Downtown San Leandro Transit-Oriented Development Strategy

Parking & Traffic Analysis of Land Use Alternatives



CITY OF SAN LEANDRO
Community Development Department

Working Paper #5
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Executive Summary

This document presents the results of the traffic and parking analyses performed as part of the Downtown San Leandro Transit Oriented Development Strategy study. The conclusions and recommendations included in this paper are intended to assist the Citizen's Advisory Committee in its discussion of desirable strategies and policies that the City should pursue for successful implementation of Transit –Oriented Development (TOD) in downtown San Leandro. Together with the previous Financial Analysis, this analysis will be used to refine the alternative land use plans previously presented to the CAC and derive from them a preferred TOD Strategy.

The study area for this analysis covers the ½-mile radius around the intersection of East 14th Street and Davis Street. This area encompasses all 39 of the potential opportunity sites identified and is used as the framework for the traffic and parking analysis.

For purposes of this working paper, the study area has been divided into two areas: the BART area and the Downtown area (see Figure 1). The division of these areas reflect the influence that BART and the future Bus Rapid Transit (BRT) has on traffic and parking generation, as well as the mixed-use characteristics of the downtown conducive to trip linking and walking.

This working document compares the three land use alternatives as defined in Working Paper #3: Downtown San Leandro Transit–Oriented Development Strategy, Land Use Alternatives.

- Alternative 1 – Commercial Office Emphasis
- Alternative 2 – High Density Residential Emphasis
- Alternative 3 – Mixed Office/Residential

For opportunity sites comprised entirely, or in part, of residential a range of housing densities were developed. For each of the three alternatives a low and a high density scenario is included in the analyses.

The traffic and parking analyses are based on several key assumptions related to the generation of traffic and parking. Key information in the derivation of trip generation and parking demand rates include transit reduction factors, mixed-use reduction factors, and auto ownership in San Leandro. While the analysis uses reasonable estimates or actual data for this information, there is latitude to refine the factors based on the future vision of TOD in downtown San Leandro. The parking analysis tests parking ratios that define the amount of parking required of private development.

The recommended traffic strategies focus on three areas, 1) travel demand reductions, 2) traffic capacity improvements, and 3) policy and analysis changes. Parking strategies are developed for different types of demands such as commercial office and retail demands and residential demands. The strategies, while they can be specific to the alternatives, are generally applicable to all three alternatives.

The initial strategies presented in this working document are intended to provide a broad menu of potential solutions that will be further developed and detailed as the TOD strategy and land use alternatives are refined.

1 | Introduction

About this Working Paper

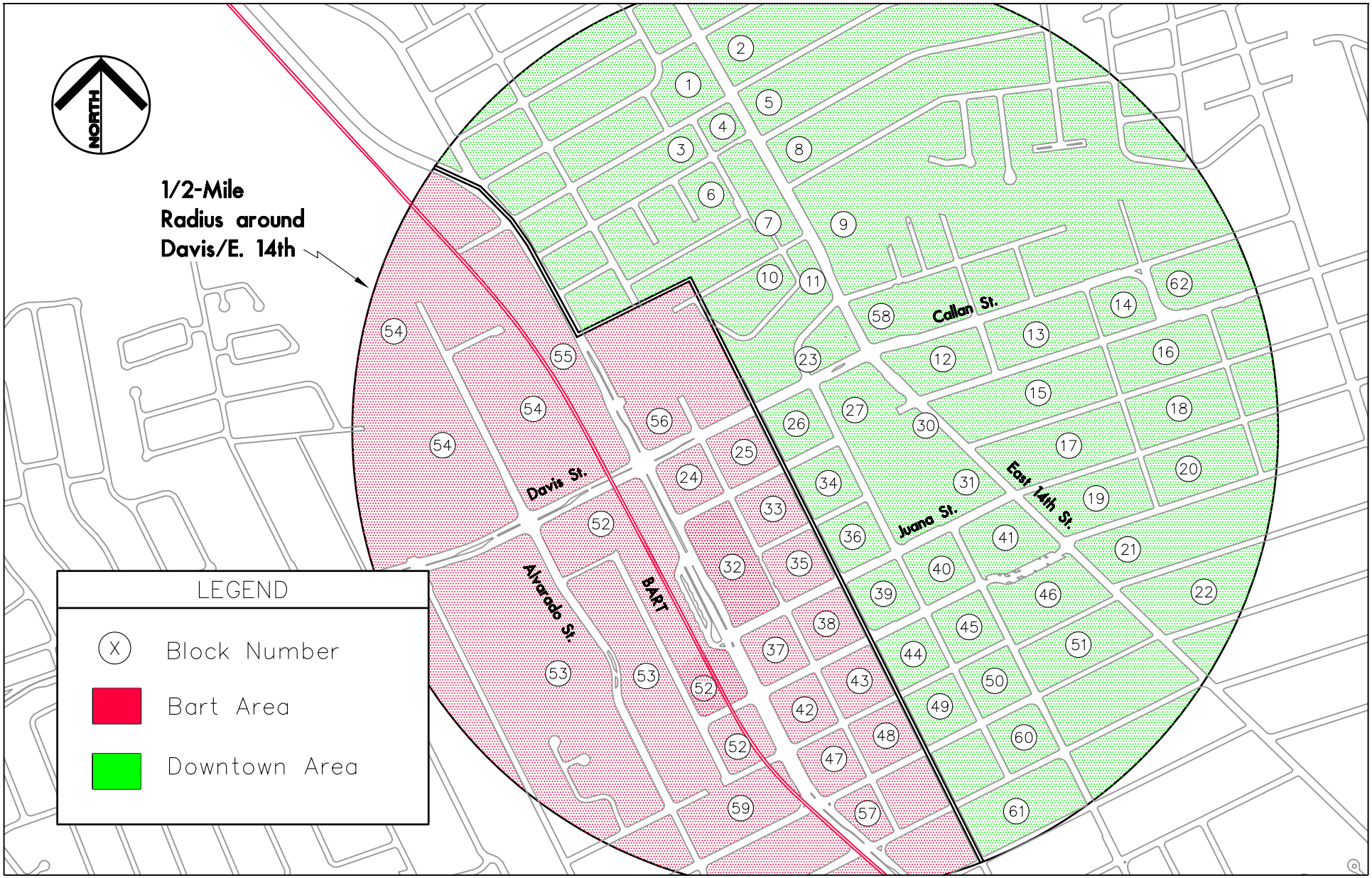
This traffic and parking working document provides a comparative evaluation of the land use alternatives developed for the Downtown San Leandro Transit-Oriented Development Strategy (see Working Paper #3). The findings of this analysis will assist in the development and selection of a preferred transit-oriented development strategy. It is not the intent to select a preferred land use alternative from this evaluation, but to provide information to the next steps in the process.

This working document evaluates a broad range of land uses and densities and tests several important assumptions related to traffic generation, parking demand, and potential revisions to current parking standards.

Study Area

The study area covers the ½-mile radius around the intersection of East 14th Street and Davis Street. This area encompasses all of the potential opportunity sites identified in the early stages of this study. The 39 opportunity sites are used as the framework for the traffic and parking analysis.

For purposes of this working paper, the study area has been divided into two areas: the BART area and the Downtown area. The division of the study area into these areas reflects the influence that BART and the future Bus Rapid Transit (BRT) has on traffic and parking generation, as well as the mixed-use characteristics of the downtown conducive to trip linking and walking. Figure 1 illustrates the study area and shows the boundaries of the BART and Downtown areas, as well as the block numbering system used in the parking analysis.



Downtown San Leandro
TOD Strategy

Kimley-Horn
and Associates, Inc.

Figure 1
Study Area

2 | Overview of Existing Conditions

Traffic

The traffic analysis compares the alternatives in terms of peak hour intersection Level of Service. "Level of Service" (LOS) is a measure of the quality of the overall operating characteristics of a street or highway. It is defined in terms of control delay, which is a measure of travel time, traffic conflicts and interruptions, freedom to maneuver, driving convenience and comfort, and operating costs. The measure ranges from LOS A (free-flow condition) to LOS F (highly congested condition). The City has established LOS D as the standard for signalized and unsignalized intersections, except at the intersection of Davis Street and San Leandro Boulevard, where the intersection operates at LOS E.

LOS D may only be exceeded when roadway improvements are not possible because of right-of-way constraints, economic feasibility, or when a roadway is in a district where the priority is for pedestrian, bicycle and public-transit circulation over automobile circulation. Caltrans' LOS goal is C/D; however, this goal is often unrealistic in urban areas. (Intersections on E. 14th Street and Davis Street are under the jurisdiction of Caltrans. All others are controlled by San Leandro.)

Table 1 summarizes the existing levels of service at the study intersections.

Table 1: Intersection Levels of Service

Intersection	AM Peak		PM Peak	
	Delay (Secs.)	LOS	Delay (Secs.)	LOS
1. Alvarado St. / Davis St.	23.9	C	18.4	B
2. Bancroft Ave. / Dutton Ave.	28.9	C	31.0	C
3. Bancroft Ave. / Estudillo Ave.	30.3	C	38.3	D
4. Bancroft Ave. / Sybil Ave.	15.6	B	13.9	B
5. East 14th St. / Dutton Ave.	16.6	B	35.4	D
6. East 14th St. / Hays St. (Chumalia St.)	3.2	A	6.1	A
7. East 14th St. / Callan Ave. (Davis St.)	32.2	C	48.4	D
8. East 14th St. / Estudillo Ave.	12.2	B	15.2	B
9. East 14th St. / Joaquin Ave.	5.8	A	9.0	A
10. East 14th St. / Juana Ave.	11.1	B	16.4	B
11. East 14th St. / Dolores Ave. (Parrott St.)	9.6	A	13.4	B
12. East 14th St. / Sybil Ave. (Castro St.)	17.9	B	23.8	C
13. Hays St. / Davis St.	9.3	A	13.7	B
14. I-880 NB Ramp / Davis St.	14.2	B	22.0	C
15. I-880 SB Ramp / Davis St.	10.2	B	18.8	B
16. MacArthur Blvd. / Dutton Ave.	19.6	B	23.1	C
17. MacArthur Blvd. / Estudillo Ave.	39.9	D	38.4	D
18. San Leandro Blvd. / Davis St.	31.1	C	34.7	C
19. San Leandro Blvd. / Williams St.	48.1	D	27.0	C
20. Wayne Ave. (Teagarden St.) / Marina Blvd.	25.7	C	31.5	C
Source: Kimley-Horn and Associates.				

Levels of service were evaluated under existing traffic conditions for 20 intersections (source: intersection levels of service were based on traffic counts provided by the City of San Leandro or conducted by Kimley-Horn and Associates in 2005 and 2006 in the vicinity of the study area for both the morning (AM) and afternoon/evening (PM) peak hours). All study intersections operate at levels of service of D or better in the AM and PM peak hours, with the exception of Hays/Davis, which operates at LOS E in the AM peak hour and at LOS F in the PM peak hour.

Current Parking Standards

Article 17 of the City's Zoning Code specifies the required number of off-street parking spaces for new development under various land uses. Table 2 summarizes the current zoning requirements for the provision of parking. In addition to the standards in the zoning code that apply to the vast majority of San Leandro, the City has adopted a different set of standards for the South Area of San Leandro, as defined in the East 14th Street South Area Development Strategy (2004). The standards for the South Area have lower parking requirements than the rest of the City. They are presented here to show the current range of standards used in San Leandro. Off-street parking requirements for the types of land uses assumed in the alternatives include:

- MIXED-USE AND MULTI-FAMILY RESIDENTIAL: For most of San Leandro the required parking for mixed-use and multi-family housing ranges from 1.5 to 2.5 spaces per unit with 0.25 spaces per unit designated for on-site guest parking. Standards for the south East 14th Street area reduce the requirements to 1.5 to 2.0 spaces per unit including guest parking between 0.5 and 1.0 space per unit.
- BARS, CAFES AND RESTAURANTS: Current standards require one space per 100 square feet of gross floor area if the establishment is under 4,000 square feet; otherwise, 40 spaces plus one space for each 50 square feet of seating area over 4,000 square feet.
- OFFICES, BUSINESSES, AND PROFESSIONAL USES: Office and professional uses require 3.33 spaces per 1,000 square feet of gross floor area, except in the south East 14th Street area which requires 3.0 spaces per 1,000 square feet of ground floor uses and 2.0 spaces per 1,000 square feet for upper floor uses.
- GENERAL RETAIL SALES: Standards require 5.0 spaces per 1,000 square feet of gross floor area for the first 5,000 square feet, and 4.0 spaces per 1,000 square feet for uses over 5,000 square feet.

Table 2: Current Parking Standards Current Parking Supply and Demand

Classification	Requirements
Retail Sales, General	1 space per 200 sq. feet for the first 5,000 sq. feet; 1 space per 250 sq. ft. for the area over 5,000 sq. feet
Offices, Business and Professional	1 space per 300 sq. feet
Residential (0.25 of requirement is for guest parking)	Studio or one-bedroom: 1.5 per unit, including 1 covered Two-bedroom unit: 2.25 per unit, including 2 covered Three-bedroom unit or larger: 2.5 per unit, including 2 covered
Residential (South Area Only)	Studio or one-bedroom: 1 covered space, plus 0.5 guest spaces per unit Two-bedroom unit: 1 covered space, plus 0.75 guest spaces per unit Three-bedroom unit: 1 covered space, plus 1 guest space per unit
Offices, Business and Professional (South Area Only)	1 space per 333 sq. feet for ground floor; 1 space per 500 sq. feet for upper stories
Entertainment Activities (bars, cafes, restaurants, etc.)	1 space per 35 sq. feet seating area; plus 1 space per 35 sq. ft. dance floor

Through a conditional use permit or planned development approval, the zoning code permits exceptions to the above parking requirements for affordable housing and senior-housing facilities, for mixed-use developments with shared parking, and for developments located within one-quarter mile of a bus stop or BART station and that incorporate parking-demand mitigation measures such as car sharing and transit passes for tenants. Shared parking is allowed if the applicant can show that it would adequately accommodate peak parking demand for a complementary mix of uses.

The transportation consultants for the TOD strategy conducted a parking inventory and occupancy survey for the downtown on March 1, 2006, with a follow-up survey during the week of July 12th which expanded the survey area. The inventories included municipal parking facilities (on-street parking and the 13 off-street public parking facilities) within the study area, including two BART parking lots.

As shown in Table 3, there are 1,823 on-street and 2,548 off-street parking spaces in the study area. Of these, 1,258 are controlled by the City and 1,290 spaces are controlled by BART. Public parking in the downtown is relatively well utilized. During the peak period– weekdays between noon and 2 pm– on-

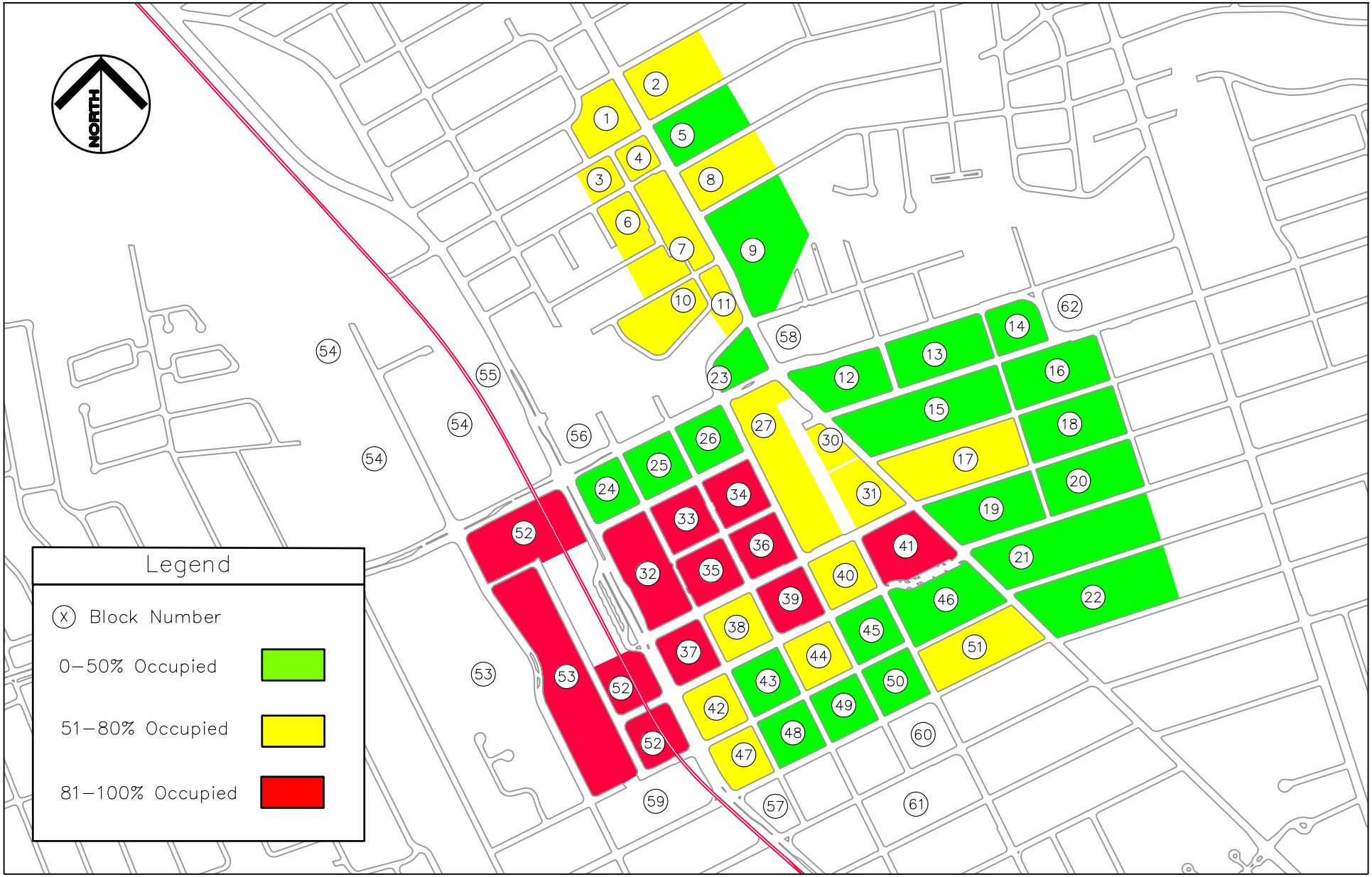
Table 3: Existing Parking Supply and Demand

	Municipal Parking Supply			Peak Period Parking Demand					
Block #	On-Street	Off-Street	Total	On-Street Occupied Spaces	On-Street Occupancy (%)	Off-Street Occupied Spaces	Off-Street Occupancy (%)	Total Spaces Occupied	Total Occupancy (%)
1	15	0	15	12	80%	0	0%	12	80%
2	26	0	26	19	73%	0	0%	19	73%
3	13	0	13	11	85%	0	0%	11	85%
4	21	92	113	17	81%	65	71%	82	73%
5	36	0	36	13	36%	0	0%	13	36%
6	21	0	21	17	81%	0	0%	17	81%
7	37	19	56	25	68%	10	53%	35	63%
8	22	0	22	12	55%	0	0%	12	55%
9	20	0	20	9	45%	0	0%	9	45%
10	11	0	11	6	55%	0	0%	6	55%
11	12	51	63	10	83%	33	65%	43	68%
12	22	230	252	12	55%	106	46%	118	47%
12	0	100	100	0	0%	65	65%	65	65%
13	64	155	219	15	23%	74	48%	89	41%
14	23	0	23	11	48%	0	0%	11	48%
15	57	58	115	24	42%	32	55%	56	49%
16	42	0	42	20	48%	0	0%	20	48%
17	34	0	34	20	59%	0	0%	20	59%
18	53	0	53	20	38%	0	0%	20	38%
19	34	0	34	15	44%	0	0%	15	44%
20	56	0	56	24	43%	0	0%	24	43%
21	65	0	65	30	46%	0	0%	30	46%
22	83	0	83	34	41%	0	0%	34	41%
23	9	0	9	0	0%	0	0%	0	0%
24	19	0	19	8	42%	0	0%	8	42%
25	33	0	33	16	48%	0	0%	16	48%
26	38	0	38	18	47%	0	0%	18	47%
27	32	395	427	30	94%	231	58%	261	61%
28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30	36	14	50	26	72%	12	86%	38	76%
31	21	68	89	18	86%	41	60%	59	66%
32	26	376	402	26	100%	368	98%	394	98%
33	37	0	37	30	81%	0	0%	30	81%
34	35	0	35	32	91%	0	0%	32	91%
35	48	0	48	45	94%	0	0%	45	94%
36	35	0	35	31	89%	0	0%	31	89%
37	31	0	31	25	81%	0	0%	25	81%
38	44	0	44	25	57%	0	0%	25	57%
39	30	0	30	28	93%	0	0%	28	93%
40	35	0	35	26	74%	0	0%	26	74%
41	31	76	107	25	81%	71	93%	96	90%
42	27	0	27	21	78%	0	0%	21	78%
43	45	0	45	20	44%	0	0%	20	44%
44	44	0	44	23	52%	0	0%	23	52%
45	32	0	32	16	50%	0	0%	16	50%
46	47	0	47	22	47%	0	0%	22	47%
47	19	0	19	13	68%	0	0%	13	68%
48	50	0	50	13	26%	0	0%	13	26%
49	40	0	40	6	15%	0	0%	6	15%
50	41	0	41	18	44%	0	0%	18	44%
51	44	0	44	26	59%	0	0%	26	59%
52	61	914	975	61	100%	912	100%	973	100%
53	66	0	66	66	100%	0	0%	66	97%
Total	1,823	2,548	4,371	1,090	60%	2,020	79%	3,110	71%

Source: Kimley-Horn and Associates, Inc. N/A = Data not available.

street parking and public parking lots are about 70 percent occupied with individual facilities 65-100 percent occupied. BART's parking facilities were 100 percent occupied.

The majority of on-street parking in the downtown area is metered and restricted to two hours from 9 am to 5 pm, but there are one, one and one-half, and four-hour segments interspersed throughout the area. Many blocks, particularly west of Hays, have unrestricted parking. In transition areas between commercial areas and residential neighborhoods, on-street parking is mostly unrestricted, but contains some areas with four-hour restrictions from 9 am to 5 pm. In residential areas, there are no parking restrictions. On-street parking in the residential neighborhoods was approximately 60 percent utilized during the noon-2 pm peak period; in the study area overall, on-street parking was approximately 65 percent utilized. Figure 2 graphically shows the existing parking occupancy by block.



Downtown San Leandro TOD Strategy

Kimley-Horn and Associates, Inc.

Figure 2
Existing Parking Occupancy by Block

3 | Description of Alternatives

Description of Alternatives

The traffic and parking analyses in this working document compare the three land use alternatives originally defined in Working Paper #3: Downtown San Leandro Transit–Oriented Development Strategy, Land Use Alternatives. The alternatives are discussed in detail in Working Paper #3. Subsequent to Working Paper #3 the consultant team has made minor changes to the land use alternatives in the course of developing the block-by-block level of detail required for the traffic and parking analysis, so the totals presented in Table 4 may differ from Working Paper #3.

Alternative 1 – Commercial Office Emphasis with High Intensity Downtown Retail

This alternative is primarily focused on commercial office development in the vicinity of the BART station. Downtown changes related to this alternative create a pedestrian-oriented, mixed-use downtown with intensified retail sites.

Table 4: Summary of Land Use Alternatives

Land Use	Alternative 1	Alternative 2	Alternative 3
Office Square Feet	2,000,000	438,000	675,000
Retail Square Feet	190,000	190,000	71,000
Dwelling Units	980 – 1,770	1,970 – 3,500	1,570- 2,724

Source: BMS Design Group

Alternative 2 –Residential Emphasis with High Intensity Downtown Retail

This alternative shares the concept of intensifying retail uses and creating a pedestrian-oriented, mixed-use downtown with Alternative 1. The focus of Alternative Two is high density residential development in the area surrounding the BART Station.

Alternative 3 – Mixed Office/Residential with Modest Downtown Retail

This alternative is a combination of the first two alternatives as both high density residential and commercial office are proposed for the area surrounding the BART Station. The primary focus of this alternative is to create minimal impact by retaining open space (e.g., Thrasher Park and railroad right-of-way adjacent to the BART Station) and reducing density assumptions.

Density Scenarios

For opportunity sites that included residential, a range of densities were developed. For each of the three alternatives a low and a high density scenario is included in the analyses to assist in the refinement of the densities for the preferred land use alternative.

Prototypes from Financial Feasibility Analysis

Working Paper #4, the Downtown San Leandro Transit-Oriented Development Strategy: Prototype Development Projects Financial Feasibility Analysis discusses in detail the three prototype development projects. These prototypes were not integrated into the alternatives for the traffic and parking analyses, so that the analyses in this working paper were directly comparable to the land use alternatives presented in Working Paper #3.

4 | Analysis of Alternatives

Traffic Analysis

This analysis evaluates the three land use alternatives under the low and high residential density scenarios described in Section 3. It is intended to provide a comparative evaluation of the alternatives in terms of traffic generation and intersection level of service. This information will be used to develop a preferred land use alternative for which a more detailed traffic analysis will be conducted.

Methodology and Assumptions

Scenarios

The traffic analysis evaluates conditions representing existing plus traffic generated by the proposed opportunity sites. This is an artificial scenario used for comparative purposes. A true future analysis would include cumulative traffic generated by growth and development outside of the study area. This level of analysis will be completed for the environmental assessment of the preferred land use alternative. The analysis includes an evaluation of the AM and PM peak hours, representing the highest traffic conditions of a typical weekday. In addition to adding traffic generated by the proposed opportunity sites, the analysis subtracts traffic from the existing uses that will be replaced by the opportunity site redevelopment.

Traffic Model

The traffic analysis was prepared using a model of downtown San Leandro using TRAFFIX software. The study area is represented by a series of zones (for each opportunity site), gateways (representing roads entering and exiting the study area), and the 20 study intersections. The model is based on the standard four-step modeling process: trip generation, trip distribution, trip assignment, and level of service calculation. Trip generation is described in the next section. Trip distribution-the direction traffic uses to enter or exit the study area-is based on existing travel patterns. Trip assignment-the specific routes traffic uses-was determined using existing travel patterns and the shortest distance between points. Multiple routes were assigned if more than one path exists between an opportunity site and a gateway. Intersection level of service was calculated using the 2000 Highway Capacity Manual operations methodology.

Trip Generation Derivation

Trip generation is the amount of traffic expected to be created from the proposed development and expected to travel downtown San Leandro streets. Trip generation is based on rates developed from national studies conducted by the Institute of Transportation Engineers (ITE) for specific types of land uses. ITE rates are derived from studies of isolated suburban developments with little or no pedestrian, bicycle, or transit accessibility for ease of data collection. Due to the nature of the sites and the data collection methodology, the ITE trip generation rates do not reflect proposed developments in urban areas and do not reflect variations in density, diversity (land use mix), site design and the multimodal transportation systems of our larger metropolitan areas which are critical factors on travel demand. Therefore, this traffic analysis adjusts the ITE rates to reflect the downtown characteristics and transit-orientation of the proposed opportunity site development in San Leandro.

Beginning with ITE trip generation rates (Trip Generation Manual, 7th Edition), the following adjustments are made:

- TRANSIT FACTOR – reflects the availability and use of BART and the future Bus Rapid Transit system. Studies of land uses within proximity to transit, especially BART, show substantial reductions in trip generation rates when compared to ITE. In downtown San Leandro, the transit factor varies between the BART area and the Downtown area (as shown in Figure 1). The primary source of information for this factor is from research conducted by Lund, Cervero, and Willson (Travel Characteristics of Transit-Oriented Development in California).
- MIXED-USE FACTOR – reflects the characteristics of a downtown environment where people park once and visit multiple sites, or are able to walk from their home or workplace to conduct business, run errands, shop and dine. The primary sources of information for this factor is from research conducted by Kimley-Horn and Associates, URBEMIS (Emissions Estimation of Land Use Development Projects, South Coast Air Quality Management District, Caltrans, 2004), ITE Trip Generation Handbook (mixed-use trip generation estimation), and Hooper (Travel Characteristics of Large Scale Suburban Activity Centers).

The reduction factors assumed in this analysis are shown below:

The resulting trip generation of the proposed development in the three alternatives is summarized in Table 5.

Trip Generation Reduction Factors						
	Transit		Mixed Use		Combined	
Land Use	BART area	Downtown Area	BART area	Downtown Area	BART area	Downtown Area
Resid	40%	20%	7%	7%	47%	27%
Office	15%	8%	1%	1%	16%	9%
Retail	5%	2%	3%	3%	8%	5%

ADDITIONAL SOURCES OF INFORMATION FOR POTENTIAL TRANSIT-ORIENTED TRIP REDUCTIONS

The above resources are adequate for the comparative traffic analysis presented in this working paper. However, for analysis of the preferred land use alternative the trip generation rates may be further refined to better reflect Bay Area trends in transit-oriented development. Additional resources that will be used to refine the trip generation rates include:

- BAY AREA TRAVEL SURVEY (BATS) – MTC 2004 – In support of the Metropolitan Transportation Commission's TOD policy, the BATS study was undertaken to characterize the demographic and travel characteristics of station area residents – individuals living within close proximity to rail stops and/or ferry terminals in the region – using an existing Bay Area data set, the 2000 Bay Area Travel Survey (BATS2000). Of interest to the downtown San Leandro TOD strategy are surveys of residents within ½ mile of rail stops, and how this data might be used to refine the assumptions used to derive traffic and parking generation. Two key parts of the survey are considered: transit mode share and average vehicle ownership. The BATS data shows that residents within ½-mile of rails stations have a 46% transit and non-motorized work mode share (this study used a 40% transit share). Specific to BART, ½-mile residents have a 22% rail mode share for commute trips and 5% rail mode share for non-commute trips. The BATS data indicates that vehicle ownership for ½-mile residents averages 1.14 vehicles per household (compared to the 1.23 used in this study from the 2000 census data for the San Leandro study area).
- TRAVEL CHARACTERISTICS OF TOD IN CALIFORNIA- A primary resource for this study, the transit mode share used in the derivation of trip

generation and parking demand rates is based on surveys of workers near the Walnut Creek and Fremont BART stations (18%). A much higher transit mode share was found at the downtown Berkeley BART station (39%). However, Berkeley was not considered comparable to downtown San Leandro. However, the future of San Leandro might have transit mode shares that fall somewhere between the Walnut Creek/Fremont and Berkeley survey data. This will be explored further in the refined analysis of the preferred alternative.

Hays Street Closure

The traffic analysis assumes the closure of Hays Street as an assumption associated with any development on Opportunity Sites 7 and 8. To expand the developable area the opportunity site assumes the closure of Hays Street as a public roadway, although its intersections with East 14th and Davis Street remain as access driveways. The intersection levels of service presented in this section assume the closure of Hays Street with a re-assignment of traffic to East 14th/Davis.

Findings

Tables 6 and 7 present the intersection levels of service for all three alternatives under the low and high density scenarios respectively. Key findings of the traffic analysis include:

- Alternative 1 generates the greatest amount of traffic and impacts the intersection of East 14th/Dutton in the low and high density scenarios. Only

Table 5: Trip Generation Comparison of Alternatives

Land Use	ITE Code	Quantity	Units	Daily	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out	Total
Alternative 1 - Commercial Office Emphasis (Low Density)										
Total Residential Trip Generation	230	980	DU	3,789	54	229	283	225	107	332
Total Retail Trip Generation	820	190,000	SF	7,781	117	70	187	325	359	684
Total Office Trip Generation	710	2,000,000	SF	18,436	2,285	309	2,594	424	2,072	2,496
Subtotal				30,006	2,456	608	3,064	974	2,538	3,512
Total Existing Trips Replaced by Redevelopment				10,110	492	130	622	353	704	1,057
Net Trips				19,896	1,964	478	2,442	621	1,834	2,455
Alternative 1 – Commercial Office Emphasis (High Density)										
Total Residential Trip Generation	230	1,770	DU	6,965	89	433	522	414	206	620
Total Retail Trip Generation	820	190,000	SF	7,781	117	70	187	325	359	684
Total Office Trip Generation	710	2,000,000	SF	18,436	2,285	309	2,594	424	2,072	2,496
Subtotal				33,182	2,491	812	3,303	1,163	2,637	3,800
Total Existing Trips Replaced by Redevelopment				10,110	492	130	622	353	704	1,057
Net Trips				23,072	1,999	682	2,681	810	1,933	2,743
Alternative 2 – Residential Emphasis (Low Density)										
Total Residential Trip Generation	230	1,970	DU	6,806	94	416	510	406	193	599
Total Retail Trip Generation	820	190,000	SF	7,781	117	70	187	325	357	682
Total Office Trip Generation	710	438,000	SF	4,043	501	69	570	93	454	547
Subtotal				18,630	712	555	1,267	824	1,004	1,828
Total Existing Trips Replaced by Redevelopment				13,337	530	158	688	490	843	1,333
Net Trips				5,293	182	397	579	334	161	495
Alternative 2 – Residential Emphasis (High Density)										
Total Residential Trip Generation	230	3,500	DU	12,225	158	760	918	727	359	1,086
Total Retail Trip Generation	820	190,000	SF	7,781	117	70	187	325	357	682
Total Office Trip Generation	710	438,000	SF	4,043	501	69	570	93	454	547
Subtotal				24,049	776	899	1,675	1,145	1,170	2,315
Total Existing Trips Replaced by Redevelopment				13,337	530	158	688	490	843	1,333
Net Trips				10,712	246	741	987	655	327	982
Alternative 3 – Mixed Office/Residential (Low Density)										
Total Residential Trip Generation	230	1,570	DU	5,391	72	332	404	322	152	474
Total Retail Trip Generation	820	71,000	SF	2,905	42	28	70	126	130	256
Total Office Trip Generation	710	674,600	SF	6,222	773	103	876	143	700	843
Subtotal				14,518	887	463	1,350	591	982	1,573
Total Existing Trips Replaced by Redevelopment				13,561	526	160	686	501	848	1,349
Net Trips				957	361	303	664	90	134	224
Alternative 3 – Mixed Office/Residential (High Density)										
Total Residential Trip Generation	230	2,724	DU	9,352	127	574	701	550	281	831
Total Retail Trip Generation	820	71,000	SF	2,905	42	28	70	126	130	256
Total Office Trip Generation	710	674,600	SF	6,222	773	103	876	143	700	843
Subtotal				18,479	942	705	1,647	819	1,111	1,930
Total Existing Trips Replaced by Redevelopment				13,561	526	160	686	501	848	1,349
Net Trips				4,918	416	545	961	318	263	581

Source: Kimley-Horn and Associates, Inc.

Alternative 2 in the high density scenario impacts this intersection as well.

- The closure of Hays Street will significantly impact the intersection of East 14th Street and Davis Street in all three alternatives and under either the low or high density scenarios. The operation of this intersection may affect the performance of BRT and other transit when implemented.

Table 6: Comparison of Intersection Levels of Service (Low Density Scenario)

Intersection		Existing AM Peak Hour			Alt. 1 AM Peak Hour			Alt. 2 AM Peak Hour			Alt. 3 AM Peak Hour		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
1	Alvarado Street / Davis Street	C	23.9	0.710	D	39.2	0.904	C	29.2	0.819	C	25.6	0.749
2	Bancroft Avenue / Dutton Ave	C	28.9	0.674	C	34.8	0.794	C	30.3	0.698	C	29.8	0.682
3	Bancroft Avenue / Estudillo Ave	C	30.3	0.848	C	30.6	0.851	C	31.9	0.871	C	29.9	0.842
4	Bancroft Avenue / Sybil Avenue	B	15.6	0.554	B	16.1	0.619	B	15.9	0.557	B	15.6	0.544
5	East 14th Street / Dutton Ave	B	16.6	0.750	E	65.5	1.101	B	18.4	0.795	C	20.6	0.821
6	East 14th Street / Hays Street	A	3.2	0.313	A	2.9	0.451	A	3.4	0.332	A	3.1	0.341
7	East 14th Street / Davis Street	C	32.2	0.987	F	138.7	1.592	E	56.4	1.174	E	61.7	1.205
8	East 14th Street / Estudillo Ave	B	12.2	0.403	B	11.8	0.425	B	12	0.421	B	11.9	0.4
9	East 14th Street / Joaquin Avenue	A	5.8	0.259	A	5.8	0.285	A	6.0	0.282	A	6.1	0.264
10	East 14th Street / Juana Avenue	B	11.1	0.354	B	11.6	0.4	B	11.5	0.392	B	11.4	0.369
11	East 14th Street / Dolores Avenue	A	9.6	0.457	A	9.7	0.485	A	9.6	0.472	A	9.9	0.462
12	East 14th St / Sybil Ave (Castro St)	B	17.9	0.676	B	18.5	0.715	B	17.9	0.682	B	17.6	0.673
13	Hays Street / Davis Street	A	9.3	0.512	A	9.4	0.693	B	10.7	0.583	A	8.7	0.553
14	Interstate 880 / Davis St NB Off-	B	14.2	0.690	B	14.6	0.712	B	14.5	0.714	B	14.2	0.7
15	Interstate 880 / Davis St SB Off-	B	10.2	0.584	B	14.4	0.704	B	10.5	0.606	B	11.1	0.608
16	MacArthur Boulevard / Dutton	B	19.6	0.628	C	21.3	0.709	C	20.9	0.661	C	20.2	0.646
17	MacArthur Boulevard / Estudillo	D	39.9	0.937	D	44.6	0.97	D	43.2	0.961	D	39.5	0.935
18	San Leandro Boulevard / Davis	C	31.1	0.610	C	33.7	0.763	C	32.2	0.625	C	32.7	0.64
19	San Leandro Boulevard / Williams	D	48.1	0.760	D	42.9	0.966	C	30.0	0.802	C	28.6	0.771
20	Wayne Avenue / Marina Boulevard	C	25.7	0.552	C	29.8	0.652	C	26.0	0.574	C	25.3	0.552
Intersection		Existing PM Peak Hour			Alt. 1 PM Peak Hour			Alt. 2 PM Peak Hour			Alt. 3 PM Peak Hour		
1	Alvarado Street / Davis Street	B	18.4	0.599	C	33.5	0.891	B	19.8	0.634	C	20.9	0.633
2	Bancroft Avenue / Dutton Ave	C	31.0	0.720	D	39	0.854	C	32.3	0.748	D	48.6	0.873
3	Bancroft Avenue / Estudillo Ave	D	38.3	0.627	D	39.5	0.66	D	39	0.648	C	30.3	0.635
4	Bancroft Avenue / Sybil Avenue	B	13.9	0.655	B	15.9	0.732	B	13.8	0.657	B	13.6	0.641
5	East 14th Street / Dutton Ave	D	35.4	0.971	F	103.5	1.299	D	45.5	1.023	D	42.7	1.022
6	East 14th Street / Hays Street	A	6.1	0.422	A	4.9	0.517	A	5.6	0.436	A	3.7	0.387
7	East 14th Street / Davis Street	D	48.4	1.067	F	137.5	1.493	E	57.2	1.119	E	57.6	1.12
8	East 14th Street / Estudillo Ave	B	15.2	0.581	B	15.2	0.597	B	15.3	0.6	B	14.1	0.546
9	East 14th Street / Joaquin Avenue	A	9.0	0.501	A	9	0.537	A	9.2	0.536	A	9.3	0.495
10	East 14th Street / Juana Avenue	B	16.4	0.613	B	17.5	0.7	B	17.6	0.684	B	16.6	0.616
11	East 14th Street / Dolores Avenue	B	13.4	0.623	B	14	0.669	B	13.8	0.659	B	13.8	0.603
12	East 14th St / Sybil Ave (Castro St)	C	23.8	0.789	C	25.5	0.792	C	24.5	0.803	C	23.4	0.778
13	Hays Street / Davis Street	B	13.7	0.730	C	24.2	0.934	B	17.8	0.8	B	15.0	0.755
14	Interstate 880 / Davis St NB Off-	C	22.0	0.671	C	22.4	0.713	C	22.2	0.707	B	19.5	0.634
15	Interstate 880 / Davis St SB Off-	B	18.8	0.663	C	20.4	0.697	B	19.9	0.696	B	16.5	0.624
16	MacArthur Boulevard / Dutton	C	23.1	0.836	D	41.4	1.017	C	24.5	0.864	C	23	0.835
17	MacArthur Boulevard / Estudillo	D	38.4	0.925	D	39.3	0.934	D	40.2	0.939	D	36.1	0.857
18	San Leandro Boulevard / Davis	C	34.7	0.760	D	39.5	0.849	D	35.8	0.778	D	35.1	0.769
19	San Leandro Boulevard / Williams	C	27.0	0.813	D	47.3	1.005	C	27.2	0.818	C	25.1	0.753
20	Wayne Avenue / Marina Boulevard	C	31.5	0.533	D	37.4	0.726	C	30.9	0.549	C	30.3	0.504

Source: Kimley-Horn and Associates, Inc.

Table 7: Comparison of Intersection Levels of Service (High Density Scenario)

Intersection		Existing AM Peak Hour			Alt. 1 AM Peak Hour			Alt. 2 AM Peak Hour			Alt. 3 AM Peak Hour		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
1	Alvarado Street / Davis Street	C	23.9	0.710	D	41.1	0.933	C	30.3	0.846	C	26.3	0.771
2	Bancroft Avenue / Dutton Ave	C	28.9	0.674	D	35.5	0.798	C	31.8	0.747	C	30.8	0.712
3	Bancroft Avenue / Estudillo Ave	C	30.3	0.848	C	31.7	0.867	C	33.3	0.890	C	30.7	0.854
4	Bancroft Avenue / Sybil Avenue	B	15.6	0.554	B	16.1	0.623	B	16.1	0.572	B	15.8	0.555
5	East 14th Street / Dutton Ave	B	16.6	0.750	E	69.1	1.105	C	20.2	0.847	C	21.8	0.858
6	East 14th Street / Hays Street	A	3.2	0.313	A	3.2	0.457	A	3.6	0.339	A	3.3	0.347
7	East 14th Street / Davis Street	C	32.2	0.987	F	149.1	1.643	E	75.8	1.287	E	76.0	1.289
8	East 14th Street / Estudillo Ave	B	12.2	0.403	B	11.8	0.440	B	12.0	0.434	B	11.8	0.408
9	East 14th Street / Joaquin Avenue	A	5.8	0.259	A	6.1	0.297	A	6.2	0.298	A	6.2	0.273
10	East 14th Street / Juana Avenue	B	11.1	0.354	B	11.8	0.418	B	11.6	0.413	B	11.4	0.380
11	East 14th Street / Dolores Avenue	A	9.6	0.457	A	9.7	0.491	A	9.6	0.477	A	9.8	0.466
12	East 14th St / Sybil Ave (Castro St)	B	17.9	0.676	B	18.5	0.717	B	18.0	0.685	B	17.6	0.674
13	Hays Street / Davis Street	A	9.3	0.512	A	9.9	0.710	B	11.7	0.621	A	8.9	0.565
14	Interstate 880 / Davis St NB Off-	B	14.2	0.690	B	14.6	0.719	B	14.6	0.730	B	14.3	0.712
15	Interstate 880 / Davis St SB Off-	B	10.2	0.584	B	14.5	0.712	B	10.7	0.620	B	11.2	0.619
16	MacArthur Boulevard / Dutton	B	19.6	0.628	C	22.0	0.723	C	22.0	0.687	C	21.0	0.665
17	MacArthur Boulevard / Estudillo	D	39.9	0.937	D	45.5	0.976	D	44.2	0.968	D	40.3	0.942
18	San Leandro Boulevard / Davis	C	31.1	0.610	C	34.2	0.786	C	32.8	0.655	C	33.2	0.654
19	San Leandro Boulevard / Williams	D	48.1	0.760	D	45.2	0.984	C	31.7	0.834	C	29.4	0.791
20	Wayne Avenue / Marina Boulevard	C	25.7	0.552	C	30.3	0.668	C	27.2	0.598	C	26.0	0.566
Intersection		Existing PM Peak Hour			Alt. 1 PM Peak Hour			Alt. 2 PM Peak Hour			Alt. 3 PM Peak Hour		
1	Alvarado Street / Davis Street	B	18.4	0.599	C	34.4	0.909	C	21.2	0.672	C	22.4	0.665
2	Bancroft Avenue / Dutton Ave	C	31.0	0.720	D	40.5	0.866	C	34.1	0.778	D	52.7	0.896
3	Bancroft Avenue / Estudillo Ave	D	38.3	0.627	D	39.8	0.667	D	39.4	0.656	C	30.6	0.641
4	Bancroft Avenue / Sybil Avenue	B	13.9	0.655	B	16.0	0.737	B	13.9	0.660	B	13.7	0.643
5	East 14th Street / Dutton Ave	D	35.4	0.971	F	109.6	1.321	E	61.3	1.089	D	54.1	1.076
6	East 14th Street / Hays Street	A	6.1	0.422	A	5.0	0.521	A	5.5	0.454	A	3.7	0.400
7	East 14th Street / Davis Street	D	48.4	1.067	F	143.2	1.522	E	68.8	1.181	E	67.5	1.172
8	East 14th Street / Estudillo Ave	B	15.2	0.581	B	15.7	0.622	B	15.8	0.628	B	14.3	0.562
9	East 14th Street / Joaquin Avenue	A	9.0	0.501	A	9.1	0.553	A	9.3	0.553	A	9.2	0.503
10	East 14th Street / Juana Avenue	B	16.4	0.613	B	18.2	0.731	B	18.2	0.713	B	16.8	0.634
11	East 14th Street / Dolores Avenue	B	13.4	0.623	B	14.0	0.685	B	14.0	0.683	B	13.8	0.616
12	East 14th St / Sybil Ave (Castro St)	C	23.8	0.789	C	25.8	0.798	C	24.9	0.813	C	23.6	0.785
13	Hays Street / Davis Street	B	13.7	0.730	C	28.0	0.963	B	19.4	0.834	B	15.6	0.775
14	Interstate 880 / Davis St NB Off-	C	22.0	0.671	C	22.5	0.726	C	22.5	0.744	B	19.6	0.660
15	Interstate 880 / Davis St SB Off-	B	18.8	0.663	C	21.1	0.715	C	21.0	0.728	B	17.2	0.645
16	MacArthur Boulevard / Dutton	C	23.1	0.836	D	43.5	1.034	C	26.3	0.892	C	24.0	0.855
17	MacArthur Boulevard / Estudillo	D	38.4	0.925	D	40.6	0.943	D	41.9	0.951	D	36.8	0.866
18	San Leandro Boulevard / Davis	C	34.7	0.760	D	40.6	0.869	D	36.6	0.803	D	35.6	0.783
19	San Leandro Boulevard / Williams	C	27.0	0.813	D	49.7	1.020	C	28.9	0.849	C	25.8	0.772
20	Wayne Avenue / Marina Boulevard	C	31.5	0.533	D	37.8	0.744	C	31.4	0.579	C	30.6	0.521

Source: Kimley-Horn and Associates, Inc.

Traffic Mitigation Measures

Table 8 provides the physical and operational mitigation measures that would be required to allow the impacted study intersections to achieve the City's level of service (LOS) D policy.

This table presents information for high-density scenarios only-the low-density scenarios require somewhat fewer measures.

These measures are not necessarily recommendations or may not even be feasibly implemented, but provide information that allows the reader to compare the potential implications of each alternative in terms of policy, costs, and effect on pedestrian and bicycle travel.

Table 8: Mitigation Measures

Intersection	Alternative 1	Alternative 2	Alternative 3
5 – East 14th / Dutton	EB approach: eliminate parking, add left turn lane. WB approach: eliminate parking, add left turn lane Change EB/WB phasing to Protected + Permitted. NB approach: eliminate parking, add right turn lane. AM: LOS C / Delay 22.8 / V/C 0.845 PM: LOS C / Delay 30.9 / V/C 0.937 All proposed mitigations would fit within existing street width. With mitigations above, queues at some approaches could exceed 300 feet. Adding lanes would reduce the queues. Adding an additional through lane in each direction would significantly reduce the queues.	WB approach: eliminate parking, add left turn lane. AM: LOS B / Delay 11.8 / V/C 0.629 PM: LOS C / Delay 20.6 / V/C 0.854 All proposed mitigations would fit within existing street width. With mitigations above, queues at some approaches could exceed 300 feet. Adding lanes would reduce the queues. Adding an additional through lane in each direction would significantly reduce the queues.	No mitigation required.
7 – East 14th / Davis	Modify EB/WB phasing to Protected. SB approach: add right turn lane, in addition to shared through-right turn lane. EB approach: add left turn lane (dual left turns). AM: LOS D / Delay 42.5 / V/C 0.984 PM: LOS C / Delay 33.6 / V/C 0.863 With mitigations above, queues at some approaches could exceed 300 feet. Adding lanes would reduce the queues. Adding an additional through lane in each direction would significantly reduce the queues. No room to widen intersection, buildings nearly front at curb.	Modify EB/WB phasing to Protected. EB approach: add left turn lane (dual left turns). AM: LOS D / Delay 47.2 / V/C 1.012 PM: LOS D / Delay 40.1 / V/C 0.909 With mitigations above, queues at some approaches could exceed 300 feet. Adding lanes would reduce the queues. Adding an additional through lane in each direction would significantly reduce the queues. No room to widen intersection, buildings nearly front at curb.	Modify EB/WB phasing to Protected. EB approach: add left turn lane (dual left turns). AM: LOS D / Delay 49.3 / V/C 1.026 PM: LOS C / Delay 30.9 / V/C 0.825 With mitigations above, queues at some approaches could exceed 300 feet. Adding lanes would reduce the queues. Adding an additional through lane in each direction would significantly reduce the queues. No room to widen intersection, buildings nearly front at curb.

NB – northbound; SB – southbound; EB – eastbound; WB – westbound
LOS – Level of Service; Delay – average intersection delay; V/C – volumes to capacity

Parking Analysis

This analysis evaluates the three land use alternatives under the low and high residential density scenarios described in Section 3. It is intended to provide a comparative evaluation of the alternatives in terms of parking demand, parking supply, occupancy by block, and determination of areas of parking surplus or deficit. This information will be used to develop a preferred land use alternative for which a more detailed parking analysis will be conducted.

Methodology and Assumptions

Definitions

Parking Demand – The number of parked vehicles expected of a specific type and amount of land use during the peak period of a typical weekday. Parking demand is estimated using rates (similar to trip generation). Parking demand is independent of parking supply.

Parking Supply – The number of parking spaces provided on a site, on-street or in municipal facilities. Parking supply in new development is governed by the parking standards in the zoning ordinance. Available parking supply are parking spaces that are not utilized by existing parking demand and are available to the general public.

Occupancy – The number of parking spaces being taken up by parked vehicles usually presented in terms of a percentage of the parking supply.

Parking Surplus or Deficit – A surplus of parking spaces means, after all demand has been accounted for, there remains unused parking spaces available. Usually applied to a block or areawide, it means that demand does not exceed supply. A deficit means that parking demand exceeds supply and the unmet demand will need to search for available parking spaces in adjacent blocks or outside of the area.

Parking Demand Derivation

Similar to traffic generation, parking demand is the number of parked cars expected to be created from the proposed development. Parking demand is also based on rates developed from national studies conducted by the Institute of Transportation Engineers (ITE) for specific types of land uses. Like traffic, ITE rates for parking are derived from studies of isolated suburban developments with little or no pedestrian, bicycle, or transit accessibility or shared parking opportunities. In fact, nearly all of the data comprising the ITE parking generation rates reflects privately owned parking for stand-alone developments such as office buildings, shopping centers, and housing developments. Therefore, this parking analysis adjusts the ITE rates to reflect the downtown characteristics and transit-orientation of the proposed opportunity site development in San Leandro.

Beginning with ITE trip generation rates (Parking Generation Manual, 3rd Edition), the transit and mixed-factors presented for trip generation are also applied to parking generation rates. In addition, a peak hour factor is applied. The peak hour factor reflects that not all land uses experience their peak parking demand at the same time. For example, residential land uses have their peak parking demand late at night when everyone is home, while office buildings peak at 10:00 AM and again at 2:00 PM, and retail stores peak at 1:00 to 2:00 PM. The peak hour factor is used to represent a single aggregate peak period. For downtown San Leandro, and for most downtowns, the period of highest parking generation is about 1:00 to 2:00 PM. The factors used in the parking analysis are shown in Table 9.

The sources for the rate adjustments are the same resources identified for the traffic generation rate adjustments. The Technical Appendix contains a detailed flowchart of the parking analysis process.

Residential Demand Rate Assumptions

The derivation of the residential demand rates deserves special attention. Parking demand for residential land uses is comprised of two components, 1) the residents themselves, and 2) the resident's guests or visitors including deliveries. The ITE parking demand rates do not break down residential demand by component requiring a method for estimating resident versus visitor demand. A reasonable estimate of the resident component of the rate can be derived from average vehicle ownership in San Leandro. 2000 census data was used to determine the average auto ownership in the census blocks that comprise the study area. This data was manipulated to determine the average auto ownership for single-family housing units versus multi-family housing units-a necessary step since 1) single family unit auto ownership tends to be higher than multi-family and 2) all

Table 9: Parking Demand Rates

Land Use	ITE Rate	Peak Hour Factor (%)	Downtown Area		BART Area		Downtown Area Adjusted Rates	BART Area Adjusted Rates
			Transit Factor	Mixed-Use Factor	Transit Factor	Mixed-Use Factor		
Residential	1.23	100%	-	-	-	-	1.23	1.23
Res. Visitor	0.41	100%	0.95	-	0.85	-	0.39	0.35
Total Residential	1.64	100%	-	-	-	-	1.62	1.58
Retail	3.35	100%	0.95	0.7	0.5	0.5	2.23	0.84
Restaurant	13.69	87.5%	0.98	0.3	0.5	0.5	3.52	2.99
Office	3.44	100%	0.85	0.95	0.83	-	2.78	2.86
Source: Kimley-Horn and Associates, Inc.								

of the proposed residential development in the opportunity sites is multi-family. Once the auto ownership was known (year 2000 average auto ownership for multi-family units in downtown San Leandro is 1.23 vehicles per unit) visitor parking was derived by subtracting auto ownership from the total ITE parking demand rate, as shown in Table 9. No peak hour factor, transit or mixed-use adjustment is taken from the resident component because it is assumed that the resident's parking spaces are reserved and not available to the general public or visitors.

Parking Ratio Assumptions

Parking ratios are the regulations that determine parking supply. For each opportunity site a parking ratio was assumed to determine how much on-site parking would be provided. The assumed parking ratios varied between residential and commercial land uses and the residential parking ratio varied between transit-oriented units located near BART and units located elsewhere in the study area. The parking ratios were developed as part of the Financial Feasibility Analysis of the development prototypes (see Working Paper #4). The parking ratios are:

- Residential – 1.5 spaces/Unit
- Commercial – 2.0 Spaces/1,000 square feet

Other Parking Assumptions

Additional parking assumptions included in the parking analysis include:

- The Estudillo Street municipal garage was increased from its existing 230 spaces to 500 spaces in all three alternatives (Block 12).
- 914 BART parking spaces were replaced at a 1:1 ratio in all three scenarios (Block 52).
- An additional 600 spaces of shared parking (in addition to the BART replacement parking) was assumed in Block 52 in Alternative 3.

Findings

Key findings of the parking analysis include:

Downtown Area

- In all three alternatives under the low or high density scenarios, development in the downtown area results in a surplus of parking. Although the parking demand generated by individual opportunity sites tends to exceed the supply provided, the downtown has a surplus of existing parking (mostly on-street) which can absorb the excess demand. However, much of the available parking spaces are located south of Dolores Street and east of East 14th Street, distant from the locations of high parking demand.
- Even without expansion of the Estudillo municipal garage, the downtown area would have a surplus of parking.

BART Area

- In Alternatives 1 and 2 under the low or high density scenarios (and in the high density scenario of Alternative 3), development in the BART area result in a deficit of parking. The deficit in Alternative 1 is substantial (greater than 1,600 unmet parking demand), about 400 unmet demand in Alternative 2, and lower in Alternative 3 (about 12 unmet parking demand).
- The BART area in Alternative 3 benefits from the additional shared parking provided in opportunity sites without proposed development (e.g., 600 spaces); whereas the development levels in Alternative 1 and 2 do not result in enough land for additional parking.
- Alternative 3 (low density scenario only) is the only scenario that results in an overall parking surplus in the BART area (a surplus of 50 spaces).
- When the downtown and BART areas are combined, Alternative 1 continues to result in a parking deficit while Alternatives 2 and 3 result in a surplus.

Overall

- Parking demand rate assumptions exceed parking ratio assumptions resulting in parking deficits on most opportunity sites.
- Residents can be accommodated by the assumed 1.5 spaces/unit parking ratio, but most visitors will be required to park off-site.
- Retail and restaurant uses can be accommodated with the assumed 2.0 space/1,000 square feet parking ratio (especially in the downtown) because of the availability of municipal on-street and off-street parking.
- The assumptions for office commercial parking demand (2.78 to 2.86 spaces/1,000 square feet) exceed the assumed parking ratio of 2.0. If the TOD strategy adopts the commercial office ratio of 2.0 then strategies will need to be developed to lower the demand.

Table 10 summarizes the parking supply and demand and areawide parking surplus or deficit. Table 11 summarizes the areawide parking occupancy for each alternative.

Figures 3 through 8 graphically portray parking occupancy for each alternative under the low and high density scenarios.

Table 10: Comparison of Parking Surplus or Deficit by Alternative

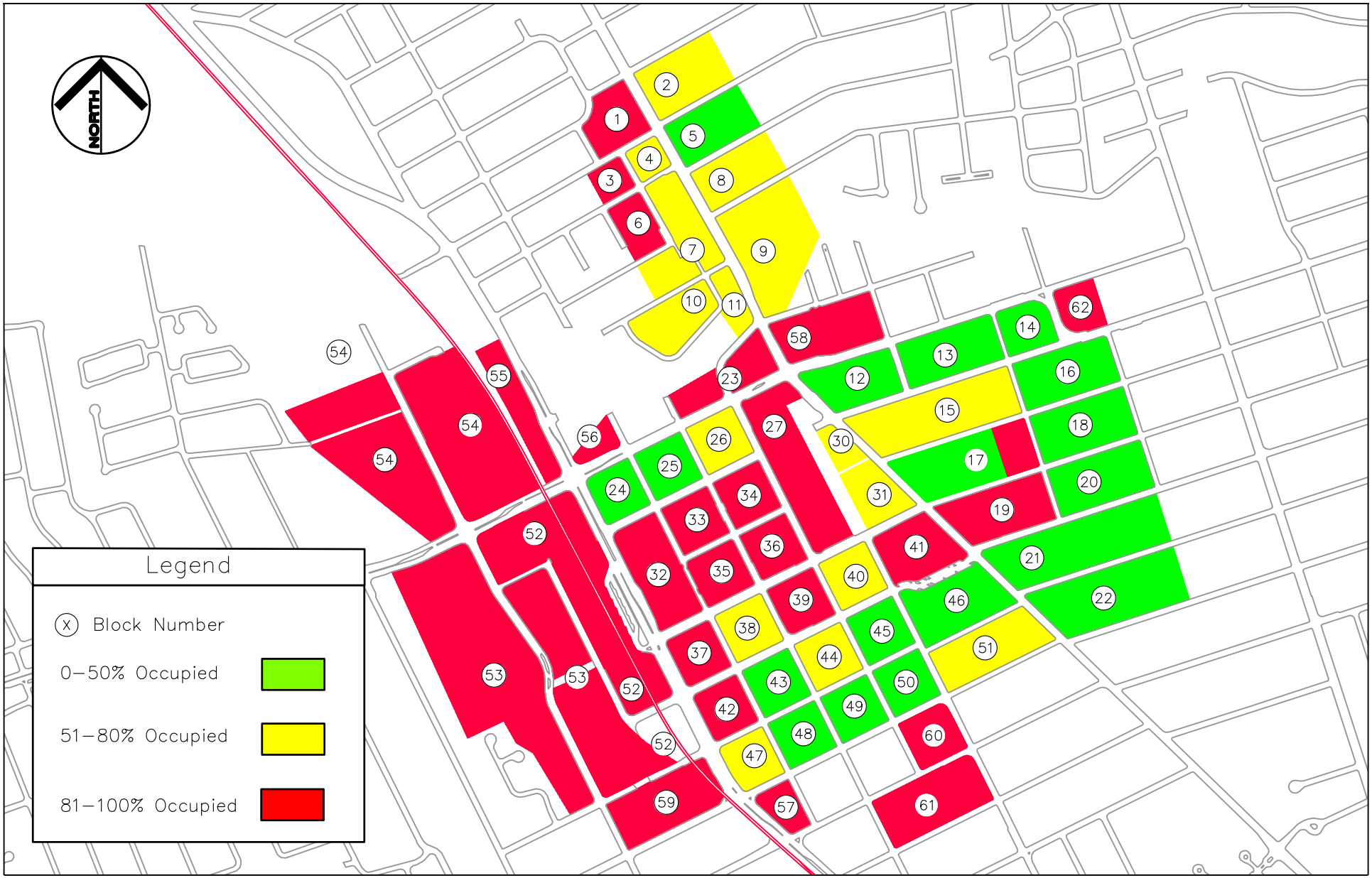
Area	Available Parking Supply			Opportunity Site Demand		Total Parking Surplus or Deficit	
	On-Street	Off-Street	Total	Low	High	Low	High
Alt. 1 - Commercial Emphasis							
Downtown	653	624	1277	129	198	1148	1079
BART	100	4	104	1719	1731	(1615)	(1627)
Total	753	628	1381	1847	1930	(466)	(549)
Alt. 2 - Residential Emphasis							
Downtown	653	624	1277	125	190	1152	1087
BART	100	4	104	463	537	(359)	(433)
Total	753	628	1381	588	727	793	654
Alt. 3 – Mixed Office/Residential							
Downtown	653	624	1277	75	113	1202	1164
BART	100	604	704	651	716	53	(12)
Total	753	1228	1981	727	828	1254	1153

Source: Kimley-Horn and Associates, Inc.

Table 11: Comparison of Areawide Parking Occupancy by Alternative

Area	Parking Supply		Parking Demand		Occupancy (Demand/Supply)	
	Low	High	Low	High	Low	High
Alt. 1 - Commercial Emphasis						
Downtown	4189	5131	2779	3796	66%	74%
BART	6008	6251	7621	7876	127%	126%
Total	10197	11382	10400	11672	102%	103%
Alt. 2 - Residential Emphasis						
Downtown	4137	5026	2722	3682	66%	73%
BART	4422	5827	4779	6258	108%	107%
Total	8558	10853	7501	9940	88%	92%
Alt. 3 – Mixed Office/Residential						
Downtown	3682	4188	2216	2762	60%	66%
BART	5711	6937	5057	6346	89%	91%
Total	9393	11124	7273	9108	77%	82%

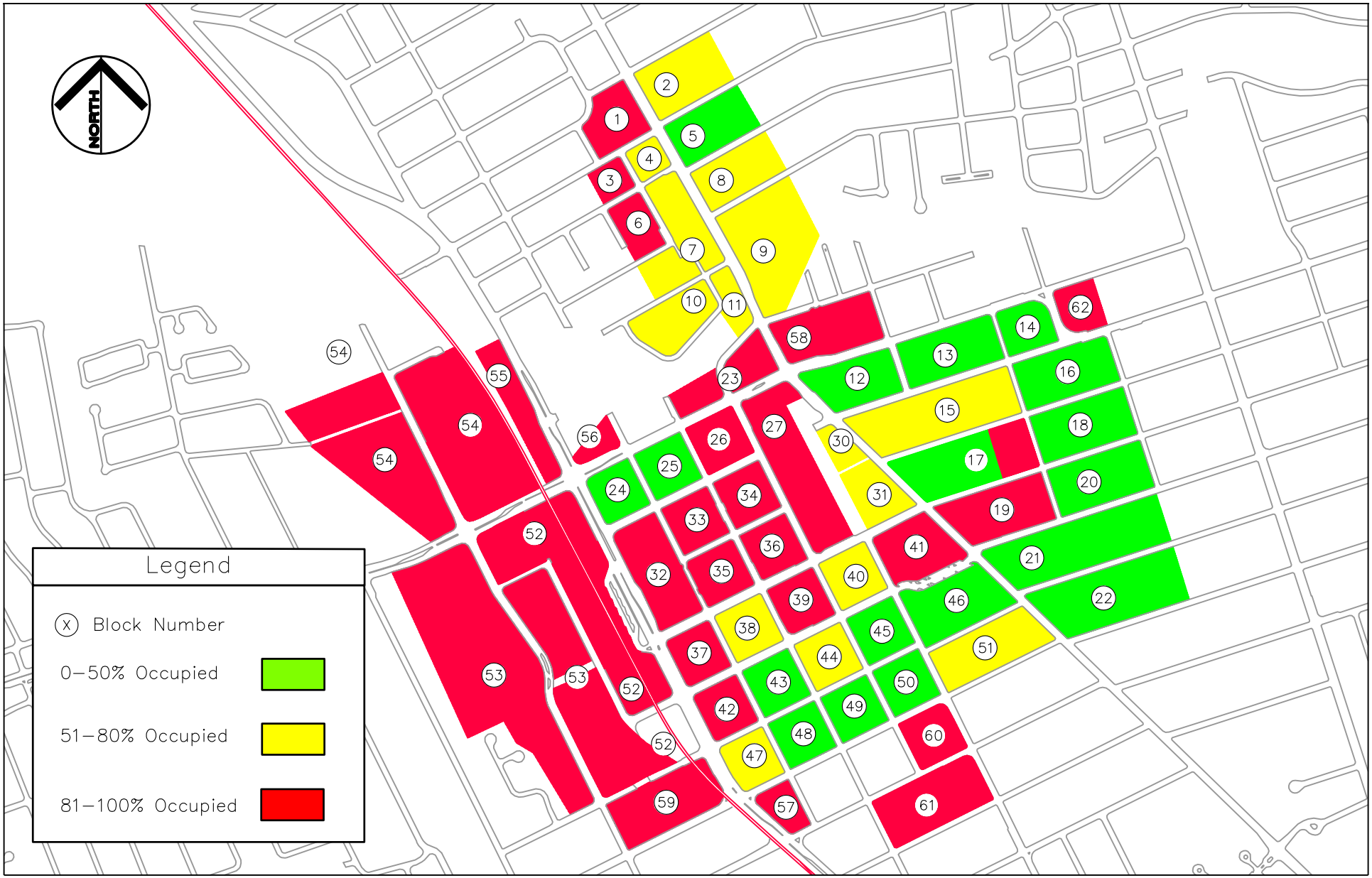
Source: Kimley-Horn and Associates, Inc.



Downtown San Leandro TOD Strategy

Kimley-Horn and Associates, Inc.

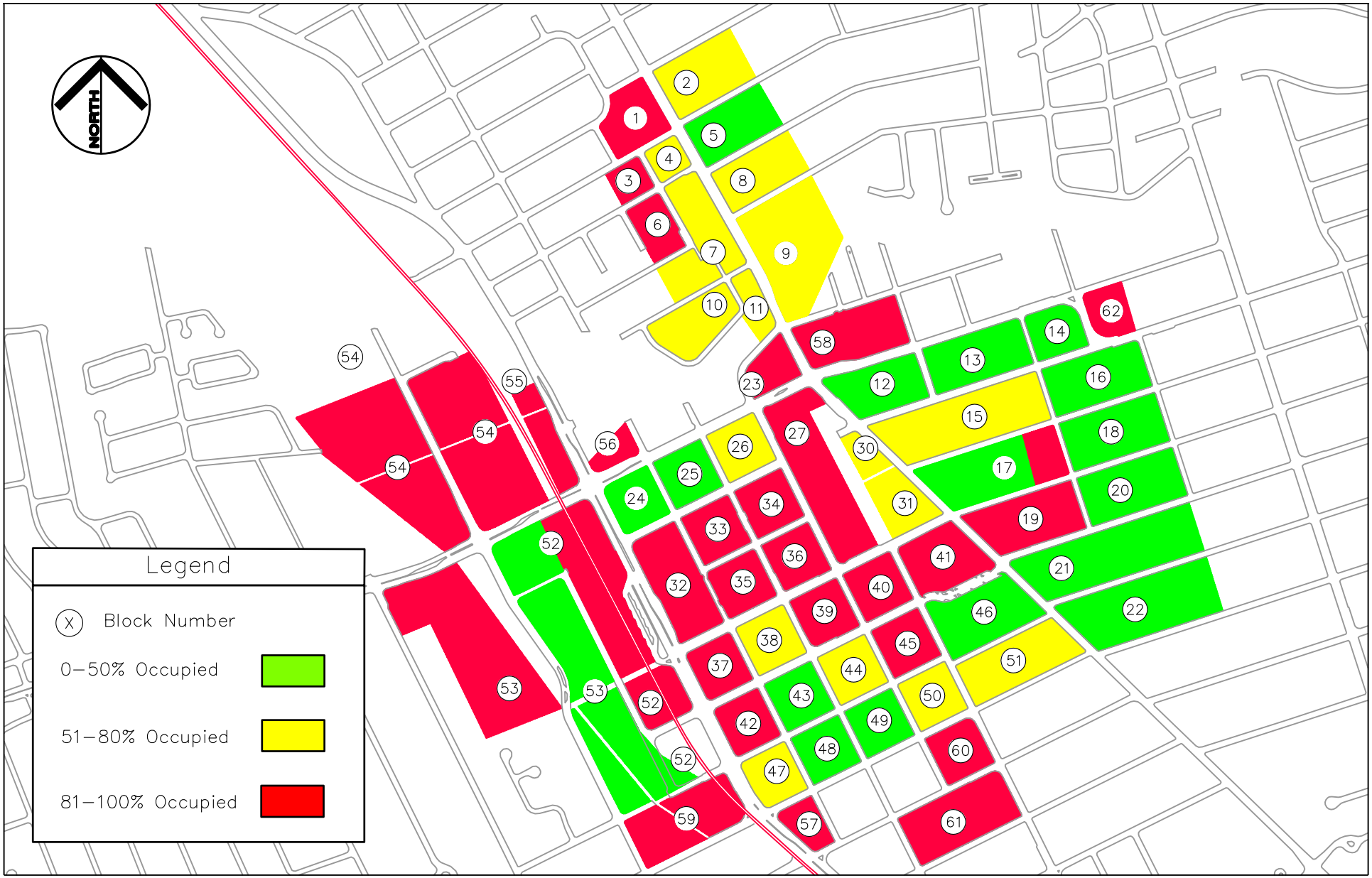
Figure 3
Parking Occupancy by Block
Alternative 1 - Low



Downtown San Leandro TOD Strategy

Kimley-Horn and Associates, Inc.

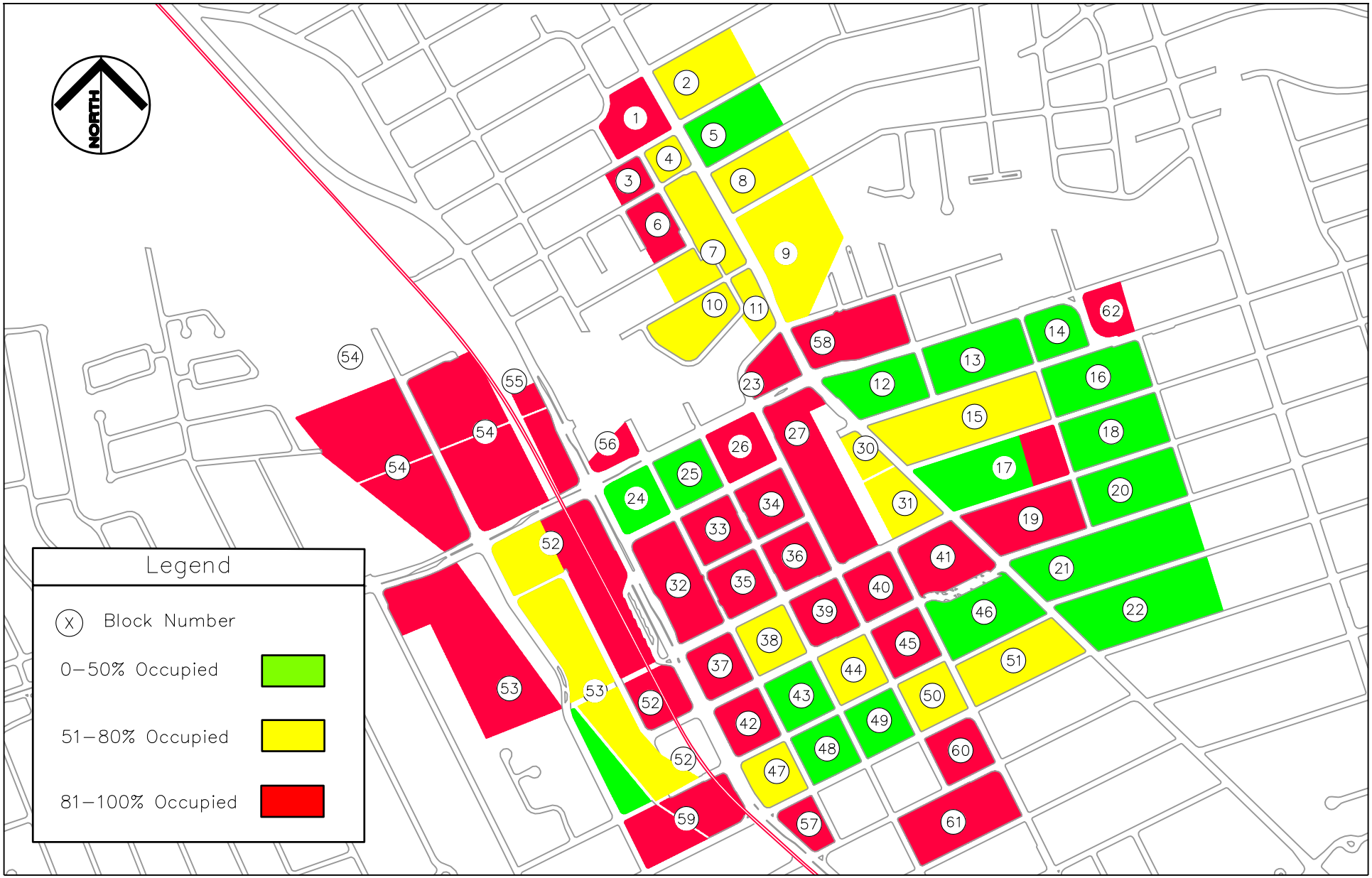
Figure 4
Parking Occupancy by Block
Alternative 1 - High



Downtown San Leandro TOD Strategy

Kimley-Horn and Associates, Inc.

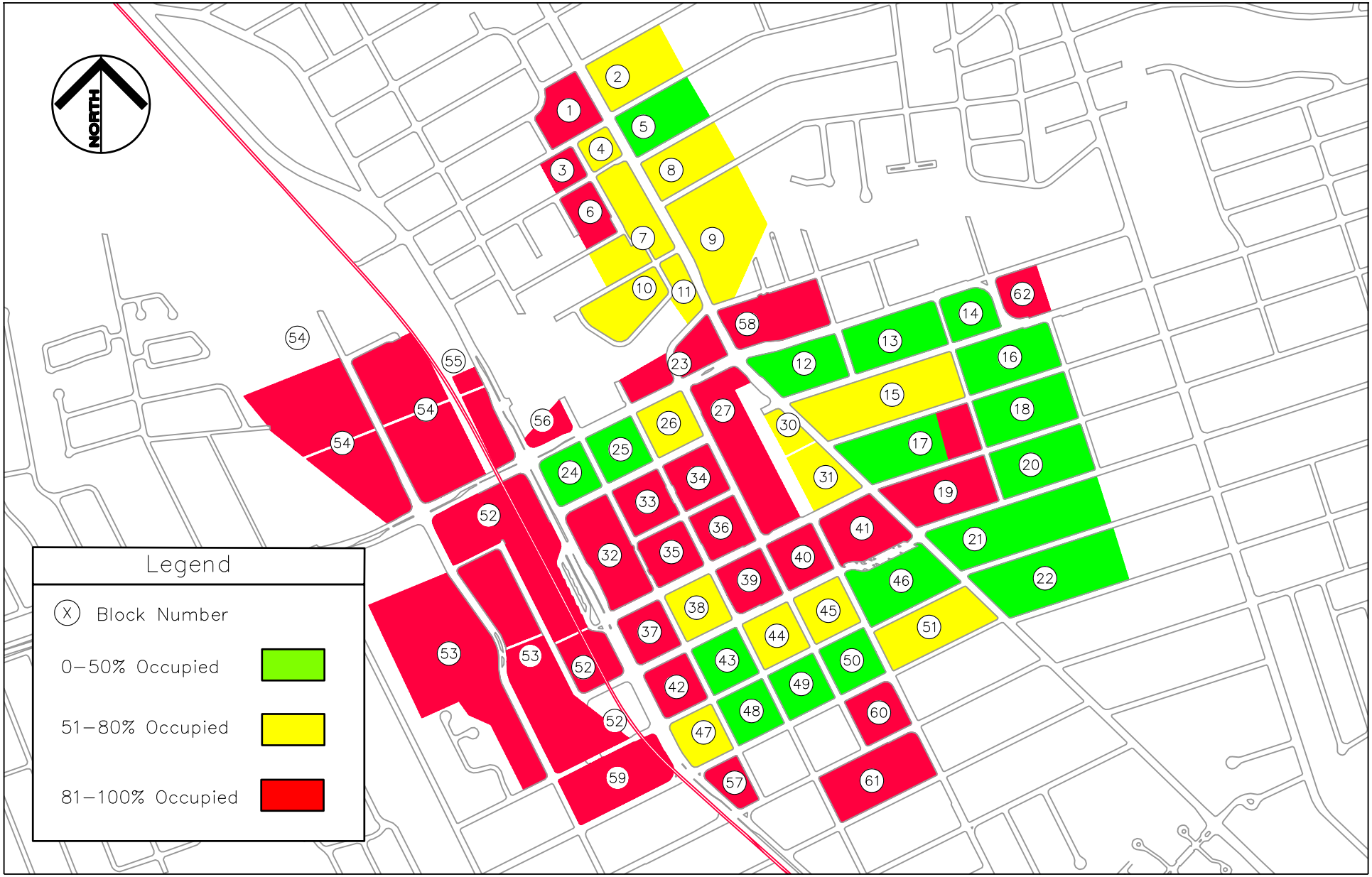
Figure 5
Parking Occupancy by Block
Alternative 2 - Low



Downtown San Leandro TOD Strategy

Kimley-Horn and Associates, Inc.

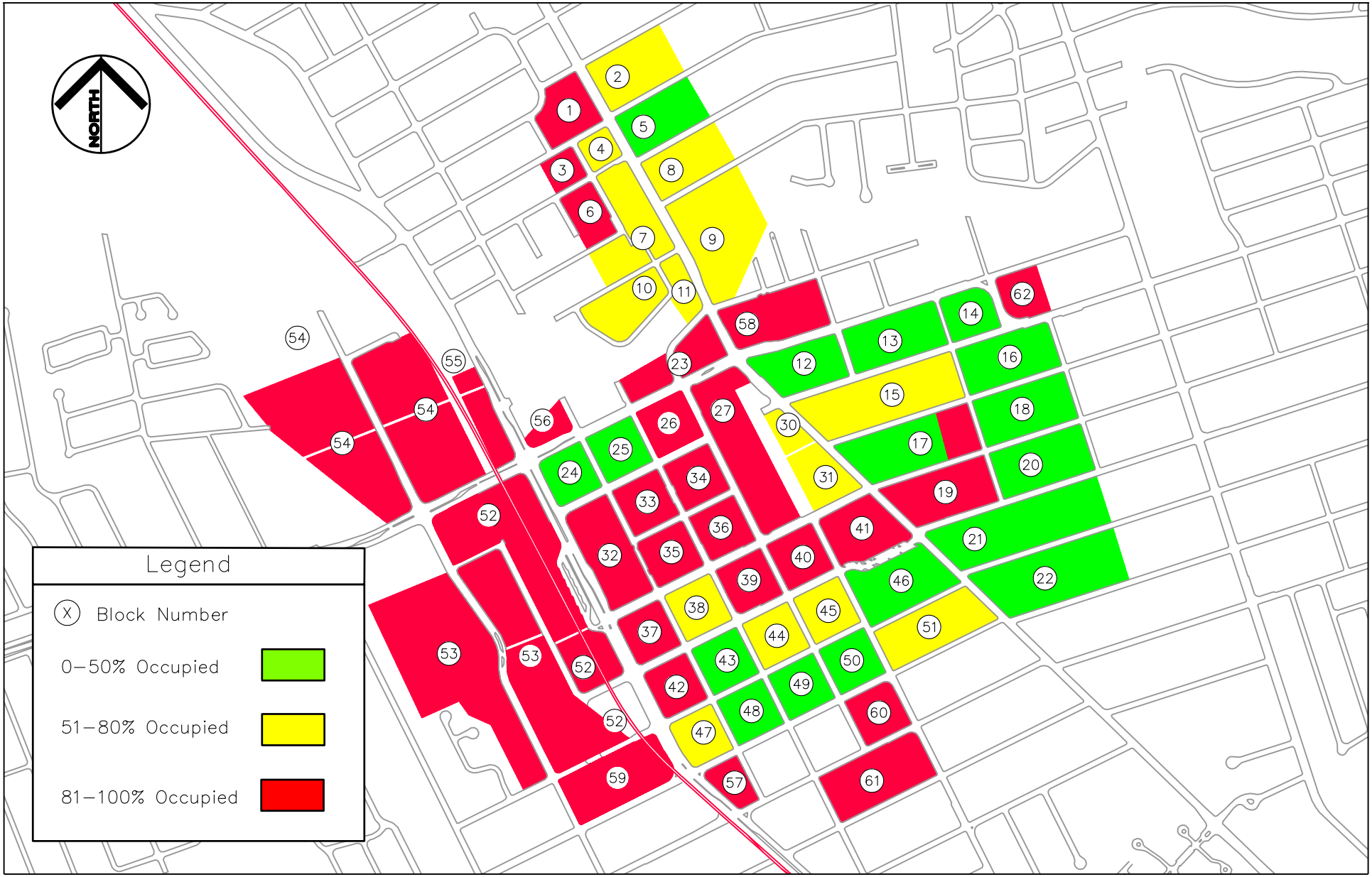
Figure 6
Parking Occupancy by Block
Alternative 2 - High



Downtown San Leandro TOD Strategy

Kimley-Horn and Associates, Inc.

Figure 7
Parking Occupancy by Block
Alternative 3 - Low



Downtown San Leandro TOD Strategy

Kimley-Horn and Associates, Inc.

Figure 8
Parking Occupancy by Block
Alternative 3 - High

5 | Strategies

Traffic Strategies

The traffic strategies presented below are organized by travel demand reduction and traffic capacity measure and can be applicable to all three alternatives. This section begins with an overview of the components of each alternative that contribute to traffic congestion and a recommendation of which strategies each alternative should emphasize.

Alternative 1 – Commercial Office Emphasis

Alternative 1 generates the highest amount of traffic and has the greatest impact on intersection levels of service when compared to the other alternatives. Although it has the lowest amount of housing, the majority of this alternative's trip generation, and thus impacts, are due to the amount of commercial office development (2,000,000 square feet). Traffic strategies for this alternative emphasize reducing commercial traffic demand.

Alternative 2 – Residential Emphasis

Alternative 2 increases the number of housing units (the highest of all three alternatives) and provides a lower amount of commercial office (438,000 square feet). This alternative generates the second highest amount of traffic with the majority generated by the residential and retail uses, so the traffic strategies emphasize reducing residential traffic demand.

Alternative 3 – Mixed Office/Residential

Alternative 3's land use falls between the ranges of Alternatives 1 and 2 (with the exception of having lower growth in retail land uses) but its combination of land uses results in the alternative with the least amount of traffic generation and parking demand. This alternative benefits from the greater transit mode share of residential, resulting in the lowest number of impacts. Traffic strategies for this alternative should balance Transportation Demand Management measures with targeted traffic capacity measures.

Travel Demand Reductions Strategies

The following strategies may be applied to new development in the downtown area.

T1. Substantially reducing the amount of commercial office land uses in the BART area and consider replacement with residential uses which have a greater transit mode share than office. This strategy implies the selection of Alternatives 2 or 3 as models for the preferred alternative.

T2. Develop high-quality and direct pedestrian connections between development and the BART and BRT and other transit systems. Place commercial office entrances closest to BART station.

T3. Adopt rigid Transportation Demand Management (TDM) policies and requirements including:
- Establishing a ceiling on the traffic generation for specific areas in conjunction with annual monitoring. Enforce the maximum on trip generation through agreements to pay additional fees for higher levels of mitigation.
- Require membership in a Transportation Management Association (TMA). TMA's provide services to smaller commercial tenants who otherwise could not effectively implement TDM programs. Services may include:
  - Customized TDM planning for members
  - TDM program marketing
  - Subsidized transit passes
  - Rideshare matching program
  - Guaranteed ride home program
  - Full-time TDM coordinator
  - Commute alternative website and on-site information resources
  - Subsidized vanpool lease program and operating expense assistance
  - Shuttle service to downtown or other locations
  - Tele-commuting center for nearby residents

T4. Require new development to charge for parking, as part of a Parking Management Strategy (see Parking Strategies). This

strategy, combined with free transit passes (for at least one year) provided by the development/management can be highly effective.

T5. Encourage the establishment of a car-sharing and/or rental car service in the BART area.

T6. Encourage other employer-sponsored financial and non-financial incentives including travel allowances in lieu of parking subsidy, parking cash-out, transit discounts, reimbursement policies that encourage alternative modes for business travel, flexible work schedules, and information on tax incentives.

Traffic Capacity Strategies

T7. Adopt a downtown TOD area Traffic Impact Fee (TIF) which funds pedestrian and bicycle connectivity improvements to transit, funds improvements to transit facilities, and prioritizes mitigation measures to maintain a LOS D at intersections on the BRT and other transit route (East 14th Street but also Davis Street and San Leandro Boulevard if BRT connects to the BART station). Mitigation of non-BRT route intersections is a secondary priority.

Policy Strategies and Analysis

T8. Establish traffic and parking assumptions used to evaluate future development applications in downtown San Leandro. The assumptions may be, and should be, different from those used elsewhere in the city. In fact, the assumptions should represent the vision of San Leandro that can realistically be achieved, and may require a paradigm shift in thinking. The assumptions used in this comparative analysis will be refined through the analysis of a preferred alternative. Once accepted, the assumptions for traffic and parking generation can be used in subsequent environmental assessment.

T9. Adopt a Statement of Overriding Considerations for intersections that fail to meet the City's LOS D standard. This strategy recognizes that higher densities can have localized traffic impacts but provide citywide and regional transportation benefits, and enhance economic activity in the downtown. This strategy also recognizes that peak period traffic congestion can serve as a deterrent to the single occupant vehicle and increase the competitiveness of transit.

T10. Consider changing the way level of service is measured in the downtown, possibly in conjunction with designating the downtown as an "infill opportunity zone" (California Government Code Section 65088-65089), which exempts these special areas from the level of service standards specified in the County Congestion Management Program. Some communities, recognizing the infeasibility and undesirability of building bigger intersections for automobiles, are adopting corridor travel time as the measure of acceptability in downtown areas. This measure (based on the Highway Capacity Manual urban streets method) balances poor operating conditions at some intersections with acceptable average speeds along the length of key corridors. Mitigation measures under this measure of LOS benefit transit and include signal interconnection and synchronization improvements, spot capacity refinements at intersections, elimination of bottlenecks (e.g., adding left turn lanes), and access management.

Parking Strategies

The parking strategies presented below are organized by type of demand (e.g., commercial office, retail and residential). Because many of the strategies are applicable to different types of demand and all three alternatives, the discussion references earlier strategies to avoid redundancy.

Commercial Office and Retail Parking Strategies

The cost of structured parking in urban areas is very high and the number of parking spaces required can determine the financial feasibility of a development project. The strategies below combine measures to both reduce demand and reduce the required number of parking spaces (and consequently cost). These strategies will need policies to implement parking charges as both a transportation demand management measure and a way to recover the cost of building structured parking.

BART Area

P1. Emphasize the development of shared parking facilities (shared between private development and BART) with market-based parking charges. This requires a development parcel large enough to accommodate a large parking structure and commercial development, a parcel of land exclusively for parking, or several smaller shared parking garages interspersed in the BART area. Because shared parking strategies distribute parking within a larger area, this strategy benefits from a parking information and/or guidance system; real-time information on the location and availability of public parking. This technology makes shared parking more efficient and effective and reduces the secondary impacts associated with "cruising" for parking.

P2. Encourage BART to reduce the amount of replacement parking for BART commuters in conjunction with the implementation of shared parking facilities. Under a shared parking strategy, overall there would be more parking in the BART area, but not all of it exclusively for BART patrons. BART's A-Line Study identified the stations adjacent to the San Leandro Station (Bay Fair and Coliseum) as potential shared parking locations (increasing the BART parking supply) allowing the San Leandro station to reduce the number of exclusive BART spaces. This depends on private development plans surrounding the adjacent stations, but should be further explored with BART.

P3. Adopt lower on-site parking ratios for commercial office development in the BART area only in conjunction with a shared parking strategy and adoption of Transportation Demand Management requirements (see Strategies T4 through T7). Based on the parking demand rates used in this analysis, commercial office demand will exceed supply by about one space per 1,000 SF of development (based on a parking ratio of 2.0 spaces/1,000 SF). Although the demand rate assumed is reasonable based on today's conditions at suburban BART stations (Walnut Creek/Fremont), it may change if this study adopts a vision that results in a mode share similar to other urban BART stations (e.g., Hayward, Berkeley). Regardless, a sound strategy will reserve areas for shared parking facilities to accommodate excess commercial office demand and BART commuters.

P4. Gradually phase in lower parking standards. Initial development in the BART area might provide 2.5 to 3.0 spaces per 1,000 SF. Over time, with implementation of shared parking the standards may be reduced to 2.0 spaces/1,000 SF. Any excess parking in the first phases of development would become available as shared parking.

P5. Consider exempting retail uses in the BART area from parking requirements. Retail uses in the BART area are primarily neighborhood, development and BART-patron serving.

P6. Reduce the amount of commercial office development, particularly in Alternative 1. Even with a shared parking strategy and further reductions in the demand rate, the amount of development in Alternative 1 results in a BART area deficit of over 1,600 vehicles. This deficit would be difficult to accommodate with shared parking facilities.

P7. Explore shared parking funding mechanisms. There are several ways or combination of methods to consider. The City and/or BART may share in the cost of adding additional parking to structures constructed as part of private development. The City, or BART, may develop, own and operate a shared facility constructed through bonds, tax increment financing, or other revenue sources. A parking district may be formed in which private development either pays into a fund for city-owned facilities in addition to their own lower parking requirements, or pay an in-lieu fee. Below is a list of common funding mechanisms, which are usually used in combination.

- Parking benefit district with assessments
- Joint public/private development with ground floor retail rent revenue
- Revenues from parking meters (mostly for operations and maintenance)
- General obligation or revenue bonds
- In-lieu fees
- Redevelopment tax increment financing
- Revenues from lease of City property
- Enforcement of time restrictions

P8. Maximize on-street parking opportunities on the internal streets west of the BART station. Explore implementing angled parking on appropriate streets. Do not establish time restrictions for on-street parking, allowing these spaces to be part of the shared parking supply, although long-term meters are an option.

Downtown Area

P9. Manage existing on-street parking using time restrictions to improve turnover and provide a pool of short-term parking, especially in the core area.

P10. Provide some unrestricted on-street parking in the periphery of the downtown to accommodate long-term parking needs, and some overflow parking from the BART area.

P11. Explore opportunities to increase on-street parking supply through the implementation of angled parking on appropriate streets.

P12. Expansion of the municipal parking garage is not required in the near-term, but may be required in the long-term. Monitor parking supply and demand to determine the need for expansion when occupancy of existing on and off-street supply reaches about 80-85%.

P13. Adopt a parking ratio of 2.0 spaces per 1,000 square feet for commercial development in the downtown, and consider exempting ground floor retail from providing any on-site parking if less than a pre-determined amount. Any excess parking can be accommodated by the surplus parking supply in the downtown area.

Residential Parking Strategies

BART Area

P14. Adopt a maximum parking ratio of 1.0 spaces per dwelling unit for TOD residential within ¼-mile of the BART station if the City accepts that the downtown TOD strategy will attract self-selective residents (those who intentionally live near BART because they own fewer or no vehicles) thus reducing the current vehicle ownership level (1.23 per household) to one or less per household. Any excess parking would be required to use the shared parking supply. This standard may be gradually implemented until TOD is established in the BART area, beginning with a parking ratio of 1.25 spaces per unit. Alternatively, allow a maximum of 1.5 spaces per unit with 0.5 spaces per unit "unbundled" from the price or rent of the unit. These "flex" spaces may be leased for additional vehicles, used by visitors or leased to non-residents (e.g., BART commuters).

P15. Allow residential development to accommodate visitors either through the shared parking supply (on and off-street) or in the unbundled flex parking supply that is permitted on-site.

Downtown Area

P16. Adopt a parking ratio averaging 1.5 spaces per unit for new residential development in the downtown area. The downtown area will not benefit as much from self-selective residents as the BART area will, and is not as accessible to transit as the BART area. This ratio will accommodate current levels of auto ownership and later can be converted to flex spaces unbundled from the units. In for-sale development, 0.5 spaces per unit must be unbundled initially or the spaces will remain with the unit.

P17. Adopt Strategy P15 for residential visitors in the downtown area.

Overall Parking Strategies

O1. Implement a Residential Parking Permit Program (RPPP) in conservation districts. This strategy preserves parking for residents and their guests by limiting and controlling the amount of non-residential parking allowed. An RPPP would allow employees to purchase permits to park on streets in the surrounding neighborhoods provided that there is sufficient on-street parking capacity to accommodate the needs of the neighborhood. The revenue generated by this strategy may be used to administer and enforce the residential permit parking program or may be used to fund improvements specific to the neighborhood in which the permit was sold

(e.g., traffic calming, landscaping, streetscapes, etc.). The City may opt to allow the residents to determine how to use the revenue generated within their district. A similar program may be implemented in commercial districts.

O2. Provide loading zones in the downtown area. Loading areas for the delivery of goods, merchandise and supplies is essential for the economic health of downtown San Leandro. Deliveries should be accommodated through a combination of on-site loading docks, on-street loading zones restricted to certain hours, and permanent on-street loading areas. Larger development projects should provide on-site loading areas conforming to the City's zoning ordinance. Smaller or otherwise constrained sites may be served by on-street loading zones that are restricted to loading in the early morning hours and afterward revert to public parking. These loading areas would be project-specific, but should be selected to serve several properties. These restricted loading areas should be as convenient as possible to the service entrances of the buildings they serve, but if that is not feasible, loading zones may be on side streets or in the backs of buildings.

O3. Consider development of a Parking Benefit District. A parking benefit district is a tool for efficiently managing the public parking supply in the downtown commercial core. It has two primary purposes:

1) It establishes an area in which the development within the district is entitled to use the public parking supply. This also includes the potential to adopt funding mechanisms as part of the benefit district (see Strategy P7).

2) It is a strategy designed to create vacant parking spaces and the desired turnover so that customers and visitors can locate parking near their destination without excessive cruising in search of a parking space, implemented by establishing time restrictions enforced with parking meters for on-street parking and eventually implementing variable parking pricing in municipal parking facilities.

A parking benefit district works by using pricing to control parking occupancy. The objective is to maintain an 85% occupancy of public parking spaces (about one out of every seven spaces vacant) during the peak periods. This ensures that there is always reserve capacity for those searching for convenient short-term parking.

The cost of an hour of parking should be the cost that achieves the 85% occupancy goal. In theory the cost of parking should vary by location with prime spaces in front of popular destinations costing more than spaces on side streets a block away. Variable pricing such as this can be achieved with new dynamic parking pricing systems which alter meter prices based on current utilization. However, San Leandro should adopt a simpler pricing method in the near-term.

6 | Conclusions

A traffic and parking analysis was prepared to provide a comparative evaluation of the three land use alternatives under both a low and high residential density scenario. The findings of the study have two objectives:

1) To provide feedback into the development of a preferred TOD strategy and land use alternative for downtown San Leandro, and

2) To use as the basis for developing the initial traffic and parking strategies included in this working document.

The traffic and parking analyses are based on several key assumptions related to the generation of traffic and parking. Key information in the derivation of trip generation and parking demand rates include transit reduction factors, mixed-use reduction factors, and auto ownership in San Leandro. While the analysis uses reasonable estimates or actual data for this information, there is latitude to refine the factors based on the future vision of TOD in downtown San Leandro. The parking analysis tests assumptions initially developed in the Financial Feasibility Analysis of Development Prototypes-the parking ratios that define the amount of parking required of private development.

Key Findings

Traffic Analysis

- Although Alternative 1 generates the most amount of traffic and impacts intersections more than Alternatives 2 and 3, the traffic generated in all three alternatives can be accommodated by the existing transportation system with minimal impacts.
- The closure of Hays Street does significantly impact the intersection of East 14th Street and Davis Street in all three alternatives and under either the low or high density scenarios. The operation of this intersection may affect the performance of BRT and other transit when implemented.

Parking Analysis

Downtown Area

- In all three alternatives under the low or high density scenarios, development in the downtown area results in a surplus of parking. Although the parking demand generated by individual opportunity sites tends to exceed the supply provided, the downtown has a surplus of existing parking (mostly on-street) which can absorb the excess demand. However, much of the available parking spaces are located south of Dolores Street and east of East 14th Street, distant from the locations of high parking demand.
- Even without expansion of the Estudillo municipal garage, the downtown area would have a surplus of parking.

BART Area

- In Alternatives 1 and 2 under the low or high density scenarios (and in the high density scenario of Alternative 3), development in the BART area result in a deficit of parking. The deficit in Alternative 1 is substantial (greater than 1,600 unmet parking demand), about 400 unmet demand in Alternative 2, and lower in Alternative 3 (about 12 unmet parking demand).
- The BART area in Alternative 3 benefits from the additional shared parking provided in opportunity sites without proposed development (e.g., 600 spaces); whereas the

development levels in Alternative 1 and 2 do not result in enough land for additional parking.
- Alternative 3 (low density scenario only) is the only scenario that results in an overall parking surplus in the BART area (a surplus of 50 spaces).
- When the downtown and BART areas are combined, Alternative 1 continues to result in a parking deficit while Alternatives 2 and 3 result in a surplus.

Overall

- Parking demand rate assumptions exceed parking ratio assumptions resulting in parking deficits on most opportunity sites.
- Residents can be accommodated by the assumed 1.5 spaces/unit parking ratio, but most visitors will be required to park off-site.
- Retail and restaurant uses can be accommodated with the assumed 2.0 space/1,000 square feet parking ratio (especially in the downtown) because of the availability of municipal on-street and off-street parking.
- The assumptions for office commercial parking demand (2.78 to 2.86 spaces/1,000 square feet) exceed the assumed parking ratio of 2.0. If the TOD strategy adopts the commercial office ratio of 2.0 then strategies will need to be developed to lower the demand.

Traffic and Parking Strategies

Traffic strategies focus on two areas, 1) travel demand reductions, and 2) traffic capacity improvements, including policy changes.

Parking strategies are developed for different types of demands such as commercial office and retail demands and residential demands. The strategies, while they can be specific to the alternatives, are generally applicable to all three alternatives.

The initial strategies presented in this working document are intended to provide a broad menu of potential solutions that will be further developed and detailed as the TOD strategy and land use alternatives are refined.

7 | Acknowledgements

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Appendices

The Appendices are under separate cover.

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