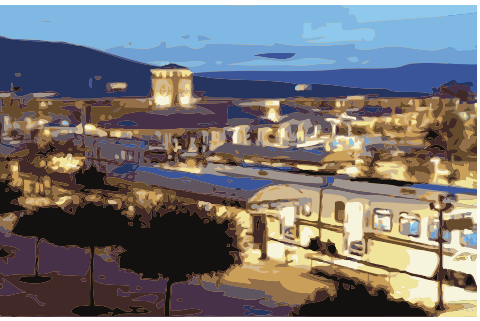
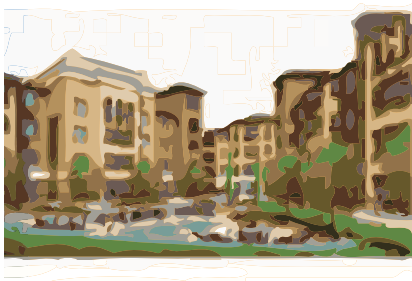
SJSU/VTA Collaborative Research Project

A Parking Utilization Survey of Transit-Oriented Development Residential Properties in Santa Clara County





Volume I: Technical Report
November 2010

San José State University
Department of Urban & Regional Planning
One Washington Square
San José, CA 95192-0185

Santa Clara Valley Transportation Authority
Transportation Planning & Congestion Management
3331 N. First Street, Building B-2
San José, CA, 95134-1927

SAN JOSÉ STATE
UNIVERSITY

VTA

SAN JOSÉ STATE UNIVERSITY

College of Social Sciences
Department of Urban and Regional Planning
One Washington Square
San José, California 95192-0185
Voice: 408-924-5882
Fax: 408-924-5872
urbplan@email.sjsu.edu

www.sjsu.edu

November 18, 2010

Mr. Chris Augenstein, AICP
Deputy Director, Planning
Santa Clara Valley Transportation Authority
3331 North First Street, Bldg. B
San José, CA 95134

RE: SJSU/VTA Collaborative Research Project – *A Parking Utilization Survey of Transit-Oriented Development Residential Properties in Santa Clara County*

Dear Mr. Augenstein:

With much pleasure, I would like to transmit to your office the final Technical Report (Volume I) for the above referenced project, which has been prepared by the graduate students of *URBP 256: Transportation Planning – Local Issues* (Spring 2010), under the leadership of Mr. Eduardo C. Serafin, PE, AICP. The report details the findings of the parking utilization surveys of transit-oriented development (TOD) residential properties in Santa Clara County, providing empirical evidence that these types of development are "over-parked."

We would like to express our gratitude to the Santa Clara Valley Transportation Authority—particularly Mr. Robert W. Swierk, AICP and Ms. Ying C. Smith, AICP—for collaboratively working with our graduate students on this project, giving them the opportunity to gain real-world experience that could help shape future land development in the South Bay. We believe this report will be useful in your efforts in informing local decision-makers regarding the benefits of reducing local parking requirements for TOD residential properties in Santa Clara County. We would also like to thank you very much for acknowledging our students' contribution with individual commendations letters. We consider this collaborative research project between SJSU and VTA an unqualified success for all parties involved.

Sincerely,

Dayana Salazar

Prof. Dayana Salazar
Professor and Chair
Department of Urban and Regional Planning

SJSU/VTA Collaborative Research Project

A Parking Utilization Survey of Transit-Oriented Development Residential Properties In Santa Clara County

VOLUME I: TECHNICAL REPORT

November 2010

San José State University (SJSU)

Department of Urban and Regional Planning (DURP)
URBP 256: Transportation Planning – Local Issues (Spring 2010)

One Washington Square
San José, CA 95192-0185
Main Office: WSQ 216A
Phone: 408.924.5882
Email: urbplan@email.sjsu.edu
www.sjsu.edu/urbanplanning

Santa Clara Valley Transportation Authority (VTA)

Transportation Planning & Congestion Management
3331 N. First Street, Building B-2
San José, CA, 95134-1927
Phone: 408.321.2300
www.vta.org/projects/studies.html

PRINCIPAL INVESTIGATORS

Eduardo C. Serafin, PE, AICP
Adjunct Lecturer, SJSU DURP

Robert W. Swierk, AICP
Senior Transportation Planner, VTA

Ying C. Smith, AICP
Transportation Planning Manager, VTA

Graduate Research Assistant

Justin M. Meek, MURP
Urban and Transportation Planner, SJSU DURP

GRADUATE STUDENT RESEARCH TEAM

Survey Logistics and Implementation Team

Team Leader: **Ross Nakasone**
Aiko Cuenco
Nile F. Eckhoff
Kevin O. Gnusti
Viona E. Hioe
Yu Nagai
George D. Schroeder
Nicholas J. Votaw

Mapping and Data Analysis Team

Team Leader: **Justin M. Meek**
Soma Chatterjee
Minghua Cui
Christopher L. Hackler
Candace O. Louie
Amelia L. Naranjo
Mark Solomon

Technical Report Preparation Team

Team Leader: **Sue-Ellen K. Atkinson**
Kenneth R. Flack
Vinay S. Murthy
Adam L. Smith
Lara L. Tran

The following students participated in the early phase of this project:

Catharine A. DeLuca
Paul N. Hierling
Ryan C. Niblock

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Note: Most figures in Chapter 5 show VTA Light Rail stations.
* Figure shows only a Caltrain station.
** Figure shows both VTA Light Rail and Caltrain stations.

List of Appendices (Volume II)*

* Volume II is in a separate document from Volume I

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Executive Summary

This technical report is the outcome of a collaborative research effort between a transportation agency, the Santa Clara Valley Transportation Authority (VTA), and a graduate student research team at San José State University's (SJSU) Department of Urban and Regional Planning (DURP). The focus of this research project is on parking utilization at transit-oriented development (TOD) residential projects in the southern portion of the San Francisco Bay Area. The intent of this research is to determine actual parking utilization for residents of 12 housing developments near VTA light rail and Caltrain stations, and to compare usage to parking supply and local requirements at these locations. The project has yielded information useful to planning practitioners and academia alike. The study follows recent research within the Bay Area that demonstrates many TOD residential properties are "over-parked" (Cervero 2009). Locally, the study provides evidence to VTA to help inform decision-makers and the public that less parking can and ought to be required for certain kinds of development projects. While this study focuses on Santa Clara County, it is expected to provide relevant information for similar development projects throughout the United States that are promoting TOD residential projects in the face of increasingly scare land resources.

PROJECT OBJECTIVE AND METHODOLOGY

The intent of this research project is to corroborate the findings of other research on the topic and provide evidence that reduced parking requirements may be permissible in Santa Clara County. If the survey demonstrates lower actual parking utilization than current parking supply, it would indicate that local jurisdictions with land-use control surrounding fixed-rail transit stations could reduce their parking requirement standards. This reduction in parking requirements could have the effect of reducing TOD construction costs and reducing the footprint of TOD development projects to make land available for other and better uses.

An initial literature review was conducted to collate existing research related to parking utilization and demand. The results from the literature review were used to determine best practices in estimating parking demand, identify local parking requirements in the study area, and develop a parking survey work plan. After an on-site survey was selected as the preferred methodology, the research team conducted pre-survey field visits and then on-site surveys, collecting a range of parking-related data. The analysis of the data is included in Chapters 6 and 7.

KEY RESEARCH FINDINGS

The key finding of this study is that all 12 TOD residential properties surveyed offer more parking than residents need and actually use. Each of the survey sites has significant unused parking (see Figure 6.4). As shown in Figure 6.1, about 26 percent of available parking spaces for the 12 survey sites were unused at the time of the on-the-ground surveys. The fact that the parking supply rate is found higher than the parking demand rate for all 12 sites (22 percent higher on average) indicates that more parking is provided than is actually needed (see Table 6.1 and Figure 6.5). This research project provides evidence that TOD residential projects in Santa Clara County may be "over-parked."

Since parking requirements for residential developments are set by local zoning requirements, local parking requirements have clearly led to the large amount of parking supplied at the residential development sites surveyed. The 2,496 unused parking spaces in 12 residential sites lead the Research Team to conclude that parking facilities at TOD residential projects in Santa Clara County may be underutilized. This finding suggests that local parking code requirements for TOD residential properties in Santa Clara County, and other similar locations, could be reduced by as much as 26 percent.

Based on the observed peak parking utilization, the parking demand rates for the 12 TOD survey sites are near the bottom of the range of required parking supply levels for municipalities across Santa Clara County (see Figure 6.2), which in some cases may exceed 2.5 parking space per dwelling unit under current local zoning requirements. This research project shows that parking demand at residences within one-half mile of a major transit station is less than what current zoning codes require. As such, many Santa Clara County municipalities could reduce their residential parking requirements significantly without the risk of "underparking" a TOD residential site.

Figure 6.6 and Table 6.1 show that on average only about 1.3 spaces are needed per dwelling unit in a TOD residential site in Santa Clara County that meets the criteria set in Section 5.2.1 of this report. This result for Santa Clara County TOD sites is comparable to the average parking demand rate of 1.2 space per dwelling unit for other San Francisco Bay Area TOD sites studied by Cervero in 2009 (see Table 2.1).

POLICY IMPLICATION: REDUCE COSTS OF UNUSED PARKING

Since unused parking supply consume land, money, and other resources in their construction and maintenance, reduction in parking requirements for TOD residential projects could benefit both local municipalities and developers alike. Constructing parking facilities increases costs for developers and proves inefficient for the municipality when a large proportion is unused. There are potential cost savings that could be garnered if parking requirements are reduced to levels suggested by the utilization data presented in this study. These cost savings can then be used to support other critical development objectives of the local municipality.

The cost of constructing parking facilities is estimated to be on average between $10,000 and $30,000 per space in garage facilities and about $5,000 per space for surface parking lots (Boroski 2002, 1). In the United States, building parking costs an average of $15,000 per space, or $44 per square foot (VTPI 2010, 5.4-2). The cost of parking facilities does vary according to the individual site, but an across-the-board average will be used in this case. Using the national average cost, the 2,496 unused parking spaces counted in this study for the 12 TOD residential sites represent about $37.4 million in opportunity cost. This estimate is only a partial estimate to the total potential opportunity cost for the whole county.

Constructing parking facilities is estimated to represent about 10 percent of total development costs for a building (VTPI 2010, 5.4-12). This cost represents a large expenditure for developers, and any provision to reduce parking requirements to reduce this amount could represent a significant reduction in overall development costs. The cost savings in development costs could then be used to support other enhancements to the project, which may be desired by the local agency and its communities. Maintenance and operation for a parking facility can also cost property owners an average of $800 per year for each residential off-street parking space[1] (VTPI 2010, 5.4-10). This maintenance cost represents about $2.0 million per year for the 12 TOD residential sites in annual opportunity cost, which could be used for other purposes to maintain the residential property. Again this annual opportunity cost is only a partial estimate to the total annual opportunity cost for the whole county.

POLICY IMPLICATION: SIMPLIFY LOCAL PARKING REQUIREMENTS

Each municipality in Santa Clara County has its own unique way of granting such a reduction. In the majority of cases, the process requires case-by-case decision making (such as conditional use

[1] Note: costs can vary between $670-5,000 per year

permits) or a previously completed legislative effort (such as a Specific Plan). In several jurisdictions, reductions can only be granted through issuance of a variance or in conjunction with the site developer's participation in and promotion of transportation demand management (TDM) programs.

Providing reduced parking requirements for TOD residential sites directly into the zoning code could save municipalities the manpower and resources required for additional permitting efforts. Additionally, this form of regulation would likely be seen as beneficial in the development community, as it would allow for a greater measure of predictability and simplicity in determining the costs associated with developing a residential site. Such a benefit may even result in an increased number of TOD residential projects in municipalities that simplify the parking requirements in such a manner.

POLICY IMPLICATION: FUTURE TRANSIT EXPANSION

Several new transit projects are planned for Santa Clara County in the coming years, notably the two Bus Rapid Transit (BRT) lines and the BART extension to San José (see Figure 7.1). The new transit lines will provide better transit service to many areas throughout Santa Clara County, including important destinations such as central business districts (CBDs), hence enabling residents the option to access these areas without driving. As more areas in Santa Clara County are connected by transit, there will be new opportunities for residents to take advantage of the accessibility and convenience that TOD residential projects offer.

This research has shown that TOD residential sites, which meet the criteria in Section 5.2.1 and are near rail stations in Santa Clara County, are over-parked. This reasoning could be further expanded to suggest that TOD residential projects near new or enhanced transit stations for BRT service, which may be comparable to rail service, could also have similarly reduced parking demand. If the quality of transit service in terms of convenience and comfort can achieved comparable to rail service, then the potential for reduced parking demand for TOD residential sites near BRT stations may be possible, if not likely.

POLICY IMPLICATION: BETTER LAND USE AND URBAN FORM

Municipalities could expect positive impacts from decreasing parking ratios for TOD residential projects. Land would be more efficiently used by making it available for additional housing or enhanced community amenities. Decreasing parking ratios from 2.2 to 1.1—while holding other

factors constant—increases the potential for building more units by 20 to 33 percent (Arrington & Cervero 2008). Reducing parking ratios should result in lower construction costs, greater housing units, higher transit ridership, and improved overall physical form and performance of residential developments (Arrington & Cervero 2008, 48-51).

Another implication of lowered parking ratios relates to urban form. By reducing the amount of parking (especially surface parking) required at a site, the overall physical form on residential properties can be improved to make them more inviting and pedestrian friendly, and thus more "livable". Putting lots of surface parking between housing units and the adjacent roads and walking paths typically become barriers to walkability.

AREAS OF FURTHER RESEARCH

Mixed-use and TOD projects present an excellent opportunity for shared-parking situations, which could increase the efficiency of parking facilities that serve these types of developments. Depending on the time of day, shared parking between residents and commercial business patrons enables the use of spaces that might otherwise be unused. If a mixed-use development is located within one-half mile of a transit station, then overall parking could be reduced and shared across all land uses. By integrating commercial and residential parking, the overall parking supply will be more efficiently used (Boroski 2002, 9). Future research on shared parking in TOD projects in Santa Clara would be useful in planning and permitting TOD projects.

TOD residential properties with reduced parking ratios should result in high transit ridership. Municipalities could then offer an incentive to private developers in the form of reduced traffic-related impact fees. The rationale would be that since these TOD residential projects generate less vehicle trips, their associated fair-share contribution to roadway traffic impacts could be lowered. Future research studies could verify that people in Santa Clara County who choose to live in TOD residential properties drive less often and have fewer cars, thereby reducing their demand for parking.

The Research Team developed a research work plan for estimating parking demand using stated-preference user surveys. For reference in future research, a methodology for conducting a user survey is included in Appendix C for VTA staff and/or other interested parties who may wish to estimate the total residential parking demand at TOD sites, particularly for those TOD residential projects that exhibit very high parking utilization.

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Chapter 1. Introduction

A collaborative research effort between a transportation agency and a university, this study was conducted to determine parking utilization at transit-oriented-development residential projects in the southern portion of the San Francisco Bay Area. The San José State University Department of Urban & Regional Planning, together with the Santa Clara Valley Transportation Authority, studied parking utilization at TOD residential properties in Santa Clara County in the spring of 2010. This research was conducted to determine actual parking utilization for residents of housing development projects near VTA light rail stations and Caltrain stations, and to compare usage to parking supply and local requirements at these locations. This study follows recent research that has demonstrated that many TOD residential projects are over-parked. The current study focuses on Santa Clara County in California, but could be used to provide relevant parking utilization information for similar locations throughout the United States.

Through a partnership with VTA, the SJSU URBP 256 class was selected to conduct this project. URBP 256 is a graduate level class in the Department of Urban and Regional Planning that focuses on transportation planning issues addressed at the neighborhood and municipal level. The research team is comprised of graduate students from this class who chose to undertake the research project as one of the main coursework for the semester. The team was directed by the instructor with technical guidance from VTA staff.

1.1 PROJECT OBJECTIVE

The primary objective for this research study is to assess parking utilization rates at existing TOD residential properties in Santa Clara County. The parking utilization rates at the survey sites are anticipated to serve as an estimation of the total parking demand at these sites. This information could then be used to determine whether TOD residential projects near transit in the county exhibit an oversupply or under-utilization of existing parking facilities.

1.2 NEED FOR THE RESEARCH PROJECT

Although research exists on the estimation of parking demand and utilization for TOD residential projects (including several focusing on California and the San Francisco Bay Area), no formal extensive research has been conducted for sites in Santa Clara County (see Section 2.5). The VTA believes having local, empirical evidence of actual parking demand or utilization for TOD residential

projects in Santa Clara County would be of great value in their efforts to inform local city staff, decision-makers, and the public about the benefits of TOD residential projects.

In fact, this issue comes up frequently during the planning process when a developer proposes a project near a transit station. Often the developer is willing to build with reduced parking ratios, but because of local zoning ordinances, public objections, and/or city council concerns, the developer is required to "over-supply" parking. VTA believes that this study will help ensure a closer match between parking supply and demand at future TOD residential projects.

1.3 OVERALL RESEARCH APPROACH

In the fall of 2009, VTA staff and SJSU faculty discussed the potential of conducting parking surveys of TOD residential projects in Santa Clara County. Two main parking survey concepts emerged from this discussion:

1. Residential user surveys of TOD residential properties in the County to establish actual parking behavior of residents in these development projects and then estimate parking demand rates reflecting conditions in the County.

2. On-the-ground parking supply and utilization survey of TOD residential properties in the County, and then use the resulting data to approximate parking demand rates for conditions in the County.

The comprehensive literature review completed by the Research Team revealed that the two main parking survey concepts above were potentially both relevant to the project objective to meet VTA's need for more concrete evidence on parking rates for TOD residential projects in Santa Clara County. The choice for the survey method was driven by the technical approach most relevant to the key research question, as well as time and logistical constraints of completing the survey in a single semester class.

From a technical perspective, if the observed parking utilization rates at TOD residential properties in the County were found to be significantly lower than 85 percent, then the parking demand for TOD residential projects in the County could be estimated from the observed parking utilization rates without additional surveys. However, if the observed parking utilization rates at TOD residential properties in the County were found to be significantly higher than 85 percent, then additional and more extensive surveys would be needed to estimate the total parking demand

because parking overflow is likely. In either case, the use of parking utilization surveys of TOD residential properties would answer the key research question of whether TOD residential projects in Santa Clara County exhibit an over-supply and/or under-utilization of parking facilities. Therefore, the Research Team proceeded with an on-the-ground parking utilization survey of TOD residential properties in the County for this research project.

1.4 PROJECT AREA

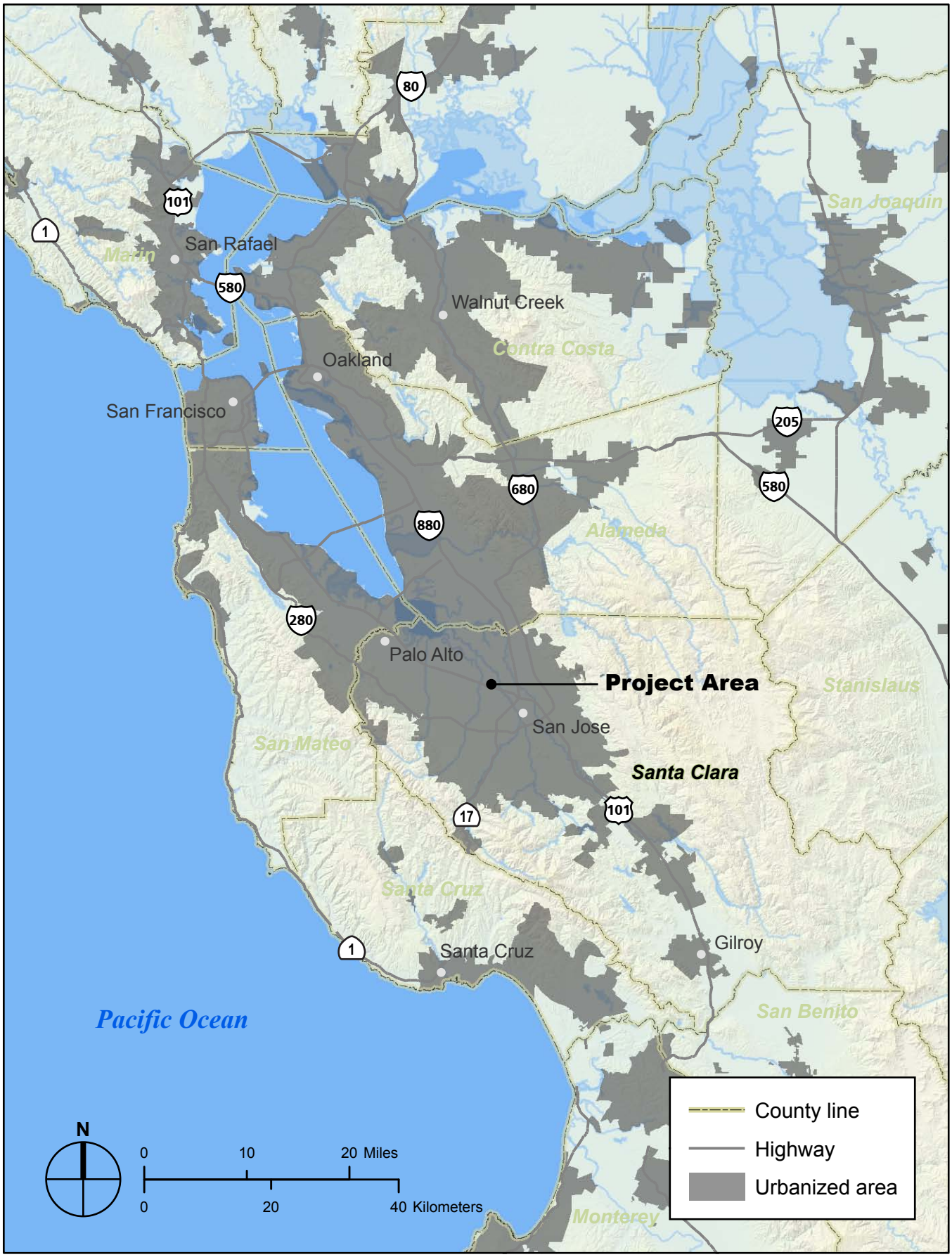
The project area is located in Santa Clara County, California in the southern portion of the San Francisco Bay Area (see Figure 1.1). Figure 1.2 shows the study area in greater detail. This figure depicts the transit stations that were investigated and were found to have eligible TOD survey sites near them. The grey circles represent a half-mile radius around a rail station, and the yellow outlines indicate one or more survey site is within this half-mile radial area. For reference, highways and city names are shown, along with VTA and Caltrain transit alignments.

1.5 PROJECT TASKS

1.5.1 Pre-Survey Tasks

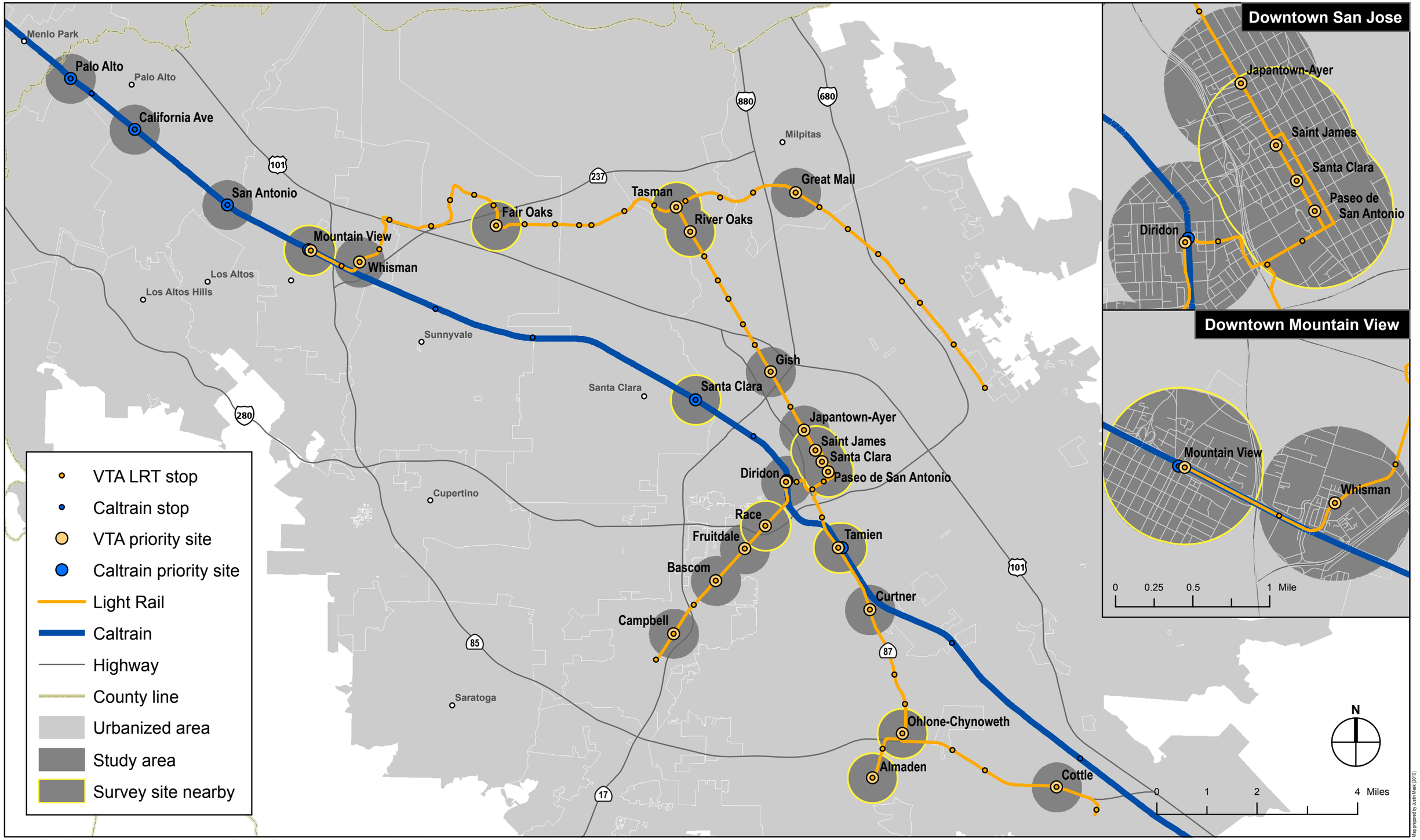
At the onset of the project, the Research Team conducted a comprehensive literature review to find existing material related to TOD parking generation and demand that was relevant to the research question. Initially, a broad survey was conducted for the following topics:

- Parking demand estimation studies for TOD sites or transit villages
- Parking demand surveys for TOD sites or transit villages
- Parking generation rates for TOD sites or transit villages
- Methodologies for estimating parking demand for TOD sites or transit villages
- Transit mode share for TOD sites or transit villages
- Auto ownership for TOD sites or transit villages
- Parking data surveys for TOD sites or transit villages
- Parking data collection methodologies



Sources: California Spatial Information Library (CaSIL) & US Census Bureau, Incorporated Places.

Figure 1.1 Project Area



Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

Figure 1.2 Study Area

Following the initial literature review, the information was collated into four discrete areas for further study:

- Current and best practices in estimating parking demand
- Local parking code requirements for municipalities in Santa Clara County
- Methodology for conducting user surveys to estimate parking demand
- Methodology for conducting on-site parking utilization surveys

First, current and best practices in estimating parking demand for TOD residential properties in the US were reviewed. This review was organized by the Research Team according to the following main references:

- Institute of Transportation Engineers (ITE) *Parking Generation*
- Urban Land Institute (ULI) *Shared Parking*
- American Planning Association (APA) *Flexible Parking Requirements*
- Eno Foundation *Parking*

Additionally, recent TOD parking research from local and national resources was reviewed, and the methodologies that were utilized in those studies were summarized. TOD parking demand rates were compiled from research study results according to location. The locations included TOD residential projects outside of California, TOD residential projects within California but outside of the San Francisco Bay Area, and TOD residential projects in the Bay Area outside of Santa Clara County. This first area of research is included in Chapter 2 of this report.

The Research Team next analyzed current parking requirements by local zoning code for TOD residential properties in Santa Clara County. All local jurisdictions in Santa Clara County with Caltrain and VTA stations with existing or proposed TOD residential projects were studied, and parking requirements were compiled on a per-housing-unit basis for the following categories:

- Attached homes/townhomes/condos (owner-occupied)
- Multi-family housing/apartments (rental)
- Parking requirement reduction for mixed used and/or TOD residential projects

This portion of the literature review is compiled in Chapter 3.

The Research Team next outlined the two potential parking survey options that were considered for this project. Scopes of work were developed from information found in the literature review for a residential user survey and an on-the-ground parking supply and utilization survey for TOD residential properties around VTA and Caltrain stations. These two survey methodologies are described in Chapters 4 and 5, respectively.

The Research Team determined the organization and scheduling of the survey field crews (comprised of three students) and prepared a Survey Logistics and Implementation Plan. The Research Team contacted the property managers of the TOD residential properties to get permission for the on-site parking survey and to gather key information on the sites. The Research Team prepared all the forms needed to carry out the survey and distribute them to the field crews. All documents utilized in the study are included as appendices to this report.

1.5.2 Survey Tasks

During the week of the survey, all surveyors completed the on-the-ground surveys according to the Survey Logistics and Implementation Plan. Field crews conducted the on-the-ground survey at the prioritized TOD residential properties assigned to them according to the Plan. The Research Team collected all completed parking surveys from the field crews, reviewed them for quality control, before moving into the data analysis task.

1.5.3 Post-Survey Tasks

The Research Team then processed the completed field surveys and generated data summaries in tabular and graphical forms for inclusion in this report. The data was analyzed with respect to the main research question and to explore potential patterns related to parking utilization.

Chapter 2. Current and Best Practices in Estimating Parking Demand for TOD Residential Properties in the U.S.

Based on the literature review completed by the Research Team, this chapter summarizes current and best practices for estimating parking demand. Sources include the Institute of Traffic Engineers (ITE), American Planning Association (APA), Urban Land Institute (ULI), and Eno Foundation. The intent here is to identify standard techniques and methodologies successfully used in planning studies. Best practices from recent, relevant research studies are also briefly summarized. A more detailed examination of best practices from relevant research is available in Appendix A. Moreover, Appendix A and this chapter include known parking demand rates for TOD residential projects from various parts of the United States.

2.1 ITE PARKING GENERATION

The ITE has parking demand guidelines for 91 different land uses based on surveys conducted in mostly suburban areas throughout the United States. Given this suburban premise, ITE warns users to be careful when using the results in more urban settings, because the findings may not be universally applicable. The ITE *Parking Generation* manual is meant solely as a guideline and should not be construed as a standard (ITE 2003).

2.1.1 Current Methodology for Estimating Parking Demand

To estimate parking demand correctly, research and data collection needs to be properly conducted (ITE 2006, C3). ITE recommends the following four data-collection steps to determine parking demand:

1. Select an appropriate site
2. Determine an independent variable
3. Collect background data
4. Conduct parking demand observation

2.1.2 Estimating Parking Demand for TOD Properties

While the ITE *Parking Generation* manual relies mainly on surveys conducted in typical suburban areas and does not include land-use categories for TOD-related properties, ITE accepts new parking data collected for emerging or different land uses. The methodology presented in the manual

provides a standard way for researchers, planners, and designers to estimate parking generation demand for different land uses not included in the current edition of the ITE *Parking Generation*.

2.2 APA FLEXIBLE PARKING REQUIREMENTS

The best practice for reviewing parking standards according to the APA *Flexible Parking Requirements* manual is a simple but comprehensive six-step process, as listed below (Smith 1983, 22-24):

1. Determine generic building characteristics
2. Review similar parking standards
3. Survey parking demand and problems at existing developments
4. Establish parking policy
5. Determine zoning requirements
6. Monitor parking standards

2.3 URBAN LAND INSTITUTE SHARED PARKING

The ULI shared parking methodology provides a systematic way to apply appropriate adjustments to parking ratios for each land use in a mixed-use development or district. Rather than relying on pre-determined parking ratios to determine the number of parking spaces needed, the ULI *Shared Parking* manual uses adjustments based on several other criteria to minimize parking when shared between different uses (Smith 2005). The principle being applied here is based on the notion that different land uses have complementary parking patterns and needs. As such, overall parking may be reduced when the need for it is shared.

2.3.1 Current Methodology for Estimating Parking Demand

The manual uses a nine-step methodology that is fairly complex and data-intensive. The methodology establishes a base parking ratio and then uses adjustments to reduce the parking ratio to meet projected demand from the multiple land uses that will share parking spaces.

1. Gather and review project data
2. Select parking ratios
3. Select factors and analyze differences in activity patterns
4. Develop scenarios for critical parking need periods
5. Adjust ratios for modal split and persons per car

6. Apply non-captive adjustments
7. Calculate required parking spaces for each scenario
8. Determine whether scenarios reflect all critical parking needs
9. Recommend a parking plan

2.4 ENO FOUNDATION

The Eno Foundation for Transportation produced a reference entitled *Parking* (Weant 1990), which has become an important reference on the subject. The Eno Foundation suggests that peak parking represents 85 percent of the demand values. On average, then, parking demand exceeds parking supply only 15 percent of the time.

The general approach to estimating parking space demand for any given activity begins by determining the population or person-accumulation for said activity. This finding is then converted into the accumulation of parked vehicles by considering mode split and vehicle occupancy for various user groups with differing parking characteristics (e.g., employee, visitor, student, etc.). Specific steps in the overall process include the following:

1. Estimate person-destinations for the generator for critical time periods (usually when peak-parking accumulation normally occurs)
2. Convert person-destinations into estimates of peak-person accumulation
3. Estimate number of drivers for each user population group that will require parking for the given activity
4. For multi-use development, estimate the peak-parking demands for each activity by adding the parking generated by different activities occurring during the same time

2.5 METHODOLOGIES IN ADVANCED RESEARCH

Having collected the best practices in estimating parking demand and measuring parking utilization from the four aforementioned standard references, the next step is to consider new, relevant research studies on the subject. The Research Team's literature review found pertinent information in studies conducted by Robert Cervero, John Boroski, Hollie Lund, and Katz, Okitsu & Associates. In a study by Cervero and others (Cervero 2009, Table 1 and Figure 2), 16 Bay Area TOD residential projects were shown to provide approximately 1.6 parking space per dwelling unit, while only 1.2 spaces per unit were needed. Among those 16 sites, parking demand rates for the Bay Area ranged from 0.74 to 1.69 (see Table 2.1). Cervero and others also found that TOD sites in

Portland, Oregon, had a similar, but slightly lower, range of 0.53 to 1.37. In a report for the City of San Diego, 14 residential properties within one-quarter mile of transit exhibited parking demand rates from 0.60 to 1.77 (Katz, Table 6). These studies are further reviewed and described in Appendix A.

TABLE 2.1 Parking Demand Rates for TOD Residential Sites

Location	Parking Demand Rate	Reference
San Francisco Bay Area		
Fremont BART	1.42	Cervero 2009, Figure 2
Alborada	*1.69*	
Archstone	*1.45*	
Mission Peaks	*1.35*	
Park Vista Apts.	*1.48*	
Presidio	*1.23*	
Sun Pointe Village	*1.47*	
Watermark Place	*1.27*	
Pleasant Hill BART	0.97	
Archstone Walnut Creek	*0.92*	
Archstone Walnut Creek Station	*1.09*	
Diablo Oaks	*0.74*	
Iron Horse Park	*0.80*	
Park Regency	*1.06*	
Villa Montanaro	*1.23*	
San Leandro (Bayfair BART)	1.07	
Union City BART	1.12	
Parkside	*1.13*	
Verandas	*1.11*	
All 16 Bay Area TOD sites	**1.20**	
Rest of California		
San Diego		Katz, Table 6
Bay Vista Methodist Heights	*0.60*	
Canyon Ridge	*1.20*	
Coronado Terrace	*1.25*	
Hawthorn 1 Apts.	*0.92*	
John Adams Manor	*0.68*	
Otay Villas	*1.06*	
Pinetree	*0.79*	
Pulitzer Place	*1.10*	
Vista Verde Apts.	*1.77*	
Rest of the United States		
Portland	1.07	Cervero 2009, Figure 2
Center Pointe (Beaverton Creek Stn.)	*1.23*	
Elmonica Court (Elmonica Station)	*0.90*	

Location	Parking Demand Rate	Reference
Cambridge Crossing (Elmonica Stn.)	*1.04*	
Wyndhaven (Willow Creek Stn.)	*0.90*	
Briarcreek Apts. (Quantama Stn.)	*1.12*	
Quatama Crossing (Quantama Stn.)	*1.32*	
Quatama Village (Quantama Stn.)	*1.37*	
Gateway Terrace (Gateway Station)	*0.53*	
Gateway Park (Gateway Station)	*0.83*	
Rachel Anne (E. 148th Ave. Station)	*0.88*	
Dalton Park (E. 148th Ave. Station)	*1.17*	
Morgan Place (E. 162nd Ave. Stn.)	*0.65*	
Sequoia Square (E. 162nd Ave. Stn.)	*0.79*	
Gresham Central (Stn.)	*1.00*	

Sources:

- Cervero, Robert, Arlie Adkins, and Cathleen Sullivan. 2009. *Are TOD sites Over-Parked?* UCTC Research Paper No. 882. Berkeley, CA: University of California Transportation Center.
- Katz, Okitsu & Associates. *Multi-Family Residential Parking Study. San Diego, CA: The San Diego Housing Commission & City Of San Diego Planning Department*. City of San Diego.

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Chapter 3. Local Parking Requirements for TOD Residential Properties in Santa Clara County

3.1 INTRODUCTION

Many communities in Santa Clara County are moving towards promoting TOD residential projects that make effective use of urban infrastructure and transportation services. While recent studies have found that residents in TOD projects have a higher tendency to ride transit (as well as bike and walk), standard parking requirements remain unchanged for many of these developments. Most current parking policies assume the same or similar parking demand at TOD projects as in other residential developments, despite the close proximity to transit services and less reliance on the automobile.

To evaluate whether local TOD residential projects provide more parking than is utilized, the amount of parking currently required by local jurisdictions needs to be investigated. This chapter contains a review and analysis of existing parking requirements for the following cities in Santa Clara County: Campbell, Gilroy, Milpitas, Morgan Hill, Mountain View, Palo Alto, San José, Santa Clara, and Sunnyvale.

This chapter begins with an overview of residential parking requirements, including guest parking. In the final section, parking reduction allowances that could be available to TOD residential projects are explored.[2]

3.2 ANALYSIS OF CURRENT PARKING REQUIREMENTS

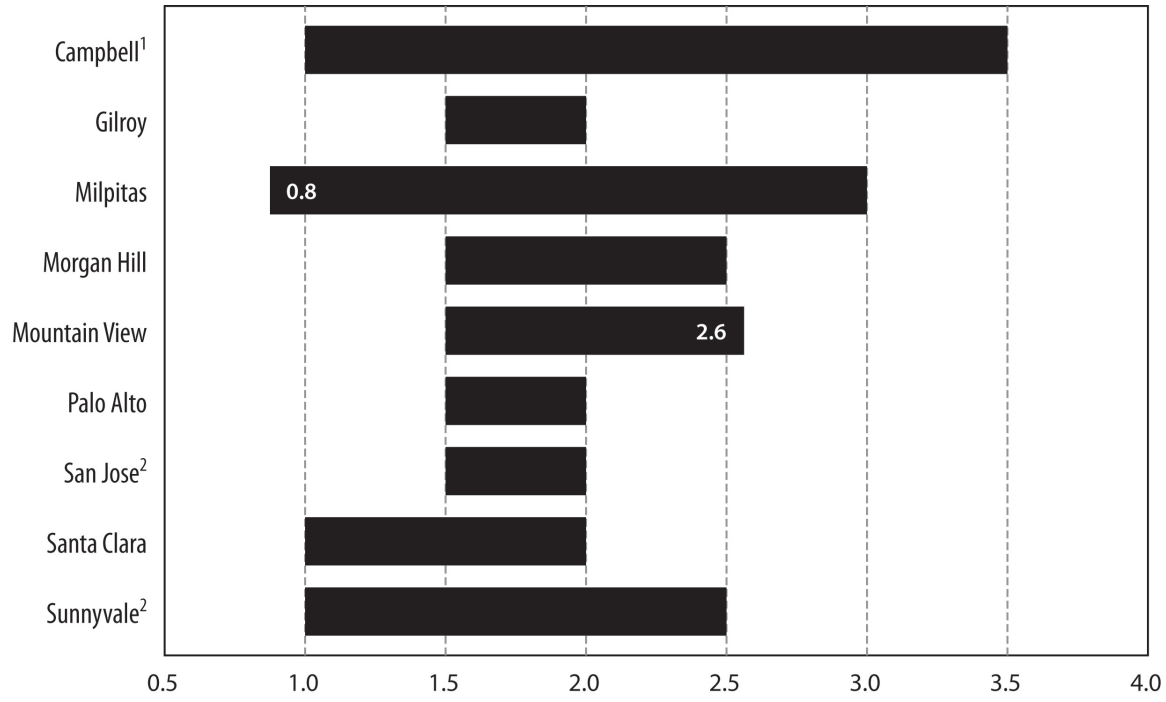
3.2.1 Current Residential Parking Requirements

Existing parking requirements for nine Santa Clara County cities are summarized in this section. The range of parking spaces required by each city is outlined below. Ranges are given for all multiple-unit housing developments, from studio apartments (representing the lowest requirements) to high-density multiple-family housing developments (representing the highest parking requirements). Other housing units included are 1, 2, and 3+ bedroom apartments, duplexes, townhouses, and condominiums. Single-family detached homes are not included, because the typical focus of TOD residential projects is on higher density.

[2] Note: Throughout this section, zoning ordinances are regularly referenced. Rather than citing each instance, we have included a list of all zoning ordinances in the bibliography of the report.

Figure 3.1 shows the residential parking requirement ranges for multi-family housing and similar uses in the nine cities. It illustrates that nearly all municipalities across Santa Clara County require at least one parking space per dwelling unit; the exception is Milpitas, which requires only 0.8 space for studio apartments located in the Milpitas Transit Area Specific Plan area. At the high end, as many as 2 to 3.5 parking spaces are required for high-density and multi-family developments. The City of Campbell has the highest minimum requirement, at 3.5 spaces for townhouses or condominiums with more than two bedrooms.[3]

FIGURE 3.1 Residential Parking Requirement Ranges for Multi-Family Housing



1. The city of Campbell zoning code is currently being revised; the minimum parking requirements may be reduced from 3.5 to 2.5 for condominiums and townhouses (City of Campbell 2010).
2. The cities of San José and Sunnyvale allow an additional 0.15 spaces for every unit with more than three bedrooms.

Note: this figure reflects zoning requirements at the time of the research project in Spring 2010. Ranges are given for multiple-unit housing developments; single-family homes are not included.

The broad range of values for parking requirements for multi-family housing types suggests that there is room to reduce parking code requirement in some municipalities.

3.2.2 Guest Parking

Many of the nine Santa Clara County cities require additional parking spaces for guests. As shown in Table 3.1, some cities simply add a specific amount of guest parking per unit, while others

[3] Please note Campbell is currently investigating reducing this requirement to 2.5 spaces.

require an additional space per number of units. In addition, some require a certain percentage of guest parking based on the overall amount of parking required.

These guest parking requirements in effect increase overall parking requirements. For example, a townhouse in Mountain View is required to provide 2 spaces for residents and an additional 0.6 of a space for guests. Increasing the required spaces from 2 to 2.6 represents a 30 percent increase in parking, a considerable increase on a per-unit basis.

TABLE 3.1 Guest Parking Requirements

City	Land Use	Number of Guest Spaces
Campbell	Apartments	1 for every 5 units
	Duplex/Townhouse/Condo	None
Gilroy	Multifamily	1 for every 4 units
	Downtown Specific Plan	1 for every 4-6 units, depending on square footage
	Duplex	None
Milpitas	Milpitas Transit Area Specific Plan	15% of required total
	All other multifamily	None
Morgan Hill	Multifamily	1 for every three units
Mountain View	Multifamily	15% of required total
	Townhouse	Additional 0.6 for each unit
	Row house	Additional 0.3 for each unit
Palo Alto	Duplex, Multifamily	None
San José	Multifamily, Mixed Use	None
Santa Clara	Multifamily, Duplex, Mixed Use	None
Sunnyvale	Multifamily	Additional 0.25 -0.5 per unit if 2 main spaces are in a garage
	Mixed use	None

3.3 PARKING REQUIREMENT REDUCTION ALLOWANCES FOR TOD SITES

In the cities examined for this project, few have specific TOD land-use categories. The main exception is San José, which has identified areas as TOD Corridors and BART Station Area Nodes and includes in its general plan a Transit Corridor Residential land-use designation. This land-use category is intended to expand the potential for residential development in proximity to major public transit, particularly along the City's TOD Corridors and Station Area Nodes (San José 2008, 162). The City of San José also has two more transit-related land-use categories in its current general plan: Transit Employment/Residential and Transit Corridor Commercial. Milpitas also features a TOD Overlay District that applies to any zoning district on lands within 2,000 feet of a rail station. Nevertheless, many cities have language related to parking reductions for residential projects located near transit. For each of the nine cities, parking requirements and allowable parking reductions in relation to TOD land uses are described in more detail in Appendix B.

Some cities offer parking reductions or set specific standards in their local zoning ordinance. Other cities have allowances for shared parking through the entitlement process, which in effect reduces the overall parking requirement for any one individual land use. Still others have lower parking requirements for certain areas near transit as established in Specific Plans or Precise Plans. Most reductions are approved on a case-by-case basis. Table 3.2 summarizes the various types of parking reductions available in each city. Table 3.3 highlights the processes required for the approval of parking reductions.

TABLE 3.2 Parking Reductions Allowed

City	Transit-Oriented Residential	Mixed-Use
Campbell	Parking Adjustment possible (no set reduction)	Parking Adjustment possible (no set reduction)
Gilroy	N/A	Tandem and shared parking can be allowed in downtown district; respective commercial & residential parking requirements combined.
Milpitas	20% reduction of residential parking requirement.	Shared parking can be allowed through the development process.
Morgan Hill	N/A	Parking may be uncovered, but standard requirements apply.
Mountain View	Several Precise Plans covering areas near transit stations include lower parking requirements than the citywide ratios. Planning Director may grant a reduction through the Conditional Use Permit process.	Zoning code requires mixed-uses to provide total aggregate number of parking spaces.
Palo Alto	20% reduction for properties near transit. Addition reductions possible subject to 30% maximum reduction.	20% reduction for properties with shared parking facilities. Additional reduction possible subject to 30% maximum reduction.
San José (downtown)	Lower base parking requirements (1 space per unit) plus a 15% reduction possible with Development Permit.	Lower base parking requirements plus up to a 50% reduction possible with a TDM program; at the discretion of the Director.
San José (elsewhere)	10% reduction possible with Development Permit.	Respective commercial and residential parking requirements combined (1 space per 200 to 250 sq. ft. of retail area; see Table 20-210 for multi-family dwelling unit parking requirements).
Santa Clara	Possible through a variance and cannot exceed 25% of parking requirement.	Reduction of 0.5 to 1 space per unit and cannot exceed 25% of parking requirement.
Sunnyvale	Shared parking can be permitted for mixed-use projects within the mixed-use combining district	Shared parking can be permitted for mixed-use projects within the mixed-use combining district

Source: Table taken from Exhibit 5 of Campbell Planning Division's January 26, 2010 Agenda (City of Campbell 2010); some information has been added to the original table from the Cities of Gilroy, San José, and Palo Alto (references available in the bibliography).

TABLE 3.3 Parking Reduction Process

Process Types	Campbell	Gilroy	Milpitas	Morgan Hill	Mountain View	Palo Alto	San José	Santa Clara	Sunnyvale
Conditional Use Permit			✓		✓				
Element of Development Process	✓	✓				✓	✓		✓
Variance (no other specific process)				✓				✓	

Source: Table taken from Exhibit 5 of Campbell Planning Division's January 26, 2010 Agenda (City of Campbell 2010); Gilroy, Palo Alto, and San José were added (sources available in bibliography).

3.4 PARKING REQUIREMENTS SUMMARY

All nine cities examined require a set number of parking spaces for multiple-unit residential developments. These requirements range from 0.8 spaces per unit to 3.5 spaces per unit, depending on the city and the unit size. While most of the cities do not have a TOD land-use category in their general plan or zoning code, some have zoning overlay districts or specific/special plans that reduce the parking requirements. Many cities also have provisions that allow for reduced parking or shared parking arrangements.

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Chapter 4. Methodology for Parking Demand User Survey for TOD Residential Properties

The Research Team selected the on-the-ground survey technique to determine parking utilization rates for eligible TOD residential projects in Santa Clara County (see Chapter 5). Prior to making this selection, the Research Team also developed a work plan for estimating parking demand using stated-preference user surveys. Because this approach involves significant time, budget, and resource commitments beyond what is available for a single semester class, it was not chosen to be implemented. Nonetheless for future reference, a methodology for conducting a user survey is included in Appendix C for VTA staff and/or other interested parties who may wish to estimate the total residential parking demand at TOD sites, particularly for those TOD residential projects that exhibit very high parking utilization.

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Chapter 5. Methodology for Parking Utilization Survey for TOD Residential Properties

This section describes the step-by-step process used by the Research Team to conduct a survey of parking supply and utilization for selected TOD residential properties in Santa Clara County to determine whether the amount of parking provided is greater than what's being used, hence providing real information whether large-scale housing developments in Santa Clara County near rail transit stations are "over-parked."

5.1 OVERVIEW OF TASKS

The parking supply and utilization survey was divided into four general tasks:

1. **Initial TOD site selection and general data collection.** The Research Team identified eligible TOD residential sites using basic criteria, such as location of the site relative to the nearest transit station, age of development project, and size of site.
2. **Initial contact with eligible TOD property site.** Through telephone contact, the Research Team identified the property manager or other proper authority to secure permission to conduct data collection at the TOD residential site, confirm data gathered, and obtain additional data potentially useful for the on-the-ground survey.
3. **Parking supply data collection and parking utilization pre-survey work.** In preparation for the peak parking utilization surveys, the Research Team conducted an initial daytime reconnaissance trip to sites where verbal permission has been obtained to collect data on each selected TOD residential site's parking supply.
4. **Peak parking utilization data collection.** The Research Team established specific criteria and methodology for conducting the peak parking utilization field surveys.

5.2 SCOPE OF WORK

5.2.1 Initial TOD Site Selection and General Data Collection

VTA provided the Research Team an initial list of "priority stations" with transit-oriented development nearby. Based on VTA staff's knowledge of the VTA light rail and Caltrain systems, the list includes 34 TOD residential projects that were thought to meet the project's criteria, such as having dedicated parking for residents living at the property. Through Internet- and GIS-based research, the Research Team identified 23 eligible TOD residential survey sites from this initial list.

The criteria used by the Research Team to verify whether a TOD residential site on VTA's list met the criteria are described below. Appendix D provides VTA's list of eligible sites, along with information gathered about them.

Eligible TOD residential projects had to meet the following criteria in order to be included in the parking survey. To be selected for the survey, eligible TOD residential sites were required to be:

- **Close to transit.** Within one-half mile of a VTA light rail or Caltrain station.[4]
- **Few vacancies.** Sites with a minimum residential occupancy of 85 percent (ITE 2004, C3).
- **Over one year old.** Sites older than one year avoid "honeymoon" popularity effects (ITE 2004, C4) and help assure that the residential property is a TOD and not just a TAD (transit-adjacent development).
- **Free parking.** Sites that do not require a charge or fee for parking (ITE 2004, C6). This guarantees consistency, as most TOD residential projects do not charge for parking.
- **Restricted/designated parking.** Sites with parking for the exclusive use of residents and their guests.[5] Sites cannot have shared parking with other developments, organizations or individuals. Shared parking and mixed-use areas result in reduced parking demand (Litman 2006, 30).
- **At least 80 units.** Sites with more than 80 units or at least 100 parking spaces. Studies of smaller developments have shown erroneous results, since the small number of units allows the actions of a few to skew the parking supply and demand disproportionately (Cervero, Adkins, and Sullivan 2009, 12). In one study, a 39-unit site showed extreme demand (Katz, Okitsu & Associates, 19). By establishing an 80-unit minimum for eligible survey sites, approximately 20 percent of potential survey sites from VTA's initial list of residential TOD sites were eliminated. Hence, the survey would be more likely to avoid outlier and erroneous data resulting from too small of a parking supply.

The above criteria are based on best-practices research procedures. In addition, the Research Team included the following two criteria for determining eligible TOD sites for the parking survey:

[4] The edge of the TOD parcel and the edge of the transit station platform was used to measure the straight-line distance between the TOD site and the station.
[5] Exclusive parking must be dedicated for the use of only the TOD site's residents and their guests. Parking for retail and/or commercial properties was not included.

- Sites have either exclusively residential or residential with attached commercial component, but with separate on-site parking.[6]
- Sites have on-site, dedicated parking (surface or underground) that is readily accessible for visual inspection (i.e., no individual garages).

Sites found to be ineligible were primarily TOD residential sites with few units or inaccessible parking facilities, such as individual unit garages. If any of the information required above could not be determined by Internet- or GIS-based research, the information was obtained in the subsequent task described below. The information gathered was compiled in a TOD Property Checklist as shown in Appendix F.

5.2.2 Initial Contact with Eligible TOD Residential Sites

For each of the eligible sites, the Research Team gathered additional information and, most importantly, permission from the property owner (or other appropriate property authority) to conduct the parking survey on-site. For each eligible site, the Research Team:

- Identified the appropriate property authority, such as the property owner, property manager or home owners association representative who can provide information about the TOD and grant permission to conduct a survey on their property
- Contacted (by phone, email, or in-person meeting) the appropriate property authority, described the research project, and asked questions that confirmed or built upon information learned in the above task (see Appendix E for the prescribe script and checklist)
- Secured written permission to conduct the parking supply and utilization survey on their property (see Appendix G for the agreement form)

The Research Team also considered whether the sites had parking facilities that can be easily observed—such as surface, tuck-under, or covered parking. This criterion ensured that the Research Team had easy access to all parking facilities (Cervero, Adkins, and Sullivan 2009, 9). Because arranging to have a manager open the site for late-night surveys was infeasible, the Research Team members tried to acquire gate access codes ahead of time.

[6] This requirement was relaxed for the residential property at Survey Site No. 5, as this development includes a mix of residential and one retail use. Please note that the property is predominantly residential, and the retail component consists of a single coffee shop.

Following this task, the list of eligible sites was reduced to those that granted permission to conduct the on-site parking survey and met the key required eligibility criteria. This information is available in Appendix F (TOD Property Checklist).

A site map was created for each site that was surveyed (see Table 5.1). Each map shows two half-mile boundary lines: one representing the straight-line radial distance from the nearest transit station, and the other shows walking distances. The half-mile walking distance calculations were created using Network Analyst in ArcGIS. The input files were roadway and transit station shapefiles. After creating a "street network," a "service area" was created for each of the stations, which were specified as the facilities to be analyzed. This enabled Network Analyst to create a half-mile walking distance away from the stations along existing streets. In some cases, where walking paths were not available, the walking distance boundary line was adjusted to reflect the built and/or natural environment.

TABLE 5.1 Survey Sites

Figure No.	Title	Survey Sites	Nearest Rail Station
5.1	Survey Sites Near Mountain View Station	1	Mountain View
5.2	Survey Sites Near Santa Clara Caltrain Station	2	Santa Clara (Caltrain)
5.3	Survey Sites Near Fair Oaks Station	6	Fair Oaks
5.4	Survey Sites Near Tasman Station	5	Tasman
5.5	Survey Sites Near River Oaks Station	4, 5	River Oaks
5.6	Survey Sites Near Santa Clara & San Antonio Stations	11, 13, 14	St. James, Santa Clara & San Antonio
5.7	Survey Sites Near Tamien Station	16	Tamien
5.8	Survey Sites Near Ohlone-Chynoweth Station	18	Ohlone-Chynoweth
5.9	Survey Sites Near Almaden Station	20	Almaden
5.10	Survey Sites Near Race Station	21	Race

Certain sites with defining characteristics are described below.

As seen in Figure 5.2, more than a half of the half-mile radial area from the Caltrain station is not walkable, since it is not accessible from the north side of the railroad tracks. To ensure Network Analyst limited the walkability of the area, the Research Team placed barriers at a few select locations along the north side of the tracks within GIS to represent the real, physical barriers that exist. Note also that because not all of the pathways within Santa Clara University (just west and north of Survey Site No. 2) are included in the street shapefile used by Network Analyst, the half-mile walkable distance is truncated at the University's borders.

Figure 5.4 shows a how a poorly interconnected street network can impede the "walkability" of an area. Long blocks and few street connections lead to diminished walking options. This is particularly evident in the neighborhood just north of the Tasman station. In contrast, people who live in residential property at Survey Site No. 5 have a shorter distance to walk to the station, even though they are not physically closer to the station.

Figure 5.5 shows that much of Survey Site No. 5 is within a half mile walking distance from the River Oaks station, while No. 4 is not. This is, in fact, only half true. A majority of both sites are within a half mile of the station. A pedestrian bridge spans the river dividing Survey Site No. 4 from development to the east. However, because the roadway files used by Network Analyst did not include this pathway, it incorrectly determined this area to be further away from the station than it actually is; this map exemplifies the importance of verifying the analysis performed in GIS makes sense given the available data at hand. (To highlight this point, the walkable boundary line was not manually adjusted to extend into the area representing Survey Site No. 4.)

Figure 5.6 demonstrates the ease of walking in a downtown environment. A gridiron street pattern lends itself to walking in all directions and few encumbrances. After all, downtown San José and its surrounding neighborhoods were laid out before the age of the automobile (Karlinskky 2010, 12).

Highways 85 and 87 act to divide much of the site area shown in Figure 5.8. However, the roadways used by Network Analyst include Highways 85 and 87 in calculating the walkable distance from the Ohlone-Chynoweth station. Any inference that there exists a walking path along them is misleading. Also, walking underneath these highways, such as along Santa Teresa, while possible, would not be an enjoyable walking experience. Nevertheless, please note that survey site No. 18 is not separated from the station by a highway and is easily accessible by foot.

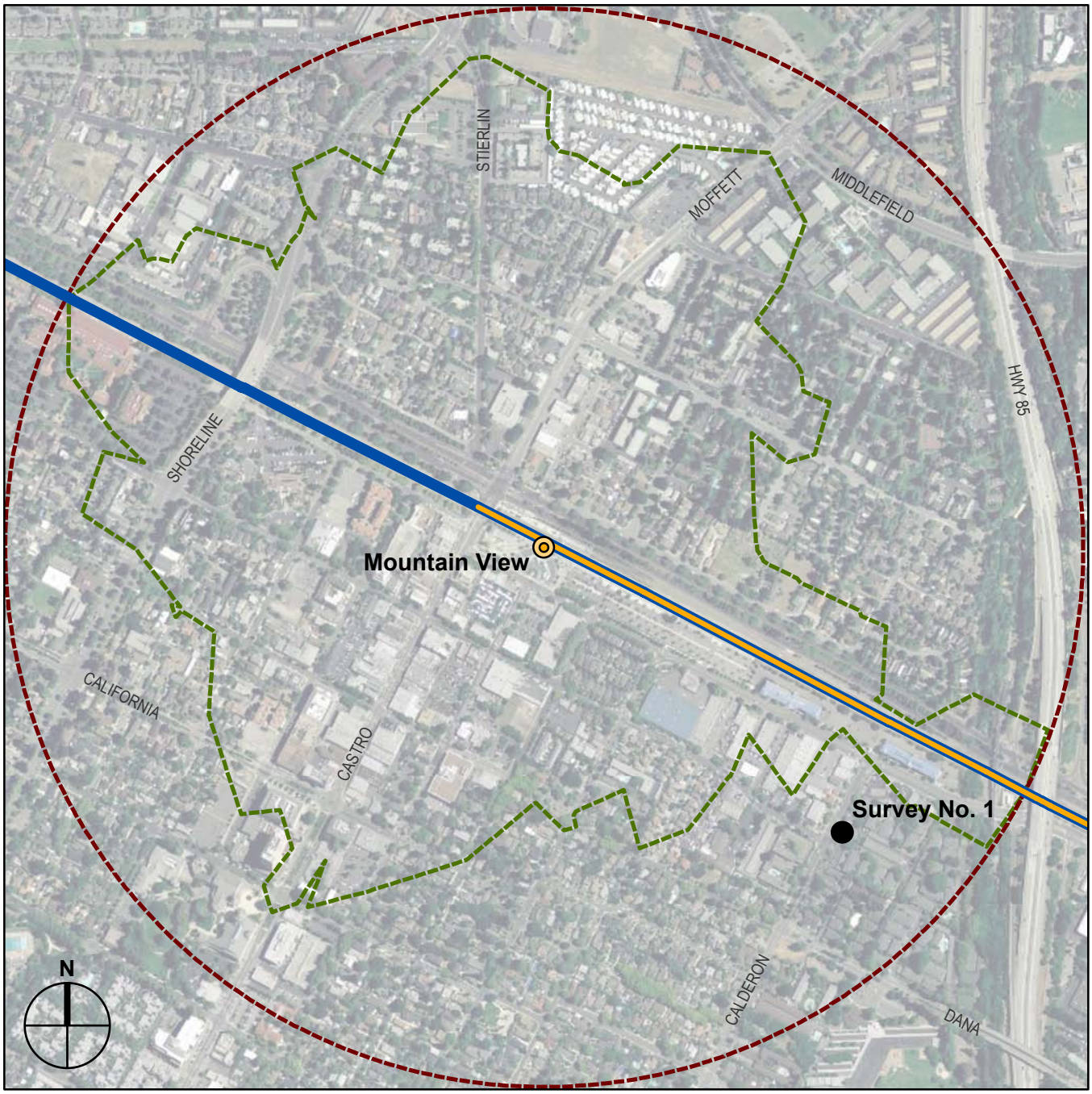
Finally, as demonstrated by Figure 5.9, there are instances where the natural environment also provides barriers to walking, as seen by the walking path around the lake near Almaden Station. Note, however, that when Network Analyst calculated the walkable distance from the Almaden Station, it indicated that some of the reservoir water to be walkable, not knowing that dry land did not exist there. As such, the walkable boundary line was manually adjusted outside of this area, and now properly borders the water's edge.

5.2.3 Parking Supply Data Collection and Parking Utilization Pre-Survey Work

For each of the selected property sites that granted verbal and/or written permission, the Research Team conducted an initial daytime reconnaissance trip. Appendix H provides the initial daytime reconnaissance trip checklist detailing what information was gathered and the issues that were identified. The initial daytime reconnaissance trip included the following:

- Identifying all of a site's parking facilities—including the total number of parking spaces. The best technique was to do on-site counts during the initial daytime reconnaissance trip. This was a simple confirmation of what was reported by the property manager during the telephone contact in the previous task, confirmation of what was reported from Internet-based research, or asking the property manager (or appropriate property authority) while on-site.
- Using maps of the parking facilities to designate proposed routes for the Survey Field Crews to conduct the parking utilization survey efficiently and accurately with minimal impact on residents. The Research Team had previously generated maps of the parking facilities to be surveyed.
- Observing TOD land uses and transit availability (ITE 2004, C9-10).
- Becoming familiar with the property site area and noting any special on-site and off-site features that may influence parking supply or demand (Cervero, Adkins, and Sullivan 2009, 10; Arrington and Cervero 2008, 31).

Following this pre-survey visit, the Research Team was able to confirm the total parking supply and later generated maps and proposed routes for the Survey Field Crews to follow for the peak parking utilization survey.

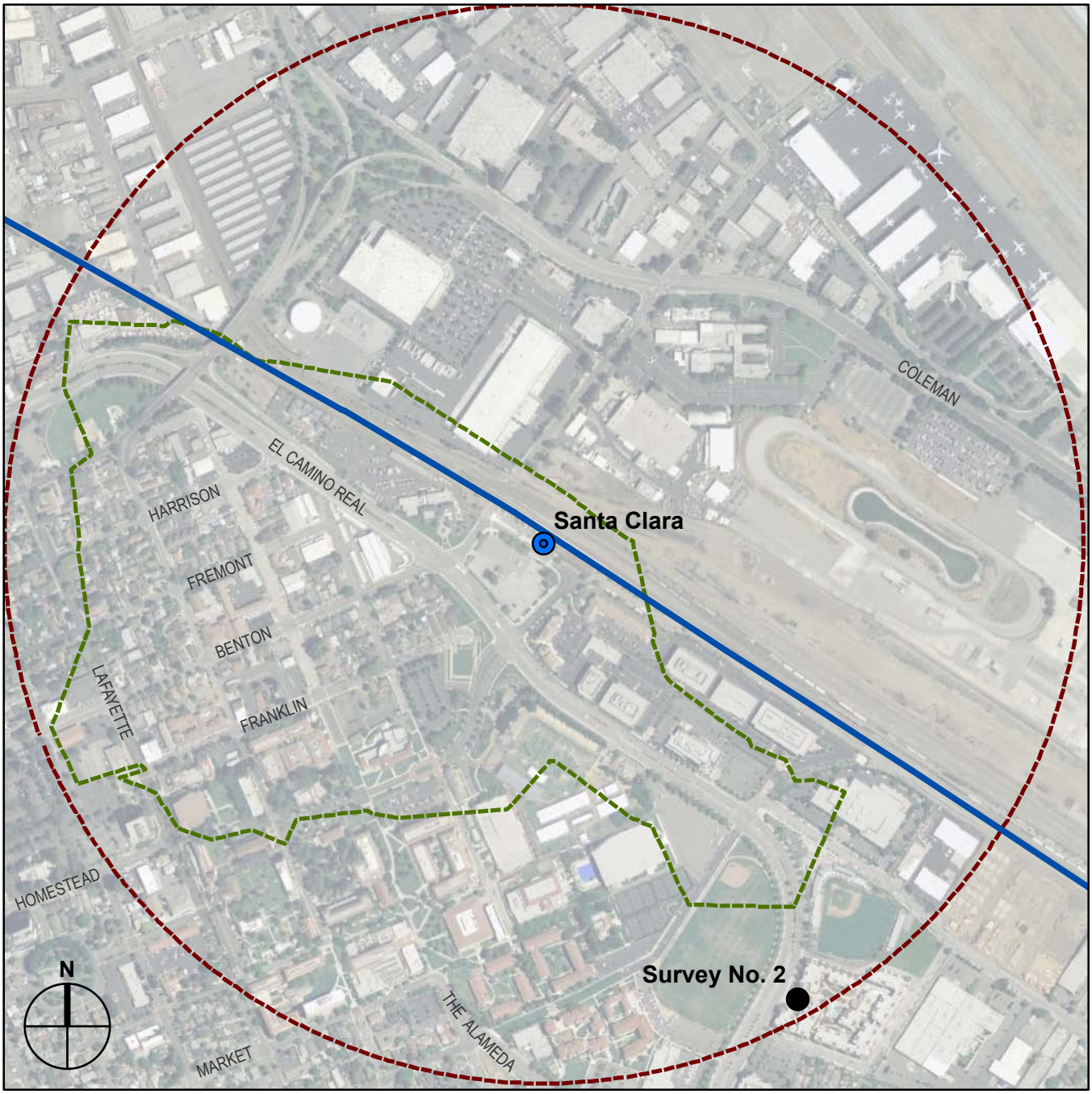


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 — 0.5 — 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.1 Survey Sites Near Mountain View Station

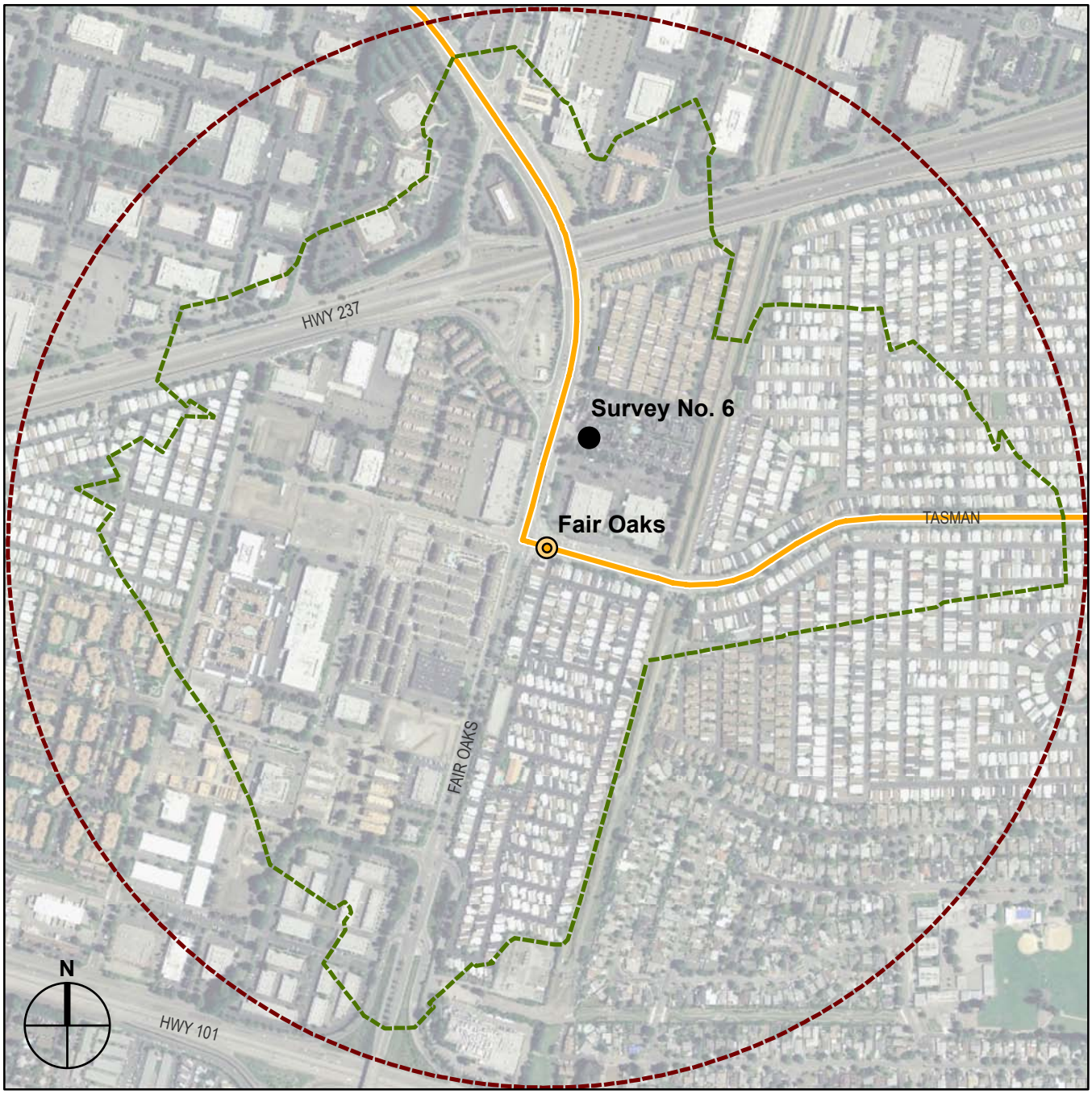


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 0.5 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.2 Survey Sites Near Santa Clara Caltrain Station

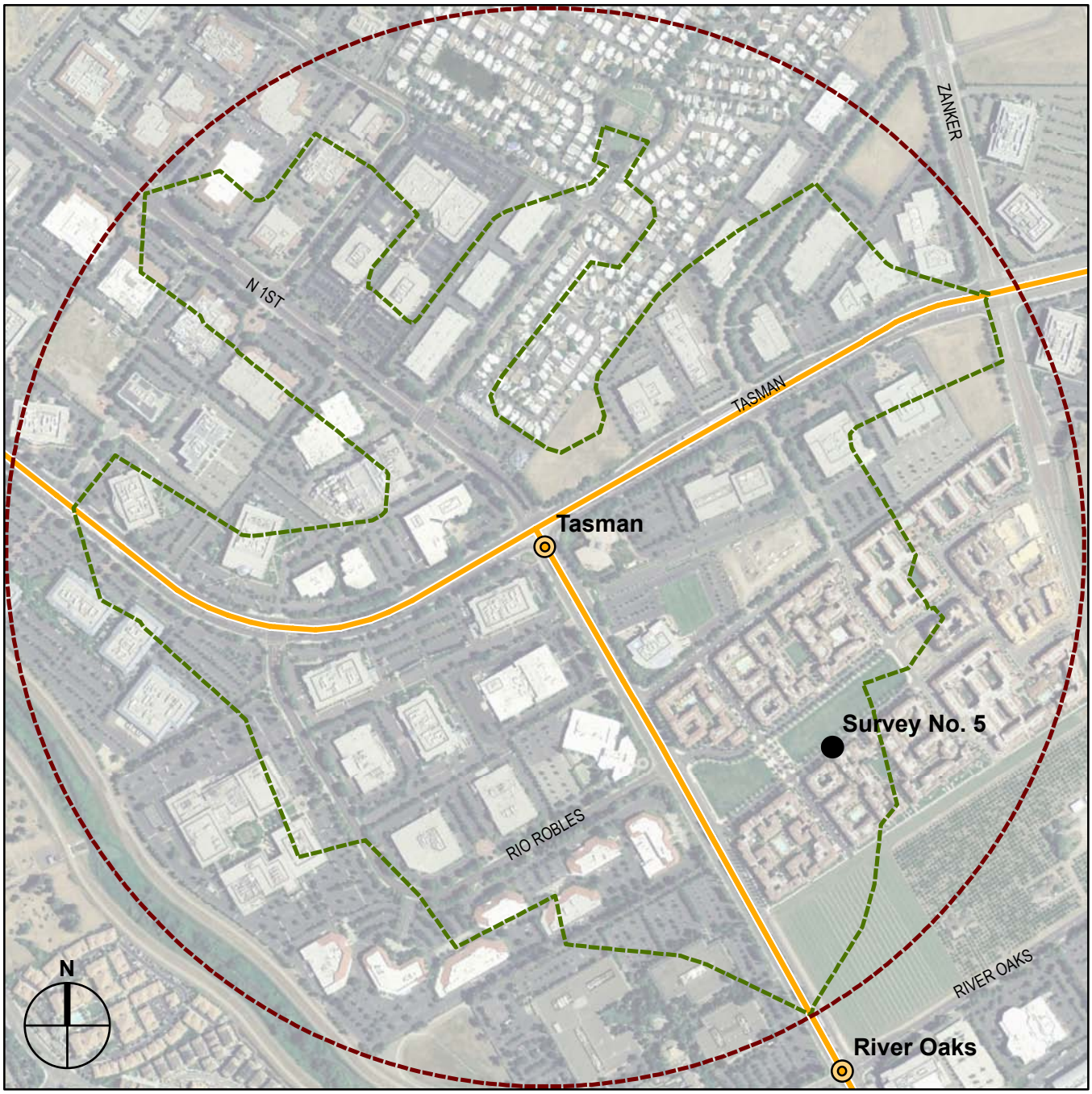


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 — 0.5 — 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.3 Survey Sites Near Fair Oaks Station

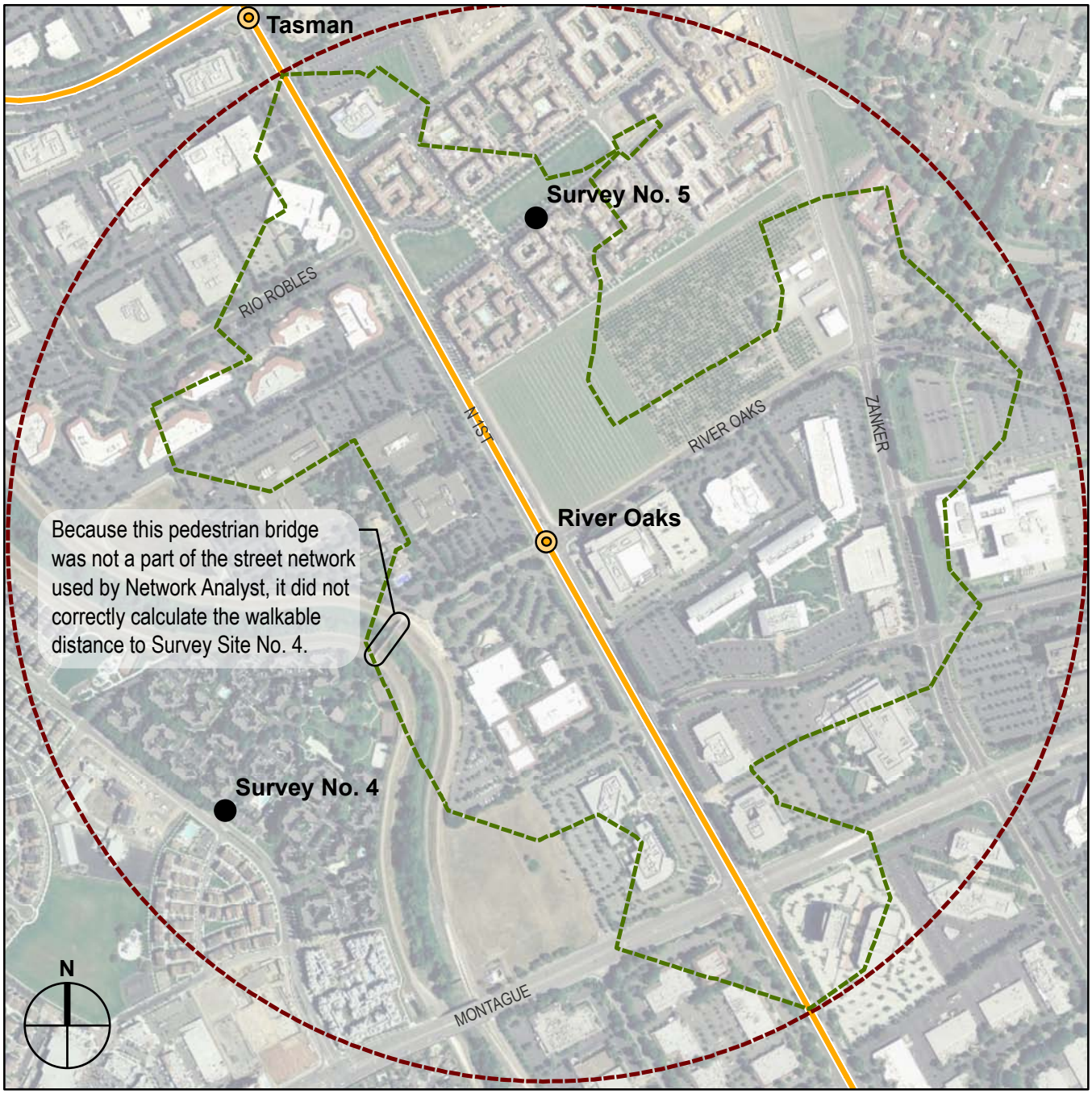


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 0.5 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.4 Survey Sites Near Tasman Station

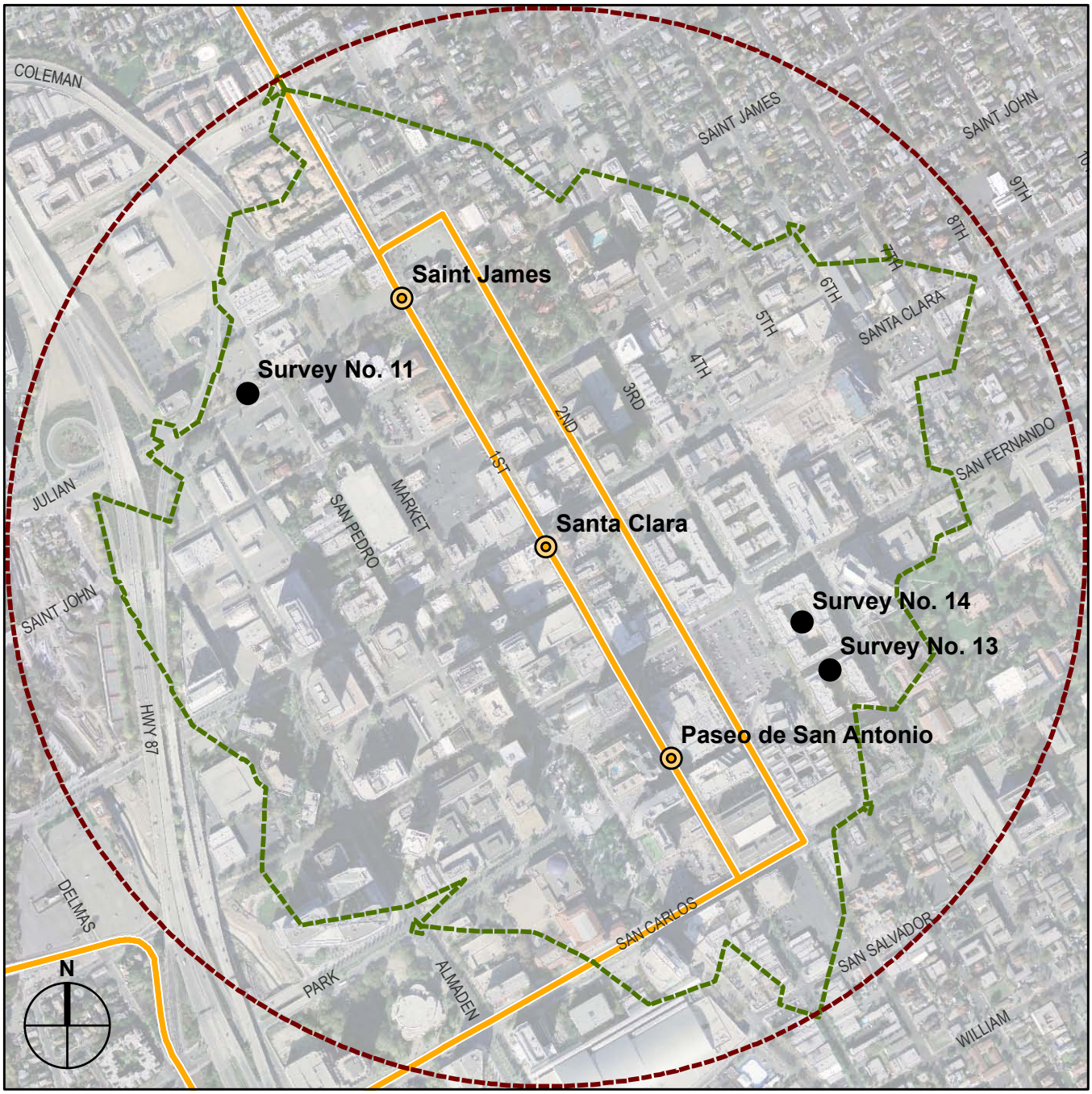


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 — 0.5 — 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.5 Survey Sites Near River Oaks Station

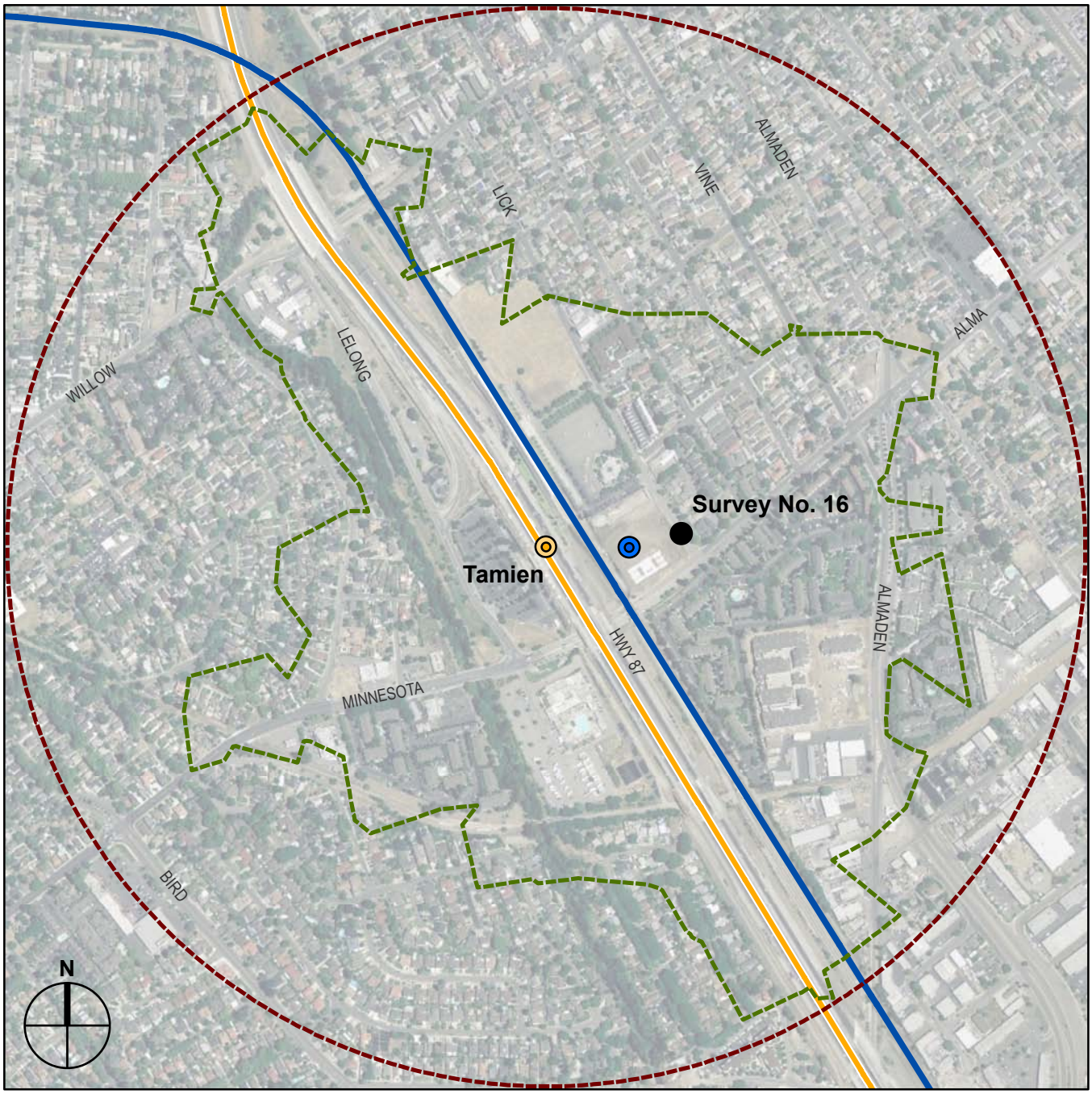


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 — 0.5 — 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.6 Survey Sites Near Santa Clara & San Antonio Stations

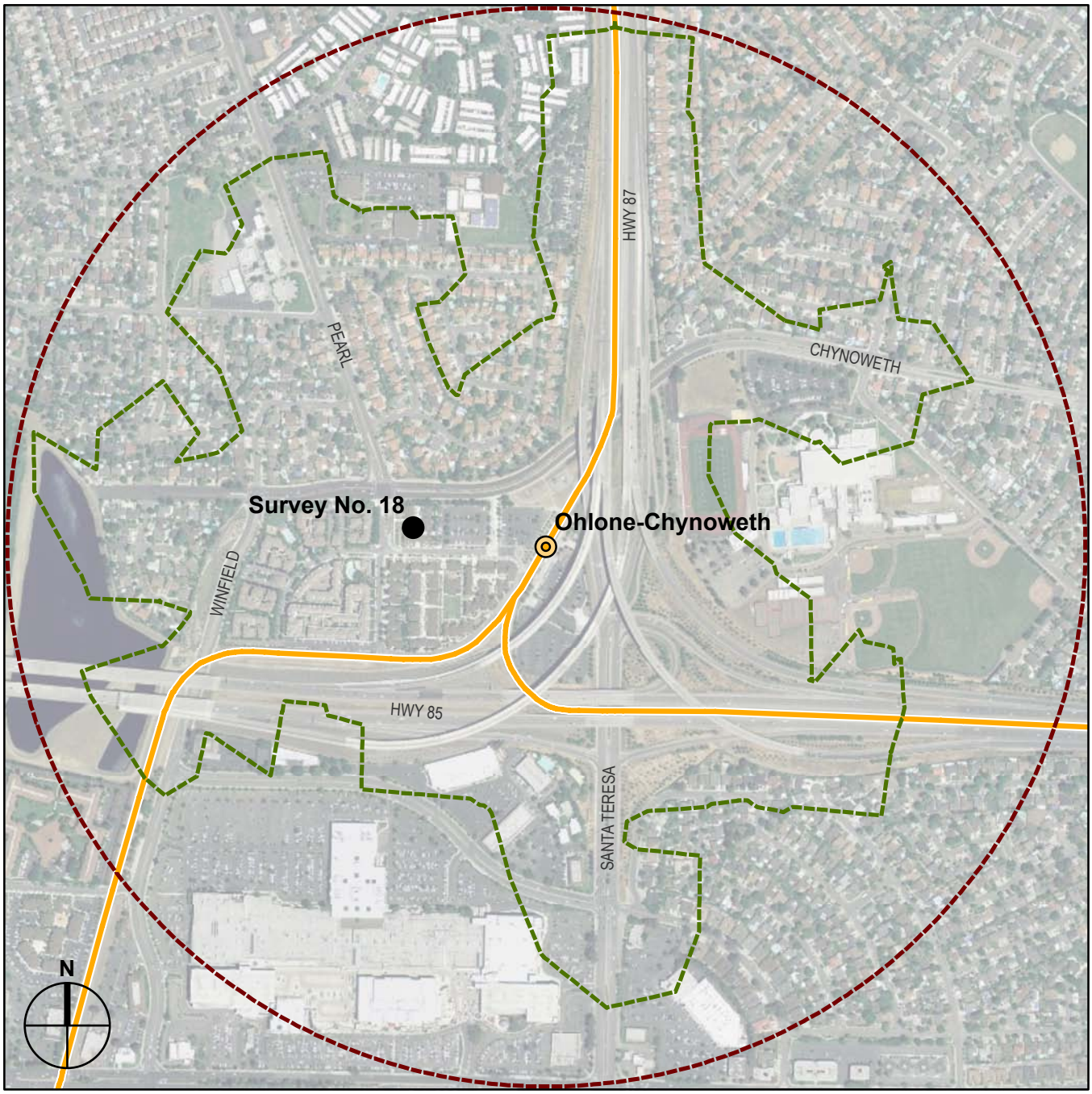


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 — 0.5 — 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.7 Survey Sites Near Tamien Station

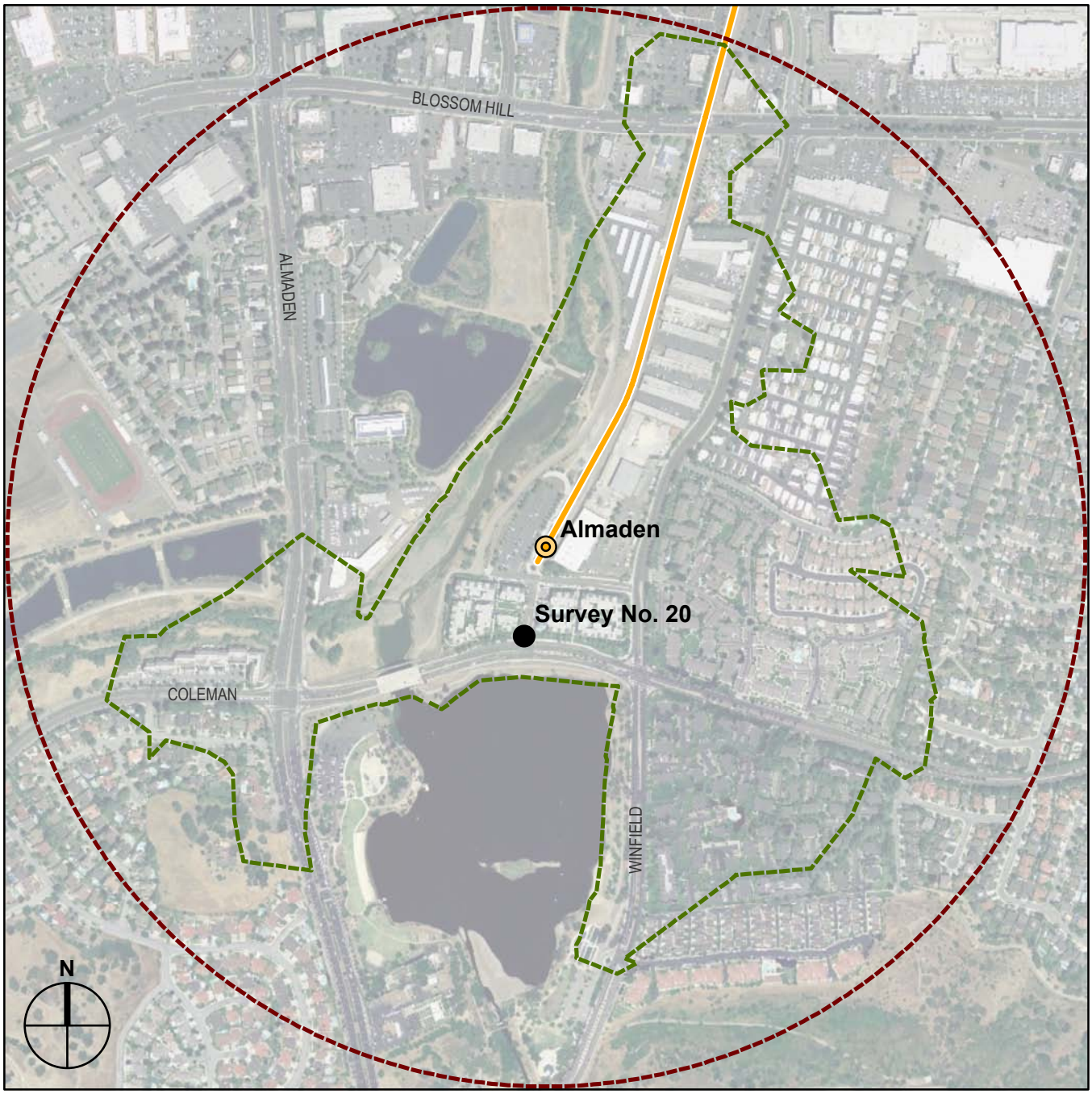


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 0.5 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.8 Survey Sites Near Ohlone-Chynoweth Station

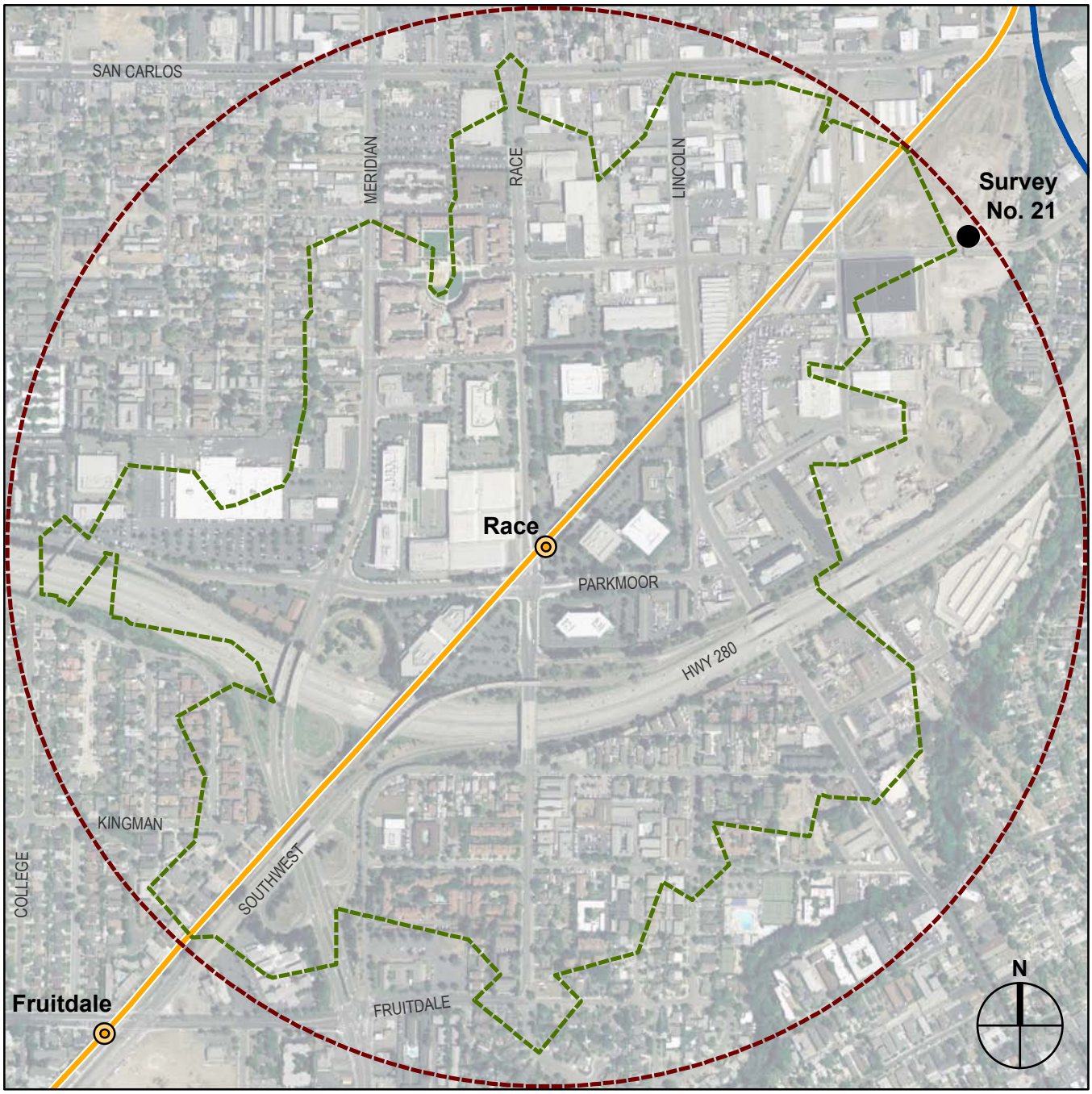


Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 0.5 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.9 Survey Sites Near Almaden Station



Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

0 0.5 1 Mile

VTA LRT stop
Caltrain stop
Light Rail line
Caltrain line
1/2 mile radial distance from rail station
1/2 mile walking distance from rail station

Figure 5.10 Survey Sites Near Race Station

5.2.4 Peak Parking Utilization Data Collection

Based on best practices for conducting parking utilization surveys, the peak parking utilization surveys were conducted mid-week between the hours of 12:00 a.m. and 4:00 a.m.[7] While the ideal methodology could include pre-peak, peak, and post-peak parking utilization counts, current literature regards the peak period survey as adequate for parking demand estimation, since most people are sleeping, and not driving, during these hours.

Surveys were conducted by Survey Field Crews of two or three members. The recommended approach was to have one team member drive, while the other one or two count. This assignment allowed data collectors to focus on data collection, while drivers focused on maneuvering through the site (Cervero, Adkins, and Sullivan 2009, 10). Data collection teams drove or walked. Generally, the survey team leader was the team member who made initial contact with the TOD residential site's proper authorities, secured permission, and conducted the initial daytime reconnaissance of the TOD property site.

Initially, there were 34 TOD residential sites initially included in the VTA priority list (see Appendix D. After applying eligibility criteria outlined previously, this number was reduced to 23 potential sites. Ultimately, the Research Team was able to secure permission from 12 sites for on-the-ground parking surveys.

A sign-up list to determine time availability was distributed to the Research Team. The Survey Field Crews were organized according to members' availability and geographic areas.

Appendix I provides additional details regarding the execution of the parking utilization survey.

[7] Please note that dates were chosen to not correspond with holidays and spring break periods.

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Chapter 6. Parking Survey Data Summaries and Analysis

After completing the pre-survey tasks, the Research Team conducted the on-site parking surveys. This chapter summarizes factors that were considered during the on-site surveys, background information on the use of parking utilization as a measure of parking demand, data that was collected, and finally the data analysis and conclusions from the study.

6.1 PARKING CLASSIFICATIONS

While conducting the on-site surveys, Survey Field Crews observed a number of different types of parking situations (see Appendix J for On-Site Parking Survey form). In order to maintain an accurate count, the types of parking spaces surveyed were classified in the following ways:

- Off-street parking
- On-street parking
- Motorcycle parking
- Open public access parking lots

This section describes each parking classification in detail and outline how Survey Field Crews approached them during the on-the-ground survey.

6.1.1 Off-Street Parking

Off-street parking is defined as parking available to TOD residents located entirely on private property and not accessible to the general public. Only dedicated private parking spaces were counted in the survey.

Loading zones were not included in the parking supply survey, unless a parking violation existed. In case of a violation, the parked vehicle was noted as it could indicate a shortage of parking.

For vehicles other than automobiles (motorcycles, ATVs, golf carts, etc.), if any one of them were parked in a space intended for an automobile, the space was counted as occupied. While the parking spaces are meant for automobile use, any other type of vehicle parked in them was considered to contribute to parking utilization.

6.1.2 On-Street Parking

On-street parking on *public* streets was not included in the parking survey, because these parking spaces are available to the general public and are not dedicated to the exclusive use of residents. Moreover, on-street parking is regulated by cities in a different way than off-street parking, and is generally not directly associated with any specific development.

Some parking spaces available on *private* streets were included in certain parking surveys. These spaces were included only if they were marked as restricted parking for residents of the property site in question, and included signs warning unauthorized vehicles would be towed. These spaces were then considered to be parking supplied for residents of the TOD survey site.

6.1.3 Motorcycle Parking

Very few of the TOD residential properties have parking spaces designated for motorcycles. Per VTA's request, these spaces were counted separately in the parking survey. However, these spaces were not included in the data analysis for vehicle parking utilization.

6.1.4 Open Parking Lots

TOD residential sites that included public-access open parking lots were not included, because parking utilization from residents of the TOD site could not be determined from a visual inspection. However, a parking lot was analyzed if it was located entirely within private property, it was available only to residents of the TOD property site, and there was signage noting that parking was restricted to residents or guests of the property (i.e., prohibited vehicles were subject to towing).

6.2 PARKING UTILIZATION V. PARKING DEMAND

As stated in earlier sections of this report, the Research Team's methodology for determining parking demand was to measure parking utilization at selected TOD residential properties during the peak demand period. The utilization ratio for each site was calculated as the proportion of parking spaces available to residents that were occupied by a vehicle. A property's parking facility was considered fully occupied if the utilization ratio was 85 percent or higher, and underutilized if it was less than this threshold. The Research Team considered the 85-percent figure as the critical threshold, as it is recognized in general professional practice as the point when a potential parker would perceive a parking facility is full and move on to other facilities to park (Carter & Burgess 2004, 19).

This methodology will only serve as an appropriate measure of parking demand when the amount of parking utilized is less than the amount of parking supplied (i.e., when parking at a site is underutilized). When parking facility is fully utilized, the total parking demand may still be unknown, as some potential parkers may choose other easier locations to park their cars (Carter & Burgess 2004, 17). Still the potentially high utilization rate would indicate that the parking supply is not over-parked. As such, either result would lead to a relevant conclusion to our research question on whether TOD residential sites in Santa Clara County are over-parked.

6.3 SURVEY DATA COLLECTION

The Research Team conducted on-site parking surveys for 12 TOD residential sites. The primary survey objective was to collect data to determine the parking utilization ratio of each TOD site. Additional data collected during on-site surveys included the survey's time and date,[8] number of cars parked outside of designated parking spaces, and number of motorcycles parked.

To determine the parking utilization ratio of each TOD site, the Research Team collected two pieces of data: 1) a count of total parking spaces supplied, and 2) a count of total occupied parking spaces. All parking spaces on the premises of the TOD residential site were counted regardless of whether they were for visitors, residents, staff, or other category. All spaces that were occupied by any kind of motorized vehicle were counted as utilized.

After collecting the total supply of parking spaces and total utilized parking spaces, the research team calculated the parking utilization ratio of each TOD site.

6.4 DATA ANALYSIS

The Research Team performed various analyses to determine parking utilization ratios, to estimate parking demand rates (if possible), and to answer the study's research question. Simple bar charts were developed to show initial relationships between parking utilization and local zoning requirements and the threshold utilization ratio, and to demonstrate the degree to which sites may be over-parked. Scatterplots and regression analysis were also used to analyze potential correlations between variables and to draw appropriate conclusions.

[8] By recording the date and time of each survey, the research team made sure that parking counts were recorded during peak utilization hours (12:00 to 4:00 a.m.).

6.4.1 Survey Data Summary

Data collected during the on-the-ground surveys are shown in Table 6.1. Among the 12 survey sites, they were all observed to have significant unused parking spaces during the peak parking demand, ranging between 17 and 39 percent of the available parking spaces observed as unused. As shown in Figure 6.1, out of the total parking spaces (9,751 supplied) about 26 percent of the parking supplied was not utilized (2,496 unused).

Since the parking utilization ratio for all survey sites was lower than the parking critical threshold of 85 percent, they may be described as <u>not</u> fully utilized. The surveys showed that the parking supply is higher than the parking utilization for all 12 survey sites. At this level of parking utilization ratio, the parking *utilization* rate may be considered as the parking *demand* rate. Looking at the total number of utilized parking spaces (7,255 utilized), which correspond to the total number of occupied housing units (5,522), the average utilized parking spaces per occupied dwelling unit is approximately 1.3 (i.e., the estimated average parking demand rate). This average parking demand rate can be compared to the average parking supply rate of about 1.7 for the surveyed sites (calculated from 9,751 total supplied spaces for 5,801 total dwelling units). On average, parking supply rates are 22 percent greater than parking demand rates.

FIGURE 6.1 Total Parking Utilization

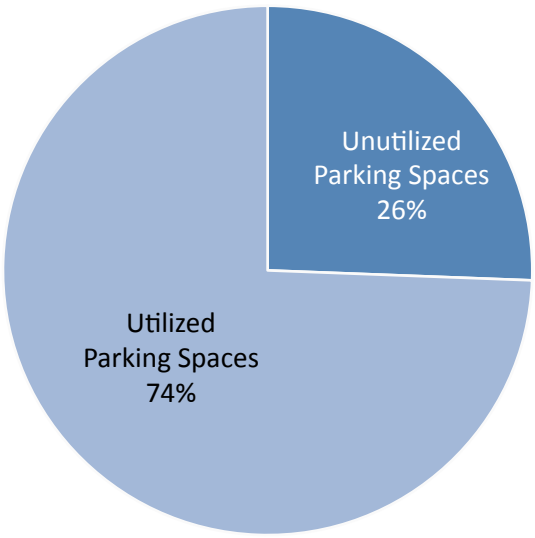


TABLE 6.1 Survey Data

Site	Housing		Parking			Parking Utilization Ratio	Parking Demand Rate	Parking Supply Rate	Over Supply (%)	Distance to Nearest Station
	Total Units	Occupied Units	Total Spaces	Utilized Spaces	Unused Spaces	(Utilized Spaces / Total Spaces)	(Utilized Spaces / Occupied Units)	(Total Spaces / Total Units)	(Supply - Demand) / Supply	(Feet)
1	294	288	438	365	73	0.83	1.27	1.49	15	2,500
2	306	294	568	439	129	0.77	1.49	1.86	19	3,060
4+	924	832	1,654	1,282	372	0.78	1.54	1.79	14	5,560
5	2,760	2,622	4,605	3,409	1,196	0.74	1.30	1.67	22	2,400
6	186	182	317	262	55	0.83	1.44	1.70	16	1,040
11*	93	93	122	99	23	0.81	1.06	1.31	19	1,060
13	210	200	373	271	102	0.73	1.36	1.78	24	1,330
14	104	100	240	148	92	0.62	1.48	2.31	36	1,500
16	115	113	186	132	54	0.71	1.17	1.62	28	130
18	176	174	338	241	97	0.71	1.38	1.92	28	690
20	250	242	387	287	100	0.74	1.19	1.55	23	730
21	383	383	523	320	203	0.61	0.84	1.37	39	3,930
Total	5,801	5,522	9,751	7,255	2,496					
Average	483	460	813	605	208	0.74	1.31	1.68	22	
Std. Dev.	751	709	1,258	936	324	0.07				

Notes

* Site 11 has an occupancy rate of 75% (it was the only survey site with an occupancy rate less than 90%).
  The total number of housing units and parking spaces were adjusted for Site 11 to reflect an occupancy rate of 100%.
  Total dwelling units: Calculation: 124 total units x 0.75 = 93
  Total parking spaces: Calculation: 163 total parking spaces x 0.75 = 122

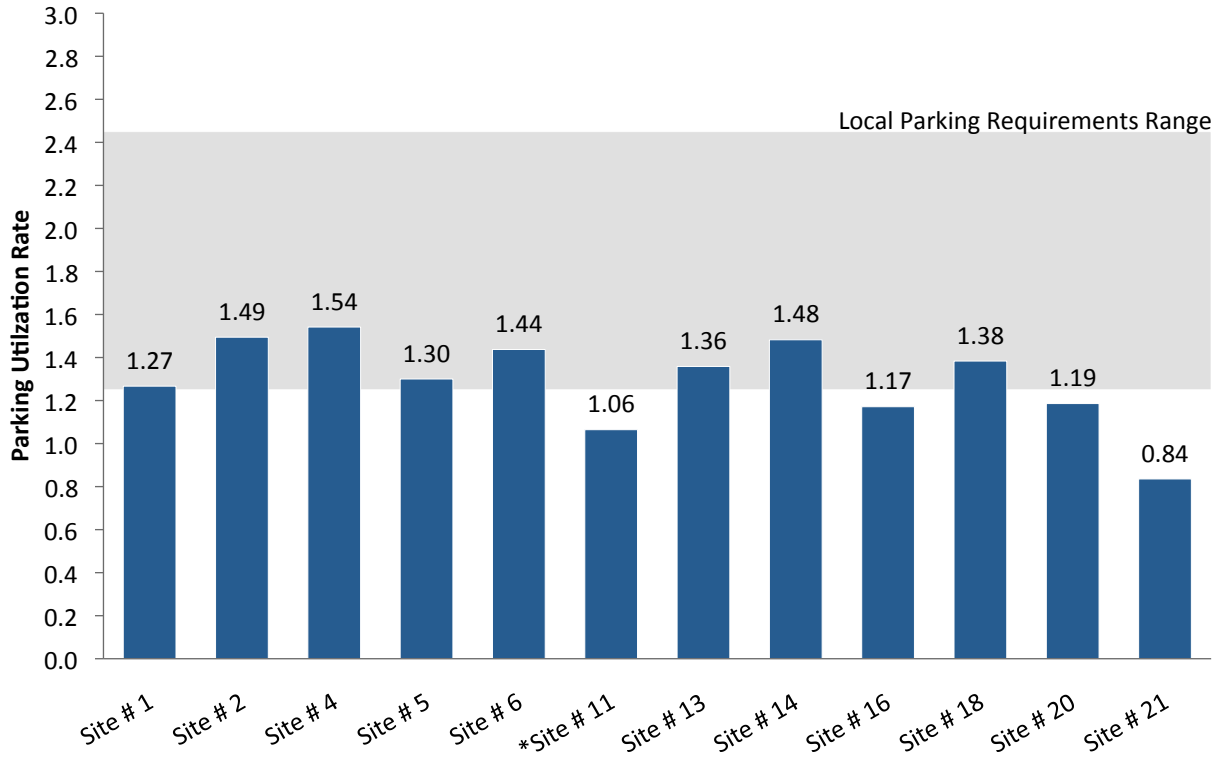
+ The actual distance is shorter than the 5,560 feet shown here.
  See Section 5.5.2 and Figure 5.5 for more detail.

6.4.2 Parking Utilization Rates for Surveyed Sites Compared to Local Zoning Requirements

The parking supply for any development site is determined during the local planning approval process, which is done in accordance with local zoning requirements. Hence, the over-supply of parking at TOD residential sites in Santa Clara County may be a function of local zoning requirements, which appear to provide more parking than is needed.

Figure 6.2 illustrates this point. It shows the range of local zoning requirements (in terms of parking spaces required per dwelling unit) and the observed utilized parking for the study's survey sites. All of the sites surveyed had utilization rates that fall into the lower end of the range of zoning requirements, with some even below the low end of the range. This observed parking utilization pattern for the surveyed sites suggests that local parking requirements could be reduced for TOD residential projects without creating parking overflow problems for nearby residents and businesses.

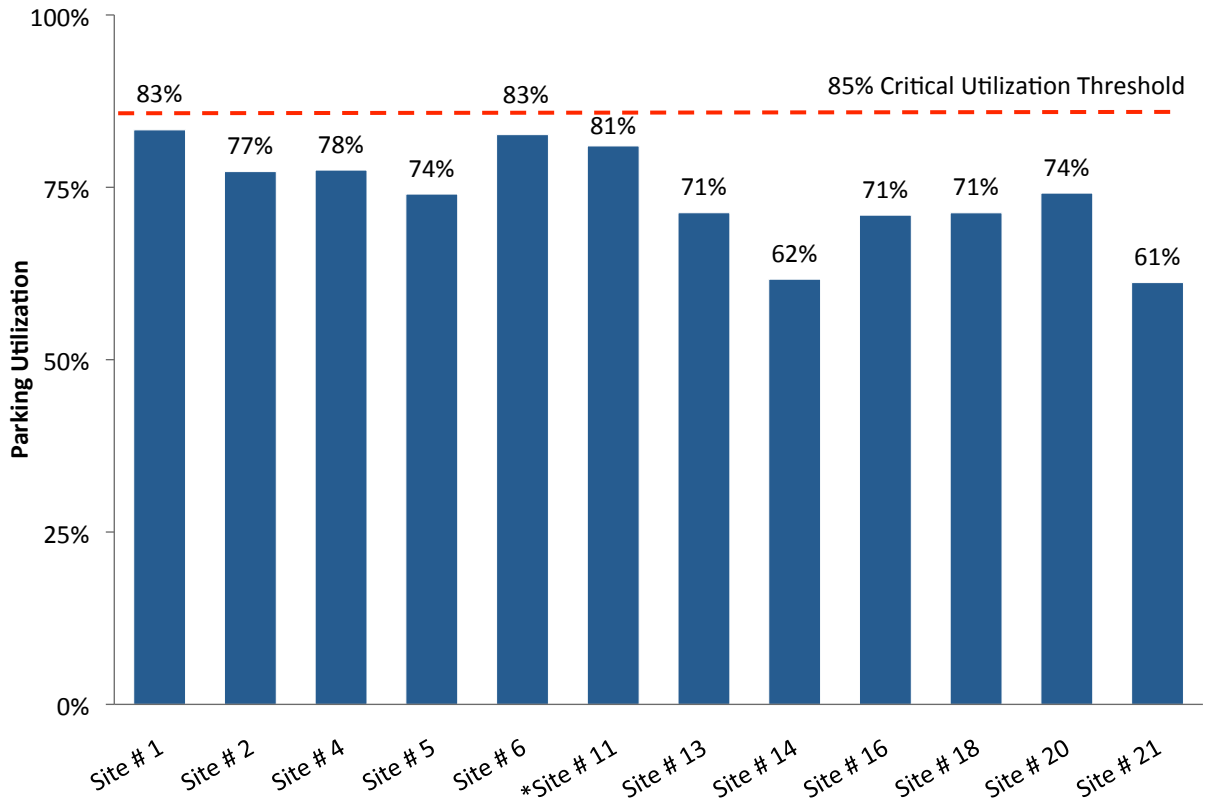
FIGURE 6.2 Parking Utilization Rates for Surveyed Sites Compared to Local Zoning Requirements



6.4.3 Parking Utilization Ratios for Surveyed Sites

Figure 6.3 shows the parking utilization ratios for all surveyed sites with respect to the critical parking utilization threshold of 85 percent, an industry-based standard. The lowest utilization ratio was observed at 61 percent, while the highest utilization ratio at 83 percent. Since all sites have parking utilization ratio below the critical threshold, the observed parking utilization may be considered to represent the total parking demand for the TOD residential sites surveyed.

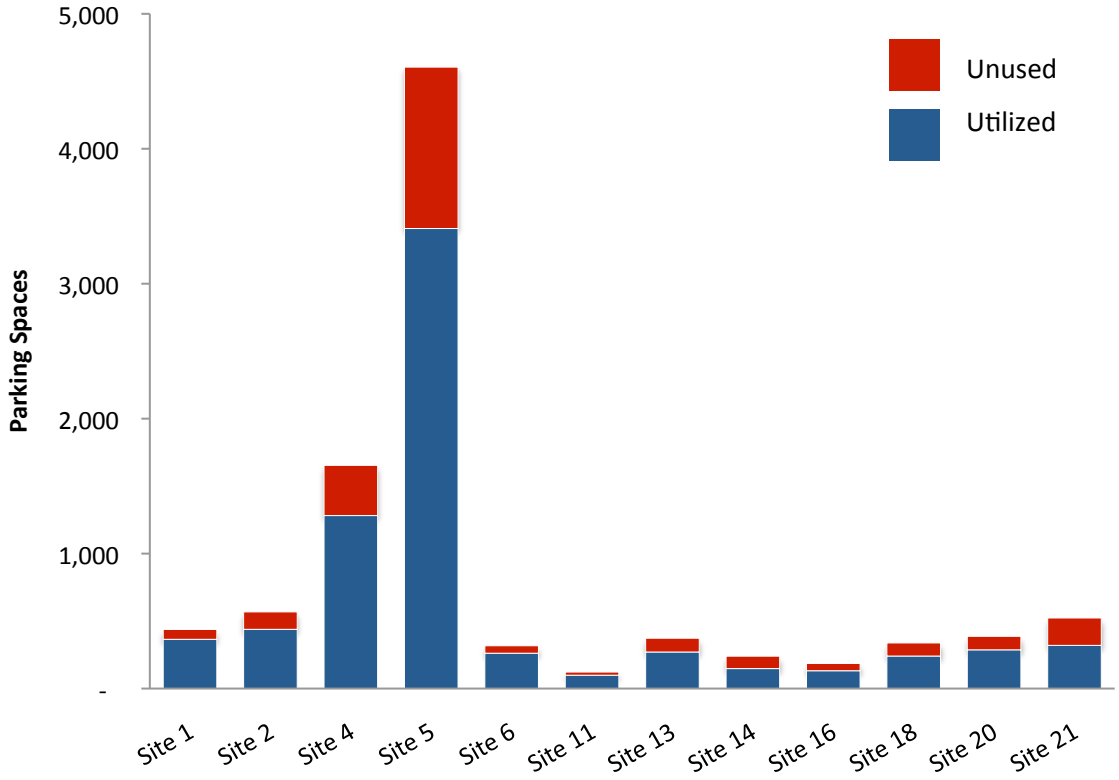
FIGURE 6.3 Parking Utilization Ratios for Surveyed Sites



6.4.4 Comparison of Parking Supply and Utilization for Surveyed Sites

The magnitude of the parking utilization (or under-utilization) for the surveyed sites is shown in Figure 6.4. The under-utilization of the parking supplied at the TOD residential sites is shown as red bars in this figure. Of the 2,496 unused parking spaces, 1,196 were at Site 5.

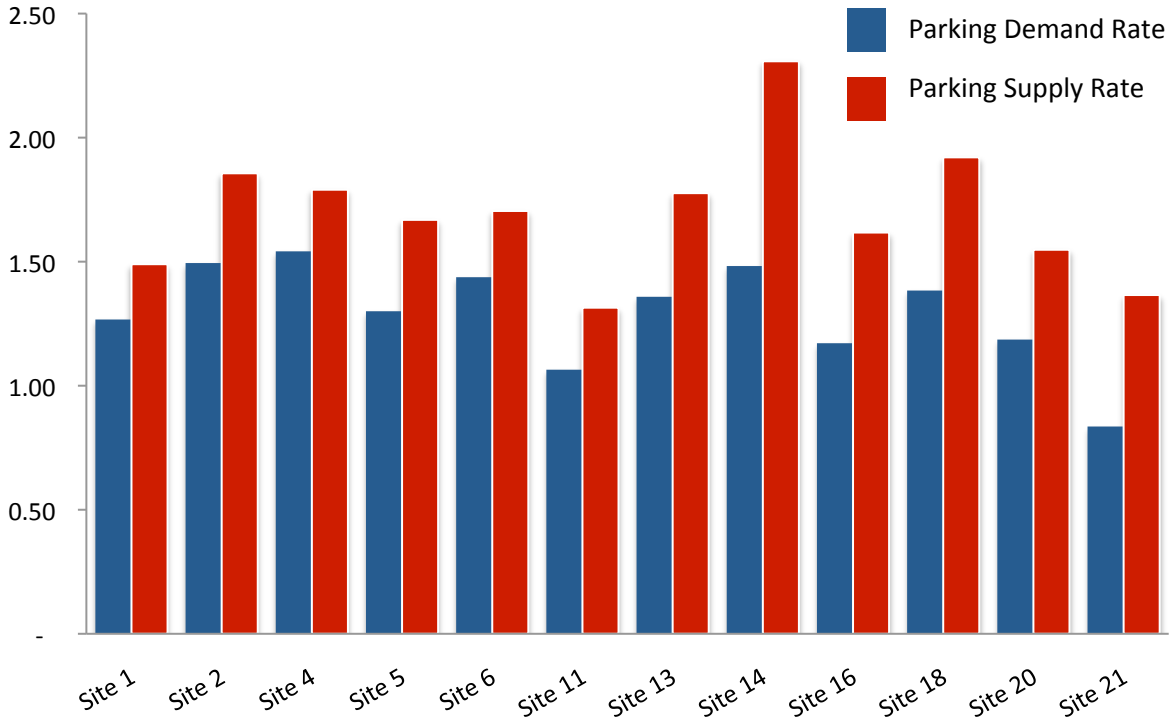
FIGURE 6.4 Comparison of Parking Supply and Utilization for Surveyed Sites



6.4.5 Comparison of Parking Supply and Demand Rates for Surveyed Sites

Figure 6.5 illustrates that the demand for parking at the TOD residential properties is significantly less than the supply. As shown in Table 6.1, the range in the parking supply and demand rates differ from one another by as little as 14 percent and as much as 39 percent. Averaged together, the parking supply rate exceeds the parking demand rate by 22 percent.

FIGURE 6.5 Comparison of Parking Supply and Demand Rates for Surveyed Sites

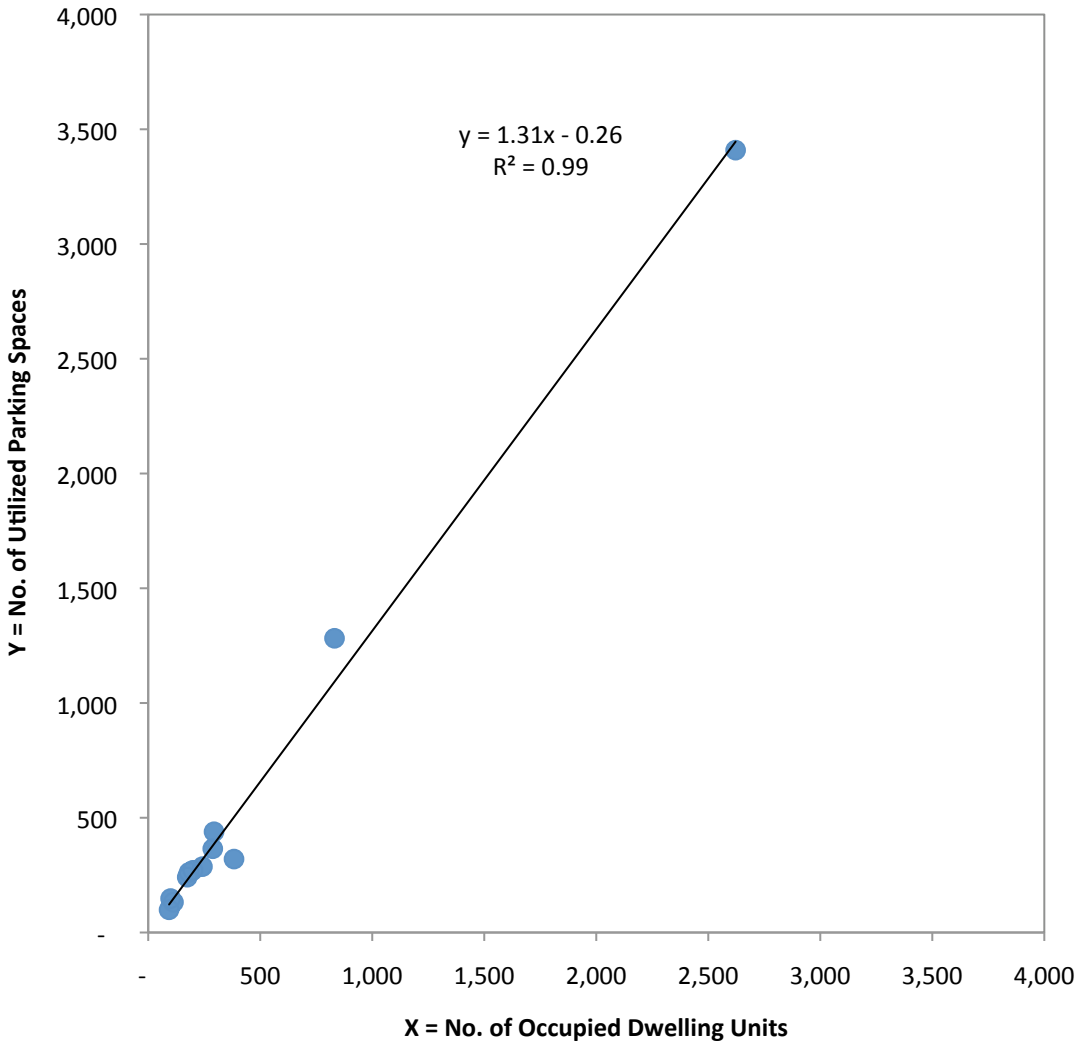


6.4.6 Relationship between Occupied Dwelling Units and Peak Parking Utilization Counts

The peak parking utilization counts were plotted against number of occupied dwelling units for the surveyed sites. A regression line was then fitted to the observed data. As shown in Figure 6.6, a strong relationship exists between peak parking utilization counts and the number of occupied dwelling units given the high R^2 value.[9] The slope of this best-fitting regression line can be used to estimate the average number of parking spaces used per dwelling unit. On average, the surveyed TOD residential sites use about 1.3 parking spaces per occupied dwelling unit during the peak parking period. This average parking utilization rate is in the very low end of the parking supply range typically required by municipalities' zoning requirements (see Figure 6.2).

[9] An R^2 value near zero indicates a week correlation, while a value near 1 indicates a strong correlation.

FIGURE 6.6 Scatterplot and Best-Fitting Regression Line of Peak Parking Utilization Counts as a Function of Number of Occupied Dwelling Units

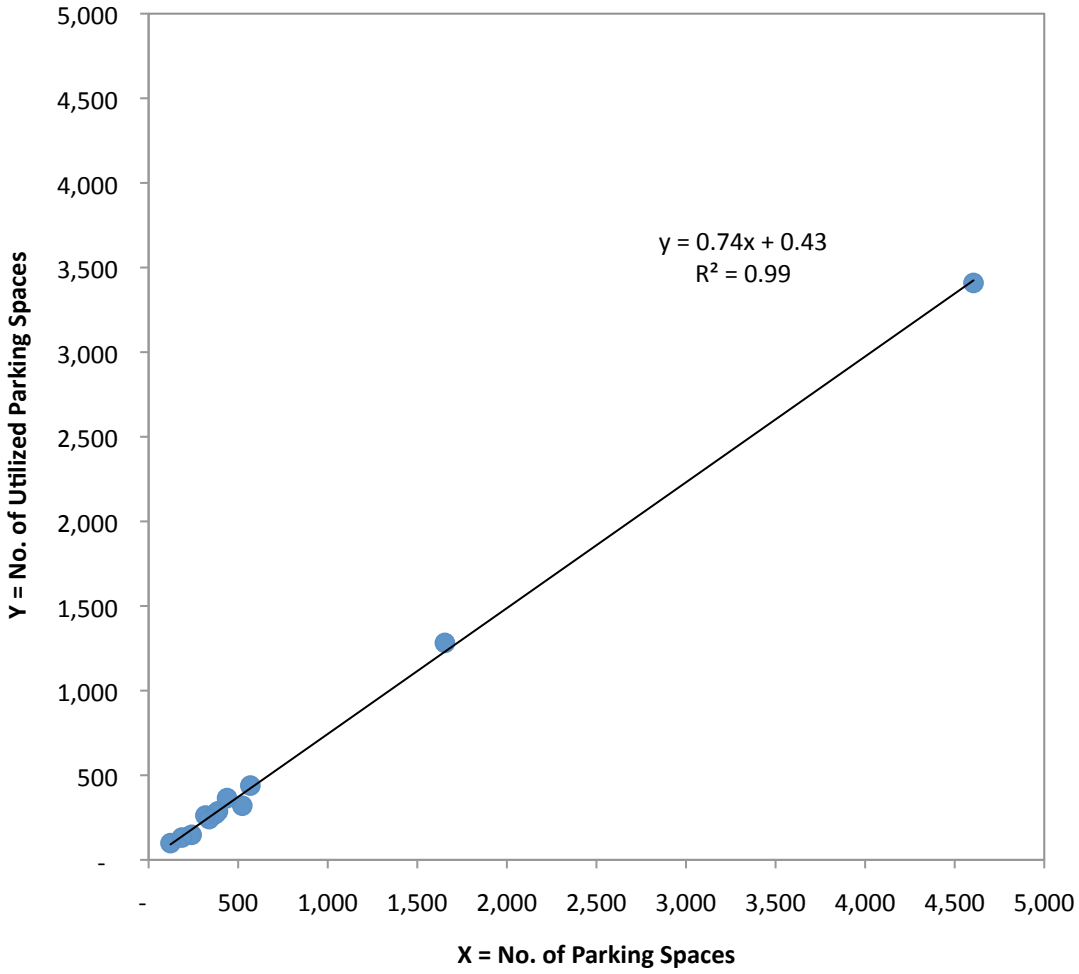


6.4.7 Peak Parking Utilization Counts as a Function of Total Parking Supply

Figure 6.7 shows the relationship between total parking supply and total utilized parking spaces. Again, a high R^2 value (0.99) indicates a strong correlation between these factors.

Analyzing these factors together helps to determine whether parking utilization is a good determinant of parking demand, as the slope of the regression line is equal to the average parking utilization ratio. Given a utilization ratio of 85 percent or above, a site would be considered fully utilized, and the parking demand could not be estimated. As shown in Figure 6.7, the slope is 0.74, which represents an average utilization of 74 percent. Since this is less than the threshold number of 85 percent, parking utilization can then be used as an estimation of parking demand.

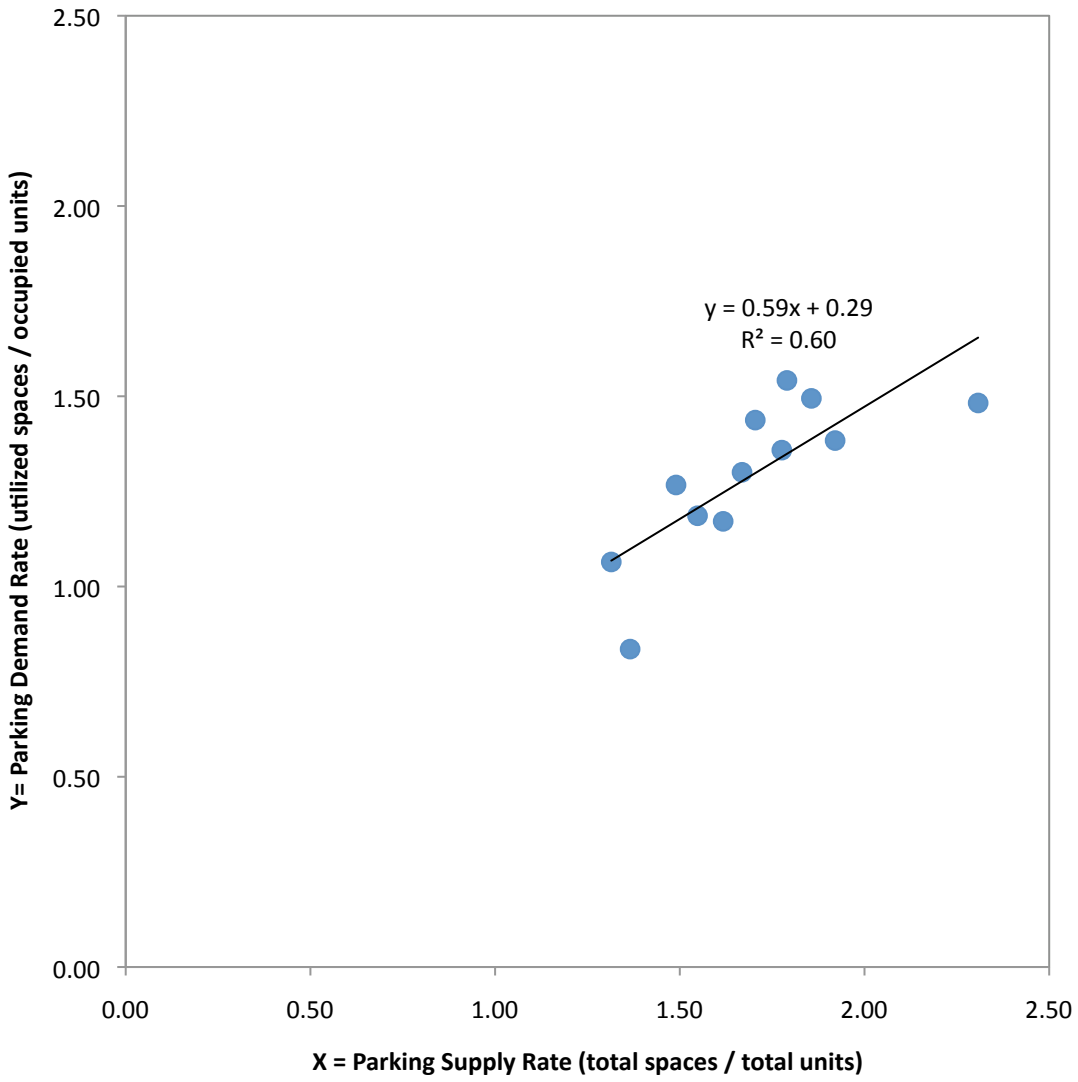
FIGURE 6.7 Scatterplot and Best-Fitting Regression Line of Peak Parking Utilization Counts as a Function of Total Parking Supply



6.4.8 Parking Demand Rates as a Function of Parking Supply Rates

As shown in Figure 6.8, the total number of parking space per dwelling unit and the peak parking per occupied dwelling unit are related to one another ($R^2 = 0.60$). The pattern indicates that residents at each site are using their allocated parking spaces, but not to the extent provided.

FIGURE 6.8 Scatterplot and Best-Fitting Regression Line of Parking Demand Rate as a Function of Parking Supply Rate



Chapter 7. Research Conclusions and Policy Implications

In addition to a summary of the project's research conclusions, Chapter 7 identifies potential policy implications for future parking supply requirements for TOD residential sites, as well as suggestions for VTA and municipalities in Santa Clara County for future potential implementation.

7.1 RESEARCH CONCLUSIONS

7.2.1 "Over-Parked" or Underutilized Parking Supply

This research shows that an excess of parking is supplied at each of the 12 TOD survey sites. Each of the survey sites has significant unused parking (see Figure 6.4). As shown in Figure 6.1, about 26 percent of available parking spaces for the 12 survey sites were unused at the time of the on-the-ground surveys. The fact that the parking supply rate is higher than the parking demand rate for all 12 sites (22 percent higher on average) indicates that more parking is provided than is actually needed (see Table 6.1 and Figure 6.5). This research project provides evidence that TOD residential projects in Santa Clara County may be "over-parked."

Since parking requirements for residential developments are set by local zoning requirements, local parking requirements have clearly led to the large amount of parking supplied at the residential developments surveyed. The 2,496 unused parking spaces in 12 residential sites lead the Research Team to conclude that parking facilities at TOD residential projects in Santa Clara County may be underutilized.

7.2.2 Reduce Residential Parking Requirements near Transit

Based on the observed peak parking utilization, the parking demand rates for the 12 TOD survey sites are near the bottom of the range of required parking supply levels for municipalities across Santa Clara County (see Figure 6.2), which in some cases may exceed 2.5 parking space per dwelling unit under current local zoning requirements. This research project shows that parking demand at residences within one-half mile of a major transit station is less than what current zoning codes require. As such, many Santa Clara County municipalities could reduce their residential parking requirements significantly without the risk of "underparking" a TOD residential site. Figure 6.6 and Table 6.1 show that on average only about 1.3 spaces are needed per dwelling unit in a TOD residential site in Santa Clara County that meets the criteria set in Section 5.2.1 of this report. This result for Santa Clara County TOD sites is comparable to the average parking demand rate of 1.2

space per dwelling unit for other San Francisco Bay Area TOD sites studied by Cervero in 2009 (see Table 2.1).

7.2 POLICY IMPLICATIONS

7.2.1 Reduce Costs of Unused Parking

Data gathered for this study indicate there were 2,496 unused parking spaces observed during the on-the-ground survey, which constitutes approximately 26 percent of total parking supply (9,751). This is a large proportion of unutilized parking spaces, and it represents a substantial opportunity for developers to invest in elements of TOD residential projects other than parking.

Since unused parking supply consume land, money, and other resources in their construction and maintenance, reduction in parking requirements for TOD residential projects could benefit both local municipalities and developers alike. Constructing parking facilities increases costs for developers and proves inefficient for the municipality when a large proportion is unused. There are potential cost savings that could be garnered if parking requirements are reduced to levels suggested by the utilization data presented in this study. These cost savings can then be used to support other critical development objectives of the local municipality.

The cost of constructing parking facilities is estimated to be on average between $10,000 and $30,000 per space in garage facilities and about $5,000 per space for surface parking lots (Boroski 2002, 1). In the United States, building parking costs an average of $15,000 per space, or $44 per square foot (VTPI 2010, 5.4-2). The cost of parking facilities does vary according to the individual site, but an across-the-board average will be used in this case. Using the national average cost, the 2,496 unused parking spaces counted in this study for the 12 TOD residential sites represent about $37.4 million in opportunity cost. This estimate is only a partial estimate to the total potential opportunity cost for the whole county.

Here's another way of estimating the opportunity cost for unused parking supply. A single parking space is typically 8 - 10 feet wide by 18 - 20 feet deep, for a total of 144 to 200 square feet per space, with an additional amount required for aisles, circulation, and other elements. On average, between 100 and 150 parking spaces could potentially be constructed on one acre of land. The average cost of building one acre of parking could therefore potentially reach $1.5 to $2.25 million (VTPI 2010, 5.4-2). Assuming mid-point yield, the 2,496 parking spaces counted in this study is estimated to cover about 20 acres. Using the mid-point of the average cost of building parking per

acre, the parking oversupply observed in this study is estimated to represent about $37.4 million in opportunity cost.

Constructing parking facilities is estimated to represent about 10 percent of total development costs for a building (VTPI 2010, 5.4-12). This cost represents a large expenditure for developers, and any provision to reduce parking requirements to reduce this amount could represent a significant reduction in overall development costs. The cost savings in development costs could then be used to support other enhancements to the project, which may be desired by the local agency and its communities. Maintenance and operation for a parking facility can also cost property owners an average of $800 per year for each residential off-street parking space[10] (VTPI 2010, 5.4-10). This maintenance cost represents about $2.0 million per year for the 12 TOD residential sites in annual opportunity cost, which could be used for other purposes to maintain the residential property. Again this annual opportunity cost is only a partial estimate to the total annual opportunity cost for the whole county.

Having a high proportion of parking facilities sitting unused is not only an inefficient use of land, it also costs developers and property owners a great deal of money to construct and maintain spaces that would ultimately be underutilized. Reducing the amount of money that municipal regulations require developers to spend on constructing parking facilities could free up considerable capital for higher-quality, more economically efficient TOD residential projects with lower annual maintenance costs.

7.2.2 Simplify Local Parking Requirements

The Research Team documented in Section 3.3 the process available for granting reduced parking requirements for residences near transit stations. As described in that section, each municipality in Santa Clara County has its own unique way of granting such a reduction. In the majority of cases, the process requires case-by-case decision making (such as conditional use permits) or a previously completed legislative effort (such as a Specific Plan). In several jurisdictions, reductions can only be granted through issuance of a variance or in conjunction with the site developer's participation in and promotion of transportation demand management (TDM) programs.

Providing reduced parking requirements for TOD residential sites directly into the zoning code would save municipalities the manpower and resources required for additional permitting efforts.

[10] Note: costs can vary between $670-5,000 per year

Additionally, this form of regulation would likely be seen as beneficial in the development community, as it would allow for a greater measure of predictability and simplicity in determining the costs associated with developing a residential site. Such a benefit may even result in an increased number of TOD residential projects in municipalities that simplify the parking requirements in such a manner.

7.2.3 Future Transit Expansion

Several new transit projects are planned for Santa Clara County in the coming years, notably the two Bus Rapid Transit (BRT) lines and the BART extension to San José. Figure 7.1 shows a map of planned and existing transit lines in Santa Clara County. The new transit lines will provide better transit service to many areas throughout Santa Clara County, including important destinations such as central business districts (CBDs), hence enabling residents the option to access these areas without driving. As more areas in Santa Clara County are connected by transit, there will be new opportunities for residents to take advantage of the accessibility and convenience that TOD residential projects offer.

This research has shown that TOD residential sites, which meet the criteria in Section 5.2.1 and are near rail stations in Santa Clara County, are over-parked. This reasoning can be further expanded to suggest that TOD residential projects near new or enhanced transit stations for BRT service, which may be comparable to rail service, could also have similarly reduced parking demand. If the quality of transit service in terms of convenience and comfort can achieved comparable to rail service, then the potential for reduced parking demand for TOD residential sites near BRT stations may be possible, if not likely.

7.2.4 Better Land Use and Urban Form

Municipalities could expect positive impacts from decreasing parking ratios for TOD residential projects. Land would be more efficiently used by making it available for additional housing or enhanced community amenities. In a study by Arrington and Cervero (2008), decreasing parking ratios from 2.2 to 1.1—while holding other factors constant—increases the potential for building more units by 20 to 33 percent. Reducing parking ratios should result in lower construction costs, greater housing units, higher transit ridership, and improved overall physical form and performance of residential developments (Arrington & Cervero 2008, 48-51).

Another implication of lowered parking ratios relates to urban form. By reducing the amount of parking (especially surface parking) required at a site, the overall physical form on residential properties could be improved to make them more inviting and pedestrian friendly, and thus more "livable". Putting lots of surface parking between housing units and the adjacent roads and walking paths typically become barriers to walkability.

7.3 AREAS OF FURTHER RESEARCH

Mixed-use and TOD projects present an excellent opportunity for shared-parking situations, which could increase the efficiency of parking facilities that serve these types of developments. Depending on the time of day, shared parking between residents and commercial business patrons enables the use of spaces that might otherwise be unused. If a mixed-use development is located within one-half mile of a transit station, then overall parking could be reduced and shared across all land uses. By integrating commercial and residential parking, the overall parking supply will be more efficiently used (Boroski 2002, 9). Future research on shared parking in mixed-use/TOD projects in Santa Clara would be useful in planning and permitting TOD projects.

TOD residential properties with reduced parking ratios should result in high transit ridership. Municipalities could then offer an incentive to private developers in the form of reduced traffic-related impact fees. The rationale would be that since these TOD residential projects generate less vehicle trips, their associated fair-share contribution to roadway traffic impacts could be lowered. Future research studies could verify that people in Santa Clara County who choose to live in TOD residential properties drive less often and have fewer cars, thereby reducing their demand for parking.

The Research Team developed a research work plan for estimating parking demand using stated-preference user surveys. For reference in future research, a methodology for conducting a user survey is included in Appendix C for VTA staff and/or other interested parties who may wish to estimate the total residential parking demand at TOD sites, particularly for those TOD residential projects that exhibit very high parking utilization.

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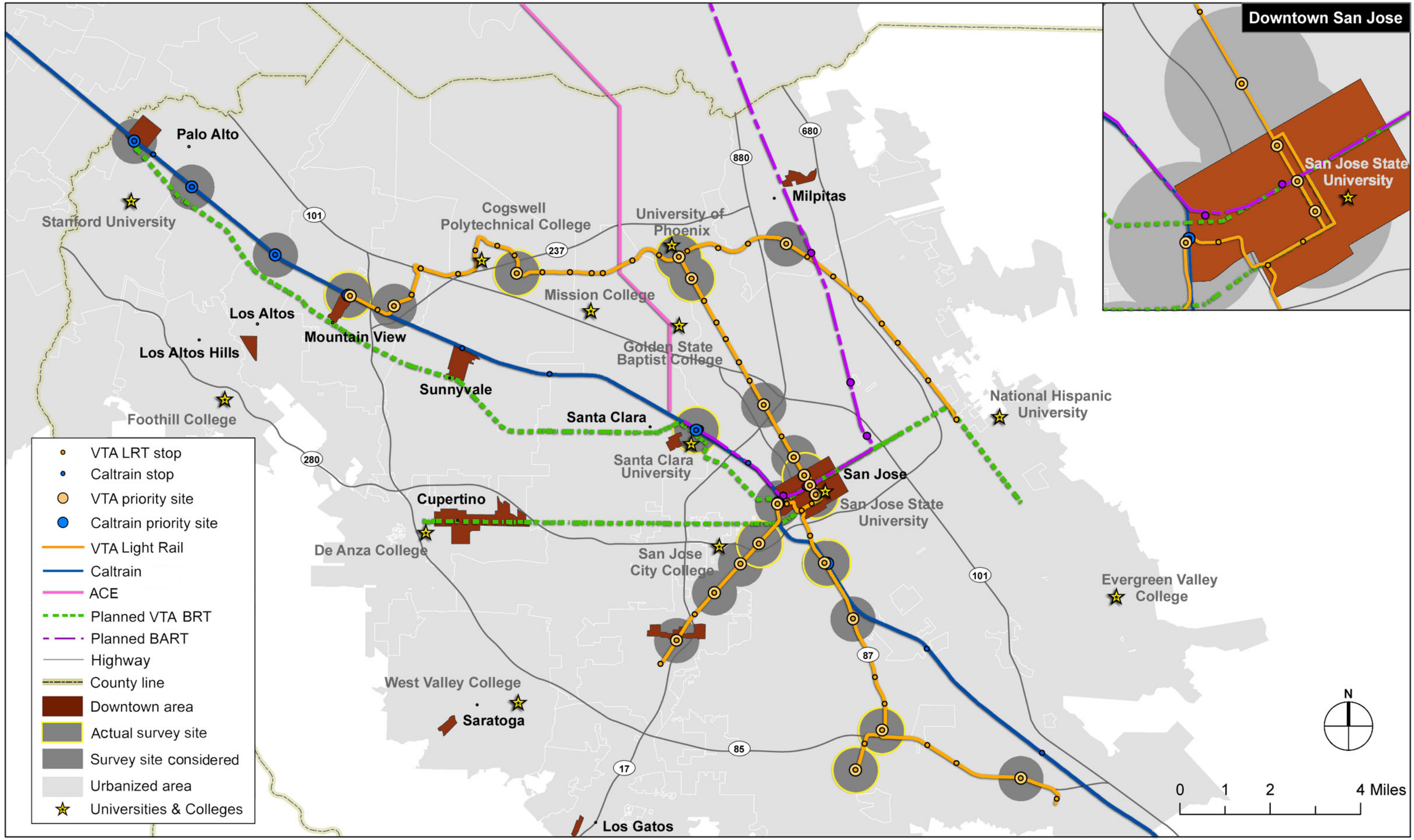

Source: Santa Clara Valley Transportation Authority and San Jose State University, Department of Urban & Regional Planning, URBP 256

Figure 7.1 Future Transit in Santa Clara County

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About the Research Sponsors

SAN JOSÉ STATE UNIVERSITY
DEPARTMENT OF URBAN AND REGIONAL PLANNING

At San José State University, the Department of Urban and Regional Planning offers graduate study leading to the degree of Master of Urban Planning. This program, accredited by the Planning Accreditation Board, is designed to prepare skilled professionals who are well grounded in the theories, methods, and techniques of planning in local, regional, and state government for the purpose of improving the quality of urban regions. In addition, it provides students with an opportunity for developing a significant background in a particular area of specialization, which includes:

- Community Design and Development
- Environmental Planning
- Transportation and Land Use Planning
- Applications of Technology in Planning

A special mission of the department is to promote planning education opportunities for a diverse student population, including working students who prefer to attend the program on a part-time basis.

The department engages faculty and students in public service projects designed to assist local communities in addressing topical planning issues, while complementing the academic curriculum with real-world professional experiences.

SANTA CLARA VALLEY TRANSPORTATION AUTHORITY

The Santa Clara Valley Transportation Authority (VTA) began as a County department created by the Santa Clara County Board of Supervisors on June 6, 1972 to oversee the region's transportation system. Until 1995, VTA's primary responsibility was the development, operation and maintenance of the bus and light rail system within the county. VTA separated from the County of Santa Clara and merged with the region's Congestion Management Agency in January 1995, thus undertaking another responsibility: managing the county's blueprint to reduce congestion and improve air quality.

Working under the direction of a 12-member Board of Directors, VTA has a $363 million annual operating budget (FY'08). VTA's low-floor bus fleet serves a 326 square mile urbanized area. The 42.2 mile light rail system is operated with a fleet of 100 low-floor light rail vehicles.

As the multimodal transportation agency for Santa Clara County, VTA has a strong interest in seeing transit-supportive land use and transportation policies implemented by local agencies in the county.