Travel Characteristics of Residents of Multi-Family Housing in the Inland Empire

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Executive Summary

This study examines the travel patterns of residents of multi-family housing in California’s Inland Empire. The results are intended to support local community planning and the vehicle miles traveled reduction goals of SB 375. Using telephone and mail back surveys, the study finds that multi-family housing residents rely primarily on driving alone in private vehicles for their work and non-work trips. Looking at work trips, however, shows that the residents of multi-family housing have higher reported bus/rail transit shares than county averages for all types of housing. Yet the percentage of work trips in single occupant vehicle trips is similar to county-wide data for all residents, indicating that the use of alternative modes, such as carpooling, is lower for these multi-family housing residents.

Comparing the portion of survey respondents that are close to transit services with those that are farther away does not reveal significant differences in transit use, although those close to transit use the carpool mode more frequently. The projects studied near transit showed less transit use than found in mature transit oriented developments (TOD) elsewhere in California, but this is expected since Inland Empire transit service are less extensive. The housing developments near transit are reasonably dense, but they lack the other elements that reduce single occupant trips such as diversity of land uses, pedestrian design features, transit service frequency, and parking pricing.

These results show that multi-family housing does support transit ridership to a degree, but that the full potential of transit-oriented development in the Inland Empire lies with increased transit service and changes in land use patterns. Inland Empire cities such as San Bernardino, Ontario, and Montclair are actively pursuing TOD strategies; transit providers are developing service enhancements and new services. Cities can build on these existing housing clusters by focusing additional housing density at transit stops and introducing mixed use development that encourages walking trips for shopping and other activities. Site planning must support the pedestrian realm, easy access to transit, land use mixing, and revised parking standards and pricing approaches. Many redevelopment opportunities exist around the Metrolink stations, but since Metrolink alone cannot serve the dispersed geography of the Inland Empire, bus innovations are important as well, to act as connecters to the rail backbone and serve travel within the Inland Empire.

The study concludes with suggestions about future research to better understand the travel patterns of Inland Empire residents, employees, and shoppers, to measure results TOD implementation, and ensure that strategies fit the particular community and market conditions in the Inland Empire.
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Chapter 1. Introduction

Policy makers are seeking to coordinate land use, housing, and transportation planning to support environmental and community development goals. California’s primary initiative in this regard is the SB 375 Sustainable Communities Strategy mandate that aims to reduce greenhouse gas (GHG) emissions by reducing vehicle miles traveled (VMT). Many regional, county, and local sustainability planning efforts have similar goals; bringing these policy goals to local implementation, however, involves many implementation challenges.

Historically, VMT has grown faster than population and employment, reflecting the impact of rising incomes and the concentration of growth in automobile-oriented suburbs. In past eras, the predominant response to VMT growth was expanding roadways. For the most part, environment and energy issues associated with VMT growth were addressed with regulations affecting pollution controls and vehicle fuel economy. While the state’s GHG efforts include vehicle fuel economy and reducing the carbon content of fuels, SB 375’s mandate to reduce VMT marks a significant new approach.

Planners face many questions in responding to SB 375. Can local and regional entities reduce per-capita VMT through coordinated land use and transportation planning? Can an automobile-oriented region such as the Inland Empire (IE) do so? Will the effects of growth in an area such as the Inland Empire swamp possible reductions in VMT per capita?

Numerous efforts are underway to develop plans and modeling techniques to answer these questions. The behavioral questions embedded in these policy directions are significant. To what degree will denser, mixed-use development and improved transit induce residents to use transit, walking, or bicycling modes? Will residents own fewer vehicles? To what degree will they choose destinations for work or shopping that are closer to their homes, reducing the distance drive and/or changing the travel mode used?

Answering all of these questions requires a comprehensive research program. Across the state, researchers are addressing many aspects of the issue. This report tackles a focused, fundamental starting point for considering these questions. Using the Inland Empire as an exemplar of a fast growing, automobile-oriented region, this study provides high quality, local information about the travel behavior of those who live in existing multifamily housing in the IE. It establishes a starting point for gauging the potential of VMT reduction strategies and assessing the results of plans designed to reduce VMT. The primary measure use is the mode choice of residents for work and non-work trips. The smaller the percentage of single occupancy trips, the less VMT.1

The travel behavior data provided here is derived from telephone and mail-back questionnaire surveys of the residents of a series of multi-family residential buildings in

1 VMT can also be reduced by lessening the distance between trip destinations, reducing the number of trips, or combining trip purposes.
the urbanized portion of San Bernardino and Riverside County. The information is of use to the Southern California Association of Governments (SCAG) as they consider transit-oriented development (TOD) policy and develop the region’s Sustainable Community Plan. The results can also be used by local cities to assess the likelihood and magnitude of changes that are possible with new land use and transportation policies. Furthermore, the data provide a baseline for future assessments of the success of land use/transportation strategies such as Sustainable Community Strategies and support the development of GIS-based modeling tools being developed by Leonard Transportation Center scholars, SCAG, and others.
Chapter 2. Literature Review

The past three decades have seen a dramatic increase in VMT in the U.S. VMT has tracked increases in gross domestic product (GDP), outpacing growth in population, and even further outpacing the number of lane-miles of roadway (Sorensen et al. 2008). The result of this trend is high levels of greenhouse gas (GHG) emissions from the transportation sector and extensive traffic congestion.

The run-up in VMT per capita is associated with factors such as increased wealth, increased female participation in the labor force, the influence of the baby boom population cohort on travel patterns, and the location of growth in automobile-oriented areas. Recently, VMT increases have moderated, and in the recent period of high gasoline prices, VMT actually decreased by a modest amount. Despite this, personal travel in vehicles is almost one-quarter of GHG emissions in the state.

VMT and Travel Trends

SB 375 challenges land use, housing, and transportation planners to develop strategies that reverse VMT growth, even when accounting for population and employment growth. Among U.S. regions, Southern California exhibits a pattern of high VMT. Vehicle miles traveled (VMT) per day in the Los Angeles MSA is the fifth highest of 14 major U.S. metro areas (Sorensen et al., 2008). Given the urban quality of many parts of the Los Angeles MSA, one would expect a lower VMT, but that is not the case. VMT is higher than the density would predict for transportation reasons (alternative modes are not well used) and land use reasons (the mix of land uses separates origins and destinations and does not support non-automobile modes).

VMT is likely to be lower in compact regions simply because trip origins and destinations are closer together and the greater mix of land uses mean that multiple trip purposes can be accomplished with one vehicle trip. The other important factor is the impact of land use and transportation planning on the travel mode used. Traditional suburban development patterns favor the automobile over other travel modes. By changing mode choice, each trip made using transit, carpool, vanpool, shuttle, walking, or bicycling reduces VMT.

The Lincoln Land Institute estimated U.S. GHG emissions from the transportation sector (Brown et al. 2008) and ranked the Riverside-San Bernardino-Ontario metropolitan area 92nd highest of the 100 U.S. metro areas in terms of GHG emission per capita from transportation (1.89 metric tons per person in the Inland Empire versus 1.30 for the 100 metro average). This total includes emissions from trucks; when they are excluded the ranking is 83, still among the worst (1.29 metric tons per person). In sum, the Inland Empire faces significant challenges in responding to SB 375 in that it lacks a well-developed transit infrastructure and an existing mixed-use land use pattern to build on. Land use and transit system changes occur over many decades.
Reducing VMT

Five dimensions are generally considered in assessing VMT reduction potential: 1) density of population and employment (making places closer together and encouraging alternative travel modes), 2) diversity of land uses (mixed residential and commercial uses and a balance of housing and jobs), 3) pedestrian- and transit-friendly design, 4) destination accessibility (ability to reach trip destinations), and 5) distance from home or work to transit (e.g., bus or rail within ¼ or ½ mile of trip origin) (National Research Council 2009). That study came to the conclusion that if the density of new and redeveloped housing across a metropolitan area was doubled, it “…might lower household VMT by about 4 to 12 percent, or perhaps as much as 25 percent, if coupled with higher employment concentrations, significant public transit improvements, mixed uses and other supportive demand management measures.” (National Research Council 2009, pp. 4).

A key example of a VMT reduction strategy is TOD. TOD links denser, mixed-use development with transit in a walkable environment. This concept has gained popularity in urban areas across the U.S. and is of growing interest in suburban areas. For example, the city of San Bernardino is planning a TOD in its core in conjunction with Omnitrans’ development of bus rapid transit service.

The State of California defines TOD in terms of proximity to transit services. For example, SB 375 provides CEQA exemptions for “sustainable community projects” if they are within ½ mile of a major transit stop or high quality transit corridor. The minimum transit threshold is either a rail transit station or a “high quality” transit corridor with a service interval no longer than 15 minutes during peak commute hours. (Section 21064.33 and 2155b).

Two previous California studies of the travel behavior of those who live in TOD provide a comparison point with this study (Lund et al., 2004; Lund and Willson, 2005). These studies showed that those who live near transit-oriented development (TOD) have higher levels of transit use than persons in nearby areas, and that they own fewer automobiles. The results of TOD, however, vary widely depending on the maturity of the transit system and local land use conditions. The best results are found in the Bay Area, where BART and other transit services have had time to mature and land use patterns have been focused around transit services. While most previous TOD studies examine housing around light and heavy rail transit, the focus here is bus and commuter rail.

Multi-Family Housing

Multi-family housing saves land as compared to single family housing, producing desirable outcomes in terms of housing cost per unit and reduced environmental impacts. In addition, multi-family housing generates fewer trips per day than single family housing. Residents of multi-family housing also own fewer automobiles per household, resulting in lower per-unit parking demand. Table 1 (next page) provides a comparison of different forms of data about the impacts of multi-family housing using national data.
derived from the Institute of Transportation Engineers (2003, 2004). These national sources are often used in local traffic impact and parking studies. The data show a significant difference in trips per weekday and in peak overnight parking occupancy between single family dwellings to multi-family forms of housing. According to these sources, increasing the share of multi-family housing may by itself have positive impacts in terms of SB 375’s goals.

Table 1. Trip Generation and Parking Occupancy

<table>
<thead>
<tr>
<th>Land Use</th>
<th>ITE Code</th>
<th>Trips per day, weekday</th>
<th>Overnight parking occupancy (associated with vehicle ownership)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Family dwelling</td>
<td>210</td>
<td>9.57</td>
<td>1.83</td>
</tr>
<tr>
<td>Apartment</td>
<td>220</td>
<td>6.72</td>
<td>N/A</td>
</tr>
<tr>
<td>Los rise apartment</td>
<td>221</td>
<td>6.59</td>
<td>1.2</td>
</tr>
<tr>
<td>High rise apartment</td>
<td>222</td>
<td>4.20</td>
<td>1.37</td>
</tr>
<tr>
<td>Condominium/townhouse</td>
<td>230</td>
<td>5.86</td>
<td>1.46</td>
</tr>
</tbody>
</table>

There are many reasons why multi-family housing has lower trips and parking demand. First, the household size is smaller in multi-family housing (families are more likely to live in a single-family dwelling). Second, these units may have a lower percentage of residents who travel by personal vehicle, such as lower income or older residents. Finally, the multi-family housing may be in a location with more walkable trip destinations, better transit services, and other travel options. These multiple factors mean that one cannot assume that a household’s travel patterns are transformed simply because of the creation of a transit-friendly environment.

The trip generation of multi-family housing varies with according to the factors mentioned previously. For example, the range of rates used in computing the average trips per weekday for Land Use 220 is between 2.0 and 12.5 trips per weekday; the standard deviation is 3.02. ITE states that higher trip rates are expected from projects that have larger units, are more expensive (indicating an income effect), and farther from the CBD (less land use mixing and fewer alternatives to driving).

The idea behind SB 375 is to alter land use, housing and transportation patterns so new housing units generate fewer vehicle trips per day than the otherwise would. This can be accomplished by arranging job locations and transit services so that transit or carpools are more fully used in the work commute. Trips can also be reduced if walkable non-work destination are provided, allowing for walking or bicycling to shopping, recreation, education trips, etc. Finally, denser, mixed use development makes it economically feasible to offer more frequent and convenient transit services, which in turn attract more transit riders. Since ITE data concerns trips, not VMT, one must also consider that the goals of SB 375 are also met when the distance of trips is shorted by virtue of origins and destinations being closed together in denser, mixed use forms of development.
Literature on the Inland Empire

The Inland Empire is an understudied region, despite its importance in the future of California. This report and others sponsored by the Leonard Transportation Center seek to remedy that lack of study. One notable exception is Johnson et al. (2008), which provides a broad overview of existing and likely future conditions in the IE. They note that the region has grown at twice the rate of the rest of California and see the Inland Empire growing from 3.9 million in 2005 to 4.9 million in 2015. This growth is driven by migration from other parts of Southern California.

In the realm of housing policy, Bluffstone et al. (2008) critique the pattern of sprawl in the Inland Empire in terms of social costs. Further information on the Inland Empire is provided in Chapter 4, Characteristics of Study Area and Multi-Family Housing.
Chapter 3. Research Design

The research design described below involves surveys of residents of newer multi-family housing complexes in the Inland Empire, focusing on questions such as the mode of travel, vehicle ownership, trips patterns, and attitudes.

Research Goals and Questions

When this study was first conceptualized by the principal investigators, there were two major target populations for the study: Inland Empire residents who live in multi-family housing within 1/4 mile of a major transit stop or high quality transit corridor (termed the “study group”) and those who live in multi-family housing but who have limited or no bus service or Metrolink service within ¼ mile (termed the “control group”). Initial field work revealed, however, that although the Inland Empire has many promising TOD plans and projects, there are few existing and occupied developments that meet the formal definition of TOD -- high frequency transit, density, and mixed land uses. In general, land use mixing and transit frequency are lacking. As a result, comparisons of study group vs. control group cannot be made with the same expectation as in previous TOD studies. Although those comparisons are provided in the analysis chapter, the main purpose of the study was revised to become a baseline measurement of travel behavior among multi-family housing residents in the Inland Empire, before the establishment of well-defined TODs.

The study’s research goals include the following:

1. To provide an understanding of the travel behavior of residents of multi-family housing in the Inland Empire.
2. To provide a baseline measurement of trip making against which future TOD projects can be assessed.
3. To provide practical guidance for forms of development, transit options, and policies that can reduce household VMT from residents of multi-family housing in the IE.

Research questions that flow from these goals include the following:

1. What is the level of vehicle availability among residents?
2. Was access to transit a factor in respondents’ residential location choice?
3. What are the respondents’ perceptions of the local transportation environment, and do those perceptions differ between respondents from study sites and control sites?
4. What is the level of single-occupant vehicle and transit travel among residents? How do those mode choices vary among work and non-work trips? How do those mode choices vary between study sites and control sites?
5. How do respondents from study sites and control sites differ relative to demographics/socioeconomic characteristics, travel patterns (reason for the trip,
their mode of transportation, length of trip and parking at destination), attitudes toward transportation, and use of public transportation?

5. Are there relationships between various demographic/lifestyle factors and auto dependency (conceptualized as percent of single occupant vehicle trips)?

The study sites have densities of 20 units per acre or more and they are within ¼ mile of transit services, but they lack the required transit frequencies and land use mixing to be considered true TODs. While not meeting the formal definition of TOD, these study sites provide insight into transit-proximate development that could become full TOD with transit service improvements and land use intensification.

Survey Instrument

A variety of methods are available to derive information on travel behavior, including intercept surveys, household surveys, measurements of traffic volumes and transit use, and use of existing data sets. Household surveys are often combined with census data in regional modeling efforts. The full behavioral dimensions of travel are often best captured with a form of household survey because the data can be used to associate individual level demographic and attitudinal features with travel behavior.

Forms of household survey vary in their comprehensiveness, ranging from travel diaries in which household members report all trips for a defined time period to simpler survey instruments focusing on particular trips. This study uses a household survey completed by the head of household or partner that concerns the top three (as identified by the respondent) trips taken on the day surveyed.

The “top three trips” approach is a good compromise between expensive household surveys and aggregated data sources. Resources were not available for a full household travel diary. The survey approach does not provide a complete inventory of daily VMT but provides important information on mode choice, travel times and attitudinal factors. The “top three trips” follows the approach taken by Lund et al. (2004) and Lund and Willson (2005) in previous studies of TOD in California, allowing comparisons with those data sets. In other words, once we know the mode choice starting point for the Inland Empire, we can assess the prospects for the region approaching the transit trip shares found in more urbanized portions of the state.

Respondent Selection and Mode of Delivery

Selection of survey respondents began with the CPP research team providing IAR with a listing of multi-family housing complexes in Riverside and San Bernardino counties, some of which were classified as a study sites, and others which were classified as control sites.

Apartment complexes throughout the Inland Empire were screened to select candidate sites for study. Those sites are characterized by being newer, three- to four-story buildings with over 100 units. Field reconnaissance was conduct by windshield surveys
in prospective areas, searching apartment rental websites, and searching on Google Earth, Google Maps, and Bing Maps. Because a complete inventory of potential study sites was not readily available, it is possible that the methods used to find potential sites did not exhaust the list of qualified study sites. The number of housing units within each complex was obtained through telephone calls placed to each of the potential study sites. Using Google Earth and an online tool that measures the area of polygons made in Google Earth, aerial photography of each site was used to calculate the number of acres occupied by each complex. The density of each complex was obtained through the division of the number of housing units and the area of each site. Researcher at IAR conducted further field checks from the list to determine the full list of addresses associated with each project. Appendix A summarizes the characteristics of each study site, organized in order of density measured by the number of units per acre (highest to lowest). A total of 4,062 units were identified in this group, with an average density of 27 units per acre.

The control group study sites are shown in Appendix B. It includes 5,759 units with an average density of 20.9 units per acre.

Although Lund et al (2004) and many other TOD survey used a mailed/mail-back questionnaire, the team decided that this study should be conducted via a phone survey approach. The study team wanted to test the potential of telephone surveys to yield a better level of accuracy and a response rate than mailed surveys.

Since apartment/condo owners and managers would not provide IAR with complete phone lists of apartment/condo dwellers, citing federal laws and corporate policies, IAR employed the following multi-step procedure to select survey respondents:

1) IAR purchased a sampling frame from Scientific Telephone Sampling (STS) which included phone numbers (both cell phones and land lines) for all listed phones within ¼ mile of the address. This list contained approximately 2,343 phone numbers, some of which were non-working numbers or business numbers rather than apartment/condo residential numbers. Even with increasing the number of call-backs to working numbers from 5 to 6, it was clear that this sampling frame would fall far short of obtaining the desired sample size.

2) IAR enriched the STS sampling frame by inputting every apartment/condo address (both study and control sites) into the on-line white pages so as to obtain additional working numbers.

3) In order to obtain unlisted numbers IAR employed a variation of a random digit dialing technique in which we added and subtracted constant numbers to the listed numbers, and a screening question was asked to confirm that indeed the respondent lived in multi-family housing within the geographical area of interest.

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2 The sites were identified by Michael Roberts, a graduate student in the Department of Urban and Regional Planning at CPP at part of his masters thesis research.

3 GeoUtilities can be found at http://www.geo-news.net/index_geof.html
4) The above procedures still did not produce a sampling frame that would yield a sufficient sample size. The IAR Project Coordinator drove to one of the study site apartments and noted that the address provided was only one building of a larger apartment/condo complex. She confirmed that this was also the case for other study sites, thus the decision was made to contact the management office of every study site for a complete map of the complex. This approach yielded additional addresses and IAR staff found listed phone numbers for those addresses in the online white pages.

To the extent possible, therefore, each person with a telephone residing in the designated areas had an equal chance of being included in the survey.

A $200 gift card drawing was offered as an incentive for participation in the survey. The above procedures resulted in 306 completed phone surveys conducted between March 24 and April 12, 2010, with significantly more surveys from the control group than study group (not surprising since there were 22 control sites and only 10 study sites). Further, this sample size was still too small for a 95% level of confidence and an accuracy of +/-5% typically employed for studies of this nature. IAR decided to modify the mode of delivery by sending post cards to 4,008 addresses of study site apartments/condos asking the recipient to call IAR to take the phone survey and receive a guaranteed incentive of a $10 gift card for the first 50 callers plus entrance into the lottery for the $200 drawing as an inducement to participate. This procedure yielded an additional 26 telephone surveys conducted between April 22 and May 6, 2010.

Sample size was still less than desired, so a final delivery approach was undertaken in which full printed surveys were mailed to 2,000 residents in study site apartment/condos. That mailed survey approach yielded an additional 83 surveys, received between June 17, 2010 and July 20, 2010. In all, the total sample size was 415 surveys completed with a mixed-mode survey approach.

**Questionnaire Construction and Interview Procedures**

To allow for comparisons with other studies, the starting point for the questionnaire was a mailed survey instrument used in Lund et al. (2004) and Lund and Willson (2005). The study team transformed and enhanced this instrument into a telephone survey so as to best meet the research needs of this project. IAR translated the questionnaire into Spanish, pretested the questionnaire, and modified and revised the questionnaire where warranted. The questionnaire was designed to last on average between 10 and 12 minutes. The mail survey was then constructed based on the telephone survey. The telephone and mail survey instruments are provided in Appendices C and D, respectively.

Telephone interviews were conducted by thoroughly trained CSUSB students via telephone from the facilities of CSUSB's Institute of Applied Research and Policy Analysis in San Bernardino, using Computer Assisted Telephone Interviewing (CATI) software. Spanish speaking interviewers were available throughout the interviewing
process and used when considered necessary to improve the chances of the respondents' participation and the clarity of the data gathered.

Calls were made Monday through Friday from 9:00 a.m. to 9:00 p.m. and on the weekends (Saturday 9:00 a.m. to 5:00 p.m., and Sunday 1:00 p.m. to 7:00 p.m.). Institute Staff CATI Shift Supervisors (CSUSB students) will be present for all interviews conducted so as to ensure the quality and reliability of the interviews. To further ensure quality control, supervisory personnel randomly selected ten percent of all completed interviews (at least one completion per interviewer) and made call-backs for verification.
Chapter 4 Characteristics of Study Area and Projects

The study area is the Inland Empire (IE) portion of San Bernardino and Riverside counties lying south of the San Bernardino mountains, contiguous to the Los Angeles metropolitan area. The Inland Empire was selected for study because it represents a fast-growing suburban area that is experiencing a transition toward greater density, mixed-use development, and employment. A transit backbone of commuter rail (Metrolink) and bus is being developed and many cities have plans for denser, mixed-use development. For example, the city of Ontario recently adopted a new general plan that includes higher density, mixed-use land use designations.

As mentioned previously, the IE’s population growth outpaces the region and California, fueled by migrants from the greater Los Angeles area seeking lower cost housing. On the economic side, major employment categories include manufacturing, construction, and transportation and distribution. Recently, the area has been hit hard by the housing crisis and recession, with the unemployment rate standing at about 15% in the summer of 2010.

The Inland Empire is represented on Figure 1. Encompassing portions of San Bernardino and Riverside counties, the area does not have an exact geographic definition, but it generally considered to be the core urbanized area the runs east/west along the I-10 and 60 freeways, bordered in the north by the San Bernardino Mountains and in the south by Orange County.

Study Area

The study area for this study is areas that are likely to have multi-family housing and a reasonable future prospect of TOD and transit development. That general area, shown in Figure 1 includes surveys from the San Bernardino cities of Chino, Chino Hills, Colton, Fontana, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Upland, Yucaipa. In Riverside County, surveys were received from residents in the cities of Moreno Valley and Riverside.
Study Area Characteristics

Figure 2 shows that rapid growth that has occurred in the two-county area. The fast growth is associated with available land and lower land costs on the edge of the Los Angeles metropolitan area. Although housing construction has slowed because of a national recession, it is expected to resume in the future. This makes the Inland Empire very important from the perspective of SB 375 because this is the area in which a significant portion of California’s growth will occur. This is a place where land use, housing and transportation provision must be well coordinated if automobile dependency is to be reduced. The data that follows in this section is drawn from the U.S. Census and American Community Survey.

Figure 2. Population Growth in San Bernardino and Riverside Counties

![Population Growth Graph]

Table 2 (next page) shows the characteristics of the population in the two counties. Compared to California as a whole, the area represents the conditions at the expanding edges of metropolitan areas, with a greater share of owner-occupied housing, larger household size, and a younger population. Given that inland suburban areas are attractive for their lower cost housing, the population has a lower than average median household income. The lack of jobs/housing balance and spread out nature of San Bernardino and Riverside counties is reflected in longer travel time for work commutes; similar factors explain the higher level of single occupant vehicle commuters.
Table 2. Demographics of San Bernardino and Riverside Counties

<table>
<thead>
<tr>
<th>2006 – 2008 (Estimate)</th>
<th>San Bernardino County</th>
<th>Riverside County</th>
<th>State of California</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1,999,753</td>
<td>2,055,232</td>
<td>36,418,499</td>
</tr>
<tr>
<td>Occupied housing units</td>
<td>589,058</td>
<td>647,443</td>
<td>12,177,852</td>
</tr>
<tr>
<td>% housing units renter occupied</td>
<td>35.2%</td>
<td>31.1%</td>
<td>42.2%</td>
</tr>
<tr>
<td>Average household size</td>
<td>3.32</td>
<td>3.13</td>
<td>2.92</td>
</tr>
<tr>
<td>Median household income</td>
<td>$56,575</td>
<td>$58,168</td>
<td>$61,154</td>
</tr>
<tr>
<td>Median age</td>
<td>30.3</td>
<td>31.6</td>
<td>34.7</td>
</tr>
<tr>
<td>Mean travel time to work (minutes)</td>
<td>29.2</td>
<td>31.6</td>
<td>27.0</td>
</tr>
<tr>
<td>Single occupant vehicle for the journey to work (%)</td>
<td>77.1%</td>
<td>75.2%</td>
<td>72.9%</td>
</tr>
</tbody>
</table>

Figure 3 provides time series information on the patterns of travel mode choice in the study counties. Consistent with regional trends, modest increases in transit use have been counteracted by decreases in carpooling and vanpooling, leading an increased percentage of work commuter driving alone. View simply in terms of past trends, there is no indication that planners should expect reductions in drive alone commuting without new plans and policies.

Figure 3. Trends in Commute Mode Share.

Source: Roberts (2010)

The average journey-to-work travel times for workers of San Bernardino and Riverside Counties are among the longest in the region, as shown on Table 3. This measure reflects
three elements: trip length, travel speed, and mode choice (since transit door-to-door times are generally longer than driving). In the case of the Inland Empire, the major contributors are long travel times and low travel speeds associated with peak period congestion.

### Table 3. Comparison of Travel Time to Work, 2006-08

<table>
<thead>
<tr>
<th>County</th>
<th>Mean journey-to-work travel time (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverside</td>
<td>31.6</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>29.2</td>
</tr>
<tr>
<td>San Bernardino</td>
<td>29.2</td>
</tr>
<tr>
<td>Ventura</td>
<td>26.4</td>
</tr>
<tr>
<td>Orange</td>
<td>25.9</td>
</tr>
<tr>
<td>Weighted five-county average</td>
<td>28.7</td>
</tr>
</tbody>
</table>

Because there are not sufficient jobs for local residents, there is a high level of commuting to employment outside the Inland Empire. Johnson et al (2008) show that despite strong local job growth, 20 percent of the region’s workers commute to jobs outside the region, barely down from 21 percent in 2000. Those commuters tend to be the most highly educated of Inland Empire residents. While the largest job destinations for commuters are Los Angeles or Orange counties, Johnson et al. (2008) show that the greatest increase in commuting outside the region was to San Diego County.

**Multi-Family Housing Characteristics**

Although there are promising plans to develop TOD and transit in the IE, the concept is in its infancy. Inland Empire residential complexes are generally single-use developments and are designed primarily to accommodate private vehicular transportation. While transit service may be nearby, transit frequencies are low (e.g., 30-60 minutes between buses) and the level of connectivity to dispersed destinations is low. The housing complexes studied here are moderately dense, but most of them lack the transit service and mixed of land uses normally associated with TOD. The travel behavior measured in this study, therefore, represents travel choices under conditions of plentiful parking, unpriced road use, relatively low levels of transit provisions, and disconnected land uses. These are conditions where one would expect to find a high reliance on private vehicle use.

Figure 4 shows a typical project that was surveyed. While attractively landscaped, the project follows typical suburban design standards, including substantial setbacks, landscaped berms, plentiful parking and roadway capacity. In addition, the projects generally do not provide direct pedestrian connections to surrounding land uses.
Figure 4. Typical Project Surveyed

Photo credit: Roberts 2010
Chapter 5. Analysis of Travel Behavior and Vehicle Availability

This chapter presents the analysis of the survey results in two sections. The first section describes the results from the full set of 415 survey respondents, including rental and ownership multi-family housing. The second section describes the results from the subset of respondents in rental housing, focusing on household vehicle availability and its implications for parking demand (301 respondents).

Analysis of All Multi-Family Respondents

The following describes the analysis of the full set of respondents, including both renters and condominium owners. It provides information on the personal and household characteristics of respondents, length of residency, reasons for residential location, perception of the local transportation environment, travel patterns, attitudes toward transportation, open ended comments, and analysis of factors that explain travel choices. Because the study is interested in determining if respondents in a study area sites (residential complexes within ¼ mile of transit) have different characteristics than those that are not near transit (the control sites), the results for each group are shown in many of the tables that follow.

Personal Characteristics of Respondents

The following section describes the demographic characteristics of the respondents of this study. It should be noted that these are the personal characteristics of the responder (who is the head of household or partner) and should not used to determine the general characteristics of the households.

Age, Gender, Ethnicity and Occupation

The average age of the respondent was 44 years, with a range of 18 to 101 years. More females (65.0%) answered the combined survey than males (34.8%). Most were Caucasian (42%), followed by Hispanic (30.4%) and African American (21.7%). In terms of the occupation of the respondent, the largest category was “professional” (18.2%) which would be even larger if one were to collapse some of the other categories, such as medical, teacher/professor, etc. into the “professional” category.

Household Characteristics

This section addresses household characteristics, such as household type and size, number of available vehicles, parking and length of residency.
Household Income

The respondents were evenly distributed among the income categories, with the greatest single concentration of respondents indicating that their income was in the range of $45,001 to $60,000. A greater percentage of study site respondents, however, reported having a higher income than control site respondents (58.4% reported an annual household income greater than $45,000 compared to 40.9% of control site respondents). The reader will note that for households in which there are several roommates living together as a family unit, it is unclear if the respondent included the roommates’ income in their response.

Household Type and Size

Regarding the type of household (apartment vs. condo/townhome) and size of the household (number of bedrooms and the number of people living in the household), there are some marked differences between households within the study site vs. the control site. Residents in the study sites are more likely to live in an apartment (89.4% study sites vs. 64.7% control sites), whereas residents within the control sites are more likely to live in a condo/townhouse (35.3% control sites vs. 10.6% study sites). Moreover, household size is smaller for study site households (66.7% of study site households have one or two residents vs. 50.2% of control households with one or two residents), and these households do not have as many bedrooms as control site households (39.4% of study site respondents live in studio or 1 bedroom apartments, vs. 26.6% of control site respondents). Finally control site respondents report children in the household under the age of 16 (56.5%) in larger numbers than study site respondents (27.6%). These factors may stem from the fact that study site are more likely to be smaller, newer units.

Vehicle Availability and Parking

Up to this point, our analysis suggests that the study sites have many of the same characteristics that one would expect in a fully developed TOD site...smaller household size, fewer children in the household, and fewer bedrooms than households in the control sites. But it was somewhat surprising to find that the study site respondents did not have fewer cars than respondents in control sites. The findings indicate that study site households have more vehicles than their counterparts in the control group (56.9% of study site households have more than one vehicle vs. 45.2% of control site households). One plausible explanation is found when looking at household income and number of drivers in the household. Specifically, study site households have a higher income when compared with the control group (see demographics above) and also are more likely to have at least one vehicle available for each person of driving age (74.1% vs. 53.1%).

In terms of where residents park their vehicles, overall 69.2% said they park their vehicle(s) in a private garage assigned to their unit (representing 345 vehicles), 47.9% park in a shared garage or outdoor lot in their development (representing 237 vehicles), and 11.7% said they park on the street (representing 63 vehicles). When looking at study vs. control site respondents, Table 4 shows the breakdown of where they park their cars.
Table 4. Where do you park?  
(% of people who answered “yes”)

<table>
<thead>
<tr>
<th></th>
<th>Study</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Private garage assigned to unit</td>
<td>72.7% (112 vehicles)</td>
<td>67.4% (233 vehicles)</td>
<td>69.2% (345 vehicles)</td>
</tr>
<tr>
<td>Shared garage or outdoor lot in development</td>
<td>57.8% (98 vehicles)</td>
<td>43.0% (139 vehicles)</td>
<td>47.9% (237 vehicles)</td>
</tr>
<tr>
<td>On the street</td>
<td>7.8% (12 vehicles)</td>
<td>13.6% (51 vehicles)</td>
<td>11.7% (63 vehicles)</td>
</tr>
</tbody>
</table>

**Length of Residency**

Regarding length of residency, study site respondents report having lived in their current location for fewer years than control site respondents. Specifically, the mean length of residency for study site respondents is 1.98 years, as compared to control site respondent which is 4.49 years. In fact, almost two-thirds of study site respondents (62.6%) have lived in their current residence for one year or less (compared to only 29.2% of control site respondents). This finding might be expected since there are more respondents living in apartments in the study sites as opposed to control sites. As mentioned previously, this length of residency applies to the respondent, which might be different than the household in the case of unrelated household units.

**Residential Location Choices**

Respondents were read a list of the reasons for moving to their current residence and asked to identify which were important to them (note: this was a multiple response question where respondents could select more than one response). Overall, the top three factors include “cost of housing” (71.8%), “type or quality of housing” (61.9%) and “quality of neighborhood” (60.0%). They were then asked to identify the MOST important factor, and 32.4% said the “cost of housing”, 16.4% said the “quality of the neighborhood” and 11.1% said the “type or quality of housing”. Table 5 illustrates the differences between study site respondents and control site respondents as to the most important factor in deciding to move to their current location. Clearly, access to transit is a minor factor, ranked 7th of the list of reasons. This is not surprising because the level of transit service is low.
Table 5. Which was the MOST important factor to you in deciding to move to your current residence?

<table>
<thead>
<tr>
<th>Study</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of housing</td>
<td>22.7%</td>
<td>36.9%</td>
</tr>
<tr>
<td>Type or quality of housing</td>
<td>18.2</td>
<td>7.8</td>
</tr>
<tr>
<td>Quality of local schools</td>
<td>0.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Quality of neighborhood</td>
<td>12.9</td>
<td>18.1</td>
</tr>
<tr>
<td>Close to job</td>
<td>11.4</td>
<td>9.2</td>
</tr>
<tr>
<td>Access to shopping and services</td>
<td>1.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Access to transit</td>
<td>0.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Access to highway</td>
<td>1.5</td>
<td>0.4</td>
</tr>
<tr>
<td>Recreational opportunities</td>
<td>0.0</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>3.8</td>
<td>8.2</td>
</tr>
</tbody>
</table>

Perceptions of Local Transportation Environment

Finally, respondents were asked to rate their neighborhood as a place to walk to destinations and as a place for people to take buses or trains. Overall, 59.9% of respondents rated their neighborhood as a “good” or “excellent” place for people to walk to destinations and 47.9% rated it as a “good” or “excellent” place for people to take buses or trains (see Table 6). Control group respondents generally gave higher ratings than their study site counterparts. These findings suggest that the study sites, despite being the close to transit service, do not provide the pedestrian environment or transit service frequencies that create a favorable environment for transit.

Table 6. Percent of Respondents who Rated their Neighborhood as “Good” or “Excellent”

<table>
<thead>
<tr>
<th>Study</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A place for people to walk to destinations</td>
<td>48.5</td>
<td>65.2</td>
</tr>
<tr>
<td>A place for people to take buses or trains</td>
<td>46.4</td>
<td>48.5</td>
</tr>
</tbody>
</table>

Travel Patterns

Respondents were asked a variety of questions regarding the three main trips they took on the business day prior to the day they responded to the survey. Each trip refers to one direction of travel (for example home to work is one trip, work to home is another trip, etc.). Respondents self-identified the three main trips.

The following analysis describes the travel patterns in terms of reason for the trip, their mode of transportation, length of trip, and parking at their destination.

Trip Purpose, Mode of Transportation, Trip Length and Parking at Destination

For purposes of analysis, the reason for the trip was coded as “work” trips, “non-work” trips and trips to go “home”. Non-work combines trip purpose such as school, shopping,
meal or snack, errands, recreational, medical, etc. The majority of trips were for non-work (60.5%) and another 22.4% were work related. Study site respondents were more likely to report work trips than control site respondents (27.8% vs. 19.0%).

Table 7 shows the results for all reported trips -- the majority of respondents report that they drove alone (75.1%), while 16.2% carpooled and 5.3% said they used some sort of public transit, either the Metrolink (1.7%) or the bus (3.6%). Walk and bicycle trips consisted 2.2% of trips, a low percentage considering that non work trips are included in this total. This reflects the automobile orientation of the Inland Empire’s transportation system and urban form.

<table>
<thead>
<tr>
<th></th>
<th>Work</th>
<th>Non-Work</th>
<th>Home</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drove Alone</td>
<td>76.1%</td>
<td>75.1%</td>
<td>73.0%</td>
<td>75.0%</td>
</tr>
<tr>
<td>Carpooled</td>
<td>12.6%</td>
<td>17.4%</td>
<td>17.2%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Rode rail transit (Metrolink)</td>
<td>2.5%</td>
<td>0.7%</td>
<td>4.1%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Rode the bus</td>
<td>6.9%</td>
<td>2.6%</td>
<td>3.3%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Bicycled</td>
<td>0.6%</td>
<td>0.2%</td>
<td>0.8%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Walked</td>
<td>0.0%</td>
<td>2.8%</td>
<td>0.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Other</td>
<td>1.2%</td>
<td>1.1%</td>
<td>0.8%</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Study site respondents were more likely than control site respondents to have carpooled with someone (22.9% vs. 12.1%). There were no differences between the two regarding use of public transit (5.1% of study site respondents reported using the bus or train vs. 5.4% of control site respondents).

Overall, the average length of a trip was 33.29 minutes (34.76 minutes for trips taken by study site respondents and 32.37 for trips taken by control site respondents).

**Work Trips:** When breaking down commuting patterns by trip purpose, we see that control site respondents whose main purpose of travel was to go to work were more likely to have driven alone (79.8% for control site and 72.0% for study site). In fact, study site respondents were far more likely than control site respondents to have carpooled with someone (16.0% vs. 9.5%), and slightly more likely to have used public transportation (10.7% vs. 8.3%). For context, a survey of resident of TODs along the Metro’s Gold line, which serves Pasadena and downtown Los Angeles, found a 15% transit share (Lund and Willson 2005). Approximately 1% of control site respondents report using Metrolink to commute to work (see Table 8).
Table 8. Mode of Transportation for Respondents Traveling to Work

<table>
<thead>
<tr>
<th>Mode of Transportation</th>
<th>Study N=75</th>
<th>Control N=84</th>
<th>Total N=159</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drove Alone</td>
<td>72.0%</td>
<td>79.8%</td>
<td>76.1%</td>
</tr>
<tr>
<td>Carpoled</td>
<td>16.0%</td>
<td>9.5%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Rode Rail Transit (Metrolink)</td>
<td>4.0%</td>
<td>1.2%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Rode Bus</td>
<td>6.7%</td>
<td>7.1%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Bicycled</td>
<td>1.3%</td>
<td>0.0%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Walked</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
<td>1.2%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

In terms of parking at their workplace, the vast majority of trips for both study site and control site ended in parking that was “free and easy to find” (68.0% for study site respondents and 75.0% for control site respondents).

Average length of trip for study vs. control site respondents differed slightly, with 39.3 minutes of travel recorded for study site respondents compared with 34.9 minutes for control site respondents.

In addition, those who are employed and reported traveling to work on the previous day were asked a series of questions regarding their employer’s policies on work schedules and commuting issues. The vast majority of respondents indicate that their employer provides free parking for the employees (85.1%). Almost one-half also said their employer allows them to work flexible hours (45.1%). When looking at study site respondents vs. control site respondents, we see that (with the exception of providing free parking) more study site respondents indicated that their employer offers work schedule flexibility and assistance with commuting than control site respondents (although the differences are relatively small). Table 9 shows the percentage of respondents who answered “yes” to these questions.

Table 9. Employer Policies on Work Schedules and Commuting Issues
(Respondents who said they traveled to work the previous business day)

<table>
<thead>
<tr>
<th>Question</th>
<th>Study</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your employer allow you to work flexible hours?</td>
<td>46.6%</td>
<td>43.5%</td>
<td>45.1%</td>
</tr>
<tr>
<td>Does your employer allow you to work from home?</td>
<td>20.5%</td>
<td>10.1%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Does your employer provide a car for use during the day?</td>
<td>17.8%</td>
<td>5.7%</td>
<td>11.9%</td>
</tr>
<tr>
<td>Does your employer provide free parking?</td>
<td>81.7%</td>
<td>88.6%</td>
<td>85.1%</td>
</tr>
<tr>
<td>Does your employer help pay for transit?</td>
<td>17.1%</td>
<td>8.8%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Does your employer help pay for tolls, fuel or other commuting costs?</td>
<td>21.9%</td>
<td>12.9%</td>
<td>17.5%</td>
</tr>
</tbody>
</table>

The preceding analysis looked only at people who reported that they traveled to work on the previous business day. The analysis on Table 10 depicts all people who said they are employed, regardless of whether they report traveling to work on the previous day (this also includes people who work from home).
Table 10. Employer Policies on Work Schedules and Commuting Issues (all workers)
(All respondents who are employed)

<table>
<thead>
<tr>
<th></th>
<th>Study</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your employer allow you to work flexible hours?</td>
<td>50.0%</td>
<td>45.4%</td>
<td>47.5%</td>
</tr>
<tr>
<td>Does your employer allow you to work from home?</td>
<td>18.1%</td>
<td>10.2%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Does your employer provide a car for use during the day?</td>
<td>12.8%</td>
<td>11.9%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Does your employer provide free parking?</td>
<td>83.9%</td>
<td>89.9%</td>
<td>87.1%</td>
</tr>
<tr>
<td>Does your employer help pay for transit?</td>
<td>13.2%</td>
<td>11.3%</td>
<td>12.2%</td>
</tr>
<tr>
<td>Does your employer help pay for tolls, fuel or other commuting costs?</td>
<td>19.1%</td>
<td>15.7%</td>
<td>17.3%</td>
</tr>
</tbody>
</table>

Finally, respondents were asked how often they use the bus or rail to commute to work or school outside the home (Question 22). The vast majority (80.3%) said they “never” take it and 6.3% said they take it every day (5 or more days a week). Comparing study site and control site respondents use of public transit, more study site respondents report “never” using public transit (83.7%) as compared to control site respondents (77.8%). In addition, more study site respondents said they use it every day (7.7% vs. 5.2%).

Non-Work Trips: About 6 out of every 10 trips (60.5%) reported were for non-work related activities. These include medical appointments, shopping, visiting friends and/or relatives, running errands and going for a meal or a snack. Just about one-half of trips made by study site respondents were non-work trips (50.4%) and 66.7% of trips made by control site respondents were non-work trips. As we saw with work trips, Table 11 shows that control site respondents were more likely to have driven alone than study site respondents (80.3% vs. 64.0%), and study site respondents are more like to carpool with someone (28.7% vs. 12.2%). In addition, very few of them took public transit (2.9% for study site and 3.4% for control site respondents).

Table 11. Mode of Transportation for Respondents Taking Non-Work Trips

<table>
<thead>
<tr>
<th></th>
<th>Study N=136</th>
<th>Control N=294</th>
<th>Total N=430</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drove Alone</td>
<td>64.0%</td>
<td>80.3%</td>
<td>75.1%</td>
</tr>
<tr>
<td>Carpoled</td>
<td>28.7%</td>
<td>12.2%</td>
<td>17.4%</td>
</tr>
<tr>
<td>Rode Rail Transit (Metrolink)</td>
<td>0.0%</td>
<td>1.0%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Rode Bus</td>
<td>2.9%</td>
<td>2.4%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Bicycled</td>
<td>0.7%</td>
<td>0.0%</td>
<td>0.2%</td>
</tr>
<tr>
<td>Walked</td>
<td>3.7%</td>
<td>2.4%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
<td>1.4%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Regarding parking at their destination, nearly three-quarters of both study site (72.0%) and control site respondents (73.4%) report that parking was “free and easy to find”.

There was a significant difference in length of non-work trip taken by the two groups: 32.2 minutes for trips taken by study site respondents and 29.5 minutes for trips taken by control site respondents.
**Trips Home:** The third category of trips that respondents reported taking were trips back home (17.2% of all reported trips). More study site respondents reported trips back home than control site respondents (21.9% vs. 14.3%). As opposed to all other trips, Table 12 shows that control site respondents were less likely to report traveling alone (69.8% vs. 76.3% for study site respondents) and study site respondents were more likely to have carpooled with another person (18.6% vs. 15.9% for control site respondents). Further, we see a difference with regard to traveling home using public transit. With work trips, study site respondents were more likely to have used public transit than control site respondents. With non-work trips study site respondents were slightly less likely to have used public transit. However, regarding trips back home more control site respondents reported taking public transit than study site respondents (11.1% for control site respondents and 3.4% for study site respondents).

<table>
<thead>
<tr>
<th></th>
<th>Study N=59</th>
<th>Control N=63</th>
<th>Total N=122</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drove Alone</td>
<td>76.3%</td>
<td>69.8%</td>
<td>73.0%</td>
</tr>
<tr>
<td>Carpool</td>
<td>18.6%</td>
<td>15.9%</td>
<td>17.2%</td>
</tr>
<tr>
<td>Roded Rail Transit</td>
<td>3.4%</td>
<td>4.8%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Roded Bus</td>
<td>0.0%</td>
<td>6.3%</td>
<td>3.3%</td>
</tr>
<tr>
<td>Bicycled</td>
<td>1.7%</td>
<td>0.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Walked</td>
<td>0.0%</td>
<td>1.6%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Other</td>
<td>0.0%</td>
<td>1.6%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

When asked about parking once they got home, 74.6% of study site and 77.8% of control site respondents said that it was “free and easy to find.”

There was a significant difference in length of trips home taken by the two groups: 35.07 minutes for trips taken by study site respondents and 42.67 for trips taken by control site respondents.

**Attitudes Toward Transportation**

In an effort to measure the respondent’s attitudes toward public transportation versus driving in a car, respondents were asked to indicate whether they “strongly agree”, “agree”, “disagree” or “strongly disagree” with three attitudinal statements. Table 13 shows that just over 40% of respondents said they feel uncomfortable driving under certain conditions (such as long distances, nighttime, or unfamiliar routes), 62.2% think they would benefit greatly from being able to get around without a car, and 44% think that government should spend more transportation money on expanding roads and highways rather than on public transit expenditures. The following table shows the percentage of respondents from the study sites and the control sites who “strongly agree” or “agree” with each statement. The larger percentage of control residents indicating that they are uncomfortable driving a car under certain conditions does not correspond with typical expectations of TOD sites versus control sites, but may relate the older average
age of respondents in the control sites. In addition, few study site respondents picked the location for transit accessibility.

Table 13. Attitudes Toward Transportation

<table>
<thead>
<tr>
<th>Study</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel uncomfortable driving a car under certain conditions, such as long distances, at nighttime, or on routes I don’t know well.</td>
<td>35.1%</td>
<td>48.0%</td>
</tr>
<tr>
<td>I and/or other members of my household would benefit greatly from being able to get around sometimes without a car.</td>
<td>68.1%</td>
<td>59.4%</td>
</tr>
<tr>
<td>The government should spend more transportation money on expanding roads and highways rather than on public transit.</td>
<td>47.2%</td>
<td>42.5%</td>
</tr>
</tbody>
</table>

Summary of Open Ended Comments

At the end of the questionnaire respondents were given an opportunity to provide any additional comments related to transportation in general. While respondents provided a wide range of responses, most of them centered on reasons why people do not use public transportation. Table 14 shows the most-often mentioned responses, provided by 15 study site respondents and 92 control site respondents:

Table 14. Open Ended Comments
General Comments (Number of mentions)

<table>
<thead>
<tr>
<th>Study</th>
<th>Control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvements and better public transportation</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>More Metrolink Stops</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>More frequent stops per bus stop</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Metrolink fare is too high, need group rates</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Add more bus stops</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Not enough buses</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Longer hours for public transportation</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Need assistance for the elderly and disabled</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

Analysis of Factors that Explain Transit Use

In this section, we examine relationships among variables that might help explain transit use.

Hypothesis #1: Respondents in the study sites are more likely to use public transportation than those in the control sites.

In order to determine if there is a difference between study site respondents and control site respondents in terms of their use of public transportation, a chi-square test of independence was conducted. The results of the chi-square were: $X^2 (1, N=718) = .014$, $p=.906$, therefore we cannot reject the null hypothesis that there are no differences between the two groups in terms of use of public transportation. This confirms that the
study sites are not fully developed TOD sites and have not yet realized significantly higher transit shares.

**Hypothesis #2: The respondents in the study group are less likely to drive alone than those in the control group.**

A chi-square test of independence was conducted to determine if there is a difference between study site respondents and control site respondents in terms of whether or not they drove alone.

The results of the chi-square are as follows: \(X^2 (1, N=718) = 8.558, p=0.003\), therefore we reject the null hypothesis that there are no differences between the two groups and report that respondents in the study group are indeed less likely to drive alone than respondents in the control group. While this result might be interpreted that the study sites are demonstrating TOD characteristics, which include walking trips, bicycle trips, as well as transit trips, the difference between the study and control groups is mostly attributable to greater carpooling trips in the study sites. Carpooling is an effective transportation mode for automobile-oriented areas and does achieve greenhouse gas reduction and energy consumption goals, but it is not traditionally considered a feature of TOD. This higher rideshare rate in the study sites is an intriguing issue that deserves further study. If multi-family housing in emerging TODs can initially produce more carpooling, that outcome supports the goal of SB 375 and is well suited to accessing the dispersed origins and destination in the Inland Empire.

**Hypothesis #3: There are differences in length of travel between control site and study site respondents in terms of overall travel, travel for work, non-work, and travel back home.**

In order to determine if there are any differences between control site respondents and study site respondents regarding the average length of the trips they took, an Independent Samples T-test of means was performed. We looked at overall trip length, and we also broke it down by trip type (work, non-work, home). We see from Table 15 (next page) that there are no significant differences between the two groups regarding the length of the trips they reported taking.
Table 15. Average Trip Length
Independent Samples Test

<table>
<thead>
<tr>
<th></th>
<th>Site</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study</td>
<td>Control</td>
<td>P-Value</td>
</tr>
<tr>
<td>Overall Trip Length</td>
<td>Mean</td>
<td>34.76</td>
<td>32.37</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>258</td>
<td>412</td>
</tr>
<tr>
<td>Work Trips</td>
<td>Mean</td>
<td>39.29</td>
<td>34.92</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>70</td>
<td>77</td>
</tr>
<tr>
<td>Non-Work Trips</td>
<td>Mean</td>
<td>32.15</td>
<td>29.48</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>130</td>
<td>274</td>
</tr>
<tr>
<td>Trips Home</td>
<td>Mean</td>
<td>35.07</td>
<td>42.67</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>57</td>
<td>60</td>
</tr>
</tbody>
</table>

Hypothesis #4: There are relationships between various demographic/lifestyle factors with auto dependency (conceptualized as percent of single occupant vehicle trips). More specifically:

- People with higher incomes have more SOV trips than those with lower incomes
- People with more cars available in their household have more SOV trips than those with fewer cars
- People who rate their neighborhood negatively as a place to walk and take transit have more SOV trips than those who rate their neighborhood more positively.
- People who reported that access to transit was an important factor in their decision to move to their current residence have fewer SOV trips than those for whom access was not mentioned as being important.
- People who live in a condo have more SOV trips than those who live in an apartment

One measure of auto dependency is the percent of SOV (single occupancy vehicle) trips taken. A new variable was created representing the percentage of time the respondent said they drove alone on the previous day (for example, someone who made two trips and said they drove alone on one of those trips was coded as 50%, someone who made three trips and said they drove alone on two of them was coded as 66.67%, someone who made one trip and drove alone is coded as 100%).

Although the prior analyses have used either chi-square or t-tests to examine relationships between variables and differences between means, a non-parametric test of association such as Spearman correlation is more appropriate to look at the relationship between percent of SOV and income and ratings of the neighborhood (which are ordinal variables) and between SOV and number of available vehicles. As seen in Table 16 below, the only factor that is significant in determining auto dependence is the number of available vehicles.
Table 16. Factors that Might Influence Auto Dependency

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Spearman’s rho</th>
<th>One-tailed P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>290</td>
<td>.022</td>
<td>.354</td>
</tr>
<tr>
<td>Number of available vehicles</td>
<td>316</td>
<td>.130</td>
<td>.010</td>
</tr>
<tr>
<td>Rate of neighborhood in terms of walking</td>
<td>317</td>
<td>.049</td>
<td>.191</td>
</tr>
<tr>
<td>Rating of neighborhood in terms of taking the bus or train</td>
<td>302</td>
<td>-.006</td>
<td>.460</td>
</tr>
</tbody>
</table>

The Mann-Whitney U test (a non-parametric test of location) was used to examine the difference between auto dependence of apartment vs. condo dwellers and those who believe access to transit was an important factor in their decision to move to their current residence vs. those who did not. The analysis showed no differences (p = .780 for the analysis of apartment vs. condo dwellers and p = .689 for the analysis of importance of access to transit).

**Hypothesis #5: People in the study sites are more likely to be younger (60 or younger) and working and those in the control sites are more likely to be over age 60 and retired.**

This test was conducted to determine if some of the differences in travel are attributable to demographic factors rather than the study/control site distinction. Before we could examine the relationship between these variables, recoding was conducted based on certain assumptions. First, age was recoded into two categories: respondents age 60 and younger, and those over the age of 60. In addition, employment status was cross-tabulated with age and recoded under the assumption that anyone over age 60 that wasn’t currently employed was retired. Therefore, our new employment variable included employed (anyone, regardless of age, who said they are employed), unemployed (those age 60 and under who said they were not currently employed), and retired (anyone over age 60 who said they are not currently employed).

As shown on Table 17, a chi-square test of independence was then run on each of these variables to see if there is a relationship between age and control vs. study site respondents, and employment status and control site vs. study site respondents.
Table 17. Chi-Square on Age and Employment Status vs. Site Location

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>df</th>
<th>Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>399</td>
<td>1</td>
<td>11.937</td>
<td>.001</td>
</tr>
<tr>
<td>Employment Status</td>
<td>399</td>
<td>2</td>
<td>23.279</td>
<td>.000</td>
</tr>
</tbody>
</table>

As we see from the table above, there is a significant relationship between age and site location and employment status and site location. Specifically, those in the study sites are more likely to be younger and employed and those in the control sites tend to be older and retired.

**Vehicle Availability/Parking Demand for Rental Housing**

The survey asked respondents to indicate number of vehicles available, which is of interest because it is the basis of parking demand. Local ordinances often use national standards, the requirements of their neighbors, and rule of thumb standards in requiring developers to provide parking for multi-family housing (Willson 2000).

The literature shows that parking demand is positively associated with income, and as a result, is likely to vary between rental and condominium units. This portion of analysis, therefore, concerns the 301 rental housing respondents.

Table 18 shows an implied parking demand of 1.45 spaces per occupied rental dwelling unit. This is somewhat higher than the often-cited Institute of Transportation Handbook rate for low/mid-rise apartments.

Table 18 Comparison of Parking Demand/Vehicle Availability per Occupied Dwelling

<table>
<thead>
<tr>
<th>Data source</th>
<th>Unit of analysis</th>
<th>Mean peak demand/vehicle availability per occupied dwelling</th>
<th>Minimum/maximum</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle availability, IE household survey, rental units (n=301)</td>
<td>Household</td>
<td>1.45 (1.32 in complex; 0.13 on-street)</td>
<td>0 - 5</td>
<td>0.77</td>
</tr>
<tr>
<td>ITE Land use 221 (19 sites across the U.S.)</td>
<td>Residential complex</td>
<td>1.2</td>
<td>0.68 - 1.94</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Most ordinances set parking requirements based on the number of bedrooms, using the logic that larger units will have more people who own vehicles. Figure 5 shows the relationships reported by rental housing respondents.

---

4 Household vehicle availability is not identical to per-unit parking occupancy counts. Household vehicle availability represents the greatest possible vehicle accumulation, but without overnight visitor parking. In contrast, occupancy counts present actual accumulation at a specific moment, which is reduced by overnight trips, night work-shifts, and off-site parking. It is likely that household vehicle availability exceeds overnight counts by a small degree because of these factors.
The patterns shown in Figure 5 are generally consistent with city standards that apply requirements on a per unit basis, albeit at lower levels. Many ordinances use a 0.5 space stepped progression in linking requirements to bedrooms; this analysis support such a practice.

The parking demand levels reported here are generally lower than minimum requirements in Inland Empire cities. Table 19 summarizes the minimum residential parking requirements for the two cities that were well represented in the sample. Over-requiring parking in multi-family housing increases the cost of development and encourages vehicle ownership and use. Willson and Roberts (2010) provide a more detailed analysis of this issue.

Table 19. Parking Requirements in Ontario and Ranch Cucamonga

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Ontario</th>
<th>Rancho Cucamonga</th>
</tr>
</thead>
<tbody>
<tr>
<td>One bedroom unit</td>
<td>1.75</td>
<td>1.5</td>
</tr>
<tr>
<td>Two bedroom unit</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Three or more bedroom unit</td>
<td>2.5</td>
<td>2</td>
</tr>
<tr>
<td>Visitor Parking</td>
<td>1 space per 4-6 units, depending on size</td>
<td>1 space per 4 units</td>
</tr>
</tbody>
</table>
Chapter 6. Conclusions, Policy Recommendations and Future Research

This study provides a benchmark for assessing future efforts to reduce automobile dependency in multi-family housing in the Inland Empire. In many ways, the Inland Empire is a region in transition from a past of single family housing and long automobile commutes to a future in which there are more housing and transportation options. In addition to fulfilling many local community goals, this transition will lessen VMT in support of SB 375.

This section outlines the key findings of the study, policy options that flow from these findings, and suggestions for future research.

Key Findings

Residents of multi-family housing in the Inland Empire are reliant on private vehicles for their work and non-work trips. To provide context, Figure 6 (next page) shows the journey-to-work mode choice results from the survey and compares them to 2006-08 American Community Survey (ACS) data for California and the counties of San Bernardino and Riverside. The tally for % SOV for all survey respondents is similar to ACS county-wide data. Note that this county-wide data is dominated by single family housing, indicating that these multi-family residents are no less dependent on SOV for work commuting. The transit share among all survey respondents is higher that county averages, however, but it appears that the transit ridership has been offset by reduced carpooling in the survey group.
The transit market itself appears to be bifurcated between bus riders, who may be more likely to be transit dependent populations making local trips and Metrolink rail riders, (more likely to be higher income and making Los Angeles and Orange County-bound trips).

Although the study group shows the highest transit share in Figure 6, the analysis did not find a statistically significant difference between the study and control groups in terms of transit use. The study group did, however, have a statistically significant lower SOV dependency than the control group. The projects in the study group, which were as close to TOD as could be identified in the Inland Empire, did not show the transit travel characteristics of mature TODs studied elsewhere in California. They do, however, perform better in terms of reduce SOV dependence.

As was noted in previous sections, the housing developments in the study group are reasonably dense, but hey lack the other d’s that hold the key to reducing VMT: diversity of land uses (most are single-use developments), pedestrian- and transit-friendly design (arterials are wide, access is focused on the automobile), destination accessibility (trip destinations are dispersed, favoring automobile use), and distance from home or work to transit (in this case, transit service is near most developments but service frequencies and connectivity is lacking). Therefore, these modest results are consistent with theory in that the sites did not meet all the criteria of successful TODs. This may change in the future as mixed-use TODs are built next to augmented transit services.
Another dimension of mode choice is the cost of travel modes. For both work and non-work trips, free parking is the norm. This practice encourages auto ownership and use. In contrast, most of those reporting a work trip indicate that employers do not help pay for transit. Accordingly, it is not just the 5 d’s mentioned above that affect these results – economic incentives for driving mean that the deck is stacked against transit, walking, and bicycling.

These results do not argue against policies for TOD in the Inland Empire – the region is just beginning a transition toward more diverse land use and transportation choices. Cities such as San Bernardino, Ontario, and Montclair are actively pursuing strategies. Plans for TOD, higher density mixed-use development, and improved transit are in place in many Inland Empire communities. Those projects will reduce SOV trips beyond these results.

The question for those responding to SB 375 mandates is how much might these new TODs reduce vehicle travel? And, how much will new transit services change travel mode choice among those living in existing developments? An order-of-magnitude check on the potential for reduction is found in the results obtained in a survey of residents along the Los Angeles County’s Metro Gold Line, which connects Pasadena and downtown Los Angeles (Lund and Willson 2005). That study area has many factors that favor transit ridership – light rail transit, frequent bus service, dense development, significant transit dependent populations, and walkable communities. In that case, residents within ¼ mile of rail stations had a 14.8% transit share, with an additional 7.5% of trips by walking and bicycling modes. TOD plans in the Inland Empire over the next 25 years include improved Metrolink service, light rail, rapid bus, and local connectors. One could conclude that these improvements, along with planned land use changes, may help the Inland Empire approach levels of transit use found along the Gold Line. While this is possible, but not assured, the Inland Empire is unlikely to exceed the Gold Line’s current rates. Therefore, SB 375 planning should be realistic about VMT reductions that are possible in the next few decades in the Inland Empire.

Policy Options

Although the focus of this study is basic research, not a policy analysis, a number of policy options has emerged in the course of analyzing the data.

First, cities can build on existing housing clusters by increasing housing density and introducing mixed use development (walkable trips for shopping, etc.). Some of the large multi-family developments studied here can be the basis for future TODs. The key is to develop a tight, walkable mixed-use cluster around improved transit service. Some cities already have plans in place for this development; they should consider streamlining and incentives to advance this development activity when the economy recovers. Cities that do not have plans should develop them now.

Second, careful site planning is important to making TODs work. This includes attention to the pedestrian realm, the ease with which developments can be served with transit, and
land use mixing. A key element is parking, which when oversupplied often degrades other travel options. Cities should lower their parking requirements if they are beyond demand levels exhibited by TODs and require that developers unbundled the cost of parking from the cost of rent.

Third, there are redevelopment opportunities around the Metrolink stations. Many of these station areas have lower intensity industrial and commercial uses, reflecting their historical roles as rail corridors. Developments in these locations can divert work trips destined for downtown Los Angeles and Orange County to transit. Many redevelopment opportunities exist around those Metrolink stations, but the lack of community features in these areas mean that comprehensive community development is required. In Orange County, there is a plan to provide 30-minute, bi-directional Metrolink service throughout the day. Such a strategy turns Metrolink more into a traditional rail service, like light or heavy rail. This is a potential for the Inland Empire that could attract non-work trips to Metrolink. An example of a mature commuter rail system that is fully integrated into walkable communities can be found on the Caltrain system that connects San Jose with downtown San Francisco.

Finally, since Metrolink or other types of rail service cannot serve the dispersed trip origins and destinations in the large geography of the Inland Empire, bus service enhancements are vital connectors to the rail backbone and for travel within the area. Bus rapid transit systems can take advantage of the large arterial system already in place; they should be supported by local shuttles that connect to individual neighborhoods. The proposed Omnitrans sbX line is an example of such a project, which links key transit generators such as downtown San Bernardino, Cal State University San Bernardino, and Loma Linda University Adventist Health Center.

**Future research**

A number of future research projects are suggested by this analysis. They include the following:

- The higher carpool rate among study group respondents deserves further investigation. A better understanding of the reasons for carpooling among this group, as derived through supplemental surveys and/or focus groups, can provide insight into whether this positive outcome can be general expected in suburban TOD developments.
- Conduct surveys of Inland Empire workplaces and retail locations concerning travel patterns. Employer surveys would be distributed through employer cooperation, while retail location surveys would be carries out using intercept surveys.
- Replicate multi-family household surveys in a decade to measure changes associated with TOD development, transit development, and SB 375 planning efforts.
- Conduct surveys and focus groups among local planners, housing developers, project lenders and investors, community groups, and property managers to
determine their willingness to consider new models for multi-family development, addressing questions such as density, mixed uses, pedestrian facilities, reduced parking requirements and unbundling. Such research would develop practical strategies for achieving the 5d’s of TOD in a manner that is realistic for market conditions in the Inland Empire.

- Conduct trip generation studies of multi-family housing complexes to determine if trip generation rates used in traffic studies are appropriate. This would be accomplished by pneumatic counters at development driveways, and would allow comparison to standard Institute of Engineers rates and other recent studies. If different rates are appropriate, they would included in traffic studies and environmental review documents for new development.
- Conduct focused studies to evaluate areas where dense, clustered development is occurring, such as the city of Ontario’s 8,200 acre New Model Colony development and the city of San Bernardino’s downtown redevelopment and TOD project. Such studies could track the factors that attract residents to these types of areas.
- Integrate the results provided here into the calibration of regional models and SB-375 modeling tools being developed by other Leonard Center researchers.

Given a twenty-year head start, more extensive transit systems, and supportive market demand, TOD in California’s urban areas is well underway and is producing good results. It is TOD in suburban areas such as the Inland Empire that requires the greatest attention in research and planning. With a realistic understanding of travel behavior of these early transit-proximate developments, plans can ensure that the greatest VMT reduction is achieved through supportive land use, site design, and transit policies and programs. Given the large share of the State’s growth that will occur in areas such as the Inland Empire, suburban TOD is vital to local visions of sustainability and the State’s SB 375 goals. This research, along with other efforts, is intended to support the process of developing land use and transit plans that are tailored to local community preference, market conditions, and transportation patterns.
References


Appendix A - Study Sites

<table>
<thead>
<tr>
<th>Study Sites</th>
<th>Address</th>
<th>City</th>
<th>Zip Code</th>
<th># of Units</th>
<th>Units/acre</th>
<th># of bus Routes</th>
<th>Headway Range</th>
<th>within 1/4 mile of ML</th>
<th>within 1/2 mile of ML</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colony Apts. at Ontario Towne Center</td>
<td>102 North Lemon Ave.</td>
<td>Ontario</td>
<td>91764</td>
<td>160</td>
<td>60.7</td>
<td>Omni - 61, 63, 80, 81, 83</td>
<td>15 - 60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>AMLI at Empire Lakes</td>
<td>9200 Milliken Ave.</td>
<td>Rancho Cucamonga</td>
<td>91730</td>
<td>521</td>
<td>27.6</td>
<td>Omni - 81</td>
<td>60 minutes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Reserve at Empire Lakes</td>
<td>11210 Fourth Street</td>
<td>Rancho Cucamonga</td>
<td>91730</td>
<td>467</td>
<td>27.2</td>
<td>Omni - 61, 81, 82</td>
<td>15 - 60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Kincaid Townhomes</td>
<td>330 East B Street</td>
<td>Ontario</td>
<td>91762</td>
<td>140</td>
<td>23.8</td>
<td>Multiple - near transcenter</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Rancho MonteVista Apartments</td>
<td>2100 West Arrow Route</td>
<td>Upland</td>
<td>91786</td>
<td>240</td>
<td>19.9</td>
<td>Multiple - near transcenter</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>College Park</td>
<td>250 College Park Drive</td>
<td>Upland</td>
<td>91786</td>
<td>448</td>
<td>17.2</td>
<td>Multiple - near transcenter</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Verano at Rancho Cucamonga</td>
<td>8200 Haven Avenue</td>
<td>Rancho Cucamonga</td>
<td>91730</td>
<td>414</td>
<td>27.6</td>
<td>Omni - 66, 82</td>
<td>15/30 - 60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Waterbrook</td>
<td>10400 Arrow Route</td>
<td>Rancho Cucamonga</td>
<td>91730</td>
<td>624</td>
<td>23.3</td>
<td>Omni - 68, 82</td>
<td>30 - 60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Ironwood &amp; Fairway Palms at Empire Lakes</td>
<td>11100 Fourth Street</td>
<td>Rancho Cucamonga</td>
<td>91730</td>
<td>496</td>
<td>22.4</td>
<td>Omni - 81, 82</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Stonegate at Towngate</td>
<td>12640 Memorial Way</td>
<td>Moreno Valley</td>
<td>92553</td>
<td>552</td>
<td>20.5</td>
<td>RTA - 11, 16, 18</td>
<td>40 - 60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Total/Average</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>4,062</strong></td>
<td><strong>27.0</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix B – Control Sites

<table>
<thead>
<tr>
<th>Control Sites</th>
<th>Address</th>
<th>City</th>
<th>Zip Code</th>
<th># of Units</th>
<th>Units/acre</th>
<th># of bus Routes</th>
<th>Headway Range</th>
<th>within 1/4 mile of Metrolink</th>
<th>within 1/2 mile of Metrolink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadstone Rancho Belago</td>
<td>27625 E. Trail Ridge Way</td>
<td>Rancho Belago</td>
<td>92555</td>
<td>236</td>
<td>34.5</td>
<td>RTA - 35, 210</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Vintage Apartment Homes</td>
<td>955 North Duesenberg Drive</td>
<td>Ontario</td>
<td>91764</td>
<td>300</td>
<td>27.8</td>
<td>Omni - 82</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>AMLI at Victoria Arbors</td>
<td>7922 Day Creek Blvd.</td>
<td>Rancho Cucamonga</td>
<td>91739</td>
<td>319</td>
<td>26.9</td>
<td>Omni - 81</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>AMLI at Day Creek</td>
<td>7828 Day Creek Blvd.</td>
<td>Rancho Cucamonga</td>
<td>91739</td>
<td>270</td>
<td>26.9</td>
<td>Omni - 81</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Landmark at Ontario Towne Center</td>
<td>950 N. Duesenberg Dr.</td>
<td>Ontario</td>
<td>91764</td>
<td>469</td>
<td>26.3</td>
<td>Omni - 82</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>The Heights (2) - across the street</td>
<td>16011 Butterfield Ranch Road</td>
<td>Chino Hills</td>
<td>91709</td>
<td>124</td>
<td>22.5</td>
<td>None</td>
<td></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>di Renzo Apartments</td>
<td>5880 Lochmoor Drive</td>
<td>Riverside</td>
<td>92507</td>
<td>158</td>
<td>22.5</td>
<td>RTA - 16</td>
<td>40 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Village Oaks</td>
<td>15773 High Knoll Dr.</td>
<td>Chino Hills</td>
<td>91709</td>
<td>280</td>
<td>21.6</td>
<td>None</td>
<td></td>
<td>No</td>
<td>No</td>
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<tr>
<td>Galleria at Towngate</td>
<td>12845 Frederick Street</td>
<td>Moreno Valley</td>
<td>92553</td>
<td>268</td>
<td>20.6</td>
<td>RTA - 11, 18</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>The Villas at Towngate</td>
<td>13120 Day Street</td>
<td>Moreno Valley</td>
<td>92553</td>
<td>394</td>
<td>20.5</td>
<td>RTA - 16</td>
<td>40 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>The Heights</td>
<td>16675 Slate Drive</td>
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<td>91709</td>
<td>208</td>
<td>20.4</td>
<td>None</td>
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<td>No</td>
<td>No</td>
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### Appendix B – Control Sites (continued)

<table>
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<tr>
<th>Control Sites</th>
<th>Address</th>
<th>City</th>
<th>Zip Code</th>
<th># of Units</th>
<th>Units/acre</th>
<th># of bus Routes</th>
<th>Headway Range</th>
<th>within 1/4 mile of Metrolink</th>
<th>within 1/2 mile of Metrolink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vista Springs Apartments</td>
<td>21550 Box Springs Rd</td>
<td>Moreno Valley</td>
<td>92557</td>
<td>212</td>
<td>20.0</td>
<td>RTA - 16</td>
<td>40 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Highland Meadows</td>
<td>12080 Pigeon Pass Rd</td>
<td>Moreno Valley</td>
<td>92557</td>
<td>360</td>
<td>19.8</td>
<td>RTA - 11, 18</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Windemere at Sycamore Highlands</td>
<td>5925 Sycamore Canyon Blvd</td>
<td>Riverside</td>
<td>92507</td>
<td>240</td>
<td>19.0</td>
<td>RTA - 16</td>
<td>40 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>CastleRock</td>
<td>5700 Lochmoor Drive</td>
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<td>92507</td>
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<td>18.5</td>
<td>RTA - 16</td>
<td>40 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Colonnade at Sycamore Highlands</td>
<td>5880 Fair Isle Drive</td>
<td>Riverside</td>
<td>92507</td>
<td>288</td>
<td>18.0</td>
<td>RTA - 16</td>
<td>40 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Tuscany Hills</td>
<td>21012 Box Springs Rd</td>
<td>Moreno Valley</td>
<td>92557</td>
<td>144</td>
<td>17.8</td>
<td>RTA - 16</td>
<td>40 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Mission Grove Park</td>
<td>7450 Northrop Drive</td>
<td>Riverside</td>
<td>92508</td>
<td>432</td>
<td>16.6</td>
<td>RTA - 20</td>
<td>50 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>El Dorado Point</td>
<td>12159 Calle Sombra</td>
<td>Moreno Valley</td>
<td>92557</td>
<td>330</td>
<td>15.4</td>
<td>RTA - 11</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Broadstone River’s Edge</td>
<td>2088 Lakeshore Drive</td>
<td>Lake Elsinore</td>
<td>92530</td>
<td>184</td>
<td>15.1</td>
<td>RTA - 7, 8</td>
<td>50-55 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Broadstone Vesada</td>
<td>3390 Country Village Road</td>
<td>Riverside</td>
<td>92509</td>
<td>261</td>
<td>15.0</td>
<td>RTA - 21, 49</td>
<td>65-70 minutes</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Broadstone Overlook Apartments</td>
<td>12963 Moreno Beach Drive</td>
<td>Moreno Valley</td>
<td>92555</td>
<td>246</td>
<td>13.3</td>
<td>RTA - 35, 210</td>
<td>60 minutes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Total/Average</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>5,759</strong></td>
<td><strong>20.9</strong></td>
<td></td>
<td></td>
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</table>
Appendix C - 2010 TOD Telephone Survey

SHELLO Hello, I am calling from the Institute of Applied Research at Cal State San Bernardino. We’re conducting a scientific study of quality of life relative to transportation and traffic, and we need the input of the head of the household or his or her partner. Have I reached [READ PHONE # FROM SCREEN]?

1. CONTINUE
2. DISPOSITION SCREEN

SHELLO2 (used only to complete a survey already started)

Have I reached [READ PHONE NUMBER]? Hello, this is ______________, calling from the Institute of Applied Research at CSU San Bernardino. Recently, we started an interview with the [MALE/FEMALE] head of the household and I’m calling back to complete that interview. Is that person available?

SPAN INTERVIEWER: PLEASE CODE WHICH LANGUAGE THE INTERVIEW WILL BE CONDUCTED IN:

1. ENGLISH
2. SPANISH

SHEAD Are you that person?

1. Yes [SKIP TO INTRO]
2. No [CONTINUE]
3. DON’T KNOW/NO RESPONSE
4. REFUSED

SHEAD2 Is the head of the household or his or her partner at home?

1. Yes [SKIP TO INTRO]
2. No [CONTINUE]
3. DON’T KNOW/NO RESPONSE
4. REFUSED

CALLBK Is there a better time I could call back to reach the head of the household?

1. Yes [SKIP TO APPT]
2. No [ENDQUEST]

APART We are targeting residents who live within an apartment or condo, do you live in an apartment or a condo?

{INTERVIEWER: ATTACHED UNITS IS WHAT WE ARE LOOKING FOR 3/25}

1. Apartment
2. Condo/ Town House
3. NEITHER (Ex: single home, mobile home)
9. REFUSED

IF (ANS > 2) ENDQUEST

INTRO This survey takes about 10 minutes to complete, and your answers may be used by transportation officials to better understand travel behavior and to shape transportation policies in the Inland Empire. And to thank you for your participation, you will be entered into a drawing for a gift card of up to $200. Your identity and your responses will remain completely confidential, and of course, you are free to decline to answer any particular survey question. I should also mention that this call may be monitored by my supervisor for quality control purposes only.

Is it alright to ask you these questions now?

1. Yes [CONTINUE]
2. No [SKIP TO APPT]
AGEQAL First, I’d like to verify that you are at least 18 years of age.
1. Yes [SKIP TO BEGIN]
2. No

QSORRY I’m sorry, but currently we are interviewing people 18 years of age and older. Thank you for your time. [ENDQUEST]

APPT Is it possible to make an appointment to ask you the survey questions at a more convenient time?
1. Yes (SPECIFY) __________________
2. No [ENDQUEST]

BEGIN I’d like to begin by asking you some general questions.

[Interviewers: Press any key to continue]

Q1. What city do you live in?
1. CHINO HILLS
2. CLAREMONT
3. LAKE ELSINORE
4. MORENO VALLEY
5. ONTARIO
6. RANCHO BELAGO
7. RANCHO CUCAMONGA
8. RIVERSIDE
9. UPLAND
10. OTHER [STAY IN JUST INCASE CONDO ACROSS THE STREET CHANGES CITY]
LIKE IN MV ONE SIDE APARTMENT IS MV OTHER IS RIVERSIDE
98. DON’T KNOW/REFUSED [TERMINATE CALL]

Q2. What is your zip code?
ZIP CODE: __________________________
99998. DON’T KNOW
99999. REFUSED

Q3. Including yourself, how many people live in your household?
NUMBER ______

998. DON’T KNOW
999. REFUSED

Q4. Again including yourself, how many are 16 years or older?
NUMBER ______

DON’T KNOW [ENTER 998]
REFUSED [ENTER 999]
Q5. How many motorized vehicle(s) are available for use by members of your household?

[INTERVIEWER: IF RESPONDENT ASKS WHETHER TO INCLUDE “STORED” OR NON-WORKING ONES, SAY “YES”]

ENTER NUMBER ______ IF NUMBER = 0, 98, OR 99 SKIP TO Q7

DON’T KNOW [ENTER 98]

REFUSED [ENTER 99]

Q6INTRO. The next few questions deal with where you typically park your vehicle(s) at your residence. WE NEED TO KNOW WHERE THEY TYPICALLY PARK

Q6A1 [IF Q5 = 1] Do you park a vehicle in a private garage assigned to your unit?
1. YES SKIP TO Q7
0. NO CONTINUE WITH Q6B1

[INTERVIEWER USES 1 FOR YES AND 2 FOR NO, AFTER THE FIRST 10 WE ADDED THE 2 FOR NO, WE LEFT THE 0 ALSO]

9. REFUSED (ONLY USE THIS IF THEY REFUSE TO TELL YOU WHERE THEY PARK THEIR CARS) ADDED AFTER THE FIRST 10 SURVEYS.

Q6A2 [IF Q5 > 1] How many of your vehicles do you park in a private garage assigned to your unit?

NUMBER__________

COUNTER = COUNTER + NUMBER. IF COUNTER = VALUE FROM Q5, SKIP TO Q7

Q6B1. [IF Q5 = 1] Do you park in a shared garage or outdoor lot in your development?
1. YES SKIP TO Q7
0. NO CONTINUE WITH Q6C1

Q6B2 [IF Q5 > 1] How many of your vehicles do you park in an assigned space in a shared parking area?

NUMBER__________

COUNTER = COUNTER + NUMBER. IF COUNTER = VALUE FROM Q5, SKIP TO Q7

Q6C1. [IF Q5 = 1] Do you park on the street?

1. YES
0. NO

9. REFUSED (ONLY USE THIS IF THEY REFUSE TO TELLYOU WHERE THEY PARK THEIR CARS.)

Q6C2 [IF Q5 > 1] How many of your vehicles do you park on the street?

NUMBER__________

COUNTER = COUNTER + NUMBER. IF COUNTER = VALUE FROM Q5, SKIP TO Q7

Q7. How many bedrooms do you have in your unit?

1. STUDIO APARTMENT
2. 1 BEDROOM
3. 2 BEDROOMS
4. 3 OR MORE BEDROOMS
9. REFUSED
Q8. Are you currently employed?
1. YES    CONTINUE
2. NO     SKIP TO Q11
9. REFUSED  SKIP TO Q11

Q9. Do you work outside your place of residence?
1. YES
2. NO, I WORK FROM HOME  SKIP TO Q11
9. REFUSED

Q10. What is your work zip code?
1. WORK ZIP CODE: ___________________________
2. CITY IF THEY DO NOT KNOW THE ZIP CODE
8. DON’T KNOW
9. REFUSED

Q11. Are you currently enrolled in school?
1. YES    CONTINUE
2. NO     SKIP TO Q13
9. REFUSED  SKIP TO Q13

Q12. Are you enrolled in an on-line program to take courses at home?
1. YES
2. NO
9. REFUSED

Q13. In what year did you move to your current residence?
YEAR: __________

DON’T KNOW [ENTER 9998]
REFUSED [ENTER 9999]

Q14. There are various reasons that people may choose to live in a certain location. I’m going to read you a list of some of these reasons and I’d like you to tell me whether each was important in deciding to move to your current residence. [INTERVIEWER: READ THE RESPONSES AND SELECT IF THEY SAY “YES”] – CHECK ALL THAT APPLY
   ___ 1. Cost of housing
   ___ 2. Type or quality of housing
   ___ 3. Quality of local schools
   ___ 4. Quality of neighborhood
   ___ 5. Close to job
   ___ 6. Access to shops & services
   ___ 7. Access to transit
   ___ 8. Access to highway
9. Recreational opportunities
10. Other (Specify) __________________
11. DON’T KNOW
12. REFUSED

Q15. Of the reasons I just read, which was the MOST important to you in deciding to move to your current residence?
1. COST OF HOUSING
2. TYPE OR QUALITY OF HOUSING
3. QUALITY OF LOCAL SCHOOLS
4. QUALITY OF NEIGHBORHOOD
5. CLOSE TO JOB
6. ACCESS TO SHOPS & SERVICES
7. ACCESS TO TRANSIT
8. ACCESS TO HIGHWAY
9. RECREATIONAL OPPORTUNITIES
10. OTHER (SPECIFY) __________________
11. DON’T KNOW
12. REFUSED

Q16. On a scale of 1 to 5 with 1 being poor and 5 being excellent, how would you rate your neighborhood as a place for people to walk to destinations? In answering, think about things such as closeness of destinations, safety, and a nice street environment.
1. POOR
2. 2
3. 3
4. 4
5. EXCELLENT
8. DON’T KNOW
9. REFUSED

Q17. Using the same 1 to 5 scale with 1 being poor and 5 being excellent, how would you rate your neighborhood as a place for people to take buses or trains? In answering, think about things such as access to destinations, frequency of buses or trains, ease of reaching a bus stop or metro station, and safety.
1. POOR
2. 2
3. 3
4. 4
5. EXCELLENT
8. DON’T KNOW
9. REFUSED

TRAVELDAY Now I’m going to ask you a series of questions regarding your travel on [INTERVIEWER LOOK AT THE DATE ON THE WHITE BOARD]
[NOTE TO INTERVIEWERS: EACH LEG OF THE TRIP IS CONSIDERED A “TRIP”. SO HOME TO WORK IS A TRIP, WORK TO SHOPPING IS A TRIP, SHOPPING TO A FRIENDS HOUSE IS A TRIP…]

Q18a. On that day, how many trips did you make? (RECORD UP TO THREE) _______

[IF Q18A = 0 SKIP TO QXXXXXXXX] EACH DESTINATION IS CONSIDERED ONE TRIP
1. ONE TRIP
2. TWO TRIPS
3. THREE TRIPS
4. NO TRIPS
8. DON’T KNOW
9. REFUSED

Q18a1. [IF Q18A > 1] Think about the first trip you made. What time did you leave?

INTERVIEWER: RECORD IN MILITARY TIME. REFER TO FALLBACK SHEET FOR TIME CONVERSION.

TIME: ___________

DON’T KNOW [ENTER 9998]
REFUSED [ENTER 9999]

Q18b1. What time did you arrive at your destination?

INTERVIEWER: RECORD IN MILITARY TIME. REFER TO FALLBACK SHEET FOR TIME CONVERSION.

TIME: ___________

DON’T KNOW [ENTER 9998]
REFUSED [ENTER 9999]

Q18c1. What was the main purpose of this trip?
1. GO TO WORK
2. GO TO SCHOOL
3. SHOPPING
4. MEAL OR SNACK
5. PICK UP/DROP OFF FAMILY
6. OTHER ERRANDS
7. VISIT FRIENDS & FAMILY MEMBERS
8. RECREATIONAL
9. MEDICAL APPOINTMENT
10. OTHER
11. GO HOME
98. DON’T KNOW
99. REFUSED

Q18d1. What was your primary means of travel/transportation?
1. DROVE ALONE
2. CARPOOLED
3. RODE RAIL TRANSIT (METROLINK)
4. RODE BUS
5. BICYCLED
6. WALKED
7. OTHER (SPECIFY) ______________
8. DON’T KNOW
9. REFUSED

Q18e1. What was the zip code you left from?
1. ZIP CODE: ______________
2. ONLY KNOW CITY…SPECIFY
8. DON’T KNOW
9. REFUSED

Q18f1. What was the zip code of your destination?
1. ZIP CODE: ______________
2. ONLY KNOW CITY…SPECIFY
8. DON’T KNOW
9. REFUSED

Q18g1. Which of the following best describes the parking at your destination? Would you say it was…..
1. Free and easy to find,
2. Free but limited,
3. Paid hourly or daily, or
4. Paid monthly?
5. Quarterly
6. Annual
7. OTHER (SPECIFY) ______________
8. DON’T KNOW
9. REFUSED

IF Q18a = 1, SKIPTO TRANS3

Q19a1. OK, now I have those same questions for the second trip you took that day. What time did you leave?
INTERVIEWER: RECORD IN MILITARY TIME. REFER TO FALLBACK SHEET FOR TIME CONVERSION.
TIME: ___________

DON’T KNOW [ENTER 9998]
REFUSED [ENTER 9999]

Q19b1. What time did you arrive?
INTERVIEWER: RECORD IN MILITARY TIME. REFER TO FALLBACK SHEET FOR TIME CONVERSION.
Q19c1. What was the main purpose of this trip?
1. GO TO WORK
2. GO TO SCHOOL
3. SHOPPING
4. MEAL OR SNACK
5. PICK UP/DROP OFF FAMILY
6. OTHER ERRANDS
7. VISIT FRIENDS OR FAMILY
8. RECREATIONAL
9. MEDICAL REASONS
10. OTHER
11. GO HOME
98. DON’T KNOW
99. REFUSED

Q19d1. What was your primary means of travel/transportation?
1. DROVE ALONE
2. CARPOOLED
3. RODE RAIL TRANSIT (METROLINK)
4. RODE BUS
5. BICYCLED
6. WALKED
7. OTHER (SPECIFY) ___________________
8. DON’T KNOW
9. REFUSED

Q19e1. What was the zip code you left from?
1. ZIP CODE: ______________________
2. City (IF THEY ONLY KNOW CITY…SPECIFY
8. DON’T KNOW
9. REFUSED [ENTER 99999]

Q19f1. What was the zip code of your destination?
1. ZIP CODE: ______________________
2. ONLY KNOW CITY…SPECIFY
8. DON’T KNOW
9. REFUSED

Q19g1. Which of the following best describes the parking at your destination? Would you say it was…..
1. Free and easy to find,
2. Free but limited,
3. Paid hourly or daily, or
4. Paid monthly?
5. Quarterly
6. Annual
7. OTHER (SPECIFY) ______________
8. DON’T KNOW
9. REFUSED

IF Q18a = 2, SKIPTO TRANS3

Q20a1. And finally I have those same questions for a third trip of that day. If you haven’t already told me about a trip for work or school, this would be the time to do it. So for trip #3, What time did you leave?
INTERVIEWER: RECORD IN MILITARY TIME. REFER TO FALLBACK SHEET FOR TIME CONVERSION.
TIME: ___________
DON’T KNOW [ENTER 9998]
REFUSED [ENTER 9999]

Q20b1. What time did you arrive?
INTERVIEWER: RECORD IN MILITARY TIME. REFER TO FALLBACK SHEET FOR TIME CONVERSION.
TIME: ___________
DON’T KNOW [ENTER 9998]
REFUSED [ENTER 9999]

Q20c1. What was the main purpose of this trip?
1. GO TO WORK
2. GO TO SCHOOL
3. SHOPPING
4. MEAL OR SNACK
5. PICK UP/DROP OFF CHILD(REN)
6. OTHER ERRANDS
7. VISIT FRIENDS/FAMILY MEMBERS
8. RECREATIONAL
9. MEDICAL REASONS
10. OTHER
98. DON’T KNOW
99. REFUSED

Q20d1. What was your primary means of travel/transportation?
1. DROVE ALONE
2. CARPOOLED
3. RODE RAIL TRANSIT (METROLINK)
4. RODE BUS
5. BICYCLED
6. WALKED
7. OTHER (SPECIFY) ______________________
8. DON’T KNOW
9. REFUSED

Q20e1. What was the zip code you left from?
1. ZIP CODE: ______________________
2. ONLY KNOW CITY…SPECIFY
8. DON’T KNOW
9. REFUSED

Q20f1. What was the zip code of your destination?
1. ZIP CODE: ______________________
2. ONLY KNOW CITY…SPECIFY
8. DON’T KNOW
9. REFUSED

Q20g1. Which of the following best describes the parking at your destination? Would you say it was…..
1. Free and easy to find,
2. Free but limited,
3. Paid hourly or daily, or
4. Paid monthly?
5. Quarterly
6. Annual
7. OTHER (SPECIFY) ______________________
8. DON’T KNOW
9. REFUSED

ONLY ASK THE FOLLOWING QUESTIONS IF RESPONDENT WORKS OUTSIDE THE HOME (IF Q8 > 1) SKIPTO TRANS4 AND IF (Q9 > 1) SKIPTO TRANS4

TRANS3: Thank you…we’re done with the hard part. These next few questions focus on your commute to work.
IF (Q8 > 1) SKIPTO TRANS4
IF (Q9 > 1) SKIPTO TRANS4

Q21a. Does your employer allow you to work flexible hours?
1. YES
2. NO
3. AT TIMES
8. DON’T KNOW
9. REFUSED

Q21b. Does your employer allow you to work from home?
1. YES
2. NO
3. AT TIMES
8. DON’T KNOW
Q21c. Does your employer provide a car for use during the day?
1. YES
2. NO
3. IF NEED BE
8. DON’T KNOW
9. REFUSED

Q21d. Does your employer provide free parking?
1. YES
2. NO
8. DON’T KNOW
9. REFUSED

Q21e. Do they help pay for transit?
1. YES
2. NO
8. DON’T KNOW
9. REFUSED

Q21f. Do they help pay for tolls, fuel or other commuting costs?
1. YES
2. NO
8. DON’T KNOW
9. REFUSED

Q22. On average, how often do you use bus or rail to commute to work or school? Would you say you use it…?
1. Every day,[5 DAYS A WEEK OR MORE]
2. Two to three times a week,
3. Once a week,
4. Once a month,
5. Rarely, or
6. Never
8. DON’T KNOW
9. REFUSED

TRANS4: I'm going to read you a few statements regarding people's attitudes about transportation. For each of the following statements, please tell me whether you Strongly Agree, Agree, Disagree, or Strongly Disagree.

Q23. Here’s the first statement……I feel uncomfortable driving a car under certain conditions, such as long distances, at nighttime, or on routes I don’t know well. [INTERVIEWER PROMPT ONLY IF NECESSARY WITH “DO YOU…”]
1. Strongly Agree
2. Agree
3. Disagree
4. Strongly Disagree
7. NEITHER AGREE OR DISAGREE
8. DON’T KNOW
9. REFUSED

Q24. I and/or other members of my household would benefit greatly from being able to get around sometimes without a car. [INTERVIEWER: ONLY IF NECESSARY, PROMPT WITH “DO YOU STRONGLY AGREE, AGREE, DISAGREE, OR STRONGLY DISAGREE?”]
   1. Strongly Agree
   2. Agree
   3. Disagree
   4. Strongly Disagree
   5. NEITHER AGREE OR DISAGREE
   7. DON’T KNOW
   8. REFUSED

Q25. The government should spend more transportation money on expanding roads and highways rather than on public transit. [INTERVIEWER: ONLY IF NECESSARY, PROMPT WITH “DO YOU STRONGLY AGREE, AGREE, DISAGREE, OR STRONGLY DISAGREE?”]
   1. Strongly Agree
   2. Agree
   3. Disagree
   4. Strongly Disagree
   7. NEITHER AGREE OR DISAGREE
   8. DON’T KNOW
   9. REFUSED

DEMOG: And now I have a few last questions about you and your background, and then we’re done.

D1. What was your age at your last birthday?
   AGE: ____________
   DON’T KNOW [ENTER 998]
   REFUSED [ENTER 999]

D2. How would you describe your race or ethnicity?
   [SELECT ALL THAT APPLY]
   ___ AFRICAN AMERICAN
   ___ AMERICAN INDIAN
   ___ PACIFIC ISLANDER
   ___ HISPANIC
   ___ WHITE
   ___ ASIAN
   ___ OTHER (SPECIFY) ______________________
   ___ DON’T KNOW
   ___ REFUSED
   IF (Q8 >1) SKIPTO D4

D3. [ASK ONLY IF Q8 = 1] What is your current occupation?
1. Accounting/Financial
2. Clerical/Secretarial
3. Manager/Administrator
4. Craftsman
5. Laborer
6. Sales
7. Service
8. Professional
9. Other (Specify) _______________________
10. Medical Field (Nurse, Doctor, Dentist)
98. DON’T KNOW
99. REFUSED

D4. Which of the following best describes your annual household income, after taxes for 2009?
1. $15,000 or less
2. $15,001 to $30,000
3. $30,001 to $45,000
4. $45,001 to $60,000
5. $60,001 to $75,000
6. $75,001 to $100,000
7. $100,001 to $150,000
8. $150,001 and over
98. DON’T KNOW
99. REFUSED

COMMENTS: Do you have any other comments about transportation that we haven’t covered?
1. COMMENTS
2. NO COMMENTS

END Thank you for your time and assistance. If you win one of the gift cards I will be calling you no later than the end of April at this phone number to let you know.

[INTERVIEWER: IF ADDRESS IS FILLED IN USE "TO CONFIRM" IF NO ADDRESS DO NOT READ THOSE WORDS]
With this specialized survey we need (to confirm) your street address is __________________________________ to determine the distance between your address and a transit stop.

1. CORRECT
2. WHAT IS THE CORRECT ADDRESS
3. WHAT ARE THE CROSS STREETS
9. REFUSED

Well, that's it. Thank you very much for your time - we appreciate it.

INTERVIEWER QUESTIONS
GENDER The respondent was...
1. Male
2. Female
3. Couldn't tell

COOP How cooperative was the respondent?
1. Cooperative
2. Uncooperative
3. Very Uncooperative

UNDSTD How well did the respondent understand the questions?
1. Very easily
2. Easily
3. Some difficulty
4. Great deal of difficulty

LNG In what language was the interview conducted?
1. English
2. Spanish

NAME Interviewer name?
Appendix D – Mail-Back Questionnaire

**Information on your Household**

Do you live in an apartment or condo/townhouse?   ____ Apartment    ____

Condo/Townhouse

What city do you live in? ___________________________   Zip code________________

How many bedrooms do you have in your unit?  ____ Studio   ____ One   ____ Two

____ Three or more

Including yourself, how many people live in your household? _____________   How many are age 16 or older? __________

How many motorized vehicles are available for use by members of your household?

___________

**Information on your Vehicles**

For each of the vehicles in your household, please check off where it is typically parked at your residence

<table>
<thead>
<tr>
<th>Vehicle #1</th>
<th>Vehicle #2</th>
<th>Vehicle #3</th>
<th>Vehicle #4</th>
<th>Vehicle #5</th>
<th>Vehicle #6</th>
</tr>
</thead>
<tbody>
<tr>
<td>A private garage assigned to your unit</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>A shared garage or outdoor lot in your development</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>On the street</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

**Information on your Place of Work/School**

Are you currently employed?   ____ Yes   ____ No

Do you work or go to school outside your place of residence?   ____ Yes   ____ No   ____ No, I work from home

What is your work zip code?   __________

Are you currently enrolled in school?   ____ Yes   ____ No

Are you enrolled in an on-line program to take courses at home?   ____ Yes   ____ No

**Information on your Place of Residence**

In what year did you move into your current residence? ______________________

When deciding to move to your current residence, what were the three (3) most important factors? (Place a 1 next to the most important, a 2 next to the second most important and a 3 next to the third most important):

____ cost of housing     ____ type or quality of housing    ____ quality of local schools

____ quality of neighborhood
___ close to job            ___ access to shops, services            ___ access to transit
___ access to highway
___ recreational opportunities
___ safety
___ other (specify) _______________________

Using a scale of 1 to 5 (with 1 being poor and 5 being excellent), how would you rate your neighborhood as a place for people to walk to destinations? In answering, think about things such as closeness of destinations, safety, and a nice street environment. (circle your answer)
(poor) 1   2  3  4  5 (excellent)

Using the same 1 to 5 scale, how would you rate your neighborhood as a place for people to take buses or trains? In answering, think about things such as access to destinations, frequency of buses or trains, ease of reaching a bus stop or metro station, and safety. (circle your answer)
(poor) 1   2  3  4  5 (excellent)

Information on Commuting

Does your employer… (check all that apply)
____ allow you to work flexible hours   ____ allow you to work from home   ____ provide a car for use during the day
____ provide free parking   ____ help pay for transit   ____ help pay for tolls, fuel or other commuting costs

On average how often do you use transit (bus or rail) to commute to work or school?
_____everyday _____ 2-3 times a week _____ once a week _____ once a month _____ rarely _____ never

Attitudes Toward Transportation Options
Please check the response that best represents your opinion to the following statements

I feel uncomfortable driving a car under certain conditions, such as long distances, at nighttime, or on routes I don’t know well.
___ strongly agree        ___agree      ___disagree      __strongly disagree       ___neither

I and/or other members of my household would benefit greatly from being able to get around sometimes without a car.
___ strongly agree        ___agree      ___disagree      __strongly disagree       ___neither

Continue on back

The government should spend more transportation money on expanding roads and highways rather than on public transit.
___ strongly agree        ___agree      ___disagree      __strongly disagree       ___neither

Information on Travel
Please provide travel information on the **THREE MAIN TRIPS** you made on the **prior business day from today**, the day you are filling out the survey. Note that a trip refers to **one direction** of travel (for instance, from home to work, or home to grocery store or home to drop family off is one trip…to return home is a second trip). If you did not make three main trips, please provide the information for the trips you did make. Please record the **DATE** of travel: ____________________, 2010

<table>
<thead>
<tr>
<th>Trip #1</th>
<th>Trip #2</th>
<th>Trip #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time you left (circle a.m. or p.m.)</td>
<td>Time you arrived (circle a.m. or p.m.)</td>
<td>Time you left (circle a.m. or p.m.)</td>
</tr>
<tr>
<td>________ a.m. / p.m.</td>
<td>________ a.m. / p.m.</td>
<td>________ a.m. / p.m.</td>
</tr>
</tbody>
</table>

**Primary trip purpose (check one)**
- Go to work [ ] [ ] [ ]
- Go to school [ ] [ ] [ ]
- Shopping [ ] [ ] [ ]
- Meal or a snack [ ] [ ] [ ]
- Pick up / drop off family [ ] [ ] [ ]
- Other errands [ ] [ ] [ ]
- Visit friends or family members [ ] [ ] [ ]
- Recreational [ ] [ ] [ ]
- Medical reasons / appointment [ ] [ ] [ ]
- Other (please specify) [ ] [ ] [ ]

**Return home [ ] [ ] [ ]

**Primary means of travel (check one)**
- Drove alone [ ] [ ] [ ]
- Carpoaled [ ] [ ] [ ]
- Rode rail transit (Metrolink) [ ] [ ] [ ]
- Rode bus [ ] [ ] [ ]
- Bicycled [ ] [ ] [ ]
- Walked [ ] [ ] [ ]
- Other (please specify) [ ] [ ] [ ]

**Origin (where you left from)**
- City [ ] [ ] [ ]
- Zip Code [ ] [ ] [ ]

**Destination (where you went to)**
- City [ ] [ ] [ ]
- Zip Code [ ] [ ] [ ]

**Parking at Destination**
Background Information
The following information is valuable to the success of this study. We appreciate any answers you can provide, and assure you that this information will be kept confidential.

Age at your last birthday: ______ Gender: ___Male ___Female

Race or Ethnicity:
___African American ___American Indian ___Pacific Islander ___Hispanic
___White ___Asian ___Other (please specify)_____________________________

Current Occupation:
___Accounting/Financial ___Clerical/Secretarial ___Manager/Administrator
___Craftsman ___Laborer ___Sales ___Service ___Professional ___Medical Field
___Education/Teacher ___Legal/Law Enforcement ___Other (please specify)_________________

Approximate Household Income after taxes:
___$15,000 or less ___$15,001 - $30,000 ___$30,001 - $45,000 ___$45,001 - $60,000
___$60,001-$75,000 ___$75,001 - $100,000 ___$100,001 - $150,000 ___$150,001 and over