes all projects that are currently built or fully funded and in the EIR stage. Against this future backdrop, using a consistent land use projection, four other road network scenarios were tested to determine the best combination of road improvements to mitigate future traffic conditions. The following list of projects represent this best-case scenario. The first two sets of projects, inside and outside of former Fort Ord, represent the No-Build Scenario. The third set represents the additional projects, most of which are included in the FORA fee reallocation.

The No-Build Scenario includes the following changes from the Year 2000 Network:

Inside Fort Ord

- 12th Street Realignment (Imjin Pkwy)
- 2nd Ave, from Lightfighter to Crescent Ct-Abrams Rd

¹ About 1,350 dwelling units, or 20 percent of the remaining development at Former Fort Ord, are projected to occur after 2030. This development is also included in the analysis as a Buildout scenario.

- Abrams Rd, from Crescent Ct to 2nd Ave
- Crescent Ct. extension to Abrams Rd
- California Ave, from Tamara Ct to Imjin Pkwy
- Eucalyptus Rd
- General Jim Moore Blvd, from Normandy to Coe
- Imjin Rd, from Reservation to Neeson
- Blanco Rd, from Reservation to Salinas River Bridge
- 8th Street, from SR 1 overpass to Inter-Garrison

Outside Fort Ord

- Climbing lane SR 1 Carmel
- SR 68 added lanes at Ragsdale
- Del Monte added lanes in Monterey
- River Rd added lanes
- Elvee Dr in Salinas, new road
- Natividad Rd added lanes
- Sanborn Rd added lanes
- Presidio of Monterey related network changes
- Several projects in Santa Cruz and San Benito Counties

Additional Program Elements

- Drop Reservation and Del Monte Widening projects in Seaside and Marina
- Drop Imjin Connector
- Drop new alignment of Reservation @ East Garrison
- Hwy 1 Sand City widening
- Drop Blanco Rd. widening from Marina to Salinas
- Reservation/Davis Widening from Marina to Salinas
- Intergarrison upgrade
- Gigling upgrade
- Add SR 1 Interchange at Monterey Rd
- Reroute Eastside Road

PROPOSED FORA FEE REALLOCATION

With the completion of the deficiency analysis, the study team conducted a select link analysis to identify the origins and destinations of traffic on the above road network. This provided a basis for understanding the impact of development at former Fort Ord on the projects to be funded. The study team conducted a nexus analysis similar to that completed for the 1997 FORA traffic mitigation program and also considered other funding scenarios that prioritized projects that could be fully funded through the FORA fee program vs those that require additional funding from other sources. The table below (Exhibit A) summarizes the proposed funding allocations and compares it to the existing FORA CIP funding program. When adopted, the fee reallocation figures in the right-hand column would replace the CIP figures in the middle column.

In this allocation scenario, ten of the eighteen projects in the program receive full funding from the FORA fees. Overall, local projects receive \$63.0 million while offsite and regional projects receive \$41.2 million.

In several cases, the projects now included in the analysis are different than the projects included in the CIP; however, the new projects better mitigate the projected impacts based on current land use and circulation plans. For example, the FORA CIP includes the Highway 68 Bypass project, which is no longer included in TAMC's Regional Transportation Plan. However, the proposed improvements to General Jim Moore Blvd as well as the new Eastside Road will carry the traffic instead.

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EXHIBIT A
Existing and Proposed FORA Fee Allocation

Project ID	Project Description	2003 Adopted FORA CIP	2005 Proposed Fee Reallocation
Regional Improvements			
R3	Hwy 1-Seaside Sand City	\$8,061,764	\$15,282,247
New	Hwy 1- Monterey Road Interchange		\$2,496,648
R6	Hwy 68 Bypass Fwy	\$22,741,732	
New	Hwy 156 - Freeway upgrade		\$7,092,169
New	Hwy 68 Operational Improvements		\$223,660
R9	Hwy 218 Widening	\$2,053,054	
Subtotal Regional		\$32,856,550	\$25,094,724
Off-Site Improvements			
1	Davis Rd n/o Blanco	\$7,016,254	\$506,958 [a]
2	Davis Rd New Bridge	\$2,557,091	
New	Davis Rd, s/o Blanco		\$8,654,502
3b	Widen Bridge, Blanco to Alisal	\$5,706,893	
4c	New 4 lane from Res to Watkins Gt	\$6,397,294	\$3,813,916 [b]
New	Widen Reservation, Watkins Gt to Davis		\$2,216,321
5	Del Monte-Seaside & Monterey	\$4,308,005	
6	Del Monte-Marina	\$5,102,561	
8	Crescent Ave	\$906,948	\$906,948
Subtotal Off-Site		\$31,995,046	\$16,098,644
On-Site Improvements			
FO1 [b]	Gateway & Misc Safety Improvements	\$5,330,485	
FO2	Abrams	\$759,570	\$759,570
FO4	Blanco/Imjin Connector	\$5,139,375	
FO5	8th Street	\$4,092,120	\$4,340,000 [c]
FO6	Intergarrison	\$4,796,750	\$4,260,000 [d]
FO7	Gigling	\$4,058,395	\$5,722,640 [d]
FO8 [e]	2nd Ave	\$0	
FO9	General Jim Moore Blvd	\$3,480,995	\$24,065,000 [f]
FO11	Salinas Ave	\$3,038,277	\$3,038,277
FO12	Eucalyptus Rd	\$3,192,565	\$5,800,000 [d]
FO13	Eastside Rd	\$5,490,162	\$12,536,370
New	South Boundary Road upgrade (remains 2 lanes)		\$2,515,064
Subtotal On-Site		\$39,378,694	\$63,036,921
Grand Total		\$104,230,290	\$104,230,290

Footnotes

[a] New project includes widening only south of Hwy 183 bridge to Blanco.

[b] Project # FO1: \$1,102,139 in 2006/07 is to be applied to the East Garrison Gateway Improvement Project. The \$469,816 per year nine-year distribution (2007/08-2015/16) is to be applied to continue any necessary safety and rehabilitation improvements.

[c] New project extends from 2nd Ave. to Intergarrison rather than from US101.

[d] New cost estimate.

[e] Project # FO8: FORA's obligation on this project (\$6.6 mil.) is already met and the project has been constructed.

[f] New project includes 4-lane widening from Normandy to McClure.

The current FORA CIP has more funds allocated to regional projects than does the recommended reallocation. Currently, FORA has programmed \$32.8 million for regional facilities and \$71.4 million for local/offsite projects (not including 2nd Avenue). The proposed reallocation would shift about \$7.5 million from regional to local/offsite projects. TAMC's planned ½ cent countywide transportation sales tax and its proposed regional development impact fee, as well as anticipated state and federal revenues, are required to fill this gap in funding in order to raise enough funding to construct the regional projects.

RELATIONSHIP TO TAMC 14-YEAR PLAN AND LOCAL IMPROVEMENT PLANS

TAMC has adopted a \$1 billion 14-year investment plan, which is a subset of the 25-year Regional Transportation Plan (RTP). The 14-year plan anticipates a certain level of FORA fees, as well as state, federal and other local funds. TAMC's analysis concluded that the proposed reallocation of FORA fees would provide sufficient funding for construction of the regional projects when combined with the other anticipated revenue sources.

However, the timing of the FORA fees will be a critical factor. For some of the regional projects, FORA fees will be needed to pay for the initial stages of project design and planning. TAMC and FORA staff will need to coordinate their planning to assure that FORA fee revenues can be provided when needed for the regional projects.

This kind of coordination needs to extend as well to the other jurisdictions involved at former Fort Ord. In some cases, such as the Highway 1/Seaside interchange, additional funding will be required from non-FORA, non-regional sources. It must also be presumed that projects built with the FORA fees will be suitably coordinated with other local improvements by the cities and the county and that all roads funded under the program will be open and available to receive their projected share of traffic. The FORA fee

program and the RTP cannot mitigate the traffic impact of development at former Fort Ord unless the new facilities are functioning and open to the public as intended.

CONCLUSION

While the magnitude of projected future development at the former Fort Ord has not changed since the Base Reuse Plan was adopted in 1997, the pattern of development and the related circulation system has been refined from previous plans. The traffic modeling conducted for this study demonstrates that future traffic conditions can be more effectively mitigated by changing certain traffic improvement projects included in the plan, and by shifting funding priorities within the plan.

With updated cost estimates for these projects and others included in the FORA CIP, there is an opportunity to focus more squarely on fully funding the local projects that would service the development paying the FORA fees. The fee revenue is dependent upon development and the local road network must be in place to support that development. The proposed FORA Fee reallocation would fully fund all ten of the local onsite transportation projects on the former Fort Ord.

The proposed fee reallocation would shift about \$7.5 million from regional projects to local/offsite projects. However, with proper coordination between TAMC and FORA, the FORA fee revenues available for the regional projects identified in this study can be applied as needed to facilitate upfront planning and engineering costs and, thus, contribute sufficiently to the completion of the regional projects.

INTRODUCTION

PURPOSE OF THE REPORT

The 2003 FORA Capital Improvement Program (CIP) acknowledges the need to revisit the 1997 TAMC Fort Ord Transportation Study to assess the validity of FORA-listed transportation obligations required by the Fort Ord Base Reuse Plan (BRP). The reasons for the review and reassessment of FORA's obligations as determined in the 1997 TAMC study are as follows:

- FORA transportation obligations as defined under the previous 1997 TAMC study may no longer be consistent with priority transportation projects as defined within TAMC's current (and to be updated) Regional Transportation Plan (RTP). Examples include widening of State Route 218 between General Jim Moore Boulevard and State Route 68, and the construction of a bypass freeway through the former Fort Ord paralleling the existing State Route 68 facility.
- Current City and County plans may not acknowledge particular obligatory improvements defined in the 1997 TAMC study. Examples include widening of Del Monte Boulevard in the Cities of Marina and Seaside, and linking Reservation Road and Imjin Parkway via Salinas Street in Marina.
- Current specific planning by the land use jurisdictions making up the former Fort Ord property may be prompting modifications to the "on-site" transportation network, including shifted roadway locations and geometric alignment shifts. These modifications have the potential to affect the capacity of the "on-site" roadway network as proposed in the BRP. The cumulative impact of these modifications needs to be analyzed to assure that the required capacity of the "on-site" network can support development proposed in the BRP. Examples include inconsistencies between CSUMB's master planning efforts and the location

of the "Eastside Road" proposed in the BRP, as well as modifications to the proposed BRP "on-site" network in development concepts being proposed for the County's East Garrison redevelopment project.

These issues prompted FORA to request a coordinated work effort with TAMC and AMBAG for the purposes of reviewing, analyzing, and adjusting the fiscal and physical transportation network obligations defined in the BRP as appropriate.

STUDY PROCESS

In addition to staff and consultants for the three agencies, the agencies invited other entities with jurisdiction or vested interests in Former Fort Ord lands to participate in a Transportation Network Team (TNT) Stakeholders group to provide input and guidance for the work (please see Appendix A for a list of TNT members). The TNT began meeting in September 2003 and to date have held eight meetings through February 1, 2005.

AMBAG prepared the land use forecasting and traffic modeling and the consulting firm of Applied Development Economics prepared the fee reallocation analysis.

TRAFFIC ANALYSIS

STUDY METHODOLOGY

The study utilizes the newly updated AMBAG Travel Demand Model to forecast traffic conditions at former Fort Ord and the surrounding regional network in 2030, and at full buildout of the Base Reuse Plan. The forecasts include five separate alternative road networks, which are compared to the year 2000 Base Case to identify the net effect of various road improvement projects. This chapter of the report describes the Travel Demand Model and the deficiency analysis for the alternate future road networks. The next section outlines the land use assumptions used for the future growth projections, and the methodology for developing the traffic analysis zones.

AMBAG REGIONAL TRAVEL DEMAND MODEL

The AMBAG Travel Demand Model is intended to be a comprehensive traffic forecasting tool useful for a wide range of applications including major transportation planning studies, Project Study Reports, Regional Transportation Plans, County General Plans, regional air quality conformity analysis, development of emission budgets for air, and other planning studies. In 2004, AMDAG undertook a major update of the model, adding a number of new features as well as more current land use and travel demand data (See Appendix B). Prior to the update, the model had the following features:

- Calibrated to a 1990 base year
- Had one hour AM and PM peak, remainder off-peak
- Covered three AMBAG counties
- Used MINUTP software
- Utilized a feedback loop in job stream to show congested speeds
- Fortran mode choice model was added in 1997 by Parsons Brinckerhoff

- Visitor trip model was added in 1997 by Parsons Brinckerhoff
- Further refinements to improve model in 1998

The 2004 updated model offers the following improvements:

- Latest data
- Better land use allocation
- Flexibility in mode choice (ability to add modes e.g. rail)
- Evaluation of ITS strategies
- Evaluation of HOV and pricing strategies
- True sensitivity to alternative mixed land use/transit-oriented development scenarios
- Ability to analyze freight movement
- Peak spreading
- GIS for model building and display of output
- Coverage expanded to include Santa Clara County
- Fresh data (traffic counts, Census 2000, HH survey, etc)
- Parcel-based land use allocation methodology
- HCM capacity methodology
- Refined link speeds
- Improved handling of signalized arterials
- Ability to plug-in IDAS system for ITS
- Addition of truck model
- Auto ownership model
- Will use 24 one-hour time periods
- TransCAD software

The TransCad software in particular permits the combination of GIS and travel modeling, which improves network accuracy as well as efficiency in model building and effective display of model output (Figure 1). The system is compatible with the existing AMBAG GIS and also provides the ability to work with Excel, Access, and similar software.

FIGURE 1
Travel Forecasting in a GIS Environment

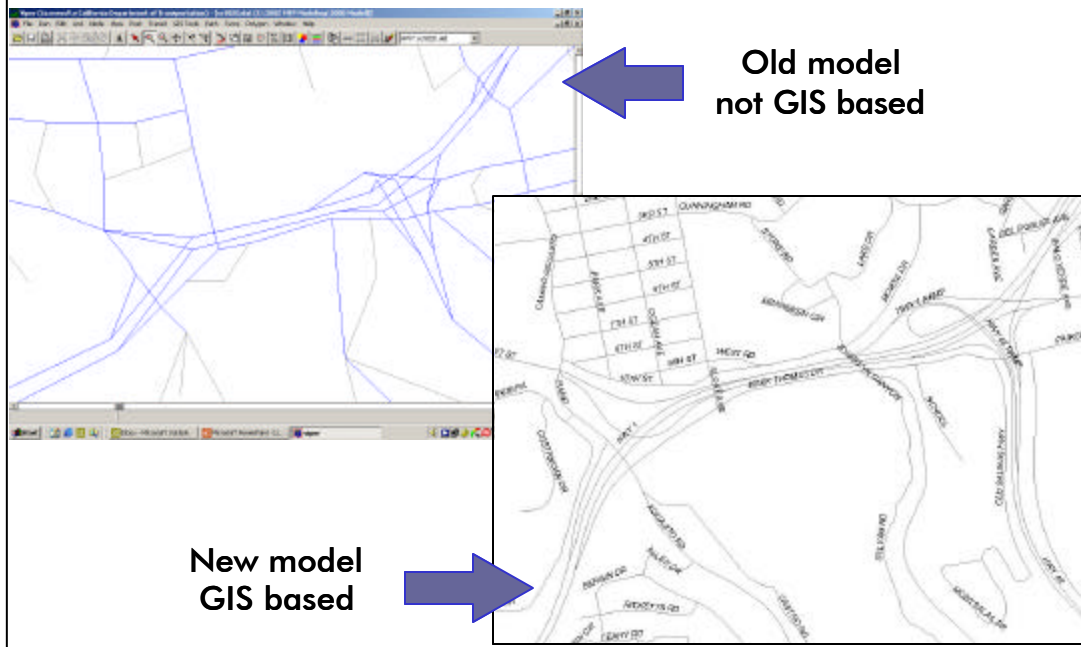


FIGURE 2
Network Development: Attributes

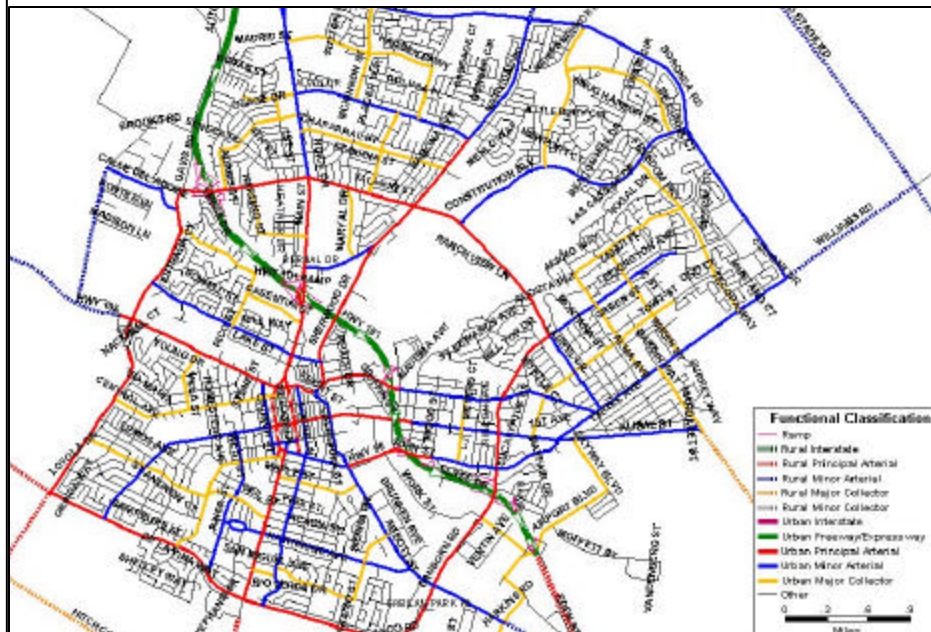


FIGURE 3 Network Development: Future Year Networks

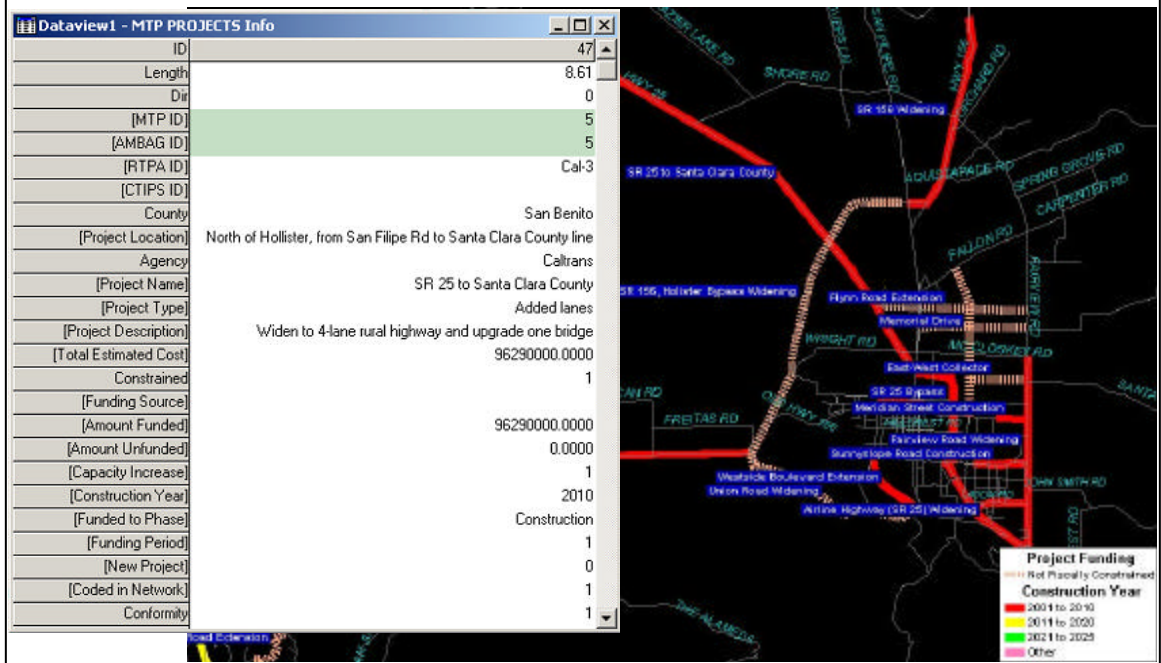
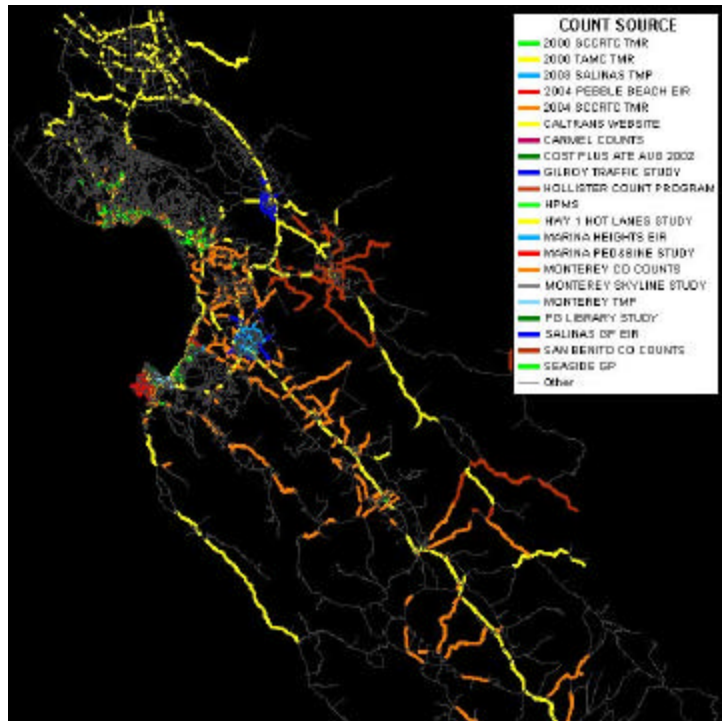


FIGURE 4 Model Validation

Monterey County Average Error

- Freeway – 2.43%
- Multilane – 3.72%
- Two Lane – 3.41%



The model includes detail functional classifications for all existing roads (Figure 2), as well as future road improvement projects (Figure 3).

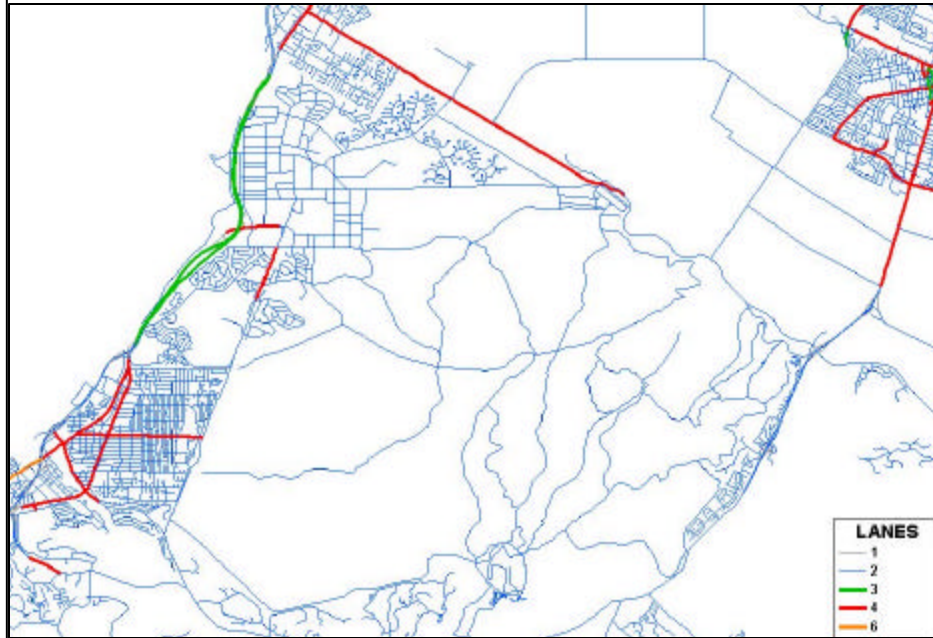
Upon completion of the model update, validation runs were conducted to test the how well the model matched known conditions for the Year 2000. The average error rate for the model in Monterey County was less than three percent on the freeways and less than four percent on the local roads (Figure 4).

EXISTING AND FUTURE ROAD NETWORKS FOR FORMER FORT ORD

The consultant team completed network deficiency studies for five alternate network scenarios (A-D plus a No-Build alternative) at the direction of the Transportation Network Team (TNT) Stakeholders Group. The network scenarios were developed iteratively to test the benefits of various transportation projects, reflecting the current land use plans and projections in the affected jurisdictions and recent changes in circulation planning in the area. The deficiency analysis began with Base Year 2000 conditions, recreating the exact road network and developed land use inventory that was in place in 2000 (see Figure 5). This was done to match the updated AMBAG land use projections, which use the Year 2000 land use inventory as a starting point.

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FIGURE 5
Base Year Network



Next, the team constructed a Future (Year 2030) No-Build Network to provide a context for evaluating the alternative future road improvement projects. The No-Build scenario forecasts traffic condition based only on “committed” road improvement projects. This is defined as follows:

- Projects that are under construction or already completed
- FORA projects that are anticipated to be open to traffic by 2010, **and**
 - Project is fully funded
 - Project has proceeded beyond the environmental phase
 - Road alignment is certain
- Other regional projects that meet the same criteria
- Road network changes included as part of land use development
 - Must have started EIR on specific plan

The No-Build Scenario includes the following changes from the Year 2000 Network (see Figures 6 and 7):

FIGURE 6
Future No-Build Network
Projects Used

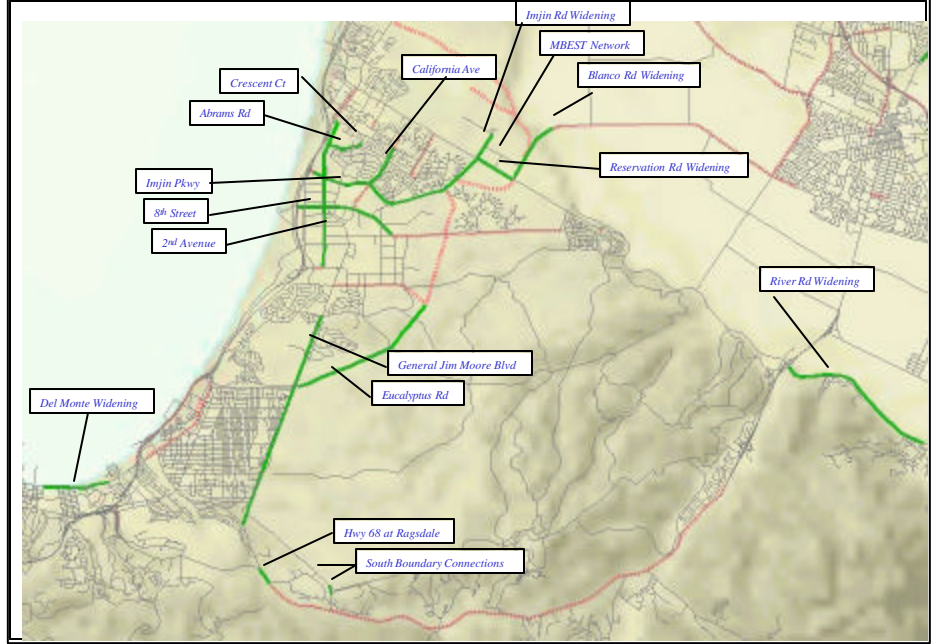
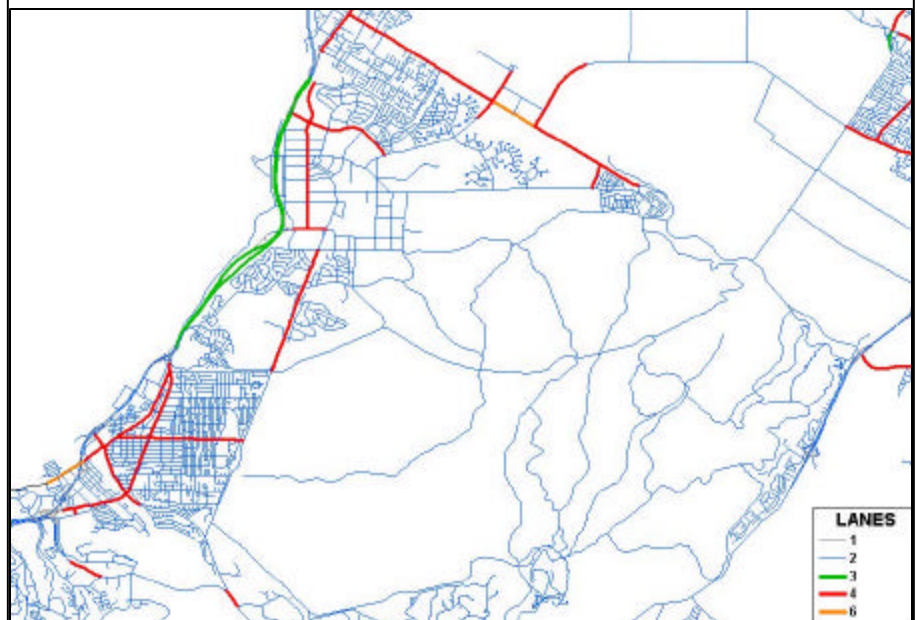


FIGURE 7
Future No-Build Network
Lane Widths



Inside Fort Ord

- 12th Street Realignment (Imjin Pkwy)
- 2nd Ave, from Lightfighter to Crescent Ct-Abrams Rd
- Abrams Rd, from Crescent Ct to 2nd Ave
- Crescent Ct. extension to Abrams Rd
- California Ave, from Tamara Ct to Imjin Pkwy
- Eucalyptus Rd
- General Jim Moore Blvd, from Normandy to Coe
- Imjin Rd, from Reservation to Neeson
- Blanco Rd, from Reservation to Salinas River Bridge
- 8th Street, from SR 1 overpass to Inter-Garrison

Outside Fort Ord

- Climbing lane SR 1 Carmel
- SR 68 added lanes at Ragsdale
- Del Monte added lanes in Monterey
- River Rd added lanes
- Elvee Dr in Salinas, new road
- Natividad Rd added lanes
- Sanborn Rd added lanes
- Presidio of Monterey related network changes
- Several projects in Santa Cruz and San Benito Counties

This No-Build Scenario provides an opportunity to evaluate all the future alternative road networks against the same land use assumptions.

Through the process of the traffic deficiency analysis, four alternative future network scenarios were tested against this No-Build Network. The specific network assumptions for each scenario are outlined below.

Scenario A – Base Reuse Plan/TAMC RTP (Figure 8)

Includes projects from No-Build Network, plus:

- Drop Reservation and Del Monte Widening projects in Seaside and Marina
- Drop Imjin Connector
- Drop new alignment of Reservation @ East Garrison
- Hwy 1 Sand City widening
- Davis Rd widening
- Blanco Rd widening
- Intergarrison upgrade
- Gigling upgrade
- Eastside Rd

FIGURE 8
Future Build Network A

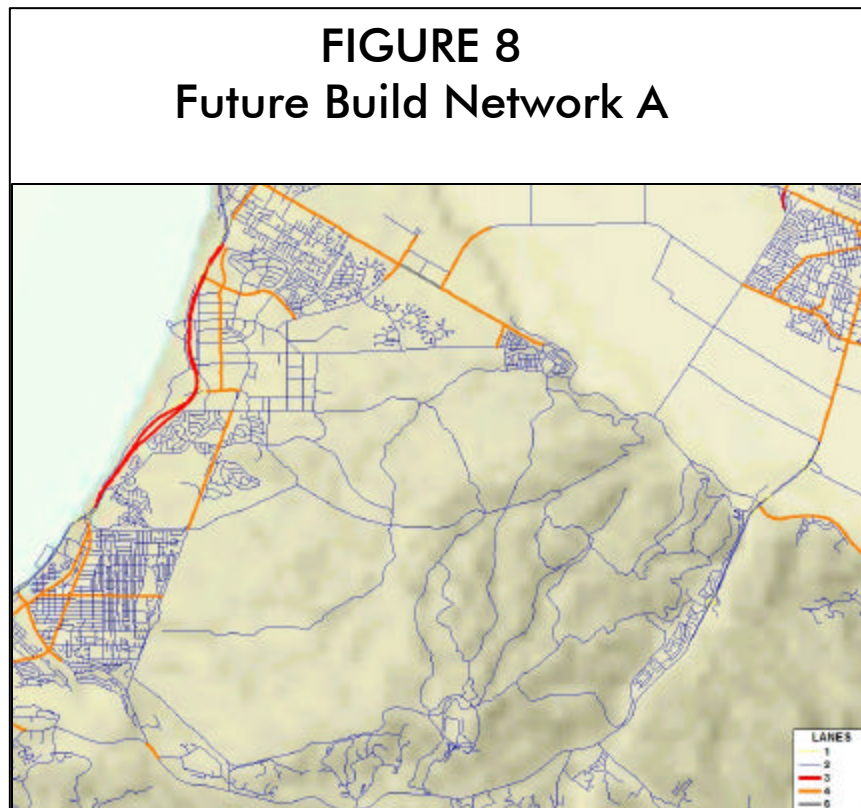
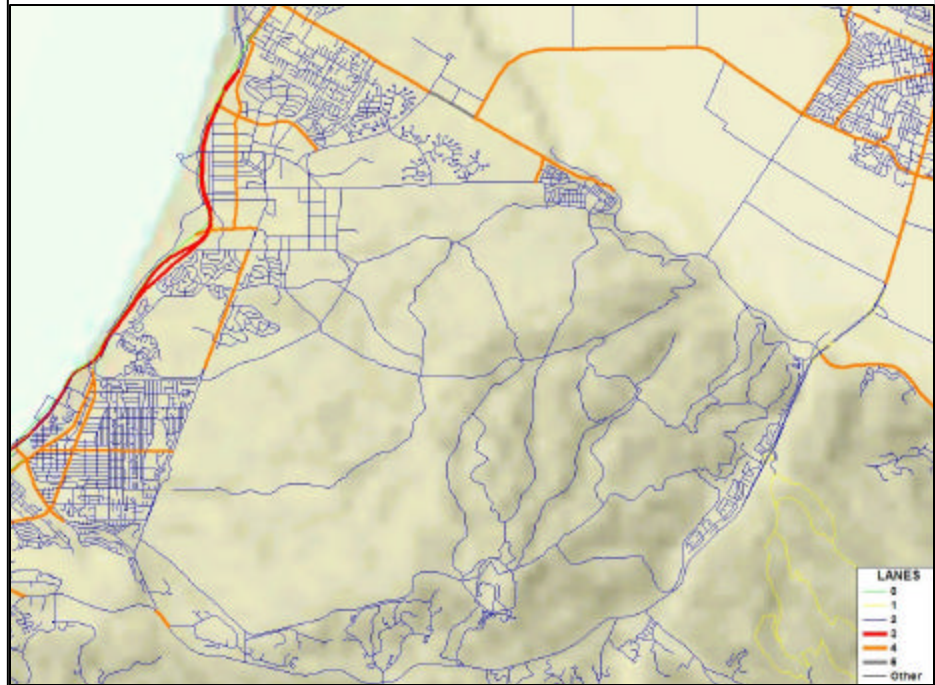


FIGURE 9
Future Build Network B



Scenario B – CSUMB Proposal (Figure 9)

Identical to A, except for elimination of Eastside Rd

CSUMB was concerned that the original alignment of Eastside Road was inconsistent with the CSUMB Master Plan circulation element and would impinge on the desired traffic flow through the campus. Scenario B eliminated Eastside Road but, as discussed later, the deficiency analysis showed a number of problems with this approach. Therefore, a significant effort was undertaken by members of the TNT Committee to devise an alternate route for Eastside Road that would address the CSUMB concerns but also accommodate development proposals in the County jurisdiction on the eastern portion of former Fort Ord. This resulted in the Eastside Rd. configuration modeled Scenario C.

Scenario C – Alternative Network (Figure 10)

Includes projects from Network A

Drop Blanco Rd. widening from Marina to Salinas

Reservation/Davis Widening from Marina to Salinas

Add SR 1 Interchange at Monterey Rd

Reroute Eastside Road

Scenario D – Alternative Network (Figure 11)

Identical to C, except has original alignment of Eastside Road

**FIGURE 10
Future Build Network C**



FIGURE 11
Future Build Network D



RESULTS OF THE DEFICIENCY ANALYSIS

The deficiency analysis identified road segments where Levels of Service would reach LOS E and F. The Base Year 2000 already has a number of such deficiencies, as shown in Figure 12. These deficiencies increase substantially with the No Build 2030 Scenario (Figure 13). Scenarios A and B show improvement on Blanco and Reservation as well as at other locations at former Fort Ord (Figures 14 and 15). Scenarios C and D improve conditions on Reservation and Davis, but slightly worsen conditions on Blanco in comparison to Scenarios A and B (Figures 16 and 17). The Eastside Rd project in Scenario C causes the future impact on Intergarrison to be confined to one road segment rather than two as in Scenario D.

The additional development associated with the BRP Buildout does not change the number of road segments experiencing deficiencies; however, Intergarrison between Eastside Road and the East Garrison project requires additional widening to accommodate traffic from Phase 2 of the East Garrison project, which is part of the Buildout

Scenario for the study. Due to the configuration of the Intergarrison/Eastside intersection, which discourages through traffic westerly on Intergarrison, a similar widening is not necessary west of Eastside Road (See figure in Appendix C). The Intergarrison widening was incorporated in the project definition included in the FORA fee reallocation discussed in the last section of the report.

FIGURE 12
Base Year Network Deficiencies



YEAR 2000 LOS E or F

FIGURE 13
Future No-Build Network Deficiencies
2030 Land Use

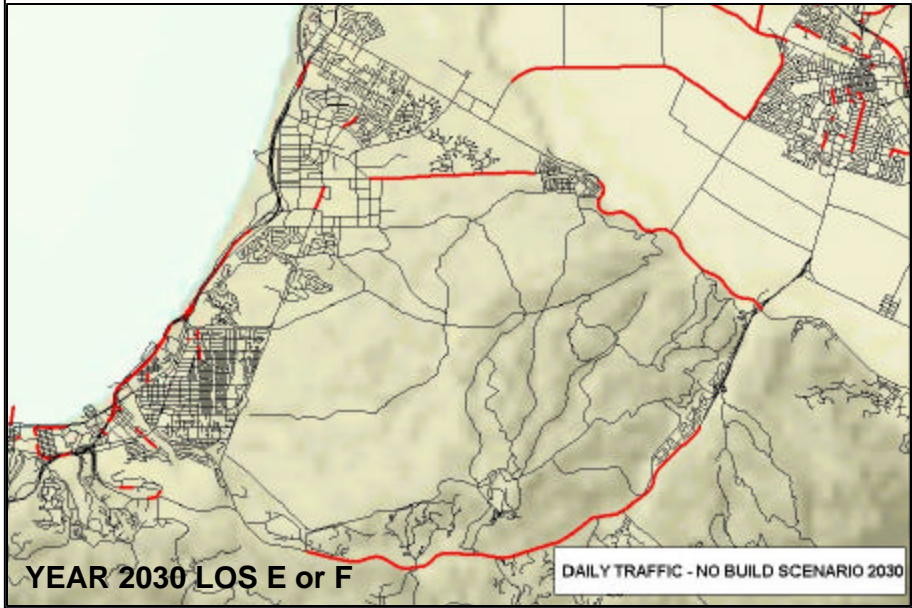


FIGURE 14
Future Build Network A Deficiencies
2030 Land Use

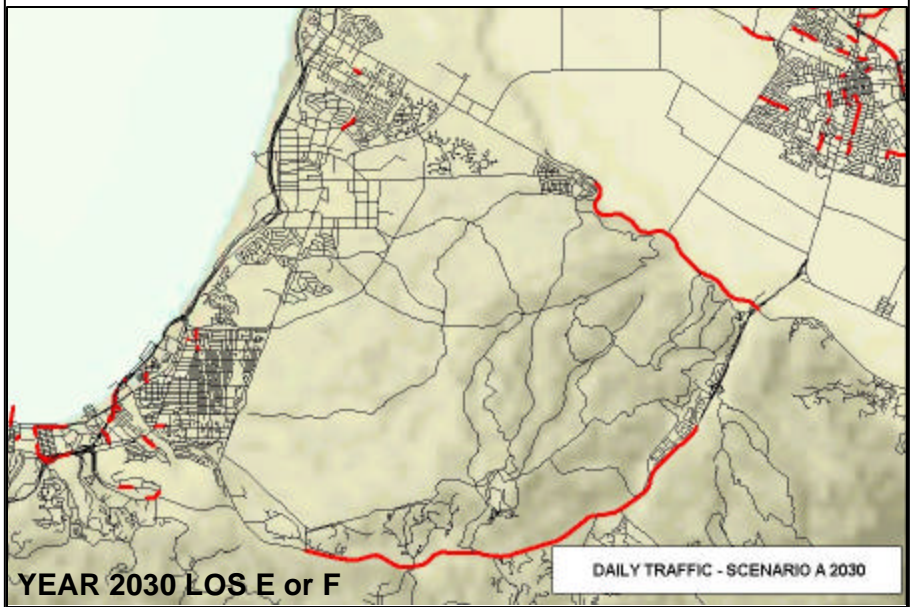


FIGURE 15
Future Build Network B Deficiencies
2030 Land Use

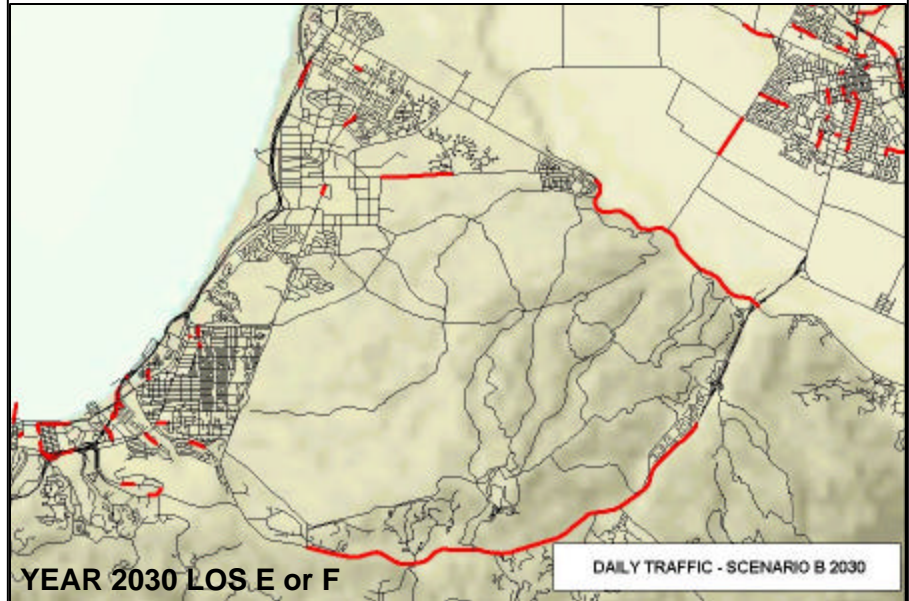


FIGURE 16
Future Build Network C - Deficiencies
2030 Land Use

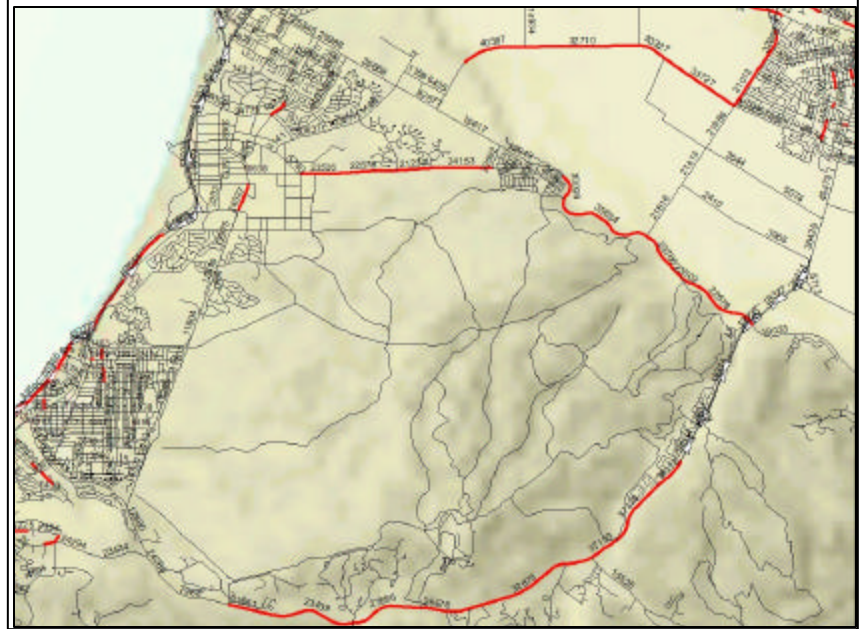


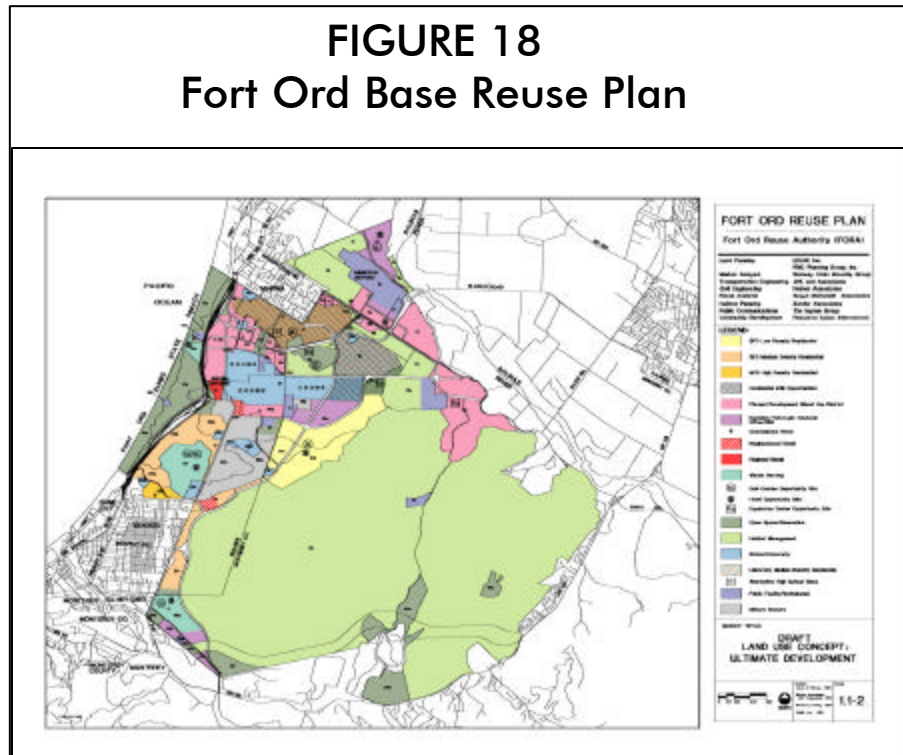
FIGURE 17
Future Build Network D- Deficiencies
2030 Land Use



LAND USE ASSUMPTIONS

The land use data used in the study reflects the total development levels included in the adopted Base Reuse Plan (BRP) (Figure 18). The pattern of development, as well as the related local road networks, has been modified from the original BRP to reflect current planning for major facilities and projects. The revised plans include the CSUMB Master Plan (Figure 19) and the specific plans for Marina Heights, Cypress Knolls, Seaside Highlands, and East Garrison (Figure 20)². Overall, the growth projections are consistent with AMBAG's current land use forecast, and are also consistent with the Fort Ord Base Reuse Plan for the former Fort Ord area. About 20 percent of the BRP buildout, or 1,350 units

FIGURE 18
Fort Ord Base Reuse Plan



²The current UC MBEST plan was not completed in time to include in this study; however, additional specific projects that were included in the analysis are the Horse Park and Monterey Peninsula College training facility in County jurisdiction, the Veterans Cemetery, the UC East campus development, the Marina Airport developments, UC Central, North and West campus developments, the Preston and Abrams housing, the Seaside Marina Gate commercial development, the Ord Gate Army facility, the Seaside resort hotel and First

including Phase 2 of the East Garrison project, are projected to occur after the 2030 time horizon, due to water supply constraints that must be overcome. The projections for Fort Ord are shown in Table 1.

TABLE 1
Fort Ord Traffic Zones - Draft Land Use Forecast

Jurisdiction	Year	Employment	Housing Units	Population
Del Rey Oaks	2000	0	0	0
	2030	350	0	0
	Buildout	350	0	0
Marina	2000	1,487	777	2,054
	2030	5,983	3,834	11,811
	Buildout	5,983	4,234	12,811
Seaside	2000	492	2,278	7,235
	2030	7,054	2,568	7,724
	Buildout	7,054	3,068	8,974
Monterey	2000	0	0	0
	2030	238	0	0
	Buildout	238	0	0
Unincorporated	2000	2,429	1,247	2,989
	2030	4,691	3,364	7,465
	Buildout	4,691	3,814	9,535
Total	2000	4,408	4,302	12,278
	2030	18,316	9,766	27,000
	Buildout	18,316	11,116	31,320

Source: AMBAG

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Tee project, proposed housing on the easterly side of General Jim Moore Blvd., the hotel/golf course project in Del Rey oaks and the golf course project in the City of Monterey.

FIGURE 19
Land Use Considerations

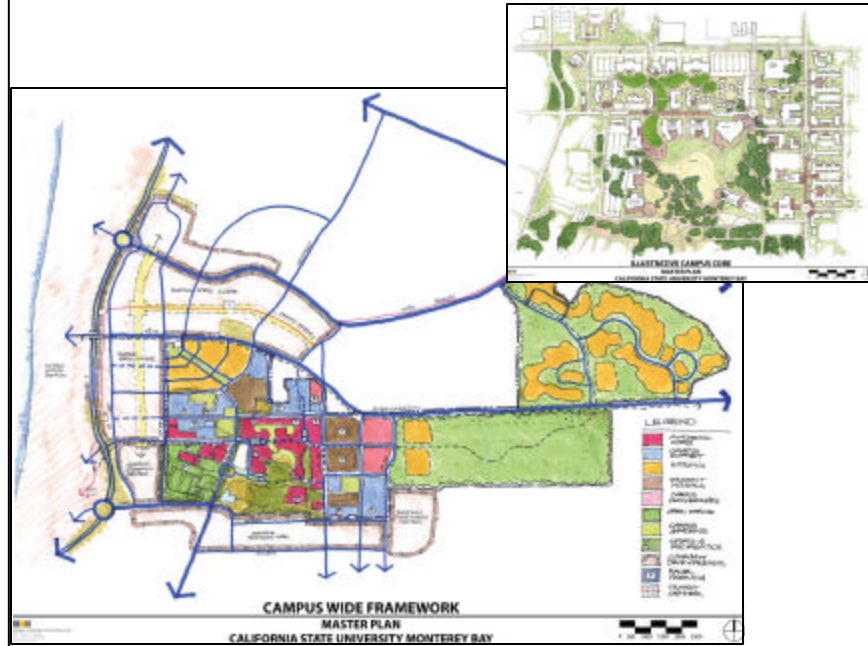
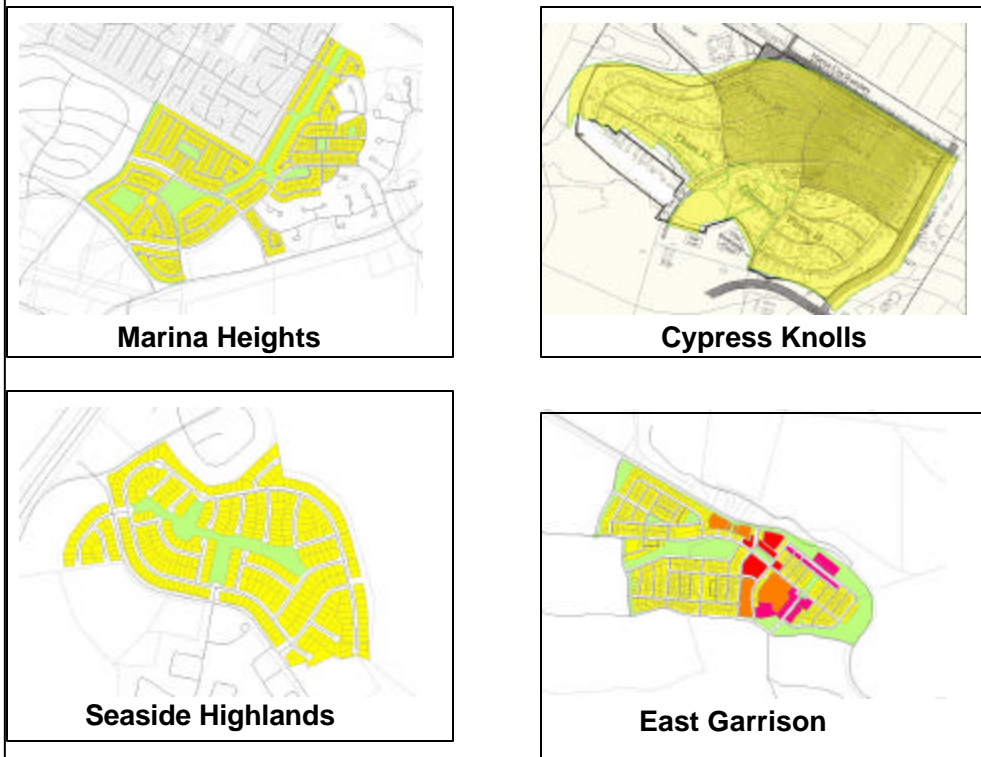


FIGURE 20
Land Use Considerations – Specific Plans



TRAFFIC ANALYSIS ZONE DEVELOPMENT

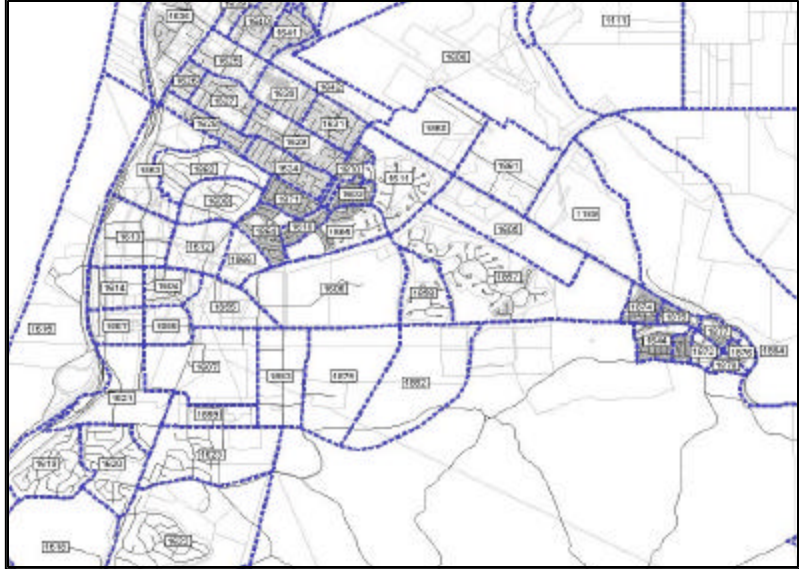
The development throughout the study areas has been distributed to traffic zones in the Travel Demand Model (Figure 21). The traffic zones and the related data have been substantially upgraded in the recent model update.

- Initially based on Census 2000 Block Groups
- Block Groups split into TAZs along Block boundaries
- CTPP for AMBAG is based on Block Group Geography
- Base year land use and demographics from Census
- Employment from geocoded InfoUSA sample
- Employment control totals by sector by county from Woods and Poole Economics
- Employment numbers are higher than in past

The future year land use assumptions include the following:

- Horizon year is 2030
- Initial county control totals from Woods and Poole
- Forecasting Population, Housing and Employment
- Employment categories
 - Agriculture
 - Industrial
 - Service
 - Retail
 - Government
 - Construction
- Allocation to TAZs used economic location choice model

FIGURE 21
Traffic Analysis Zones



PROPOSED FORA FEE REALLOCATION

SELECT LINK ANALYSIS

Based on the deficiency analysis described in Chapter 1, Scenario C proved to offer the best overall traffic solution, and a select link analysis has been prepared to identify the sources and volumes of traffic using the proposed future transportation facility improvements in Scenario C. Table 2 summarizes the projects included in the analysis, which are also depicted in Figure 22.

The select link analysis performed traffic assignments on each project for the Base Year 2000 and the Future Year 2030. In this process, the analysis accounted for existing travel demand shifting to the new roads. The select link analysis tracks the origins and destinations of trips passing through each of the projects, with the difference between 2000 and 2030 accounting for trips caused by new development (Figure 23). The analysis categorized the trips as shown in Figure 24 to provide a basis for assigning FORA responsibility for the transportation projects. Table 3 shows the resulting trip numbers, separating those with a FORA origin and/or destination from those with no FORA connection.

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TABLE 2
Project Descriptions for FORA Fee Reallocation

ID	Project	Description
Regional Improvements		
R3	Hwy 1-Seaside Sand City, added lanes	Widen Highway 1 from Fremont Avenue to at least Canyon Del Rey and make interchange and related local road improvements in the vicinity of Canyon Del Rey and Fremont Avenues.
New	Hwy 1- Monterey Road Interchange	Construct new interchange at Monterey Road
New	Hwy 156 - Freeway upgrade	Widen existing highway to 4 lanes and upgrade highway to freeway status with appropriate interchanges. Interchange modification as needed at US 156 and 101
New	Hwy 68 Operational Improvements	Operational improvements at San Benancio, Laureles Grade and at Corral De Tierra including left turn lanes and improved signal timing.
Off-Site Improvements		
New (1)	Davis Rd n/o Blanco	Widen to 4 lanes from the SR 183 bridge to Blanco
New	Davis Rd, s/o Blanco	Widen to 4 lanes from Blanco to Reservation; Build 4 lane bridge over Salinas River
New (4c)	Widen Reservation, 4-lane to Watkins Gate	Widen to 4 lanes from existing 4 lane section (west of East Garrison) to Watkins Gate
New	Widen Reservation, Watkins Gt to Davis	Widen to 4 lanes from Watkins Gate to Davis Rd
8	Crescent St. extend to Abrams	Extend existing Crescent Court Southerly to join proposed Abrams Dr on the Former Ft Ord
On-Site Improvements		
FO2	Abrams (Crescent to 2nd Avenue connection)	Construct a new 2-lane arterial from intersection with 2nd Ave easterly to intersection with Crescent Court extension
New (FO5)	8th Street	Upgrade/construct new 2-lane arterial from 2 nd Ave to connection with Intergarrison
FO6	Intergarrison Road	Upgrade to a 4-lane arterial from Eastside Road easterly to Reservation Rd
FO7	Gigling Road	Upgrade/Construct new 4-lane arterial from General Jim Moore Blvd easterly to Eastside Rd
New (FO9)	General Jim Moore Blvd, Normandy to McClure	Widen from 2 to 4 lanes from Normandy Rd to McClure
New	General Jim Moore Blvd, McClure to South Boundary Road	Widen from 2 to 4 lanes from McClure southerly to South Boundary Rd
FO11	Salinas Ave	Construct new 2 lane arterial from Reservation Rd southerly to Abrams Dr
FO12	Eucalyptus Rd	Upgrade to 2 lane collector from General Jim Moore Blvd to Eastside Rd.
New	Eastside Rd (New alignment in Scenario C)	Construct new 2 lane arterial from Gigling Rd to Schoonover Dr
New	South Boundary Road upgrade (remains 2 lanes)	Upgrade to a 2 lane arterial, along existing alignment.

Source: FORA/TAMC

FIGURE 22
FOR A Fee Reallocation Network

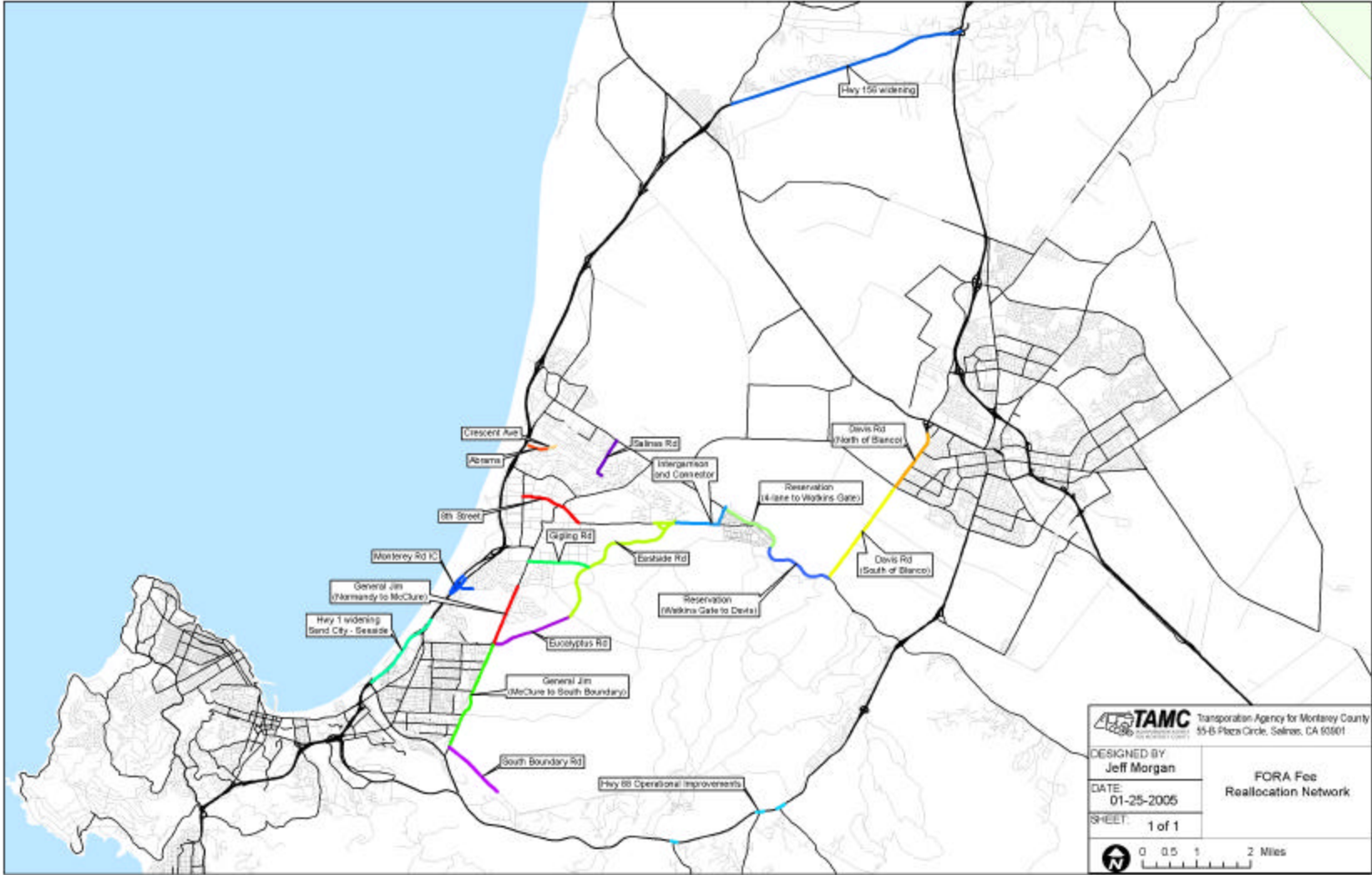


FIGURE 23
Select Link Analysis – Origin-Destination Pattern

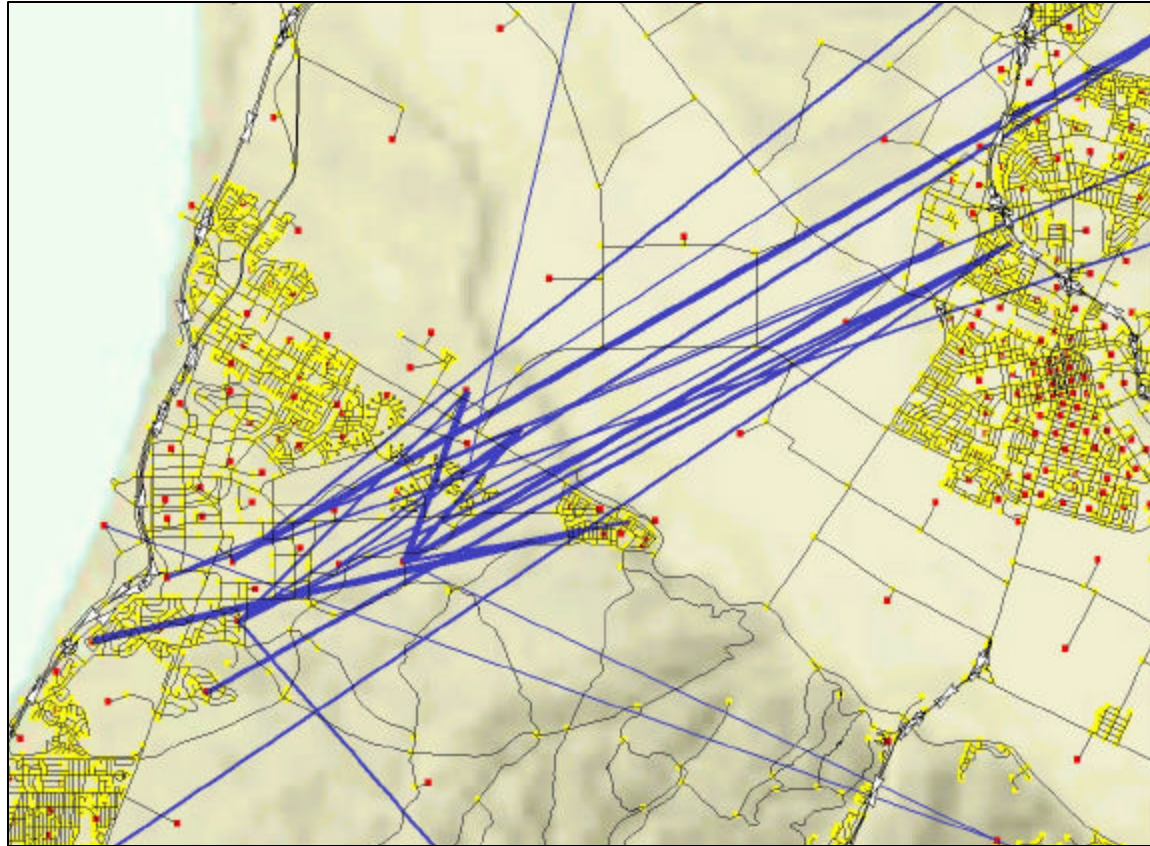
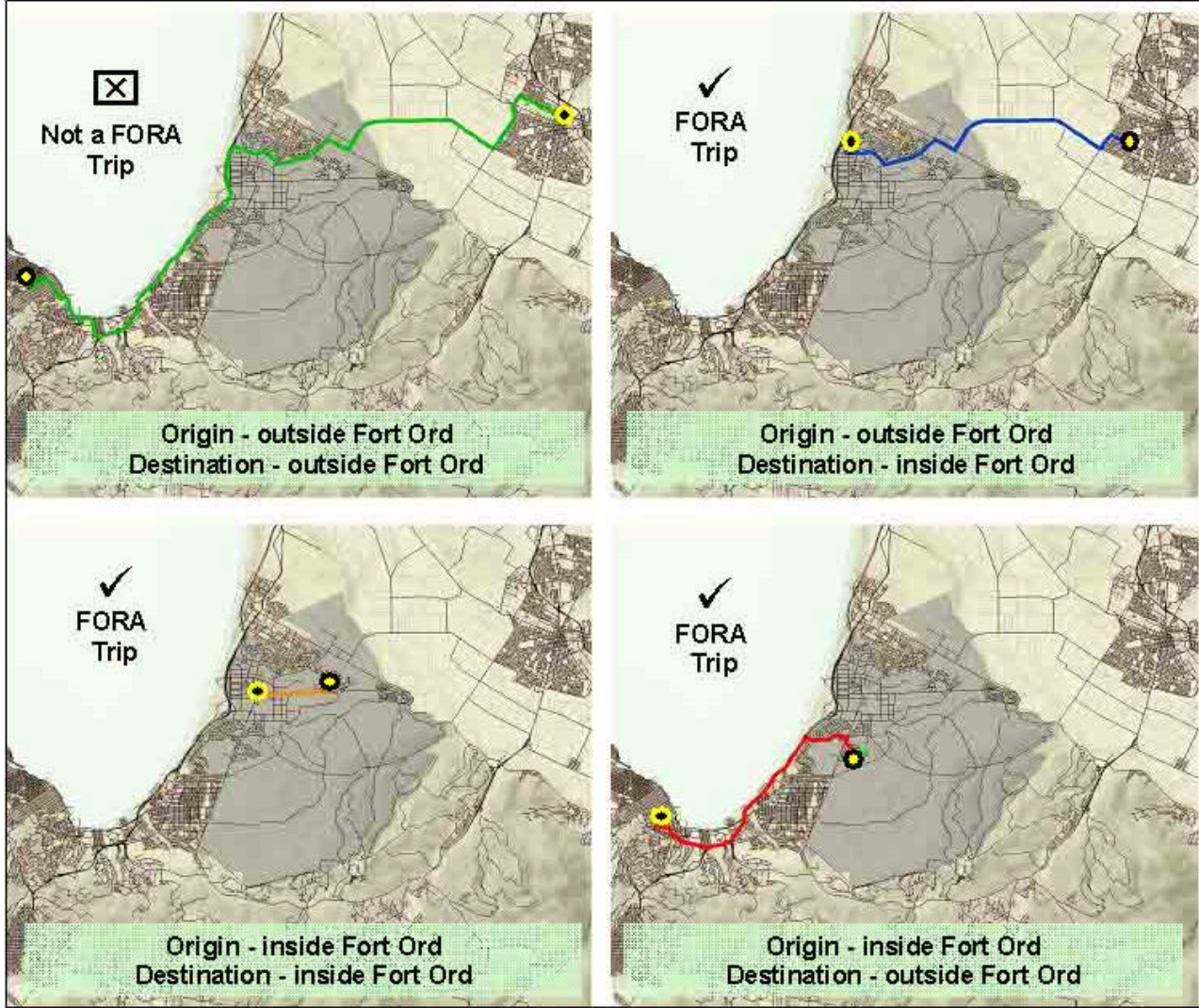


FIGURE 24
Select Link Analysis – Four Classes of Trips



**TABLE 3
FORA Fee Re-allocation Select Link Analysis Results**

		Hwy 1 Sand City	2nd Ave	8th St	Hwy 68 Ops	Hwy 156 Freeway	Abrams	Crescent	Davis n/o Blanco	Davis s/o Blanco
2000	FORA O and D	0	89	479	0	0	0	0	0	0
	FORA O or D	7,539	640	962	456	916	228	228	4,601	1,972
	Not FORA O or D	60,740	0	0	19,737	27,176	0	0	30,767	8,284
		68,279	729	1,441	20,193	28,092	228	228	35,368	10,256
2030	FORA O and D	0	791	955	0	0	0	0	0	0
	FORA O or D	33,829	6,487	3,355	1,461	3,508	896	896	22,055	0
	Not FORA O or D	74,021	0	0	21,223	33,295	7	7	33,399	18,400
		107,850	7,278	4,310	22,684	36,803	903	903	55,454	32,141
New Trips	FORA O and D	0	702	476	0	0	0	0	0	0
	FORA O or D	26,290	5,847	2,393	1,005	2,592	668	668	17,454	16,428
	Not FORA O or D	13,281	0	0	1,486	6,119	7	7	2,632	5,457
		39,571	6,549	2,869	2,491	8,711	675	675	20,086	21,885

**TABLE 3 (continued)
FORA Fee Re-allocation Select Link Analysis Results**

		Eastside Road	Eucalyptus Road	Gigling Road	Hwy 1 New I/C	Inter- garrison	General Jim Moore Blvd	Reservation Road Watkins to Davis	Reservation to Watkins	Salinas Avenue	South Boundary Road.
2000	FORA O and D	163	7	9	202	13	25	0	0	32	0
	FORA O or D	2,428	588	638	6,175	299	4,752	3,104	3,018	752	638
	Not FORA O or D	1,986	1,986	0	0	431	41	4,579	4,579	0	14,732
		4,577	2,581	647	6,377	743	4,818	7,683	7,597	784	15,370
2030	FORA O and D	1,031	247	1,029	651	1,636	449	0	0	248	0
	FORA O or D	8,311	2,875	5,065	7,917	7,089	5,888	26,102	20,478	2,003	2,038
	Not FORA O or D	3,133	2,391	742	0	2,738	164	10,754	10,754	1	15,603
		12,475	5,513	6,836	8,568	11,463	6,501	36,856	31,232	2,252	17,641
New Trips	FORA O and D	868	240	1,020	449	1,623	424	0	0	216	0
	FORA O or D	5,883	2,287	4,427	1,742	6,790	1,136	22,998	17,460	1,251	1,400
	Not FORA O or D	1,147	405	742	0	2,307	123	6,175	6,175	1	871
		7,898	2,932	6,189	2,191	10,720	1,683	29,173	23,635	1,468	2,271

Source: Dean Munn, Bernardin-Lochmueller and Assoc.

NEXUS ANALYSIS

Although the FORA fees are technically a Mello-Roos Special Tax, the original cost allocation in 1997 was done as a development impact fee nexus analysis. The consultants have taken the same approach as a starting point here. For those projects where there are existing deficiencies (LOS E or F in the Base Year 2000), the nexus calculation needs to separate the cost share for existing development from that of new development. Based on the scenario analysis, four projects appear to have existing deficiencies in the 2000 Base Year: Highway 68, Highway 156, Davis n/o Blanco, and Highway 1 at Monterey Road where a new interchange is planned³ (Table 4). The fee calculations for these projects first deduct the amounts attributable to existing traffic. For example, on Highway 68 existing traffic constitutes 89 percent of the projected 2030 traffic, so only 11 percent of the costs of that project can be attributed to new development. The trips from former Fort Ord development account for 40 percent of the new trips. The FORA nexus calculation for Highway 68 improvements therefore is: $\$9,876,000 \times 11\% \times 40\% = \$437,550$. The nexus calculations for each of the four projects listed above are calculated this way.

For all the other projects, new development is assigned 100 percent of the cost, since no existing LOS deficiencies exist. The FORA allocation, therefore, reflects the share of trips generated by new development at the former Fort Ord compared to new development elsewhere. Line 2 in Table 4 shows the resulting figures.

³ As of this writing, Seaside and the US Army have agreed on terms that would include land rights over the federally owned Ord Military Community to enable construction of an interchange. However, a final contract is not yet in place and approved by the two parties.

**TABLE 4
Cost Allocations**

Line No.	Project Scenario	TOTAL	Hwy 1 Sand City	8th St	Hwy 68 Ops	Hwy 156 Freeway	Abrams	Crescent	Davis n/o Blanco	Davis s/o Blanco
1	Current Project Costs Year 2000 Deficiency?	\$376,225,867	\$45,000,000	\$4,340,000	\$9,876,000 Yes	\$197,000,000 Yes	\$759,569	\$906,948	\$3,151,000 Yes	\$22,555,000
2	FORA 2004 Nexus Obligation Percent of Project Cost	\$135,789,460 36.1%	\$29,896,894 66.4%	\$4,340,000 100.0%	\$437,550 4.4%	\$13,874,521 7.0%	\$751,692 99.0%	\$897,543 99.0%	\$991,769 31.5%	\$16,930,936 75.1%
3	FORA Share Option 1: Prorata Based on Fees Percent of Project Cost	\$104,230,288 27.7%	\$22,948,483 51.0%	\$3,331,330 76.8%	\$335,858 3.4%	\$10,649,908 5.4%	\$576,989 76.0%	\$688,942 76.0%	\$761,269 24.2%	\$12,995,974 57.6%
4	FORA Share Option 2: Fund Local First Percent of Project Cost	\$104,230,288 27.7%	\$15,282,247 34.0%	\$4,340,000 100.0%	\$223,660 3.2%	\$7,092,169 3.6%	\$759,569 100.0%	\$906,948 100.0%	\$506,958 16.1%	\$8,654,502 38.37%

**TABLE 4 (continued)
Cost Allocations**

Line No.	Project Scenario	TOTAL	Eastside Road	Eucalyptus Road	Gigling Road	Hwy 1 New I/C	Inter-garrison	General Jim Moore Blvd	Reservation Rd Watkins to Davis	Reservation to Watkins	Salinas Avenue	South Boundary Road
1	Current Project Costs Year 2000 Deficiency?	\$376,225,867	\$12,536,370	\$5,800,000	\$5,722,640	\$19,100,000 Yes	\$4,260,000	\$24,065,000	\$5,500,000	\$10,100,000	\$3,038,276	\$2,515,064
2	FORA 2004 Nexus Obligation Percent of Project Cost	\$135,789,460 36.1%	\$10,715,755 85.5%	\$4,998,840 86.2%	\$5,036,552 88.0%	\$4,884,232 25.6%	\$3,343,226 78.5%	\$22,306,239 92.7%	\$4,335,824 78.8%	\$7,461,223 73.9%	\$3,036,206 99.9%	\$1,550,458 61.6%
3	FORA Share Option 1: Prorata Based on Fees Percent of Project Cost	\$104,230,286 27.7%	\$8,225,279 65.5%	\$3,837,047 66.2%	\$3,865,994 67.6%	\$3,749,075 19.6%	\$2,566,218 60.2%	\$17,121,989 71.1%	\$3,328,124 60.5%	\$5,727,141 56.7%	\$2,330,554 76.7%	\$1,190,112 47.3%
4	FORA Share Option 2: Fund Local First Percent of Project Cost	\$104,230,286 27.7%	\$12,536,370 100.0%	\$5,800,000 100.0%	\$5,722,640 100.0%	\$2,496,648 13.1%	\$4,260,000 100.0%	\$24,065,000 100.0%	\$2,216,321 40.3%	\$3,813,916 37.8%	\$3,038,276 100.0%	\$2,515,064 100.0%

Source: ADE., Inc.

It is noted that, based on the original 1997 traffic study for the Fort Ord Base Reuse Plan and the resulting mitigation fee structure adopted by FORA, FORA has designed and constructed a series of transportation mitigation projects, resulting in offsets to its originally defined obligation. FORA's projection of available fee revenue-based on new development considered in the Base Reuse Plan and the remaining transportation mitigations required is \$104.2 million.

In Line 3 of Table 4, FORA's financial share of all the project costs is prorated to match this total to indicate how the dollars might be allocated to each project based on the nexus methodology. While this would be one option for the new fee reallocation, another approach would better match the available resources with the cost requirements of the proposed transportation improvements, as discussed below.

RECOMMENDED APPROACH: FUND LOCAL NETWORK FIRST

One major concern for many fee programs is the need to generate complete funding for necessary improvement projects. In this case, the nexus between FORA's project impacts and their resulting fees provides full funding for only a selection of the projects necessary to fully mitigate projected future traffic volumes in the area. Therefore, we developed a funding allocation scenario to concentrate resources on local network improvements. The remaining resources are used to contribute towards offsite and regional projects where FORA's nexus impact is lower and where more outside funding would be required to complete the projects (Line 4 of Table 4). In this allocation scenario, ten of the eighteen projects in the program receive full funding from the FORA fees. Overall, local projects receive \$63.0 million while offsite and regional projects receive \$41.2 million.

COMPARISON WITH EXISTING FORA CAPITAL IMPROVEMENT PROGRAM ALLOCATIONS

As mentioned above, FORA currently has about \$104.2 million programmed in its Capital Improvement Program (CIP) for road improvements (Table 5).

TABLE 5
Adopted FORA Capital Improvement Program Road Improvements

Regional Improvements		
R3	Hwy 1-Seaside Sand City	\$8,061,764
R6	Hwy 68 Bypass Fwy	\$22,741,732
R9	Hwy 218 Widening	\$2,053,054
Subtotal Regional		\$32,856,550
Off-Site Improvements		
1	Davis Rd n/o Blanco	\$7,016,254
2	Davis Rd New Bridge	\$2,557,091
3b	Widen Bridge, Blanco to Alisal	\$5,706,893
4c	New 4 lane from Res to Watkins Gt	\$6,397,294
5	Del Monte-Seaside & Monterey	\$4,308,005
6	Del Monte-Marina	\$5,102,561
8	Crescent Ave	\$906,948
Subtotal Off-Site		\$31,995,046
On-Site Improvements		
FO1 [a]	Gateway & Misc Safety Improvements	\$5,330,485
FO2	Abrams	\$759,570
FO4	Blanco/Imjin Connector	\$5,139,375
FO5	8th Street	\$4,092,120
FO6	Intergarrison	\$4,796,750
FO7	Gigling	\$4,058,395
FO8 [b]	2nd Ave	\$0
FO9	General Jim Moore Blvd	\$3,480,995
FO11	Salinas Ave	\$3,038,277
FO12	Eucalyptus Rd	\$3,192,565
FO13	Eastside Rd	\$5,490,162
Subtotal On-Site		\$39,378,694
Grand Total		\$104,230,290

Footnotes

[a] Project # FO1: \$1,102,139 in 2006/07 is to be applied to the East Garrison Gateway Improvement Project. The \$469,816 per year nine-year distribution (2007/08-2015/16) is to be applied to continue any necessary safety and rehabilitation improvements.

[b] Project # FO8: FORA's obligation on this project (\$6.6 mil.) is already met and the project has been constructed.

In several cases, the projects now included in the analysis are different than the projects included in the CIP; however, the new projects better mitigate the projected impacts based on current land use and circulation plans. For example, the FORA CIP includes the Highway 68 Bypass project, which is no longer included in TAMC's Regional Transportation Plan. However, the proposed improvements to General Jim Moore Blvd as well as the new Eastside Road will carry the traffic instead.

The current FORA CIP has more funds allocated to regional projects than does the recommended reallocation. Currently, FORA has programmed \$32.8 million for regional facilities and \$71.4 million for local/offsite projects (not including 2nd Avenue). The proposed reallocation would shift about \$7.5 million from regional to local/offsite projects (Table 6). TAMC's planned ½ cent countywide transportation sales tax and its proposed regional development impact fee, as well as anticipated state and federal revenues, are required to fill this gap in funding in order to raise enough funding to construct the regional projects.

PROJECT PHASING AND RELATIONSHIP TO TAMC 14-YEAR PLAN AND LOCAL IMPROVEMENT PLANS

The phasing of the improvement projects will depend in part on the priorities for traffic mitigation based on development phasing, and also on the pace of the development that will pay the fees. The revenue availability is dependent on the market absorption rates of the development. If the proposed fee reallocation is approved, FORA will prepare a forecast of anticipated fee collections for its CIP planning process.

TABLE 6
Proposed FORA Capital Improvement Program Road Improvements

Regional Improvements		
R3	Hwy 1-Seaside Sand City, added lanes	\$15,282,247
New	Hwy 1- Monterey Road Interchange	\$2,496,648
New	Hwy 156 - Freeway upgrade	\$7,092,169
New	Hwy 68 Operational Improvements	\$223,660
Subtotal Regional		\$25,094,724
Off-Site Improvements		
New (1)	Davis Rd n/o Blanco	\$506,958
New	Davis Rd, s/o Blanco	\$8,654,502
New (4c)	Widen Reservation, 4-lane to Watkins Gate	\$3,813,916
New	Widen Reservation, Watkins Gt to Davis	\$2,216,321
8	Crescent Ave extend to Abrams	\$906,948
Subtotal Off-Site		\$16,098,644
On-Site Improvements		
FO2	Abrams (Crescent to 2nd Avenue connection)	\$759,570
New (FO5)	8th Street	\$4,340,000
FO6	Intergarrison Road	\$4,260,000
FO7	Gigling Road	\$5,722,640
New (FO9)	General Jim Moore Blvd, Normandy to McClure	\$7,465,000
New	General Jim Moore Blvd, McClure to South Boundary Road	\$16,600,000
FO11	Salinas Ave	\$3,038,276
FO12	Eucalyptus Rd	\$5,800,000
New	Eastside Rd (New alignment in Scenario C)	\$12,536,370
New	South Boundary Road upgrade (remains 2 lanes)	\$2,515,064
Subtotal On-Site		\$63,036,921
Grand Total		\$104,230,290

Source: TAMC/ADE

TAMC has adopted a \$1 billion 14-year investment plan, which is a subset of the 25-year Regional Transportation Plan (RTP). The 14-year plan anticipates a certain level of FORA fees, as well as state, federal and other local funds. TAMC's analysis concluded that the proposed reallocation of FORA fees would provide sufficient funding for construction of the regional projects when combined with the other anticipated revenue sources. However, the timing of the FORA fees will be a critical factor.

For some of the regional projects, FORA fees will be needed to pay for the initial stages of project design and planning. TAMC and FORA staff will need to coordinate their planning to assure that FORA fee revenues can be provided when needed for the regional projects. As previously noted, the FORA revenue forecasts are based upon market absorption assumptions and, therefore, actual revenue accrual will continue to change based on market realities. Therefore, the coordination between TAMC and FORA will be an ongoing process over the forecasted RTP and FORA CIP development horizons.

This kind of coordination clearly needs to extend as well to the other jurisdictions involved at former Fort Ord. In some cases, such as the Highway 1/Seaside interchange, additional funding will be required from non-FORA, non-regional sources. It must also be presumed that projects built with the FORA fees will be suitably coordinated with other local improvements by the cities and the county and that all roads funded under the program will be open and available to receive their projected share of traffic. The FORA fee program and the RTP cannot mitigate the traffic impact of development at former Fort Ord unless the new facilities are functioning and open to the public as intended.

CONCLUSION

While the magnitude of projected future development at the former Fort Ord has not changed since the Base Reuse Plan was adopted in 1997, the pattern of development and the related circulation system has been refined from previous plans. The traffic modeling conducted for this study demonstrates that future traffic conditions can be more effectively mitigated by changing certain traffic improvement projects included in the plan, and by shifting funding priorities within the plan.

Several offsite or regional projects have shifted scope since 1997 for reasons largely unrelated to Fort Ord development. These include the Highway 68 Bypass, the Highway 218 widening, and the Del Monte widening projects through Seaside and Marina. In addition, the traffic modeling has shown that improvements to Reservation Rd and Davis Rd would be as effective as the previously planned improvements to Blanco Rd. Other new projects found to be important for future traffic mitigation include a new interchange on Highway 1 at Monterey Rd, a more extensive widening of General Jim Moore Blvd, a new alignment of Eastside Rd, and an upgrade to South Boundary Rd. It is recommended that these projects be included in the FORA CIP in lieu of the previous Highway 68 and 218 projects, the Del Monte Ave projects, the Blanco-Imjin connector and the previous project designs on Blanco and Davis Roads.

With updated cost estimates for these projects and others included in the FORA CIP, there is also an opportunity to focus more squarely on fully funding the local projects that would service the development paying the FORA fees. The fee revenue is dependent upon development and the local road network must be in place to support that development. The proposed FORA Fee reallocation would fully fund all ten of the local onsite transportation projects on the

former Fort Ord. In contrast, the existing CIP would fully fund eight projects.

The proposed fee reallocation would shift about \$7.5 million from regional projects to local/offsite projects. However, with proper coordination between TAMC and FORA, the FORA fee revenues available for the regional projects identified in this study can be applied as needed to facilitate upfront planning and engineering costs, and thus contribute sufficiently to the completion of the regional projects. TAMC's 14-year plan provides a funding plan to supplement FORA fees with other transportation revenues, including the proposed sales tax measure and regional development impact fees, to complete the regional projects.

APPENDIX A: TNT MEMBERS

Name	Affiliation
John Heiser	City of Marina
Dick Goblirsch	City of Del Rey Oaks
Peter Le	City of Marina
Charles Johnson	City of Marina
Bob Enea	Monterey Horse Park
Anne Cribbs	Monterey Horse Park
Vicki Nakamura	Monterey Peninsula College
Tim O'Halloran	City of Seaside
Dave Meza	MCWD
Nick Nichols	Monterey County Redevelopment Agency
George Divine	Monterey County Public Works
Enrique Saavedra	Monterey County Public Works
Graham Bice	UC MBEST
Doug Bilse	City of Monterey
Dave Murray	Caltrans
Mark McCumsey	Caltrans
Nick Chiulos	Monterey County
Rob Robinson	Base Realignment and Closure Office
Andrew Cardinalli	US Army RCI
Keith McCoy	East Garrison Partners
Bob Schafer	Marina Community Partners
Melissa Gutheil	CSUMB
Niraj Dangoria	CSUMB

Distribution List Included

Bill Wiseman	RBF Consulting
Chip Rerig	City of Monterey
Bill Fell	City of Monterey
Dan Keen	City of Seaside
Tony Altfeld	City of Marina
Stanley Kulakow	Sand City
John Olejnik	Caltrans
Pat Kelly	US Army
Paul Greenway	Monterey County Public Works

FORA Staff

Jim Feeney	FORA
Jim Arnold	FORA
Steve Endsley	FORA

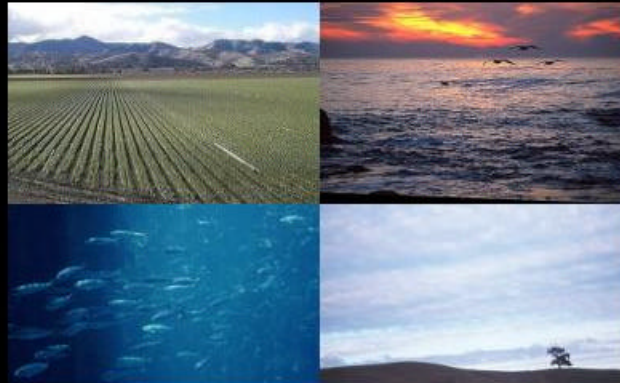
TAMC Project Team

Debbie Hale	TAMC
Andy Cook	TAMC
Jeff Morgan	TAMC
Dean Munn	AMBAG
Doug Svensson	ADE

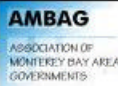
APPENDIX B:
AMBAG Regional Travel Demand Model

AMBAG REGIONAL TRAVEL DEMAND MODEL

Capacity and Level of Service Methodology



Dean Munn
Senior Transportation Planner
Association of Monterey Bay Area Governments



FORA TNT – March 9, 2004

Level of Service Methodology

Two Lane and Multilane (without access control)

MULTILANE HIGHWAY LOS CRITERIA

FREE FLOW SPEED	CRITERIA	LOS				
		A	B	C	D	E
60 mi/h	Minimum Speed (mi/h)	60.0	60.0	59.4	58.7	55.0
	Maximum v/c	0.30	0.49	0.70	0.90	1.00
	Maximum Service Flow Rate					2200
55 mi/h	Minimum Speed (mi/h)	55.0	55.0	54.9	52.9	51.2
	Maximum v/c	0.29	0.47	0.68	0.88	1.00
	Maximum Service Flow Rate					2100
50 mi/h	Minimum Speed (mi/h)	50.0	50.0	50.0	48.9	47.5
	Maximum v/c	0.28	0.45	0.65	0.86	1.00
	Maximum Service Flow Rate					2000
45 mi/h	Minimum Speed (mi/h)	45.0	45.0	45.0	44.4	42.2
	Maximum v/c	0.26	0.43	0.62	0.82	1.00
	Maximum Service Flow Rate					1900

SOURCE: HIGHWAY CAPACITY MANUAL 2000

TWO LANE HIGHWAY LOS CRITERIA

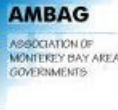
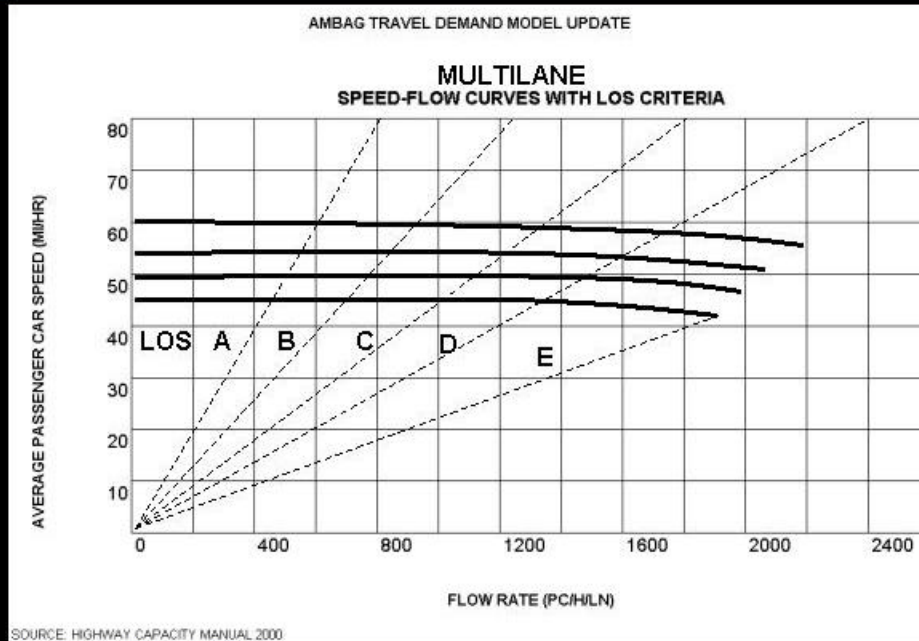
CRITERIA	LOS				
	A	B	C	D	E
Maximum v/c	0.31	0.52	0.72	0.83	1.00
Maximum Service Flow Rate					1700

ADAPTED FROM HIGHWAY CAPACITY MANUAL 2000



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Level of Service Methodology



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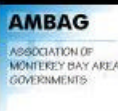
Level of Service Methodology

Freeways

BASIC FREEWAY LOS CRITERIA

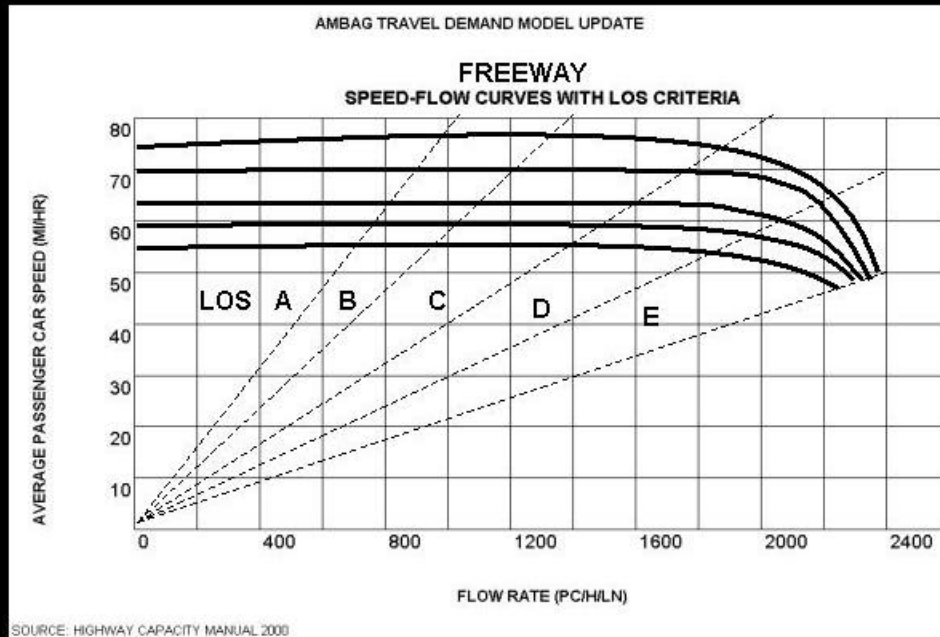
FREE-FLOW SPEED	CRITERIA	LOS				
		A	B	C	D	E
75 mi/h	Minimum Speed (mi/h)	75.0	74.8	70.6	62.2	53.3
	Maximum v/c	0.34	0.56	0.76	0.90	1.00
	Maximum Service Flow Rate					2400
70 mi/h	Minimum Speed (mi/h)	70.0	70.0	66.2	61.5	53.3
	Maximum v/c	0.32	0.63	0.74	0.90	1.00
	Maximum Service Flow Rate					2400
65 mi/h	Minimum Speed (mi/h)	65.0	65.0	64.6	59.7	52.2
	Maximum v/c	0.30	0.60	0.71	0.89	1.00
	Maximum Service Flow Rate					2350
60 mi/h	Minimum Speed (mi/h)	60.0	60.0	60.0	57.6	51.1
	Maximum v/c	0.29	0.47	0.68	0.88	1.00
	Maximum Service Flow Rate					2300
55 mi/h	Minimum Speed (mi/h)	55.0	55.0	55.0	54.7	50.0
	Maximum v/c	0.27	0.44	0.64	0.85	1.00
	Maximum Service Flow Rate					2250

SOURCE: HIGHWAY CAPACITY MANUAL 2000



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Level of Service Methodology



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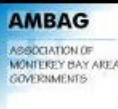
S

Capacity Equations

Maximum Service Flow Rate (by direction)

Freeway	$SF = C \times N \times f_{w} \times f_{LAT} \times f_{HV} \times f_{POP}$
Multilane	$SF = C \times N \times f_{w} \times f_{LAT} \times f_{HV} \times f_{POP} \times f_{MED} \times f_{ACC} \times f_{SIG}$
Two Lane	$SF = C \times N \times f_{w} \times f_{LAT} \times f_{HV} \times f_{POP} \times f_{DIR} \times f_{ACC} \times f_{SIG}$

C	Ideal Flow Rate
N	Number of lanes
f_w	Adjustment for Lane width
f_{LAT}	Adjustment for Lateral Clearance
f_{HV}	Adjustment for Heavy vehicles
f_{POP}	Adjustment for Driver Population
f_{DIR}	Adjustment for Directional Distribution
f_{MED}	Adjustment for Median Type
f_{ACC}	Adjustment for Access Point Density
f_{SIG}	Adjustment for Signal Delay



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HOURLY ONE-DIRECTION CAPACITY

IDEAL FLOW

Ideal Flow Rates by Facility Type

	Free Flow Speed						
	76	70	66	60	60	46 or less	
Freeway	2400	2400	2350	2300	2250	2100	1900
Multilane				2200		2000	1800
Two Lane					1700	1700	1700

CAPACITY ADJUSTMENTS

Adjustment for Lateral Clearance

Shoulder Width	Capacity Adjustment Factor			
	1 Lane	2 Lanes	3 Lanes	4 Lanes
6	1.00	1.00	1.00	1.00
5	1.00	0.99	0.99	1.00
4	0.97	0.98	0.99	0.99
3	0.97	0.97	0.98	0.99
2	0.93	0.97	0.98	0.99
1	0.93	0.96	0.97	0.99
0	0.88	0.95	0.97	0.98

Heavy-Vehicle Adjustment

Area Type	Capacity Adjustment Factor		
	Freeway	Multilane	Two-Lane
Rural	0.90	0.90	0.90
Suburban	0.90	0.90	0.90
Urban	0.90	0.90	0.90
Dense Urban	0.90	0.90	0.90
Commercial	0.90	0.90	0.90

Adjustment For Lane Width

Lane Width	Capacity Adjustment	
	Multilane	Two Lane
12	1.00	1.00
11	0.97	0.94
10	0.91	0.87
9		0.78

Adjustment For Directional Distribution

Area Type	Capacity Adjustment Factor
Rural	0.94
Suburban	0.90
Urban	0.60
Dense Urban	0.60
Commercial	0.60

Adjustment For Median Type

Adjustment	Capacity Adjustment	
	Un-Divided	Divided
Multilane	0.87	1.00
Two-Lane	0.87	1.00

Capacity Adjustment variable (see documentation)

Adjustment For Access-Point Density

Area Type	Access Points per mile	Adjustment
Rural	0 to 10	1.00
Suburban	10 to 20	0.94
Urban	20 to 30	0.90
Dense Urban	30+	0.88
Commercial	30+	0.80

Driver Population Factor

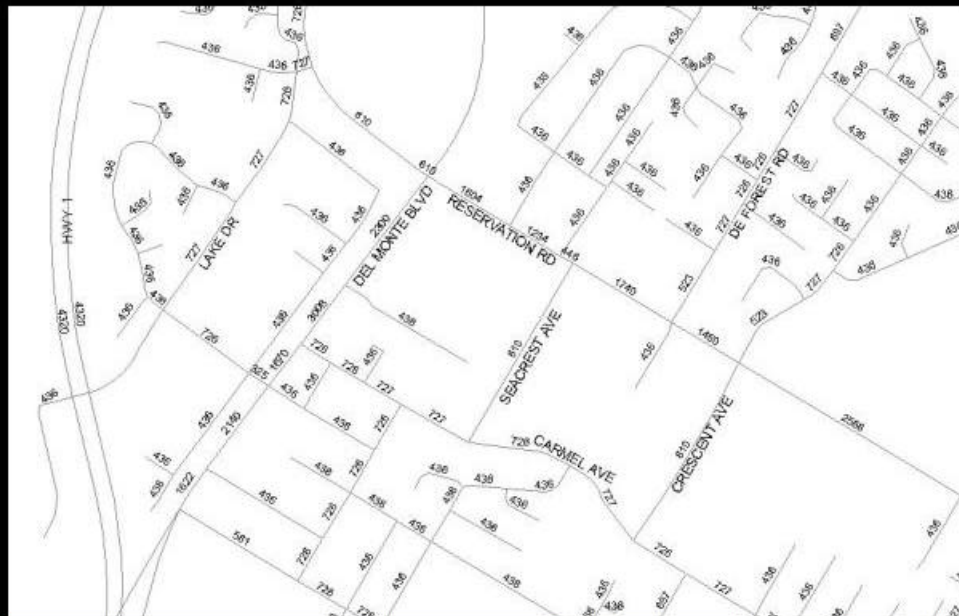
Area Type	Capacity Adjustment Factor		
	Freeway	Multilane	Two-Lane
Rural	0.90	0.90	0.90
Suburban	0.95	0.95	1.00
Urban	1.00	1.00	1.00
Dense Urban	1.00	1.00	1.00
Commercial	1.00	1.00	1.00

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HOURLY ONE-DIRECTION CAPACITY NETWORK EXAMPLE - CITY OF MARINA



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APPENDIX C: EASTSIDE ROAD ALIGNMENT

