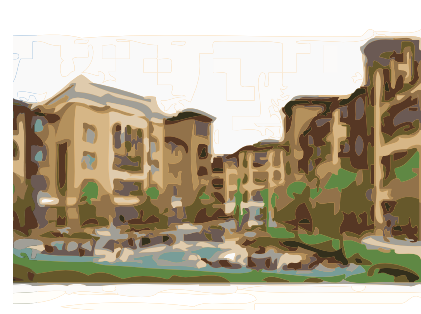


# SJSU/VTA Collaborative Research Project



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



### Volume II: Technical Appendices December 2010

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**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 Appendices (Volume II) 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. This volume includes the appendices to the main report, which details the findings of the parking utilization surveys of transit-oriented development (TOD) residential properties in Santa Clara County and provides 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*

Dayana Salazar  
Professor and Chair  
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**SJSU/VTA** Collaborative Research Project

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

**VOLUME II: TECHNICAL APPENDICES**

December 2010

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## Overview

Volume II is the compilation of the technical appendices to the technical report for *A Parking Utilization Survey of Transit-Oriented Development Residential Properties in Santa Clara County*.

The 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 may be "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 scarce land resources.

Included in Volume II is a summary of the current and best practices for estimating parking demand (Appendix A). Also included in this volume is a discussion of current parking requirements within nine municipalities in Santa Clara County (Appendix B) and a work plan for determining parking demand in instances where parking utilization may be deemed very high (Appendix C). Supplemental materials that went with the preparation for and implementation of the on-the-ground parking survey, such as the initial master list of priority survey areas and the parking survey instrument, are provided in Appendices D through J.

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## **Appendix A. Current and Best Practices in Estimating Parking Demand for TOD Residential Properties in the U.S.**

Appendix A identifies and explores current and best practices and methodologies 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 is to identify the research techniques and methodologies successfully used in previous studies. Best practices from relevant research studies are examined and summarized. In addition, known parking demand rates from various parts of the United States are included in this appendix to help illustrate the range of parking demand rates for TOD residential projects.

### **A.1 ITE PARKING GENERATION**

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

Critics of the manual have cited several concerns relating to the *ITE Parking Generation* guidelines (ITE 2004):

- The data was collected in the 1980s, so it may not be applicable for present-day use.
- The data is very limited, and in some cases there are only 3-4 studies for a particular land use.
- Data was collected only in suburban areas, where parking is free and unlimited.

Additionally, ITE doesn't include specific parking generation data for mixed-use developments. ITE suggests that researchers refer to ULI guidelines for mixed-used development parking generation rates (ITE 2003, B6). The latest edition of the *ITE Parking Generation* manual (released in July 2010) may, or at least start to, address the above concerns.

### A.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 following these four data-collection steps to determine parking demand:

1. **Select site.** Site selection is one of the most crucial steps in determining parking demand; otherwise, it might lead to an inaccurate conclusion. ITE suggests that the researcher count the total parking demand per land use, including all customer, visitor, on- or off-street, residential, and employee parking for that specific land use.
2. **Determine an independent variable.** The independent variable should be a physically measurable characteristic of the survey site, such as property size (in acres), number of employees, number of residents, etc.
3. **Collect background data.** There are a number of factors that can influence parking demand, such as occupancy, transit availability, and area type.
4. **Conduct parking demand observation.** The objective of this step is to count the number of parked cars in peak hours and also off-peak hours.

### A.1.2 Estimating Parking Demand for TOD Properties

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 is open to the inclusion of additional parking data collected for new and different land uses. The research collected by ITE and the methodology presented in the manual provide a standard way for researchers, planners, and designers to estimate parking generation demand for different land uses not currently included in the manual.

## A.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 that focuses on continual review of current policy (Smith 1983, 22-24). The six steps are summarized below:

1. **Determine Generic Building Characteristics.** For residential development, this includes measuring vehicle ownership of residents and the type of development. It includes

evaluating owner-occupied vs. rental properties, single family vs. multi-family, market segment served by the development, size of the units, and if parking is bundled or unbundled.

2. **Review Parking Standards Elsewhere.** Good practice includes examining parking requirements in other localities that are reasonably similar to the target area. This can include formal literature on the subject as well as existing codes from other areas.
3. **Survey Parking Demand and Problems at Existing Developments.** Measuring demand with on-the-ground surveys at existing developments allows one to note how existing policies over- or underestimate the amount of parking that is actually necessary for a development.
4. **Establish Parking Policy.** Using observations from existing developments and knowledge of other jurisdictions' parking requirements, minimum parking requirements can be set for any given development.
5. **Determine Zoning Requirements.** Once parking requirements for given types of developments have been set, they can be translated into regulations in the zoning code.
6. **Monitor Parking Standards.** Once enacted, the recommended practice is monitoring parking conditions at regular intervals in order to understand how well the new codes work, and if any refinements are necessary.

### **A.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). It is based on the principle that different land uses have complementary parking patterns and needs. As such, overall parking may be reduced when the need for it is shared.

### A.3.1 Current Methodology

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 or estimated demand from the multiple land uses that will share parking spaces.

1. **Gather and Review Project Data.** Since the ULI shared parking analysis is intended for a combination of land uses, either at a single project site or parking district that shares parking facilities, it is not used to determine the parking needs for a single use. Needed information includes the type and size of each individual land use. For example, a project labeled as “retail” may include entertainment, restaurants, cinemas, et cetera, and must be categorized as such. It is important to not oversimplify land uses because these different uses require different parking needs.
  - Review local zoning practices to determine accepted practices where local zoning policies do not include shared parking and may require a variance to reduce parking requirements. Local policy makers may be unfamiliar with the practice, and they may need additional information about this methodology.
  - Survey existing conditions, local users, and facilities as appropriate. It may be necessary to collect data locally, including comparing data to similar existing developments, in order to support the analysis.
  - Research the modal split and transportation demand management practices in the project’s environs that will affect peak accumulation of parked vehicles (e.g., what are the available public transportation options, parking pricing, ridesharing programs?).
  - Discuss parking management strategies with all stakeholders to ensure that shared parking can occur in the study phase. Relationships among land uses, both physical and functional, will affect the success of shared parking (Smith 2005, 20-22).
2. **Select Parking Ratios.** The Shared Parking methodology uses the “cornfield development” to determine the base parking ratio. This is the number of spaces that would be needed if the land use were located by itself in an area with no transit and weak pedestrian connections. The ratios represent “the peak accumulation of vehicles at the peak hour on a

design day for that land use” (Smith 2005, 22). ULI uses the 85<sup>th</sup> percentile to determine parking ratios, which are further divided into weekday and weekend. Recommended parking ratios are also broken down into visitor/customer and employee/resident. An additional category for reserved parking is needed since reserved spaces generally cannot be shared (Smith 2005, 22-24).

3. **Select Factors and Analyze Differences in Activity Patterns.** Parking needs of land uses vary by time of year, day of week, and hour of day. Parking needs of different uses do not peak all at the same time. Time-of-day and seasonality variables are analyzed first. ULI provides default time-of-day adjustment and separated parking ratios for weekend and weekday conditions.
  - Monthly Activity Patterns: Peak parking needs differ from use to use. For example, retail may peak during the holiday shopping season, while conventions and seminars are less likely to be scheduled between Thanksgiving and New Year’s Day. This study breaks the month of December into two periods to better predict parking patterns associated with the holidays.
  - Time-of-Day Patterns: Activity generally does not vary as greatly monthly patterns, but sometimes adjustments must be made for unusual situations (Smith 2005, 24-25).
4. **Develop Scenarios for Critical Parking Need Periods.** Several scenarios should be developed to identify the peak-hour period. Examples of when parking is typically is needed most include (Smith 2005, 25):
  - Weekend evening in July
  - Weekend afternoon and evening in December before Christmas
  - Weekend afternoon and evening in late December
5. **Adjust Ratios for Modal Split and Persons per Car.** Base parking ratios reflect suburban conditions with no transit or ridesharing. Therefore, adjustments must be made to reflect a reduction in auto use due to transit use, ridesharing, drop-offs, walk-ins, et cetera. Miniscule adjustments should be avoided; adjustments are intended for significant changes

in the modal split. Two adjustments can be made: modal split and persons per car. Adjustments depend on available data and may require professional judgment or assumptions.

6. **Apply Non-captive Adjustments.** A reduction in parking may be needed due to patronage of multiple land uses. The “captive market” is people who will use multiple land uses while only requiring parking for one land use. For example, an office worker who walks to a restaurant at lunch time and does not require additional parking would be considered in the captive market. Determining the non-captive adjustment requires the greatest professional judgment (Smith 2005, 29).
7. **Calculate Required Parking Spaces for Each Scenario.** Total the parking needs for each land use to estimate the overall shared parking need for each scenario.
8. **Determine whether Scenarios Reflect All Critical Parking Needs.** It is advisable to check other hours of the day with peak accumulation to be sure that parking needs are not overlooked. If several scenarios are close, more hours on several days should be tested.
9. **Recommend a Parking Plan.** Develop a comprehensive parking plan that assures that success of shared parking (Smith 2005, 32).

#### **A.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 methodology 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. This methodology may act as a guide for the best time frames to use when surveying parking demands at TOD residential properties.

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

## **A.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, among others. The methodologies used in each study to estimate parking utilization and/or demand are described below. The methodologies from these studies focusing on TOD parking were combined with best practices from standard reference manuals by the Research Team to develop the best approach for conducting our survey of parking utilization of TOD residential properties in Santa Clara County.

### **A.5.1 Methodology from Robert Cervero**

Robert Cervero and his research team compared parking generation rates for thirty-one housing complexes near transit stations in the San Francisco Bay Area and Portland, Oregon (Cervero 2009). The rates at the complexes (15 projects in Oregon and 16 projects in the Bay Area) were compared to the total number of parking stalls and 2003 ITE parking generation rates for “Low/Mid-Rise Apartments”. All projects selected were within two-thirds of a mile from the nearest transit stop.

Candidate sites were identified in each region, and the list was further narrowed by those sites where the property owners and building managers allowed the research team on site to conduct the studies. Data was collected in May, early June, late September, and October to focus on the non-summer, non-rainy months of 2008. All counts were conducted during the middle of the week, and data was collected during peak and off-peak periods. Teams of at least three were sent to each site, each consisting of a driver and at least two “counters”. The resulting counts were tabulated to obtain peak and off-peak demand totals.

Another study by Cervero focused on the trip reduction impacts of TOD residential projects (Cervero 2008). Seventeen TOD housing projects were studied in this research, and counts were conducted using pneumatic-tube recorders at all curb cuts and driveways that were operated by a consultant firm. Studies were conducted during mid-week time periods in late May. All vehicle counts collected were converted to 24-hour and AM/PM peak hour rates per dwelling unit, and were compared to the ITE *Trip Generation* manual. Comparisons between the collected data and the ITE rates were made using the “weighted averages” from ITE as well as the regression equations.

#### A.5.2 Methodology from John Boroski

In contrast, John Boroski and his team focused on the ULI *Shared Parking* handbook in their research on transit-oriented development (Boroski 2002). They noted that Cervero had conducted previous research (1996) at over 6,500 housing units in 26 areas within one quarter mile of urban rail stations. Boroski’s research focused on 12 housing projects near BART stations.

A study of parking policies researched three different TOD studies where all of the sites were within one-half mile of transit (Willson 2005). The first effort utilized mail-back questionnaires at 36 different TOD sites with the second study focused on 37 residential properties in Pasadena. With the 37 properties in Pasadena, mail-back questionnaires were used, as well as site analysis, studies of transportation and land-use characteristics in the region, and interviews with property owners or developers. The final study centered on determining replacement parking, and explored principles and methodologies for doing so at four study locations.

#### A.5.3 Methodology from Hollie Lund

Hollie Lund has studied travel characteristics for TOD residential projects throughout California (Lund 2004, 11). This research includes 40 TOD residential projects in the Bay Area, Sacramento, Los Angeles, and San Diego in residential, office, hotel, and retail settings. All studies were conducted in the summer, and the sites were near a variety of rail facilities ranging from light, heavy, and commuter rail lines.

The research took a “case-study approach” by focusing on “best case models” and including a technical advisory board. (Lund 2004, 11) The researchers studied a variety of rail types and land uses so that the results could be used to guide many different projects in the future.

The research focused on three survey populations: residents within rail station areas, office employees near rail station areas, and retail and hotel employees in station areas (Lund 2004, 12). The primary questions that the researchers were looking to answer were whether or not a residential or office location in a TOD increases the probability of transit use.

Site selection process began with a list of study sites from the previous 1993 and 1995 reports (Lund 2004, 13). The list was then expanded to include TOD residential projects along new and existing rail lines. The resulting list was then narrowed to remove sites that were not in suburban areas that were developed specifically as TOD residential projects, and the sites on the list must be in station areas with transit headways of 15 minutes or less (Lund 2004, 13). The minimum residential intensity was 50 units or more.

The survey was conducted using questionnaires by mail, intercept surveys at retail complexes, surveying of hotel guests, property manager interviews, and site visits (Lund 2004, 14). The final response rate for residential questionnaires was 13 percent (Lund 2004, 15). At residential locations, the site data collected included parking supply in terms of spaces available per unit, cost of parking per month, number of total housing units, average cost of rent and mortgages, DUA, and distance from transit (Lund 2004, 16). A strength of this research was the scope of the data that was collected, in that the range of land uses and transit intensities allows for comparisons for many different types of future projects. However, a weakness was the relatively low response rate from the questionnaires (Lund 2004, 17).

#### A.5.4 Variables that Affect Parking Demand

Litman offers a list of variables that may impact parking demand (see Table A.3). While Litman outlines over a dozen factors that may affect parking demand, some do not agree with his findings (Cervero, Adkins, and Sullivan 2009, 22). While it is generally agreed upon that a resident's income affects parking demand (Litman 2006, 37), Cervero argues that residential density, socio-demographic factors, and rents as variables that do not affect parking demand (Cervero, Adkins, and Sullivan 2009, 22). Elaborating on his findings, Cervero also believes that distance to transit and transit headways are the only significant off-site variables affecting parking demand (Cervero, Adkins, and Sullivan 2009, 22).

**TABLE A.3** Factors Affecting Parking Demand

Factors	Description	Analysis Method
Walkability	Quality of walking environment	Pedestrian Environmental Factor and pedestrian level of service (Evaluating Non-motorized Transport, "VTPI, 2005)
Demographics	Age and physical ability of residents or commuters	Census and other surveys with information on age, physical ability, and vehicle ownership information
Income	Average income of residents or commuters	Census and other surveys with income and vehicle ownership information
Housing tenure	Whether housing is owned or occupied	Census and other surveys with information on vehicle ownership by housing tenure
Pricing	Parking that is priced or cashed out	Price elasticity models ("Transportation Elasticities," VTP, 2005, Pratt, 2000)
Unbundled parking	Parking sold or rented separately from building space	Price elasticity models.
Parking & mobility management	Parking and mobility management programs are implemented at a site.	Methodologies described in this book, VTPI (2005), and experience with comparable programs
Geographic location	Vehicle ownership and trip generation rates in an area	Population and travel data to identify variations
Residential density	Number of residents or housing units per acre	Models such as Holzchew (1994) can be used to determine how density affects vehicle ownership and use.
Employment density	Number of employees per acres	Adjust employee parking requirements to reflect automobile commute mode
Land-use mix	Range of and uses located within convenient walking distance	Apply trip and parking demand reduction factors. Apply shared parking factors.
Transit accessibility	Nearby transit service frequency and quality	Adjust worksite parking to reflect transit commute mode split. Models, such as Hartzchew (1994) can predict how transit service quality affects vehicle ownership and use.
Carsharing	Whether a carsharing service is located within or near a residential development	Based on experience with comparable programs

Source: Litman 2003, 30.

## A.6 PARKING DEMAND RATES FOR TOD RESIDENTIAL PROPERTIES IN THE U.S.

Determining the appropriate parking demand rates for TOD residential projects located at major VTA stations requires a strong understanding of the existing travel characteristics, the characteristics of nearby transit service, and the level of residential density to be developed.

For reference, parking demand rates for TOD residential projects are summarized in Table A.4. Rates for TOD residential projects within the San Francisco Bay Area, elsewhere in California and the United States are included.

**TABLE A.4** Parking Demand Rates for TOD Sites

Location	Parking Demand Rate	Reference
<i>Bay Area</i>		
Fremont BART	1.42	Cervero 2009, Figure 2
<i>Alborada</i>	1.69	
<i>Archstone</i>	1.45	
<i>Mission Peaks</i>	1.35	
<i>Park Vista Apts.</i>	1.48	
<i>Presidio</i>	1.23	
<i>Sun Pointe Village</i>	1.47	
<i>Watermark Place</i>	1.27	
Pleasant Hill BART	0.97	
<i>Archstone Walnut Creek</i>	0.92	
<i>Archstone Walnut Creek Station</i>	1.09	
<i>Diablo Oaks</i>	0.74	
<i>Iron Horse Park</i>	0.80	
<i>Park Regency</i>	1.06	
<i>Villa Montanaro</i>	1.23	
San Leandro (Bayfair BART)	1.07	
Union City BART	1.12	
<i>Parkside</i>	1.13	
<i>Verandas</i>	1.11	
<b>All 16 Bay Area TOD sites</b>	<b>1.20</b>	
<i>California</i>		
San Diego		Katz, Table 6
<i>Bay Vista Methodist Heights</i>	0.60	
<i>Canyon Ridge</i>	1.20	
<i>Coronado Terrace</i>	1.25	
<i>Hawthorn 1 Apts.</i>	0.92	
<i>John Adams Manor</i>	0.68	
<i>Otay Villas</i>	1.06	
<i>Pinetree</i>	0.79	
<i>Pulitzer Place</i>	1.10	
<i>Vista Verde Apts.</i>	1.77	
<i>United States</i>		
Portland	1.07	Cervero 2009, Figure 2
<i>Center Pointe (Beaverton Creek Stn.)</i>	1.23	
<i>Elmonica Court (Elmonica Station)</i>	0.90	
<i>Cambridge Crossing (Elmonica Stn.)</i>	1.04	
<i>Wyndhaven (Willow Creek Stn.)</i>	0.90	
<i>Briarcreek Apts. (Quantama Stn.)</i>	1.12	

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<i>Quatama Crossing (Quantama Stn.)</i>	<i>1.32</i>
<i>Quatama Village (Quantama Stn.)</i>	<i>1.37</i>
<i>Gateway Terrace (Gateway Station)</i>	<i>0.53</i>
<i>Gateway Park (Gateway Station)</i>	<i>0.83</i>
<i>Rachel Anne (E. 148th Ave. Station)</i>	<i>0.88</i>
<i>Dalton Park (E. 148th Ave. Station)</i>	<i>1.17</i>
<i>Morgan Place (E. 162nd Ave. Stn.)</i>	<i>0.65</i>
<i>Sequoia Square (E. 162nd Ave. Stn.)</i>	<i>0.79</i>
<i>Gresham Central (Stn.)</i>	<i>1.00</i>

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**Sources:**

- Cervero, Robert, Arlie Adkins, and Cathleen Sullivan. 2009. *Are TOD residential projects 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.

The small number of TOD studies makes it difficult to draw inferences from Table A.4. Nevertheless, the table shows a range of observed parking demand rates for TOD residential projects, which vary from a low of 0.53 to a high of 1.77. Of particular interest are the parking demand rates for TOD residential projects in the Bay Area. According to Cervero, while these TOD residential projects provide approximately 1.6 parking spaces per dwelling unit (Cervero 2009, Table 1), actual observed peak parking showed only 1.2 occupied parking spaces per unit was needed (Cervero 2009, Figure 2). This represents a 24-percent difference between supply and demand. The number of parked vehicles per dwelling unit is remarkably close to those found for residential TOD survey sites in Santa Clara County (see Volume I – Technical Report, Table 6.1 Survey Data and Figure 6.1).

## **A.7 IMPACTS OF LOWER PARKING RATIOS**

In a study on the effects of TOD on housing, parking, and travel, four case studies are used to illustrate the effect varying parking ratios can have on buildings' density and cost and transit ridership (Arrington & Cervero 2008, 48). According to the study, decreasing parking ratios from 2.2 to 1.1, while holding other factors constant, results in:

- A 20 to 33 percent increase in the number of potential units in a TOD
- Lower total construction costs for parking even with more residential units
- Higher transit ridership

- Increased financial feasibility of TOD residential projects (e.g., from lower capital costs for parking and greater yields per unit)
- Improved urban form (e.g., garden apartments have a greater amount of “active street edges” for pedestrian use)

The main implication of this research indicates that “people living in TOD residential projects drive less often than their neighbors in conventional developments” (Arrington & Cervero 2008, 51).

Based on their findings, the researchers suggest that local governments should develop new, more realistic parking standards, impact fees, and mitigation for TOD residential projects.

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## **Appendix B. Local Parking Requirements for TOD Residential Properties in Santa Clara County**

### **B.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 appendix 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 appendix 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.<sup>1</sup>

### **B.2 ANALYSIS OF CURRENT PARKING REQUIREMENTS**

#### **B.2.1 Current Residential Parking Requirements**

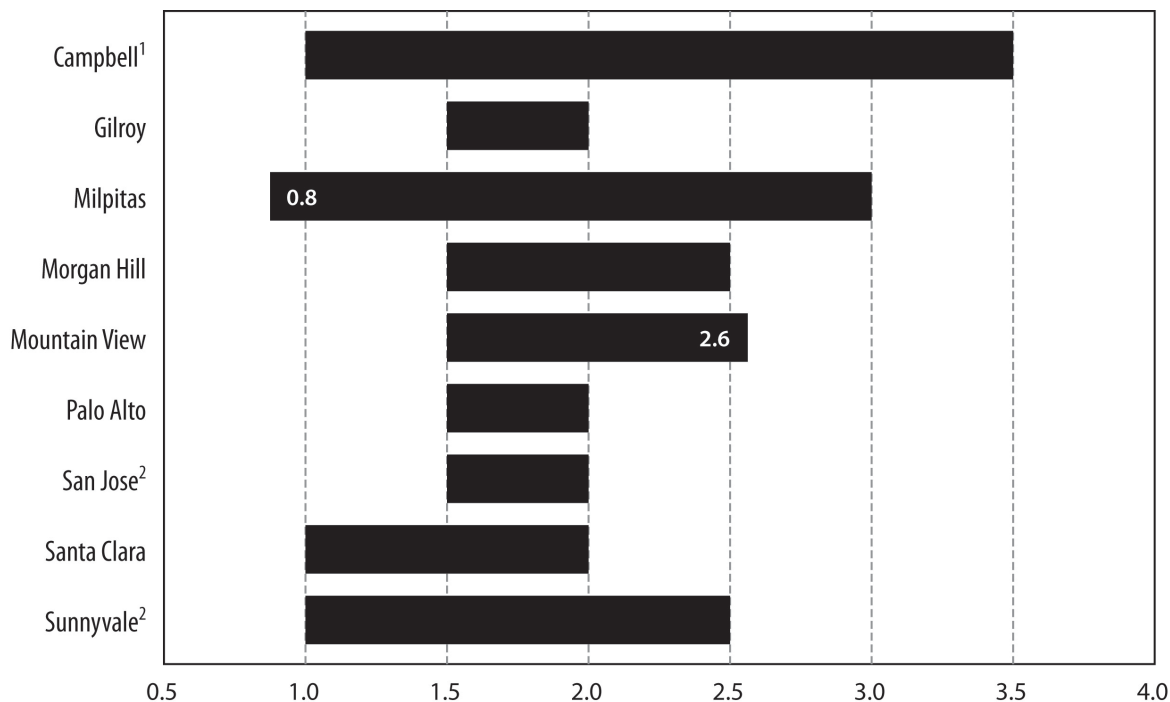
Existing parking requirements for nine Santa Clara County cities are summarized in this section. The range of parking spaces required by each city is outlined below. Ranges are given for all multiple-unit housing developments, from studio apartments (representing the lowest requirements) to high-density 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.

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<sup>1</sup> 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 B.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.<sup>2</sup>

**FIGURE B.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 Jose 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.

<sup>2</sup> Please note Campbell is currently investigating reducing this requirement to 2.5 spaces.

B.2.2 Guest Parking

Many of the nine Santa Clara County cities require additional parking spaces for guests. As shown in Table B.1, some cities simply add a specific amount of guest parking per unit, while others 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 B.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
Milpitas	Duplex	none
	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 Jose	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

**B.3 PARKING REQUIREMENT REDUCTION ALLOWANCES FOR TOD RESIDENTIAL PROJECTS**

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 detail in this appendix.

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 B.2 summarizes the various types of parking reductions available in each city.

**TABLE B.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; also, 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. Additional reductions possible subject to 30% maximum reduction.	20% reduction for properties with shared parking facilities. Additional reduction possible subject to 30% maximum reduction.
San Jose (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 Jose (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 Jose, and Palo Alto (references available in the bibliography).

### B.3.1 Campbell

Campbell is currently in the process of revising its parking requirements and plans to add a TOD land-use category (City of Campbell 2010). Projects that fall under this category will be required to provide 2 parking spaces per unit: 1.5 spaces for residents and 0.5 for guests.

The current parking standard for TOD residential projects in Campbell is the same standard for residential developments (2.5 spaces per unit), less a project-specific parking reduction for projects within one-quarter mile of light rail. In terms of current provisions, Campbell's current parking ordinance does allow an unspecified reduction in parking requirements for TOD residential projects that meet this one-quarter mile requirement.

The same applies to mixed-use developments; the parking required is the sum of total parking spaces on the combined requirement for all uses, less a project-specific reduction. City staff, however, is proposing the standard be set at 2 spaces per unit for TOD residential projects and a 50 percent decrease in guest parking for the residential component in mixed-use properties (City of Campbell 2010).

No TOD land-use categories for parking were found in the Downtown Development Plan or the Winchester Boulevard Master Plan even though both are near light rail stations.

### B.3.2 Gilroy

Gilroy does not have any TOD land-use categories in its general parking requirements table (Section 31.21). Additionally, there are no TOD land-use categories for parking in its Downtown Specific Plan. However, the Downtown Specific Plan has lower parking requirements than other parts of the city, possibly due to its location near the Gilroy Transit Center. (All three Gilroy TOD residential projects from the list of sites provided by VTA are situated within the Downtown Specific Plan area.) The differences in parking requirements for projects downtown as compared to those elsewhere in the city are shown in Table B.3.

In Gilroy's Downtown Specific Plan area, all parking requirements can be met via the payment of in-lieu fees. The Planning Division Manager also has the discretion to allow shared parking in districts within the Downtown Specific Plan area.

**TABLE B.3** Gilroy Parking Comparison

General	Downtown Specific Plan
1-2 bdrm unit: 1.5 min	Units < 800 sq. ft.: 1
3 bdrm unit: 2 min	Units > 800 sq. ft.: 1.5 min +
Guest: 1/every 4 units	Guest: > 800 sq. ft.: 1/every 6 units < 800 sq. ft.: 1/every 4 units

Source: City of Gilroy Off-Street Parking Requirements and Downtown Gilroy Specific Plan

### B.3.3 Milpitas

Milpitas features a Transit-Oriented Development Overlay District that applies to any zoning district on lands within 2,000 feet of a rail station. As documented in the Milpitas Zoning Ordinance (Section XI-10-12.06), total off-street parking required may be reduced up to 20 percent for residential developments in all TOD overlay districts. Guest parking is required for 15 percent of the required total parking. Milpitas has the largest amount of existing TOD language in regard to parking, even though it does not have any TOD land-use categories in its general parking requirements (Section XI-10-53.09, Table 53.09-1).

The Midtown Specific Plan and Milpitas Transit Area Specific Plan adopted the reduced parking requirements stated in the Transit-Oriented Development Overlay. Table B.4 details the differences between multi-family parking requirements outside the TOD overlay district and those within the district or one of the two Specific Plans.

Development projects in the Transit Area Specific Plan area have maximum off-street parking requirements which are equal to the minimum off-street parking requirements of the base zoning district. For locations within the Transit Area Specific Plan, preferential parking for carpools is one percent of the total amount of parking spaces required.

**TABLE B.4** Milpitas Non-TOD and TOD Parking Comparison

Multi-family unit type	Non-TOD (covered spaces)	TOD Overlay/Milpitas Transit Area SP (covered spaces)	Min. parking difference
Studio	1.0 min	0.8 min 1.0 max	-0.2
1 Bedroom	1.5 min	1.2 min 1.5 max	-0.3
2+ Bedrooms	2.0 min	1.6 min 2.0 max	-0.4
4 or more bedrooms	3.0 min per unit, plus 1.0 for each add'l bdrm	2.6 min per unit, plus 1 for each add'l bdrm	-0.4

Source: City of Milpitas Overlay Districts and Standards; Midtown Specific Plan; and Transit Area Specific Plan

#### B.3.4 Morgan Hill

The Community Development Director for the City of Morgan Hill has the authority to assign parking requirements to uses not shown in the general parking requirements table, and may also assign reduced parking requirements when shared parking exists. Additionally, the Planning Commission may allow in-lieu fees in exchange for reducing parking requirements in the Central Commercial Residential Zone (where TOD residential projects are permitted).

#### B.3.5 Mountain View

Mountain View has a variety of precise plan areas, some of which include altered parking requirements because of their close proximity to Caltrain and light rail stations. The San Antonio Station Precise Plan (Caltrain) states that the general parking requirements shall generally apply to projects in this area. The Whisman Station Precise Plan (VTA light rail) states that each unit shall have a minimum of two private parking spaces, one of which shall be covered.

Two Precise Plans govern development in within the vicinity of the Mountain View Transit Center: the Downtown Precise Plan and Evelyn Avenue Corridor Precise Plan . In the Downtown Precise Plan, studios and 1-bedroom dwelling units require 1.5 spaces per unit, while units with 2 bedrooms or more require 2 spaces per unit. Both multi-family unit types require 0.3 guest parking spaces per unit. The Evelyn Avenue Corridor Precise Plan, which covers areas immediately adjacent to the Transit Center, has the lowest parking requirements in the city. In the Mixed-Unit Residential portion of the Precise Plan area, only 1 space is required per studio and 1-bedroom unit, with 2 spaces required per 2-bedroom unit or larger.

Although no specific standard is set for TOD parking requirements, reductions are available. The Planning Director may grant a reduction for off-street parking requirements for TOD residential projects through a Conditional Use Permit. This occurs on a case-by-case basis so that each proposed location can be considered in the context of adjacent uses. To be given a parking reduction, the project applicant is required to provide evidence justifying a reduction and demonstrating it will not result in a parking deficiency (Section A36.37.050). Shared parking reductions are also possible but only approved upon certain conditions, including, but not limited to, the completion of a shared parking use analysis.

### B.3.6 Palo Alto

Palo Alto offers a 20 percent parking reduction for properties near transit, a 20 percent reduction for properties with shared parking, and a 20 percent reduction for properties with Transportation Demand Management (TDM) programs or parking alternatives. Although this could potentially add up to a possible reduction of 60 percent, the total maximum allowable reduction is only 30 percent (Section 18.52.050).

Similar to Milpitas, Palo Alto has a TOD overlay district. Called the California Avenue Pedestrian and Transit Oriented Combining District, this overlay applies to properties within walking distance of the California Avenue Caltrain station. General parking requirements apply to multi-family residential properties in this zone, but are allowed reductions in required parking (20-30%) subject to a TDM program and the Community Development Director's approval.

Project applicants interested in reduced parking requirements must indicate parking and traffic demand measures that would be implemented to reduce the need for parking and trip generation (Section 18.34.040d). Measures may include, but are not limited to:

- Limiting “assigned” parking to one space per residential unit
- Providing for Caltrain and/or other transit passes
- Other measures to encourage transit use or reduce parking needs

### B.3.7 San José

Throughout much of San José, the City allows parking reductions of up to 10 percent with a development permit for residential projects located within 2,000 feet of a proposed or existing rail station. This reduction is also available for “neighborhood business districts” designated in the General Plan (San José Zoning Ordinance § 20.90.220).

In its downtown, the City also grants up to a 15 percent reduction<sup>3</sup> as part of the issuance of a development permit for projects with TDM programs. Examples of acceptable TDM programs include the VTA Eco Pass, parking cash-out, alternate work schedules, ride sharing, transit support, carpool/vanpools, and shared parking. If a project fails to maintain a TDM program, and for areas

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<sup>3</sup> Note: the parking requirements for residential developments in downtown San José are much lower than requirements for developments elsewhere in the city. For a Residential Multiple Dwelling project, the requirements downtown are only 1 space per unit, while 1.5 to 2.6 spaces per unit are required elsewhere.



within Downtown San José that cannot meet parking requirements, the project applicant may be required to pay an in-lieu fee (San José Zoning Ordinance § 20.70.330).

For the Midtown Specific Plan and the Tamien Station Area Specific Plan, no specific parking requirements are contained within these planning documents even though their corresponding areas have TOD residential projects. However, the 10 percent reduction in off-street parking requirements for residential projects outside of downtown San José and within 2,000 feet of a Light Rail station would also apply to these to specific plan areas.

### B.3.8 Santa Clara

According to section 18.22.040 of Santa Clara's Zoning Ordinance, reduced parking requirements can be accommodated for mixed-use development and/or projects located near transit because increased transit accessibility and mixed land-uses reduce vehicle trips and vehicle demand. Parking requirements can also be reduce for developments accompanied by a TDM program.

Parking shared among uses is encouraged where efficiency in shared use can be demonstrated. Modifications or reductions to the automobile parking space requirements are possible through a variance and cannot exceed 25 percent.

Santa Clara has a Transit-Oriented Mixed-Use Combining Zoning District, which allows for parking reductions granted by the zoning administrator for mixed-use developments located near transit with a TDM program. Residential components of mixed use developments can have a reduction in required parking by 0.5 to 1 space per unit compared to multi-family residential units outside of the Transit-Oriented Mixed-Use Combining Zoning District.

### B.3.9 Sunnyvale

Sunnyvale has a Mixed-Use Combining Zoning District, which permits parking requirement reductions for mixed-use projects. Traditionally, parking ratios for residential mixed-use projects and TOD residential projects are set by accepted guidelines from the ITE or ULI. Any parking requirement adjustments are determined through project review and approval from the Community Development Director (Section 19.46.050). The zoning ordinance does not offer any additional language regarding parking reductions if close to transit.

The Downtown Specific Plan addresses parking regulations for the area around the Caltrain station. It makes no mention of specific parking requirements for TOD residential projects. However, the

requirements for multi-family housing are generally the same as the standard parking requirements outside the specific plan area.

### B.3.10 Parking Reduction Process

As described above, many of the nine cities examined in this report have provisions for a reduction in the amount of parking required for residential developments. Table B.5 shows the type of process required for developments to be granted a parking reduction allowance.

**TABLE B.5** 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).

## B.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.

## Appendix C. Methodology for Parking Demand User Survey for TOD Residential Properties

Prior to the Research Team selecting an on-the-ground survey technique to determine parking utilization, the Research Team also developed a work plan for estimating parking demand using stated-preference user surveys. This appendix provides such a methodology. While a significant amount of time and resources are required to estimate residential parking demand using stated-preference user surveys, the methodology described in this section is provided for VTA or other interested parties who may wish to estimate the total parking demand at TOD sites, particularly TOD residential properties that exhibit high parking utilization.

In the event that the results of an on-the-ground survey indicate a parking utilization of 85 percent or more, the parking facility may be operating at full capacity. However, parking *utilization* is not necessarily the same as parking *demand*.<sup>4</sup> To determine actual residential parking demand for that facility, researchers must be able to determine how many cars are owned by residents.

There are two ways to obtain this information. The first involves canvassing the management of the TOD properties in question, as they have records for vehicles registered to their tenants. This method, however, has several drawbacks, as managers may consider revealing such information as a breach of their client's privacy and their information may not be kept up-to-date.

The second method involves a survey of residents that asks for the total number of cars owned per household along with other key variables. Since residents themselves are the most direct source of information on their parking behaviors, the second method is a better approach than the first.

### C.1 USER SURVEY DEVELOPMENT METHODOLOGY

#### C.1.1 Relationships Among Variables

The research project conducted by SJSU students investigates parking utilization at TOD residential properties to determine whether or not parking has been “over-supplied.” With a user survey, additional variables and their relationships can also be investigated. Listed below are relationships between key variables that pertain directly to understanding parking utilization, and demand:

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<sup>4</sup> Parking utilization or occupancy is an indicator of how the existing supply is being used. Parking demand, on the other hand, indicates how many patrons would like to park at a given location and time if there were sufficient supply (Carter & Burgess 2004, 29). If parking spaces are insufficiently available at a residential development, drivers will likely park on nearby streets or possibly at a significant distance from their residence. In other words, if a dedicated parking lot is perceived as full by its users, they will likely park in adjacent public parking areas.

1. The relationship between residents' incomes and the number of cars that they own.
2. The relationship between the size and age composition of each household and the number of cars that they own.
3. The relationship between transit accessibility during peak and non-peak hours and the share of trips for which residents use transit.
4. The relationship between the local built environment and land-use mix and the share of trips for which residents use transit, walk, or ride bicycles.

In order to investigate these relationships, the project's survey instrument would need to collect certain data from both TOD residents and residents of more traditional developments. These key data are presented below along with the relationship(s) above to which they are relevant:

- Number of cars the household possesses (1,2)
- Number of parking permits household uses (1,2)
- Household income (1)
- Household's residential arrangement (i.e., rent vs. own property) (1)
- Household size (2)
- Number of household residents under age 18 (2)
- Number of household residents who work outside the home (2)
- Number of household residents above age 65 (2)
- Frequency with which household members use public transportation (3,4)
- Frequency with which household members use non-motorized modes (3,4)

Certain data pertaining to the residential properties themselves would also need to be collected. The most opportune method of gathering this data listed below would be from property management rather than from residents.

- Number of parking spaces reserved for residents
- Number of parking permits allocated to each unit
- Number of dwelling units, both total and occupied. This count should include an inventory of dwelling unit size (e.g. number of studio units, number of two-bedroom units, et cetera.)

### C.1.2 Additional Variables

Conducting a user survey of TOD residents would afford researchers the opportunity to investigate further relationships between household demographics, car ownership, and modal split. As such, this survey could include the collection of further data, including the following:

1. **TOD Self-selection.** Examine whether the household chose to live in a TOD for transit proximity. (This could relate to modal split.)
2. **Journey to work.** Examine length, frequency, and location of work trips. (This relates to modal split.)
3. **Employer subsidy.** Examine what transportation subsidies a household receives from employers (i.e., free parking, transit passes, commuter checks). (This relates to modal split.)
4. **Profession.** Examine the occupational background of each working household member. (This relates to income, number of working household members, and modal split.)

### C.1.3 Deliverables

A draft survey instrument would be developed for review by the VTA. Upon incorporation of feedback and approval from the VTA, the Research Team would prepare the final survey instrument to be used when surveying residents of TOD residential projects throughout Santa Clara County.

## C.2 IRB APPROVAL

Before work can begin, approval from the University's Institutional Review Board (IRB) is necessary to conduct a user survey, as the survey would not be considered within one of the six categories exempt from review. Preparation of the IRB application "Request to Use Human Subjects in Research" is required to obtain IRB approval. This application includes:

- A protocol narrative
- A copy of the final survey instrument
- A sample consent form (on SJSU or VTA letterhead)
- Foreign-language translations of the consent form and survey instrument (e.g., Spanish and Vietnamese).
- A written agreement from the participating institution (i.e., the VTA)

### C.2.1 Deliverables

An application would be submitted to the IRB for review and approval prior to beginning the survey. The approval period for the IRB would be expected to take two to four weeks.

## **C.3 SITE SELECTION**

Prior to conducting a user survey, a list of appropriate sites to conduct the survey would be generated. Using VTA's list of priority TOD residential projects, the Research Team would identify eligible TOD residential sites through Internet- and GIS-based research. A list of priority sites has been developed from VTA staff's knowledge of the VTA light rail and Caltrain systems. The list includes stations that have some residential TOD residential projects nearby that generally meet the project criteria, such as having discrete or self-contained parking supply dedicated for residents living in the development.

Once the set of eligible sites has been generated, the Research Team would determine the appropriate authority that would give permission to conduct user surveys on a property (e.g., building manager, home owners association, et cetera.). They would then contact that authority for the purposes of gaining permission to conduct the survey and to ascertain the necessary background information for the property as detailed in Section C.1. Finally, they would obtain a written agreement from amenable authorities for each property that the Research Team would conduct a survey in. The written agreement would specify both the timeframe within which the Research Team would be allowed to conduct the survey and what type of promotion the Research Team would be allowed to use to advertise the existence of the survey prior to implementation.

As mentioned above, the Research Team would use some form of promotion to communicate the existence of the user survey to the TOD property residents. Depending on the type of user survey

conducted, this promotion could include flyers hung in common areas of each property, direct mail, or e-mails from either building management or the Research Team. Promotion would be selected based upon what would best complement the survey form being conducted (see Section C.4) and what would be agreed to by the appropriate authority of each property.

### C.3.1 Deliverables

A complete list of properties considered eligible TOD residential projects for the purposes of this project would be generated, including information on who would be determined to be the appropriate authority, when and how many times they were contacted, and which properties the Research Team secured permission to conduct the survey from. This list would be delivered to the VTA along with copies of all written agreements between the Research Team and the eligible properties.

## C.4 SURVEY IMPLEMENTATION / DATA COLLECTION

The three commonplace strategies for collecting user-survey data are:

1. **In-person survey.** Interviewers canvass a selected property in person, knocking on each resident's door to request their participation in a survey. Upon approval by a resident, the interviewer would ask questions from the final survey instrument. Given the time sensitivity of this strategy, the instrument should aim to be completed within 10-15 minutes.
  - *Key advantages:* This method minimizes the chance of selection bias and user error.
  - *Key constraints:* This method is time and labor intensive as it requires several interviewers to travel to each selected property at different times of a day. Additionally, funding for such an endeavor may not be available. As such, this strategy would only be implemented after other strategies have been exhausted and additional survey responses were necessary for a valid result.
2. **Survey by mail.** All residents of selected properties are mailed a survey instrument along with a stamped, pre-labeled return envelope. Responses would then need to be mailed back to a predetermined SJSU mailbox or to a dedicated PO Box. To encourage a high response rate, respondents would be entered into a raffle drawing. Follow-up letters would be mailed out after a set interval to those who do not initially respond.

- *Key advantages:* This method requires significantly less labor than in person surveys along with minimizing the effect of the times of day chosen for canvassing. Due to less labor, the final cost of implementation may be lower as well.
  - *Key constraints:* This method requires a longer implementation period than in person surveys, as surveys would take 2-3 days to reach residents, several days must be allotted for residents to fill out the instrument, and then the return of the surveys would take another 2-3 days. Additionally, user error may be more significant in this method, as respondents may misunderstand the instrument or forget to mail it back.
3. **Online Survey.** All residents of selected properties are e-mailed an invitation to take the user survey via an online surveying tool. Respondent e-mails would need to be gathered, which could be done by empowering site managers to send out the e-mail invitation, receiving a list of resident e-mails from site managers, or by requiring users to supply their e-mail addresses. Similar to option 2, a raffle drawing would be used to encourage wider response. Follow-up e-mails would be sent out to those who do not initially respond.
- *Key Advantages:* Online survey programs typically compile collected data automatically, resulting in a minimal labor requirement. Additionally, an online survey would require the least amount of time, as neither surveyor time nor mailing time are required.
  - *Key Disadvantages:* E-mail addresses are often considered private information by site managers, residents, or both, and as such could be hard to obtain. Selection bias may occur if e-mail addresses can only be obtained by residents volunteering the information. Additional bias could be introduced due to some residents not having Internet access or e-mail, or not understanding the online survey program.

#### C.4.1 Deliverables

Regardless of the method of data collection, upon receiving surveys from respondents, the results would be compiled into a single data table. This table, along with the survey instrument, would be made available to the VTA in their preferred form.



## C.5 DATA ANALYSIS

Once respondent data has been collected and compiled, it would be analyzed in order to describe the parking demand at TOD properties, with particular emphasis given to determining parking demand based on property size, dwelling unit size, and rental units vs. owner-occupied units. Analysis would also be undertaken to determine the difference, if any, between parking demand at TOD and traditional properties in Santa Clara County. The following analytical approaches would be undertaken:

1. **Parking demand.** Prepare descriptive statistics of the key factors important to evaluating parking demand.
2. **Correlation.** Use the number of dwelling units (or rooms in a dwelling unit) to investigate the relationship to parking demand and other variables. In particular, this information could also be used to measure the correlation between housing size and transit share and/or auto ownership.
3. **Regression analysis.** Regression analysis could also be used to investigate the effect that different demographic and environmental characteristics have on parking demand at TOD residential projects. This could be done with each variable in isolation, in combination, or by studying the comparative effects of each. Analysis techniques could include best-fit regression lines, logistic modeling, scatterplots, or sensitivity analysis.

### C.5.1 Deliverables

Results of this analysis would be compiled into a draft report for review by VTA staff. The Research Team would then create a final report incorporating VTA feedback and comments.

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## Appendix D. Master TOD List

VTA's priority list of transit and TOD residential projects is provided below.

Station Name	Station Type	TOD Residential Properties Nearby (Notes)
Palo Alto Transit Center	Caltrain	800 High, Oak Court, The Palo Alto
California Avenue	Caltrain	(Uncertain whether any nearby developments have parking that can be field observed)
San Antonio	Caltrain	The Crossings (uncertain whether parking can be field observed)
Downtown Mountain View	LRT/Caltrain	Avalon Creekside (other developments have parking that cannot be field observed or pose observation problems)
Santa Clara Transit Center	Caltrain	Domicilio
Whisman	LRT	Whisman Station (uncertain whether parking can be field observed)
Fair Oaks	LRT	Kenginston Place (other developments have parking that cannot be field observed)
Tasman	LRT	North Park
River Oaks	LRT	North Park, Riverwood, Mansion Grove
Great Mall/Main	LRT	Several developments (need to check which have parking that can be field observed)
Gish	LRT	First & Gish
Japantown/Ayer	LRT	Vendome Place, Ryland Mews, others
St. James	LRT	City Heights, Axis
Santa Clara	LRT	The 88, 101 San Fernando, others
Paseo de San Antonio	LRT	Paseo Plaza, 360 Residences (may not be occupied yet)
San Jose Diridon	LRT/Caltrain	Avalon at Cahill, Plant 51, Lofts on The Alameda
Tamien	LRT/Caltrain	Sykleline at Tamien Station
Curtner	LRT	Curtner Gardens
Ohlone/Chynoweth	LRT	Ohlone-Chynoweth Commions
Cottle	LRT	Santa Palmia, Village of Marineo of Palm Valley (Check if developments nearby are close enough to be considered TOD residential projects)
Almaden	LRT	Almaden Lake Village
Race	LRT	Monte Vista - Cannery Square & Madison Place
Fruitdale	LRT	Villa Fontanas, Fruitdale Station
Bascom	LRT	(Check if developments nearby are close enough to be considered TOD residential projects)
Downtown Campbell	LRT	Several developments (need to check which have parking that can be field observed)

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TOD Priority Station Master List

TOD Name	Nearby Station < 1/2 mile	City	Date (first occupied)	Age > 1 year	Units	Occupied	Affordable	No. of Parking Spaces	Peak Utilization				Notes
									Car		Motorcycle		
									LP	IP	LP	IP	
Avalon at Creekside	Mountain View LRT/Caltrain	Mountain View	1963	Yes	294	98%	100%	438 total (294 resident and 144 guest)	365	1	1	-	May be a TAD
Domicilio	Santa Clara Caltrain	Santa Clara	2007	Yes	306	96%	10%	568 total (387 resident, 15 handicap, 166 guest)	439	-	-	-	under Prometheus management, VTA might be able to get permission
Whisman Station	Whisman LRT	Mountain View	N/A	Yes	503								Whisman station consists of Town homes with private parking garages. Unable to count parked cars.
Mansion Grove	River Oaks and Tasman LRT	Santa Clara	1998	Yes	924	90%	~10%	1,654 (surface and underground)	1,282	2	13	16	huge site w/ surface parking; three driveway access
North Park	Tasman and River Oaks LRT	San Jose	2001	Yes	2,760	95%	15%	4,605 (underground). Parking along the park is open to residents, visitors, or public	3,409	6	4	49	small retail component, on-street & underground parking; 6 different properties and 7 buildings each with their own underground parking. 2,760 apt units with at least one space for each unit.
Kensington Place	Fair Oaks LRT	Sunnyvale	1992	Yes	186	98%	?	132 surface and 185 underground	262	-	5	-	surface parking around apartments; \$50 deposit for extra remote - garage is not assigned but can only be accessed by remote. One remote per unit
Vendome Place	Japantown/Ayer LRT	San Jose		Yes	106								May have live/work component
Ryland Mews	Japantown/Ayer and St. James	San Jose		Yes	131								
The 88	Santa Clara LRT	San Jose		Yes	197	30%							Ground floor Safeway, separate underground secured parking, relatively new
101 San Fernando	Santa Clara LRT	San Jose		Yes	323								Underground parking, ground floor retail & commercial
City Heights	St. James LRT	San Jose	2007	Yes	124	75%	0%	163	99	-	-	1	underground parking
Axis San Jose	St. James LRT	San Jose	2008	Yes	329	27%	0%						underground secured parking, relatively new
Paseo Plaza	Paseo de San Antonio LRT	San Jose	1994	Yes	210	95%	0%	373 (underground)	271	-	-	-	Paseo Plaza & Paseo Villa are on the same site, with Paseo Villas having
Paseo Villas	Paseo de San Antonio LRT	San Jose	1999	Yes	104	96%	0%	240 (gated garage structure)	148	-	1	-	a ground floor retail component. Does not have shared parking.
The Avalon at Cahill Park	San Jose Diridon LRT/Caltrain	San Jose	2008	Yes	218	> 85%	0%	~230					retail component along The Alameda, residential in rear all the way to park, podium parking.
Skyline at Tamien Station	Tamien LRT/Caltrain	San Jose	2009	Yes	115	98%	21%	186 car garage (including 4 handicap, 38 motorcycle, 15 guest)	132	-	4	-	podium or underground parking
Curtner Studios	Curtner LRT	San Jose	? < 2008	Yes	178	99%	100%						SRO only, looks like podium parking
Ohlone Chynoweth Commons	Ohlone-Chynoweth LRT	San Jose	2000	Yes	176	99%	100%	338	241	-	-	-	podium parking, commercial/retail component, and park & ride parking adjacent to site. 18 units have enclosed garage. These have been subtracted from the total unit count.
Palm Valley*	Cottle LRT	San Jose		Yes	1,700								Seems to be more like a TAD- Village of Marineo and Santa Palmia closest to station
Almaden Lake Village	Almaden LRT	San Jose	2000	Yes	250	97%	20%	387 total (375 underground, 12 street)	287	-	-	5	underground parking
Monte Vista**	Race LRT	San Jose	2007	Yes	383	100%	20%	523 total (including 5 handicap, 68 guest)	320	-	11	-	Right on the 1/2 mile radius border. No passcodes needed for the daytime survey.
Villa Fontanas	Fruitdale LRT	San Jose		Yes	91	60%							Fairly new- 2008
Fruitdale Station	Fruitdale LRT	San Jose		Yes	500								Fairly new- 2008

**Notes**

Sites that were surveyed are highlighted in blue. The parking utilization is provided for legally (LP) and illegally (IP) parking cars and motorcycles.

This table was prepared by the SLI Team; last updated on March 21, 2010.

\* Individual properties include Santa Palmia, Village of Marineo, Palma Sorrento, and Villa Veneto.

\*\* Individual properties include Cannery Square and Madison Place.

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## Appendix E. TOD Preliminary Contact Checklist

### STEPS

1. The Project Team should visit the websites of the selected eligible TOD sites (from Attachment 1B) to obtain background information on the sites.
2. The Project Team should call the appropriate property authority (i.e., property manager, property owner, or home owners association), explain the purpose of the survey project, and get permission for the survey.
3. Phone calls should be made during business hours.
4. The Project Team should set up an appointment with the property manager, if necessary.

**TOD Name:** \_\_\_\_\_

**TOD Address:** \_\_\_\_\_

**Date/Time:** \_\_\_\_\_

**Contact Person:** \_\_\_\_\_

### Part I—Request for Participation and Permission Questions

Q1. Would you give the SJSU Project Team permission to conduct a parking supply and utilization survey of [SITE ADDRESS OR NAME OF DEVELOPMENT]?	
Q2. Name of authority granting permission:	
Q3. Position authorizing her/him to grant permission:	

### Part II—Threshold Questions

The following questions determine whether your selected TOD is a good candidate for the survey.

Q4. Are your parking facilities observable via drive-by or walk-through by our Project Team? For example, underground, surface, or secure parking lots?	
--	--

Q5. Are there any keys or passcodes we'll need to access the parking facilities? How do we get them?	
Q6. How many parking spaces are there in your property that is dedicated or reserved for use by residents and their guests?	
Q7. Is the parking free or included with the residential units? [Free or included parking is required.]	
Q8. How old is your property? OR, Was the date of first occupancy by a resident less than a year ago? [More than a year old is required.]	
Q9. Is your parking facility used only by your residents/occupants and/or their guests? [Exclusively for residential use is required. No shared parking.]	
Q10. How many residential units are in the property? [More than 80 units are required.]	
Q11. What is the resident occupancy rate of your property? OR, What is your current vacancy rate? OR, Ask how many units are currently occupied and then calculate the occupancy rate using the total number of residential units and the number of units being occupied. [Over 85 percent occupancy is required.]	

**Part III—Additional Questions**

Q12. Is the property owner-occupied or rental property? If mixed, what is the breakdown?	
Q13. Are the prices of the residential units determined by the market? OR, Are there units made affordable through government or nonprofit regulation or subsidies?	
Q14. If there are affordable units, how many/what percentage is affordable?	



<p>Q15. Is your property exclusively residential in character? If not exclusively residential, what other uses are there?</p>	
---	--

**Part IV—Pre-Survey Visit**

<p>Q16. Can SJSU Project Team visit your property site during the daytime, before conducting the nighttime survey?</p>	
--	--

If yes, ask the following questions.

<p>Q17. When would you give us the keys/passcodes for the parking facilities?</p> <p>When might be a good time for the SJSU Project Team to meet you, if needed?</p>	
--	--

**Part V—Anticipated Questions from the Property Manager**

If the property manager asks you why you have to visit the site during the late night or very early morning hours, provide the following sample responses.

Responses:

- The hours between 12 midnight and 4:00 AM are considered to be peak parking demand, since most residents are likely to be home sleeping.
- The SJSU Project Team will be simply counting the number of parked vehicles and the number of parking spaces in the property site.
- The SJSU Project Team will not disturb residents, will not make noise, and will not block traffic or parking on-site.

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**Appendix F. TOD Property Checklist**

TOD Name	Date Property Opened	Residential or mixed-use	Shared parking— Y/N (If yes, comment)	Number of residential units	# of units affordable	% of occupied units	# of parking spaces	Location of transit stop(s) (within ½ mile)	Proximity to the nearest CBD	Owner or Rental
Avalon at Creekside										
Domicilio										
Whisman Station										
Mansion Grove										
North Park										
Kensington Place										
Vendome Place										
Ryland Mews										
The 88										
101 San Fernando										
City Heights										
Axis San Jose										
Paseo Plaza										
Paseo Villas										
The Avalon at Cahill Park										
Skyline at Tamien Station										
Curtner Studios										
Ohlone Cynoweth Commons										
Palm Valley (Santa Palmia, Village of Marineo, Palma Sorrento, Villa Veneto)										
Almaden Lake Village										
Monte Vista (Cannery Square and Madison Place)										
Villa Fontanas										
Fruitdale Station										

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## **Appendix G. Permission to Conduct a Parking Supply and Utilization Survey**

The following page shows the letter sent to potential survey site property managers to gain permission to access their site in the evening time (11 p.m. to 5 a.m.).



## **Appendix H. Pre-Survey On-Site Reconnaissance Checklist**

After determining the eligible TOD residential properties for the parking survey, making initial contact over the phone and securing verbal permission to conduct the initial daytime reconnaissance, the Project Team will go to the selected sites during the day to do a pre-survey visit. In parallel, the Project Team will continue to obtain written permission (see Appendix I) to conduct the nighttime peak parking survey at the selected sites.

The main purposes of this pre-survey visit include:

- To familiarize Survey Field Crew leader (SLI Team member) with the property site
- To bring the base site map prepared by the MDA Team to the field and take notes needed for the nighttime survey
- To confirm the TOD property manager's responses to some of the questions asked during the telephone contact/interview

### **Steps for Pre-Survey Visit**

1. Before going to the survey site, review the information collected from the online research and phone contact/interview completed in Task 2.
2. The MDA Team will prepare an aerial map of selected TOD properties. This map is needed to make some notes of several important locations.
3. Following verbal permission from the property manager (or other property authority) and at the date/time agreed upon with the property manager, go to the selected TOD property site to do a pre-survey visit. Don't forget to bring camera, SJSU ID & California ID, different color markers or pens, notebook, and maps.
4. Meet with the property manager, if he or she has agreed to meet with you, to provide you with the access code, access key, sitemap, and signed permission letter (Attachment 2D) to do the survey.

5. Familiarize yourself with the property site area and take pictures, particularly of things that may impact the conduct of the nighttime survey. Propose a route and make notes needed for nighttime survey. See checklist below.
  
6. Compile the data that you get from pre-survey visit for use in the nighttime survey.



**TOD RESIDENTIAL PROPERTY INFORMATION**

TOD Property Name: \_\_\_\_\_

TOD Property Address: \_\_\_\_\_

LRT/CALTRAIN Rail Station: \_\_\_\_\_

Property Manager (or Authority) Name/ Contact Information: \_\_\_\_\_

Security Guard Name/ Contact information: \_\_\_\_\_

SLI Team Member (assigned to pre-survey visit): \_\_\_\_\_

Date/Time of Pre-Survey Visit: \_\_\_\_\_

Type of Parking:

- \_\_\_ Surface lot
- \_\_\_ Underground
- \_\_\_ Multi-level garage structure
- \_\_\_ Other (please describe) \_\_\_\_\_

Type of Parking Access on TOD Property Site:

- \_\_\_ **GATED** (parking sites protected by gate, walls or other security measures)
- \_\_\_ **GARAGES** (parking sites are located in indoor area intended for parking area specifically)
- \_\_\_ **OPEN PARKING WITH SPECIFIC SIGNAGE SAYING THAT THIS PARKING LOT IS DEDICATED TO THE SURVEYED TOD** (parking sites are located in an open area)
- \_\_\_ **OTHER** (please specify) \_\_\_\_\_

Access Code: \_\_\_\_\_

Instruction for the Access Code: \_\_\_\_\_

Identify specific challenges to property site access and other related considerations:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Total residential units: \_\_\_\_\_

Total parking supply dedicated for residents (total parking supply): \_\_\_\_\_

If the property manager couldn't give you the specific number of the total parking supply, **you need to count** the total parking supply.

Is there ongoing construction on-site or on immediately adjacent streets?    Y

### PREPARING NIGHTTIME SURVEY ROUTES

After familiarizing yourself with the general area of property site and driving around the actual property site, do the following:

- Propose a route** to conduct the parking utilization survey efficiently and accurately with minimal impact on residents
- Please make notes, mark your map,** and make sure that you know the following important locations:
  - Where is best the place for Survey Field Crew to park when doing the survey at night?
  - Where is the parking facility located on the TOD property site?
  - Where is the leasing/manager's office located?

### OUTCOME/THINGS ACQUIRED FROM PRE-SURVEY VISIT

- Pre-Survey Visit Checklist that you filled in
- Proposed route for nighttime survey
- Map and notes on several important locations
- Access code/ access key
- Signed permission letter
- TOD property site pictures

## Appendix I. Peak Parking Utilization Field Survey Instructions

### Field Survey Instructions

The purpose of the field survey instructions is to inform Survey Field Crews of the appropriate procedure for surveying on-site and completing the survey form. To ensure all surveys are conducted consistently, please review the following survey procedures well in advance of your assigned survey visit.

#### A. CONDUCT

- Survey Field Crews should wear bright clothing, have proper identification on their person (California or SJSU ID), and have the signed permission letter available to explain their presence on site.
- Survey Field Crews should avoid talking to tenants on-site unless questioned by proper authorities (security guard, property management, etc.)
- Survey Field Crews should conduct surveys as efficiently and quietly as possible to minimize noise and intrusion.
- Survey Field Crews should be mindful of the property they are visiting and should not leave trash or any of your survey items behind.

#### B. ITEMS TO BRING

Survey Field Crew members should coordinate with each other to ensure the following items are on-hand prior to arriving at the survey location:

- Survey Instructions
- Site Map
- Survey Form/Clipboard
- Signed Permission Letter
- Access or Gate Code
- California & SJSU ID
- Contact Info (team members and property contact)
- Pencil
- Phone
- Flashlight (use only if absolutely necessary – don't disturb tenants)
- Watch (note time of survey)

#### C. PRIOR TO CONDUCTING SURVEY

The quality of the data collected is highly dependent on the organization of survey activities on the night of the survey and the understanding of Survey Field Crews regarding survey procedures. Survey Field Crews should review and familiarize themselves with the information gathered from the preliminary site visit. Survey Field Crews should consult with their Team Leader prior to the site visit, if there are questions regarding the pre-survey information.

Review the following information from the pre-survey visit:

- Review the map for parking location and site access
- Check to make sure the access code (if gated) and property contact information has been provided
- Review pictures (if taken during pre-survey visit) or diagram of the parking lot
- Review additional notes from pre-survey visit regarding challenging site access and other special considerations

If driving through the parking lot, Survey Field Crews should assign a driver and a surveyor to conduct the counts. If walking through the parking lot, assign each person a section to count based on the survey maps prepared during the pre-survey visit.

#### **D. ARRIVING ON-SITE**

Use the information gathered from the pre-survey visit when faced with possible logistical challenges:

- Decide if the Survey Field Crew will drive or walk the site?
- Where is the parking lot? (refer to site map)
  - IF gated, how do we access the parking lot? (refer to site map and pre-survey notes)
  - IF meeting the property manager/security guard for entry into the property, call prior to arriving on-site to ensure the person is there. Call again after arriving on-site to meet up.
  - IF parking is gated or in a garage, refer to pre-survey notes for any access codes
- Access Problems:
  - IF access code doesn't work, first check with the Team Leader who conducted the pre-survey visit. Then, check if the pre-survey notes have an on-call site manager to contact
  - IF no on-site manager is available and Survey Field Crew still can't access the site, go home and note your inability to enter the site. Discuss with team for next steps.
- Management/Security Problems:
  - IF approached by security or management who is not aware of the survey, introduce yourself and briefly discuss the survey assignment. Present signed permission letter to confirm your right to be on the premises
  - IF asked to leave, discontinue survey and leave property immediately. Take note of the situation and speak to the property manager the following day.
  - IF approached by a tenant, briefly state your purpose and continue surveying. If possible, do not speak to tenants!
- Survey Field Crew Issues:
  - IF team member(s) do not show up at the survey location, call to locate the missing person
  - IF team member(s) is/are late, the rest of the team should begin surveying at the scheduled time
  - IF only one person shows up, conduct survey as planned and make note of the other team members' absence. Discuss with team for next steps.

#### **E. COLLECTING PARKING DATA**

Parking **utilization** shall be documented as follows:

- Record the number of vehicles parked legally in the parking facility (record in Section 3 on Survey Form). Motorcycles are counted as vehicles.

- Record the number of “unofficial” parked cars – cars that parked in unmarked spaces or restricted spaces i.e. red curbs, hatched areas, double-parked, etc.
- Tally the total number of vehicles parked including both legally parked and “unofficially” parked cars. Record sum in Section 3
- Include any observations of particular interest under Section 3 in Notes.

#### **F. QUALITY CONTROL**

It is important for Survey Field Crews to conduct quality control measures to ensure validity of the data collected. Survey Field Crews should do the following checks on team members before and after surveying:

##### Before

- Spot field checks to verify Survey Field Crews are at the correct location.
- Survey Field Crews are putting the correct information on the correct survey form.

##### After

- Review data within a day or two of data collection for any discrepancies.
- **IF** discrepancies are found, contact the field crew member responsible for completing the survey form and verify data.

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## **Appendix J. VTA On-Site Parking Survey Form**

The following page shows the form used to conduct the parking survey.

# VTA ON-SITE PARKING SURVEY

## Section 1. Survey Information

Fill in your name and contact information as the surveyor who completed this form.

Team Leader: \_\_\_\_\_

Date: April 6 (Tues) 7 (Wed) 8 (Thurs)

Survey Field Crew: \_\_\_\_\_

Start time: \_\_\_\_\_ AM  
PM

Lead Contact #: \_\_\_\_\_

End time: \_\_\_\_\_ AM  
PM

## Section 2. TOD Location

Use info collected from Pre-Survey Visit to complete Section 2 prior to the night survey. Make sure the correct information corresponds to the correct TOD site. Refer to site map for exact location of parking lot and entry access.

TOD Name: \_\_\_\_\_

Nearest LRT Station: \_\_\_\_\_

TOD Address: \_\_\_\_\_

Parking Type: 1. Surface Lot 2. Underground Access: 1. Gated \_\_\_\_\_ (access code)  
(circle one)

3. Multi-level garage 4. Other 2. Open

# Parking Spaces \_\_\_\_\_ 3. Garage \_\_\_\_\_ (access code)  
(info from property website or property manager)

4. Guard \_\_\_\_\_ (Name)

Notes from pre-survey visit:

\_\_\_\_\_  
(Phone)

## Section 3. Parking Survey

Complete Section 3 by recording the number of parked cars. Complete parking supply prior to nighttime survey.

Note: Motorcycles are counted separately

# Cars Parked Legally: \_\_\_\_\_

# Motorcycles Parked Legally: \_\_\_\_\_

# "Unofficial" Parked Cars: \_\_\_\_\_  
(cars parked at unmarked spaces)

# "Unofficial" Parked Motorcycles: \_\_\_\_\_  
(parked in front of a parked car or unmarked space)

Cars Subtotal: \_\_\_\_\_

Motorcycles Subtotal: \_\_\_\_\_

NOTES:

# Total Vehicles Parked: \_\_\_\_\_

# Total Parking Supply Available: \_\_\_\_\_

% Parking Occupied: \_\_\_\_\_



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- 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.