

***City of Oakley
Long Range Roadway Plan***

***Prepared for:
City of Oakley***

December 2002

1001-1552

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I. INTRODUCTION

A. Purpose of Study

Prior to its incorporation, the City of Oakley was dependent on Contra Costa County for its transportation planning, transportation facilities funding, and road construction and maintenance. The City of Oakley is currently in the process of adopting its first General Plan and taking control of its long-term transportation planning and facility needs. This long range circulation plan provides the technical background for the General Plan Circulation Element.

B. Relationship to the General Plan

The General Plan Circulation Element identifies Oakley's long range transportation system, addressing all major modes of travel within Oakley, including roadways, transit, bicycle, and pedestrian components. The Circulation Element includes a circulation diagram that identifies the major roads in Oakley and describes the characteristics of each roadway type. This Long Range Roadway Plan supports the determination of major roadway improvements that have been incorporated into the General Plan, and summarizes the analysis conducted to ensure that the roads adequately serve Oakley's growth and the growth in traffic from the neighboring cities of Antioch, Brentwood, and unincorporated Contra Costa County.

C. Scope of Plan

This plan is comprised of the following elements:

- An assessment of existing conditions and existing travel characteristics;
- Long range traffic projections to the year 2025;
- Identification of level of service (LOS) standards;
- Development of a long range functional classification system and circulation plan;
- Determination of road widths;
- Identification of recommended traffic control at key intersections; and
- Order-of-magnitude construction cost estimates for the long range roadway plan.

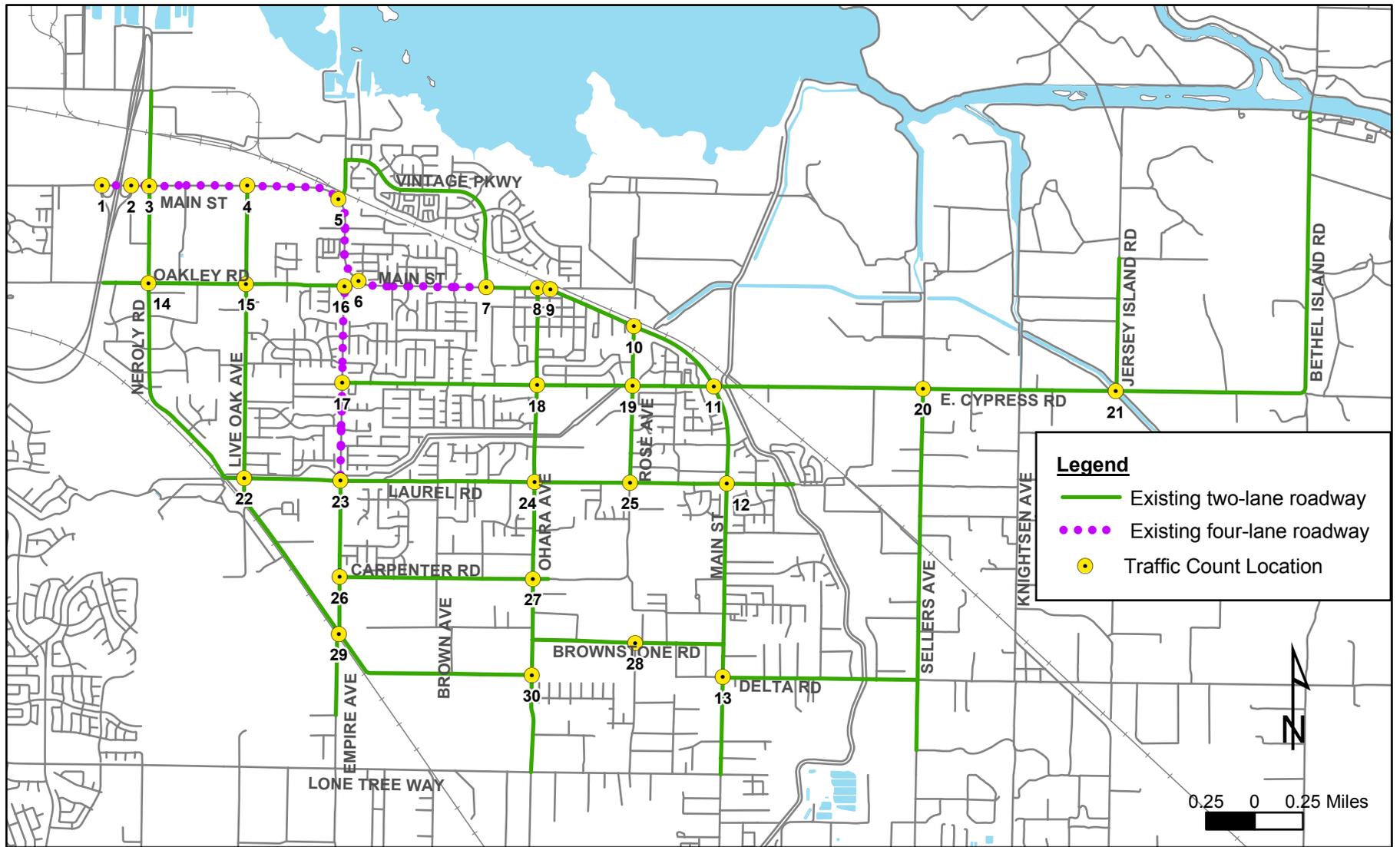
II. EXISTING CONDITIONS

A. Existing Circulation System

Figure 1 illustrates the existing circulation system and number of lanes on each of the major streets serving Oakley. Oakley's existing circulation system is primarily comprised of a grid pattern of two-lane rural roads and collector streets. The system is based on an approximately 1-mile grid of major streets, and a ½-mile grid of collector streets. Within the ½-mile grid is a system of local streets serving residential subdivisions and commercial areas. Within the downtown area, roughly bounded by Norcross Lane, 5th Street, Main Street, and Home Street, the street system is pedestrian scaled with short blocks and relatively narrow streets.

Oakley's circulation system contains a few multi-lane arterial streets that serve relatively high levels of traffic. The principal arterial in Oakley is Main Street (State Route 4 [SR 4]), which connects Oakley to Brentwood to the south and State Route 160 (SR 160) to the west. While most of Main Street is a two-lane undivided arterial, it widens to a four-lane divided (raised median) arterial from Vintage Parkway to SR 160. The raised median along this segment is discontinuous, but Main Street provides left-turn lanes at most intersections. Empire Avenue is a major north-south divided arterial from Main Street to West Cypress Road. This arterial routes traffic from Brentwood and many of Oakley's subdivisions to Main Street.

While major intersections along Main Street are controlled with traffic signals, most of the intersections on Main Street and throughout Oakley are controlled with stop signs. Many of the unsignalized intersections on Main Street are located in Oakley's downtown area, where it can be difficult to turn left onto Main Street during peak hours due to the high level of traffic on Main Street. Most stop-controlled intersections in other sections of town are currently operating adequately with this type of control. However, as traffic volumes increase, it is expected that more intersections in Oakley will require traffic signals.



Oakley Long Range Roadway Plan



FEHR & PEERS
TRANSPORTATION CONSULTANTS

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EXISTING CIRCULATION SYSTEM

FIGURE 1

B. Existing Traffic Volumes

Roadway Levels of Service

Transportation professionals grade roadway and intersection operations using the concept of level of service (LOS), a qualitative measurement of facility operation and driver comfort. Level of service grades range from LOS A (free-flowing operation with little or no delay) to LOS F (congested stop-and-go operation with low speeds, substantial delay and long vehicle queues). Table 1 summarizes the LOS grading system. The level at which performance standards have traditionally been established in Oakley is LOS D, which is a common standard used in communities throughout Contra Costa County. Table 2 presents the daily volume thresholds to achieve LOS D for the major roadway types addressed in this plan.

Table 1 Level of Service Descriptions	
Level of Service	Description
A	Insignificant delays; most vehicles do not stop at intersections.
B	Minimal delays; some drivers begin to notice effects of other vehicles.
C	Moderate delays; most drivers feel somewhat restricted by other traffic, and intermittent cycle failures may appear at intersections.
D	Tolerable delays; queues may develop at intersections, but dissipate rapidly.
E	Significant delays; traffic volumes approach capacity, and vehicles may wait through several signal cycles at intersections.
F	Excessive delays; queues may block upstream intersections, and arrival flow rates exceed capacity.

Source: *Highway Capacity Manual, Special Report 209*, Transportation Research Board, 2000.

Table 2 Volume Thresholds for LOS D by Road Type	
Road Classification	Daily Volume
2-lane Collector	12,500
2-lane Rural Undivided Road	16,200
2-lane Arterial	17,800
4-lane Undivided Arterial	33,800
4-lane Divided Arterial	35,600
6-lane Divided Arterial	53,400

Source: *2000 Highway Capacity Manual*

Table 3 compares existing daily roadway volumes with daily roadway capacities, and presents the resulting level of service. The information presented in Table 3 is based on traffic counts conducted in May 2002 and traffic projections from the 2000 East County Traffic Model. Presently, about 65 percent of the roads analyzed are operating at LOS D or better. The remaining 35 percent of the analyzed road segments, all of them located along or adjacent to Main Street, are operating at LOS E or LOS F. While level of service based on average daily traffic volumes is useful for determining the required number of lanes on a road, the primary constraint on roadway capacity is at intersections, which account for most of the delay experienced by drivers. Current intersection operations are further described below.

Intersection Levels of Service

Morning and evening peak hour intersection turning movement counts were conducted at 30 intersections within the City of Oakley in May 2002. Figures 2A through 2C present existing morning (AM) and evening (PM) peak hour turning volumes and intersection configurations at the study intersections.

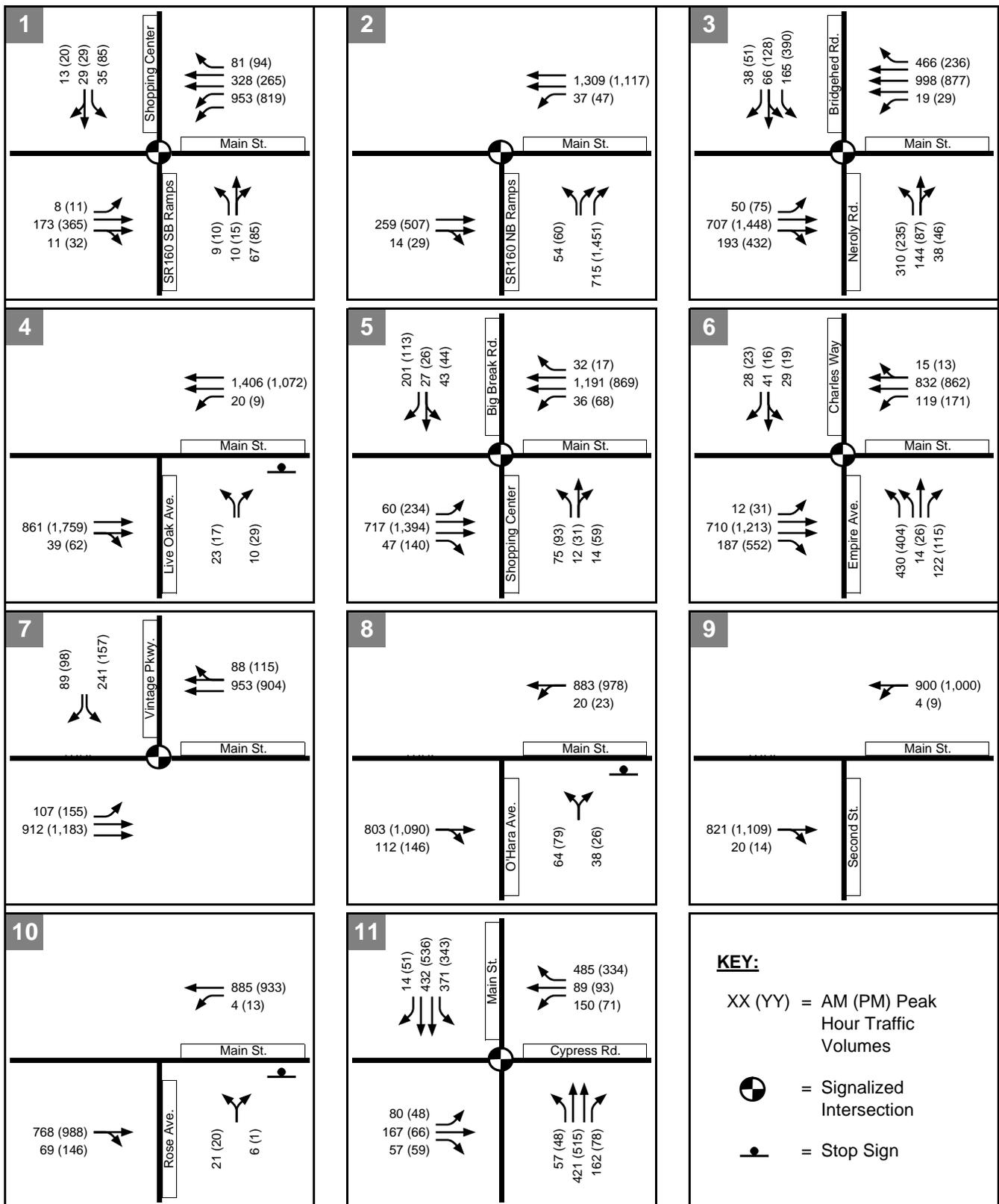
Table 4 documents existing intersection levels of service within Oakley. Six intersections currently operate unacceptably at LOS E or LOS F: four along Main Street (at Live Oak Avenue, O'Hara Avenue, Rose Avenue, and Delta Road); Oakley Road/Neroly Road; and West Cypress Road/Empire Avenue. All are currently side-street, stop-controlled with the exception of Oakley Road/Neroly Road, which is controlled with an all-way stop.

C. Level of Service Standards

All Contra Costa jurisdictions, including the City of Oakley, participate in the Measure C-1988 Growth Management Program. Measure C requires, among other things, that each jurisdiction adopt LOS standards for *Basic Routes* and implement actions and adhere to Traffic Service Objectives (TSOs) for *Routes of Regional Significance* (described in Section II.E). The only Route of Regional Significance in Oakley, which is evaluated according to different criteria than Basic Routes, is Main Street (SR 4).

All other facilities are considered to be Basic Routes. Oakley has adopted LOS D, or a volume-to-capacity (V/C) ratio of 0.90, as the threshold of acceptability for signalized intersections. Any signalized intersection operating worse than LOS D would be considered inconsistent with this standard. Based on current traffic counts, Oakley does not have any signalized intersection on a Basic Route operating below LOS D.

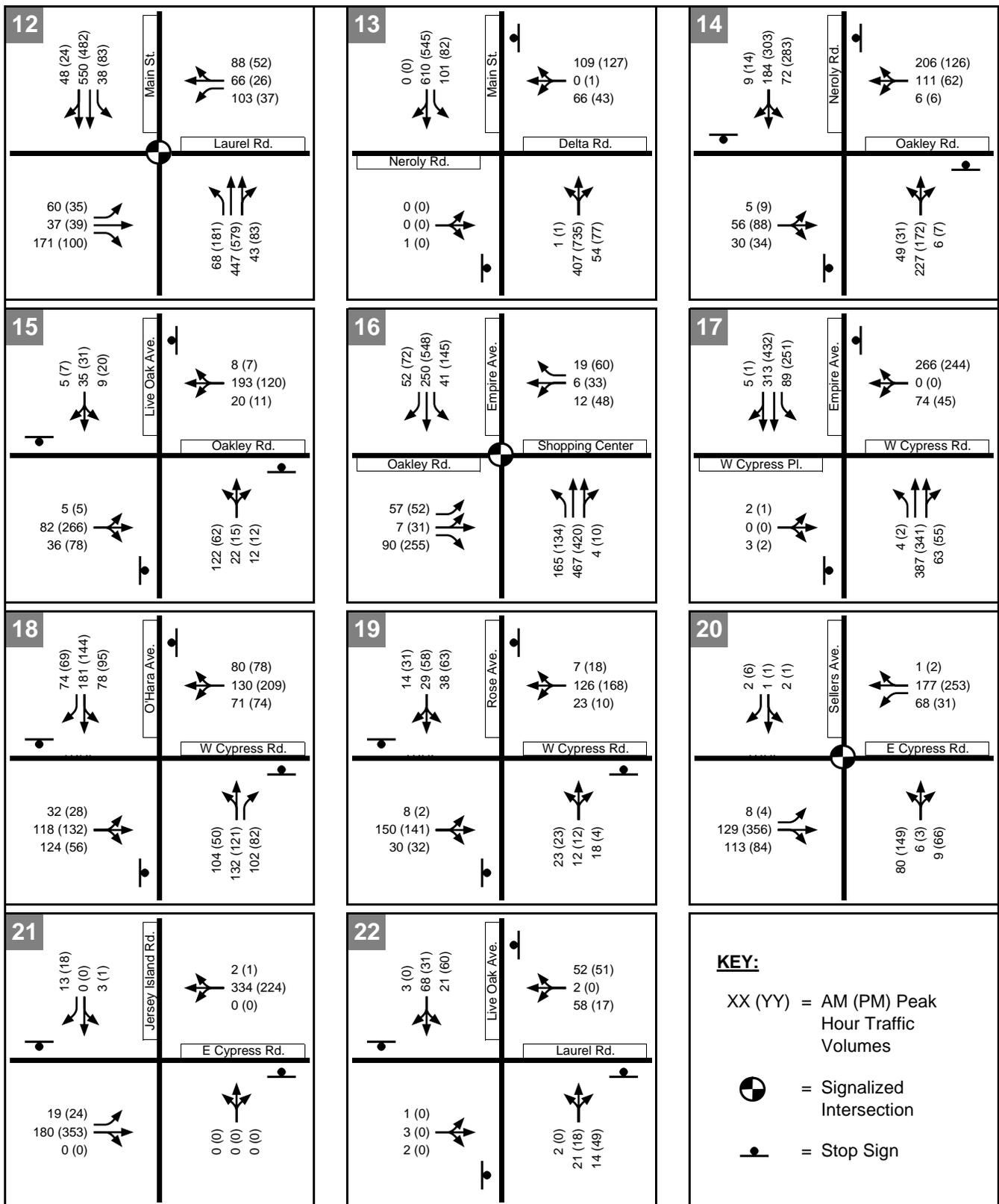
Table 3 Existing Roadway Levels of Service				
Roadway	Road Type¹	Daily Volume²	Capacity³	Level of Service³
Main Street, East of Bridgehead Road	4D	39,500	35,600	F
Main Street, West of Empire Avenue	4D	39,600	35,600	F
Main Street, East of Empire Avenue	4D	31,700	35,600	D
Main Street, West of Vintage Parkway	4U	30,000	35,600	D
Main Street, West of Rose Avenue	2RU	27,800	16,200	F
Main Street, South of Cypress Road	2RU	17,000	16,200	F
Main Street, South of Laurel Road	2RU	21,100	16,200	F
Brentwood Boulevard, South of Delta Road	2RU	23,100	16,200	F
Neroly Road, South of Main Street	2RU	16,200	16,200	E
Cypress Road, East of Main Street	2RU	12,500	16,200	C
Delta Road, East of Brentwood Boulevard	2RU	5,900	16,200	C
Empire Avenue, South of Main Street	4D	11,000	35,600	C
O'Hara Avenue, South of Main Street	2RU	4,000	16,200	C
Empire Avenue, South of Laurel Road	2RU	8,700	16,200	C
O'Hara Avenue, South of Laurel Road	2RU	4,800	16,200	C
Laurel Road, East of O'Hara Avenue	2RU	5,400	16,200	C
Laurel Road, West of Empire Avenue	2RU	4,600	16,200	C
Cypress Road, West of O'Hara Avenue	2RU	2,900	16,200	C
Live Oak Road, South of Main Street	2C	5,700	12,500	C
Carpenter Road, East of O'Hara Avenue	2C	2,000	12,500	C
<p>Notes:</p> <ol style="list-style-type: none"> 1. Road types: 6D – six-lane divided arterial, 4D – four-lane divided arterial, 4U – four-lane undivided arterial, 2U – two-lane undivided arterial, 2C – two-lane collector, 2RU – two-lane rural undivided road. 2. Daily volumes based on traffic counts (2002) and East Contra Costa Travel Demand Model (year 2000). 3. Roadway capacity and level of service based on the <i>2000 Highway Capacity Manual</i>. <p>Source: Fehr & Peers Associates, October 2002.</p>				



Oakley Long Range Circulation Plan

**EXISTING PEAK HOUR TRAFFIC VOLUMES
AND INTERSECTION CONFIGURATION AND CONTROL**

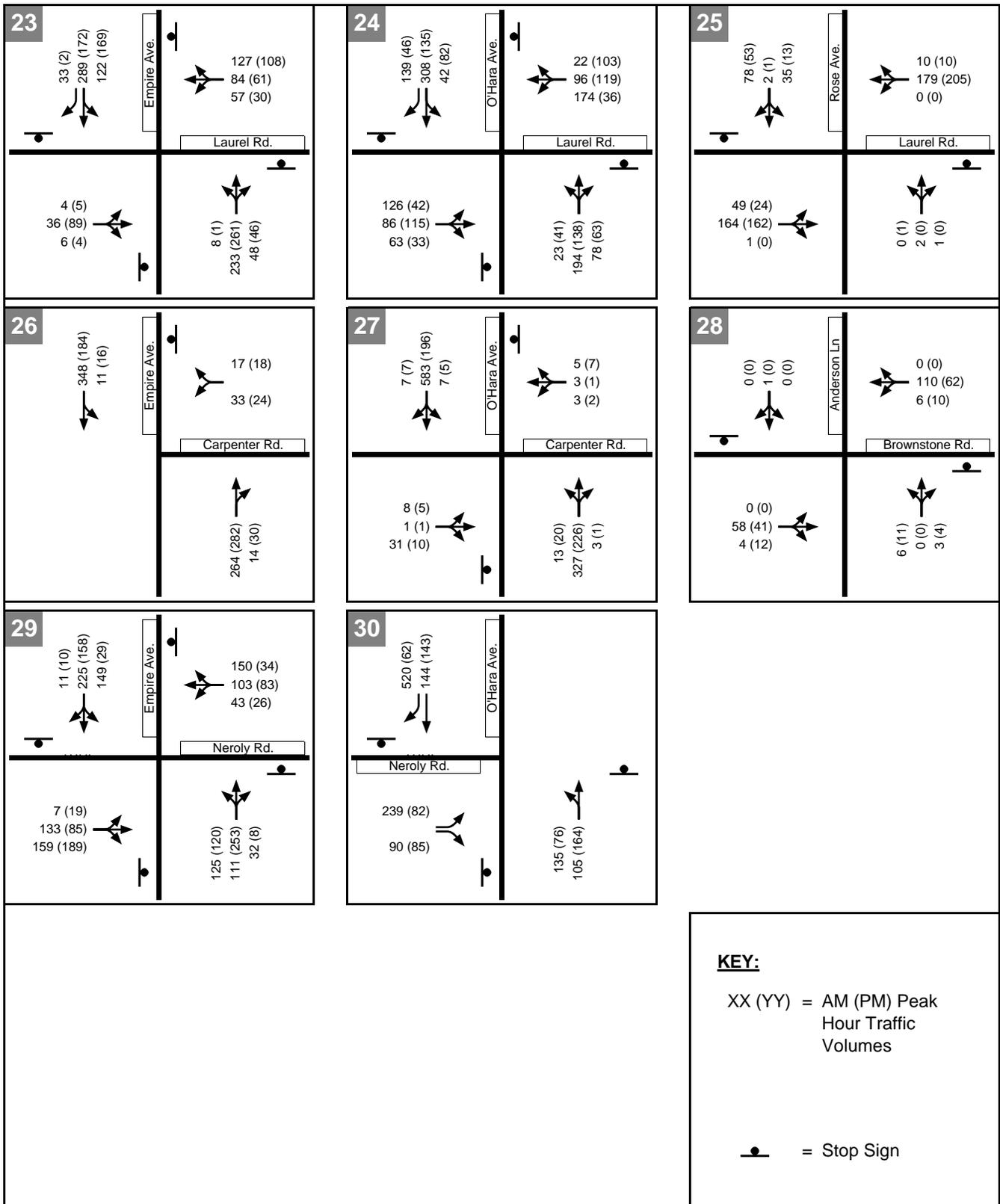
FIGURE 2A



Oakley Long Range Circulation Plan

EXISTING PEAK HOUR TRAFFIC VOLUMES AND INTERSECTION CONFIGURATION AND CONTROL

FIGURE 2B



As mentioned previously, Main Street is a Route of Regional Significance and is subject to special performance standards (i.e., TSOs). The level of service TSO established for Main Street in Oakley is a peak hour LOS D at signalized intersections, and a peak hour LOS E for any individual movement at unsignalized intersections. As shown in Table 4, all signalized intersections along Main Street currently meet the TSO; four unsignalized intersections (Live Oak Avenue, O'Hara Avenue, Rose Avenue, and Delta Road) currently exceed the TSO.

D. Existing Travel Characteristics

The US Census Bureau collects detailed information on where people work and the characteristics of their travel to work. Data from the 2000 Census on the work locations of Oakley residents are currently unavailable from the Census Bureau. The 1990 Census indicated that approximately half of Oakley residents worked in eastern or central Contra Costa County; it is likely that these patterns will shift slightly with the 2000 Census, given the increase in commuting between Oakley and the employment centers of eastern Alameda County and Silicon Valley. The 1990 Census also showed that approximately three-quarters of the people who work in Oakley live in East County.

Data from the 2000 Census are available for choice of commute modes to work. Table 5 compares this information for 1990 and 2000. A large majority of Oakley residents travel to work by car, while small proportions travel by transit or non-motorized modes. Between 1990 and 2000, the proportion of Oakley residents traveling to work using transit and other modes or working from home increased, while the proportion using carpools decreased.

E. Planned Improvements

Contra Costa County Capital Road Improvement Program

Prior to Oakley's incorporation, Contra Costa County provided engineering, construction, and maintenance services for roadway systems in Oakley. Roadway and intersection improvements were included in the County's Capital Road Improvement Program (CRIP). CRIP is a programming document to secure funding for transportation improvements. CRIP improvements in Oakley were primarily funded through the Oakley/North Brentwood Area of Benefit fee program with some additional fund sources including developer participation.

Table 4
Existing Intersection Levels of Service

Intersection		AM			PM		
		V/C	Delay (sec)	LOS	V/C	Delay (sec)	LOS
1	Main Street / SR160 SB Ramps	0.44		A	0.51		A
2	Main Street / SR160 NB Ramps	0.60		A	0.77		C
3	Main Street / Neroly / Bridgehead	0.55		A	0.90		D
4	Main Street / Live Oak Avenue		(NBL) > 50	F		(NBL) > 50	F
5	Main Street / Big Break Road	0.53		A	0.56		A
6	Main Street / Empire Avenue	0.47		A	0.63		B
7	Main Street / Vintage Pkwy	0.50		A	0.48		A
8	Main Street / O'Hara Avenue		(NB) >50	F		(NB) >50	F
9	Main Street / Second Street		(WBL) 1	A		(WBL) 1	A
10	Main Street / Rose Avenue		(NB) >50	F		(NB) >50	F
11	Cypress Road / Main Street	0.54		A	0.45		A
12	Laurel Road / Main Street	0.35		A	0.33		A
13	Delta Road / Main Street		(WB) > 50	F		(WB) > 50	F
14	Oakley Road / Neroly Road		13	B		36	E
15	Oakley Road / Live Oak Avenue		9	A		11	B
16	Oakley Road / Empire Avenue	0.28		A	0.49		A
17	W Cypress Road / Empire Avenue		(WB) 28	D		(WB) 36	E
18	W Cypress Road / O'Hara Avenue		16	C		16	C
19	W Cypress Road / Rose Avenue		9	A		9	A
20	E Cypress Road / Sellers Avenue	0.25		A	0.42		A
21	E Cypress Road / Jersey Island Road		(SBL) 14	B		(SBL) 15	C
22	Laurel Road / Live Oak Avenue		8	A		7	A
23	Laurel Road / Empire Avenue		17	C		14	B
24	Laurel Road / O'Hara Avenue		23	C		12	B
25	Laurel Road / Rose Avenue		(NB) 12	B		(NB) 13	B
26	Carpenter Road / Empire Avenue		(WB) 14	B		(WB) 12	B
27	Carpenter Road / O'Hara Avenue		(WB) 18	C		(EB) 11	B
28	Brownstone Road / Anderson Lane		(SB) 10	B		(NB) 9	A
29	Neroly Road / Empire Avenue		23	C		15	B
30	Neroly Road / O'Hara Avenue		21	C		10	A

Notes:
Results shown as V/C (volume-to-capacity) ratio for signalized intersections, and average delay for unsignalized intersections. Signalized intersection operations analyzed using the CCTALOS methodology (see *Technical Procedures*, CCTA, September 17, 1997), and unsignalized intersection operations analyzed consistent with the *2000 Highway Capacity Manual* methodologies. For unsignalized intersections, delay is shown for the worst movement or approach; for example, WB = westbound approach, and NBL = northbound left-turn movement.

Source: Fehr & Peers Associates, October 2002.

Table 5 Journey to Work Modal Shares of Oakley Residents		
Transportation Mode	1990	2000
Drive Alone	77.5%	77.6%
Carpool	18.6%	14.6%
Bus / Rail	2.0%	2.3%
Bicycle / Walk	1.1%	1.4%
Other ¹	0.8%	4.1%
Total	100%	100%
Notes: ¹ Includes working at home. Source: 1990 and 2000 Census.		

The 1997/98 through 2003/04 CRIP included the following roadway improvements in Oakley¹:

- A traffic signal at the intersection of Laurel Road/Empire Avenue;
- Extension of Laurel Road to future interchange with the SR 4 Bypass (construction was not scheduled within the CRIP timeframe);
- Widening of Laurel Road from Rose Avenue to SR 4 (two-lane arterial standards); and
- Widening of Laurel Road from Brown Road to Neroly Road (two-lane arterial standards).

Oakley/North Brentwood Area of Benefit

In 1987, the Contra Costa Board of Supervisors adopted the “Oakley/North Brentwood Area of Benefit (AOB)” to improve the safety and capacity of the circulation system in Oakley and surrounding areas. This AOB expanded the area and scope of the original “Oakley Area of Benefit” adopted in 1985. The AOB and its associated traffic impact fee are intended to fund the construction of major thoroughfare improvements to serve the land use in the Oakley/North Brentwood section of the County General Plan.

The AOB fee only funds the minimum interim roadway improvements needed to meet traffic service level and safety standards. Capital improvements eligible for AOB funding include the basic pavement width to accommodate the needed lanes, necessary intersection improvements (turning lanes and channelization), and traffic signals. The AOB does not

¹ The most recent CRIP (2001/02 through 2007/08) was published after the incorporation of Oakley as a City in 1999; therefore, the document does not include any roadway improvement projects in Oakley.

fund design elements considered not to have a direct effect on capacity, such as raised medians, general street lighting, landscaping, extensive storm drain systems, curbs and sidewalks, or ultimate right-of-way to provide these design elements.

East County Action Plan

The Action Plan for Routes of Regional Significance in Eastern Contra Costa County (June 2000) is a planning document mandated by the County's Measure C Growth Management Program (1988). The vision of the action plan is to improve mobility, sustain economic vitality, and maintain a favorable quality of life in eastern Contra Costa County.

Routes of Regional Significance in Oakley

A designation as a "Route of Regional Significance" in the East County Action Plan indicates that the facility connects two or more regions of the County, carries a significant amount of through traffic, and provides access to a regional highway or transit facility. Routes of Regional Significance may benefit from regional traffic impact fees. Main Street (SR 4) from SR 160 to the Oakley/Brentwood city limit boundary is the only designated Regional Route in Oakley. Routes of Regional Significance in the vicinity of Oakley include SR 160, Lone Tree Way, Hillcrest Avenue and the future SR 4 Bypass.

The level of service TSOs for Main Street within Oakley were previously discussed in Section II.C. An additional TSO for Main Street is to achieve a Delay Index of less than 2.5.² Another TSO that applies to East County is to increase transit ridership by 25 percent between 2000 and 2010.

The East County Action Plan includes the following roadway action items to be implemented by the year 2010 in and around the City of Oakley:

- Construct the SR 4 Bypass as a four-lane expressway from the SR 4 freeway to Balfour Road in Brentwood;
- Widen SR 4 through the City of Oakley to four travel lanes; and
- Widen the SR 4 freeway to eight travel lanes from Bailey Road in Pittsburg to the SR 4 Bypass.

² The Delay Index is calculated by dividing the peak hour travel time for a given road segment by the free-flow off-peak travel time for the same segment. For example, a Delay Index of 3.0 means that it will take three times as long to traverse a segment of road in the peak hour than it does in the off-peak. This TSO was developed to reflect that there will be significant through traffic and congestion in the peak hours on regional routes, and that more flexible standards are required to address traffic impacts.

Contra Costa County General Plan

The *Contra Costa County General Plan, 1995-2010* (Contra Costa County, 1996) establishes the transportation goals, policies, and implementation measures for the County's long range (year 2010) circulation system. The circulation element of the General Plan addresses all modes of travel including vehicular, freight, transit, bicycling, air, water, and rail. Within the Oakley area, the General Plan proposes the following roadway improvements:

- SR 4 Bypass;
- Connection of Laurel Road to the Bypass via an interchange;
- Empire Avenue extension south to Brentwood;
- O'Hara Avenue extension south to Brentwood;
- East Cypress connection to Laurel Road (a new road that connects East Cypress Road from east of Main Street to Laurel Road); and
- Delta Road connection to Lone Tree Way (a new road that connects Delta Road from east of Main Street to Lone Tree Way).

The last two roadway improvements are intended to route high volumes of traffic from eastern unincorporated Contra Costa County (Bethel Island and Knightsen) to roads that connect to the SR 4 Bypass.

The Oakley/North Brentwood section of the County General Plan includes the following additional roadway improvements:

- Brown Road collector extension from Laurel to Neroly;
- Carpenter Road collector extension from O'Hara to SR 4;
- Rose Avenue collector extension from Laurel to Brownstone;
- Del Antico Avenue realignment and extension to Rose;
- Neroly Road arterial extension from O'Hara to SR 4; and
- Downtown Oakley one-way couplet (Main and Acme).

The last item on the list (Downtown couplet) has been superseded by the recent Old Town Specific Plan, which proposes alternatives to the couplet concept.

Contra Costa Countywide Comprehensive Transportation Plan

The *Contra Costa Countywide Comprehensive Transportation Plan* (CCTA, 2000) addresses region-wide transportation issues. In the East County area, the Comprehensive Transportation Plan reflects the regional roadway improvements stated above, namely the construction of the SR 4 Bypass and widening of the SR 4 freeway.

Contra Costa Congestion Management Program

The Contra Costa *Congestion Management Program* (CMP) was updated in 2001 to respond to changes brought about by the passage of Senate Bill 45. The CMP contains specific components as defined in the CMP legislation including: 1) traffic level of service standards, 2) multi-modal performance measurements, 3) a 7-year capital improvement program (CIP), 4) a land use impact analysis program, and 5) a travel demand management element. The 7-year CIP in the 2001 CMP update includes the following roadway improvements:

- SR 4 Bypass;
- Extension of Laurel Road to SR 4 Bypass;
- Main Street Bypass in downtown Oakley; and
- Widening of SR 4 (non-freeway) in Oakley.

The Local Compliance Guide of the CMP presents traffic LOS standards for the following intersections in Oakley that are part of the CMP network:

- Main Street/Neroly Road – LOS E
- Main Street/Big Break Road – LOS E
- Main Street/Empire Avenue – LOS E
- East Cypress Road/Main Street – LOS E

Based on the 2000 CMP *Level of Service Compliance Monitoring Report*, as well as the LOS results presented in Table 4, all CMP intersections in Oakley meet the LOS standards established in the Local Compliance Guide.

III. FUTURE CONDITIONS

A. Long Range Land Use Projections

Table 6 presents the growth forecast for Oakley between 2000 and the buildout of the Oakley General Plan Preferred Alternative. These projections show an increase of 133 percent in the number of households. Employment is projected to grow at a much greater rate, particularly in the retail sector. Appendix A contains a detailed breakdown of future land use projections in the Oakley area.

Table 7 compares population and employment growth in the neighboring cities of Antioch and Brentwood, and county-wide. Based on the recently updated General Plan, Brentwood's population is projected to grow by 202 percent in the next 25 years; regional forecasts predict that Antioch's population is expected to grow by 30 percent. (Antioch is currently in the process of updating its General Plan, and future land use forecasts for that city may change as a result.) County-wide, population is projected to grow by 24 percent over the next 25 years.

The Brentwood General Plan shows substantial growth in employment (over 500 percent) over the next 25 years, compared to Antioch's 78 percent and the County's 37 percent employment growth rates.

Table 6 Growth in Oakley Year 2000 to General Plan Buildout			
	Year		Percent Change
	2000¹	Buildout²	
Households	9,265	21,565	133%
Household Population	27,864	68,451	146%
Total Employees	4,168	34,486	727%
Service Employees	796	8,160	925%
Retail Employees	322	17,192	5,239%
Other Employees	3,053	9,134	199%
1. Based on Association of Bay Area Governments (ABAG) <i>Projections 2000</i> data for City of Oakley and the Oakley sphere of influence (SOI) area. 2. Based on buildout of the Oakley General Plan Preferred Alternative for City of Oakley and the SOI area. Source: PMC, Fehr & Peers Associates, June 2002.			

Table 7 Comparison of Growth in Neighboring Cities and Countywide Year 2000 to 2025						
Jurisdiction	Population		Percent Change	Employment		Percent Change
	Year 2000	Year 2025		Year 2000	Year 2025	
Oakley	27,900	68,500	146%	4,200	34,500	727%
Brentwood	23,300 ¹	70,400 ²	202%	5,200 ¹	32,100 ²	517%
Antioch	90,500 ¹	117,500 ³	30%	16,300 ¹	29,000 ³	78%
Countywide	949,000 ¹	1,180,000 ³	24%	361,000 ¹	495,000 ³	37%

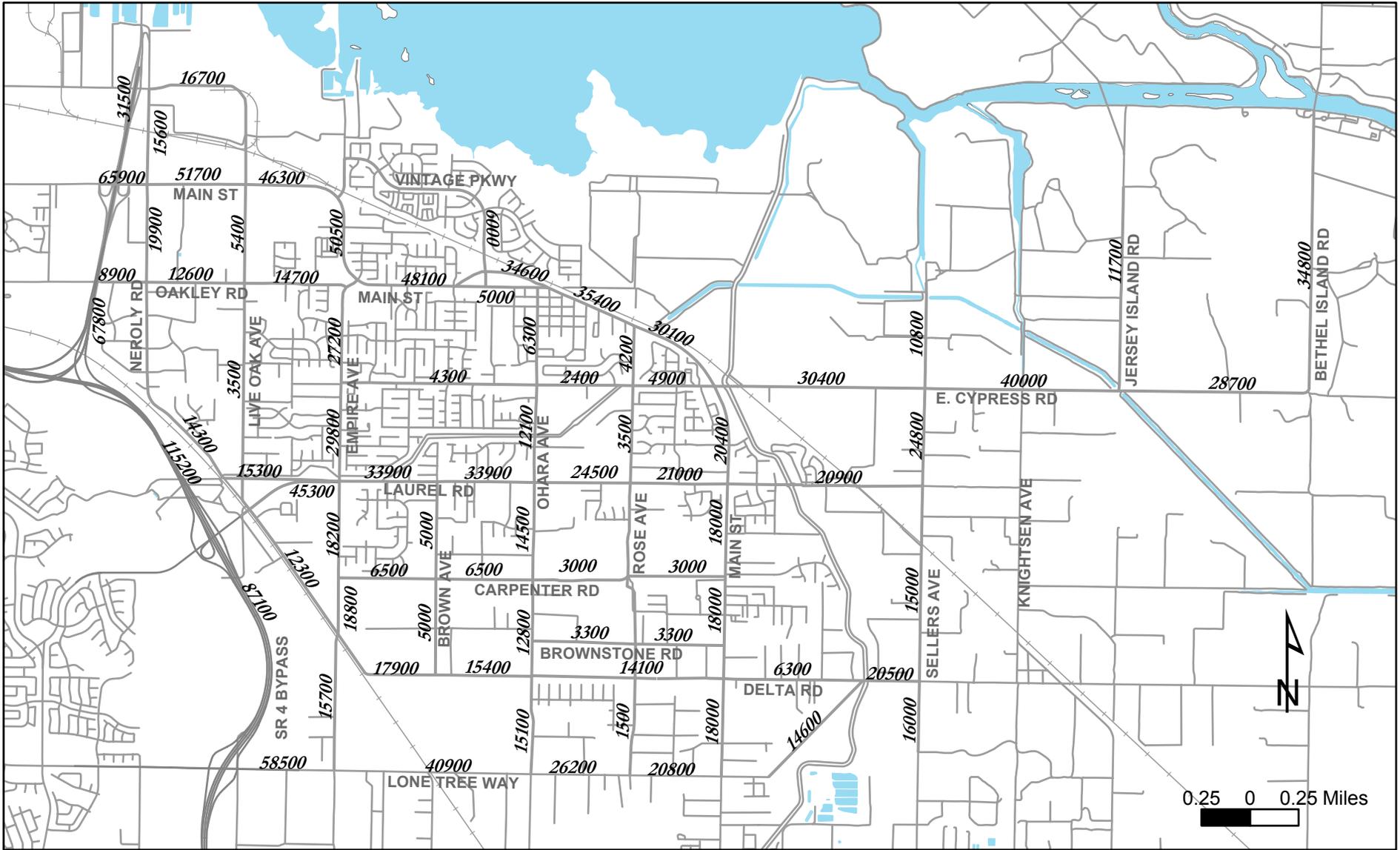
Notes:
1. Based on Association of Bay Area Governments (ABAG) *Projections 2000* for the year 2000.
2. Based on *Brentwood General Plan 2001 Update* (Fehr & Peers Associates, November 2001).
3. Based on ABAG *Projections 2000* for the year 2025.
Source: Fehr & Peers Associates, October 2002.

B. Long Range Traffic Conditions

The Contra Costa Transportation Authority (CCTA) develops, maintains, and controls the use of the East County Travel Demand Model. This sub-regional model is the basis for most long-range planning conducted in East County. The model forecasts traffic volumes based on population and employment projections, and assumptions on future improvements to the transportation system. The model was used to estimate traffic volumes assuming the buildout of the Oakley General Plan Preferred Alternative, as well as growth in neighboring cities, consistent with their current adopted General Plans.

Table 8 and Figure 3 present future average daily traffic volumes on key roadway segments in Oakley as projected by the East County Travel Demand Model. Table 8 also shows levels of service associated with these traffic volumes based on the road's present capacity. As shown, 12 of the 20 segments (60 percent) are expected to have volumes that approach or exceed the road's current capacity (LOS E or LOS F).

Table 8 Future Roadway Levels of Service Based on Existing Road Widths Year 2025				
Roadway	Road Type¹	Daily Volume²	Capacity³	Level of Service³
Main Street, East of Bridgehead Road	4D	51,700	35,600	F
Main Street, West of Empire Avenue	4D	50,500	35,600	F
Main Street, East of Empire Avenue	4D	48,100	35,600	F
Main Street, West of Vintage Parkway (Downtown Bypass)	4U	34,600	35,600	E
Main Street, West of Rose Avenue	2RU	35,400	16,200	F
Main Street, South of Cypress Road	2RU	20,400	16,200	F
Main Street, South of Laurel Road	2RU	18,000	16,200	F
Brentwood Boulevard, South of Delta Road	2RU	18,000	16,200	F
Neroly Road, South of Main Street	2RU	19,900	16,200	F
Cypress Road, East of Main Street	2RU	30,400	16,200	F
Delta Road, East of Brentwood Boulevard	2RU	6,300	16,200	C
Empire Avenue, South of Main Street	4D	27,200	35,600	C
O'Hara Avenue, South of Main Street	2RU	6,300	16,200	C
Empire Avenue, South of Laurel Road	2RU	18,200	16,200	F
O'Hara Avenue, South of Laurel Road	2RU	14,500	16,200	D
Laurel Road, East of O'Hara Avenue	2RU	24,500	16,200	F
Laurel Road, West of Empire Avenue	2RU	45,300	16,200	F
Cypress Road, West of O'Hara Avenue	2RU	4,300	16,200	C
Live Oak Road, South of Main Street	2C	5,400	12,500	C
Carpenter Road, East of O'Hara Avenue	2C	3,000	12,500	C
Notes:				
1. Road types: 6D – six-lane divided arterial, 4D – four-lane divided arterial, 4U – four-lane undivided arterial, 2U – two-lane undivided arterial, 2C – two-lane collector, 2RU- two-lane rural undivided road.				
2. Daily volumes based on East Contra Costa Travel Demand Model (year 2002).				
3. Roadway capacity and level of service based on the <i>2000 Highway Capacity Manual</i> .				
Source: Fehr & Peers Associates, October 2002.				



Oakley Long Range Roadway Plan



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FUTURE DAILY TRAFFIC VOLUMES AT GENERAL PLAN BUILDOUT

FIGURE 3

IV. LONG RANGE ROADWAY PLAN

A. Recommended Circulation Improvements

Roadway Level of Service and Sizing

The improvements planned for Oakley, as summarized in Section II.E, result in a comprehensive circulation system, where the 1-mile grid of arterials and ½-mile grid of collector streets provide an adequate level of street connectivity for regional and local travel. Combined with the proposed connections to the SR 4 Bypass at Laurel Road and Lone Tree Way, the planned circulation system appears to be optimal in terms of connectivity. The recommendations of this long range plan are consistent with the planned improvements in terms of roadway alignment, street connectivity, and the completion of the grid system. The primary differences between the proposed long range plan and the current planned improvements are the size and type of roadways recommended for various segments, which is partially determined by the desired level of service.

As part of this study, the costs and benefits of establishing LOS C or LOS D standards were analyzed.³ Because of the high cost of improvements necessary to achieve LOS C, and because LOS D is the performance threshold in use in many Contra Costa County jurisdictions, the City adopted LOS D as the standard for transportation system performance. Table 9 presents recommended roadway widths and future level of service based on the analysis conducted for this long range plan. Figure 4 presents a diagram of the recommended roadway system. The recommended road sizes are based on the LOS D capacity thresholds presented earlier, as well as consideration on the types and intensities of land uses envisioned to occur adjacent to each road. For example, in some instances, the projected traffic volumes on a road segment might justify construction of a two-lane road, but consideration of the adjacent land uses or the types of vehicles associated with those uses indicate that a four-lane road would be more appropriate.

As shown in Table 9, all of the road segments would operate at LOS D or better except the segment of Main Street east of Empire Avenue. This segment of Main Street has a built-out frontage and cannot be substantially widened without physical impacts. However, the need for widening this segment is partially dependent on the effectiveness of the proposed Laurel/Cypress connector and the Downtown Bypass; therefore, the capacity needs for this segment will be more fully investigated as more detailed plans for these additional projects are developed.

³ For a detailed discussion of the relative costs for establishing LOS C or LOS D standards, please see the memorandum from Fehr & Peers Associates to the City of Oakley dated September 24, 2002.

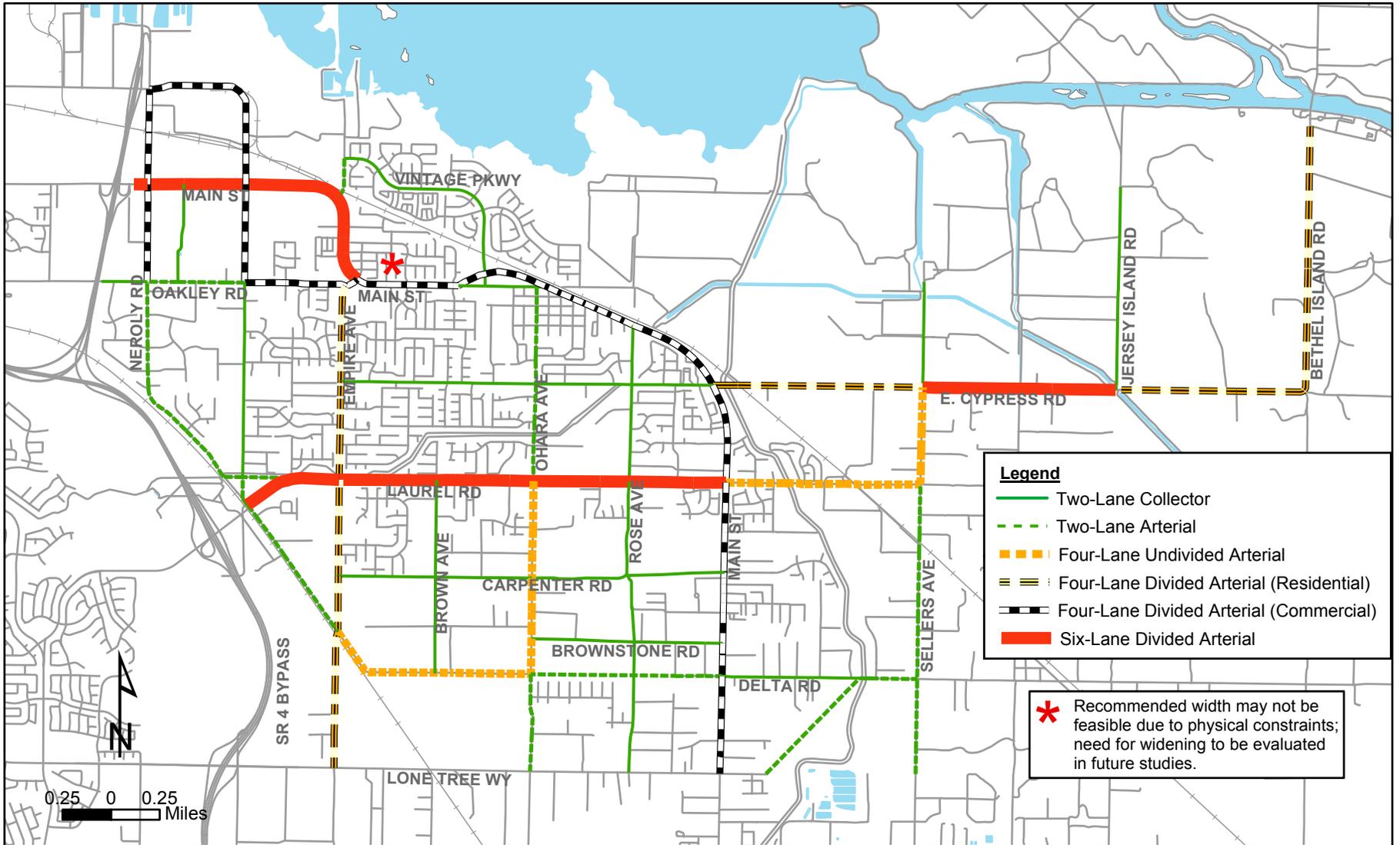
**Table 9
Future Roadway Levels of Service With Recommended Road Width
Buildout of General Plan Land Use**

Roadway	Daily Volume ¹	Capacity ²	Level of Service	Recommended Road Width ³
Main Street W. of Bridgehead Rd.	65,900	53,400	D	6D ⁴
Main Street E. of Bridgehead Rd.	51,700	53,400	D	6D
Main Street W. of Empire Ave.	50,500	53,400	D	6D
Main Street E. of Empire Ave.	48,100	53,400	D	4D - 6D ⁵
Main Street W. of Vintage Pkwy. (Downtown bypass)	34,600	35,600	D	4D
Main Street W. of Rose Ave.	35,400	35,600	D	4D
Main Street S. of Cypress Rd.	20,400	35,600	C	4D
Main Street S. of Laurel Rd.	18,000	35,600	C	4D
Brentwood Blvd. S. of Delta Rd.	18,000	35,600	C	4D
Bridgehead Rd. N. of Main St.	15,600	35,600	C	4D
Neroly Rd. S. of Main St.	19,900	35,600	C	4D
Neroly Rd. W. of Laurel Rd.	15,300	17,800	D	2U
Live Oak Rd. S. of Main St.	5,400	12,500	C	2C
Empire Ave. S. of Main St.	27,200	35,600	C	4D
Empire Ave. S. of Laurel Rd.	18,200	35,600	C	4D
Vintage Pkwy. N. of Main St	6,000	12,500	C	2C
O'Hara Ave. S. of Main Street	6,300	12,500	C	2C
O'Hara Ave. S. of Laurel Rd.	14,500	35,600	C	4D
Sellers Ave. N. of E. Cypress Rd.	10,800	12,500	D	2C
Sellers Road S. of E. Cypress Rd.	24,800	33,800	C	4U
Sellers Ave. S. of Laurel Rd.	15,000	17,800	D	2U
Jersey Is. Rd. N. of E. Cypress Rd.	11,700	12,500	D	2C
Bethel Is. Rd. N. of E. Cypress Rd.	34,800	35,600	D	4D
Wilbur Ave. E. of Bridgehead Rd.	16,700	35,600	C	4D
Oakley Rd. W. of Empire Ave.	14,700	35,600	C	4D
Cypress Rd. W. of O'Hara Ave.	4,300	12,500	C	2C
E. Cypress Rd. E. of Main St.	30,400	35,600	C	4D
E. Cypress Rd. E. of Sellers Ave.	40,000	53,400	C	6D
E. Cypress Rd. E. of Jersey Is. Rd.	28,700	35,600	C	4D
Laurel Rd. W. of Empire Ave.	45,300	53,400	C	6D
Laurel Rd. E. of Empire Ave.	33,900	35,600	D	4D ⁶
Laurel Rd. E. of O'Hara Ave.	24,500	35,600	C	4D ⁶
Laurel Rd. E. of Main Street	20,900	33,800	C	4U
Carpenter Rd. E. of O'Hara Ave.	3,000	12,500	C	2C
Neroly Rd. E. of Empire Ave.	17,900	33,800	C	4U
Neroly Rd. W. of Main St.	14,100	17,800	C	2U
Delta Rd. E. of Brentwood Blvd.	6,300	17,800	C	2U
Delta Rd. E. of Lone Tree Connector	20,500	33,800	C	2U - 4U

Notes:

1. Based on East Contra Costa Travel Demand Model (year 2025).
2. Based on the 2000 *Highway Capacity Manual*.
3. Lane abbreviations are as follows:
6D – six-lane divided arterial, 4D – four-lane divided arterial, 4U – four-lane undivided arterial, 2U – two-lane undivided arterial, 2C – two-lane collector.
4. May require localized widening to accommodate westbound left-turning vehicles and northbound right-turning vehicles at freeway ramps; overall cross-section remains as a six-lane divided arterial.
5. Substantial widening is not feasible without acquiring right-of-way through developed property.
6. Along this section of Laurel Road, right-of-way for 6 lanes will be preserved.

Source: Fehr and Peers Associates, October 2002.



Oakley Long Range Roadway Plan



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RECOMMENDED ROADWAY CLASSIFICATIONS

FIGURE 4

Figures 5A through 5C illustrate the proposed street cross-sections for the recommended street types in the circulation plan. These street types are consistent with those presented in the Circulation Element of the General Plan.

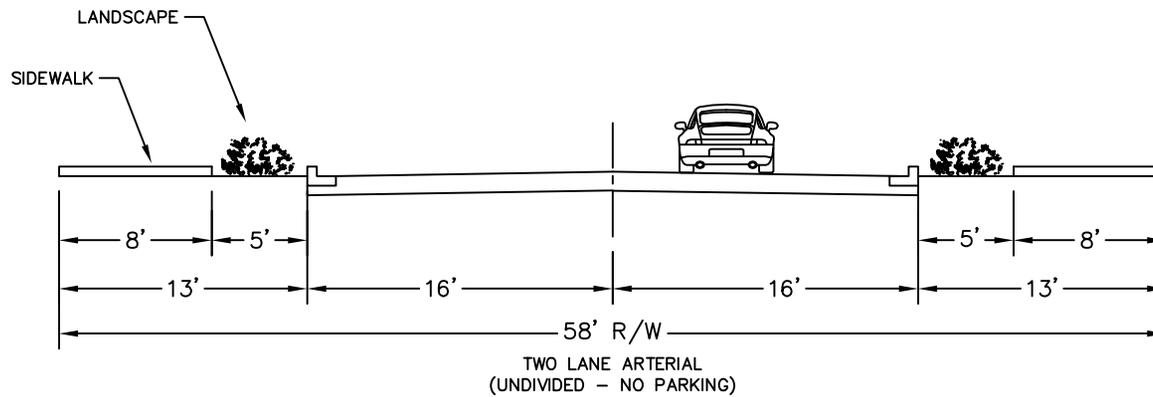
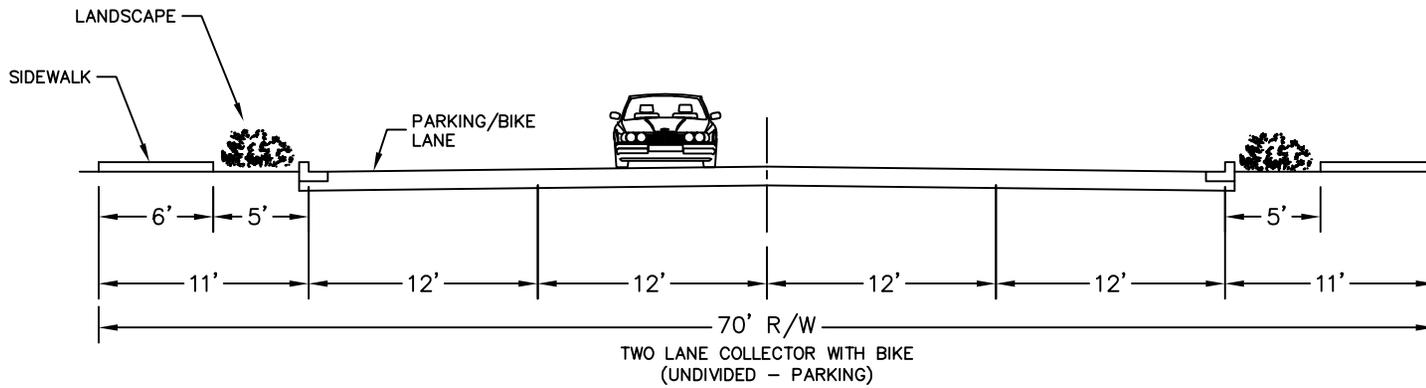
While it is difficult to forecast intersection turning movement volumes under very long range conditions, it is possible to identify intersection locations likely to require installation of traffic signals given the recommended roadway types. In order to safely accommodate the traffic volumes forecasted in this analysis, it is recommended that traffic signals be installed at all intersections of four-lane streets, and at intersections of two-lane collectors with four-lane arterials. The likely locations of future traffic signals are shown on Figure 6.

Downtown Main Street Options

The City of Oakley is considering two options for the treatment of SR 4 through the downtown area. The Old Town Oakley Specific Plan prepared in 1999 proposed three alternative plans for widening and/or realigning SR 4 through the downtown.

- Alternative A (Widen in Place) – Widening SR 4 to a four-lane divided road in its current alignment from 2nd Street to Vintage Parkway.
- Alternative B (General Plan Couplet) – A one-way couplet utilizing Main Street as the westbound direction and Acme Street as the eastbound direction.
- Alternative C (North Realignment) – Realigning SR 4 north of Main Street and reconnecting to Main Street west of Vintage Parkway. This alternative includes extending Norcross Lane and O’Hara Avenue to intersect the realigned SR 4.

Subsequent to the completion of the Old Town Oakley Specific Plan, the project’s advisory committee eliminated Alternative B from further consideration. Figure 7A illustrates the two remaining alternatives. Alternative C has been recommended due to its advantages from a transportation perspective and its benefits to the vitality of the downtown. Alternative C provides a high-capacity bypass of the downtown area, and maintains adequate downtown access. Alternative C allows Main Street to revert to a true “main street” serving downtown businesses and creating a pedestrian-oriented area without the barrier created by SR 4.

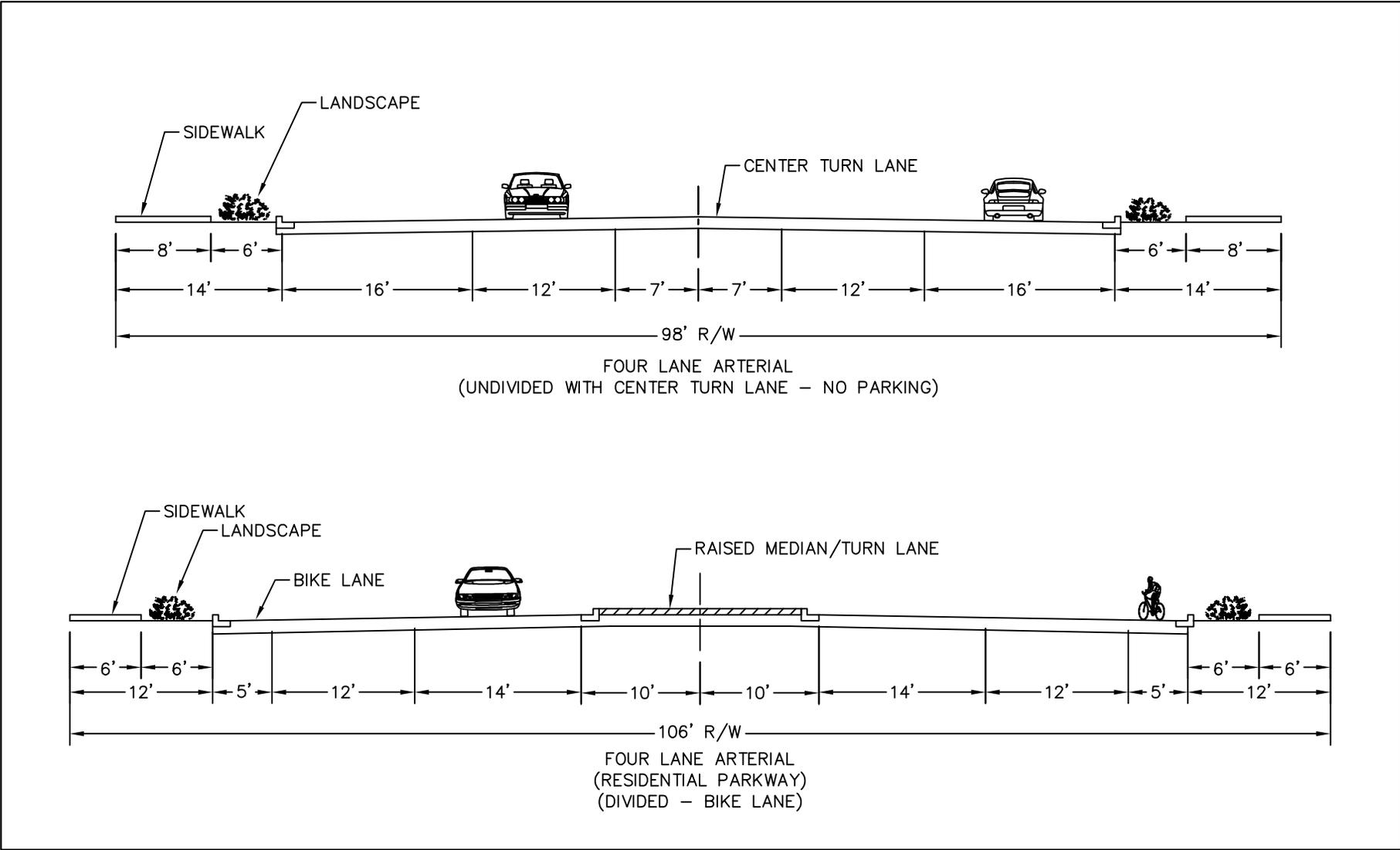


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Oakley Long Range Circulation Study

RECOMMENDED STREET CROSS-SECTIONS
FIGURE 5A

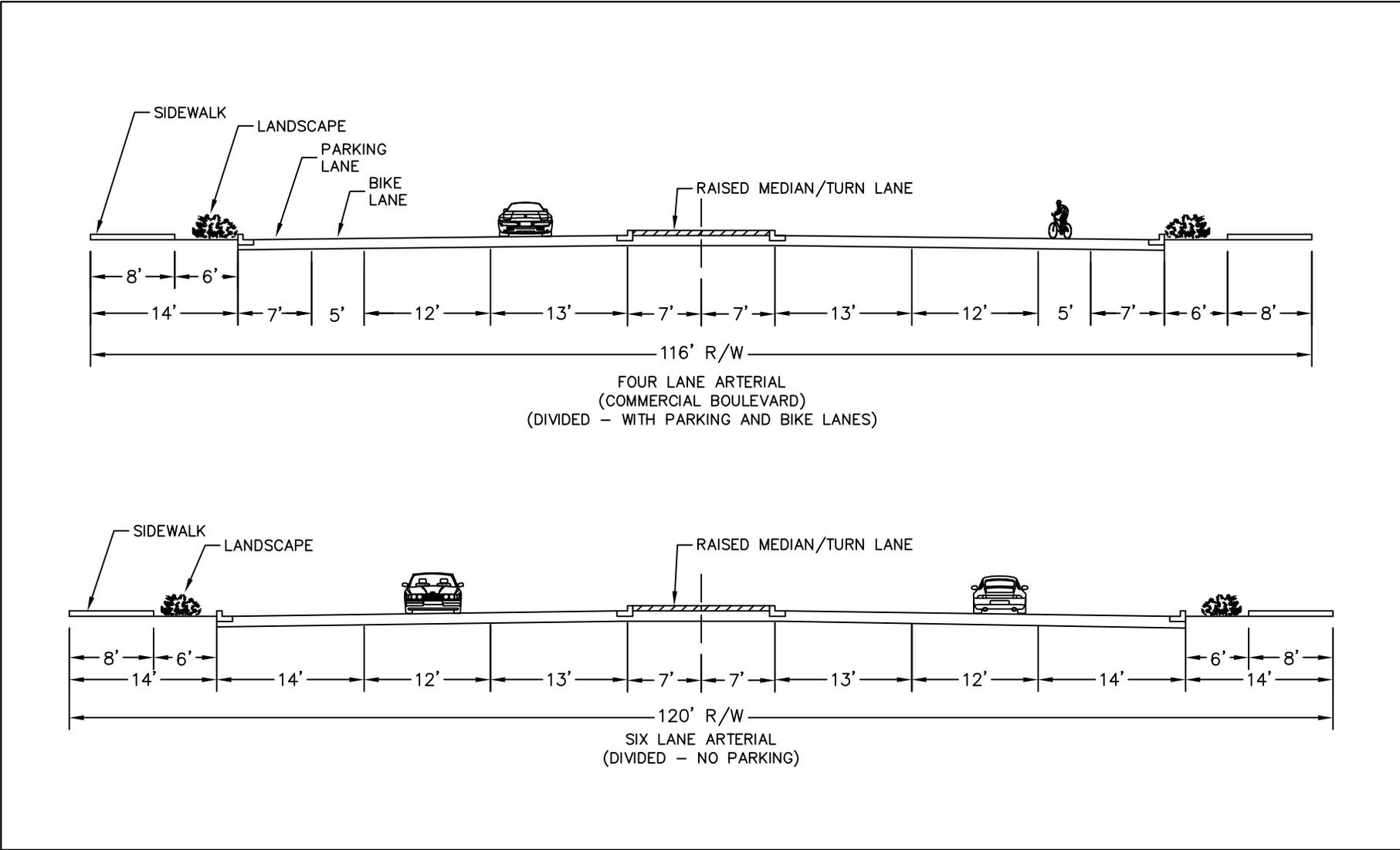


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Oakley Long Range Circulation Study

RECOMMENDED STREET CROSS-SECTIONS
FIGURE 5B

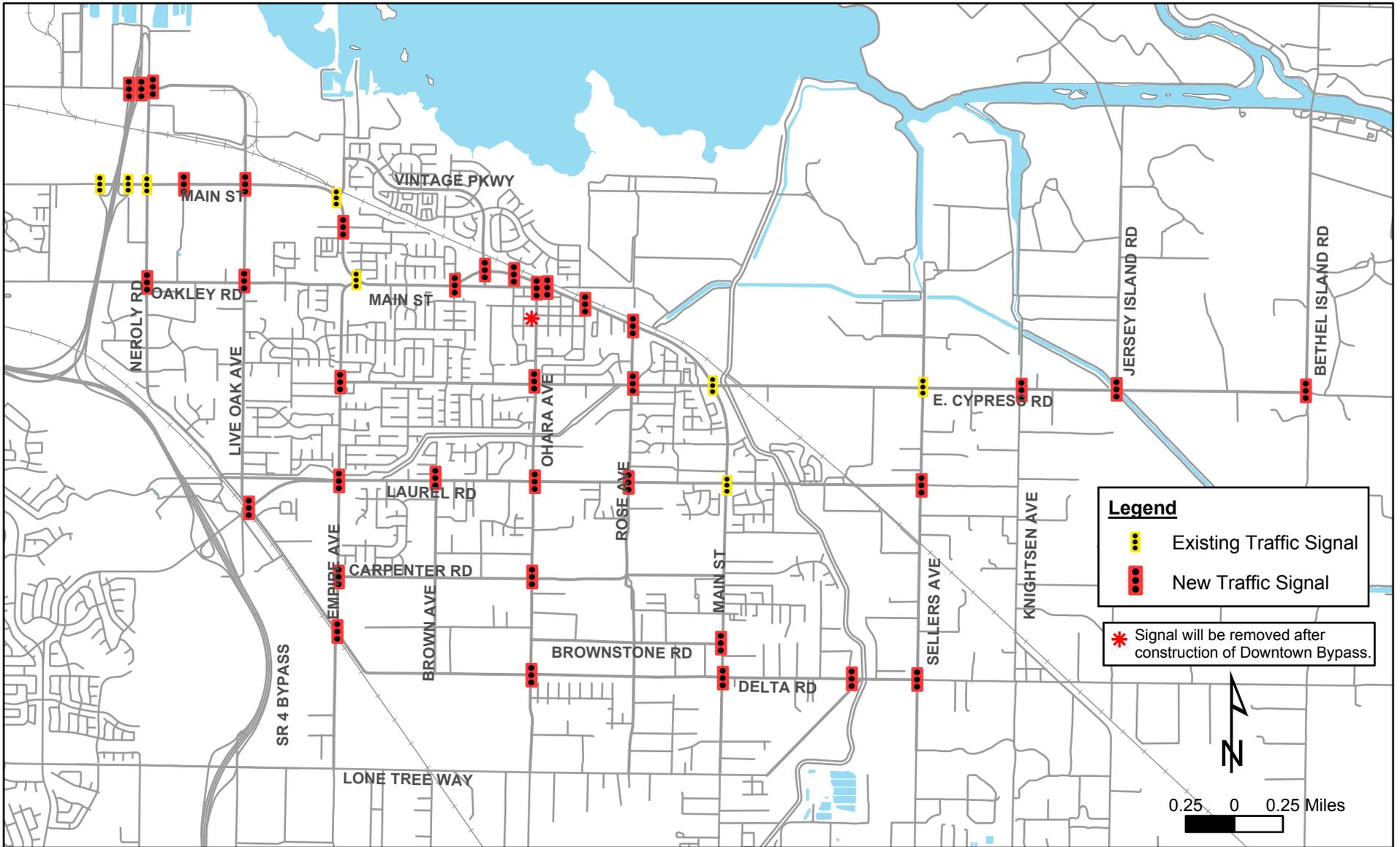


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Oakley Long Range Circulation Study

RECOMMENDED STREET CROSS-SECTIONS
FIGURE 5C



Oakley Long Range Roadway Plan

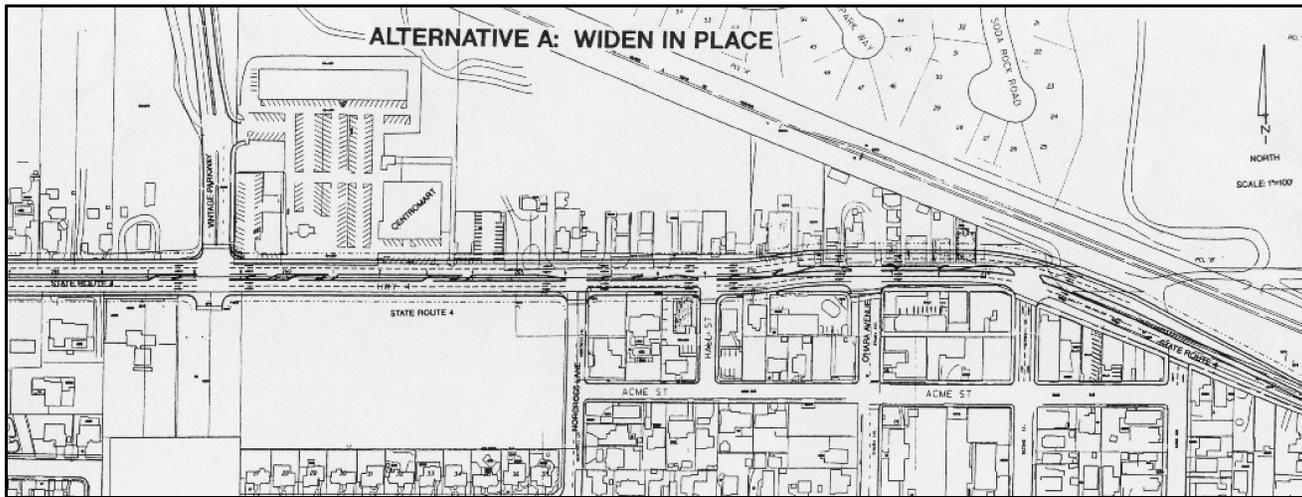
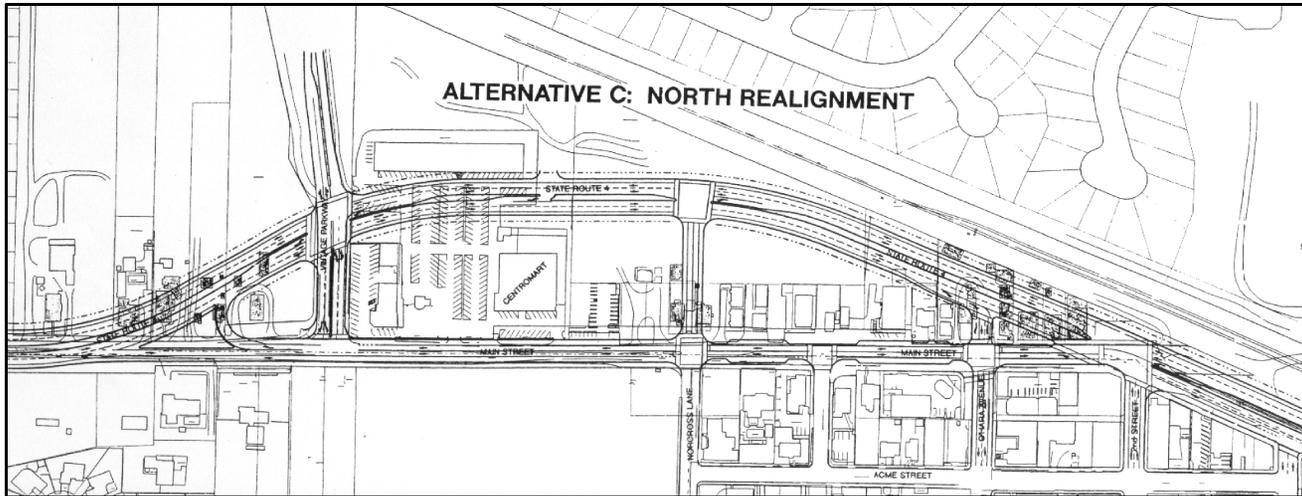


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TRAFFIC SIGNAL LOCATIONS

FIGURE 6



NORTH
SCALE 1"=100'



SOURCE: Old Town Oakley Specific Plan



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Oakley Long Range Circulation Plan

DOWNTOWN MAIN STREET OPTIONS

FIGURE 7A

Figure 7B schematically illustrates the recommended downtown circulation system incorporating the Alternative C concept. In addition to the north realignment of SR 4, Figure 7B illustrates other recommendations including:

- The elimination of one-way streets in the downtown areas as isolated, unpaired one-way streets lead to confusion and result in a circuitous circulation system; and
- The provision of a traffic signal at 4th Street and Main Street to provide alternative access to SR 4 from the downtown area, Home Street, and Las Dunas Avenue.

B. Order-of-Magnitude Cost Estimates

Cost estimates have been divided into the following three components, which are further discussed below:

- Roadway Construction
- Right-of-Way Acquisition; and
- Miscellaneous Items

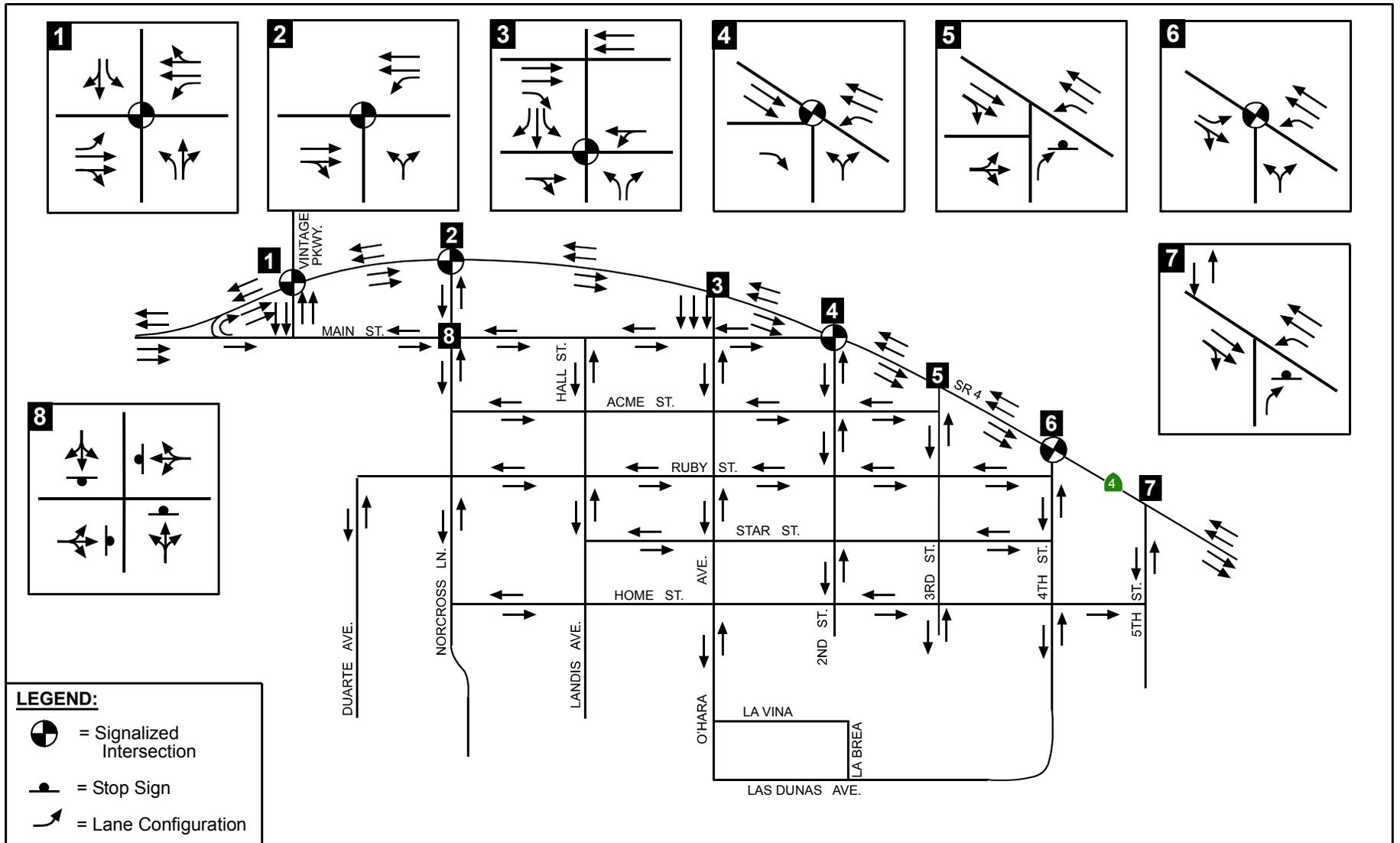
Roadway Construction

Table 10 presents order-of-magnitude roadway construction cost estimates to implement the long range roadway plan. The cost estimates are based on urban standards that include sidewalks, landscaping, curb and gutter, drainage, lighting, etc., as shown in the street cross-sections and in the unit cost details provided in Appendix B. The cost estimates do not include traffic signals, railway crossings, or canal/creek bridges, which are treated as separate items below.

Appendix B provides detailed unit cost information for each roadway type and an explanation of the cost estimating methodology. Cost estimates were developed for the following types of roads (as shown in Figures 5A through 5C): 1) six-lane divided arterials, 2) four-lane divided arterials, 3) four-lane undivided arterials, 4) two-lane undivided arterials, and 5) two-lane collectors. On-street parking and bicycle lanes have been taken into account where required. Existing improvements have also been taken into account.

Right-of-Way Acquisition

Table 11 presents order-of-magnitude cost estimates for acquiring right-of-way for constructing roadways to their ultimate width to achieve LOS D standards. The amount of right-of-way required to be purchased by the City is determined by subtracting the amount of right-of-way already owned by the City from the right-of-way required for the roadway's ultimate width.



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Oakley Long Range Circulation Plan

**RECOMMENDED LONG RANGE CIRCULATION PLAN
IN DOWNTOWN AREA**

FIGURE 7B

Table 10
Order-of-Magnitude Construction Cost Estimates for Long Range Roadway Plan

Roadway	Segment	Length (mi.)	Existing Lanes ¹	Future Lanes ¹	Cost ²
Main St.	Neroly-Big Break	1.0	4D	6D	\$ 3,520,000
Main St.	Big Break-Empire	0.4	4D	6D	\$ 1,330,000
Main St.	Empire-Teakwood	0.3	4D	4Dc	\$ 200,000
Main St.	Teakwood-Vintage	0.4	4D	4Dc	\$ 100,000
Main St.	2nd-E.Cypress	1.0	2RU	4Dc	\$ 4,310,000
Main St.	E. Cypress-Laurel	0.5	2RU	4U	\$ 1,500,000
Main St.	Laurel-Delta	1.0	2RU	4U	\$ 2,950,000
Wilbur Ave.	Bridgehead-Live Oak	0.5	N/A	4Dc	\$ 3,000,000
Oakley Rd.	SR 160-Neroly	0.2	2RU	2C	\$ 430,000
Oakley Rd.	Neroly-Live Oak	0.5	2RU	2C	\$ 940,000
Oakley Rd.	Live Oak-Empire	0.5	2RU	4Dc	\$ 1,190,000
W. Cypress Rd.	Empire-Main	1.8	2C	2C	\$ 1,410,000
E. Cypress Rd.	Main-Sellers	1.0	2RU	4U	\$ 3,460,000
E. Cypress Rd.	Sellers-Jersey Is. Rd	1.0	2RU	6D	\$ 4,440,000
E. Cypress Rd.	Jersey Is. Rd - Bethel Is. Rd.	1.0	2RU	4Dr	\$ 3,630,000
Laurel Rd.	Empire-Live Oak	0.5	2RU	2U	\$ 1,000,000
Laurel Rd.	Empire-O'Hara	1.0	2RU	4Dr	\$ 3,030,000
Laurel Rd.	O'Hara-Main	1.0	2RU	4U	\$ 2,550,000
Laurel Rd.	Main-Sellers (Existing)	0.5	2RU	4U	\$ 1,600,000
Laurel Rd.	Main-Sellers (New)	0.5	N/A	4U	\$ 2,560,000
Carpenter Rd.	Empire-O'Hara	1.0	2RU	2C	\$ 1,850,000
Carpenter Rd.	O'Hara-Main	1.0	N/A	2C	\$ 3,650,000
Brownstone Rd.	O'Hara-Main	1.0	2RU	2C	\$ 1,850,000
Neroly Rd.	Empire-Brown	0.6	2RU	4U	\$ 1,730,000
Neroly Rd.	Brown-O'Hara	0.5	2RU	2U	\$ 980,000
Neroly Rd.	O'Hara-Main	1.0	N/A	2U	\$ 3,500,000
Delta Rd.	Main-Lone Tree Ext.	0.7	2RU	2U	\$ 1,490,000
Delta Rd.	Lone Tree Ext.-Sellers	0.3	2RU	4U	\$ 870,000
Bridgehead Rd.	Wilbur-Main	0.5	2RU	4Dc	\$ 2,140,000
Neroly Rd.	Main-Oakley	0.5	2RU	4Dc	\$ 2,140,000
Sandy Ln.	Main-Oakley	0.5	2RU	2C	\$ 940,000
Live Oak Ave.	Wilbur-Main	0.5	N/A	4Dc	\$ 3,060,000
Live Oak Ave.	Main-Oakley	0.5	2RU	4Dc	\$ 2,140,000
Live Oak Ave.	Oakley-Laurel	1.0	2RU	2C	\$ 1,730,000
Empire Ave.	Main-Laurel	1.0	4D	4D	\$ 840,000
Empire Ave.	Laurel-Neroly	0.8	2RU	4U	\$ 2,650,000
Brown Rd.	Laurel-Carpenter	0.5	2RU	2C	\$ 880,000
Brown Rd.	Carpenter-Neroly	0.5	N/A	2C	\$ 1,950,000
O'Hara Ave.	Main-W. Cypress	0.5	2U	2U	\$ 100,000
O'Hara Ave.	W. Cypress-Laurel	0.5	2RU	2C	\$ 850,000
O'Hara Ave.	Laurel-Carpenter	0.5	2RU	2C	\$ 840,000
O'Hara Ave.	Carpenter-Neroly	0.5	2RU	2U	\$ 980,000
Rose Ave.	Main-Laurel	0.8	2RU	2C	\$ 1,190,000
Rose Ave.	Laurel-Neroly	1.0	N/A	2C	\$ 3,510,000
Sellers Rd.	N. of E. Cypress	0.5	2RU	2C	\$ 940,000
Sellers Rd.	E. Cypress-Laurel	0.5	2RU	4U	\$ 1,680,000
Sellers Rd.	Laurel-Delta	1.0	2RU	2U	\$ 2,010,000
Jersey Island Rd	N. of E. Cypress	1.3	2RU	2C	\$ 2,340,000
Bethel Island Rd	N. of E. Cypress	1.4	2RU	4Dr	\$ 5,500,000
Bethel Island Rd	S. of E. Cypress	1.1	N/A	2U	\$ 3,810,000
		36.5			\$ 101,290,000

Notes:
1. Existing and future lanes (see Figure 5A-5C for cross-section assumptions):
2RU - Two-lane rural road, 2C - Two-lane undivided collector, 2U - Two-lane undivided arterial,
4U - Four-lane undivided arterial, 4Dc - Four-lane divided arterial (commercial), 4Dr - Four-lane
divided arterial (residential), 6D - Six-lane divided arterial.
2. All costs are in 2002 dollars. The detailed unit cost estimates are included in Appendix B.
Source: Fehr and Peers Associates, October 2002.

Table 11 Right-of-Way Acquisition Cost Estimates for Long Range Roadway Plan					
Roadway	Segment	Length (mi.)	Existing Lanes¹	Future Lanes¹	Cost²
Main St.	Neroly-Big Break	1.0	4D	6D	\$1,280,000
Main St.	Big Break-Empire	0.4	4D	6D	\$1,950,000
Main St.	Empire-Teakwood	0.3	4D	4Dc	\$80,000
Main St.	Teakwood-Vintage	0.4	4D	4Dc	\$120,000
Main St.	2nd-E.Cypress	1.0	2RU	4Dc	\$290,000
Main St.	E. Cypress-Laurel	0.5	2RU	4U	\$40,000
Main St.	Laurel-Delta	1.0	2RU	4U	\$460,000
Wilbur Ave.	Bridgehead-Live Oak	0.5	N/A	4Dc	\$1,040,000
Oakley Rd.	SR 160-Neroly	0.2	2RU	2C	\$70,000
Oakley Rd.	Neroly-Live Oak	0.5	2RU	2C	\$190,000
Oakley Rd.	Live Oak-Empire	0.5	2RU	4Dc	\$350,000
W. Cypress Rd.	Empire-Main	1.8	2C	2C	\$120,000
E. Cypress Rd.	Main-Sellers	1.0	2RU	4U	\$670,000
E. Cypress Rd.	Sellers-Jersey Is. Rd	1.0	2RU	6D	\$1,100,000
E. Cypress Rd.	Jersey Is. Rd - Bethel Is. Rd.	1.0	2RU	4Dr	\$790,000
Laurel Rd.	Empire-Live Oak	0.5	2RU	2U	\$120,000
Laurel Rd.	Empire-O'Hara	1.0	2RU	4Dr	\$270,000
Laurel Rd.	O'Hara-Main	1.0	2RU	4U	\$510,000
Laurel Rd.	Main-Sellers (Existing)	0.5	2RU	4U	\$510,000
Laurel Rd.	Main-Sellers (New)	0.5	N/A	4U	\$880,000
Carpenter Rd.	Empire-O'Hara	1.0	2RU	2C	\$270,000
Carpenter Rd.	O'Hara-Main	1.0	N/A	2C	\$1,150,000
Brownstone Rd.	O'Hara-Main	1.0	2RU	2C	\$450,000
Neroly Rd.	Empire-Brown	0.6	2RU	4U	\$480,000
Neroly Rd.	Brown-O'Hara	0.5	2RU	2U	\$20,000
Neroly Rd.	O'Hara-Main	1.0	N/A	2U	\$670,000
Delta Rd.	Main-Lone Tree Ext.	0.7	2RU	2U	\$80,000
Delta Rd.	Lone Tree Ext.-Sellers	0.3	2RU	4U	\$110,000
Bridgehead Rd.	Wilbur-Main	0.5	2RU	4Dc	\$510,000
Neroly Rd.	Main-Oakley	0.5	2RU	4Dc	\$650,000
Sandy Ln.	Main-Oakley	0.5	2RU	2C	\$90,000
Live Oak Ave.	Wilbur-Main	0.5	N/A	4Dc	\$1,060,000
Live Oak Ave.	Main-Oakley	0.5	2RU	4Dc	\$670,000
Live Oak Ave.	Oakley-Laurel	1.0	2RU	2C	\$290,000
Empire Ave.	Main-Laurel	1.0	4D	4D	\$270,000
Empire Ave.	Laurel-Neroly	0.8	2RU	4U	\$600,000
Brown Rd.	Laurel-Carpenter	0.5	2RU	2C	\$200,000
Brown Rd.	Carpenter-Neroly	0.5	N/A	2C	\$630,000
O'Hara Ave.	Main-W. Cypress	0.5	2U	2U	\$40,000
O'Hara Ave.	W. Cypress-Laurel	0.5	2RU	2C	\$0
O'Hara Ave.	Laurel-Carpenter	0.5	2RU	2C	\$0
O'Hara Ave.	Carpenter-Neroly	0.5	2RU	2U	\$130,000
Rose Ave.	Main-Laurel	0.8	2RU	2C	\$260,000
Rose Ave.	Laurel-Neroly	1.0	N/A	2C	\$1,270,000
Sellers Rd.	N. of E. Cypress	0.5	2RU	2C	\$90,000
Sellers Rd.	E. Cypress-Laurel	0.5	2RU	4U	\$330,000
Sellers Rd.	Laurel-Delta	1.0	2RU	2U	\$0
Jersey Island Rd	N. of E. Cypress	1.3	2RU	2C	\$230,000
Bethel Island Rd	N. of E. Cypress	1.4	2RU	4Dr	\$1,210,000
Bethel Island Rd	S. of E. Cypress	1.1	N/A	2U	\$1,180,000
Total		36.5			\$ 23,780,000

Notes:
1. Existing and future lanes (see Figure 5A-5C for cross-section assumptions):
2RU - Two-lane rural road, 2C - Two-lane undivided collector, 2U - Two-lane undivided arterial,
4U - Four-lane undivided arterial, 4Dc - Four-lane divided arterial (commercial), 4Dr - Four-lane
divided arterial (residential), 6D - Six-lane divided arterial.
2. Vacant land: \$3.45/square foot. Developed land: \$325,000 per single-family dwelling.
Source: Fehr and Peers Associates, October 2002.

Miscellaneous Items

Table 12 presents the order-of-magnitude cost estimates for the following miscellaneous items:

- Traffic signals – Locations of all existing and proposed traffic signals as shown on Figure 6.
- Canal/creek bridges – Locations of canal/creek bridges that require widening are presented on Figure 8.
- Railway crossings - Locations of railroad crossings that require improvement are presented on Figure 8.
- Main Street Downtown Bypass – Includes the realignment of SR 4 in the downtown area, and its associated street extensions, traffic signals, and other improvements as shown on Figures 7A and 7B.
- Laurel Road railroad grade separation – Railroad grade separation of Laurel Road to the SR 4 Bypass and the planned Laurel interchange.

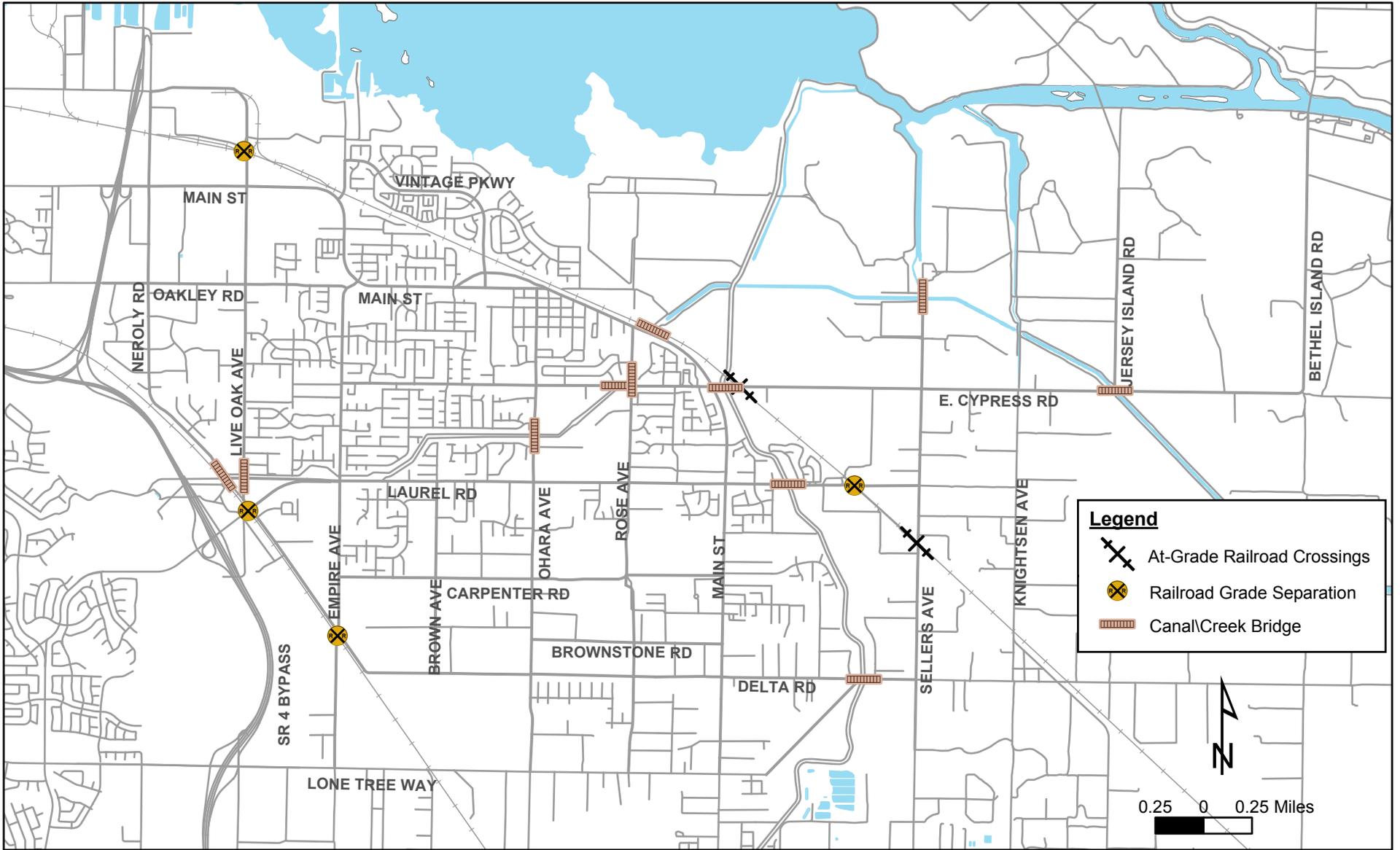
Total Costs and Funding Sources

Table 13 presents a summary of costs associated with implementing this plan. These costs are order-of-magnitude estimates based on currently available information; all improvements will be subject to further engineering studies and more refined cost estimates as the project development process moves forward.

Funding for the roadway system of arterials and collectors outlined in this plan will come primarily from sponsors of the new development projects in the City of Oakley, through direct improvements to the frontage of each property, and contributions to a city-wide traffic impact fee. The city-wide fee is currently being developed consistent with the requirements of AB 1600. This fee will replace the Oakley/North Brentwood Area of Benefit fee currently collected to support transportation improvements in Oakley. Other fund sources may include state programs, regional fee programs to support improvements on major regional routes, and the potential reauthorization of the Measure C transportation sales tax.

Table 12	
Miscellaneous Cost Estimates for Long Range Roadway Plan	
Item	Cost¹
Traffic Signals ²	\$4,950,000
Canal/Creek Bridges	\$2,170,000
Railroad Crossings	\$1,380,000
Main Street Downtown Bypass	\$4,400,000
Laurel Road Railroad Grade Separation	\$3,500,000
Total Miscellaneous Costs	\$16,400,000
Notes:	
1. All costs are in 2002 dollars.	
2. Includes 18 new traffic signals.	
Source: City of Oakley and Fehr and Peers Associates, October 2002.	

Table 13	
Total Cost Estimates for Long Range Roadway Plan	
Item	Cost
Roadway Construction	\$ 101,290,000
Right-of-way Acquisition	\$ 23,780,000
Miscellaneous Items	\$ 16,400,000
Total Cost	\$ 141,470,000
Source: Fehr and Peers Associates, October 2002.	



Oakley Long Range Roadway Plan

APPENDIX A

**City of Oakley
General Plan Buildout Land Use Projections**

Appendix A

City of Oakley General Plan Buildout Land Use Estimates							
Zone ¹	Acres	Households	Household Population	Service Empl.	Other Empl.	Retail Empl.	Total Empl.
152	38	0	0	66	0	423	489
153	38	0	0	0	27	1270	1297
154	102	168	554	0	0	0	0
186	234	0	0	1345	3155	0	4500
187	182	0	0	6658	603	0	7262
188	975	669	2210	0	0	475	475
189	975	325	1073	0	0	0	0
190	975	0	0	0	342	90	431
191	60	0	0	0	0	1704	1704
192	16	0	0	0	0	548	548
193	44	0	0	0	222	561	784
194	36	0	0	0	258	627	885
195	43	0	0	0	426	441	867
196	43	0	0	0	207	664	871
197	45	0	0	0	1042	0	1042
198	37	0	0	0	936	0	936
199	63	150	433	0	445	0	445
200	23	157	409	0	0	255	255
201	73	254	840	0	0	170	170
202	75	275	910	0	0	513	513
203	17	0	0	0	0	400	400
204	160	384	1270	0	0	0	0
205	117	227	750	0	0	0	0
206	160	406	1341	0	0	0	0
207	120	252	831	0	0	0	0
208	55	250	776	0	0	166	166
209	13	13	28	0	0	310	310
210	113	442	1377	0	0	268	268
211	100	465	1538	0	0	0	0
212	63	83	275	0	0	0	0
213	7	7	22	0	0	284	284
214	4	9	30	0	0	92	92
215	4	0	0	0	0	32	32
216	20	84	276	0	0	175	175
217	35	52	173	0	0	706	706
218	65	158	521	0	0	0	0
219	18	89	294	0	0	0	0
220	17	27	88	0	0	0	0
221	39	176	385	0	0	226	226
222	35	172	390	0	0	98	98
223	116	287	921	0	0	61	61
224	97	344	1138	0	0	26	26
225	63	31	101	0	0	0	0
226	8	0	0	0	0	248	248
227	102	278	920	0	0	183	183
228	88	338	1116	91	0	0	91
229	122	473	1563	0	0	0	0
230	160	435	1439	0	0	0	0
231	73	84	276	0	0	0	0
232	97	207	604	0	0	0	0
233	160	258	853	0	0	0	0
234	165	283	817	0	0	1258	1258

Appendix A

Zone ¹	Acres	Households	Household Population	Service Empl.	Other Empl.	Retail Empl.	Total Empl.
235	9	0	0	0	0	445	445
236	156	20	68	0	0	515	515
253	48	77	255	0	0	340	340
254	58	118	390	0	0	0	0
255	106	221	732	0	0	0	0
256	92	329	1087	0	0	148	148
257	79	327	1079	0	0	0	0
258	72	356	1175	0	0	0	0
259	142	493	1630	0	0	279	279
260	9	12	38	0	0	320	320
261	18	34	112	0	0	247	247
262	107	329	947	0	0	84	84
263	144	283	936	0	0	0	0
264	123	321	1061	0	0	29	29
265	103	348	1149	0	0	0	0
266	145	630	1807	0	0	0	0
267	58	74	246	0	0	0	0
268	115	233	706	0	0	66	66
269	115	485	1364	0	0	0	0
270	29	44	146	0	0	25	25
271	20	69	228	0	0	0	0
272	9	0	0	0	0	125	125
273	56	0	0	0	0	0	0
274	115	302	997	0	0	0	0
275	86	492	1628	0	0	0	0
276	86	432	1241	0	0	139	139
277	234	0	0	0	0	0	0
278	528	0	0	0	0	0	0
279	396	0	0	0	0	0	0
280	396	0	0	0	0	0	0
289	18	37	121	0	0	389	389
290	28	22	72	0	0	600	600
291	110	271	651	0	0	209	209
292	91	173	548	0	7	0	7
293	364	637	2066	0	123	0	123
294	455	1293	4042	0	0	578	578
295	250	543	1762	0	839	39	878
296	45	15	50	0	96	0	96
297	353	645	2084	0	394	0	394
298	360	1100	3565	0	13	0	13
299	270	818	2654	0	0	0	0
300	320	508	1648	0	0	0	0
302	85	184	609	0	0	0	0
303	85	139	460	0	0	0	0
304	85	265	777	0	0	140	140
305	213	571	1778	0	0	0	0
399	9	0	0	0	0	202	202
Total		21565	68451	8160	9134	17192	34486
Notes:							
1. Zone numbers correspond to Traffic Analysis Zones (TAZs) in the East County Travel Demand Model.							
Source: PMC, June 2002.							

APPENDIX B

Roadway Construction Unit Costs and Cost Estimating Methodology

NEW AREA				Four Lane Divided Arterial (Residential)		Four Lane Divided Arterial (Commercial)		Four Lane Undivided Arterial		Six Lane Divided Arterial		Two Lane Undivided Arterial		Two Lane Undivided Collector	
				4 Travel Lanes 20' Median 12' Setbacks 6' Sidewalks 5' shoulder 106' R/W 62' Pavement		4 Travel Lanes 14' Median 14' Setbacks 8' Sidewalks 5' shoulder 120' R/W 78' Pavement		4 Travel Lanes 0' Median 14' Setbacks 8' Sidewalks 0' shoulder 98' R/W 70' Pavement		6 Travel Lanes 14' Median 14' Setbacks 8' Sidewalks 0' shoulder 120' R/W 78' Pavement		2 Travel Lanes 13' Setbacks 8' Sidewalks 58' R/W 32' Pavement		2 Travel Lanes 11' Setbacks 6' Sidewalks 70' R/W 48' Pavement	
	Unit of Measure	Unit Cost	Unit Cost Per SF	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost
Clearing & Grubbing	SF	\$0.18	\$0.18	\$19.08	2.1%	\$21.60	2.4%	\$17.64	2.0%	\$21.60	2.4%	\$10.44	2.4%	\$12.60	3.0%
Demolition (AC)	SF	\$0.51	\$0.51		0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
Earthwork (inc. import fill)	CY	\$22.28	\$0.83	\$87.47	9.7%	\$99.02	11.0%	\$80.87	9.0%	\$99.02	11.0%	\$47.86	11.2%	\$57.76	13.5%
Erosion Control	Acres	\$1,500.00	\$0.03	\$3.65	0.4%	\$4.13	0.5%	\$3.37	0.4%	\$4.13	0.5%	\$2.00	0.5%	\$2.41	0.6%
Drainage Ditch	LF	\$20.00			0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
Reinforced Concrete Pipe	LF	\$55.67		\$55.67	6.2%	\$55.67	6.2%	\$55.67	6.2%	\$55.67	6.2%	\$55.67	13.1%	\$55.67	13.1%
Storm Drain Lateral	LF	\$25.00		\$3.88	0.4%	\$4.88	0.5%	\$4.38	0.5%	\$4.88	0.5%	\$2.00	0.5%	\$3.00	0.7%
Drainage Structures	EA	\$1,555.00		\$3.89	0.4%	\$3.89	0.4%	\$3.89	0.4%	\$3.89	0.4%	\$3.89	0.9%	\$3.89	0.9%
AC Pavement	SY	\$33.55	\$3.73	\$231.12	25.6%	\$290.77	32.2%	\$260.94	28.9%	\$290.77	32.2%	\$119.29	28.0%	\$178.93	42.0%
Signing/Striping/Marking	LF	\$2.50		\$2.50	0.3%	\$2.50	0.3%	\$2.50	0.3%	\$2.50	0.3%	\$2.50	0.6%	\$2.50	0.6%
Median Curb	LF	\$8.00		\$18.00	2.0%	\$18.00	2.0%	\$0.00	0.0%	\$18.00	2.0%				
Median Landscaping + Irrig.	SF	\$3.44	\$3.44	\$68.80	7.6%	\$48.16	5.3%	\$0.00	0.0%	\$48.16	5.3%				
Vertical Curb and Gutter	LF	\$18.50		\$37.00	4.1%	\$37.00	4.1%	\$37.00	4.1%	\$37.00	4.1%	\$37.00	8.7%	\$37.00	8.7%
Sidewalk	SF	\$5.00	\$5.00	\$60.00	6.6%	\$80.00	8.9%	\$80.00	8.9%	\$80.00	8.9%	\$80.00	18.8%	\$60.00	14.1%
Border Landscaping + Irrig.	SF	\$3.44	\$3.44	\$41.28	4.6%	\$41.28	4.6%	\$41.28	4.6%	\$41.28	4.6%	\$34.40	8.1%	\$34.40	8.1%
Lighting	LF	\$31.44		\$31.44	3.5%	\$31.44	3.5%	\$31.44	3.5%	\$31.44	3.5%	\$31.44	7.4%	\$31.44	7.4%
Traffic Signals	LS	\$0		\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%
Total Construction				\$663.77		\$738.33		\$618.98		\$738.33		\$426.48		\$479.60	
Traffic Control	4%			\$26.55		\$29.53		\$24.76		\$29.53		\$17.06		\$19.18	
Subtotal				\$690.32		\$767.86		\$643.74		\$767.86		\$443.54		\$498.78	
Planning and Design	10%			\$69.03		\$76.79		\$64.37		\$76.79		\$44.35		\$49.88	
Construction Mgmt.	10%			\$69.03		\$76.79		\$64.37		\$76.79		\$44.35		\$49.88	
Contingency	15%			\$103.55		\$115.18		\$96.56		\$115.18		\$66.53		\$74.82	
Program Management	5%			\$34.52		\$38.39		\$32.19		\$38.39		\$22.18		\$24.94	
Total Project				\$966.45		\$1,075.01		\$901.23		\$1,075.01		\$620.96		\$698.30	
Per Mile				\$5,102,860.24		\$5,676,046.98		\$4,758,492.61		\$5,676,046.98		\$3,278,649.77		\$3,687,018.49	
Frontage Portion				\$374.86	38.8%	\$433.35	40.3%	\$394.25	43.7%	\$433.35	40.3%	\$470.36	75.7%	\$524.65	75.1%
Program Portion				\$591.59	61.2%	\$641.65	59.7%	\$506.98	56.3%	\$641.65	59.7%	\$150.60	24.3%	\$173.65	24.9%
Total				\$966.45		\$1,075.01		\$901.23		\$1,075.01		\$620.96		\$698.30	

Source: Fehr & Peers Associates, October 2002.

UPGRADE EXISTING 2-LANE ROAD Assume 32' of pavement To 4 lanes: widen to the outside				Six Lane Divided Arterial 6 Travel Lanes 14' Median 14' Setbacks 8' Sidewalks 0' shoulder 120' R/W 78' Pavement		Four Lane Divided Arterial (Comm) 4 Travel Lanes 14' Median 14' Setbacks 8' Sidewalks 12' shoulder 116' R/W 74' Pavement		Four Lane Divided Arterial (Res) 4 Travel Lanes 20' Median 12' Setbacks 6' Sidewalks 5' bikelane 106' R/W 62' Pavement		Four Lane Undivided Arterial 4 Travel Lanes 14' Setbacks 8' Sidewalks 98' R/W 70' Pavement		Two Lane Undivided Arterial 2 Travel Lanes 13' Setbacks 8' Sidewalks 58' R/W 32' Pavement		Two Lane Undivided Collector 2 Travel Lanes 11' Setbacks 6' Sidewalks 0' bikelane 70' R/W 48' Pavement	
	Unit of Measure	Unit Cost	Unit Cost Per SF	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost
Clearing & Grubbing	SF	\$0.18	\$0.18	\$15.84	3.1%	\$15.12	2.9%	\$13.32	2.9%	\$11.88	2.6%	\$4.68	1.0%	\$6.84	3.0%
Demolition (AC)	SF	\$0.51	\$0.51	\$4.08	0.8%	\$4.08	0.8%	\$4.08	0.9%	\$4.08	0.9%	\$4.08	0.9%	\$4.08	1.8%
Earthwork (inc. import fill)	CY	\$22.28	\$0.83	\$72.62	14.1%	\$69.32	13.4%	\$61.06	13.2%	\$54.46	11.8%	\$21.45	4.7%	\$31.36	13.9%
Erosion Control	Aeres	\$1,500.00	\$0.03	\$3.03	0.6%	\$2.89	0.6%	\$2.55	0.6%	\$2.27	0.5%	\$0.90	0.2%	\$1.31	0.6%
Drainage Ditch	LF	\$20.00			0.0%		0.0%		0.0%		0.0%		0.0%		0.0%
Reinforced Concrete Pipe	LF	\$55.67		\$25.05	4.9%	\$25.05	4.9%	\$25.05	5.4%	\$13.92	3.0%	\$13.92	3.0%	\$13.92	6.2%
Storm Drain Lateral	LF	\$25.00		\$4.88	0.9%	\$4.63	0.9%	\$3.88	0.8%	\$4.38	0.9%	\$2.00	0.4%	\$3.00	1.3%
Drainage Structures	EA	\$1,555.00		\$3.89	0.8%	\$3.89	0.8%	\$3.89	0.8%	\$3.89	0.8%	\$3.89	0.8%	\$3.89	1.7%
AC Pavement	SY	\$33.55	\$3.73	\$171.48	33.2%	\$156.57	30.3%	\$111.83	24.3%	\$141.66	30.7%	\$29.82	6.5%	\$29.82	13.2%
Signing/Striping/Marking	LF	\$2.50		\$2.50	0.5%	\$2.50	0.5%	\$2.50	0.5%	\$2.50	0.5%	\$2.50	0.5%	\$2.50	1.1%
Median Curb	LF	\$8.00		\$18.00	3.5%	\$18.00	3.5%	\$18.00	3.9%		0.0%		0.0%		0.0%
Median Landscaping + Irrig.	SF	\$3.44	\$3.44	\$48.16	9.3%	\$48.16	9.3%	\$68.80	14.9%		0.0%		0.0%		0.0%
Vertical Curb and Gutter	LF	\$18.50		\$37.00	7.2%	\$37.00	7.2%	\$37.00	8.0%	\$37.00	8.0%	\$37.00	8.0%	\$37.00	16.4%
Sidewalk	SF	\$5.00	\$5.00	\$80.00	15.5%	\$80.00	15.5%	\$60.00	13.0%	\$80.00	17.3%	\$80.00	17.3%	\$50.00	22.1%
Border Landscaping + Irrig.	SF	\$3.44	\$3.44	\$41.28	8.0%	\$41.28	8.0%	\$41.28	9.0%	\$41.28	9.0%	\$34.40	7.5%	\$34.40	15.2%
Lighting	LF	\$31.44		\$7.86	1.5%	\$7.86	1.5%	\$7.86	1.7%	\$7.86	1.7%	\$7.86	1.7%	\$7.86	3.5%
Traffic Signals	LS	\$0		\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%	\$0.00	0.0%
Total Construction				\$535.66		\$516.34		\$461.10		\$405.17		\$242.50		\$225.97	
Traffic Control	4%			\$21.43		\$20.65		\$18.44		\$16.21		\$9.70		\$9.04	
Subtotal				\$557.08		\$536.99		\$479.54		\$421.38		\$252.20		\$235.01	
Planning and Design	10%			\$55.71		\$53.70		\$47.95		\$42.14		\$25.22		\$23.50	
Construction Mgmt.	10%			\$55.71		\$53.70		\$47.95		\$42.14		\$25.22		\$23.50	
Contingency	15%			\$83.56		\$80.55		\$71.93		\$63.21		\$37.83		\$35.25	
Program Management	5%			\$27.85		\$26.85		\$23.98		\$21.07		\$12.61		\$11.75	
Total Project				\$779.92		\$751.79		\$671.36		\$589.93		\$353.07		\$329.02	
Per Mile				\$4,117,958.66		\$3,969,435.81		\$3,544,771.92		\$3,114,814.78		\$1,864,235.65		\$1,737,200.16	
Frontage Portion				\$363.20	46.6%	\$350.96	46.7%	\$293.58	43.7%	\$303.33	51.4%	\$202.14	57.3%	\$240.85	73.2%
Program Portion				\$416.72	53.4%	\$400.82	53.3%	\$377.78	56.3%	\$286.60	48.6%	\$150.94	42.7%	\$88.16	26.8%
Total				\$779.92		\$751.79		\$671.36		\$589.93		\$353.07		\$329.02	

Appendix B

UPGRADE EXISTING 4-LANE DIVIDED ARTERIAL Assume 64' pavement Assume 16' median Assume 100' R/W				Six Lane Divided Arterial 6 Travel Lanes 14' Median 14' Setbacks 8' Sidewalks 0' shoulder 120' R/W 78' Pavement		Eight Lane Divided Arterial 8 Travel Lanes 14' Median 14' Setbacks 8' Sidewalks 0' shoulder 144' R/W 102' Pavement	
	Unit of Measure	Unit Cost	Unit Cost Per SF	Section Cost Per LF	Percent of Total Cost	Section Cost Per LF	Percent of Total Cost
Clearing & Grubbing	SF	\$0.18	\$0.18	\$10.08	2.1%	\$14.40	3.0%
Demolition (AC)	SF	\$0.51	\$0.51	\$8.16	1.7%	\$8.16	1.7%
Demolition (curb)	LF	\$2.50		\$2.50	0.5%	\$2.50	0.5%
Earthwork (inc. import fill)	CY	\$22.28	\$0.83	\$46.21	9.6%	\$66.01	13.7%
Erosion Control	Acres	\$1,500.00	\$0.03	\$1.93	0.4%	\$2.75	0.6%
Drainage Ditch	LF	\$20.00			0.0%		0.0%
Reinforced Concrete Pipe	LF	\$55.67		\$13.92	2.9%	\$13.92	2.9%
Storm Drain Lateral	LF	\$25.00		\$4.88	1.0%	\$6.38	1.3%
Drainage Structures	EA	\$1,555.00		\$3.89	0.8%	\$3.89	0.8%
AC Pavement	SY	\$33.55	\$3.73	\$111.83	23.2%	\$201.30	41.8%
Signing/Striping/Marking	LF	\$2.50		\$2.50	0.5%	\$2.50	0.5%
Median Curb	LF	\$8.00		\$0.00	0.0%	\$0.00	0.0%
Median Landscaping + Irrig.	SF	\$3.44	\$3.44	\$0.00	0.0%	\$0.00	0.0%
Vertical Curb and Gutter	LF	\$18.50		\$37.00	7.7%	\$37.00	7.7%
Sidewalk	SF	\$5.00	\$5.00	\$80.00	16.6%	\$80.00	16.6%
Border Landscaping + Irrig.	SF	\$3.44	\$3.44	\$34.40	7.2%	\$34.40	7.2%
Lighting	LF	\$31.44		\$7.86	1.6%	\$7.86	1.6%
Traffic Signals	LS	\$0		\$0.00	0.0%	\$0.00	0.0%
Total Construction				\$365.15		\$481.07	
Traffic Control	4%			\$14.61		\$19.24	
Subtotal				\$379.76		\$500.31	
Planning and Design	10%			\$37.98		\$50.03	
Construction Mgmt.	10%			\$37.98		\$50.03	
Contingency	15%			\$56.96		\$75.05	
Program Management	5%			\$18.99		\$25.02	
Total Project				\$531.66		\$700.44	
Per Mile				\$2,807,165.92		\$3,698,303.01	
Frontage Portion				\$276.57	52.0%	\$349.96	50.0%
Program Portion				\$255.09	48.0%	\$350.47	50.0%
Total				\$531.66		\$700.44	