



LAVTA Comprehensive Operational Analysis

Existing Conditions Report

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1 INTRODUCTION

OVERVIEW

The Livermore Amador Valley Transit Authority (LAVTA) has embarked on a Comprehensive Operational Analysis (COA) to improve the effectiveness and efficiency of the existing Wheels service as well as to provide a roadmap for future service investments. This memo summarizes existing conditions for LAVTA transit operations including an analysis of demographic data, an on-board survey, and available ridership and on-time performance data to assess transit performance at the system, route, and route segment levels.

The analysis of system performance is designed to help understand how LAVTA can achieve the following goals:

- Improve ridership and efficiency: the COA will look to build ridership systemwide and improve the performance of routes that are not meeting productivity or farebox recovery targets.
- Evaluate whether service levels are matched to demand: A key component of the service alternatives developed as part of the COA will be to identify service approaches that meet the mobility needs of residents in low-density areas, which may not be served effectively by traditional fixed-route transit.
- Identify key causes of on-time performance issues: LAVTA service performs below the 90% on-time target. The on-time performance analysis will identify routes, segments, and time periods with significant on-time performance issues, which will be utilized in a subsequent scheduling efficiency task to adjust scheduled running times as necessary.

Report Structure

This existing conditions report summarizes the existing LAVTA system and will serve as a foundation for subsequent phases of the Comprehensive Operational Analysis study. The following chapters are included:

- Chapter 2 – Market Analysis
- Chapter 3 – On-Board Survey
- Chapter 4 – LAVTA Bus System Overview
- Chapter 5 – Evaluation of Existing LAVTA Bus Routes
- Appendix A – LAVTA Bus Route Boarding and Alighting Maps
- Appendix B – LAVTA Route Report Cards

2 MARKET ANALYSIS

OVERVIEW

This section focuses on a series of maps that help better understand how the geographic areas in the LAVTA service area differ in terms of characteristics that affect transit usage. The evaluation includes the following characteristics and is based on the 2010 US Census, 2013 American Community Survey (ACS), and 2011 Longitudinal Employer-Household Dynamics (LEHD):

- Population density
- Employment density
- Tenure (rental households)
- Households without access to a vehicle
- People below poverty
- Senior population (65 and over)
- College-aged population (18-24)

The analysis also developed averages for the service area, which are based on all census blocks or block groups within a half mile of LAVTA services. Additionally, a Transit Dependency Index was created, which assigns scores to block groups based on the combined density of persons in poverty, rental households, seniors aged 65 and above, young adults aged 18-24, and zero vehicle households.

DEMOGRAPHIC ANALYSIS

Public transportation is most efficient when it connects population and employment centers where people can easily walk to and from bus stops. The reach of transit is generally limited to within $\frac{1}{4}$ to $\frac{1}{2}$ mile of the transit line (depending on the built environment), or a 10-minute walk, and thus the size of the travel market is directly related to the density of population and employment in that area. The average population per census block in the service area is 53 persons, or an average population density of 4,646 persons per square mile. As shown below in Figure 1, there are numerous areas with relatively high population density, including parts of Dublin north of I-580, parts of Pleasanton east of I-680, and much of Livermore and Springtown. However, one of the challenges of the service area is the large expanses of sparsely populated areas between population centers and the major barriers that divide residential development (primarily major freeways and other roadways) making efficient transit routing more challenging.

Employment density is shown in Figure 2. Employment clusters are scattered throughout the Wheels service area, and the locations with the highest density include Lawrence Livermore National Laboratory, Stoneridge Mall and the surrounding area, the Bernal Corporate Park, downtown Livermore, and office and medical facilities in north Pleasanton.

The prevalence and density of rental households is another important factor in determining potential transit use, as transit ridership is typically higher in areas with a high percentage of renters. On average, 177 persons per square mile in the service area live in rental households; this is also equivalent to 28% of the average census block population. As can be seen in Figure 3, areas with above-average density of rental households include the area near the Stoneridge Shopping Center, Pleasanton near the Tassajara Creek, south Pleasanton, west Livermore, and in Livermore immediately adjacent to the Lawrence Livermore National Laboratory where several apartment complexes are located.

For self-evident reasons, individuals without access to a vehicle represent a particularly strong market for transit. In some cases, individuals do not have access to an automobile for health, financial, or legal reasons, while others simply choose to live car-free. On average, 62 households per square mile do not own a vehicle. The census block south of Stanley Boulevard in Livermore has the highest density of households without a vehicle (see Figure 4), with the surrounding area of Livermore and Pleasanton east of 1st Street and south of Arroyo Valley also relatively dense. Overall the census blocks with low vehicle ownership closely mirror those with high rental densities.

Poverty status is another strong indicator of a higher-than-average propensity to use transit because as income falls, the cost of owning and using a private vehicle becomes more burdensome, which makes transit a more attractive option. This analysis used the Census classification of poverty status to identify those living below the federal poverty line. Since disposable income is largely a factor of household size and household income, the Census considers household income and the number of members in the household in classifying a household as in poverty or not. On average, 318 persons per square mile, or 5% of a census block's population, is below poverty. This is relatively low and may indicate relatively limited transit-reliance in the service area. As can be seen below in Figure 5, census blocks with above average population living in poverty are located along Bernal Avenue in Pleasanton, south of Stanley Boulevard in west Livermore, and in central Livermore.

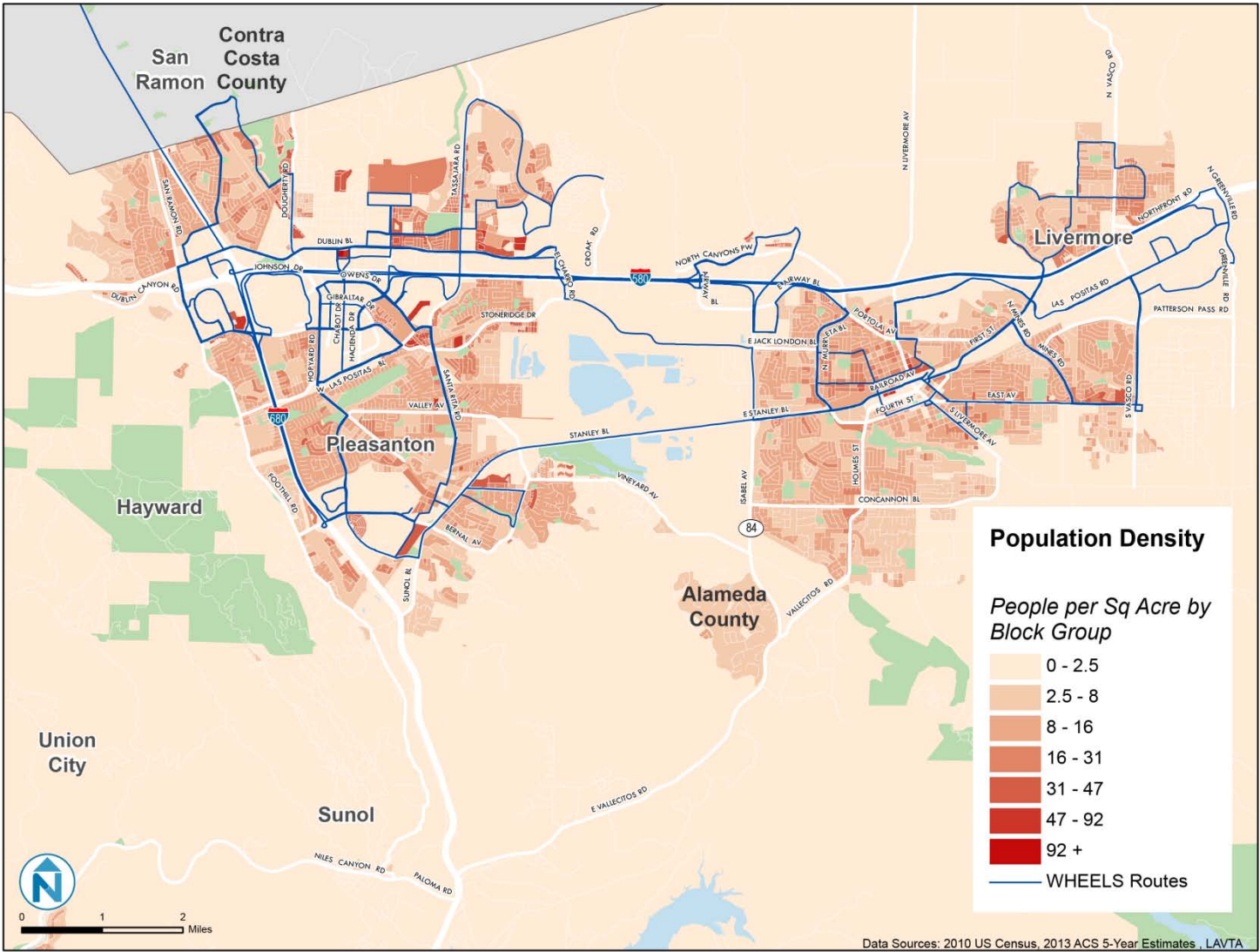
Older adults (65 and older) are an important transit ridership group since seniors may have limited mobility on foot and may not be able to drive. Many seniors are retirees, and as a result, take fewer daily trips. Transit provides an important option for this population to remain as active and independent as possible, and to age in place. On average, seniors make up 6% of a census block's population within a half-mile of transit service. This is an average of 428 seniors per square mile. As shown in Figure 6, high densities of older adults can be found where there are numerous senior housing complexes, such as west of the intersection of Sunol Boulevard and Bernal Avenue and north of Vineyard Avenue in Pleasanton, as well as scattered throughout Livermore.

College-aged youth (18-24) are also an important transit demographic since many are students who may not own a vehicle for financial or other reasons, or may prefer transit to driving. This demographic is also increasingly seeking alternative transportation options beyond the automobile. On average, 327 persons per square mile or 4% of a census block is composed of college-aged individuals (Figure 7). The largest concentration of youth population in the LAVTA service area is located at the Santa Rita Jail in Dublin. Other heavy concentrations are mostly found at apartment developments located throughout the service area. Youth density is comparatively low in Pleasanton and denser in central Livermore north of Railroad Avenue and along East Avenue.

Figure 8 shows the Transit Dependency Index for the service areas. Based on the combined densities of attributes considered likely to increase the propensity of transit use, the Transit Dependency Index shows that there are more transit-dependent areas in Livermore than in Pleasanton. Overall, areas with high Transit Dependency scores are well served by Wheels, with many of these communities connected by either the Rapid or Route 10. Improved service frequency on Route 10 would benefit many of these communities. Areas along Stoneridge Dr east of Santa Rita Rd show high transit dependency but are only served on the edge by Routes 8 and 10. Additional service may be justified in this area by operating a route on Stoneridge Dr.

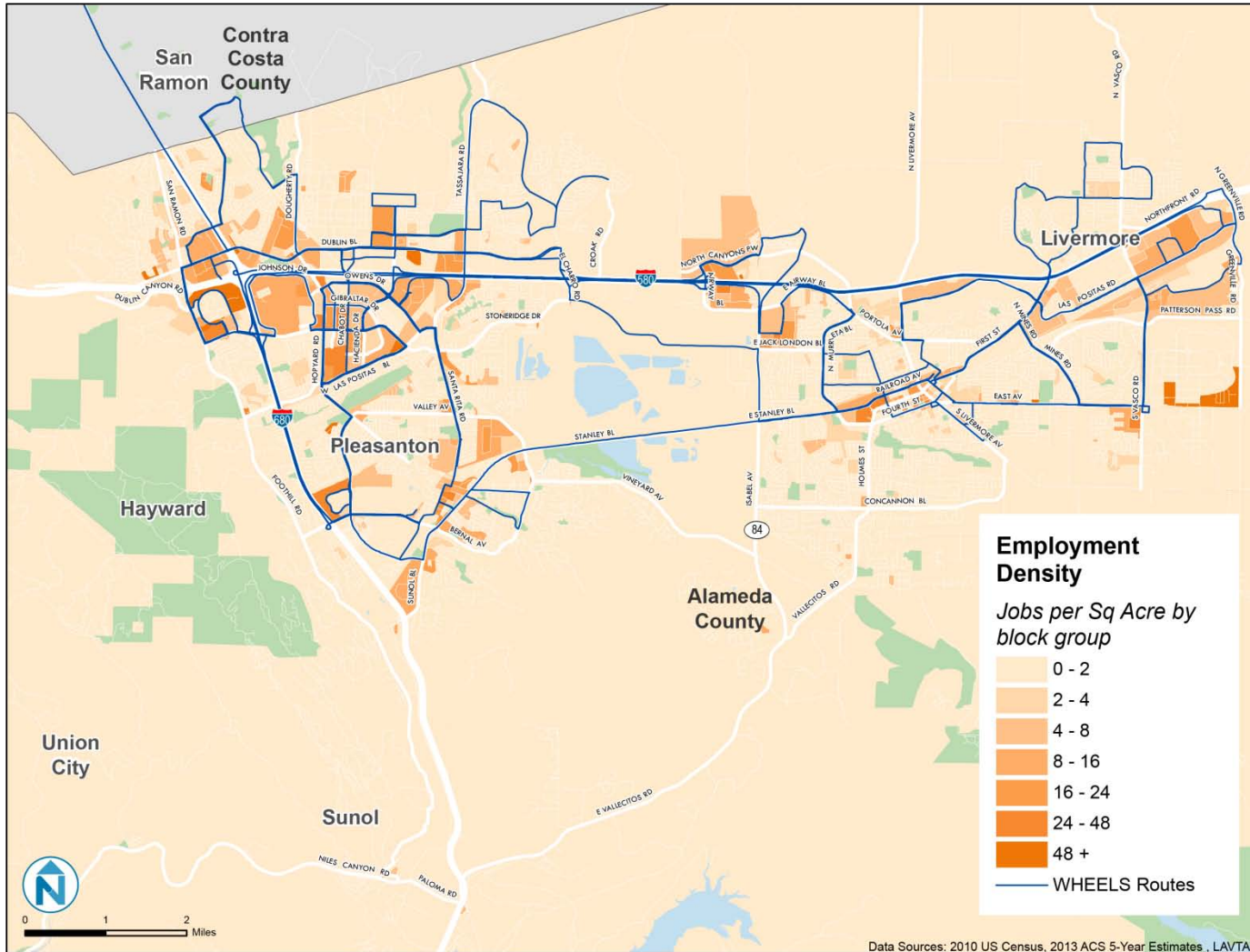
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Figure 1 Population Density



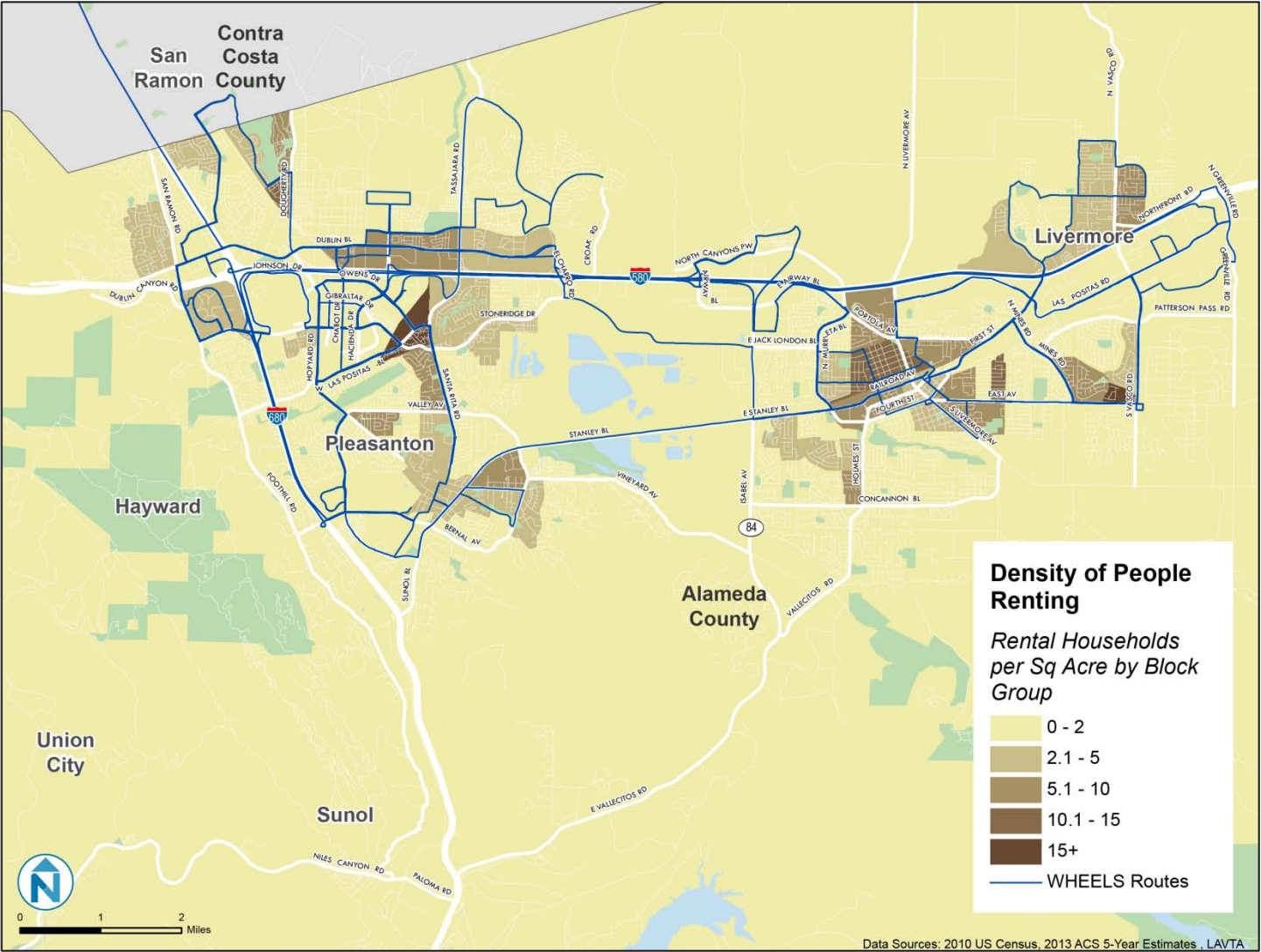
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Figure 2 Employment Density



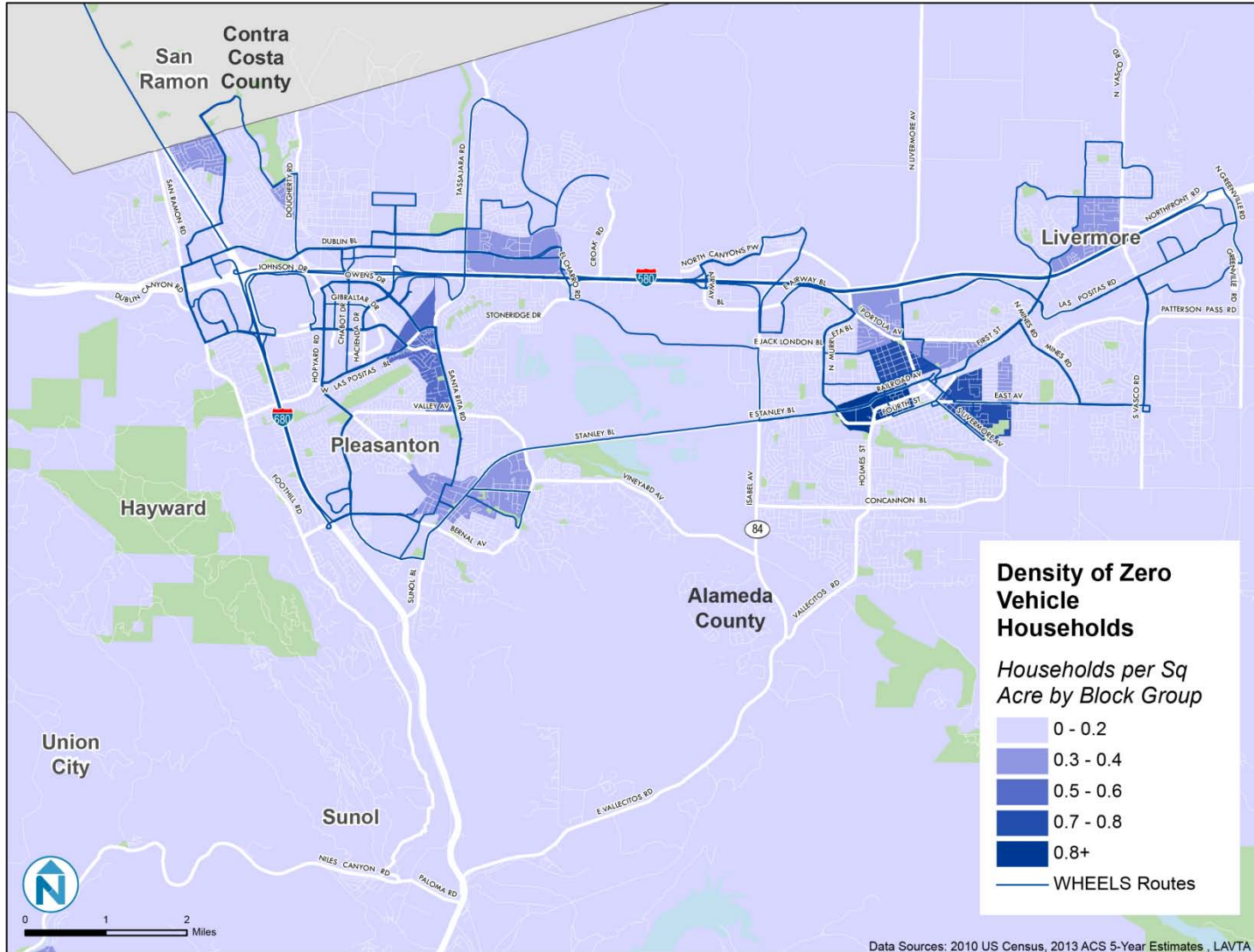
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Figure 3 Density of Rental Households



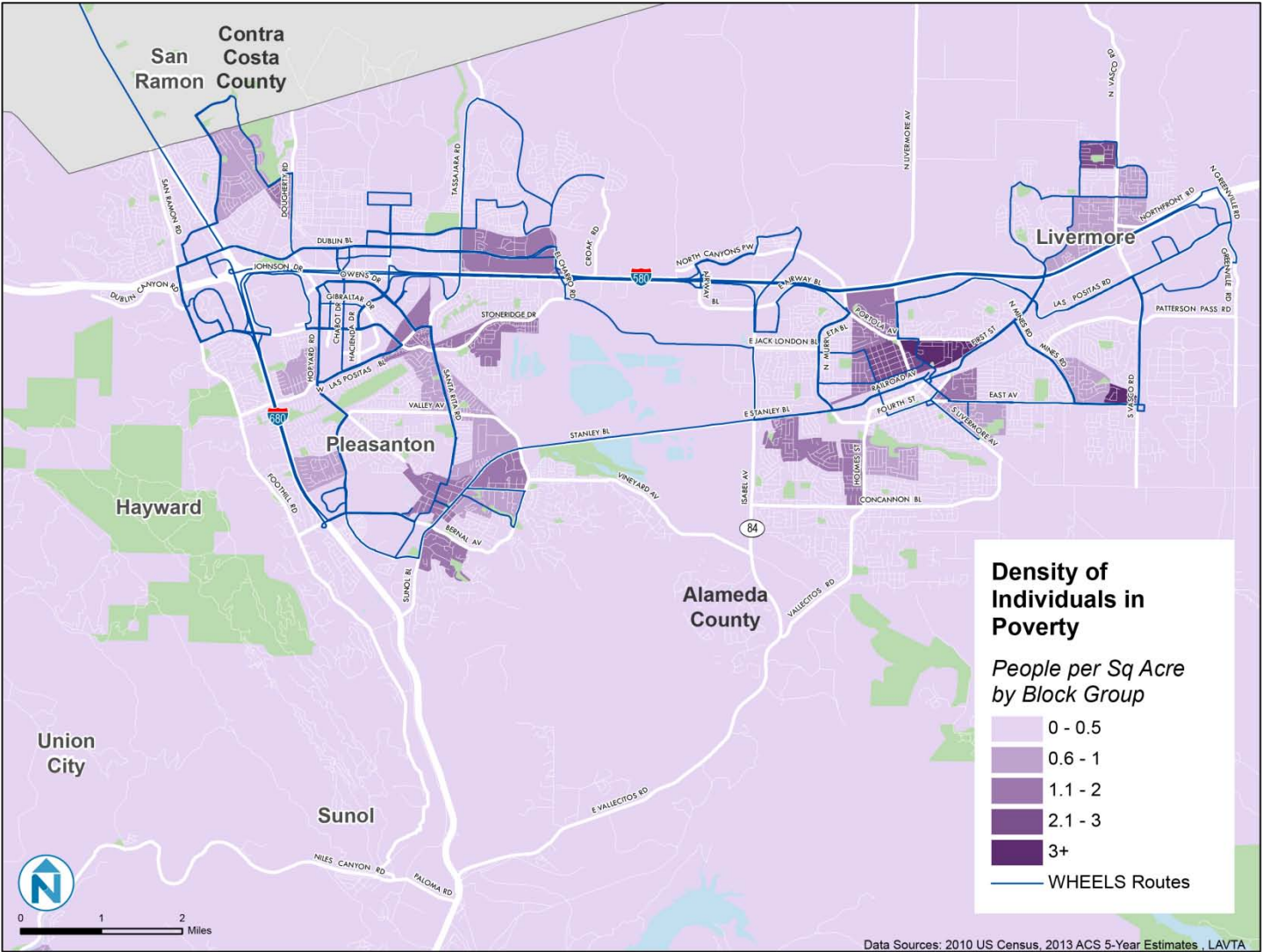
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Figure 4 Density of Zero Vehicle Households



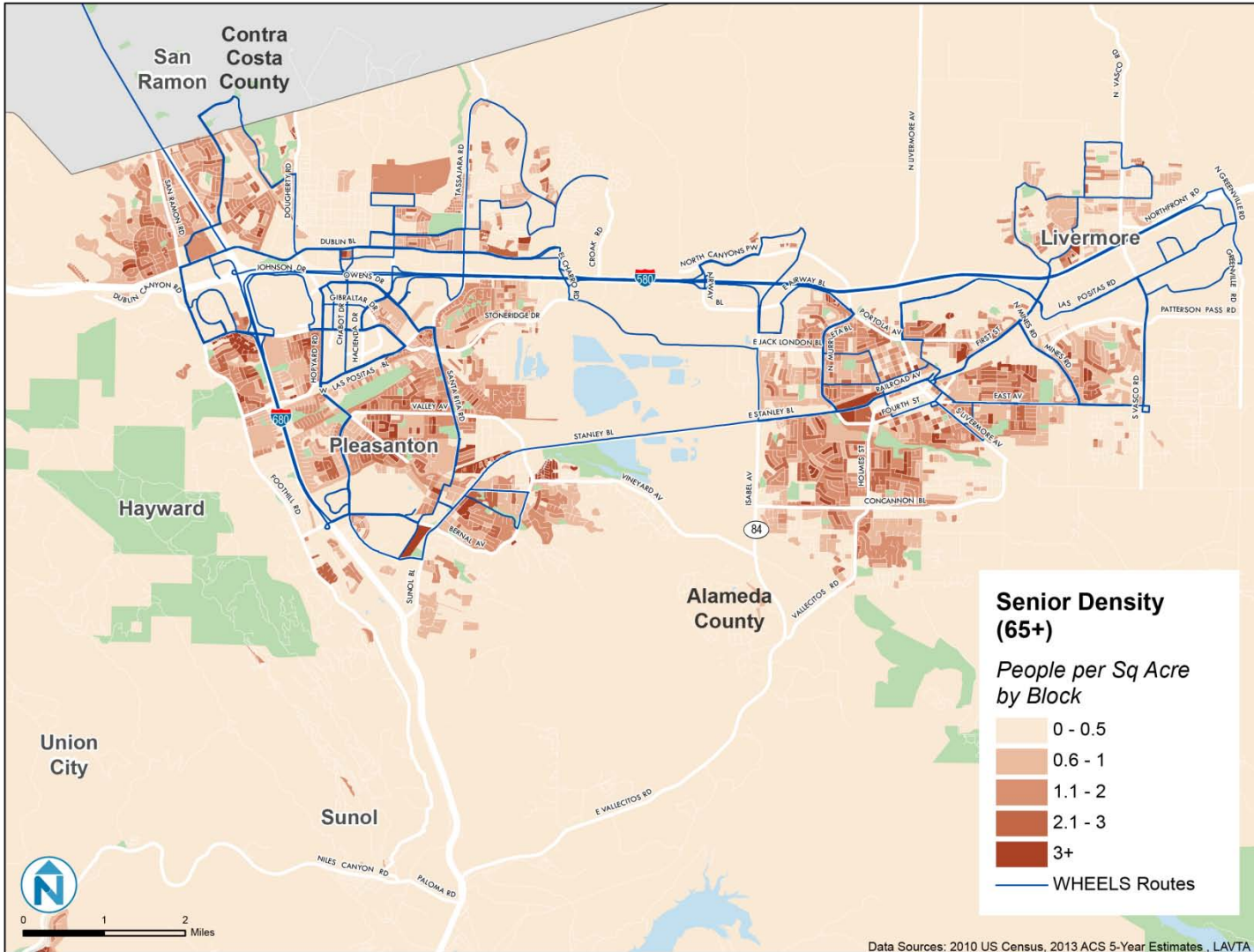
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Figure 5 Density of Individuals below Poverty



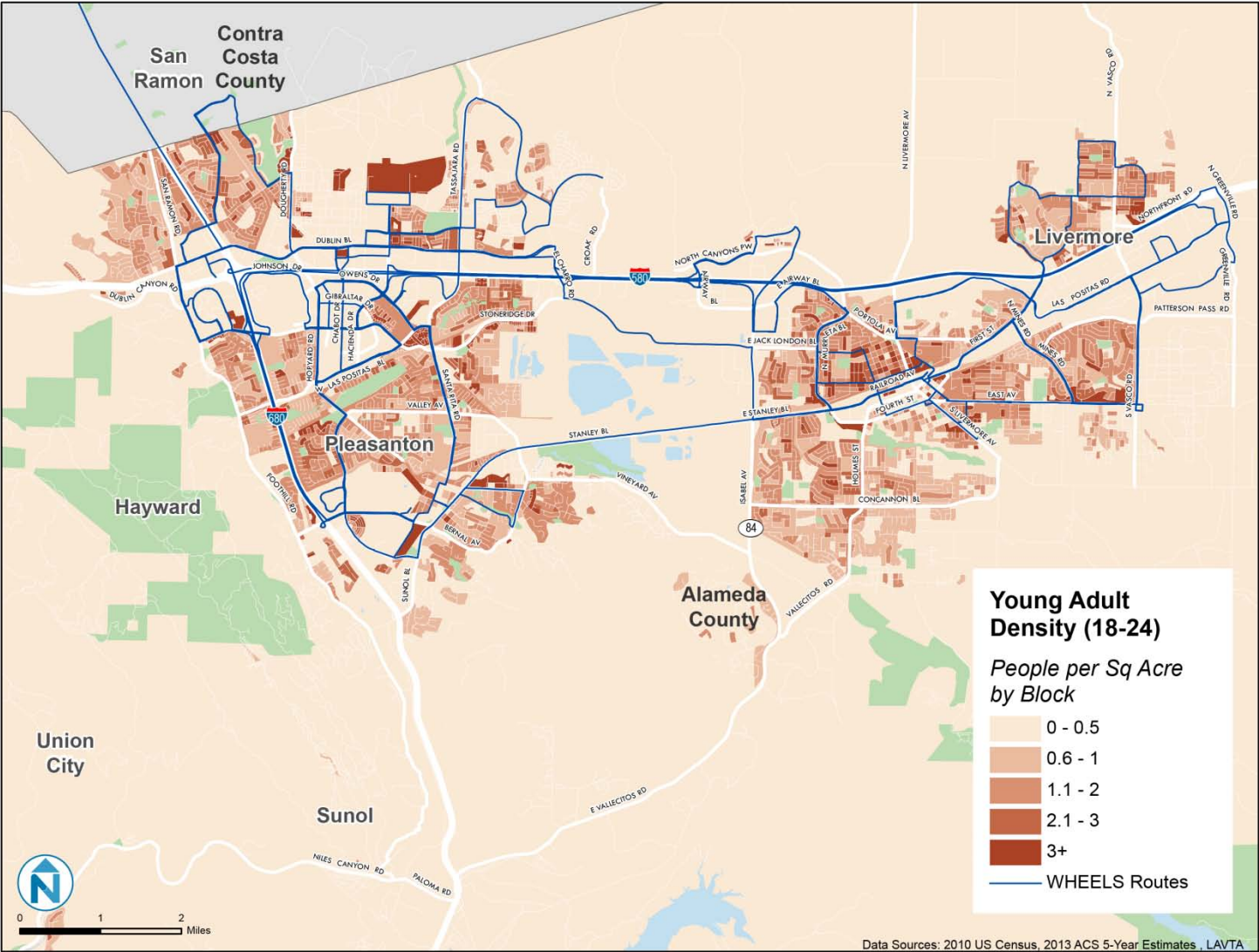
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Figure 6 Density of Seniors Aged 65 and Above



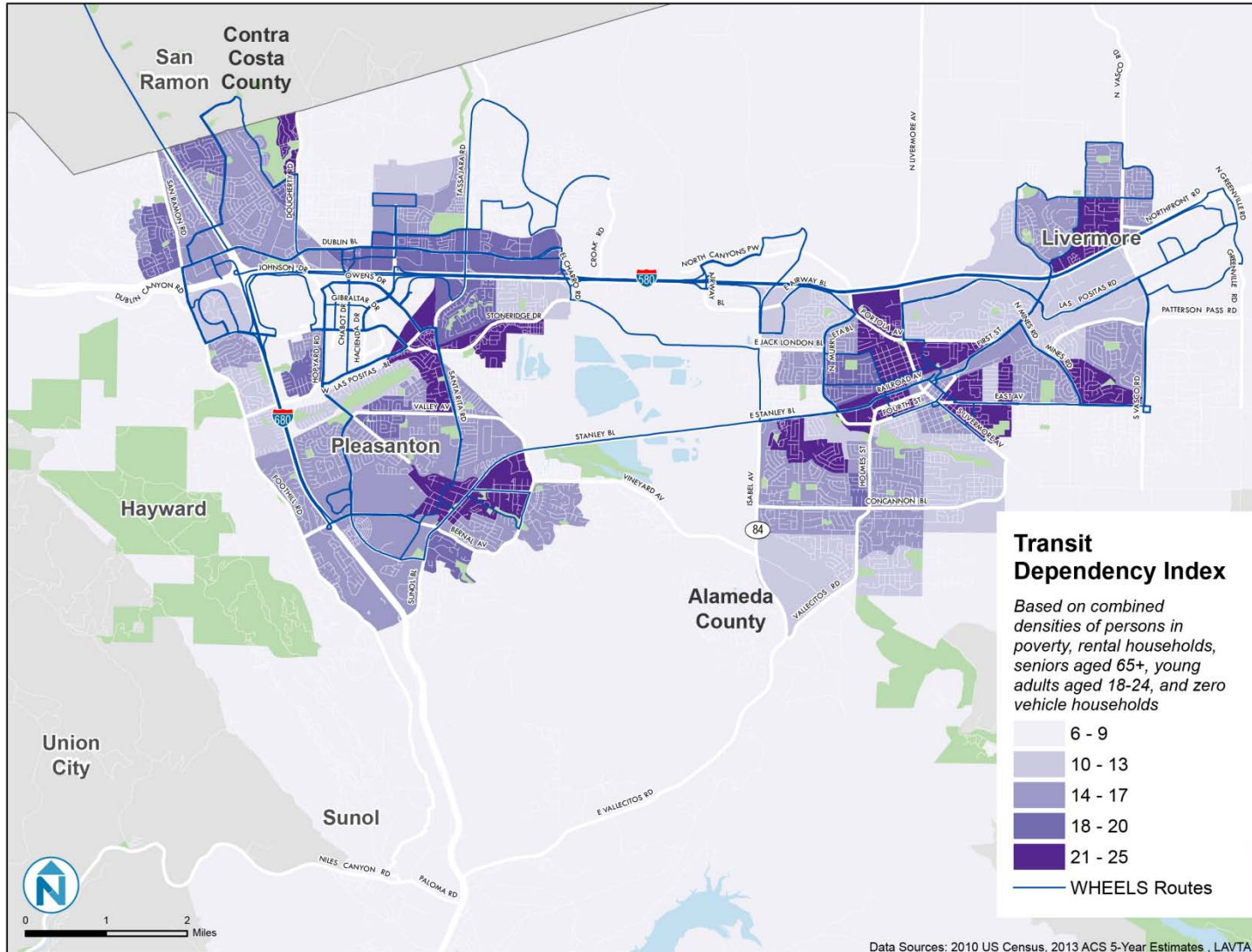
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Figure 7 Density of College-Aged Adults Aged 18-24



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Figure 8 Transit Dependency Index

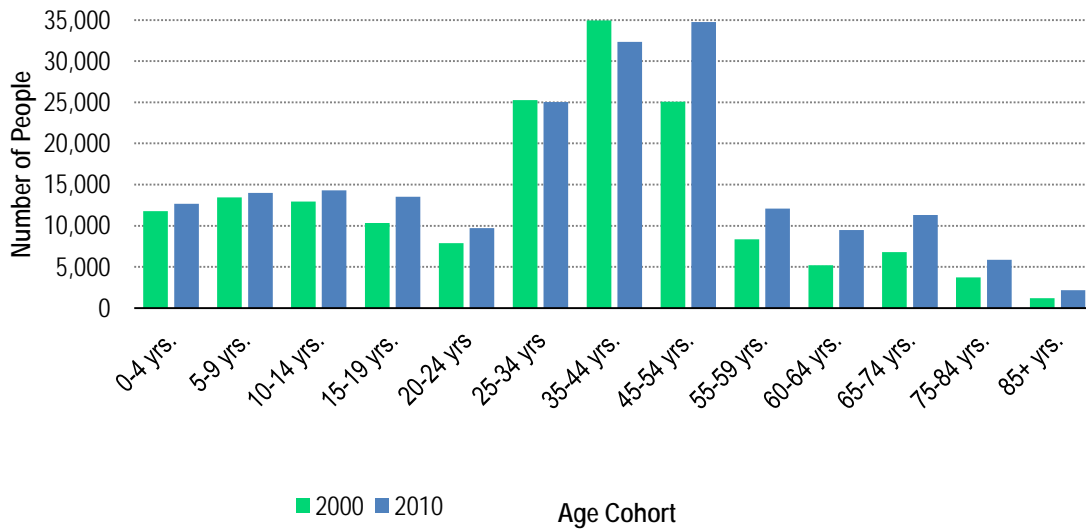


DEMOGRAPHIC TRENDS

Population by Age

Figure 9 is a general population comparison from the U.S. Census of Dublin, Livermore and Pleasanton from 2000 to 2010. Each city-wide general population statistics were summed for a service-area estimate by age cohort. While nearly every cohort grew from 2000 to 2010, the 45 to 54 year cohort increased by almost 10,000 residents. Additionally, cohorts 55 to 59 years, 60 to 64 years, and 65 to 74 all increased by about 5,000 residents. The 35 to 44 cohort declined by about 2,500 residents.

Figure 9 Population in Service Area by Age Cohort



Race/Ethnicity

Figure 10 shows race Census data of Dublin, Livermore and Pleasanton from 2000 to 2010. Each city-wide race statistics were summed for a service-area estimate. The service area is becoming more racially diverse with a decrease in percentage of people who identify as white, and increases in percentage of people who identify as all other categories: Asian, Other, Multiracial, black or African American, and Native Hawaiian and Other Pacific Islander. The only category that did not increase from 2000 to 2010 was American Indian and Alaska Native.

Figure 10 Race in Service Area

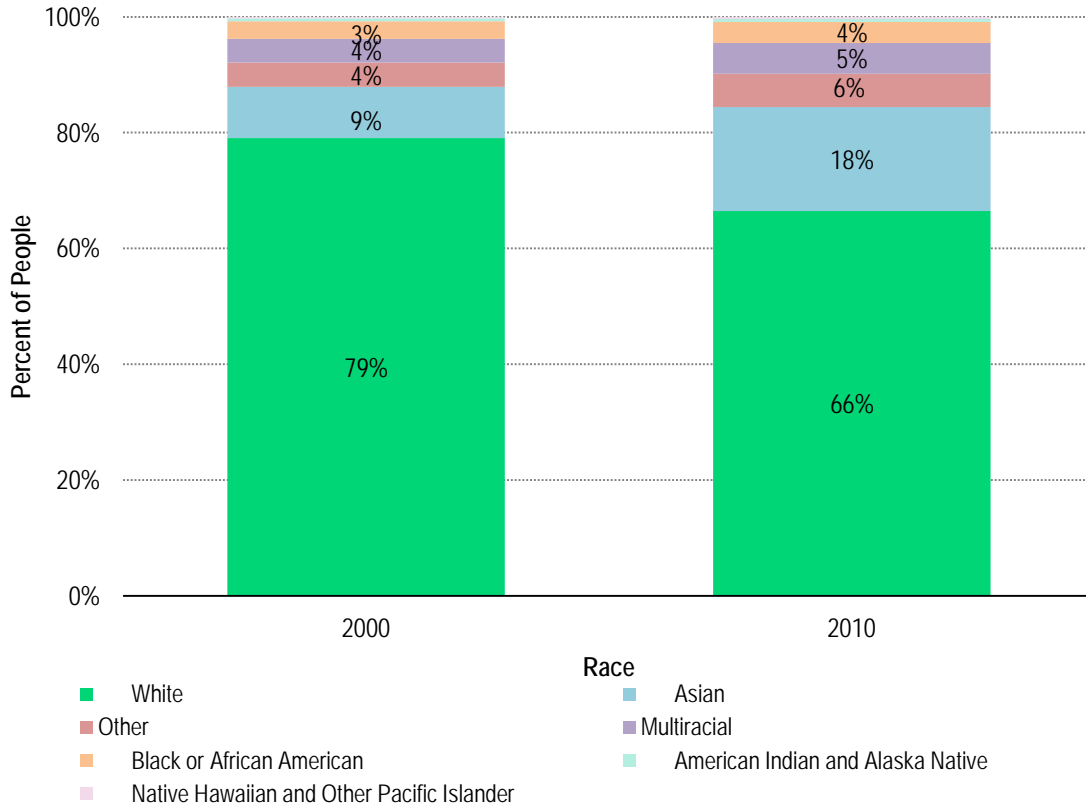
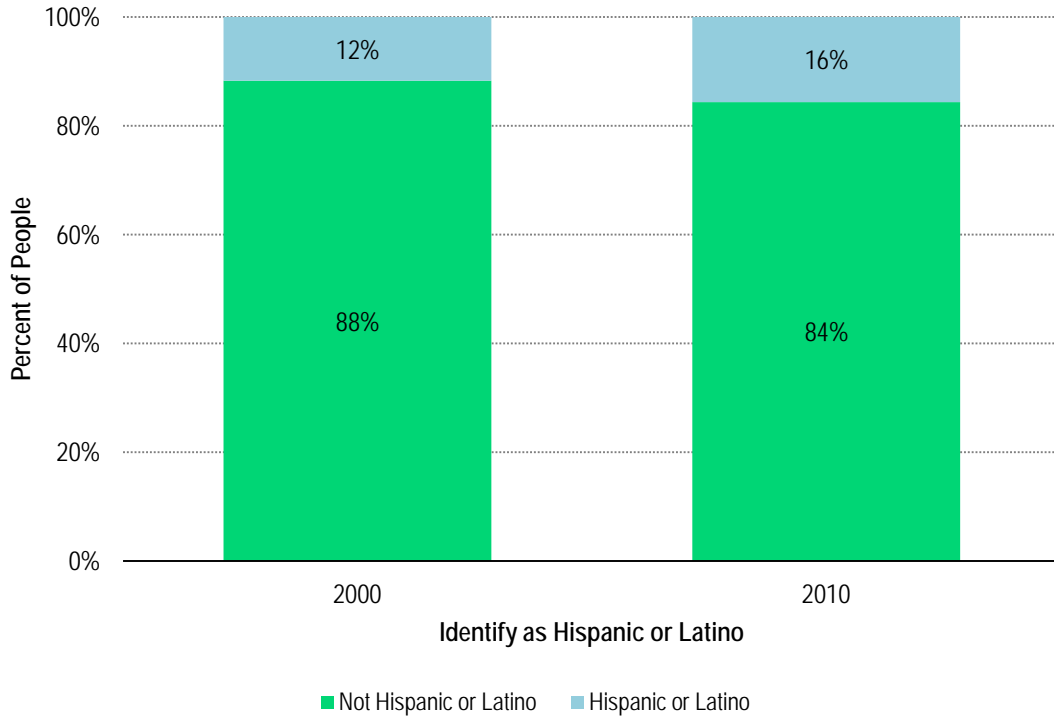


Figure 11 shows people who identify as Hispanic or Latino of Dublin, Livermore and Pleasanton from 2000 to 2010. Each city-wide statistic was summed for a service-area estimate. The percentage of people who identify as Hispanic or Latino increased in the service area between 2000 and 2010.

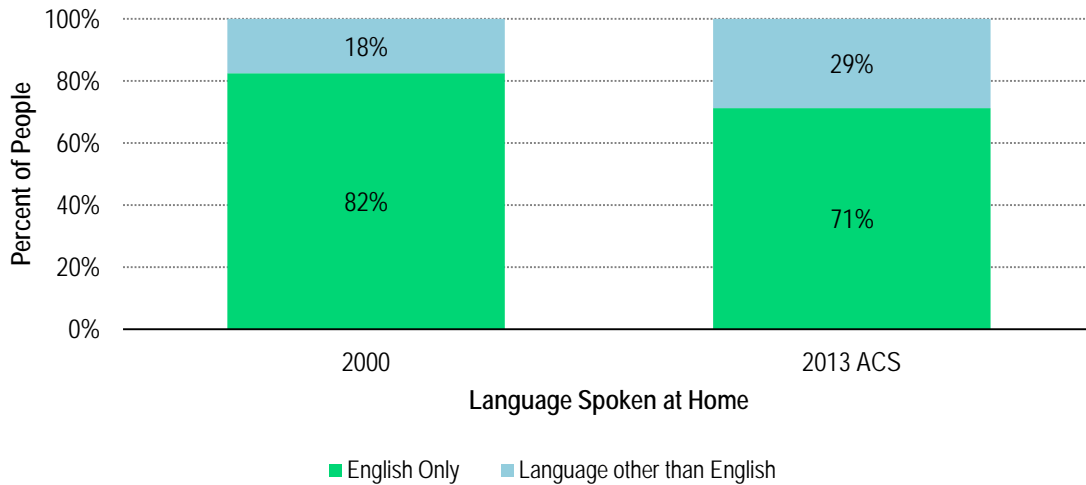
Figure 11 Hispanic or Latino People in Service Area



Language

Figure 12 shows people who speak another language other than English in Dublin, Livermore and Pleasanton from 2000 to 2013. Each city-wide statistic was summed for a service-area estimate. The percentage of people who speak another language other than English at home has increased from 18% to 29% between 2000 and the 2013 American Community Survey estimate.

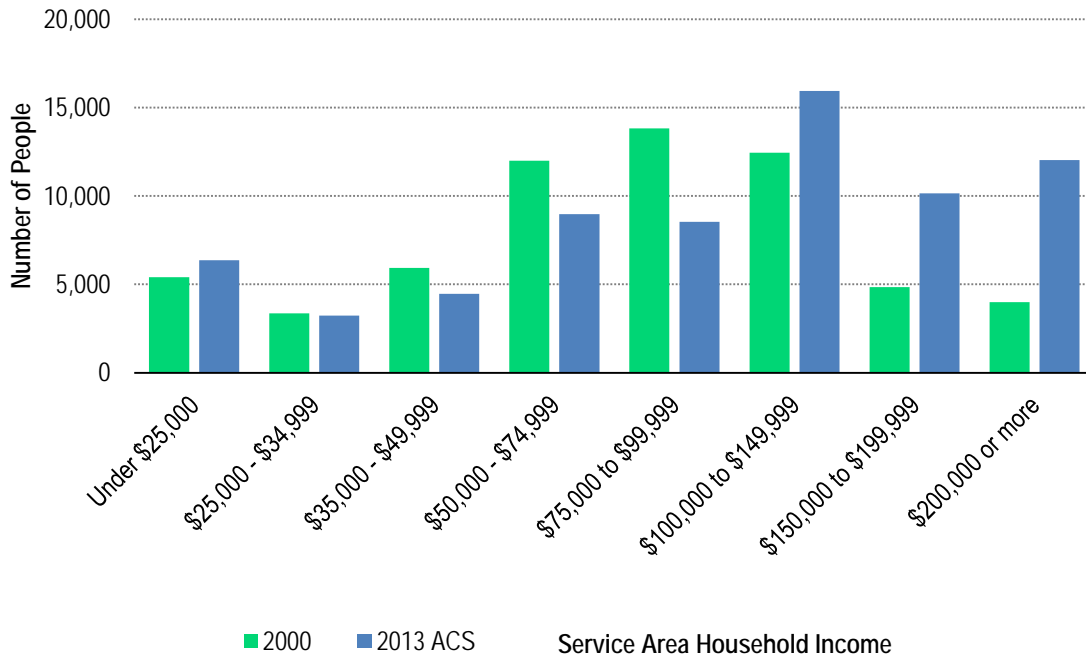
Figure 12 Language Spoken at Home in Service Area



Income

Figure 13 shows income across Dublin, Livermore and Pleasanton from 2000 to 2013. Each city-wide statistic was summed for a service-area estimate. In general, the population of higher income groups has increased substantially, while lower income groups have declined. To a certain extent, this pattern is expected because incomes generally rise with inflation, but the pattern in the LAVTA service area is so strong that it indicates that people with high incomes have been moving into the area at a much faster rate than people with lower incomes. In addition, some people at lower incomes have likely been displaced due to the rising cost of housing. Given that LAVTA's riders tend to have incomes below \$75,000, declines in this income group may be hurting ridership. If these trends continue, LAVTA will need to continuously attract choice riders to increase ridership.

Figure 13 Service Area Household Income



3 ON-BOARD SURVEY

PASSENGER SURVEY

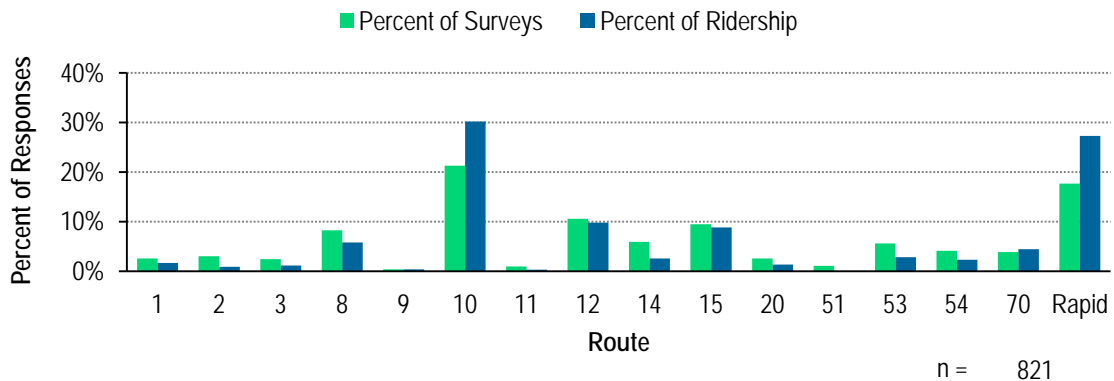
Overview

In order to better understand the experience of LAVTA customers, a passenger survey was conducted on all routes between the dates of April 25, 2015 and June 1, 2015. The survey was composed of a 21 question set, soliciting information regarding passenger travel patterns, characteristics, and recommendations for improved service. Passengers were provided the two page survey in either English or Spanish. Unless otherwise specified, the results reported in this memo represent weekday survey responses.

A total of 1,112 surveys were completed, 821 by weekday passengers, and 291 by weekend passengers. The weekday response was sufficient to provide a confidence level of 99% with a margin of error of 5% at the system level. As shown in Figure 14, the survey response was generally proportionate to ridership by route.

The highest percentages of surveys were completed by passengers on Routes 10 and the Rapid, accounting for 21% and 18% of collected surveys respectively. These are also the LAVTA's highest ridership routes. Route 12 (11%) and Route 15 (10%) were the only other routes to contribute more than 10% of total collected surveys. Routes 9 and 51 received one percent or less of total surveys. These routes are very low ridership, with fewer than 20 daily boardings.

Figure 14 Weekday Survey Responses by Route



Area of Residency

Livermore, Pleasanton, and Dublin residents account for 69% of passengers utilizing LAVTA services (Figure 15). No other municipal population composes more than 5% of the passenger population. However, the fact that 6% of passengers reported living in San Francisco or Oakland,

which are connected by BART, indicates that some riders are commuting to employment in the LAVTA service area, likely using a combination of BART, LAVTA, and possibly other transit services. Eight percent of respondents resided in either Tracy or Stockton, which suggests a significant portion of riders are commuting long distances from points farther east. Compared to 2007 survey results, these findings represent a decrease the ridership share among respondents residing in Livermore (from 49% to 39%) and Pleasanton (from 21% to 18%), but an increase in the ridership share among Dublin residents (from 6% to 12%).

Figure 16 shows a further breakdown of respondents who reported living in other areas. Among these, 4% listed San Leandro, San Lorenzo, Hayward or Castro Valley. An additional 3% listed Concord, Pleasant Hill, Walnut Creek or Danville. Areas of residency with 5 or less respondents were grouped into “Other”.

Figure 15 Passenger Area of Residency

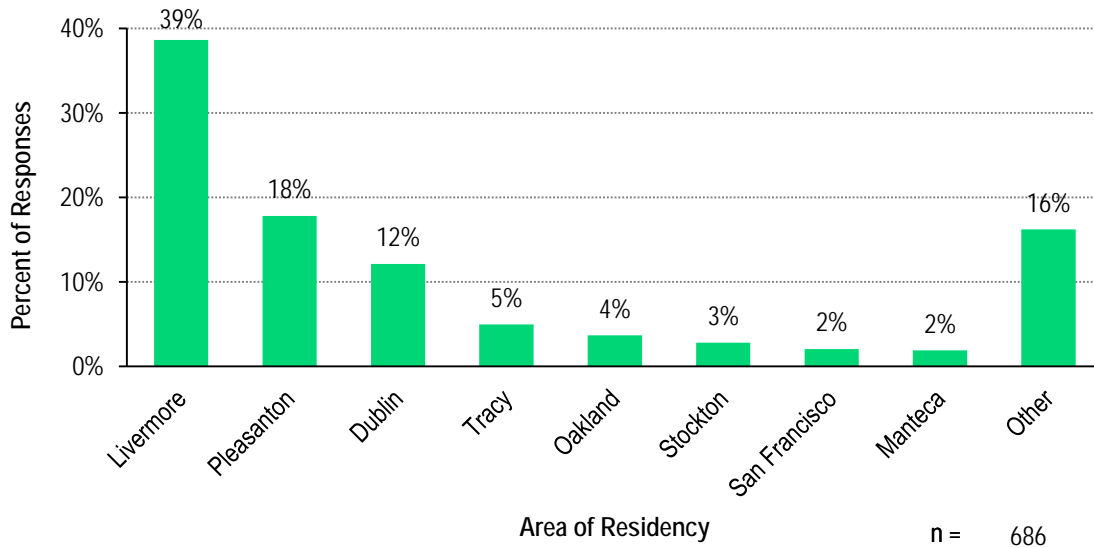
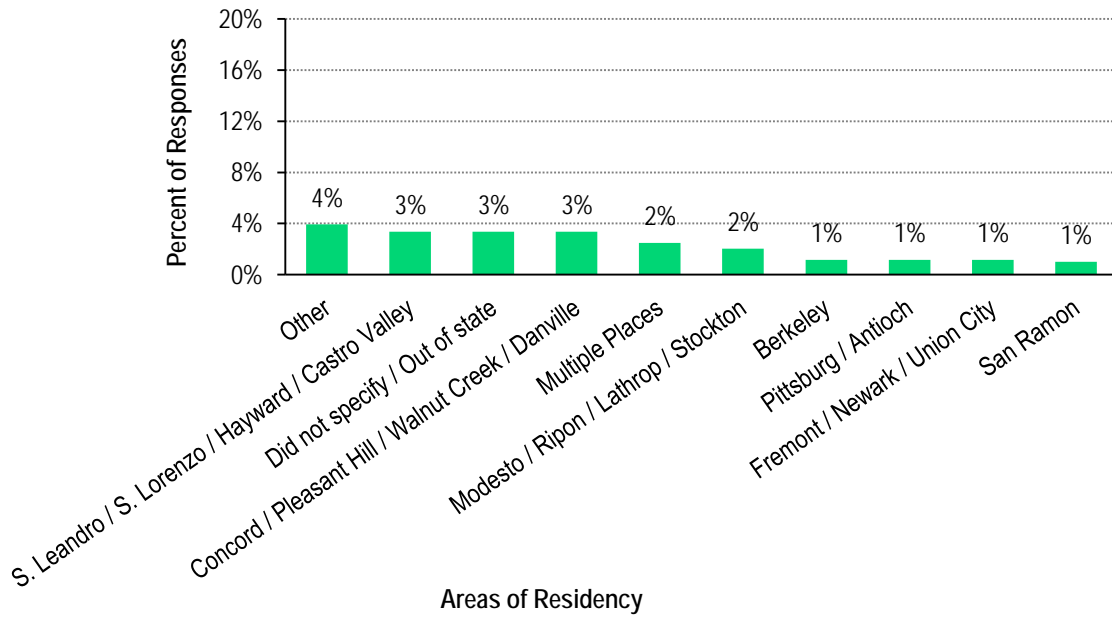


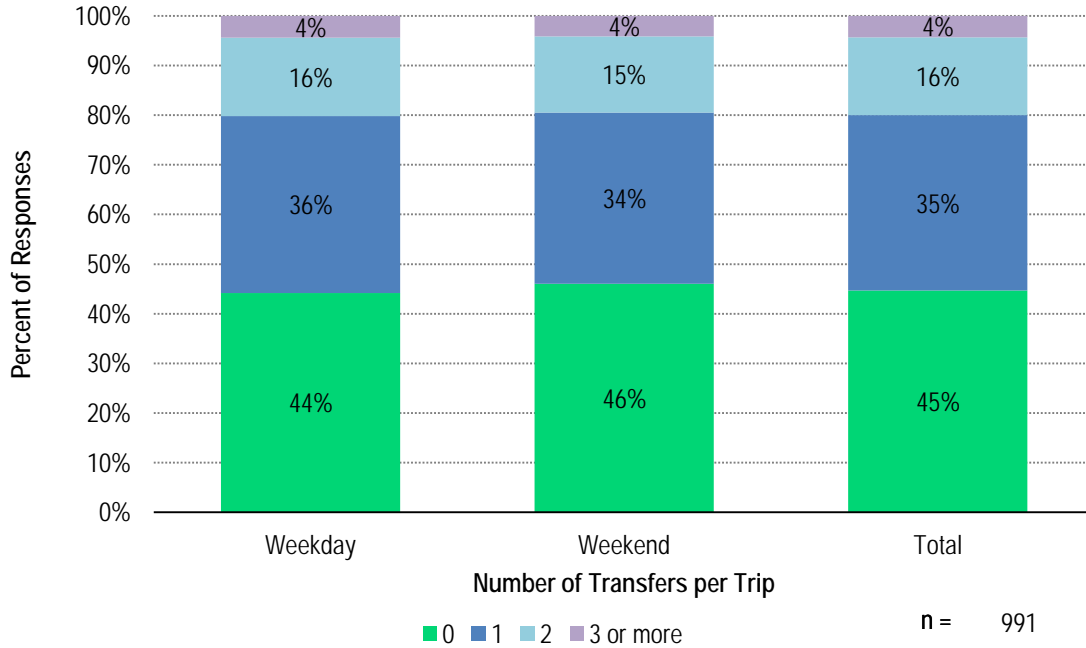
Figure 16 Other Category of Areas of Residency



Transfers

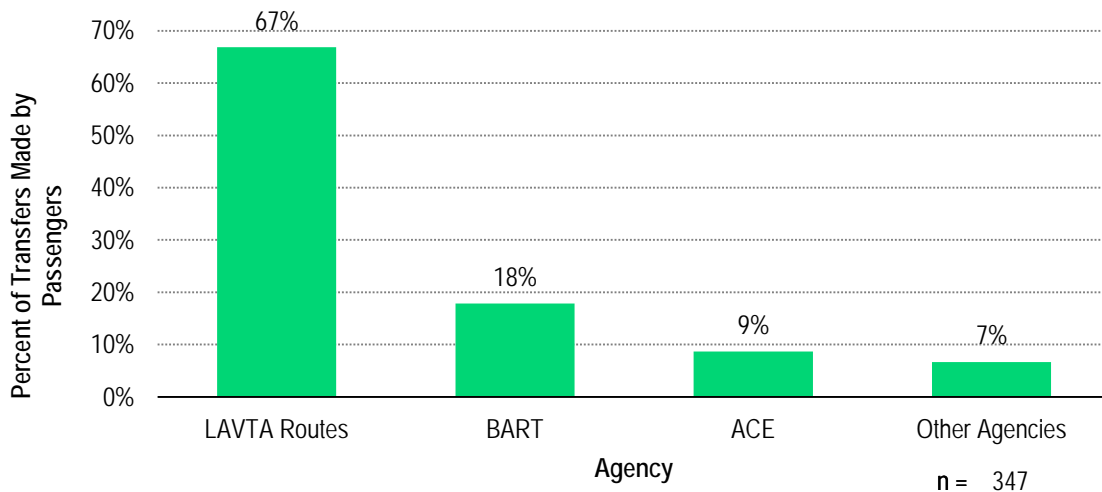
Less than half of respondents do not transfer to or from another service provider. The remaining 55% of respondents transfer on their trip, which is high for a non-radial oriented system. The number of transfers is also interesting, as more than 20% of riders have more than one transfer. This is also high, and likely reflects multi-modal connections to rail services such as ACE and BART. These findings represent an increase in transfer activity when compared to data collected from the previous survey. In 2007, 39% of respondents reported to make one or more transfers on their usual local bus trips.

Figure 17 Total Transfers Made by Passengers



Of the passengers that made transfers, most of the transfers to or from a LAVTA route were to another LAVTA route (67%), see Figure 18. Transfers to or from BART service is 18% of all transfers, and transfers to or from ACE service is 9%. The remaining 7% of all transfers are to or from another agency. In comparison to the 2007 Wheels On-Board Rider Survey, the percentage of passengers who transferred to ACE or BART services decreased from 38% in 2007 to 27% in 2015.

Figure 18 Transfers To or From LAVTA Routes

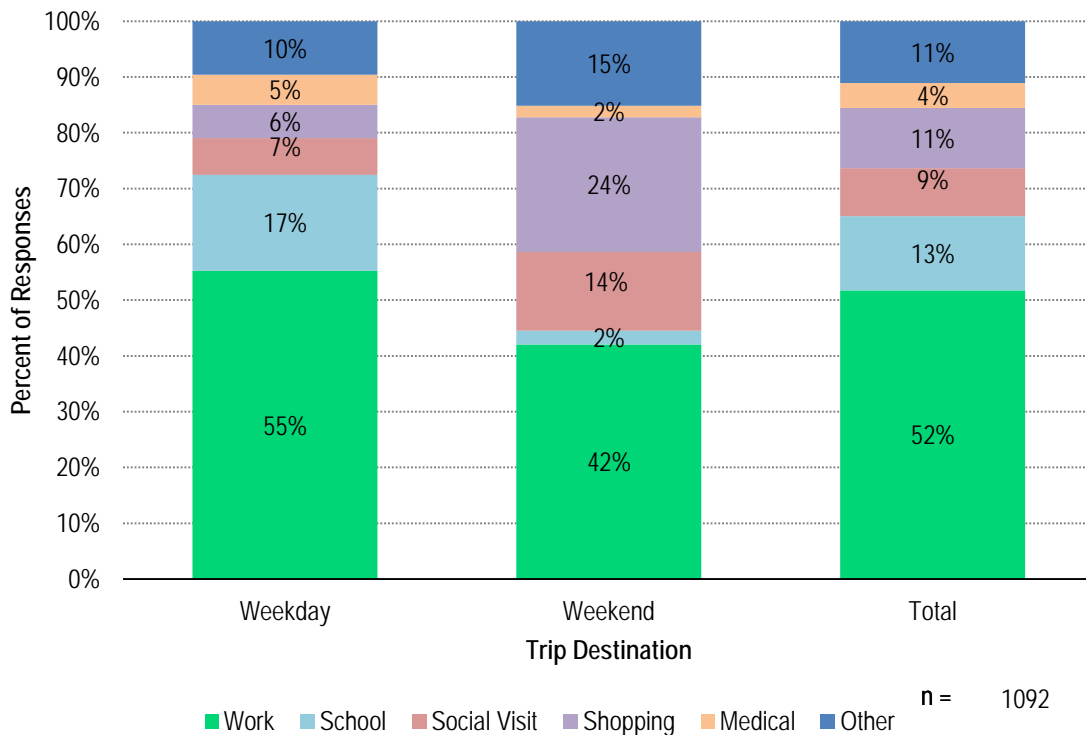


Trip Purpose

Respondents were asked where they were traveling to and from in order to determine trip purpose. Work and school commute trips account for almost 75% of trips during weekdays as shown in Figure 19. School trips account for 13% of both weekday and weekend trips. Weekend trips not surprisingly consist of a larger proportion of shopping (24%) and social visits (14%) compared to weekday trips. Work trips on weekends were still the predominant trip type, with 42% of respondents going to work. This highlights the demand from service workers needing to access worksites seven days a week.

In comparison to the 2007 Wheels On-Board Rider Survey, the percentage of passengers who were regular commuters to work or school has decreased slightly: 77% of passengers' trip purpose was work or school in 2007, and 65% of passengers' trip purpose was work or school in 2015. Additionally, the percentage of passengers stating their trip purpose is social has increased 4%, from 5% in 2007 to 9% in 2015. Shopping and Medical trip purposes were within 1% difference between the 2007 and 2015 surveys.

Figure 19 Passenger Trip Purpose



Access Mode

The majority of passengers (69%), access transit via walking, while 9% accomplish the first leg of their trip in a car, either by driving their own vehicle or carpooling (Figure 20). This chart excludes responses for "other", which made up 17% of total responses. The vast majority of responses for "other" were modes of transit, which was asked separately in another question. Bicycle access is 4%, which is higher than typically seen in systems like LAVTA. The percentage of passengers who accessed transit via walking decreased since the 2007 Wheels On-Board Rider

Survey, from 78% in 2007 to 69%. Driving or bicycle access to transit were both within 1% between the 2007 and 2015 surveys.

Figure 21 shows access mode by income, excluding responses for “other”. This chart shows that transit access mode is most similar for the lowest and highest income groups, with over 86% of passengers walking to access transit. In the middle income groups, those earning \$35,000-\$50,000 and \$50,000-\$75,000, respondents reported using an automobile to access transit at much higher rates; up to 20% of respondents in these groups either drove alone or got a ride from someone else, compared to only 8% in the lowest and highest income groups. Bicycle access was also higher for the low and high income groups. Given that these are LAVTA’s two largest ridership groups (43% earn less than \$25,000 and 23% earn over \$75,000), these findings suggest that improvements to pedestrian and bicycle access to transit should be a high priority for LAVTA.

Figure 20 Passenger Mode of Transportation to Bus Stop

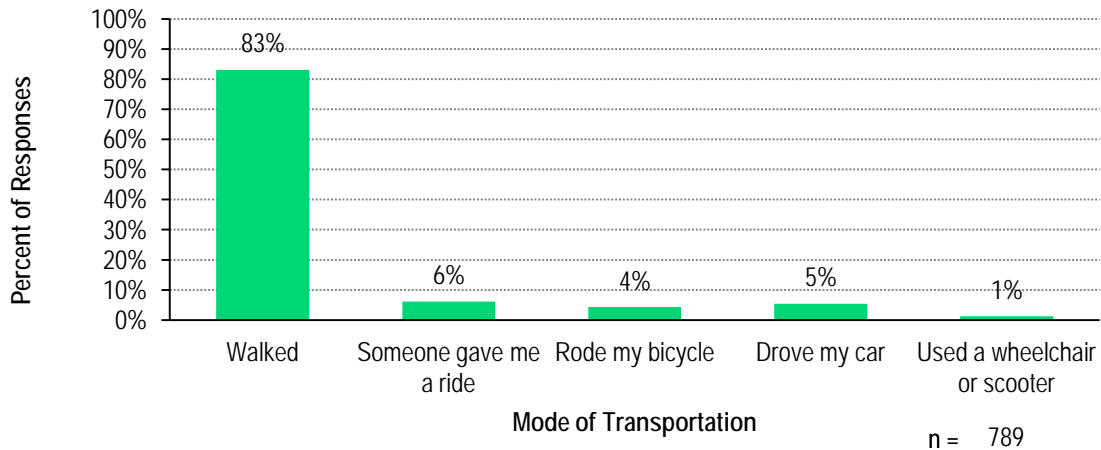
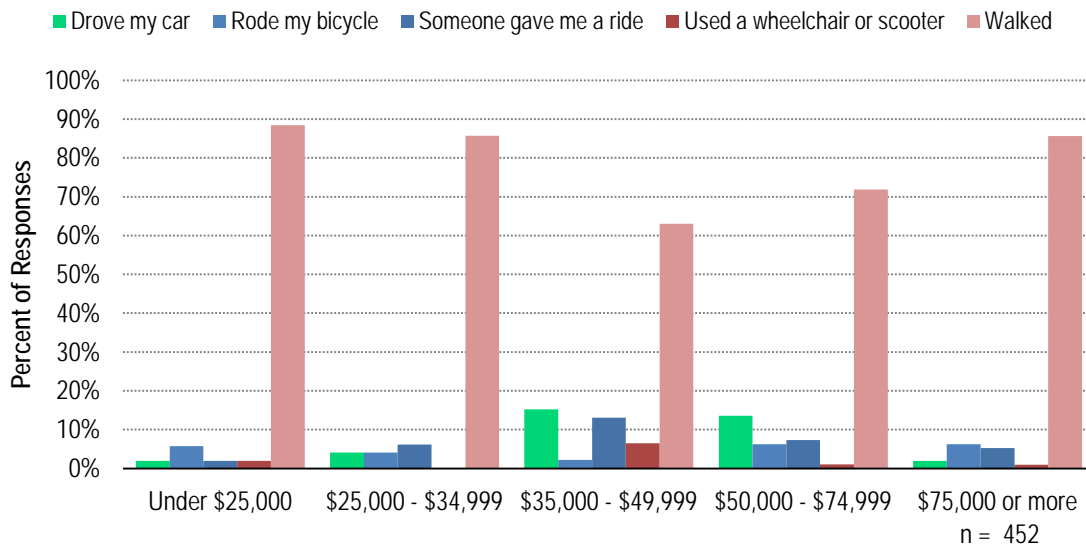


Figure 21 Transit Access Mode by Income



Private Vehicle Availability

Only thirty percent of respondents had access to a vehicle for the bus trip they made, suggesting that the majority of LAVTA patrons are transit dependent (Figure 22). In 2007, approximate one-third of riders also indicated that they had vehicle access to make their trip. Figure 23 compares passenger household incomes and access to private vehicles. The data shows that income is highly correlated with vehicle availability. Whereas nearly half of passengers in the highest income brackets (making above \$50,000 a year) have access to a car, only 18% of those in the lowest income bracket have access to a car. While the passengers who have access to a car and are riding transit could be considered “choice” riders, the vast majority are riding to work and may still have primarily economic motivations for using transit.

Figure 22 Passenger Access to Private Vehicle

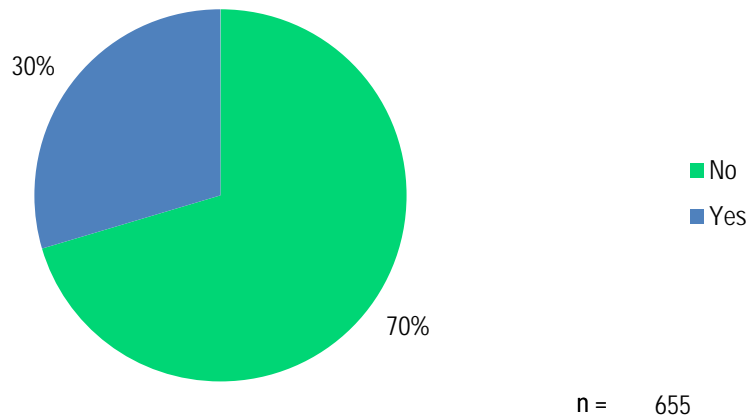
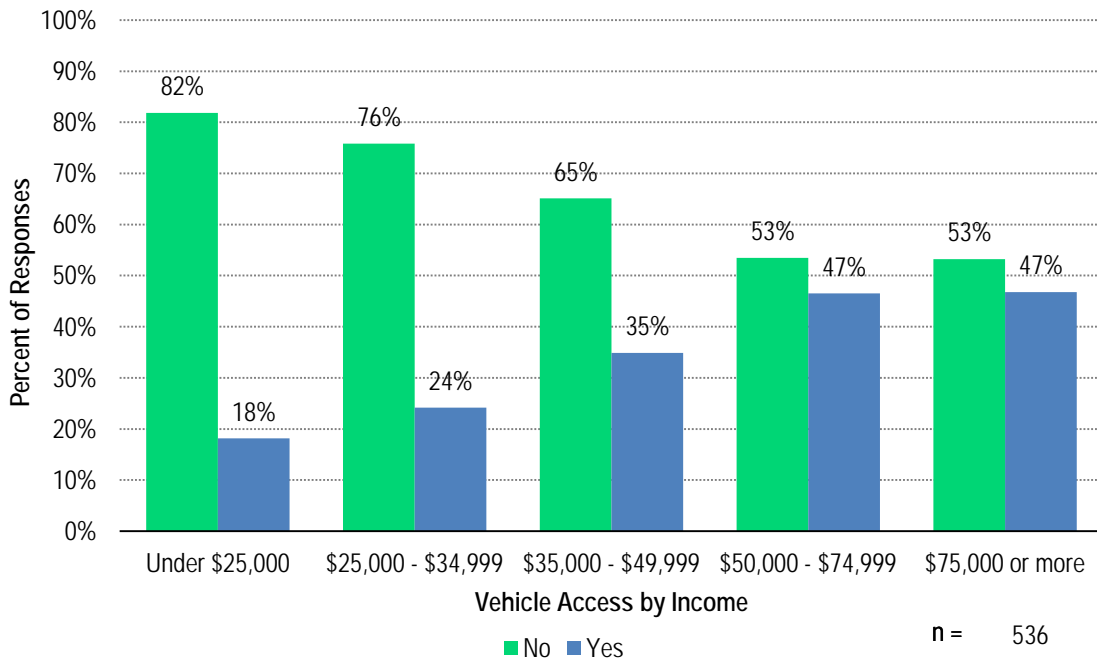


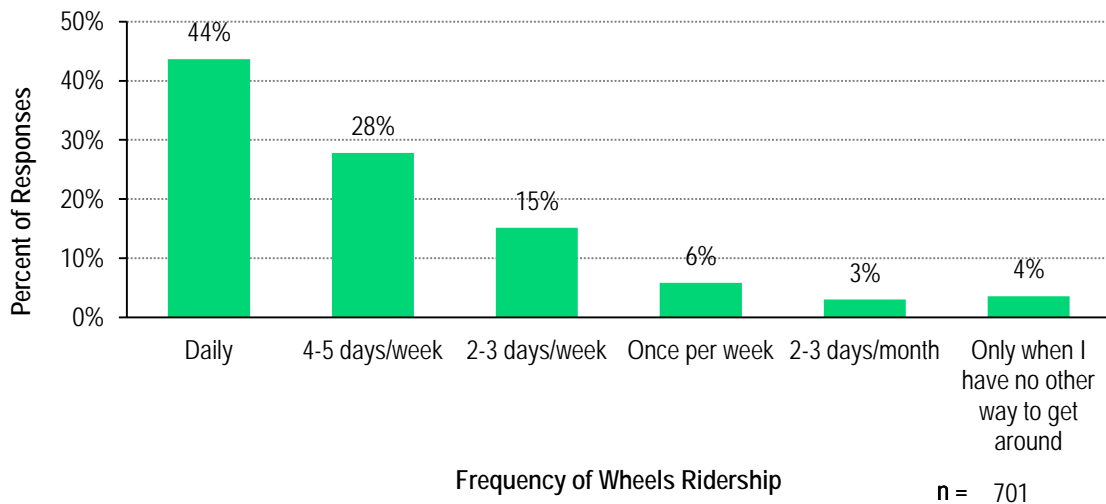
Figure 23 Passenger Household Income and Vehicle Access



Frequency of Use

As shown in Figure 24, 44% of respondents use Wheels on a daily basis and 72% use Wheels service 4-7 days per week. This suggests that the majority of existing riders use the service on a daily basis, and reflects that most riders are transit dependent and are thus using Wheels for all trips types, including shopping, medical, personal, and work trips. In 2007, approximately 76% of respondents reported to riding Wheels 4-7 days per week, which is nearly identical to results from 2015.

Figure 24 Frequency of Wheels Usage by Passengers

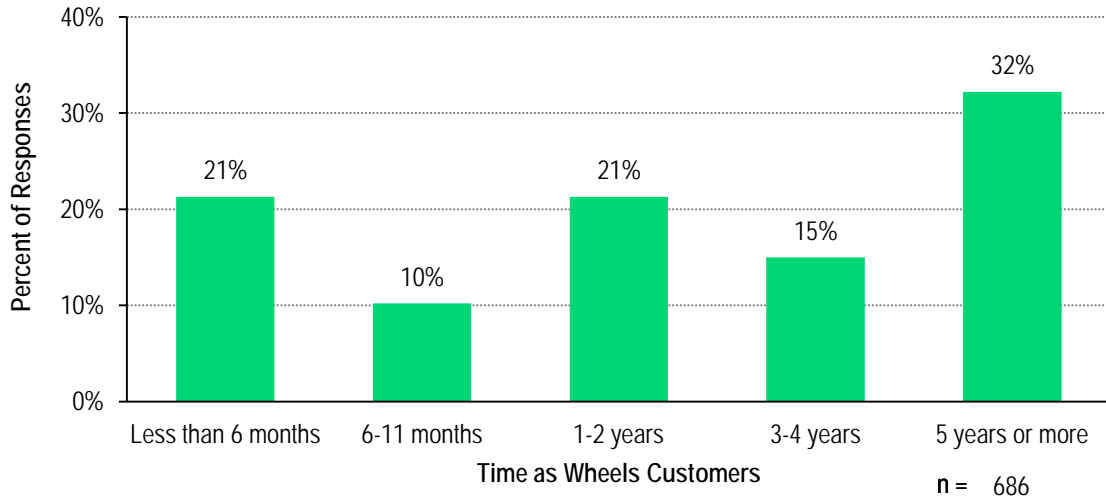


Longevity of Use

Not only are customers typically frequent users, but close to one-third are long time users as visible in Figure 25. Almost one third of respondents (31%) have been riding for less than one year. This suggests that rider turnover is much higher than average. Typically, rider turnover for an agency like LAVTA will be closer to 20%. LAVTA does not appear to be retaining its customers effectively, which is corroborated by the underlying recent ridership declines. A factor causing the high turnover may be rising housing costs in the Tri-Valley. Lower to moderate-income riders may be displaced by high housing costs, forcing them to move elsewhere and cease riding on LAVTA services.

The high turnover rate shows the challenge LAVTA has for continually needing to market the service to new riders. One of LAVTA's most effective opportunities to increase systemwide ridership is to reduce the rider turnover number from 31% to closer to 20%. Ridership turnover remained essentially the same since the 2007 Wheels On-Board Rider Survey, increasing from 29% in 2007 to 31% in 2015.

Figure 25 Length of Time Passengers Have Been Wheels Passengers



Race/Ethnicity

Figure 26 shows that 30% of respondents identify as Hispanic or Latino. Additionally, racial self-identification information collected and displayed in Figure 27 provided further information about the characteristics of Wheels passengers. A majority of passengers self-identified as white (38%) or Asian/Pacific Islander (26%). African American, Multi-Racial, and Other categories composed 13%, 8%, and 16% of the passenger population respectively. About 40% of those who identified as other wrote in Latino/Hispanic as their identification in the survey. Overall, the LAVTA service area is very racially diverse.

Figure 26 Respondents Identifying as Hispanic or Latino

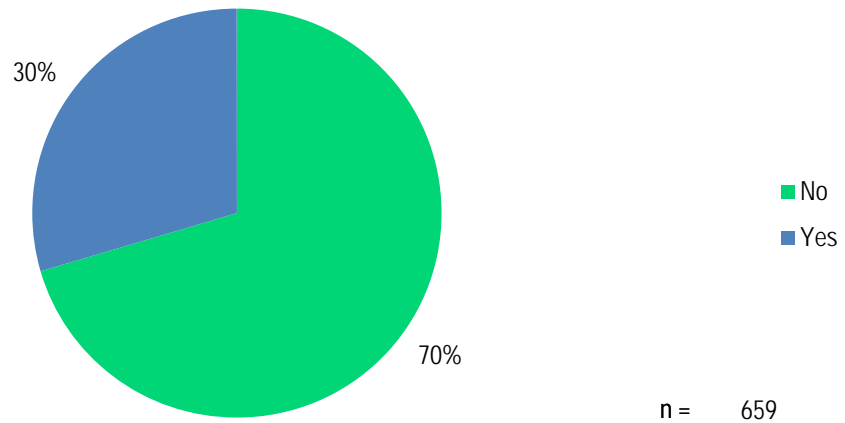
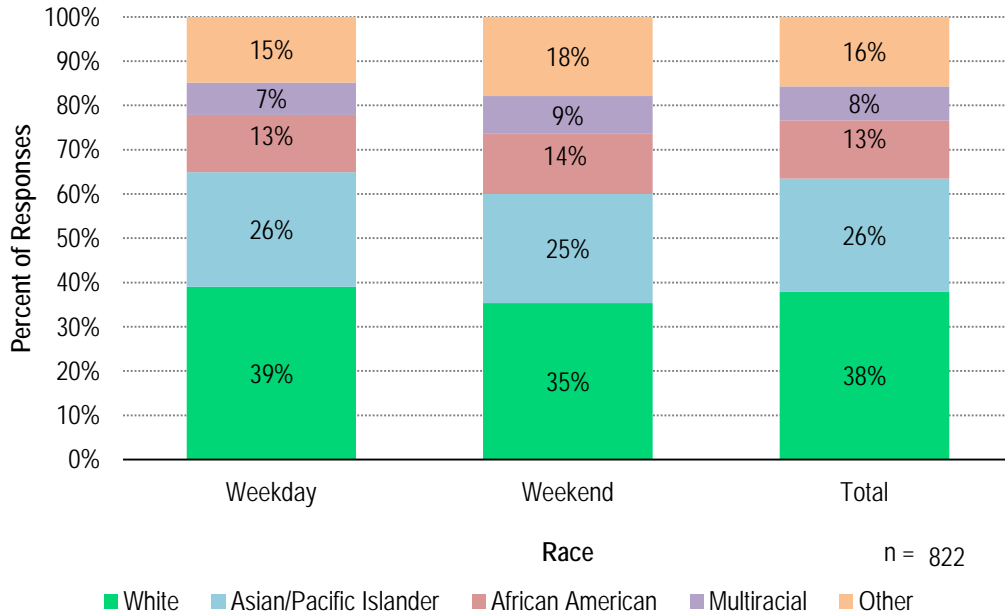


Figure 27 Passenger Self-Identification

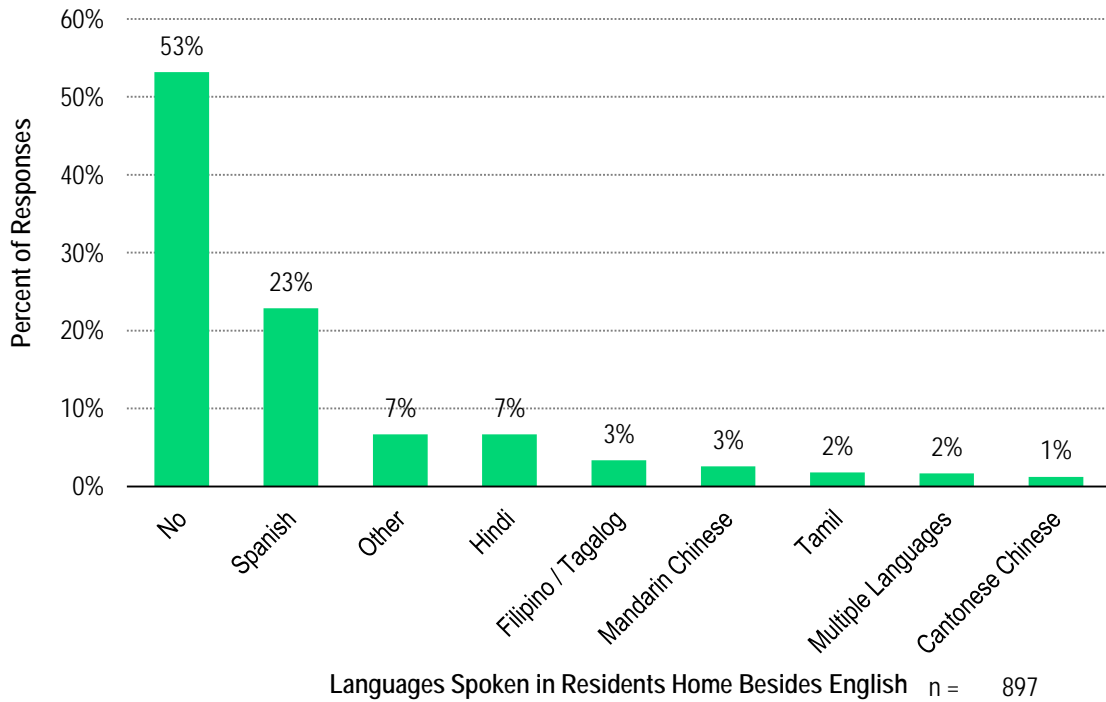


Language

Nearly half of all passengers speak a language other than English in the home, which is very high, particularly given that the paper survey was only translated into English and Spanish (Figure 28). It is likely that an even higher percentage of all riders speak another language at home.

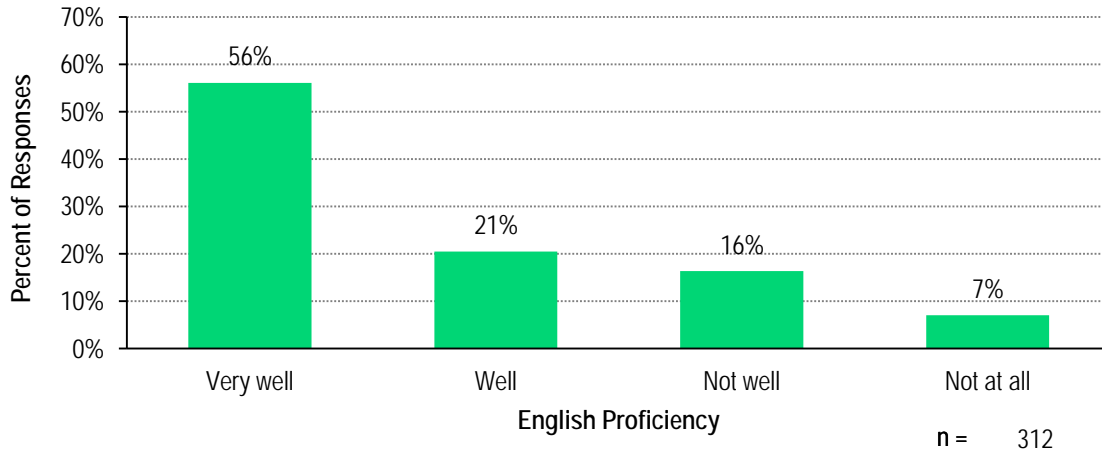
Spanish was the most common language other than English spoken in the home, with nearly a quarter of all riders reporting it is spoken at home (23%). Hindi (7%), Filipino / Tagalog (3%), and Mandarin Chinese (3%) were the only other languages that had a response of over 2%, with various other languages spoken amongst communities represented in the passenger populace. Some of the languages passengers listed in the Other category were German (0.9%), French (0.8%), Telugu (0.7%), Korean (0.6%), and Arabic (0.3%). The high percentage of passengers who speak languages other than English indicate a strong need for LAVTA to provide translated outreach materials, and to conduct inclusive outreach efforts that allow participation on the part of all passenger communities. Inclusive outreach efforts could help to identify transit service issues of particular importance to specific cultural communities or to those who do not speak English as a first language.

Figure 28 Languages Spoken in Passenger Household besides English



The bilingual passengers identified in the survey effort tend to be relatively proficient in English as featured in Figure 29. However, this result probably underestimates the percentage of riders with limited English proficiency, since the group of passengers who responded to the printed survey was likely biased towards those passengers who felt confident taking the survey in the first place. A total of 56% responded that they speak English very well. Additionally, 21% marked that they speak English well, while 23% stated they did not speak English well or at all. This supports the findings of previous questions, indicating that a significant percentage of passengers speak a language other than English as their primary language and that within this group, only half report a high proficiency in English.

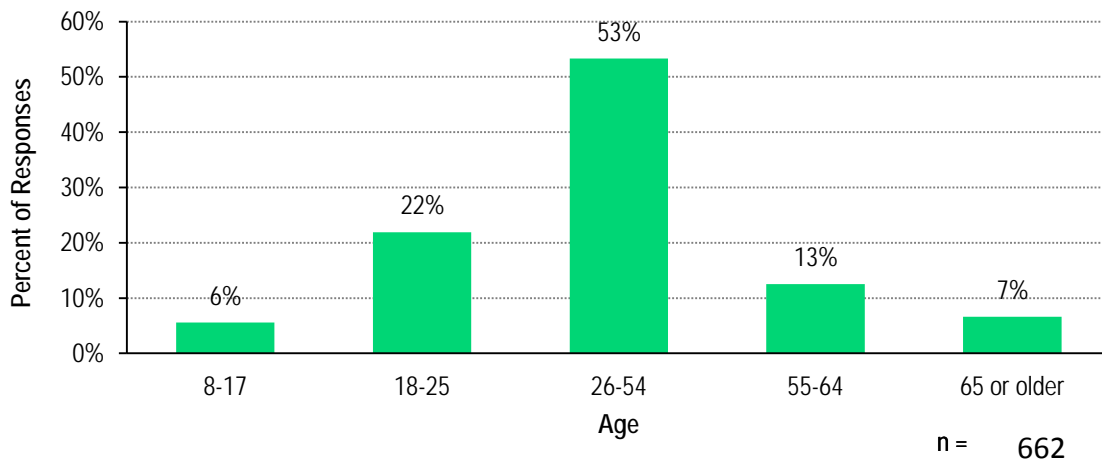
Figure 29 English Proficiency of Passengers from Homes Where another Language is Spoken



Age

Figure 30 shows the ages of those surveyed. Passengers were most likely to be aged 26-54 (53%) or 18-25 (22%). Only 13% of passengers surveyed were aged 55-64, 7% were 65 or older, and 6% were aged 8-17. Those on LAVTA services are predominantly of working age, which adds to the findings of Figure 19, showing work as the purpose for most trips. However, student and young adult ridership is also important, with nearly a quarter of respondents college-aged. Compared to comparable systems, ridership among older passengers is also relatively high, with 20% of passengers aged 55 and above. Some systems have seen increasing demand in this age group for paratransit trips, so attracting these passengers to fixed-route transit is important to containing paratransit costs. Compared to 2007 survey responses, the most notable changes in ridership shares are among riders aged 55 and older (increasing from 8% to 20%) and riders aged 8-17 (decreasing from 12% to 6%).

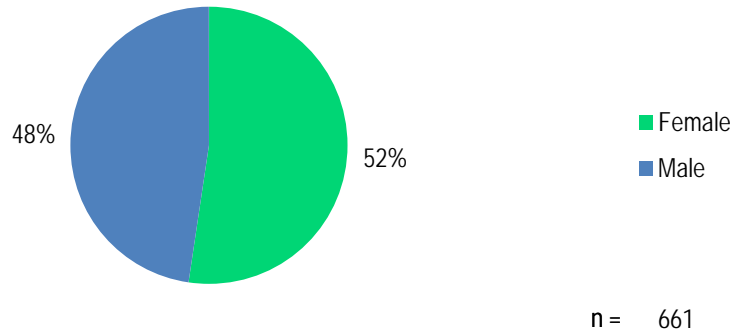
Figure 30 Passenger Age



Gender

Figure 31 shows that 52% of respondents self identified as female, and 48% as male. This gender balance is typical nationally. It represents a slight shift from 2007, when 53% of survey respondents were male.

Figure 31 Passenger Gender

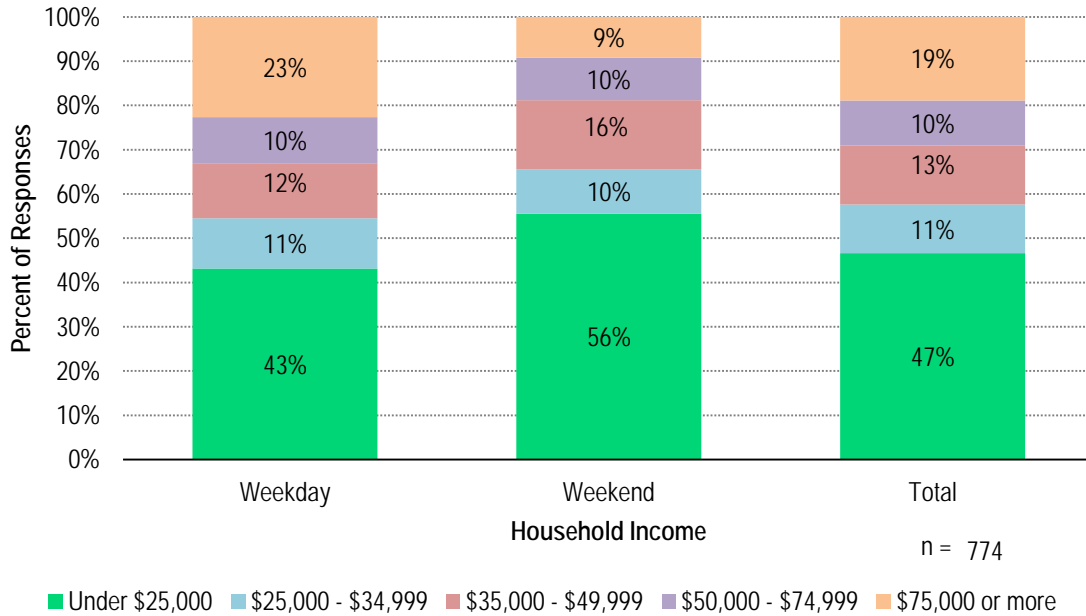


Income

Figure 32 shows the annual household income of those surveyed. Most passengers' (47%) household earnings are less than \$25,000. Additionally, 19% earned more than \$75,000, 13% earned \$35,000-\$49,999, 11% earned \$25,000-\$34,000, and 10% earned \$50,000-\$74,999. Compared to 2007 survey findings, the most notable difference is a decrease among riders earning less than \$25,000 (from 58% to 47%) and an increase in riders earning \$75,000 or more (from 14% to 19%).

The largest variance between weekday and weekend transit passengers occurred amongst those with incomes below \$25,000 and above \$75,000. Those with incomes below \$25,000 composed 43% of weekday passengers and 56% of weekend passengers, showcasing the reliance of transit for those in this income group. The large number of passengers earning less than \$25,000 suggests the number of transit dependent patrons carried by LAVTA. For households with incomes above \$75,000, passenger splits dropped from 23% during weekdays to 9% during weekends, highlighting the availability of other modes of transportation such as personal vehicles, as discussed previously with Figure 23. This finding reflects the relatively unique nature of the LAVTA service area, with a significant percentage of higher income riders using the system for commuting and lower income riders using the system for both commuting and daily needs. Weekend service should first and foremost serve those who rely heavily on transit for daily trip-making, but in the future attracting choice riders to weekend service represents a potential growth opportunity.

Figure 32 Annual Passenger Household Income



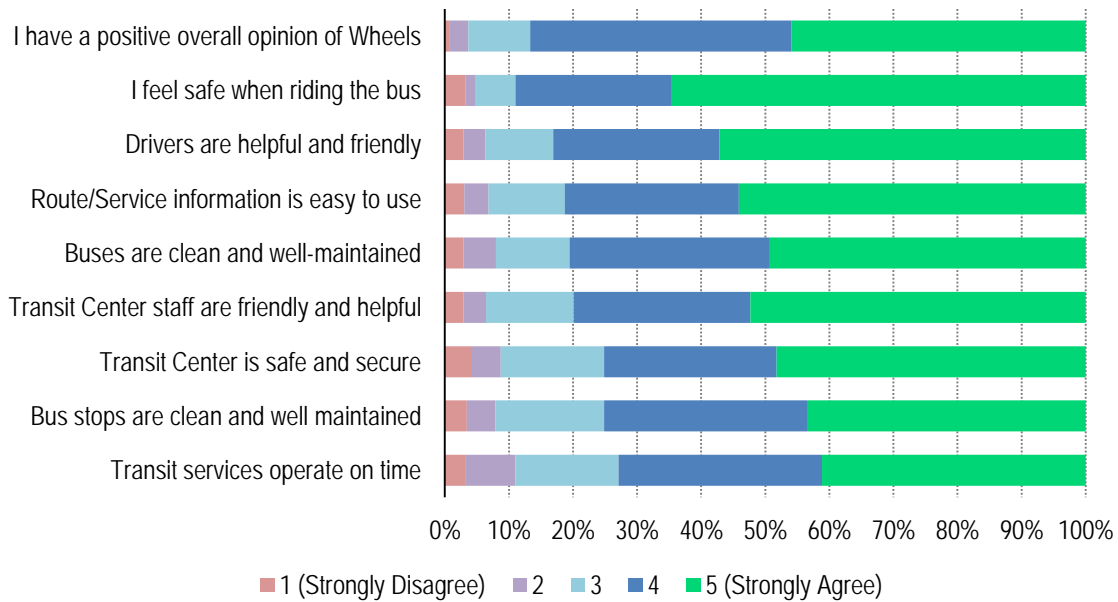
Passenger Satisfaction and Recommendations

The LAVTA passenger survey effort also provided passengers with the opportunity to provide feedback on satisfaction with Wheels services. Passengers ranked their satisfaction on a scale from 1-5 for topics including, but not limited to, safety, customer service, and overall maintenance of facilities as featured in Figure 33.

Overall, respondents had a very positive opinion of Wheels service, with only 4% of respondents reporting a low or somewhat low opinion of Wheels. Respondents had the most positive feelings about their experience with Wheels on board the bus, with over 80% of respondents agreeing or strongly agreeing that they feel safe on the bus, that drivers are helpful and friendly, and that buses are clean and well-maintained. Respondents similarly agreed that route/service information is easy to use. The only statement with which more than 10% of respondents disagreed or strongly disagreed was that transit services operate on time, suggesting potential for future improvements. No other statement caused passengers to disagree at a rate of 10% or above, which is very low compared to similar systems. Safety and cleanliness at bus stops and the transit center also rated lower in satisfaction. While these characteristics are likely not primary determinants of whether a passenger chooses to make a trip by transit, safety and cleanliness are important to how the system is perceived and in attracting choice riders.

These responses represent large improvements in passenger opinions related to service categories. In the 2007 survey, only 60% gave a high or somewhat high opinion of Wheels service (compared to 89% in 2015). In fact, attitudes towards all service categories in the 2015 survey show higher approval rates compared to the 2007 survey (excluding questions pertaining to Transit Center and Transit Center Staff, which were not included in the previous survey).

Figure 33 Overall Passenger Satisfaction



The survey also asked passengers about preferred improvements and potential expansion of current services, shown in Figure 34. Both weekday and weekend passengers preferred increasing service frequency at rates of 31% and 30%, respectively. Service earlier/later in the day was selected by 17% of weekday and 18% of weekend passengers. Notably, “nothing,” was the third most selected option by passengers. This response is very unusual, but corresponds with the high levels of customer satisfaction found in the previous question. This may reflect the fact that currently, LAVTA is largely attracting transit-reliant passengers or commuters who use only certain services. There are likely many non-riders for whom the current service is not adequate to induce usage, so these needs should be considered in addition to the needs of existing passengers. All other improvement options received a preference rate below 2%. Responses for “other” largely referred to Clipper Card integration, driver customer service, Coordination with BART transfer, better bus stop facilities, better service information, specific route alignment or stop placement.

Figure 34 Preferred Improvements to Wheels Services

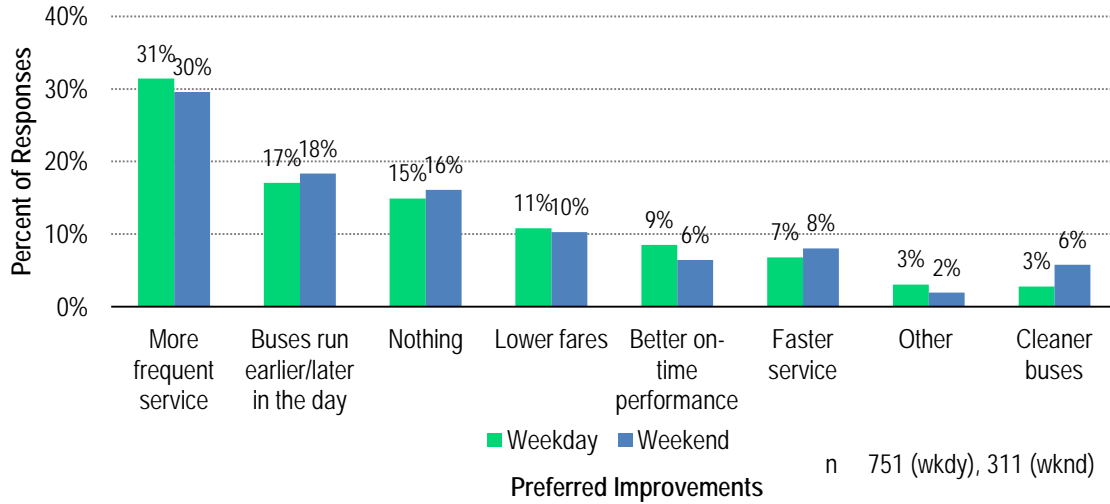
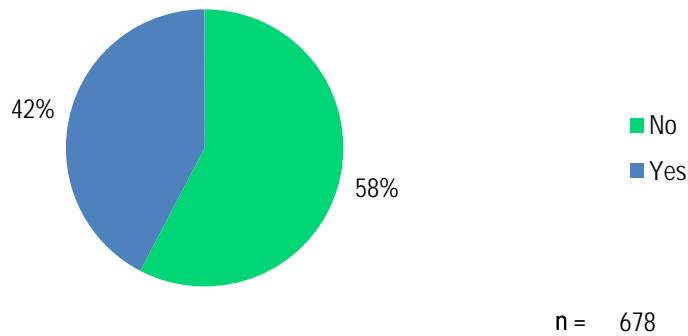


Figure 35 shows passenger comments on the need to expand LAVTA services. When asked if there is an area or location that needs more service, a majority of respondents (58%) said that there is not. This response is very unusual, and did not differ significantly by income. When asked where improvements were needed, responses included the following:

- More service on routes 8, 12, 14, 15, 20x, and Rapid, particularly on weekends
- Dublin and Dublin Boulevard
- Las Positas College
- Pleasanton
- Portola
- San Ramon
- Springtown
- Vasco/Vasco Road

Figure 35 Passengers Response to whether there is an Area or Location that Needs More Service



4 LAVTA BUS SYSTEM

SYSTEM OVERVIEW

The LAVTA Wheels bus system includes a network of 33 routes serving the Dublin, Pleasanton, and Livermore area, including one Rapid route and 16 school-focused routes. LAVTA also operates Dial-A-Ride service in compliance with the Americans with Disabilities Act (ADA).

The non-school routes vary widely in terms of service frequency and span. Routes operate with headways ranging from 15 minutes to 120 minutes depending on the day and time period. Eight routes provide all day service. Some routes operate only during peak times, while others operate from 4:00 a.m. to 2:00 a.m. Service frequencies and spans for each route are shown in Figure 36. Six routes operate on Saturdays, and five on Sundays.

Figure 37 below shows the LAVTA's systemwide routes, and Figure 38 shows the service network with connecting agency routes. Service is strongly oriented towards connections to BART service, providing connections to the Dublin/Pleasanton-Daly City train at the East and West Dublin/Pleasanton stations. Several routes also serve stations of the Altamont Corridor Express (ACE), providing rail connections all the way to San Jose to the south and Stockton to the northeast. Several County Connection bus routes also service the LAVTA service area in Dublin and Pleasanton, while LAVTA routes 70X and 70XV serve Walnut Creek BART and Pleasant Hill BART in Contra Costa County.

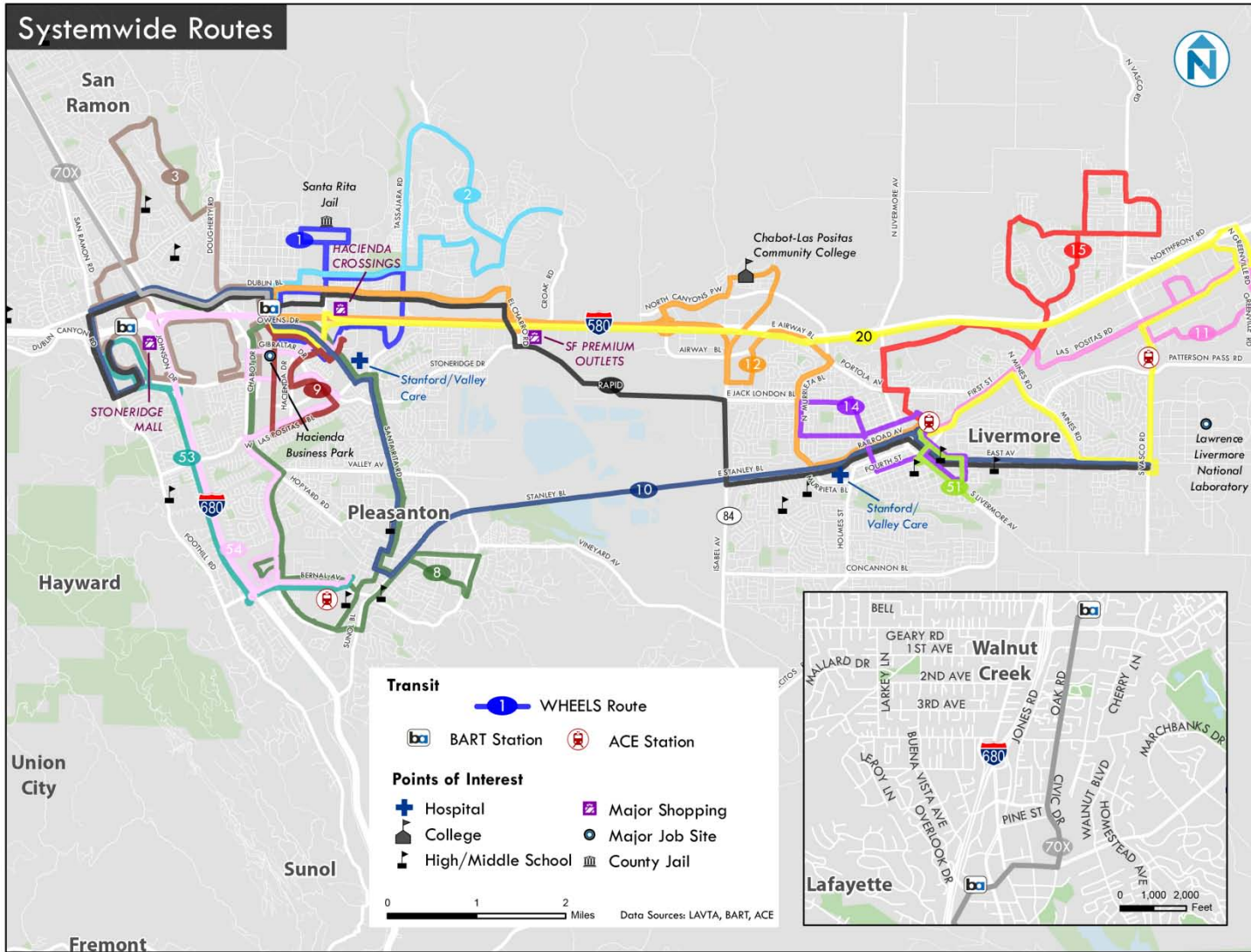
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Figure 36 Frequency and Span of Service by Route

Route	Frequency of Service					Span of Service		
	AM	Midday	PM	Saturday	Sunday	Weekday	Saturday	Sunday
Route 1	30	30	30	30	30	6:00 a.m. – 8:55 p.m.	8:01 a.m. – 9:25 p.m.	8:01 a.m. – 9:25 p.m.
Route 2	60	-	60	-	-	6:30 a.m. – 9:20 a.m. 3:20 p.m. – 6:48 p.m.	-	-
Route 3	30	-	30	60	-	5:55 a.m. – 9:20 a.m., 3:30 p.m. – 8:50 p.m.	9:01 a.m. – 5:51 p.m.	-
Route 8A	60	60	60	-	-	6:15 a.m. – 7:02 p.m.	-	-
Route 8B	60	60	60	-	-	6:45 a.m. – 8:32 p.m.	-	-
Route 8	-	-	-	50-60	40	-	8:01 a.m. – 11:11 p.m.	9:01 a.m. – 2:18 p.m.
Route 9	15-30	-	15	-	-	6:30 a.m. – 9:19 a.m. 3:30 p.m. – 6:19 p.m.	-	-
Route 10	30	30	40	16-48	40	4:12 a.m. – 1:44 a.m.	4:57 a.m. – 1:14 a.m.	5:17 a.m. – 1:14 a.m.
Route 11	45	-	45	-	-	6:42 a.m. – 8:48 a.m. 4:12 p.m. – 6:18 p.m.	-	-
Route 12	15-30	60	15-60	60	120	5:58 a.m. – 10:42 p.m.	9:01 a.m. – 9:47 p.m.	9:02 a.m. – 8:47 p.m.
Route 14	30	30	30	-	-	6:42 a.m. – 8:06 p.m.	-	-
Route 15	30-60	30-60	30-60	60	60	5:12 a.m. – 11:58 p.m.	6:02 a.m. – 11:48 p.m.	7:08 a.m. – 8:43 p.m.
Route 20X	45	-	45	-	-	6:15 a.m. – 9:54 a.m. 3:52 p.m. – 6:36 p.m.	-	-
Route 51	-	-	30	-	-	3:12 p.m. – 6:57 p.m.	-	-
Route 53	25-75	-	60	-	-	5:33 a.m. – 8:41 a.m. 3:55 p.m. – 7:31 p.m.	-	-
Route 54	65 – 75	-	60	-	-	5:33 a.m. – 8:23 a.m. 3:47 p.m. – 6:28 p.m.	-	-
Route 70X/70XV	30	-	30	-	-	5:43 a.m. – 8:53 a.m. 4:00 p.m. – 6:41 p.m.	-	-
Rapid	12-18	15	15	-	-	5:16 a.m. – 8:04 p.m.	-	-

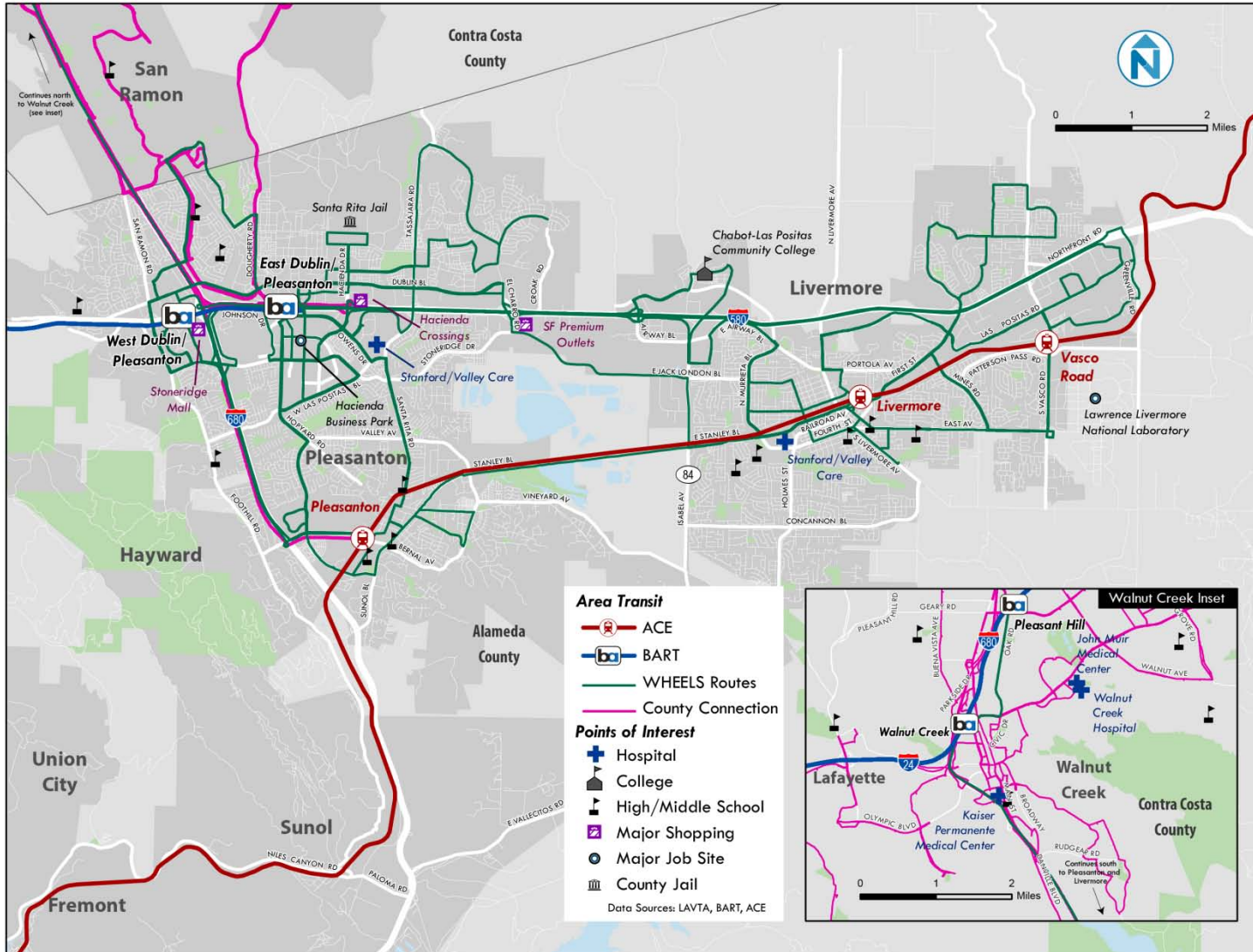
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Figure 37 Systemwide Routes



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Figure 38 LAVTA Service Area Transit Service



SYSTEM PERFORMANCE

In order to analyze the productivity of routes, LAVTA's 2012 - 2021 Short Range Transit Plan (SRTP) proposed route categories so that routes with a similar purpose were compared against each other. The categories of routes as they exist today are as follows:

- Primary: Routes 10, 12/12x, 20X, and Rapid
- Regional Express: Route 70X/70XV
- Neighborhood Feeder: Routes 1, 2, 3, 8A/8B, 9, 11, 14, 15, 51, 53, and 54
- School: 401, 402, 403, 501, 502, 503, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611

Primary routes operate between the municipalities in the service area. With the exception of Route 20X, which only operates during peak hours, Primary routes generally operate all day with regular frequencies, usually at least half hourly or hourly service. Regional Express service operates at 30 minute headways during peak periods. This is specifically a peak hours-only service to connect people to multiple BART stations in the service area. Neighborhood Feeder routes serve smaller geographic areas and may operate with limited spans of service, with the exception of route 15, which operates regularly throughout the day. School routes operate Mondays through Fridays, and are intended to help area students get to and from school, although the service is always open to the general public.

Due to the special nature of school-based services, those routes will not be evaluated at the same level of detail as the other routes in this document. School-based services are an important part of any transit system because they provide coverage to a transit-dependent cohort. They can be very expensive due to the fact that they usually only have one or two trips but require a vehicle and driver at peak times. A later evaluation of schedules and how to schedule driver work efficiently will address maximizing efficiencies on school-based routes.

PRIMARY, REGIONAL EXPRESS, AND NEIGHBORHOOD FEEDER

Ridership

Data was extracted from the LAVTA Automated Passenger Counter system for the month of February 2015, excluding President's Day. Average weekday boardings and boardings per service hour are shown in Figure 39. Figure 40 shows the average weekday boardings further broken down by category. Figure 41 illustrates the amount of daily weekday service, in hours, provided on each route by category. As expected, routes with the most service have the highest total ridership.

Boardings per service hour is one of the most commonly used measures to identify the efficiency of a route. This metric helps account for differences in levels of service provided, and does not penalize services that have long deadheads (travel without passengers to get to the start of a trip, or go back to the garage afterwards). Figure 42 illustrates this measure by category.

Among Primary routes, Route 10 has the highest boardings per service hour at 20.8. The average for that category of routes is 16.9 boardings per service hour. Among the Regional Express routes, the 70X and its variant with one morning and one evening trip, the 70XV, average 17 boardings per service hour. There is much more variation among the Neighborhood Feeder routes. Route 53 has the highest number of boardings per service hour in the whole system with over 32 boardings per service hour. Unlike the Rapid, which has high total ridership but 110 trips per day, Route 53

has only eight trips all day, and only in the morning and afternoon peaks. The average for the Neighborhood Feeders is 14.2 boardings per service hour.

Figure 39 Average Weekday Performance Statistics by Route

Route	Average Weekday Boardings	Weekday Boardings Rank	Average Weekday Boardings per Service Hour	Boardings per Hour Rank
Route 53	120	8	32.3	1
Route 15	507	4	22.3	2
Route 54	99	11	21.1	3
Route 10	1,485	2	20.8	4
Route 70X	248	5	18.9	5
Route 12	567	3	18.6	6
Route 14	162	6	15.4	7
Rapid	1,664	1	14.9	8
Route 51	26	18	13	9
Route 8B	140	7	12.7	10
Route 8A	116	9	11.4	11
Route 20X	58	13	11.1	12
Route 1	114	10	9.5	13
Route 11	31	17	8.6	14
Route 2	44	15	8	15
Route 12X	56	14	7.7	16
Route 9	38	16	7.4	17
Route 3	65	12	5.5	18
Route 70XV	10	19	4.8	19
Average	285		16.1	

Figure 40 Average Weekday Boardings by Route

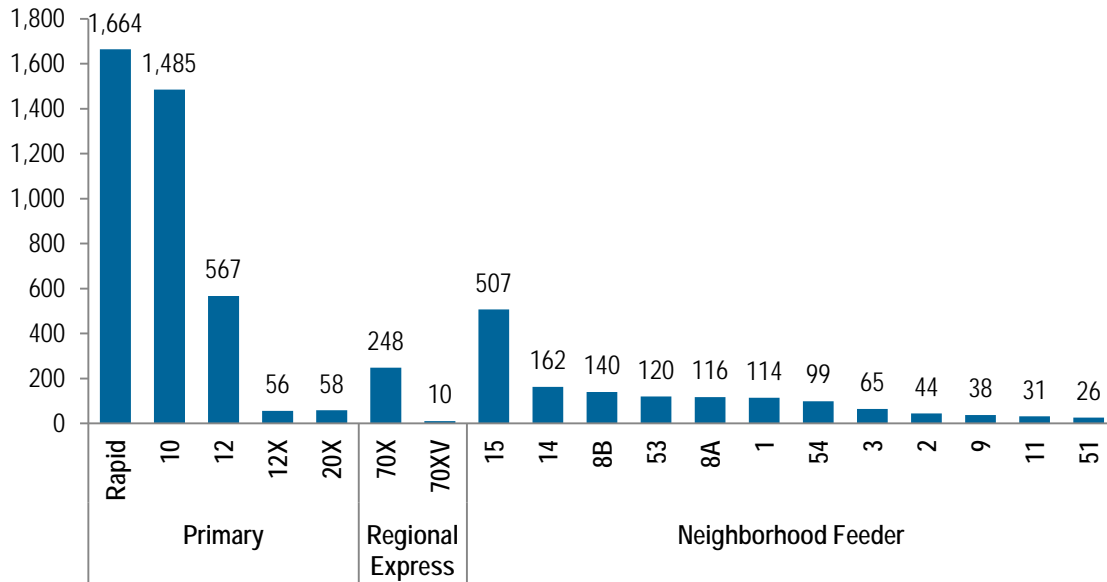


Figure 41 Daily Hours of Service by Route

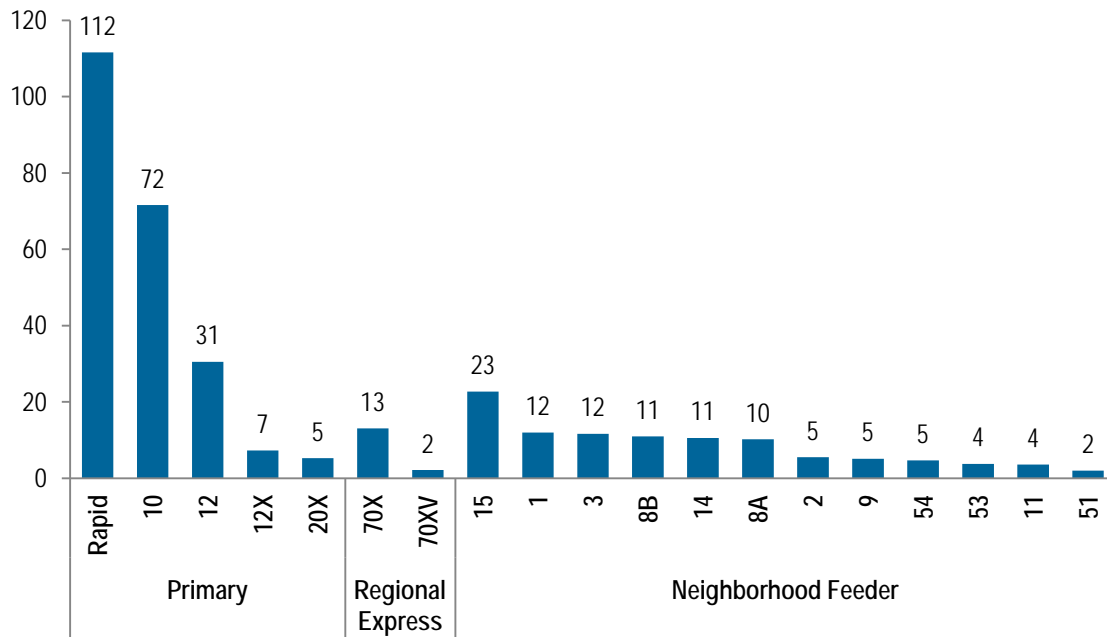


Figure 42 Average Weekday Boardings per Service Hour by Route

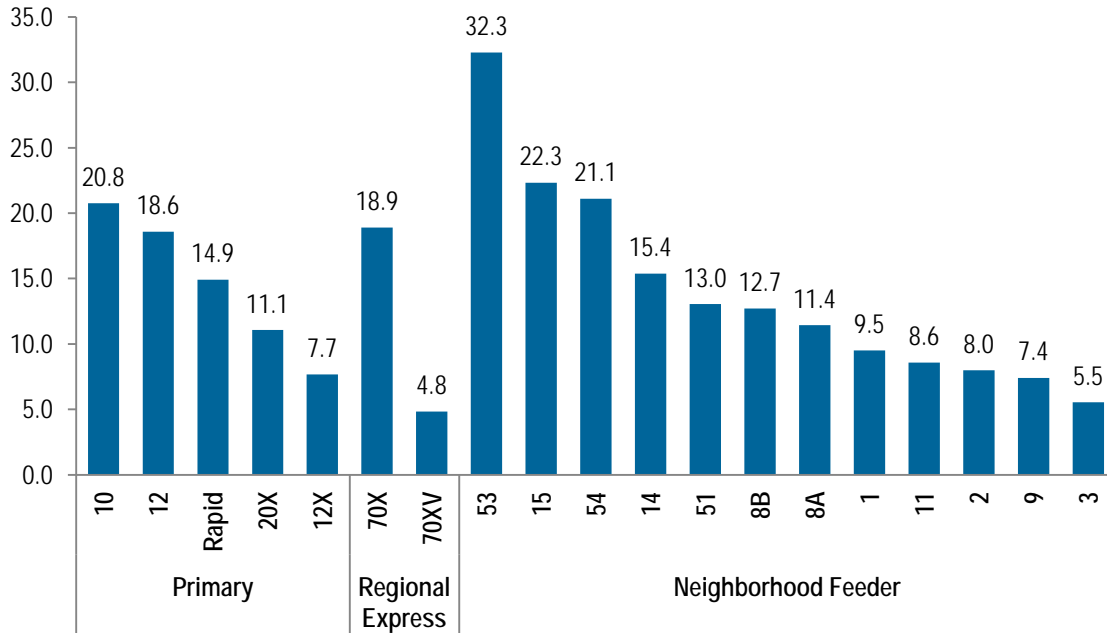
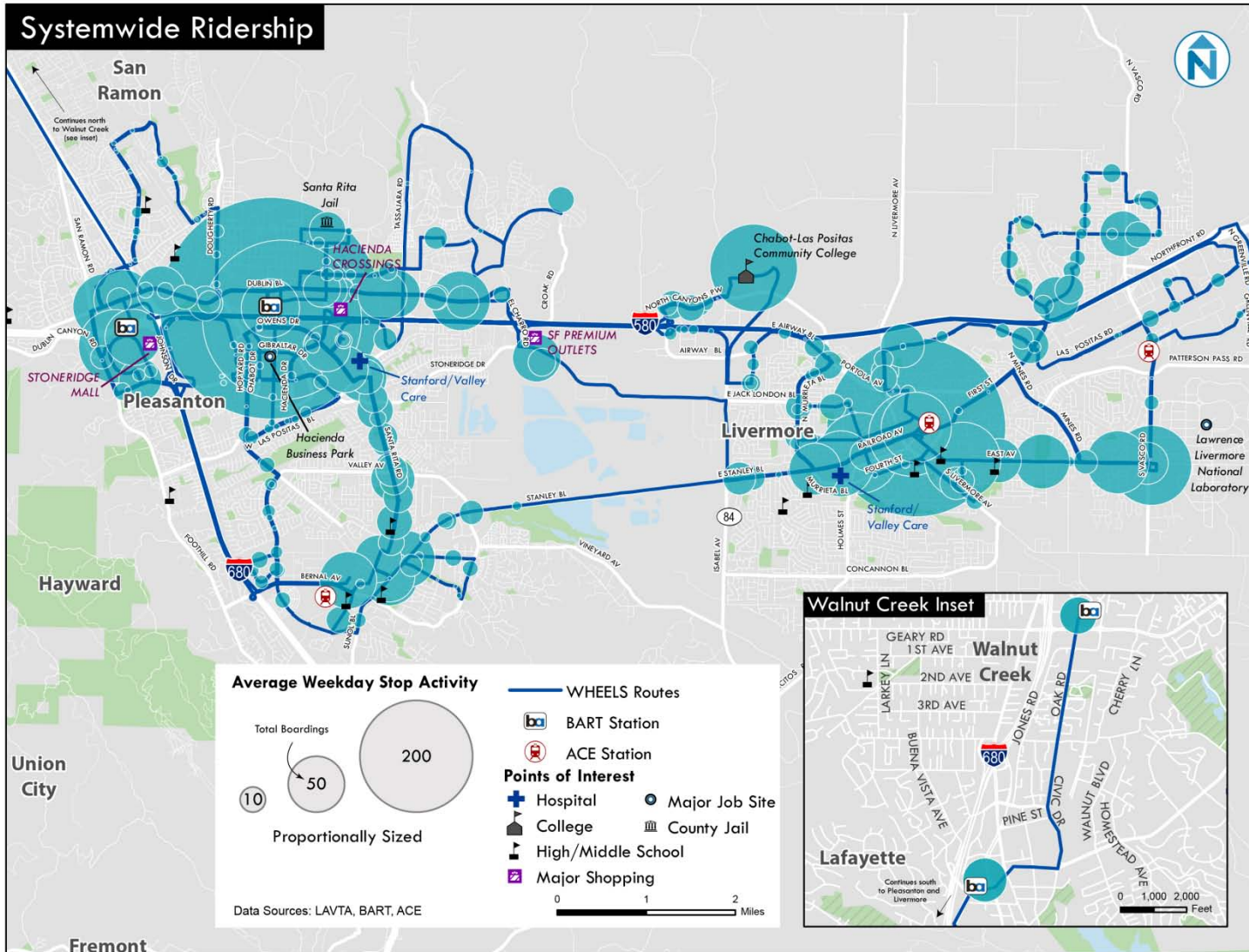


Figure 43 below is a map illustrating the average weekday boardings in February at every stop in the LAVTA bus system. For stops that are served by more than one route, the boardings and alightings for all routes at the stop were summed to calculate the total boarding and alighting activity. Transit centers are the highest ridership areas in the system, although Las Positas College, Santa Rita Road, the Livermore Outlets, East Avenue, and Springtown also exhibit high ridership.

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Figure 43 LAVTA Systemwide Boardings



On-Time Performance

Weekday on-time performance by route is shown in Figure 44, Figure 45, and Figure 46. For the purposes of this analysis, “on-time” is defined as any departure from a scheduled timepoint between one minute early and five minutes late. “Early” is defined as any departure one minute earlier than the scheduled time at those same timepoints, and “late” is defined as departures more than five minutes late.

Data used for this analysis is based on raw Automatic Vehicle Locator (AVL) outputs that has been post-processed by LAVTA staff. The system average for on-time performance is 79%, and early trips account for 19% of all trips.

It is important to note that these designations are based on the departure times at all the timepoints along a route, which gives a better picture of the performance of the route as the passengers see it, as boardings occur along the route. When on-time performance is measured solely on how far off the schedule the trip was at the end of the route, the nuances and opportunities for making the route more reliable to passengers can be missed.

Although lateness is problematic, being early is a much more impactful problem on ridership than being late. If a bus is late by seven minutes, a rider is delayed by seven minutes. But if a bus is two minutes early, and a rider isn't at the stop yet, they may have to wait for close to an hour for the next bus, or longer if it was the last bus for a route providing peak-only service.

The routes with the best on-time performance are Routes 1, 2, 51, and 53. The routes with the worst on-time performance include Routes 3, 9, 12X, 70X, and 70XV, which all have more than 25% of trips arriving more than 5 minutes late.

Poor on-time performance can often be attributed to circuitous routing, heavy traffic congestion not effectively factored into the amount of time given to make the trip, signal prioritization, fare payment methods, and stop spacing. For instance, Routes 12X, 70X, and 70XV are all exposed to freeway traffic on I-580 or I-680. Another cause of poor on-time performance related to scheduling is not building enough recovery time between trips. For example, if one peak hour trip habitually ends five minutes late due to traffic and the next trip is scheduled to start five minutes after the end of the last, a driver doesn't have time to run to the bathroom or stand and stretch. If the trip is six minutes late and the next scheduled trip is five minutes later, the lateness can be compounded throughout the day.

Figure 44 Average Weekday On-Time Performance by Route

Route	On-Time	Early	Late
Route 1	91%	3%	5%
Route 2	95%	1%	3%
Route 3	64%	1%	35%
Route 8A/B	81%	2%	17%
Route 9	72%	1%	27%
Route 10	81%	3%	17%
Route 11	74%	5%	21%
Route 12	78%	1%	21%
Route 12X	63%	0%	36%
Route 14	76%	3%	21%
Route 15	75%	3%	22%
Route 20X	82%	2%	16%
Route 51	98%	0%	2%
Route 53	92%	3%	5%
Route 54	70%	11%	18%
Route 70X	57%	0%	43%
70XV	35%	0%	65%
Rapid	81%	1%	18%
Average	79%	2%	19%

Figure 45 Average Weekday On-Time Percentage by Route

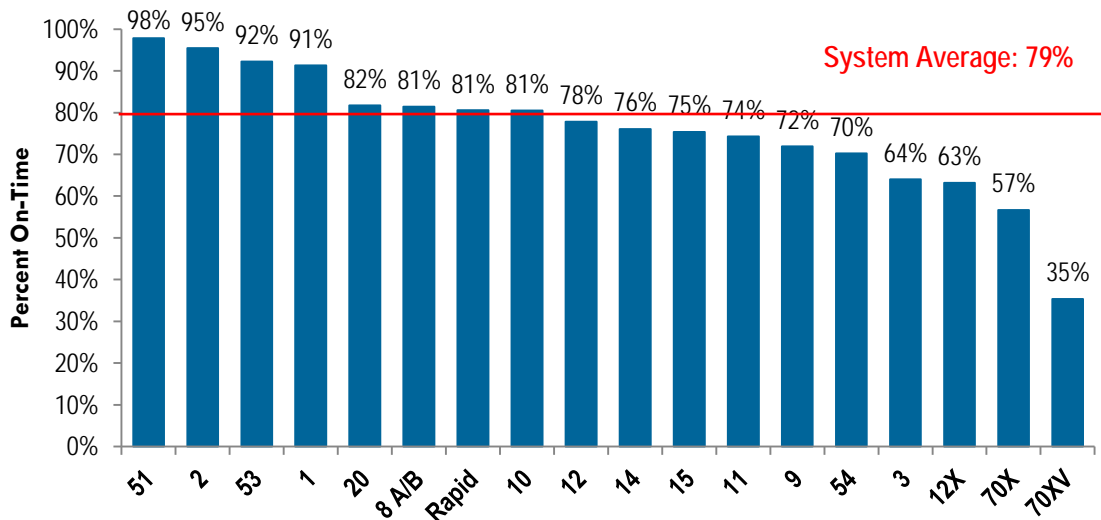
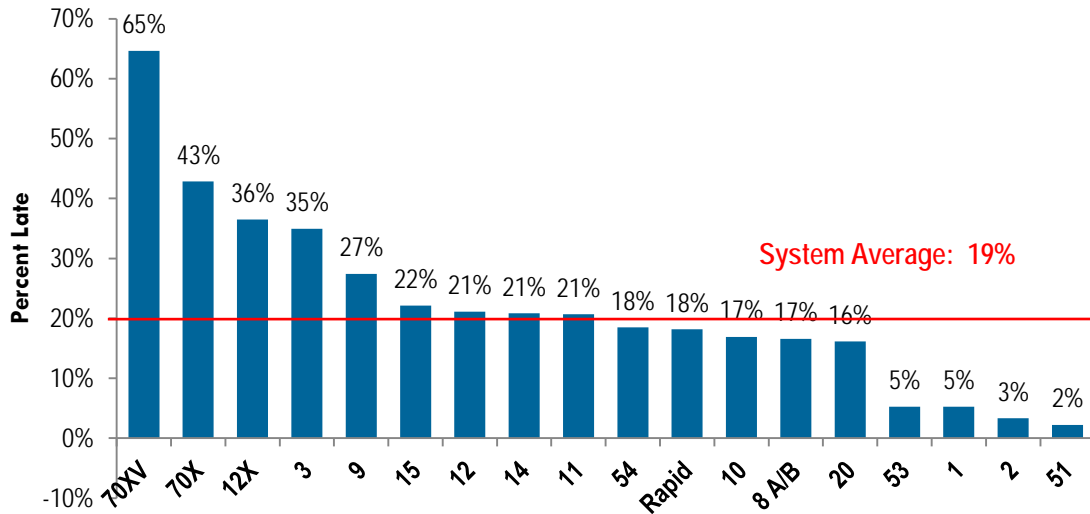


Figure 46 Average Weekday Late Trips by Route



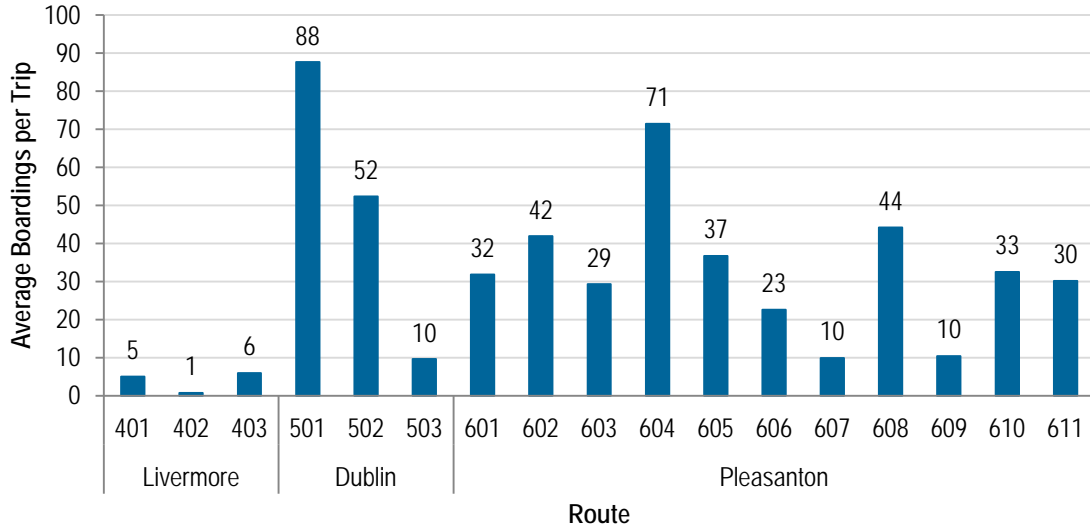
SCHOOL ROUTES

Boardings per trip by route and city are shown in Figure 47. Livermore school trippers are underperforming. Route 402 averages only one passenger per trip. Most of Route 402's alignment duplicates Route 12 and Route 14. Route 401 averages 5 passengers per trip and Route 403 averages 6 passengers per trip. Due to underperformance, Livermore school trippers should be looked at to improve performance.

In Dublin, school trippers are significantly more utilized, all average 10 or more passengers per trip. Both Routes 501 and 502 carry children from East Dublin to Dublin High School and Wells Middle School, and due to high demand, additional vehicles have been added to provide sufficient capacity.

All Pleasanton school trippers average more than 10 passengers per trip. Several trips, including afternoons on 604 and 608 require more than one vehicle to accommodate passenger loads.

Figure 47 School Route Average Boardings per Trip



5 EVALUATION OF EXISTING LAVTA BUS ROUTES

This chapter presents performance summaries for all existing LAVTA bus routes. The summaries include route descriptions, a discussion of other transit that serves similar markets, and route strengths and weaknesses. As with the systemwide summary, ridership data is from February 2015. Schedule adherence data was from the same time period.

Route 1 – E. BART to East Dublin to E. BART

Description

Route 1 operates between the East Dublin/Pleasanton BART station and East Emerald Glen Park, operating primarily in a one-way loop along Dublin Boulevard, Central Parkway, and Santa Rita Road.

In addition to the East Dublin/Pleasanton BART station, the route serves major destinations such as Emerald Point, Santa Rita Jail, Rose Pavilion, and the California Center. Additional locations served include Creekside, Waterford Plaza, Wal-Mart, and Oracle.

Four trips operate a different variation from the normal loop, and connect the Jail and BART directly.

At a Glance		
Weekday Boardings		114
Weekday Service Hours		12.0
Weekday Boardings per Hour		9.5
Weekday Schedule Adherence	On Time	91%
	Early	3%
	Late	5%
Frequency (minutes)	AM	30
	Midday	30
	PM	30
	Sat	30
	Sun	30
Span	Mon-Fri	6:00 a.m. – 8:55 p.m.
	Sat	8:01 a.m. – 9:25 p.m.
	Sun	8:01 a.m. – 9:25 a.m.

Route Productivity

Route 1 has the 10th highest number of boardings of any route in the system as well as the 6th highest number of weekday service hours (12.0). Average weekday boardings per hour on Route 1 are 9.5, ranking 13th compared with all routes. Productivity on Route 1 is lower than the systemwide average of 16.1 boardings per hour.

The biggest generators on Route 1 are the BART station and Santa Rita Jail. Productivity does not vary much by time – there are no real peak trips or peak times, as almost every trip carries less than 5 passengers.

On-Time Performance

Route 1 has above average on-time performance, with 91% of trips arriving on time to scheduled time points.

Summary

Route 1 is a Neighborhood Feeder route for the E Dublin/Pleasanton BART station whose only unique market is service to the Santa Rita jail. There are relatively few boardings at other locations. Despite 30-minute all day service, productivity is low. The only stops with over 15 daily boardings that are not served by other routes are the jail and the Rose Pavilion. Route 1 duplicates segments of Routes 2, 12, and 9. Route 1 is designed as a one-way loop, which ensures that all passengers face out-of-direction travel and thus have longer trips. Service in the vicinity of Route 1 should be restructured to reduce duplication and improve efficiency.

Route 2 – E. BART to Dublin Ranch to E. Bart

Description

Route 2 operates between the East Dublin/Pleasanton BART station and Dublin. From the BART station, Route 2 operates along Central Parkway before completing a one-way clockwise loop consisting primarily of Tassajara Road and Fallon Road. This one-way loop is designed to accommodate bus stops on one side of the road. The route was recently extended in 2014 along Positano Parkway to Croak Road, which is a growing part of the Positano master-planned community.

In addition to the BART station, major destinations served by the route include Emerald Glen Park and Fallon Middle School.

At a Glance		
Weekday Boardings		44
Weekday Service Hours		5.5
Weekday Boardings per Hour		8.0
Weekday Schedule Adherence	On Time	95%
	Early	1%
	Late	3%
Frequency (minutes)	AM	60
	Midday	-
	PM	60
	Sat	-
	Sun	-
Span	Mon-Fri	6:30 a.m. – 9:20 a.m. 3:20 p.m. – 8:50 p.m.
	Sat	-
	Sun	-

Route Productivity

Route 2 has the 5th lowest daily boardings of any route in the system, as well as the 8th lowest weekday service hours (5.5). Average weekday boardings per hour on Route 2 are 8.0, ranking 5th lowest compared with all routes. Productivity on Route 2 is lower than the systemwide average of 16.1 boardings per hour. Only one trip carries more than 6 passengers.

Route 2 has 12 minutes of layover mid-route at Positano/Valentano, which reduces route productivity. The majority of the 19 riders at this stop are likely to be operators boarding and alighting the bus, and not passengers.

On-Time Performance

Route 2 has the second-best on-time performance systemwide, with 95% of trips arriving on time to scheduled time points.

Summary

Route 2 is a Neighborhood Feeder route to the E. Dublin/Pleasanton BART station and also serves Fallon Middle School, however service is peak only. The primary markets are service to BART and service to the middle school.

Results from the on-board survey indicate that 60% of riders are traveling to/from work, and 20% are traveling to/from school. Half of Route 2 riders have been riding for a year or less, compared to 31% for the system as a whole.

School tripper routes 501 and 502 also operate in the same area, although not along the same alignment. Service on Tassajara Road is very unproductive and the route is circuitous, with a one-way loop in the middle of the route forcing some passengers to ride all the way around. Route 2 should be restructured to simplify service, reduce duplication, and improve productivity and efficiency.

Route 3 – E. BART to Stoneridge Mall to West Dublin to E. BART

Description

Route 3 operates between the East Dublin/Pleasanton BART station, Stone Ridge Mall, and West Dublin. Route 3 operates primarily along Johnson Drive before serving Stoneridge Mall and continuing north primarily along Village Parkway. Route 3 returns south along Stagecoach Road and Dougherty Road.

The route serves the East Dublin/Pleasanton BART station, Clorox Services, Stoneridge Mall, Dublin High School, and San Ramon Senior Center, as well as various hotels.

Route 3 operates 7 morning trips in the clockwise direction and 8 afternoon trips in the counterclockwise direction.

Two County Connection routes (35 and 36) provide service between the Dublin/Pleasanton BART station and the area of Dublin served by Route 3.

At a Glance		
Weekday Boardings		65
Weekday Service Hours		11.7
Weekday Boardings per Hour		5.5
Weekday Schedule Adherence	On Time	64%
	Early	1%
	Late	35%
Frequency (minutes)	AM	30
	Midday	-
	PM	30
	Sat	60
	Sun	-
Span	Mon-Fri	5:55 a.m. – 9:20 a.m. 3:30 p.m. – 8:50 p.m.
	Sat	9:01 a.m. – 5:51 p.m.
	Sun	-

Route Productivity

Route 3 ranks 12th in number of boardings of any route in the system, and 7th in number of weekday service hours (11.7). Average weekday boardings per hour on Route 3 are 5.5, making it the second lowest compared with all routes, and well below the systemwide average of 16.1 boardings per hour.

Ridership is highest at the two BART stations, with the overall pattern being oriented to serving stops north of the BART stations. Overall, ridership is low throughout the route, with only two trips carrying more than 6 people. The segments south of the BART stations attract only 6 passengers on a circuitous alignment, resulting in productivity less than half that of the northern segments. Overall, there are no times when Route 3 carries more than 7 passengers per hour.

On-Time Performance

Route 3 has below average on-time performance, with 64% of trips arriving on time to scheduled time points, 35% late, and 1% of trips arriving early.

Summary

Route 3 is a peak-only Neighborhood Feeder route serving two BART stations. Despite 30-minute peak frequency, Route 3 is a very low performing route. The alignment is circuitous, difficult to understand, and requires out-of-direction travel. It also does not operate all-day. Service on this route should be restructured to reduce duplication of service and improve productivity. Consideration should be given to alternative or flexible service approaches such as dial-a-ride service.

Route 8A – E. BART to Downtown Pleasanton to E. BART

Description

Route 8A operates between the East Dublin/Pleasanton BART station and downtown Pleasanton. From the BART station, Route 8A operates in a clockwise loop consisting primarily of Hopyard Drive, Valley Avenue, Bernal Avenue, and Santa Rita Road. The route deviates from the loop to serve Bernal Business Park in a clockwise fashion.

The route serves the East Dublin/Pleasanton BART station, Bernal Business Park, Ridgeview Commons, Pleasanton Middle School, Oak Hills Center, Village High School, Amador Valley High School, Amador Center, and Valley Medical Center.

Several small changes were made to 8A and 8B in 2014 that allow the routes to have a 60 minute cycle time. These changes have led to slight increases in productivity.

At a Glance		
Weekday Boardings		116
Weekday Service Hours		10.2
Weekday Boardings per Hour		11.4
Weekday Schedule Adherence	On Time	81%
	Early	3%
	Late	17%
Frequency (minutes)	AM	60
	Midday	60
	PM	60
	Sat	60
	Sun	-
Span	Mon-Fri	6:15 a.m. – 7:02 p.m.
	Sat	8:01 a.m. – 8:49 p.m.
	Sun	9:01 a.m. – 2:18 p.m.

Route Productivity

Route 8A has the 9th highest number of boardings of any route in the system as well as the 10th highest number of weekday service hours (10.2). Average weekday boardings per hour on Route 8A are 11.4, ranking 11th compared with all routes.

Ridership productivity is highest on the route segment from the East Pleasanton BART station to Hopyard Road & Las Positas Boulevard, with an average of 38.7 boardings per service hour. Ridership productivity is lowest on the route segment from Koll Center Parkway & Koll Center Drive to Neal Street & First Street, with 1.2 boardings per hour. The biggest generators on Route 8A are the East Pleasanton BART station and Pleasanton Middle School.

Morning and afternoon peak periods are the most productive, and midday service is also more productive than the route average. Evening service is the least productive (5.9 boardings per hour). Load factors on Route 8A are relatively constant throughout the day with no trips exceeding 10 passengers.

On-Time Performance

Routes 8A and 8B have above average on-time performance, with 81% of trips arriving on time to scheduled time points. Early running occurs at a rate of 17%.

Summary

See Route 8B.

Route 8B – E. BART to Downtown Pleasanton to E. BART

Description

Route 8B is a clockwise version of Route 8A, and operates between the East Dublin/Pleasanton BART station and downtown Pleasanton. From the BART station, Route 8B operates in a modified clockwise loop consisting primarily of Owens Drive, Santa Rita Road, Valley Avenue, and Hopyard Drive. The route deviates to serve Kottinger Park along Vineyard Avenue and Kottinger Drive.

The route serves the East Dublin/Pleasanton BART station, Wal-Mart, Valley Care Medical Center, Amador Center, Amador Valley High School, Kottinger Park, Village High School, Oak Hills Center, Pleasanton Middle School, and Pleasanton Gateway Plaza.

At a Glance		
Weekday Boardings		140
Weekday Service Hours		11.0
Weekday Boardings per Hour		12.7
Weekday Schedule Adherence	On Time	81%
	Early	3%
	Late	17%
Frequency (minutes)	AM	60
	Midday	60
	PM	60
	Sat	-
	Sun	-
Span	Mon-Fri	6:45 a.m. – 8:32 p.m.
	Sat	-
	Sun	-

Several small changes were made to 8A and 8B in 2014 that allow the routes to have a 60 minute cycle time. These changes have led to slight increases in productivity.

Route Productivity

Route 8B has the 7th highest number of boardings of any route in the system as well as the 8th highest number of weekday service hours (11.0). Average weekday boardings per hour on Route 8B are 12.7, ranking 10th compared with all routes.

Ridership productivity is highest on the route segment from the East Pleasanton BART station to Santa Rita Road & Valley Avenue, with an average of 32.1 boardings per service hour. The only other segment with productivity greater than 10 passengers per service hour is the segment from Neal Street & First Street to Bernal Avenue & Palomino Drive, with an average of 14.5 boardings per service hour. Ridership productivity is lowest on the route segment from Bernal Avenue & Palomino Drive to Valley Avenue & Wild Rose Place, with 5.9 boardings per hour. The biggest generators on Route 8B are the East Pleasanton BART station, Amador Center, and downtown Pleasanton.

The afternoon peak period is the most productive (16.1 boardings per service hour), while morning and midday services are also more productive than the route average. Evening service is the least productive (10.0 boardings per hour). Load factors on Route 8B are consistent throughout the day, and no trips experience a maximum load greater than 10 passengers.

On-Time Performance

Routes 8A and 8B have above average on-time performance, with 81% of trips arriving on time to scheduled time points. Early running occurs at a rate of 17%.

Summary

Routes 8A and 8B are Neighborhood Feeder routes that operate as large counter-clockwise and clockwise loops on weekdays, with several differences in route deviations. Both routes operate hourly on weekdays and perform near but slightly below the system average. Route 8 operates only in the counterclockwise direction on Saturdays and bi-directionally on Hopyard/Valley on between BART and Pleasanton on Sunday. Route 8's span on Sundays is too short for most trips, as serve ends at 2:18 p.m.

The Route 8A deviation to Bernal Business Park produces very little ridership, and is also served by Route 54. At the southern end of the route, the two routes have several differences in routing including a deviation to Kottinger Park. The eastern portion of the route is duplicated by Route 10, which operates more frequently, has a much longer service span, and also serves Livermore. The western portion is duplicative with much of Route 54.

Route 9 – E. BART/California Center/Hacienda Business Park/E. BART

Description

Route 9 operates between the East Dublin/Pleasanton BART station and Las Positas Boulevard, providing service to the Hacienda Business Park. In the morning, Route 9 operates a clockwise loop consisting primarily of Owens Drive, Hacienda Drive, Stoneridge Drive, Las Positas Boulevard, and Willow Road. The route is reversed in the afternoon, operating in the counterclockwise direction.

The route serves the East Dublin/Pleasanton BART station, Wal-Mart, Alameda Superior Court, and Hart Middle School.

About half of Route 9 trips are interlined with Route 70X, which is noted on the Route 9 timetable.

At a Glance		
Weekday Boardings		38
Weekday Service Hours		5.1
Weekday Boardings per Hour		7.4
Weekday Schedule Adherence	On Time	72%
	Early	1%
	Late	27%
Frequency (minutes)	AM	15 – 30
	Midday	-
	PM	15
	Sat	-
	Sun	-
Span	Mon-Fri	6:30 a.m. – 9:19 a.m. 3:30 p.m. – 6:19 p.m.
	Sat	-
	Sun	-

Route Productivity

Route 9 ranks 4th to last in daily boardings and 6th to last in weekday service hours (5.1). Average weekday boardings per hour on Route 9 are 7.4, ranking third to last systemwide.

Ridership productivity is highest on the route segment from the East Pleasanton BART station to California Center, with an average of 18.5 boardings per service hour. No other segment has ridership productivity greater than 10 boardings per service hour. Ridership productivity is lowest on the route segment from California Center to Stoneridge Drive & Gibraltar Drive, with 2.1 boardings per hour. The biggest ridership generators on Route 9 are the East Dublin/Pleasanton BART station and California Center. No Route 9 trips having a maximum load exceeding 5 passengers.

On-Time Performance

Route 9 has below average on-time performance, with 72% of trips arriving on time to scheduled time points. Most trips that are not on time are caused by trips arriving late (27% of all trips).

Summary

Route 9 is a Neighborhood Feeder route designed as a short collector to distribute BART passengers to the Hacienda Business Park. Despite operate every 15 minutes during peak periods, productivity is very low. Providing productive “last mile” connections with fixed-routes is very difficult without sufficient employment demand and incentives. The service is also duplicative with portions of Route 54. Service to the Hacienda Business Park area should be revised to provide one consistent corridor.

Route 10 – Livermore, Pleasanton, Dublin, E. BART

Description

Route 10 operates between the Lawrence Livermore National Laboratory (LLNL) and downtown Livermore, Pleasanton, and Dublin. From LLNL, Route 10 operates primarily along East Avenue, Stanley Boulevard, Santa Rita Road, and Dublin Boulevard.

The route serves LLNL, Livermore Transit Center, Valley Care Livermore Campus, Village High School, Amador Valley High School, Walmart, and East Dublin/Pleasanton BART station. On evenings and weekends when Rapid is not operating, Route 10 is extended to serve Dublin Plaza, West Dublin/Pleasanton BART station, and Stoneridge Mall.

At a Glance		
Weekday Boardings		1,485
Weekday Service Hours		71.6
Weekday Boardings per Hour		20.8
Weekday Schedule Adherence	On Time	81%
	Early	2%
	Late	17%
Frequency (minutes)	AM	30
	Midday	30
	PM	40
	Sat	16-48
	Sun	40
Span	Mon-Fri	4:12 a.m. – 1:44 a.m.
	Sat	4:57 a.m. – 1:14 a.m.
	Sun	5:17 a.m. – 1:14 a.m.

Route Productivity

Route 10 has the second-highest number of boardings of any route in the system as well as the second highest number of weekday service hours (71.6). Average weekday boardings per hour on Route 10 are 20.8, ranking 4th among all routes. Productivity on Route 10 is well above the systemwide average of 16.1 boardings per hour.

Ridership productivity is highest on the route segment from the East Pleasanton BART station to Santa Rita Road & Valley Ave, with an average of 37.4 boardings per hour. The only other segment that has more than 20 boardings per hour is the segment from Stanley Boulevard & Valley Memorial Hospital to Livermore Transit Center (22.4 boardings per service hour). Ridership productivity is lowest on the route segment from Dublin Boulevard & Golden Gate Drive to East Pleasanton BART station, with 6.2 boardings per hour. The biggest generators on Route 10 are the East Dublin/Pleasanton BART station and Livermore Transit Center.

Morning and afternoon peak periods are the most productive, and midday service is also more productive than the route average. Early morning service is the least productive (9.0 boardings per hour). Load factors on Route 10 are consistent throughout the day with no trips having maximum load of greater than 25 passengers.

On-Time Performance

Route 10 has above average on-time performance, with 81% of trips arriving on time to scheduled time points. Trips that are not on time are caused by late running in 17% of those instances.

Summary

Route 10 is a Primary route, and one of LAVTA's strongest performers. It benefits from high levels of service, consistent headways of 30 minutes for most of the day, a direct alignment, and strong ridership anchors at both ends of the route. Survey results indicate that 38% of weekday riders on the route are going to a destination other than work or school, compared to 28% of weekday riders on all routes. This indicates that the route is serving an all day market for many different types of trips.

Route 10 and the Rapid both connect Livermore to the Dublin/Pleasanton BART station. They also operate on the same streets and stops between the Livermore Transit Center and the LLNL. On East Avenue, Route 10 carries fewer passengers than the Rapid, however, because Route 10 goes into the Livermore Transit Center and the Rapid does not, more passengers with transfer connections at the Livermore Transit Center appear to be using Route 10.

Route 10 serves the portion of the Rapid route from East Dublin/Pleasanton BART in the evenings when Rapid has stopped running, which is unnecessarily confusing for passengers. Service hours and routing should be coordinated between these two routes for consistency, based on demand. Route 10 is truncated at the Livermore Transit Center on Saturdays, with every second trip extending to the LLNL and East Avenue.

The overlap between Rapid and Route 10 on East Avenue should be examined.

Route 11 – Transit Center to Greenville Road to Transit Center

Description

Route 11 operates between the transit center in downtown Livermore and Greenville Road. Three morning and three afternoon trips are offered. From the transit center, Route 11 operates via 1st Street and Las Positas Road before operating in a clockwise loop consisting of Greenville Road and National Drive.

The route serves the downtown Livermore Transit Center and Target, as well as industrial and commercial districts northeast of Livermore.

Route Productivity

Route 11 has the third-lowest number of boardings of any route in the system, as well as the third lowest number of weekday service hours (3.6). Average weekday boardings per hour on Route 11 are 8.6, ranking 14th compared with all routes.

At a Glance		
Weekday Boardings		31
Weekday Service Hours		3.6
Weekday Boardings per Hour		8.6
Weekday Schedule Adherence	On Time	74%
	Early	5%
	Late	21%
Frequency (minutes)	AM	45
	Midday	-
	PM	45
	Sat	-
	Sun	-
Span	Mon-Fri	6:42 a.m. – 8:48 a.m. 4:12 p.m. – 6:18 p.m.
	Sat	-
	Sun	-

Ridership is heavily centered on the Livermore Transit Center, with more than half of the daily 31 boardings coming at that location. No other stop had more than 2 boardings or 3 alightings. The ridership pattern suggests that most Route 11 riders transfer to other routes and the on-board survey data suggests this as well.

Route 11 only operates during the morning and afternoon peak periods with the morning period (9.1 boardings per service hour) having a slightly better productivity than the afternoon (8.1 boardings per service hour). Load factors on Route 11 are highest on the first trip of each peak period. No trips have maximum loads exceeding 10 passengers.

On-Time Performance

Route 11 has below average on-time performance, with 74% of trips arriving on time to scheduled time points. Trips that are not on time are more often early (21 %) than late (3%).

Summary

Route 11 is a Neighborhood Feeder route that has low ridership, which is influenced by the low levels of service, with 45 minute headways at peak and no service off peak. No trips average over 10 daily boardings. Almost all of Route 11's riders must transfer to reach their final destination.

Survey results indicate that nearly all of Route 11 riders are traveling to and from work, which is logical given that it is a peak only route serving an employment area.

Much of the Route 11 service area is also served by Route 20X, and Arroyo Park Plaza is served by Route 15. Route 20X and Route 11 should be coordinated or consolidated to better serve this area.

Route 12/12X – Transit Center to E. BART

Description

Route 12 and Route 12x operate between the East Dublin/Pleasanton BART station and the downtown Livermore Transit Center. Route 12 operates primarily along Dublin Boulevard, Canyons Parkway, Isabel Avenue, Airway Boulevard, Murrieta Boulevard, and Stanley Boulevard. Route 12x is an express variant that operates along I-580 before following the same alignment as Route 12 along Isabel Avenue towards Livermore.

Major destinations served by both routes include the East Dublin/Pleasanton BART station, WHEELS Offices, BART Park & Ride on Airway Boulevard, and downtown Livermore Transit Center. In addition, Route 12 serves Las Positas College, Fallon Gateway, and Hacienda Crossings.

Route 12 At a Glance		
Weekday Boardings		567
Weekday Service Hours		30.5
Weekday Boardings per Hour		18.6
Weekday Schedule Adherence	On Time	78%
	Early	1%
	Late	21%
Frequency (minutes)	AM	15 – 30
	Midday	60
	PM	15 – 60
	Sat	60
	Sun	60
Span	Mon-Fri	5:58 a.m. – 10:42 p.m.
	Sat	9:01 a.m. – 9:47 p.m.
	Sun	9:02 a.m. – 8:47 a.m.

Route Productivity

Route 12 has the third-highest number of boardings systemwide, as well as the third-highest number of weekday service hours (30.5). Average weekday boardings per hour on Route 12 are 18.6, ranking 6th compared with all routes. In contrast, Route 12x operates 7.2 service hours per weekday and has an average productivity of 7.7 boardings per hour, which ranks 16th compared to other routes and is below the system average.

Ridership productivity for Route 12 is highest on the route segment from the East Dublin BART station to Dublin Boulevard & Fallon Gateway, with an average of 32.2 boardings per service hour. Ridership productivity is lowest on the route segment from Las Positas College to Airway Boulevard Park & Ride, with 10.6 boardings per hour. Only 2 boardings and 2 alightings occur at the Airway Boulevard Park & Ride and there are a total of 21 boardings in the 3.5 mile long segment between the Airway Boulevard Park & Ride and Los Positas College.

For Route 12x, the segment with the highest productivity is from Stanley Boulevard & Valley Memorial Hospital to the Livermore Transit Center, with an average of 9.2 boardings per hour. It is worth noting that this is lower than the worst performing segment on

Route 12X At a Glance		
Weekday Boardings		56
Weekday Service Hours		7.2
Weekday Boardings per Hour		7.7
Weekday Schedule Adherence	On Time	63%
	Early	0%
	Late	36%
Frequency (minutes)	AM	30 – 60
	Midday	-
	PM	30
	Sat	-
	Sun	-
Span	Mon-Fri	6:12 a.m. – 8:42 a.m. 4:12 p.m. – 8:45 p.m.
	Sat	-
	Sun	-

Route 12. Ridership productivity is lowest on the route segment from Kittyhawk Road & Armstrong Street to Airway Boulevard Park & Ride, with 4.6 boardings per hour.

The biggest trip generators on Route 12 are the East Dublin BART station, the Livermore Transit Center, and Las Positas College. Route 12x's highest ridership stops are the East Dublin BART station and the Livermore Transit Center.

Midday service is the most productive on Route 12, with an average of 22.6 boardings per service hour. Ridership productivity is also above average in the morning and afternoon peak periods. Night service is the least productive at 9.2 boardings per hour. Load factors on Route 12 are relatively consistent throughout the day, with a peak in the eastbound direction in the morning (towards Livermore Transit Center) and in the westbound direction in the afternoon (towards East Dublin BART station). This suggests that the route may primarily be used for directional commuting.

Route 12x only operates during peak times. The 7:30 a.m. eastbound trip carries 8 passengers and none of the remaining trips carry more than 4 passengers.

On-Time Performance

Route 12 has average on-time performance with 78% of trips arriving on time to scheduled time points. Trips that are not on time are mostly caused by late running (21%). For Route 12x, 63% of trips arrive on time to scheduled time points and 36% are late.

Summary

Route 12 is a Primary route, with Las Positas College driving a great deal of demand; no other LAVTA routes serve the college. Route 12X is designed to be an express version of Route 12 that skips Las Positas College during peak times. While time savings between Livermore and BART are up to 15 minutes, Route 12X is not attracting significant ridership. It appears that commuters are using other options than Route 12X, between Livermore and BART, such as the Rapid. Route 12X should be looked at for complete restructuring.

Route 12 duplicates Route 10 and Rapid service on Stanley Boulevard. Route 12 duplicates Rapid service on Dublin Boulevard. The unique market of Los Positas College is the defining feature of Route 12. Strategies to reduce duplication of service with other routes should be examined.

Route 14 – Transit Center to Downtown Livermore to Transit Center

Description

Route 14 is a neighborhood circulator that operates between the Livermore Civic Center and downtown Livermore, serving the Livermore Transit Center. Route 14 operates in a one way loop primarily along Chestnut Street, Pine Street, P Street and 4th Street.

The route serves the Livermore Transit Center, Junction Avenue Middle School, Livermore High School, and the Livermore Public Library and Civic Center.

Route Productivity

Route 14 has the 6th highest number of boardings of any route in the system, as well as the 9th highest number of weekday service hours (10.5). Average weekday boardings per hour on Route 14 are 15.4, ranking 7th compared with all routes.

At a Glance		
Weekday Boardings		162
Weekday Service Hours		10.5
Weekday Boardings per Hour		15.4
Weekday Schedule Adherence	On Time	76%
	Early	3%
	Late	21%
Frequency (minutes)	AM	30
	Midday	30
	PM	30
	Sat	-
	Sun	-
Span	Mon-Fri	6:42 a.m. – 8:06 p.m.
	Sat	-
	Sun	-

Ridership productivity is highest on the route segment from the Livermore Transit Center to Murrieta Boulevard & Olivina Avenue, with an average of 32.8 boardings per service hour followed by the Pacific Avenue & South Livermore Avenue to Livermore High School segment with an average of 22.6 boardings per service hour. The 4th Street & P Street to Pacific Avenue & South Livermore Avenue segment has the lowest productivity, carrying only 1.7 passengers per service hour. The biggest generators on Route 14 are the Livermore Transit Center and the Livermore Public Library and Civic Center.

The morning peak period is the most productive with boardings per service hour declining throughout the service day. Night service is the least productive (9.5 boardings per hour). Load factors on Route 14 are relatively low throughout the day, peaking at 8 passengers in the morning.

On-Time Performance

Route 14 has slightly below average on-time performance with 76% of trips arriving on time to scheduled time points, 21% late, and 3% arriving early.

Summary

Route 14 is a Neighborhood Feeder that has high levels of service and above average ridership. There are some duplicative segments with Route 12, which may reduce some of the ridership potential. The segment between Fourth Street & P Street and Pacific Avenue & South Livermore Avenue is very unproductive, presenting a potential opportunity for improvement.

Route 15 – Transit Center to Springtown to Transit Center

Description

Route 15 operates between the transit center in downtown Livermore and Springtown. From downtown Livermore, Route 15 operates via Las Positas Road before operating in a figure eight pattern consisting primarily of Springtown Boulevard and Scenic Avenue.

The route serves the downtown Livermore Transit Center, Wal-Mart, Kaiser, Target, and the Christensen School.

Route Productivity

Route 15 has the 4th highest number of boardings of any route in the system as well as the 4th highest number of weekday service hours (22.7). Average weekday boardings per service hour is 22.3, the second highest among all routes and nearly twice as high as the systemwide average of 16.1 boardings per hour.

At a Glance		
Weekday Boardings		507
Weekday Service Hours		22.7
Weekday Boardings per Hour		22.3
Weekday Schedule Adherence	On Time	75%
	Early	3%
	Late	22%
Frequency (minutes)	AM	30 – 60
	Midday	30 – 60
	PM	30 – 60
	Sat	60
	Sun	60
Span	Mon-Fri	5:12 a.m. – 11:58 p.m.
	Sat	6:02 a.m. – 11:48 p.m.
	Sun	7:08 a.m. – 8:43 p.m.

Ridership productivity is highest between the Livermore Transit Center and Las Positas Road & Hilliker Place (Wal-Mart), with an average of 74.9 boardings per service hour along this segment. The only other segment with productivity greater than 20 boardings per service hour is Bluebell Drive & Las Flores Road to Las Positas Road & Hilliker Place (Wal-Mart), with 23.5 boardings per service hour. Ridership productivity is lowest on the segment from Bluebell Drive & Galloway Street to Dalton Avenue & Pasatiempo Street, with 3.8 boardings per hour. The highest ridership stop on Route 15 is the downtown Livermore Transit Center, followed by Wal-Mart.

Service is most productive during the midday with 29.4 boardings per service hour, although the afternoon peak period is almost identical (29.3 boardings per service hour). The morning peak period also performs above the route average with 24.1 boardings per service hour. Early morning service is the least productive (9.1 boardings per hour). Load factors on Route 15 range from 5 to 20 passengers most of the day.

On-Time Performance

Route 15 has slightly below average on-time performance, with 75% of trips arriving on time to scheduled time points. Late running occurs at a rate of 22%.

Summary

Route 15 is very productive Neighborhood Feeder route despite serving largely suburban residential development. The route benefits from 30 minute headways most of the day. Boardings per trip is highest midday, which suggests the route is popular for more than just commuting. The least productive part of the route is the upper portion of the loop on Springtown Boulevard and Scenic Avenue, with the walkshed limited by the Springtown Golf Course.

Route 20X – BART to Vasco Road to Transit Center

Description

Route 20X operates between the East Dublin/Pleasanton BART station and the downtown Livermore Transit Center. From the BART station, Route 20x operates for almost 10 miles on I-580 and then circulates on Las Positas Road, Vasco Road, and 1st Street.

The route provides peak directional service between the East Dublin/Pleasanton BART station, Lawrence Livermore National Laboratory (LLNL), the Vasco ACE station, and the downtown Livermore Transit Center. Trips originate in the morning at BART and terminate in the afternoon at BART, so the route serves the reverse commute market.

At a Glance		
Weekday Boardings		58
Weekday Service Hours		5.2
Weekday Boardings per Hour		11.1
Weekday Schedule Adherence	On Time	82%
	Early	2%
	Late	16%
Frequency (minutes)	AM	45
	Midday	-
	PM	45
	Sat	-
	Sun	-
Span	Mon-Fri	6:15 a.m. – 9:54 a.m. 3:52 p.m. – 6:36 p.m.
	Sat	-
	Sun	-

Route Productivity

Route 20X ranks 13th in the number of boardings of any route in the system, and has the 7th-lowest number of weekday service hours (5.2). Average weekday boardings per hour on Route 20X are 11.1, ranking 12th compared with all routes.

The East Dublin/Pleasanton BART station is the highest ridership stop. No other stop attracts more than 10 boardings. The LLNL is the primary single destination for passengers boarding at the BART station. The segment of the route between East Ave & Vasco Rd and Livermore Transit Center has very little boarding activity, with just two daily boardings at Livermore Transit Center and very little activity at other stops.

Six of the nine Route 20x trips carry 6 or less passengers, which is low for a peak oriented commuter route that operates for 10 miles on the freeway. The highest observed load was 11 passengers.

On-Time Performance

Route 20X has above average on-time performance, with 82% of trips arriving on time to scheduled time points. Late running occurs at a rate of 16%

Summary

Route 20X is a Primary route that travels on I-580 to the LLNL via Vasco Road. Despite travel time between BART and LLNL being quicker on Route 20X (26 minutes in the AM peak) than the Rapid (34 minutes), fewer than 15 people a day are making this trip. Route 20X's ridership is too low to warrant express service in its current format, as Route 20X averages only 6.5 passengers per trip.

Route 51 – Transit Center to Civic Library

Description

Route 51 operates on a loop between the Livermore Transit Center in downtown Livermore and the Livermore Civic Library. From the transit center, Route 51 travels via Maple Street, Livermore Avenue, and Dolores Street.

The route also serves Livermore High School. It only operates in the afternoons and evenings on weekdays.

Route 51 was previously called Route 704.

Route Productivity

In its second month of operation, Route 51 had the second lowest number of boardings systemwide (26), as well as the lowest number of weekday service hours (2.0). However, average weekday boardings per hour on Route 51 were 13.0, ranking 9th compared with all routes.¹

Ridership productivity is highest on the route segment from the downtown Livermore Transit Center to the Livermore Library and Civic Center, with an average of 19.1 boardings per service hour. Ridership productivity is lowest on the route segment from Livermore Library to Livermore High School, with 12.4 boardings per hour. The biggest generators on Route 51 are the Livermore Transit Center and Livermore Library.

Average boardings per revenue hour is slightly higher in the afternoon peak with an average of 13.2 compared to the evening productivity of 12.7 boardings per service hour. Load factors fluctuate throughout the day, peaking at four passengers on the 5:12 p.m. trip.

On-Time Performance

Route 51 has the best on-time performance systemwide at 98%.

Summary

Route 51 is a Neighborhood Feeder route that operates only in the afternoons and evenings, limiting use for potential passengers. Almost the entire route is served more frequently by Route 14, although Route 14 is a unidirectional loop, requiring passengers traveling from Livermore Transit Center to the Civic Center to travel out of direction. Route 51 provides a direct connection between these destinations in both directions. As a new service, it will take time to evaluate trends in ridership and productivity.

At a Glance		
Weekday Boardings		26
Weekday Service Hours		2.0
Weekday Boardings per Hour		13.0
Weekday Schedule Adherence	On Time	98%
	Early	0%
	Late	2%
Frequency (minutes)	AM	-
	Midday	-
	PM	30
	Sat	-
	Sun	-
Span	Mon-Fri	3:12 p.m. – 6:57 p.m.
	Sat	-
	Sun	-

¹ The average weekday boardings on this route, like all routes, were calculated using APC data, which may include errors such as operators getting on and off the vehicle during layovers. Due to the very low ridership on this route, these operator boardings may be causing the ridership presented here to be significantly higher than it actually is.

Route 53 – Pleasanton ACE Station to W. BART

Description

Route 53 operates between the Pleasanton ACE station and West Pleasanton BART Station. From the ACE station, Route 53 travels via Bernal Avenue, I-680, and Stoneridge Mall Road.

The route serves the Pleasanton ACE Station, Corporate Commons, Safeway Corporate Headquarters, and Stoneridge Mall.

Schedules on Route 53 are coordinated with ACE trains, and ACE subsidizes the route through a grant from the Bay Area Air Quality Management District (BAAQMD).

Route Productivity

Route 53 ranks 8th in boardings, despite ranking 16th in weekday service hours (3.7).

Average weekday boardings per hour on Route 53 are 32.3, making it the most productive route at twice the system average.

Morning ridership is heavily oriented to connections between ACE and BART, as it is a quick, freeway based trip between the two. Likewise, the predominant pattern in the afternoon is connecting BART to ACE. The biggest generators on Route 53 are the Pleasanton ACE station, the West Dublin/Pleasanton BART station, and Stoneridge Mall.

Morning and afternoon peak periods are the most productive, with an average productivity of 35.8 and 36.4 boardings per service hour respectively. Evening service is the least productive time period with 13.3 boardings per hour. Load factors are highest in the morning and decline throughout the service day. On average, no trips exceed 25 passengers on board at one time.

On-Time Performance

Route 53 has the third-highest on-time performance systemwide, with 92% of trips arriving on time to scheduled time points.

Summary

Route 53's function is to provide peak-hour connections between ACE trains and BART, and has very high productivity. It appears that nearly as many passengers are commuting to ACE as from ACE in each time period.

At a Glance		
Weekday Boardings		120
Weekday Service Hours		3.7
Weekday Boardings per Hour		32.3
Weekday Schedule Adherence	On Time	92%
	Early	3%
	Late	5%
Frequency (minutes)	AM	25 – 75
	Midday	-
	PM	60
	Sat	-
	Sun	-
Span	Mon-Fri	5:33 a.m. – 8:23 a.m. 3:55 p.m. – 7:31 p.m.
	Sat	-
	Sun	-

Route 54 – Pleasanton ACE Station to Hacienda Business Park to BART

Description

Route 54 operates between the Pleasanton ACE Station, Hacienda Business Park, and the Dublin/Pleasanton BART Station. From the ACE Station, it travels northbound primarily along Valley Avenue and Las Positas Boulevard before returning southbound along I-680. The direction of travel is reversed during the afternoon peak.

Major destinations on the route include the Pleasanton ACE Station, Bernal Business Park, Hart Middle School, Alameda County Court, Rosewood Commons, and the East Dublin/Pleasanton BART Station.

Schedules on Route 54 are coordinated with ACE trains, and ACE subsidizes the route through a grant from the Bay Area Air Quality Management District (BAAQMD).

At a Glance		
Weekday Boardings		99
Weekday Service Hours		4.7
Weekday Boardings per Hour		21.1
Weekday Schedule Adherence	On Time	70%
	Early	11%
	Late	18%
Frequency (minutes)	AM	65 – 75
	Midday	-
	PM	60
	Sat	-
	Sun	-
Span	Mon-Fri	5:33 a.m. – 8:20 a.m. 3:48 p.m. – 7:28 p.m.
	Sat	-
	Sun	-

Route Productivity

Route 54 has the eleventh-most number of boardings of any route in the system as well as the fifth lowest number of weekday service hours (4.7). However, average weekday boardings per hour are 21.1, ranking 3rd compared with all routes.

Ridership productivity is highest between the East Dublin BART Station and California Center, with an average of 37.4 boardings per service hour. The Pleasanton ACE Station and the East Dublin/Pleasanton BART Station are the biggest trip generators.

Morning ridership data was not available, but the first trip of the morning is being eliminated in August 2015 due to low ridership. In the afternoon, load factors are highest on the first trip and decline throughout the rest of the peak. The highest load recorded was 20 passengers, indicating that standing room only is a rare occurrence and excess capacity likely exists.

On-Time Performance

Route 54 has below average on-time performance, with 70% of trips arriving on time to scheduled time points. Running early occurred on 11% of trips, and 18% run late.

Summary

Like Route 53, Route 54 is a Neighborhood Feeder route that offers timed connections from ACE trains at peak periods. Ridership is relatively high, especially near the BART station, given the limited schedule and circuitous routing serving business parks. It may be worth considering options for coordinating Routes 54 and 9.

Route 70X/70XV – Pleasant Hill BART to E. Dublin/Pleasanton BART/Pleasant Hill BART to E. BART

Description

Route 70X operates every 30 minutes during peak periods between the East Dublin/Pleasanton BART station and the Pleasant Hill BART station during the morning and evening peaks, and on holidays. From the East Dublin/Pleasanton station, it travels via Dublin Boulevard, I-680, and Oak Road.

The route serves the East Dublin/Pleasanton BART station, the Walnut Creek BART station, and the Pleasant Hill BART station.

Route 70XV operates one morning trip from Pleasant Hill BART station to the East Dublin/Pleasanton BART station, and one evening trip between the East Dublin/Pleasanton BART station and Pleasant Hill BART station. Unlike the 70X, both travel deviate to Stoneridge Mall. Route 70XV travels along Johnson Drive to Stoneridge Mall and then along I-680.

Route 70X is being modified in August 2015 to bypass Walnut Creek in the general noncommute direction in order to improve on-time performance.

Route Productivity

Route 70X has the 5th highest number of boardings of any route in the system, as well as the 5th highest number of weekday service hours (13.1). Average weekday boardings per hour on Route 70X is 18.9, ranking 5th systemwide.

Route 70XV has the fewest boardings of all routes in the system and ranks second to last in terms of weekday service hours (2.1). Average weekday boardings per hour on Route 70XV are 4.8, again the lowest ranking route in the system and well below the system average. On average, it has only 10 total daily boardings, nearly all of which are at stops also served by Route 70X. Route 70XV only has two trips, so it averages 5 passengers per trip, which suggests that the market to East Dublin is too small to support a separate trip.

Route 70XV At a Glance		
Weekday Boardings		10
Weekday Service Hours		2.1
Weekday Boardings per Hour		4.8
Weekday Schedule Adherence	On Time	35%
	Early	0%
	Late	65%
Frequency (minutes)	AM	1 Trip
	Midday	-
	PM	1 Trip
	Sat	-
	Sun	-
Span	Mon-Fri	7:36 a.m. – 8:36 a.m. 4:45 p.m. – 5:49 p.m.
	Sat	-
	Sun	-

Route 70X At a Glance		
Weekday Boardings		248
Weekday Service Hours		13.1
Weekday Boardings per Hour		18.9
Weekday Schedule Adherence	On Time	57%
	Early	0%
	Late	43%
Frequency (minutes)	AM	30
	Midday	-
	PM	30
	Sat	-
	Sun	-
Span	Mon-Fri	5:43 a.m. – 8:53 a.m. 4:00 p.m. – 6:41 p.m.
	Sat	-
	Sun	-

For Route 70X, productivity is relatively consistent across route segments; ridership is highest between the Walnut Creek BART station and the Pleasant Hill BART station. In contrast, Route 70XV has significant variation in productivity along the route. Ridership productivity is highest on the route segment from Stoneridge Mall Road & McWilliams to Stoneridge Mall with 13.8 boardings per service hour. Productivity is the lowest on the route segment between Stoneridge Drive & Hopyard Road to Johnson Drive & Commerce Drive at 1.8 boardings per hour, which is not surprising given the low density in this area. The biggest trip generators on Route 70X and 70XV are the East Dublin and Walnut Creek BART stations.

Load factors on Route 70X are relatively consistent throughout the day, and no trips experience maximum loads greater than 15 passengers.

On-Time Performance

Route 70X and Route 70XV have the lowest average on-time performance systemwide, with only 57% and 35% of trips arriving on time to scheduled time points, respectively. For both routes, the remaining trips run late.

Summary

Routes 70X and 70XV are the only Regional Express routes. They provide a connection between the end of the Dublin/Pleasanton BART line and the Pittsburg/Bay Point line at Walnut Creek and Pleasant Hill. The 70X attracts riders in both directions in the morning and afternoon.

With only one low-ridership trip in the morning on the 70XV, the coverage to Stoneridge Mall could be provided by Route 3 with a transfer from the 70X at the East Dublin/Pleasanton BART station. With the current schedule, riders would get to Stoneridge Mall via Route 3 at 8:23 a.m. instead of 8:13 a.m., but total travel times from Walnut Creek BART would be 26 minutes longer in the morning.

Routes 70X and 70XV largely depend on parking availability at the BART park-and-rides, none of which has excess capacity. The growth potential of both routes is limited by the lack of parking on either end.

Rapid – Livermore to E. BART to Stoneridge Mall

Description

The Rapid operates between Stoneridge Mall in Pleasanton, downtown Livermore, and Lawrence Livermore National Laboratories (LLNL). From LLNL, the Rapid travels via East Avenue, Stanley Boulevard, Isabel Avenue, Fallon Road, Dublin Boulevard and Foothill Boulevard.

The route serves Stoneridge Mall, the West Dublin/Pleasanton BART station, the East Dublin/Pleasanton BART station, the downtown Livermore Transit Center, Livermore High School, Valley Memorial Medical Center, and Lawrence Livermore National Laboratories.

The Rapid does not operate on weekends.

Infrastructure investments have been made along the route alignment to increase operating speeds, including queue jumps and transit signal priority.

At a Glance		
Weekday Boardings		1,664
Weekday Service Hours		111.6
Weekday Boardings per Hour		14.9
Weekday Schedule Adherence	On Time	81%
	Early	1%
	Late	18%
Frequency (minutes)	AM	12-18
	Midday	15
	PM	15
	Sat	-
	Sun	-
Span	Mon-Fri	5:16 a.m. – 8:04 p.m.
	Sat	-
	Sun	-

Route Productivity

The Rapid has the highest number of boardings of any route in the system (1,664), as well as the highest number of weekday service hours (111.6). Average weekday boardings per hour on the Rapid are 14.9, ranking only 8th among all routes. Productivity on the Rapid is slightly higher than the systemwide average of 16.1 boardings per hour.

Ridership productivity is highest on the route segment from Stanley Boulevard & Murdell Lane to Railroad Avenue & Bankhead Theater, averaging 30.5 boardings per service hour. The only other segment with ridership productivity above 20 boardings per hour is between the East Dublin BART station and Dublin Boulevard & Keegan Street. Ridership productivity is lowest on the segment from Dublin Boulevard & Keegan Street to Stanley Boulevard & Murdell Lane, with 3.4 boardings per hour, where density is low. The biggest generators along the Rapid are the East Dublin BART station, Livermore Transit Center, and Dublin Blvd @ Golden Gate Drive (by the West Dublin/Pleasanton BART station).

Boardings per revenue hour are highest in the afternoon peak, with 18.1 boardings per hour, followed by the early morning (16 boardings per hour). Evening service is the least productive, with 12.8 boardings per hour. Load factors on the Rapid increase throughout the day in the eastbound direction and decline throughout the day in the westbound direction, indicating that the route is likely being used for directional commuting. The Rapid does not have any trips that experience a maximum load greater than 20 passengers.

On-Time Performance

The Rapid has above average on-time performance, with 81% of trips arriving on time to scheduled time points. On average, trips run late 18% of the time.

Summary

The Rapid is a Primary route, and has high ridership overall. The ridership pattern has slight directionality, with high afternoon and evening ridership eastbound and higher morning ridership westbound. Ridership is high on the first few trips of the day and remains high towards the end of the day, indicating possible latent demand for earlier or later service.

The Rapid's span of service is severely limited. No late evening or weekend service is provided and instead extensions of local routes are used to cover most route segments. LAVTA has invested in the Rapid brand and alignment and has raised customer expectations with a high level of service. Existing and potential riders may be confused by the need to use different routes on weekends and evenings, which reduces overall ridership potential.

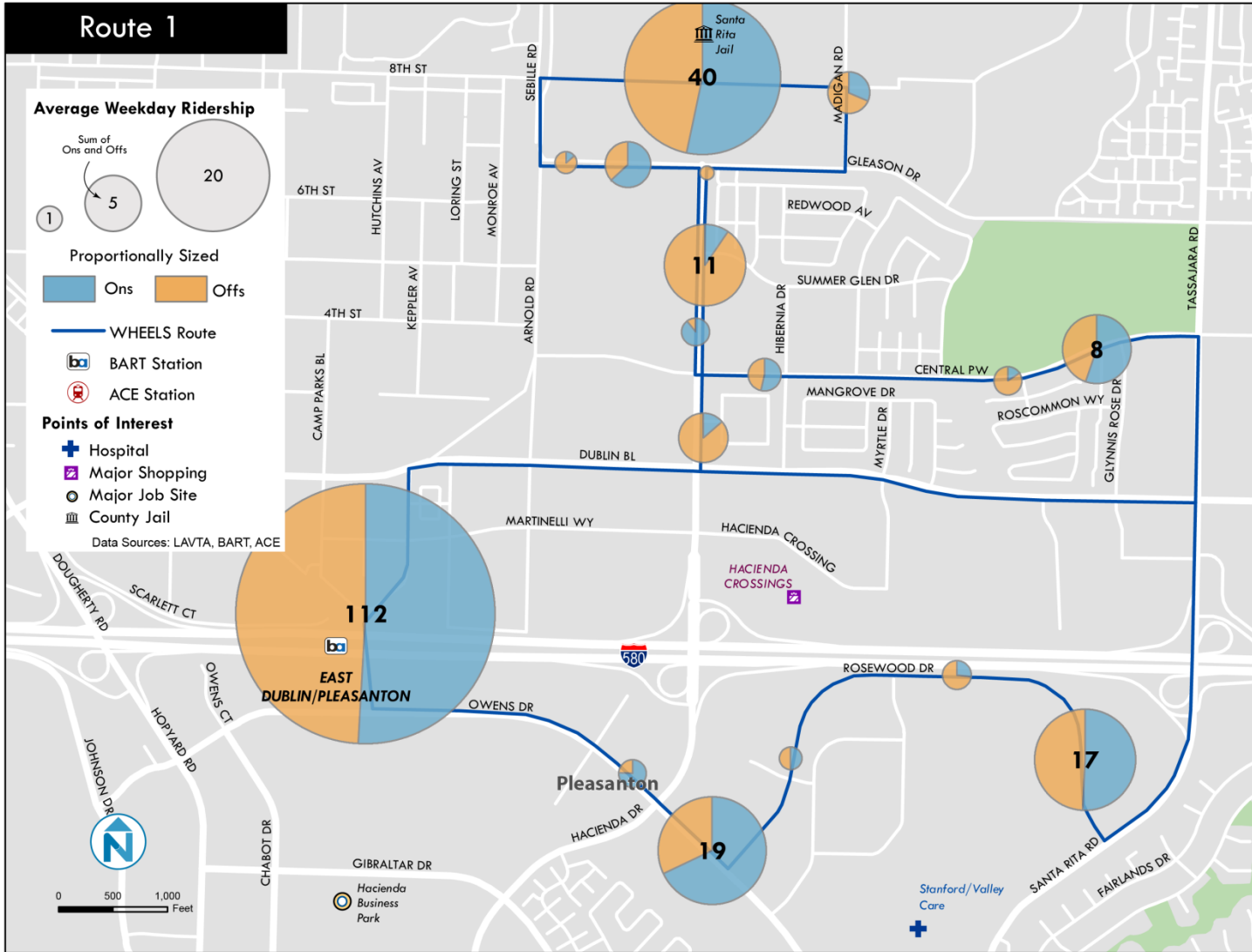
Survey data indicate that 63% of Rapid riders travel to or from work, which is higher than the weekday system average of 55%. This indicates that the route is used more work trips than for discretionary trips. About 39% of Rapid riders transfer, which is similar to the weekday system average of 44%.

The Rapid duplicates Route 10 on East Avenue in Livermore, and has higher ridership than Route 10. The Rapid duplicates Route 12 on Dublin Boulevard, and also in parts of Livermore. Reducing duplication of service with other competing routes is a key to improving the Rapid's performance.

Appendix A LAVTA Route Boarding and Alighting Maps

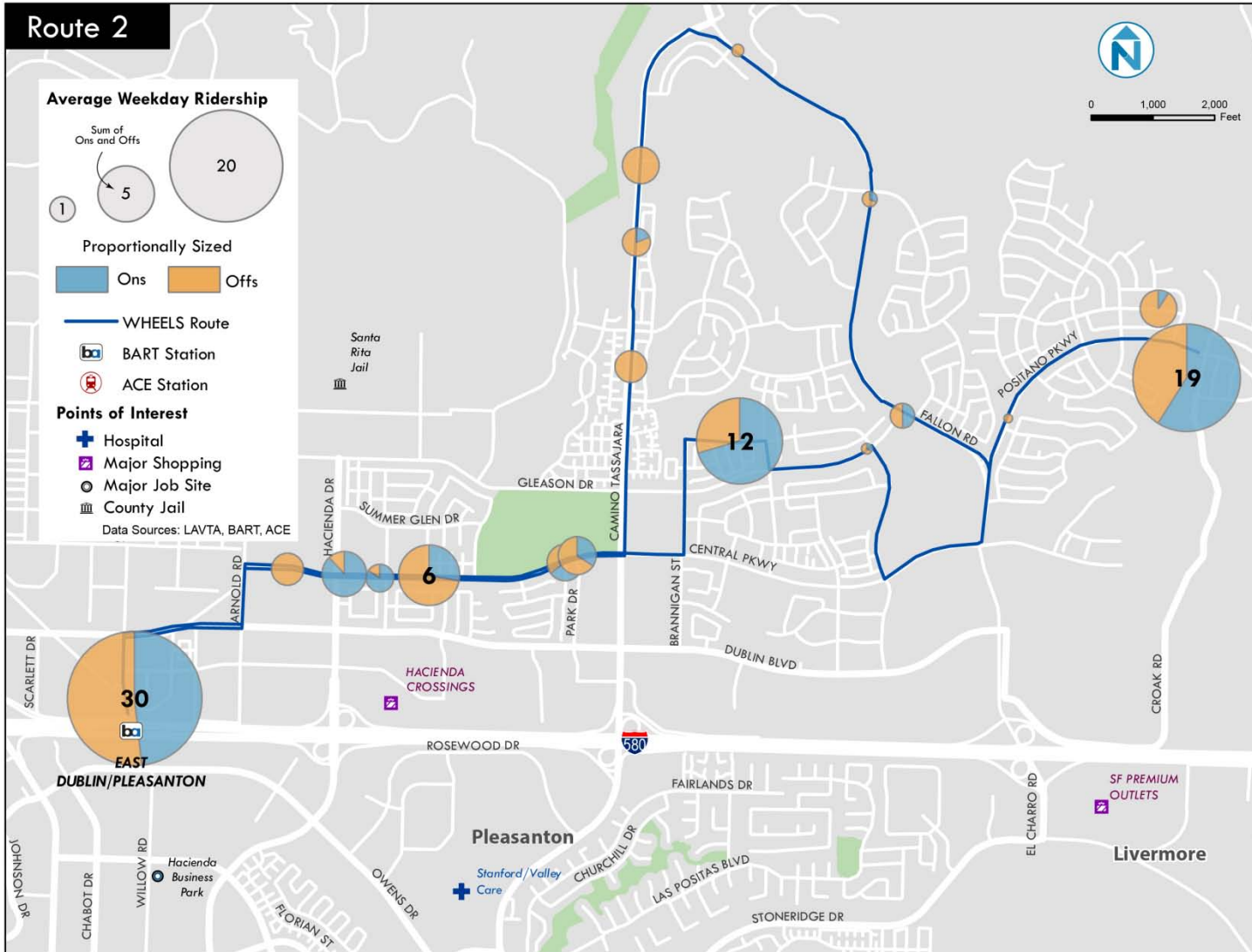
LAVTA COA | EXISTING CONDITIONS REPORT
 Livermore Amador Valley Transit Authority

Figure 48 Route 1 Ridership



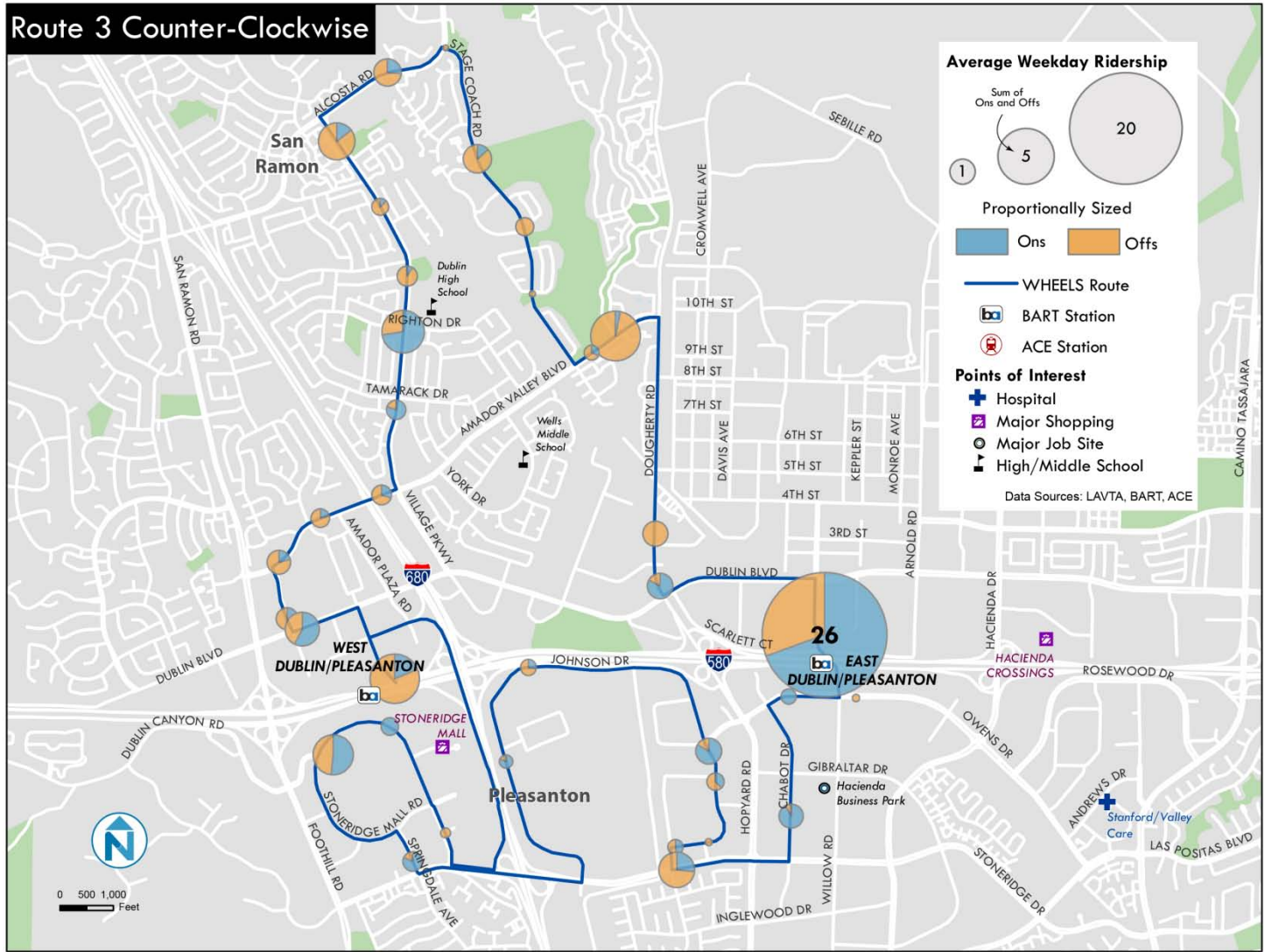
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Figure 49 Route 2 Ridership



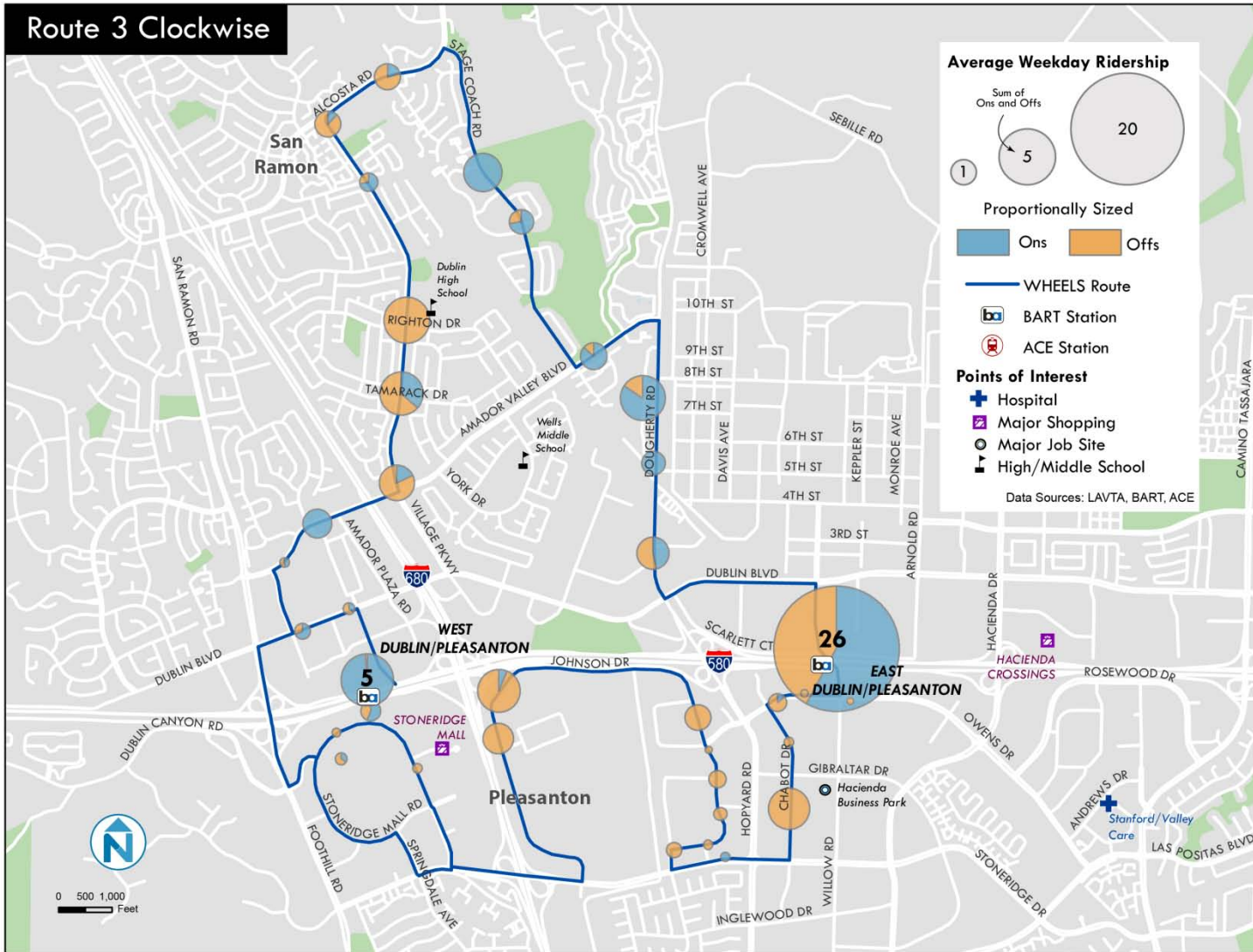
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Figure 50 Route 3 Ridership (Counter-Clockwise)



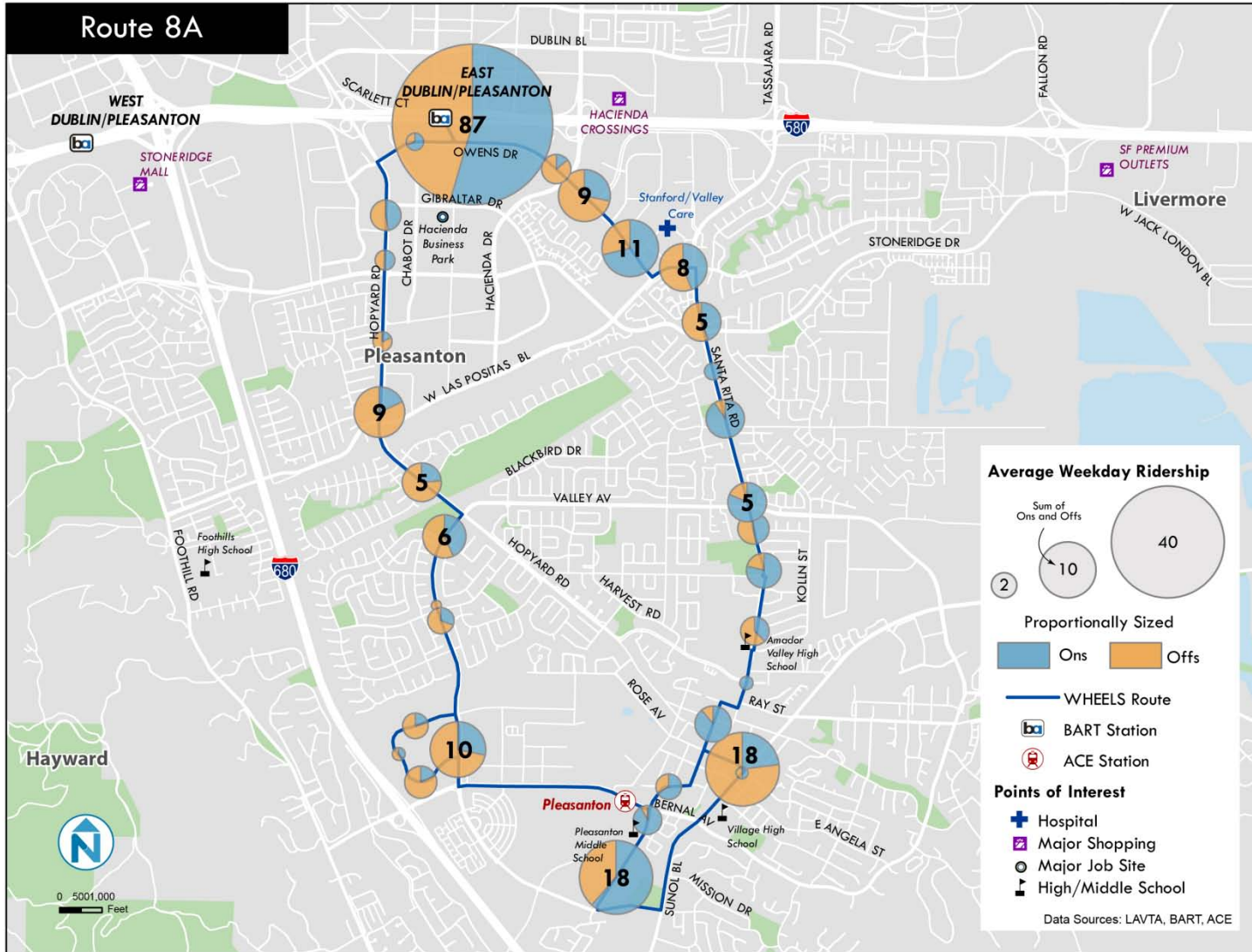
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Figure 51 Route 3 Ridership (Clockwise)



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Figure 52 Route 8A Ridership



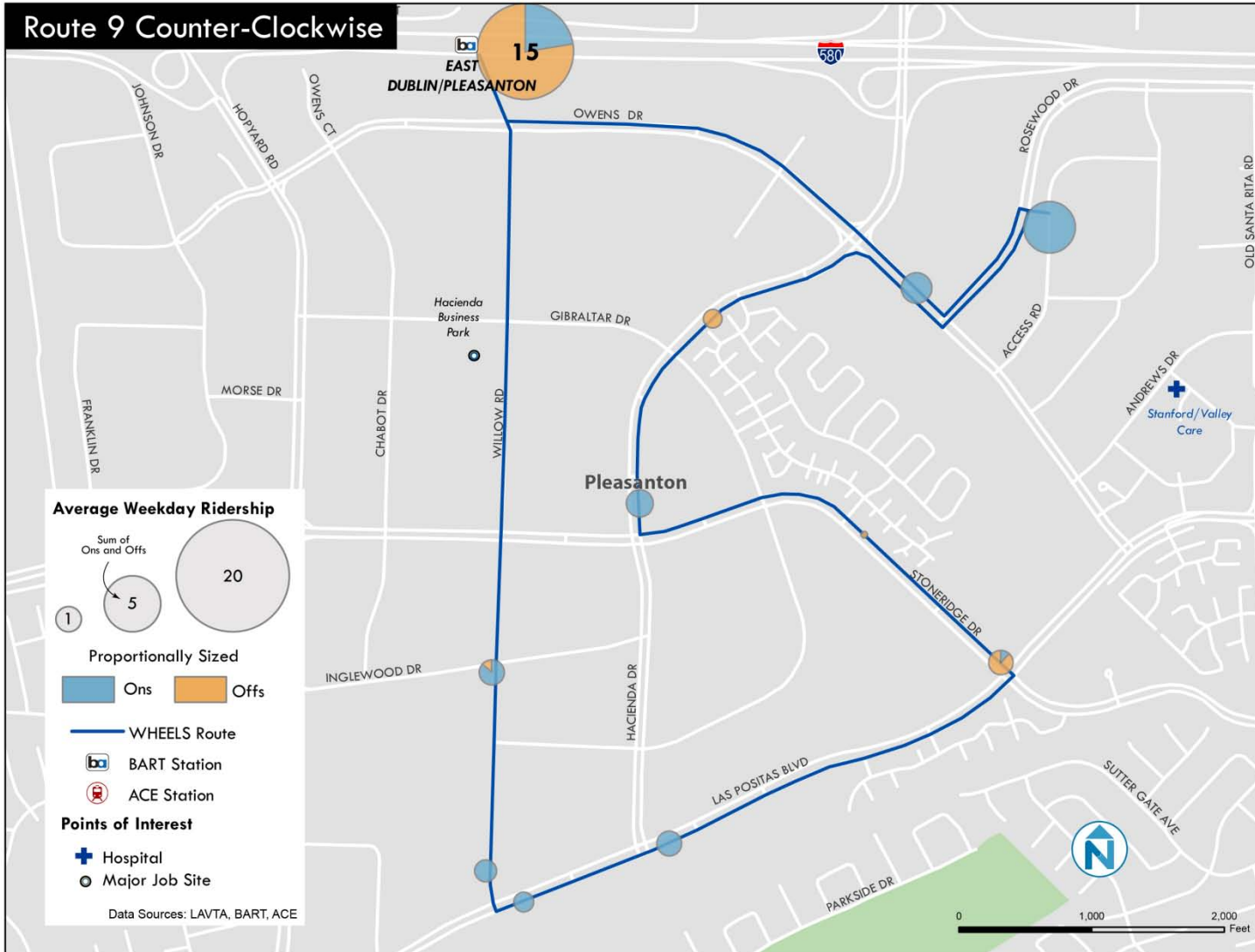
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Figure 53 Route 8B Ridership



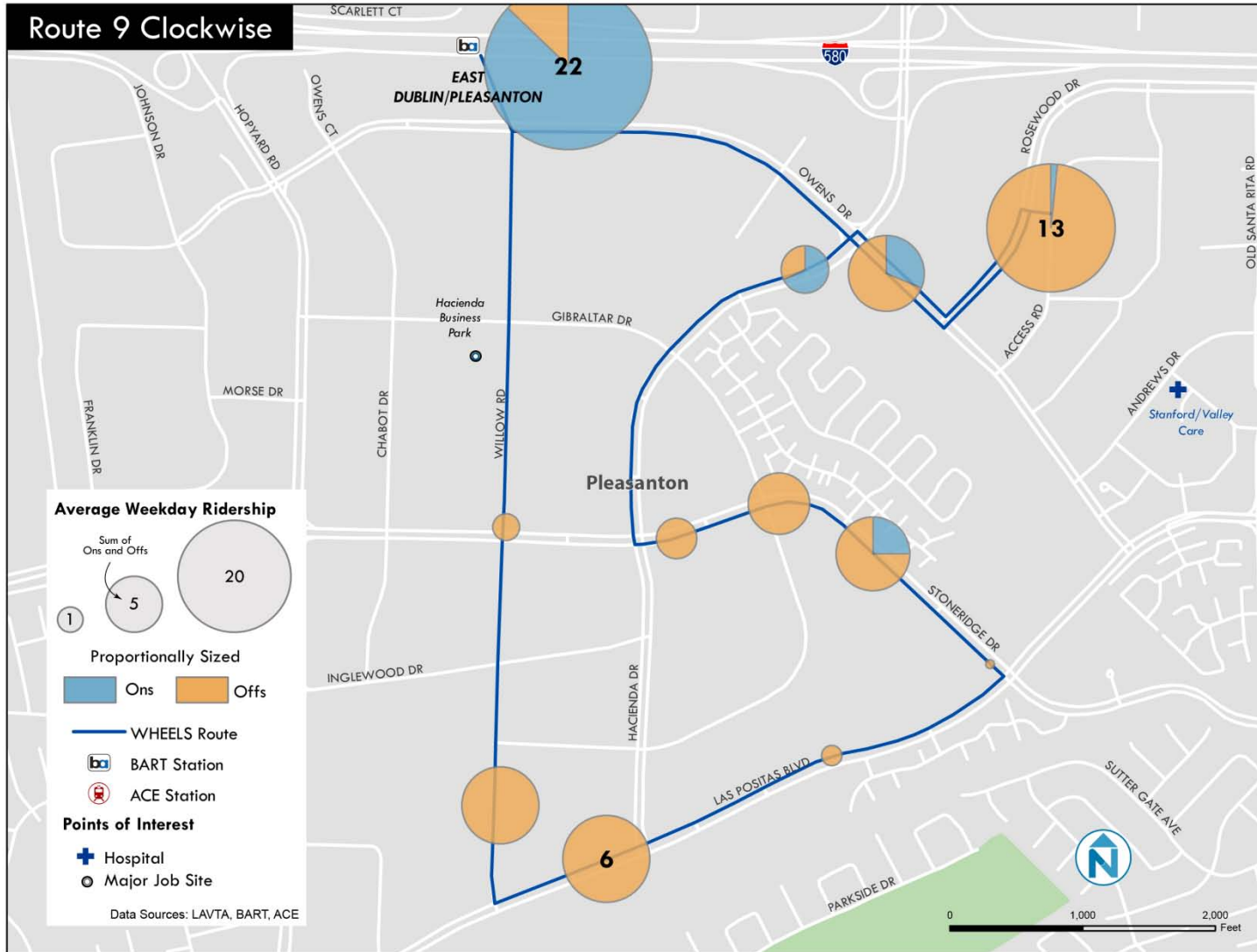
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Figure 54 Route 9 Ridership (Counter-Clockwise)



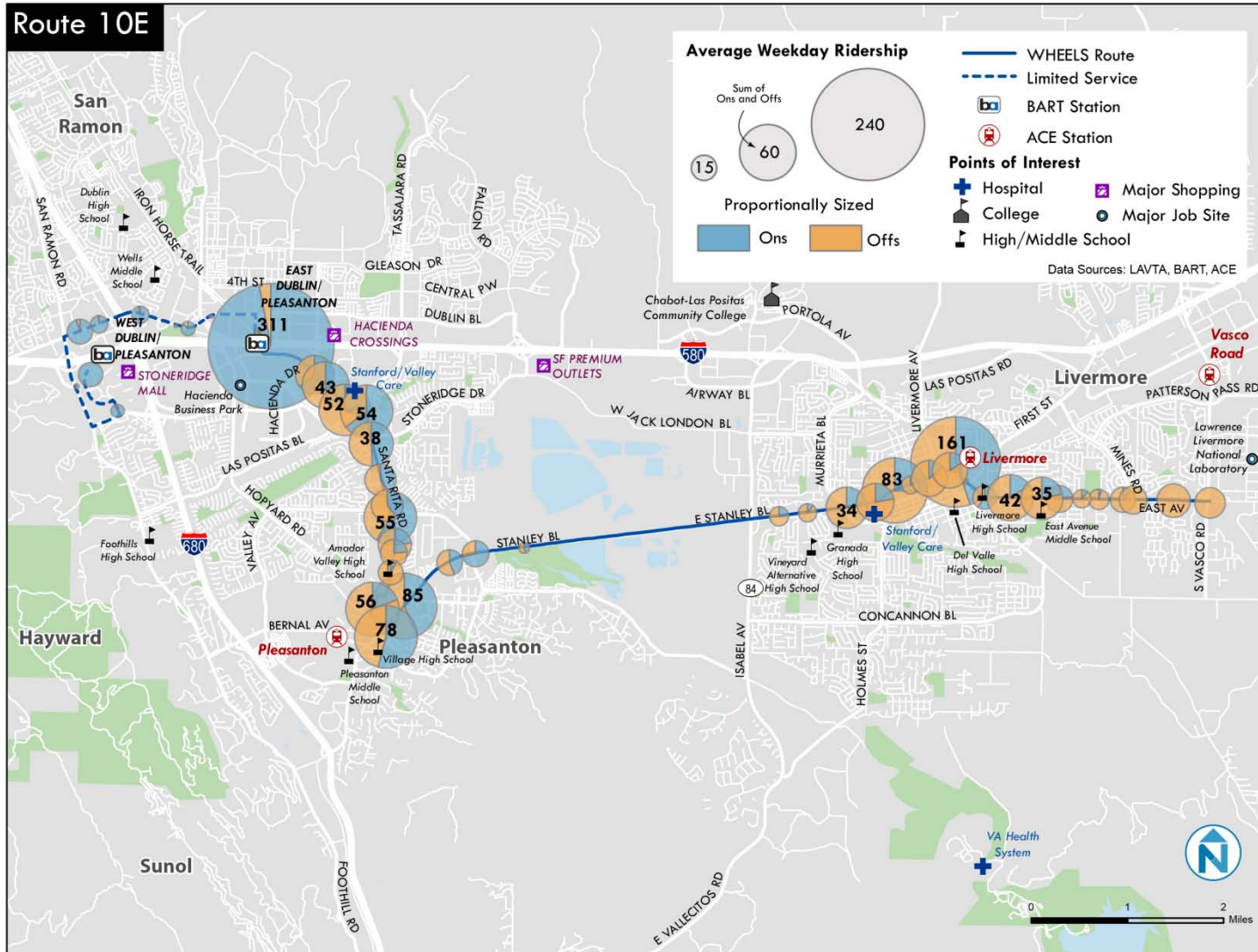
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Figure 55 Route 9 Ridership (Clockwise)



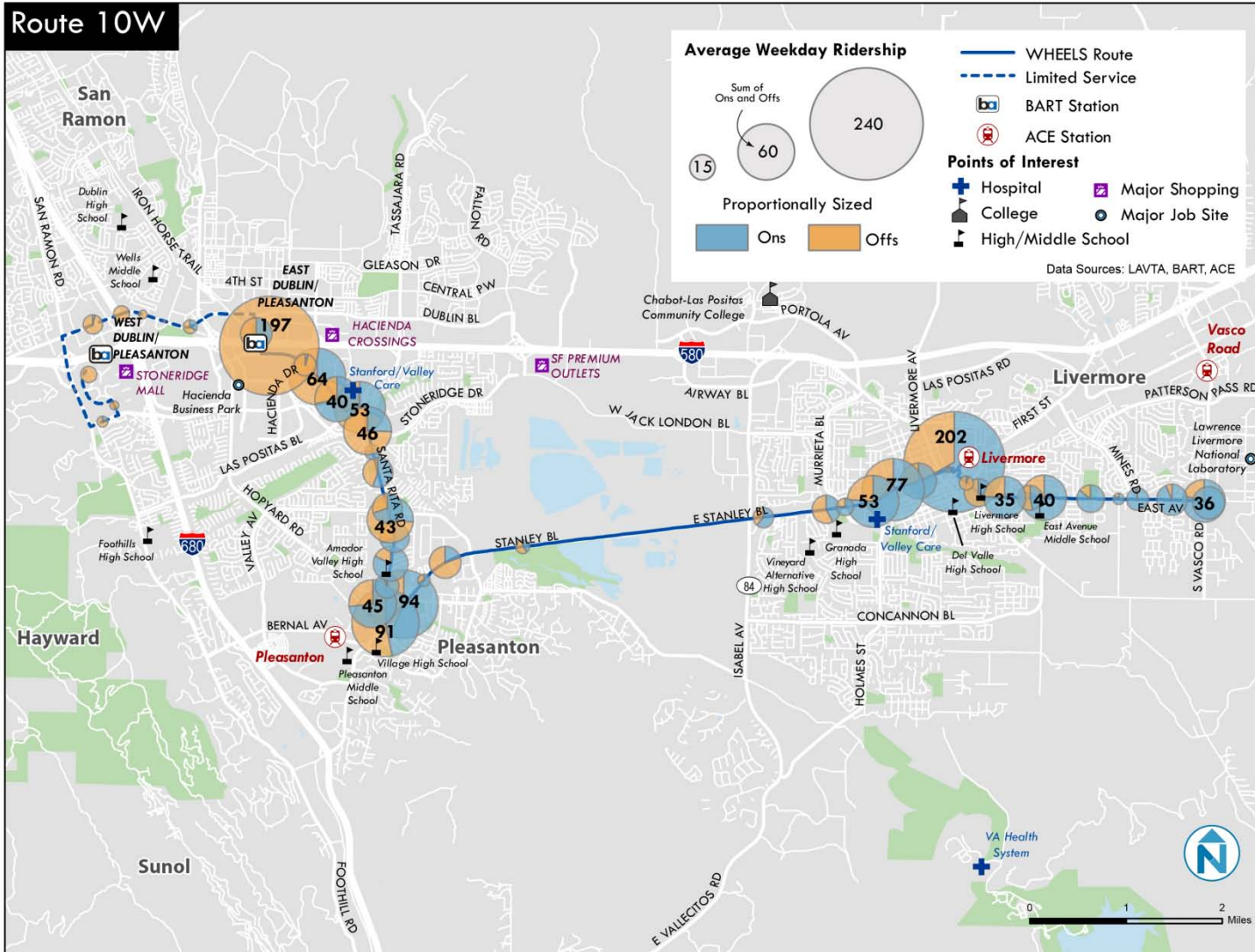
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Figure 56 Route 10 Ridership (Eastbound)



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Figure 57 Route 10 Ridership (Westbound)



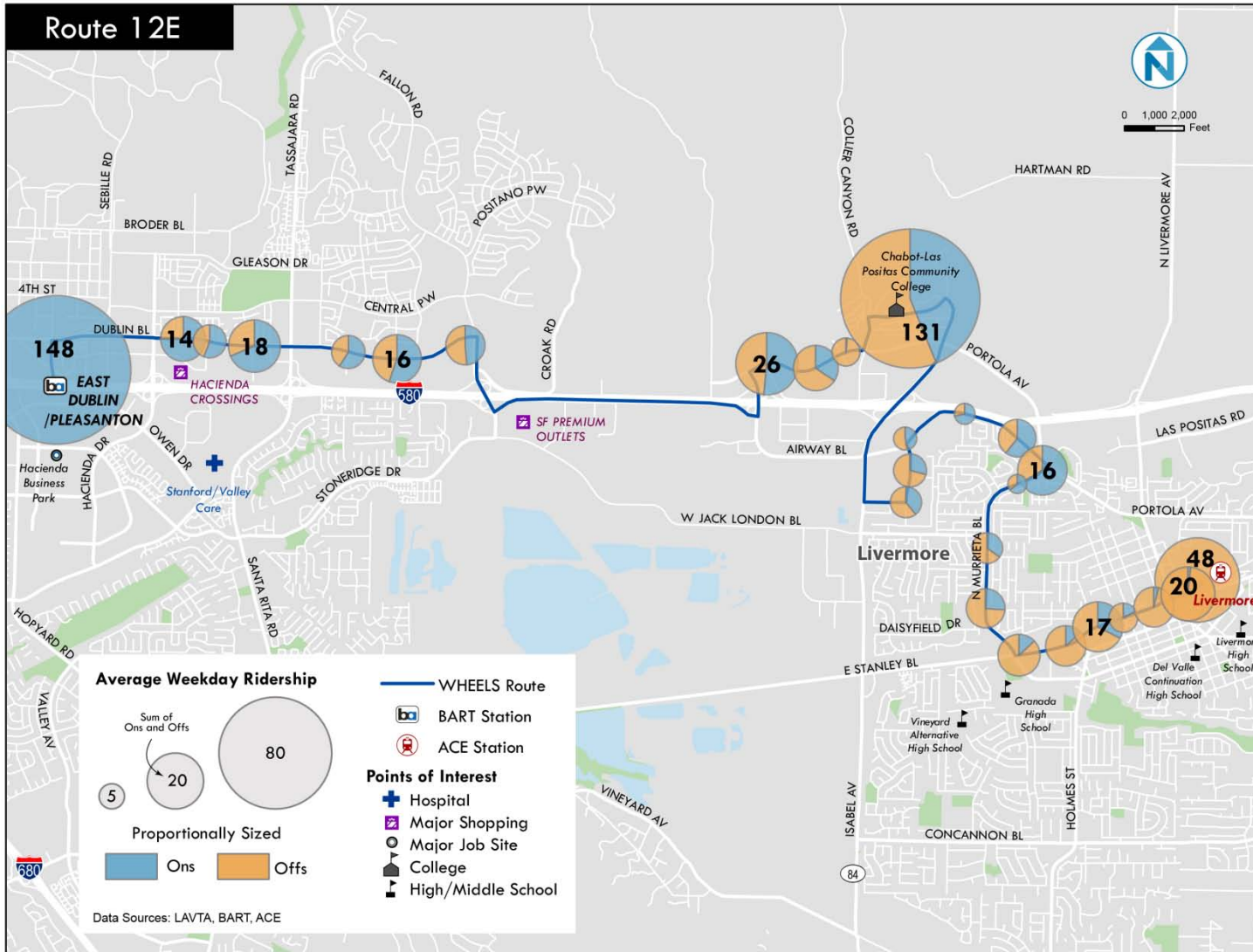
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 58 Route 11 Ridership



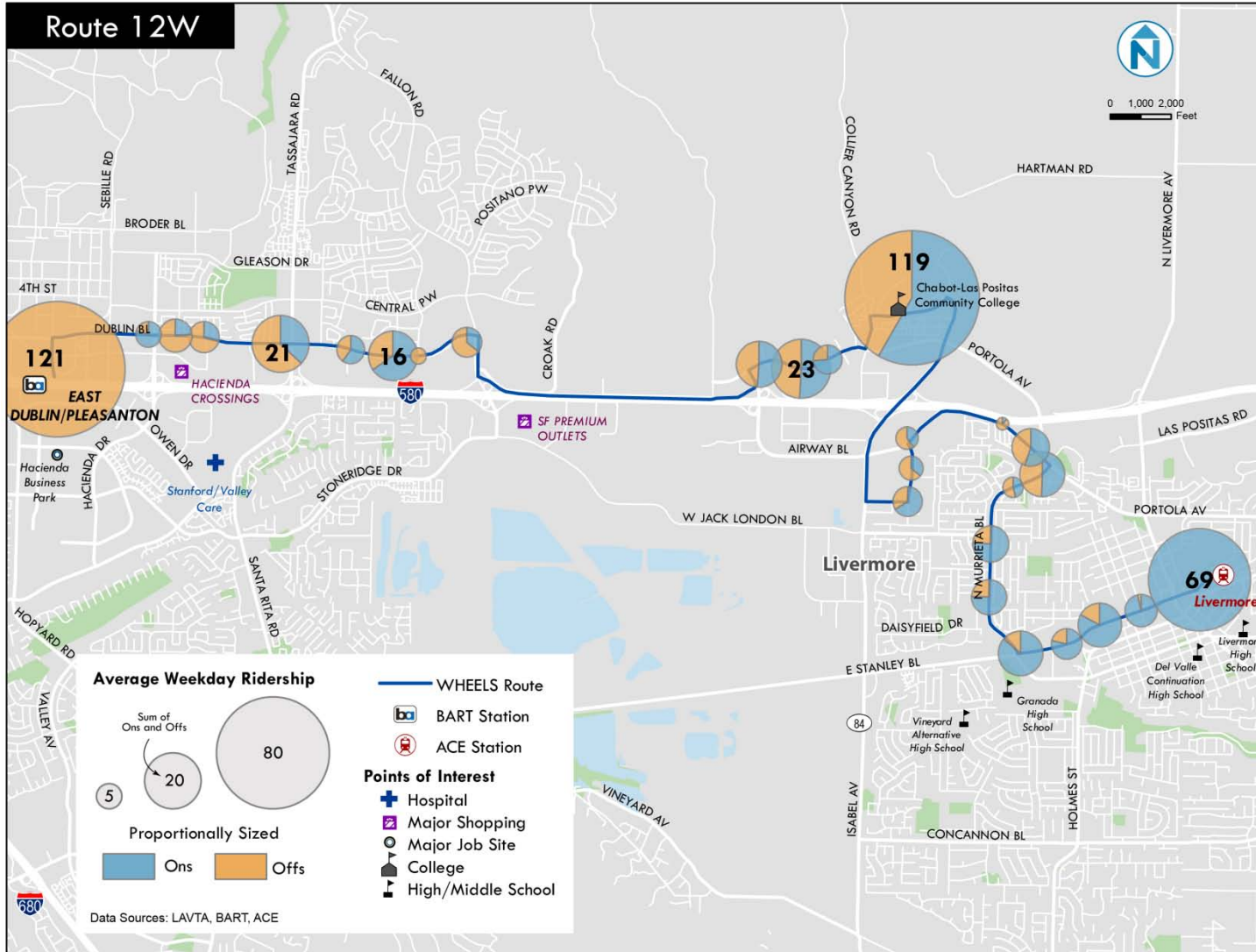
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Figure 59 Route 12 Ridership (Eastbound)



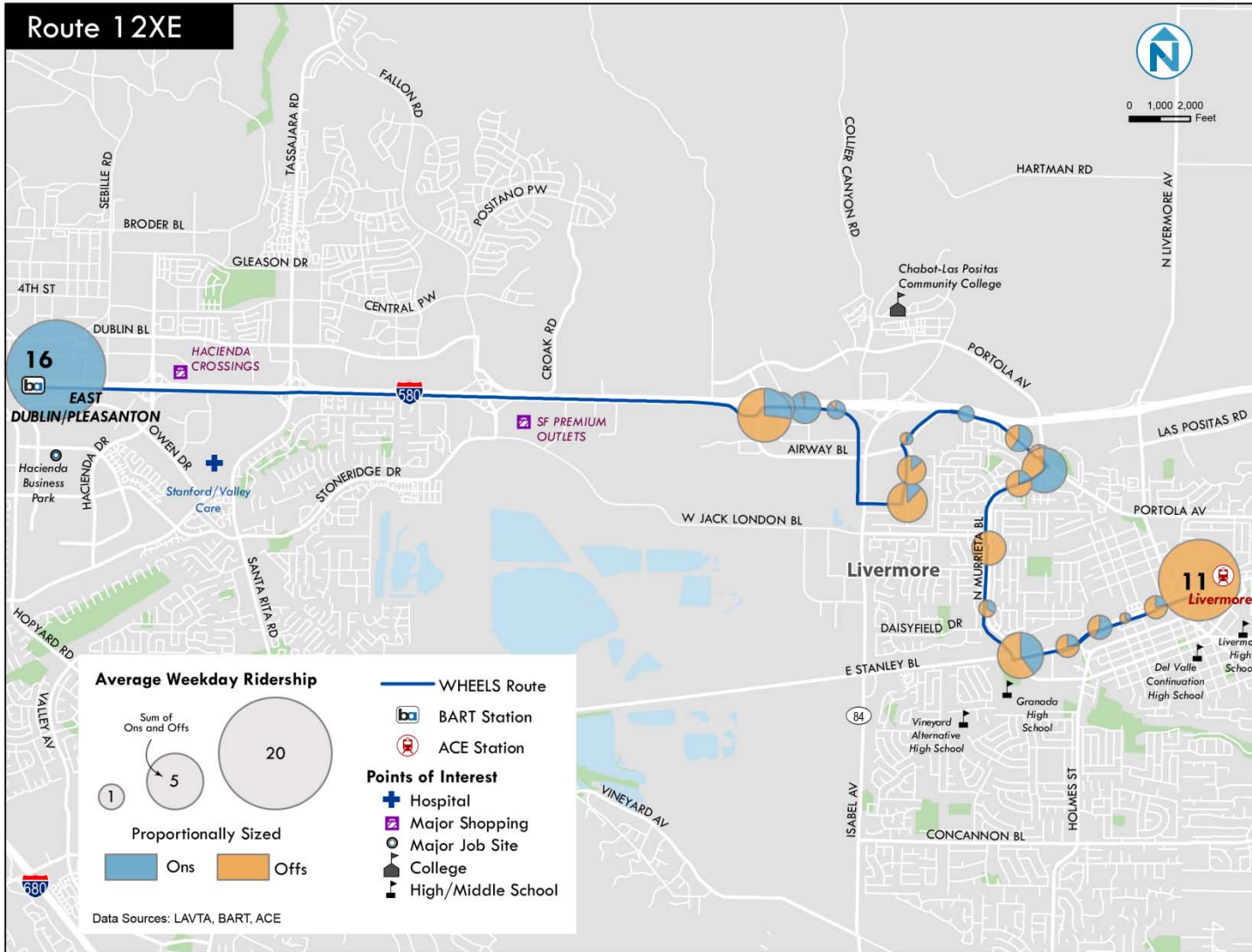
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 60 Route 12 Ridership (Westbound)



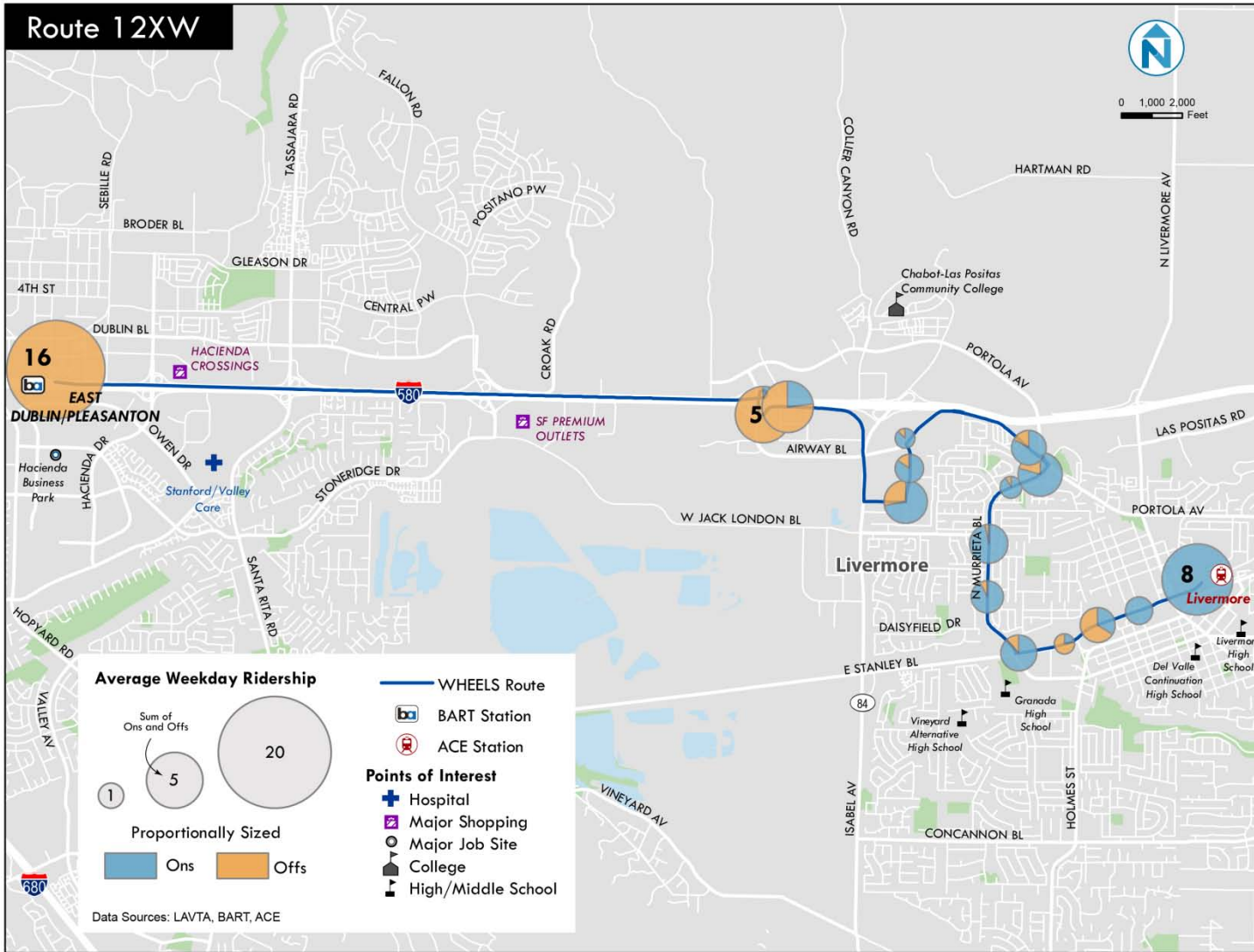
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 61 Route 12X Ridership (Eastbound)



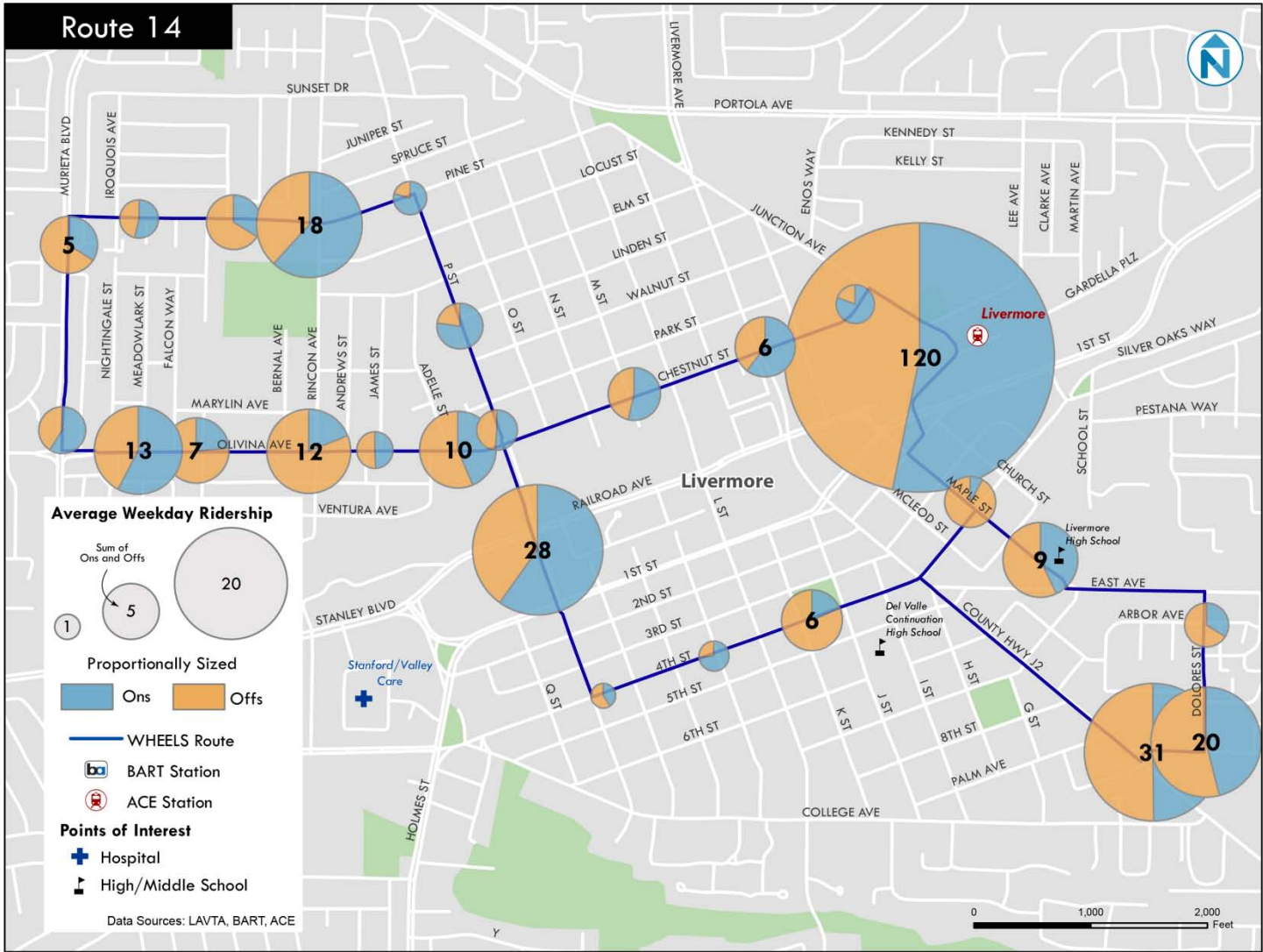
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 62 Route 12X Ridership (Westbound)



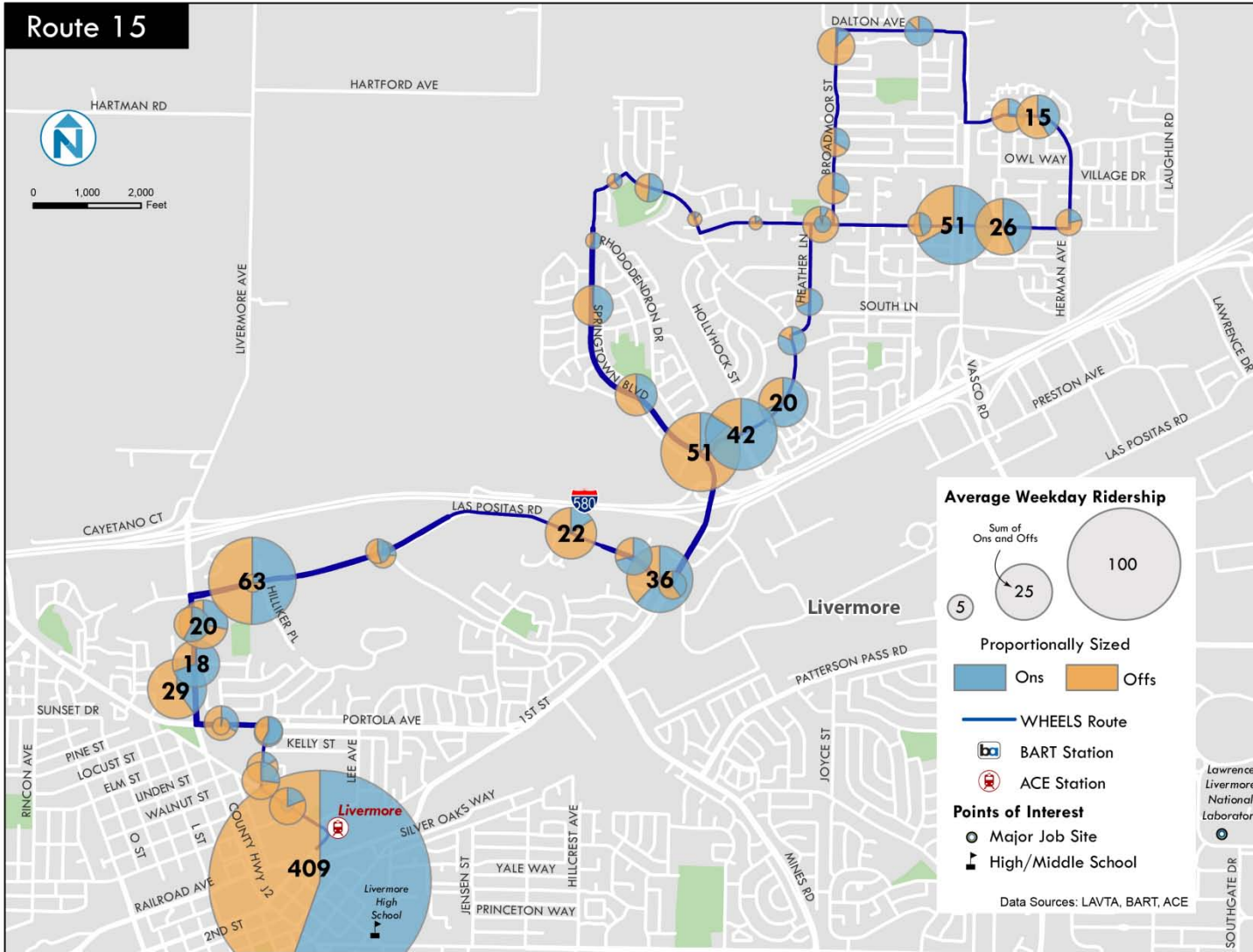
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 63 Route 14 Ridership



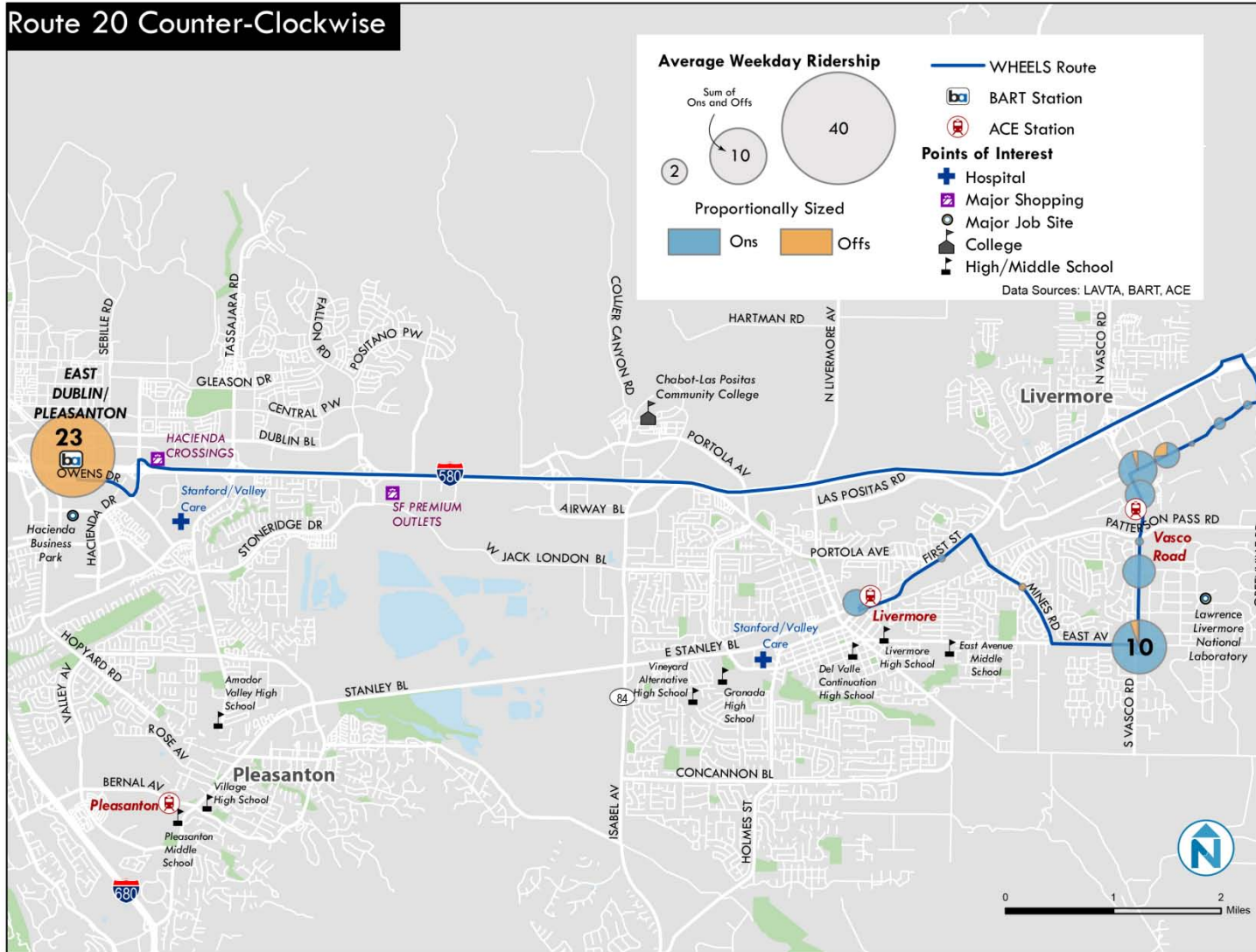
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 64 Route 15 Ridership



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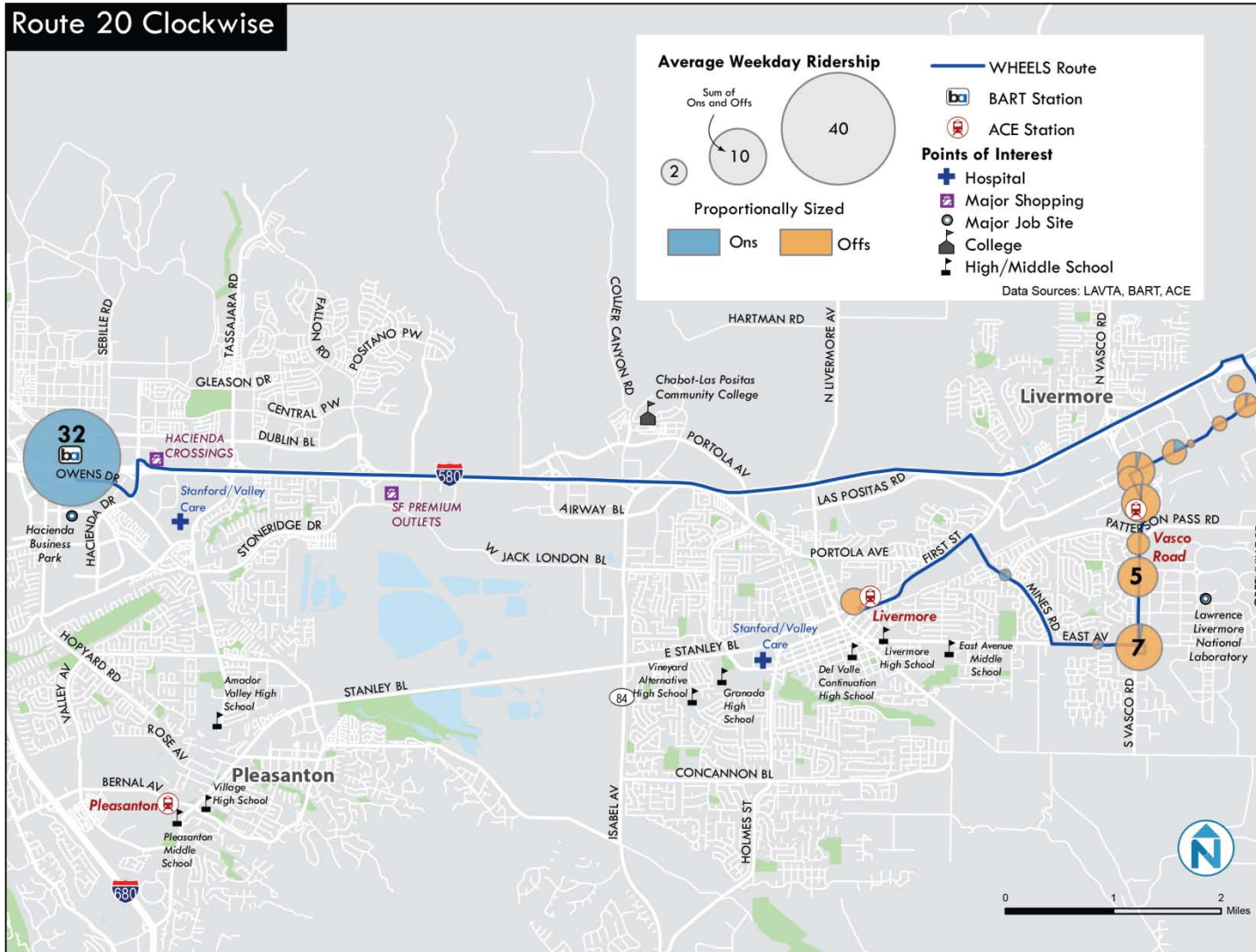
Figure 65 Route 20 Ridership (Counter-Clockwise)



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Livermore Amador Valley Transit Authority

Figure 66 Route 20 Ridership (Clockwise)



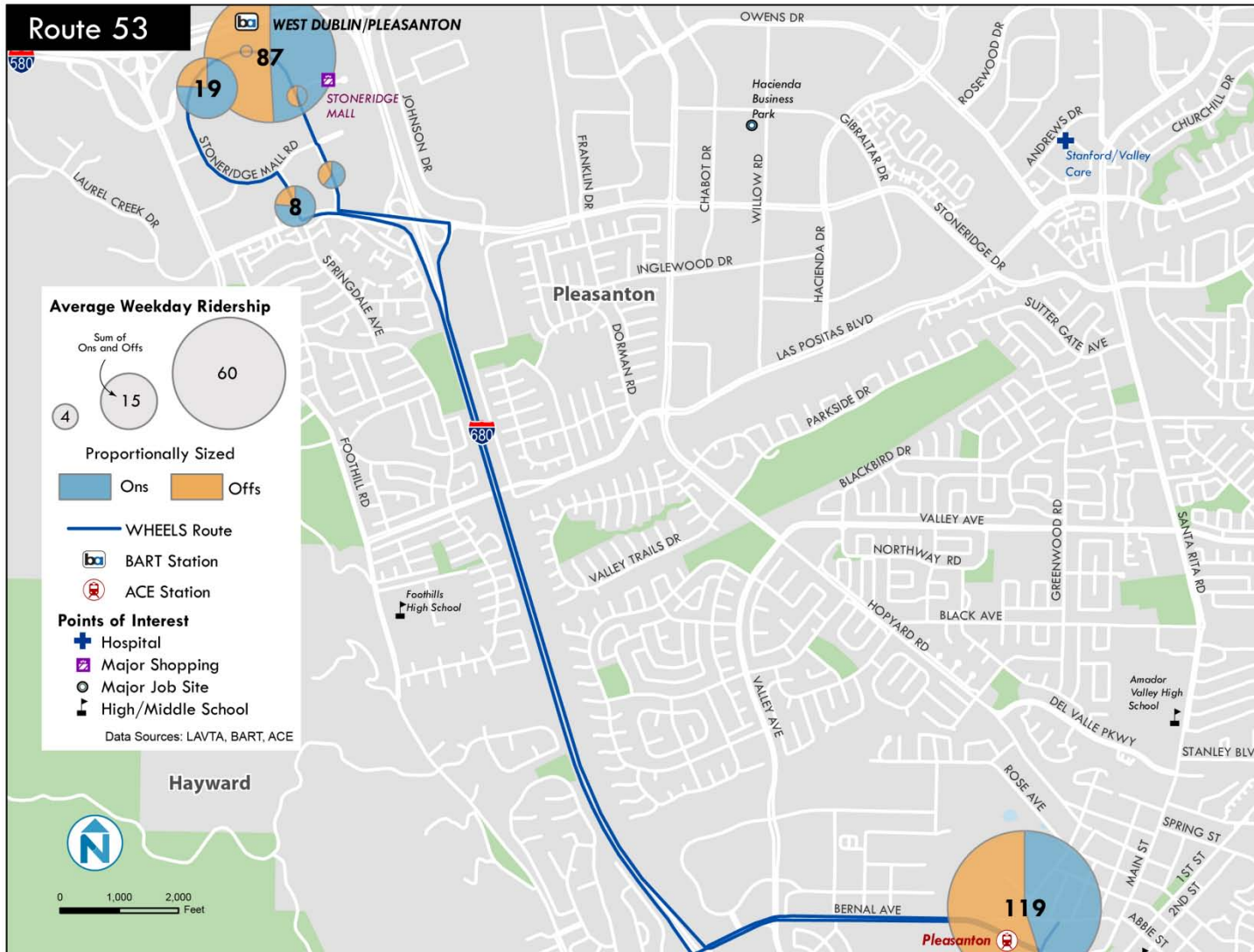
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 67 Route 51 Ridership



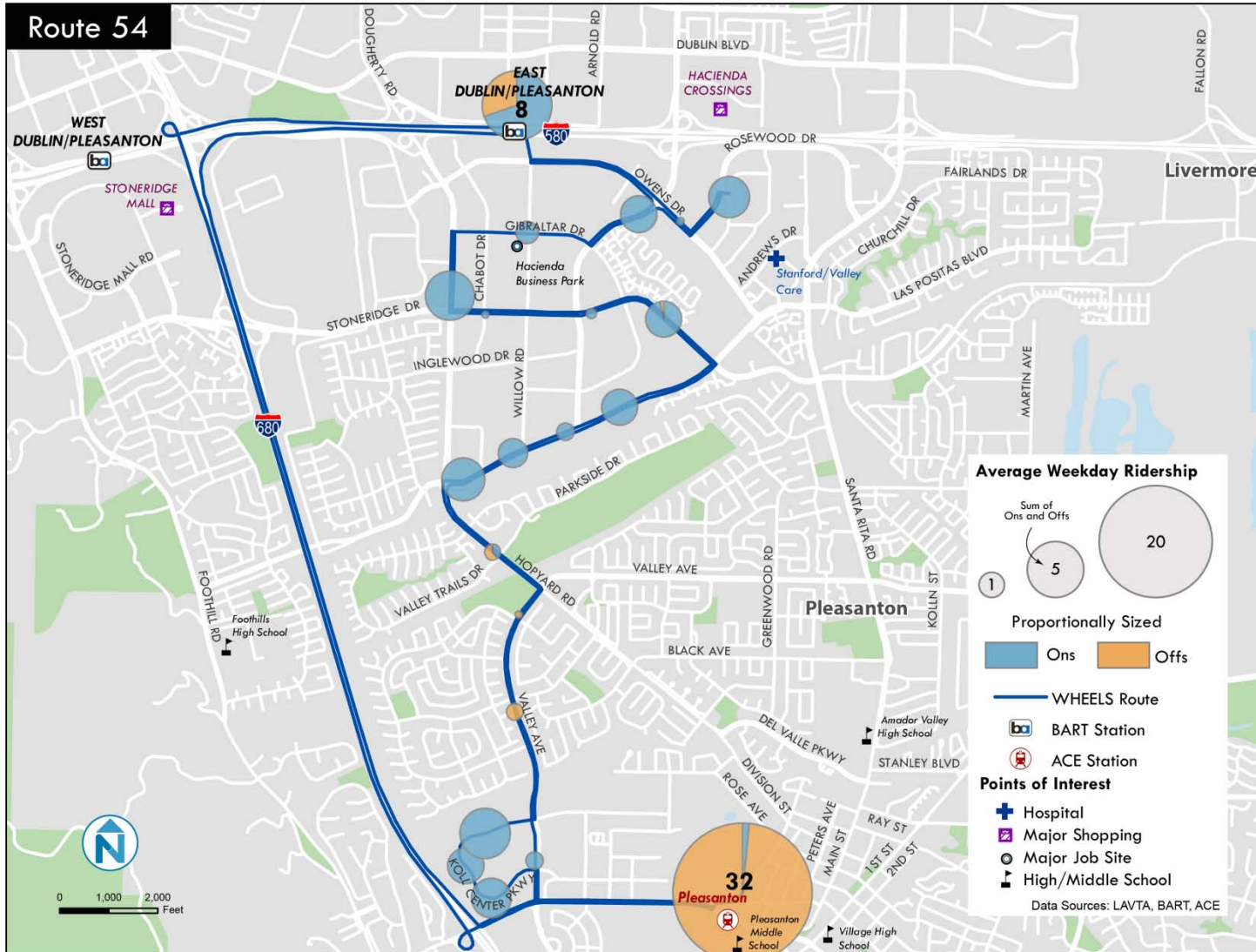
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 68 Route 53 Ridership



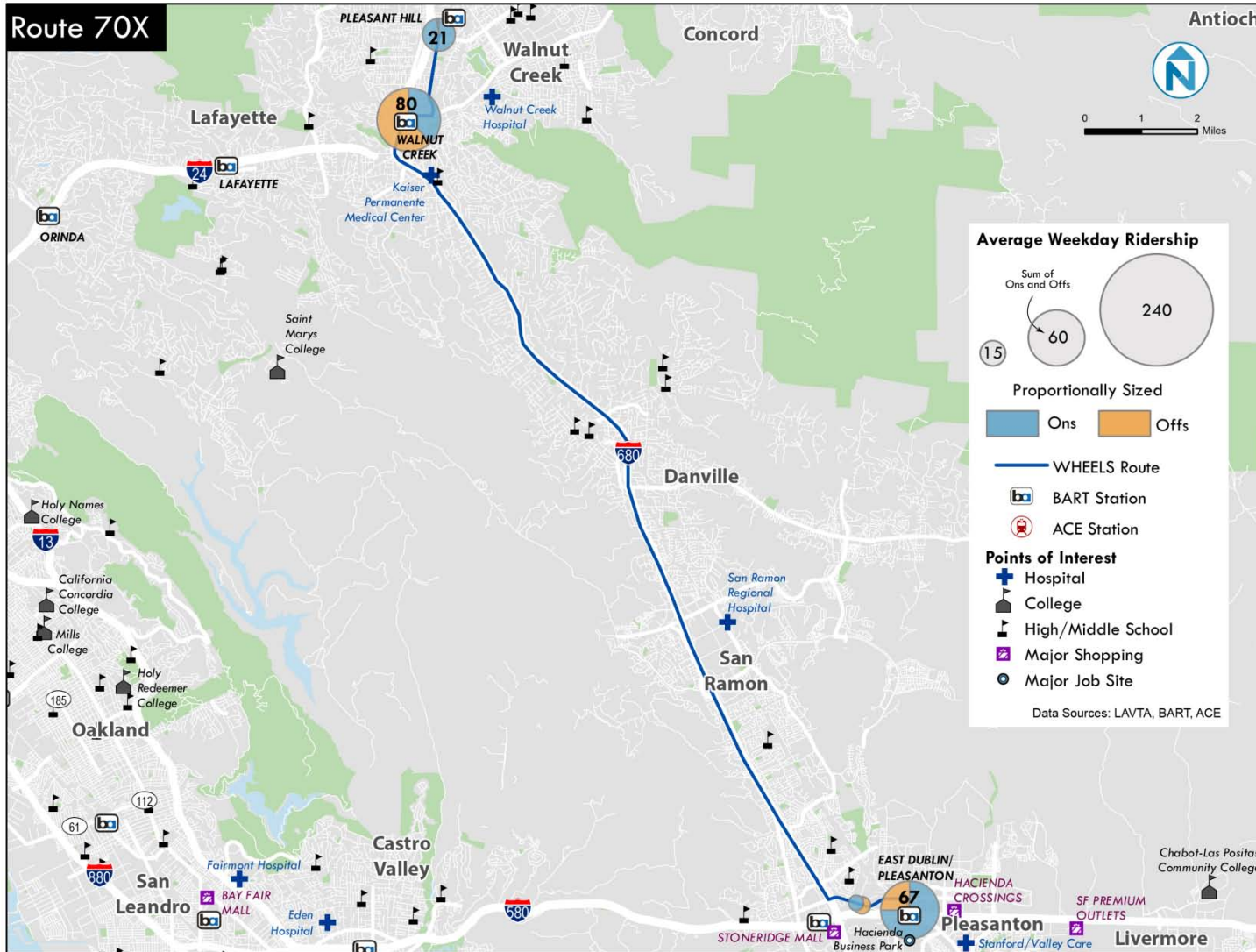
LAVTA COA | EXISTING CONDITIONS REPORT
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Figure 69 Route 54 Ridership



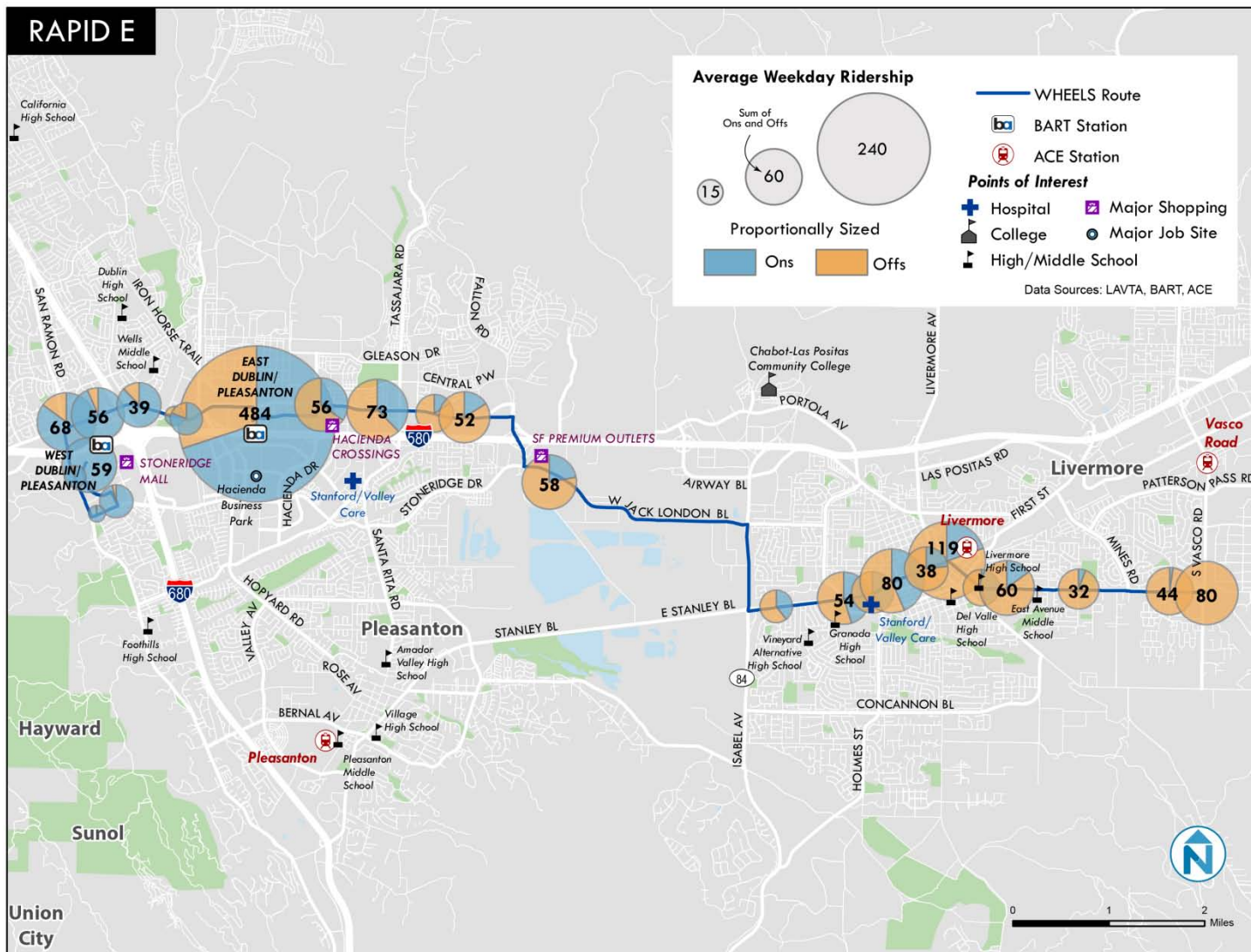
LAVTA COA | EXISTING CONDITIONS REPORT
 Livermore Amador Valley Transit Authority

Figure 70 Route 70X Ridership



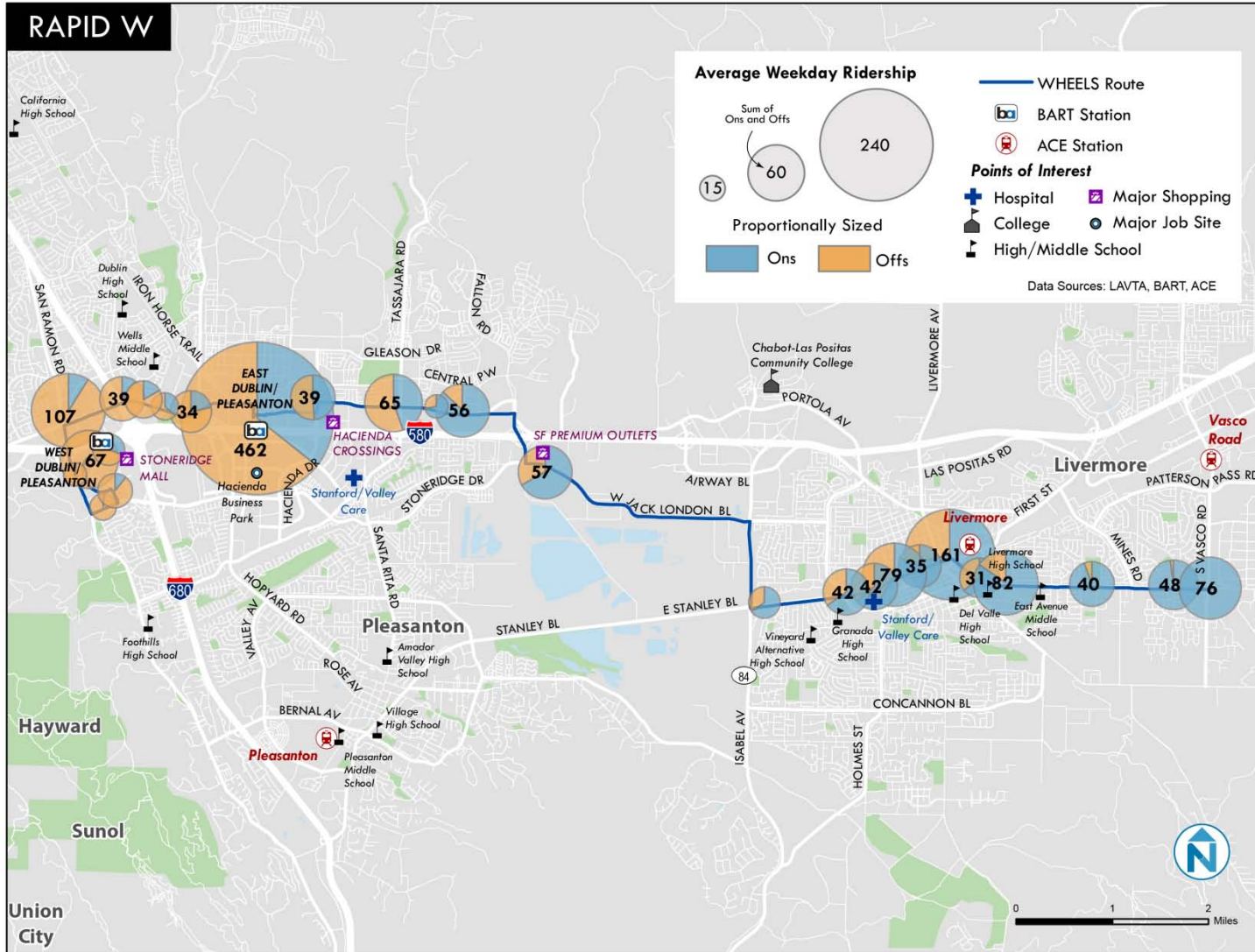
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Figure 71 Rapid Ridership (Eastbound)




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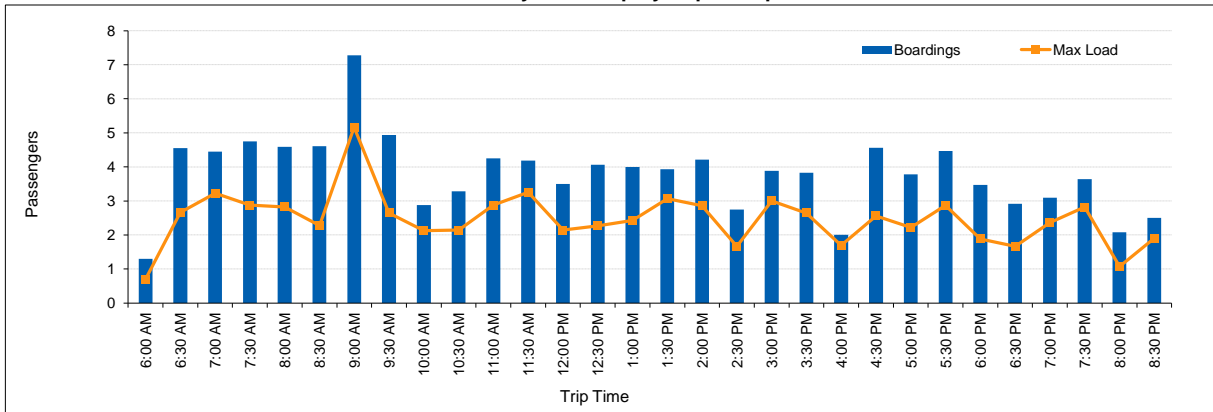
Figure 72 Rapid Ridership (Westbound)



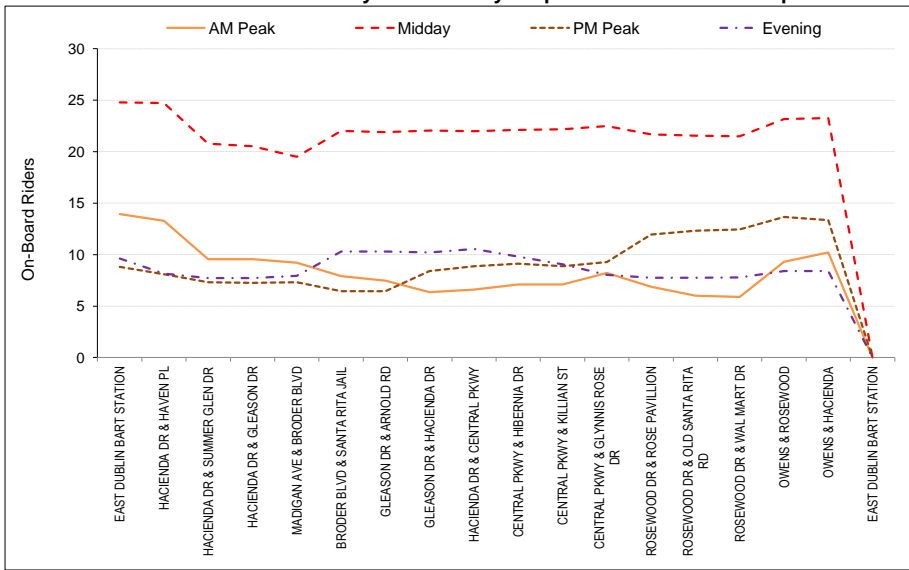
APPENDIX B: LAVTA ROUTE REPORT CARDS

Route 1 Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		114	114	12.0	9.5	91%	3%	5%	57
By Segment											
1	EAST DUBLIN BART STATION 0 to BRODER BLVD & SANTA RITA JAIL 0	60	16	3.5	17.1						
2	BRODER BLVD & SANTA RITA JAIL 0 to CENTRAL PKWY & GLYNNIS ROSE DR 0	26	23	3.6	7.3						
3	CENTRAL PKWY & GLYNNIS ROSE DR 0 to ROSEWOOD DR & ROSE PAVILLION 0	4	4	1.8	2.4						
4	ROSEWOOD DR & ROSE PAVILLION 0 to EAST DUBLIN BART STATION 0	24	72	3.0	7.7						
By Time Period											
AM		24	24	2.5	9.7				14	EAST DUBLIN BART STATION &	L
Midday		49	49	4.8	10.2				25	EAST DUBLIN BART STATION &	L
PM		23	23	2.3	9.7				14	OWENS & ROSEWOOD &	L
Eve		18	18	2.3	7.6				11	HACIENDA DR & CENTRAL PKWY &	L

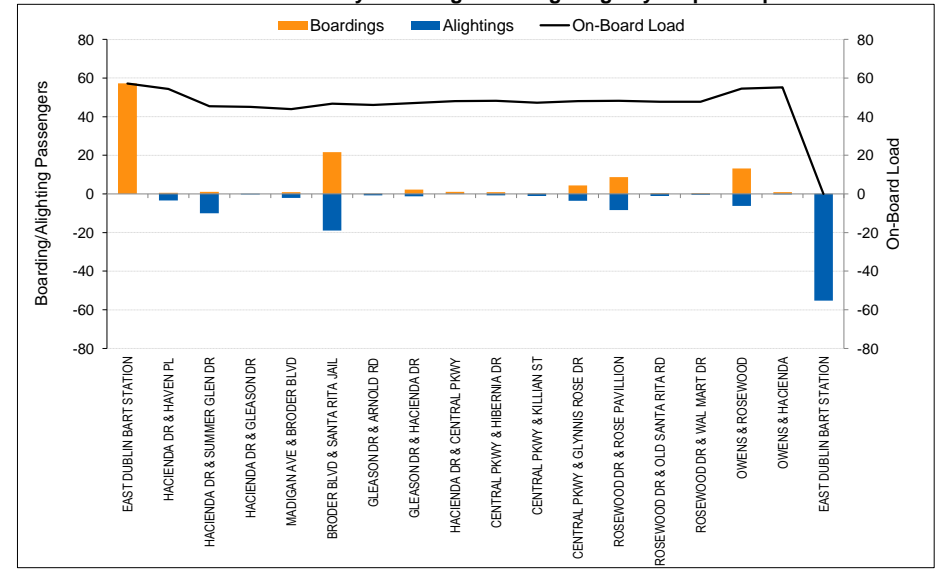
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop



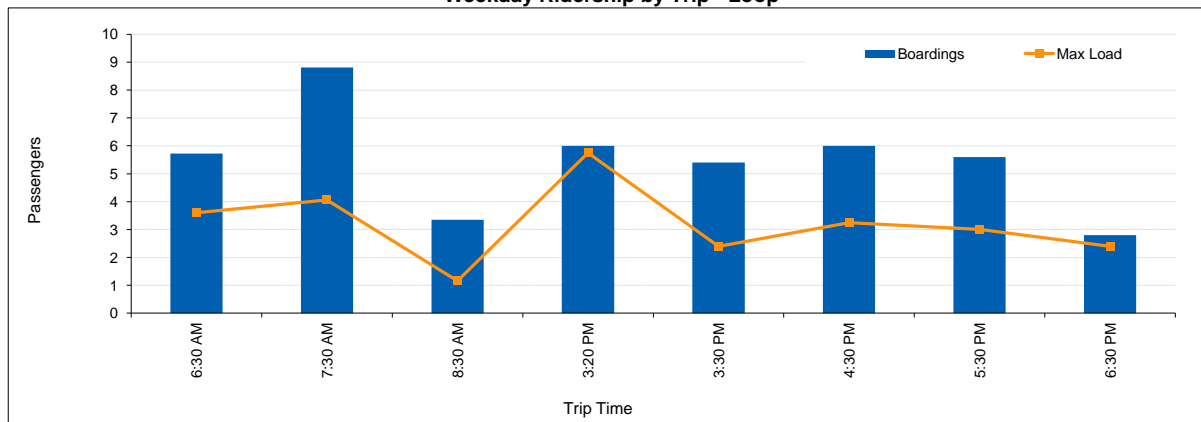
Weekday Boardings and Alightings by Stop - Loop



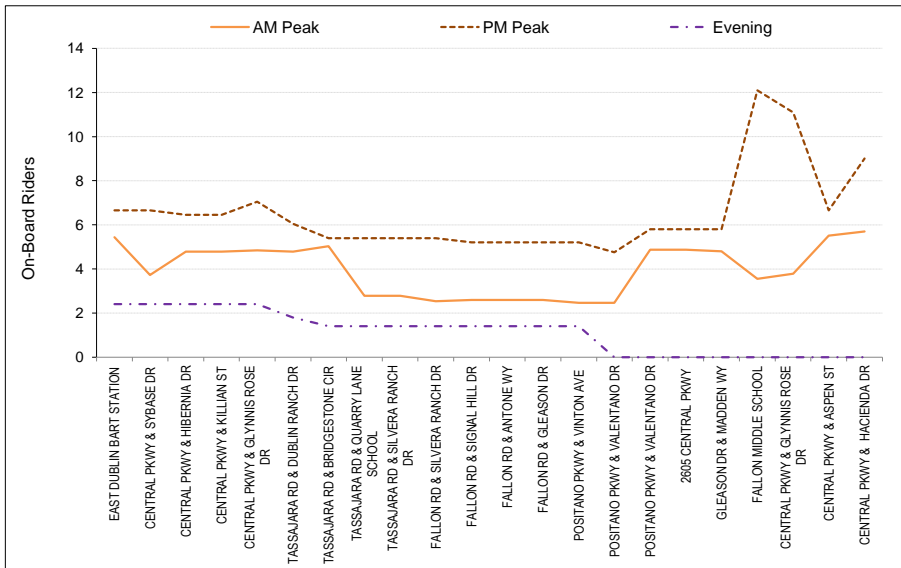
Route 2 Weekday		Route Productivity Summary			
		Activity	Service	Productivity	
		Boardings	Alightings	Service Hours	Boardings per Service Hour
		Total	44	44	5.5
By Segment					
1	EAST DUBLIN BART STATION 0 to CENTRAL PKWY & GLYNNIS ROSE DR 0	16	17	0.7	22.3
2	CENTRAL PKWY & GLYNNIS ROSE DR 0 to FALLON RD & SILVERA RANCH DR 0	2	6	0.6	2.9
3	FALLON RD & SILVERA RANCH DR 0 to POSITANO PKWY & VALENTANO DR 0	1	3	2.0	0.4
4	POSITANO PKWY & VALENTANO DR 0 to FALLON MIDDLE SCHOOL 0	11	8	1.0	11.4
5	FALLON MIDDLE SCHOOL 0 to CENTRAL PKWY & GLYNNIS ROSE DR 0	9	4	0.3	24.8
6	CENTRAL PKWY & GLYNNIS ROSE DR 0 to CENTRAL PKWY & HACIENDA DR 0	5	6	0.8	6.7
By Time Period					
	AM	18	19	2.5	7.2
	PM	23	23	2.7	8.6
	Eve	3	3	0.3	9.3

Route Operations Summary					
On-Time Performance			On-Board Load		
% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
95%	1%	3%	16	FALLON MIDDLE SCHOOL &	L
			6	CENTRAL PKWY & HACIENDA DR	L
			12	FALLON MIDDLE SCHOOL &	L
			2	EAST DUBLIN BART STATION &	L

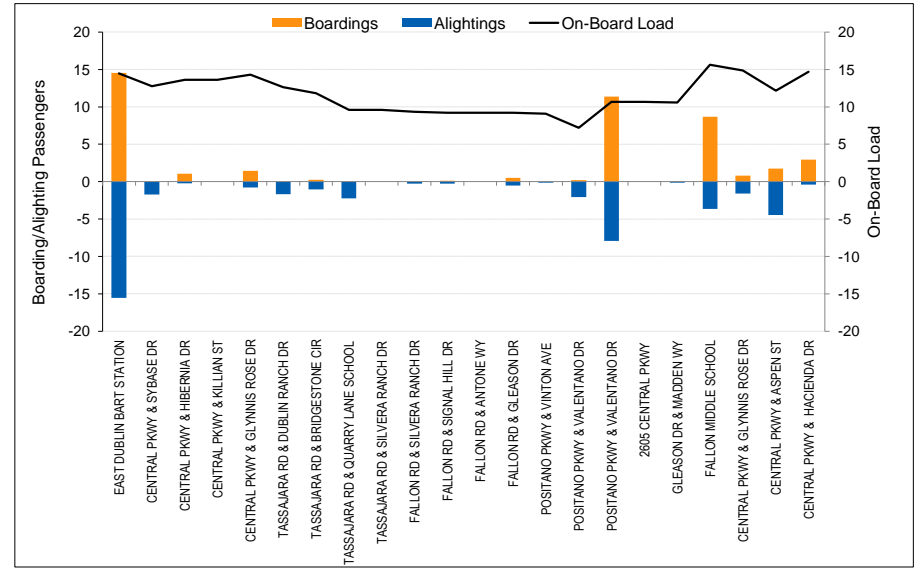
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop

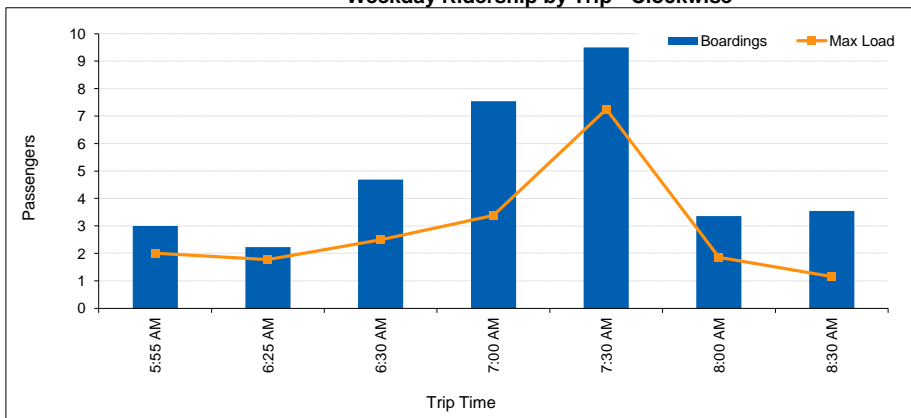


Weekday Boardings and Alightings by Stop - Loop

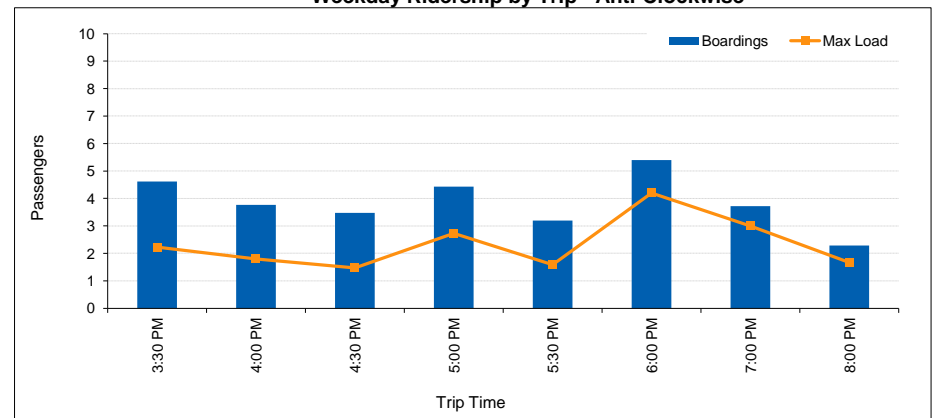


Route 3 Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		65	65	11.7	5.5	64%	1%	35%	19
Clockwise		34	34	5.0	6.8				15	EAST DUBLIN BART STATION &	C
Anti-Clockwise		31	31	6.7	4.6				19	DOUGHERTY RD & DUBLIN BLVD &	A
By Segment											
1	EAST DUBLIN BART STATION 0 to STONERIDGE DR & HOPYARD RD 0	17	16	1.3	13.1						
2	STONERIDGE DR & HOPYARD RD 0 to JOHNSON DR & COMMERCE DR 0	2	7	1.1	1.8						
3	JOHNSON DR & COMMERCE DR 0 to STONERIDGE MALL RD & MC WILLIAMS LN 0	2	3	1.3	1.5						
4	STONERIDGE MALL RD & MC WILLIAMS LN 0 to STONERIDGE MALL 0	1	1	1.1	0.8						
5	STONERIDGE MALL 0 to WEST DUBLIN BART STATION 0	1	4	1.1	1.0						
6	WEST DUBLIN BART STATION 0 to VILLAGE PKWY & AMADOR VALLEY BLVD 0	8	3	1.8	4.4						
7	VILLAGE PKWY & AMADOR VALLEY BLVD 0 to VILLAGE PKWY & BRIGHTON DR 0	4	5	0.5	8.4						
8	VILLAGE PKWY & BRIGHTON DR 0 to ALCOSTA BLVD & VILLAGE PKWY 0	1	8	0.5	1.9						
9	ALCOSTA BLVD & VILLAGE PKWY 0 to AMADOR VALLEY BLVD & STAGECOACH RD 0	4	4	0.7	5.8						
10	AMADOR VALLEY BLVD & STAGECOACH RD 0 to OWENS DR & WILLOW RD & 0	25	15	2.3	10.5						
By Time Period											
AM		34	34	5.0	6.8				15	EAST DUBLIN BART STATION &	C
PM		19	19	4.2	4.7				10	DOUGHERTY RD & DUBLIN BLVD &	A
Eve		11	12	2.5	4.6				9	DOUGHERTY RD & DUBLIN BLVD &	A

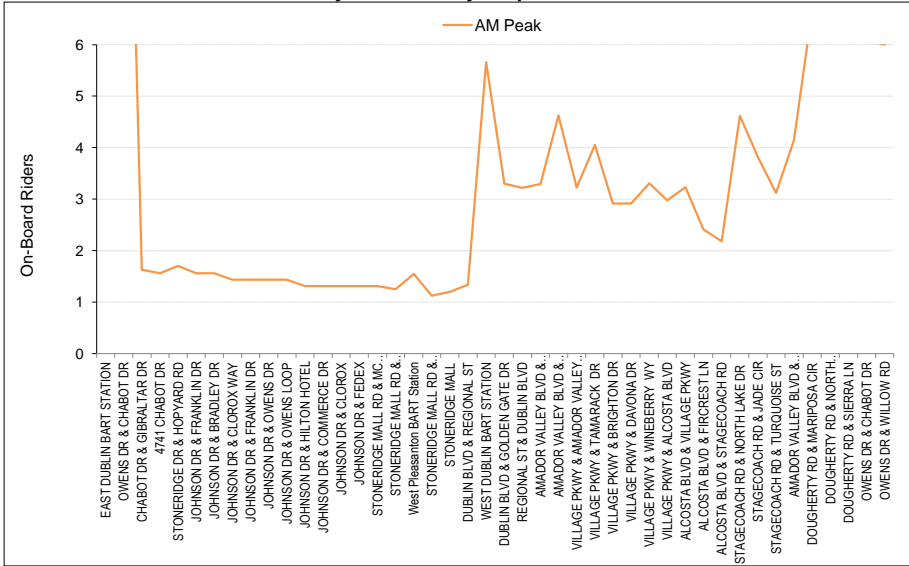
Weekday Ridership by Trip - Clockwise



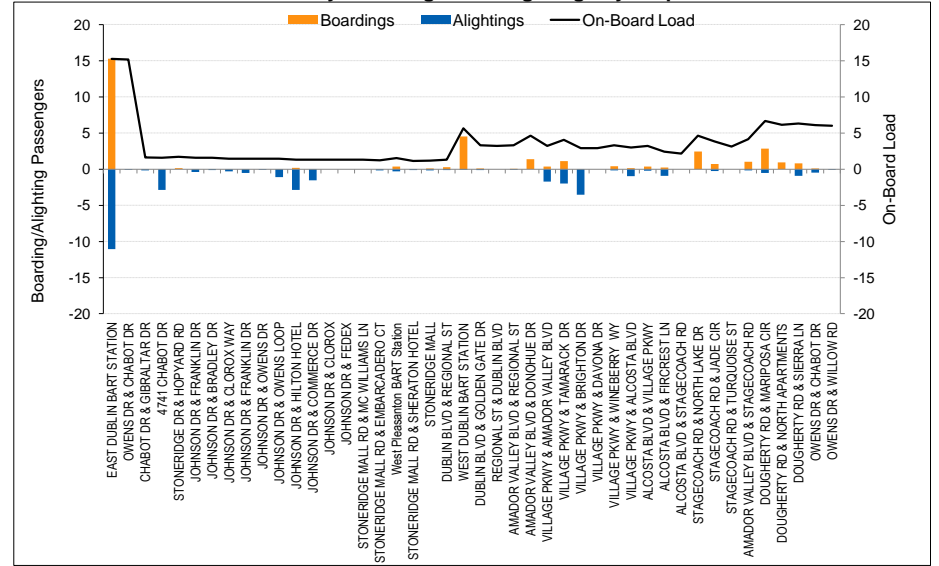
Weekday Ridership by Trip - Anti-Clockwise



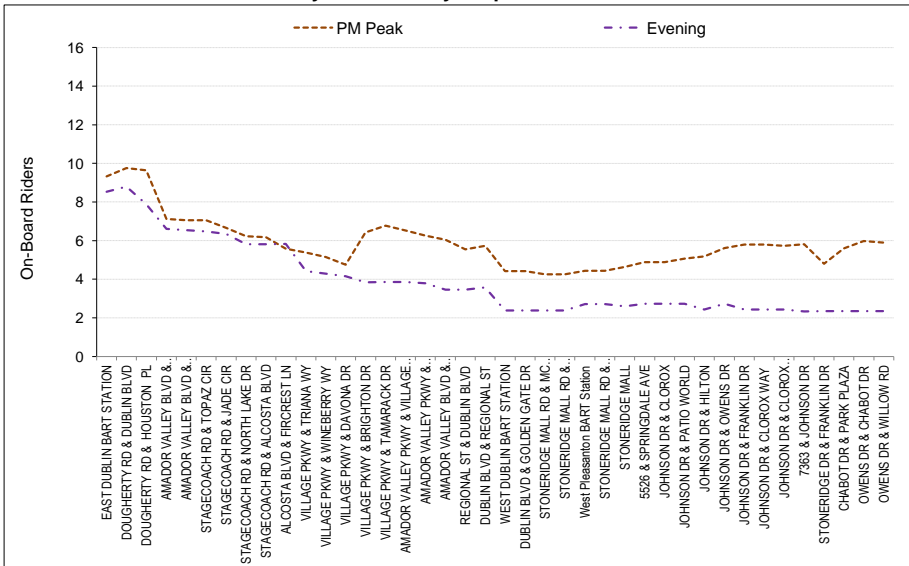
Weekday On-Board by Stop and Time Period - Clockwise



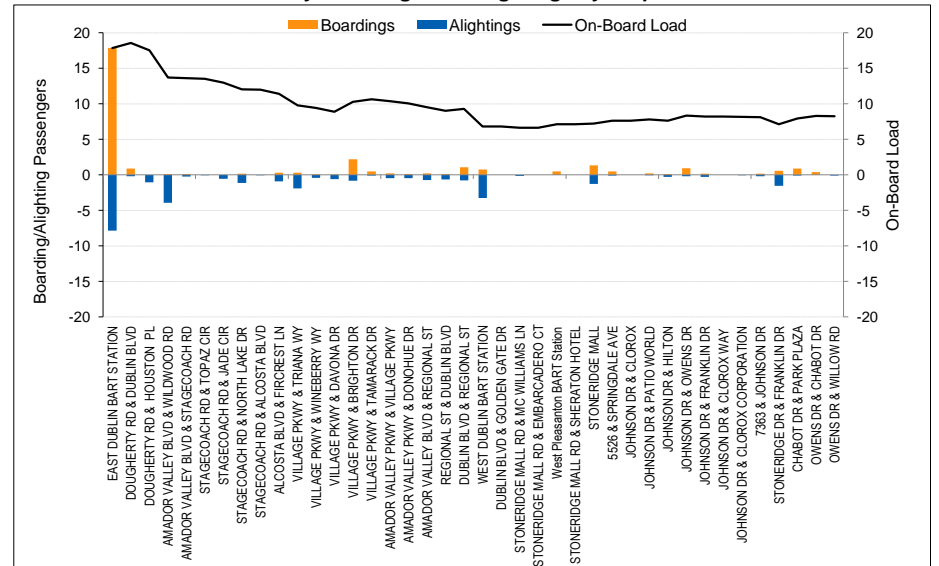
Weekday Boardings and Alightings by Stop - Clockwise




Weekday On-Board by Stop and Time Period - Anti-Clockwise

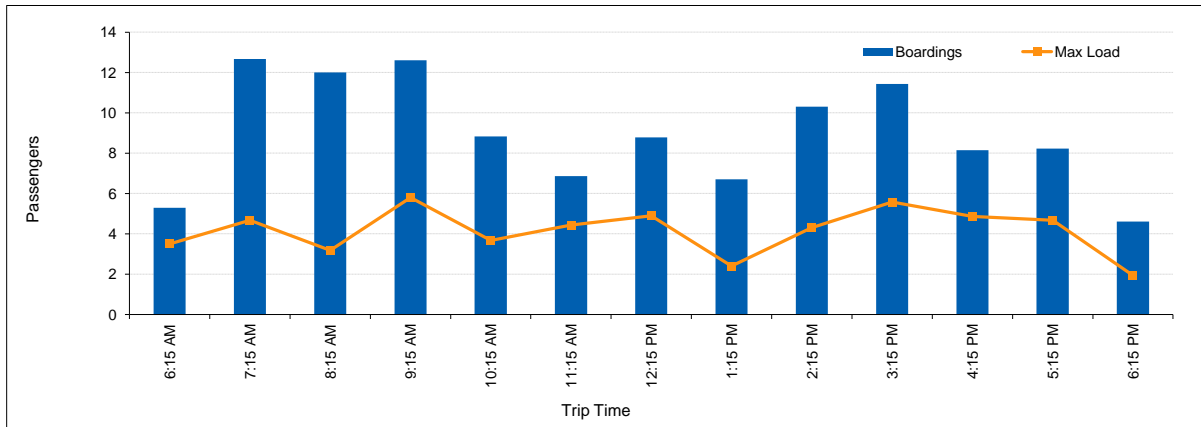


Weekday Boardings and Alightings by Stop - Anti-Clockwise

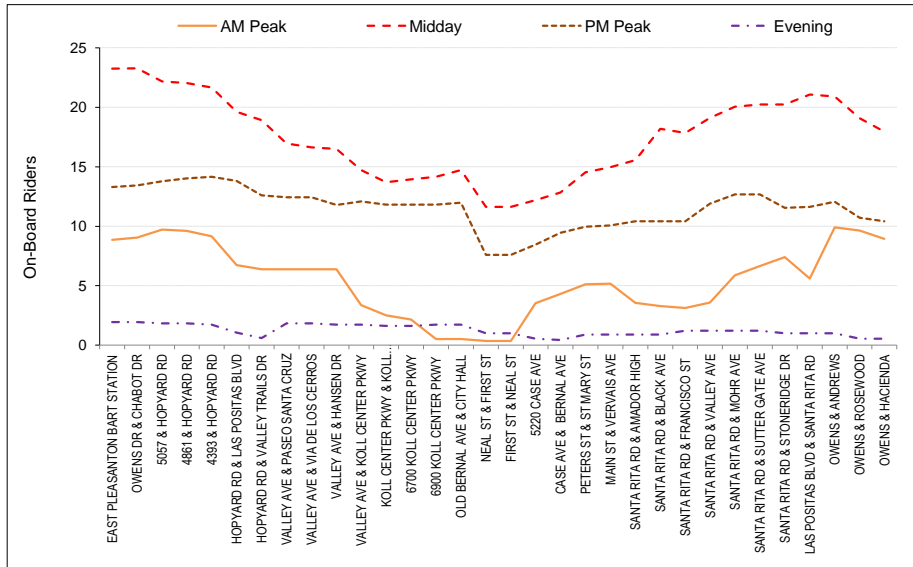


Route 8A Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		116	120	10.2	11.4	81%	2%	17%	48
By Segment											
1	EAST PLEASANTON BART STATION 0 to HOPYARD RD & LAS POSITAS BLVD 0	50	43	1.3	38.7						
2	HOPYARD RD & LAS POSITAS BLVD 0 to KOLL CENTER PKWY & KOLL CENTER DR 0	9	24	1.5	6.0						
3	KOLL CENTER PKWY & KOLL CENTER DR 0 to NEAL ST & FIRST ST 0	3	6	2.2	1.2						
4	NEAL ST & FIRST ST 0 to 5220 CASE AVE 0	4	14	1.1	4.1						
5	5220 CASE AVE 0 to SANTA RITA RD & VALLEY AVE 0	24	12	1.7	13.9						
6	SANTA RITA RD & VALLEY AVE 0 to OWENS & HACIENDA 0	26	21	2.4	10.8						
By Time Period											
AM		30	31	2.3	12.7				10	OWENS & ANDREWS &	L
Midday		54	55	4.7	11.5				23	OWENS DR & CHABOT DR &	L
PM		28	28	2.3	11.8				14	4393 & HOPYARD RD &	L
Eve		5	6	0.8	5.9				2	EAST PLEASANTON BART STATION	L

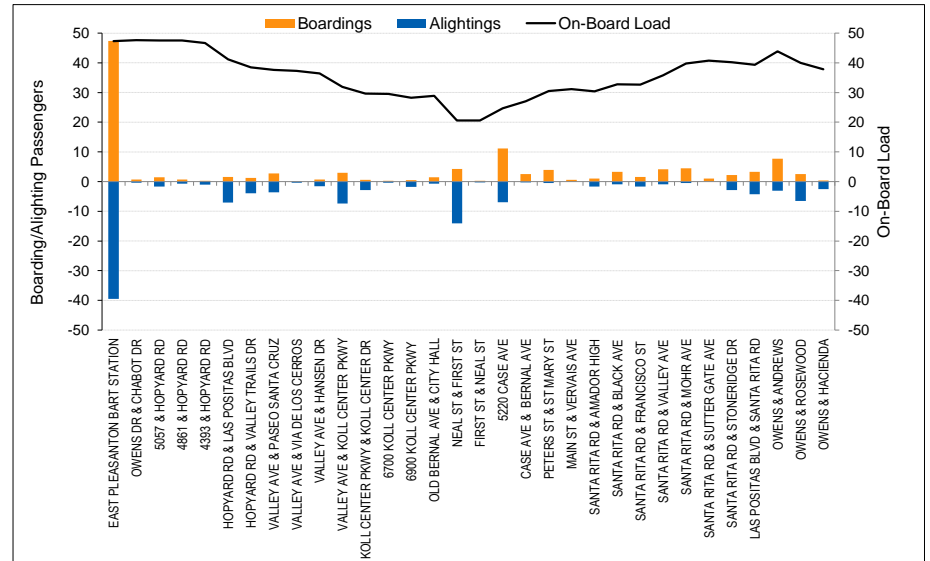
Weekday Ridership by Trip - Loop



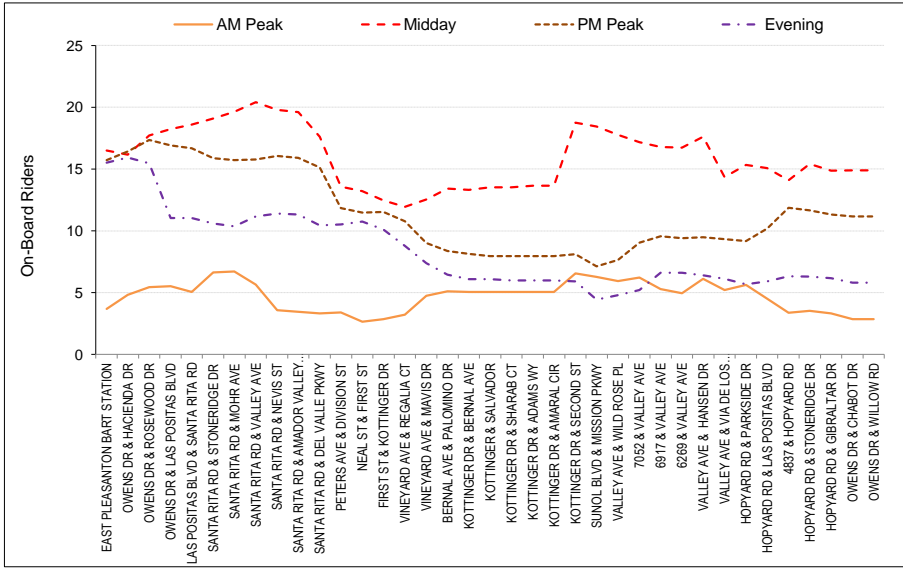
Weekday On-Board by Stop and Time Period - Loop



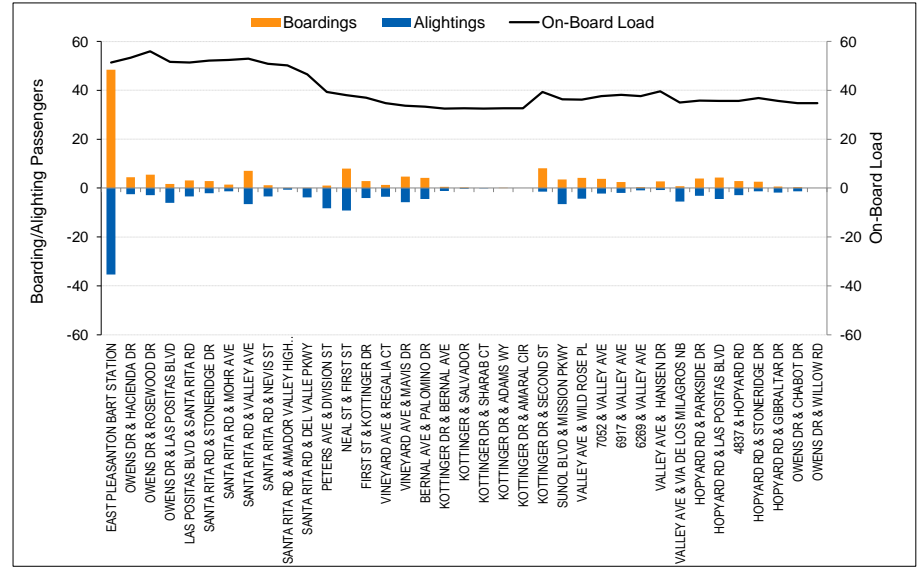
Weekday Boardings and Alightings by Stop - Loop




Weekday On-Board by Stop and Time Period - Loop

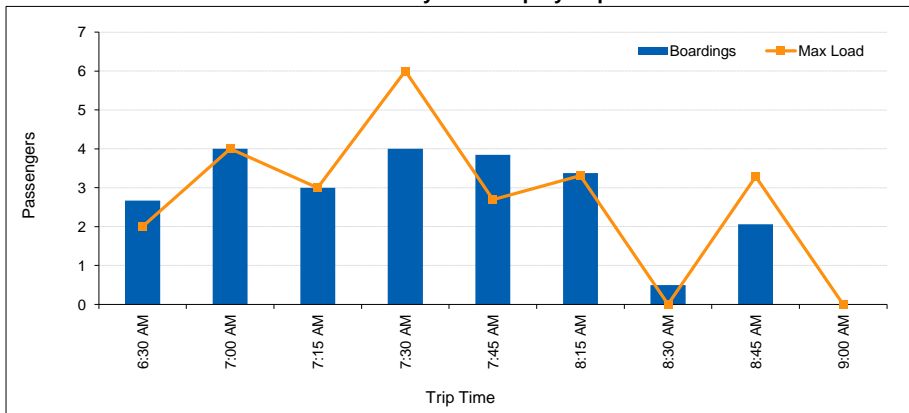


Weekday Boardings and Alightings by Stop - Loop

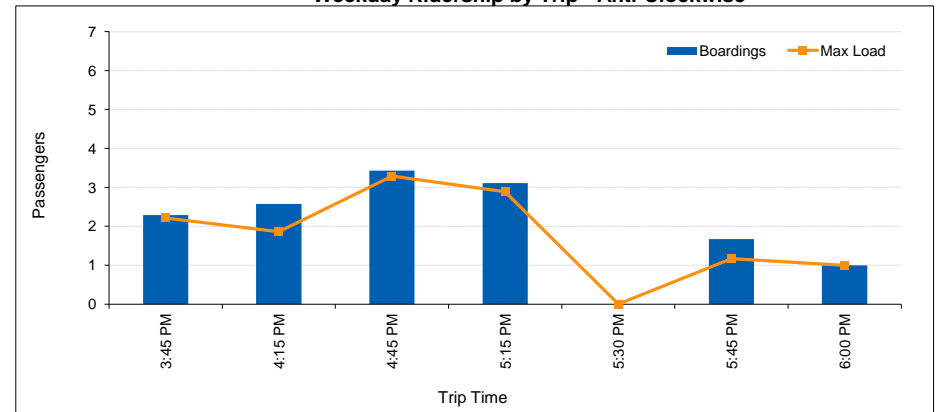


Route 9 Weekday	Route Productivity Summary				Route Operations Summary					
	Activity	Service	Productivity		On-Time Performance			On-Board Load		
	Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
	Total	38	52	5.1	7.4	72%	1%	27%	33	EAST PLEASANTON BART STATION
Clockwise	23	39	2.8	8.2				33	EAST PLEASANTON BART STATION	C
Anti-Clockwise	14	14	2.2	6.3				12	OWENS & ROSEWOOD &	A
By Segment										
1 EAST PLEASANTON BART STATION 0 to CALIFONIA CENTER 0	27	6	1.9	13.9						
2 CALIFONIA CENTER 0 to STONERIDGE DR & LAS POSITAS BLVD 0	4	23	2.4	1.6						
3 STONERIDGE DR & LAS POSITAS BLVD 0 to WILLOW RD & GIBRALTER DR 0	2	6	1.1	2.3						
4 WILLOW RD & GIBRALTER DR 0 to OWENS DR & WILLOW RD 0	4	17	1.2	3.6						
By Time Period										
AM	23	34	2.5	9.3				28	EAST PLEASANTON BART STATION	C
Midday		5	0.3					5	EAST PLEASANTON BART STATION	C
PM	13	13	1.9	6.9				11	OWENS & ROSEWOOD &	A
Eve	1	1	0.3	3.2				1	EAST PLEASANTON BART STATION	A

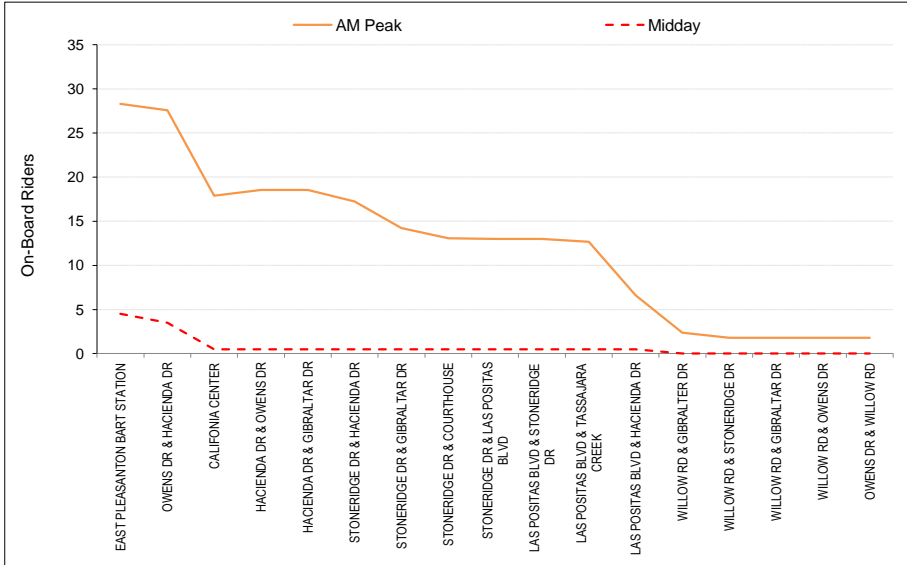
Weekday Ridership by Trip - Clockwise



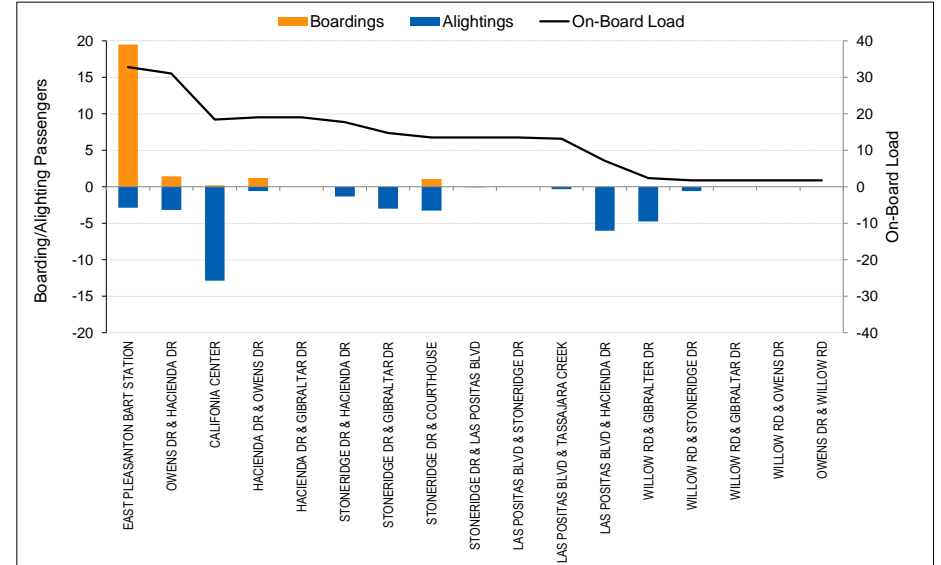
Weekday Ridership by Trip - Anti-Clockwise



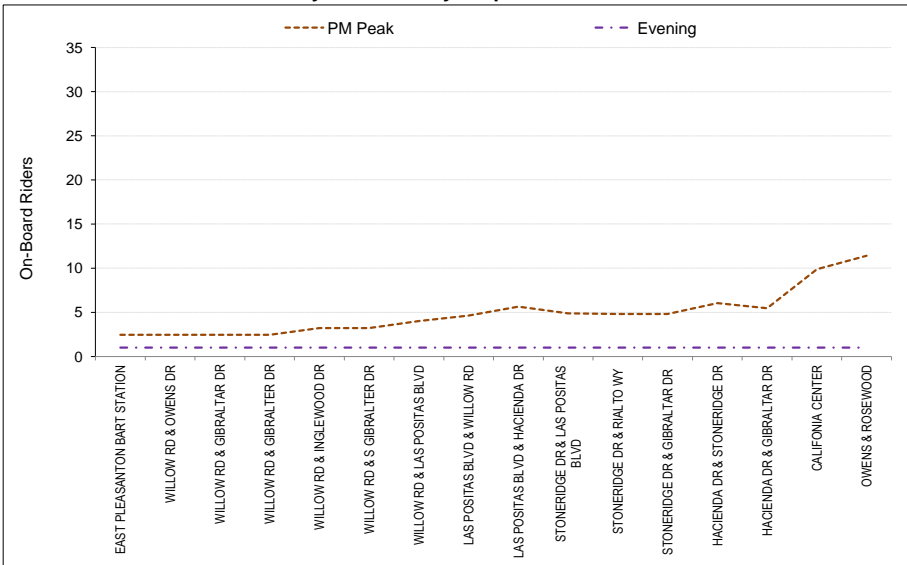
Weekday On-Board by Stop and Time Period - Clockwise



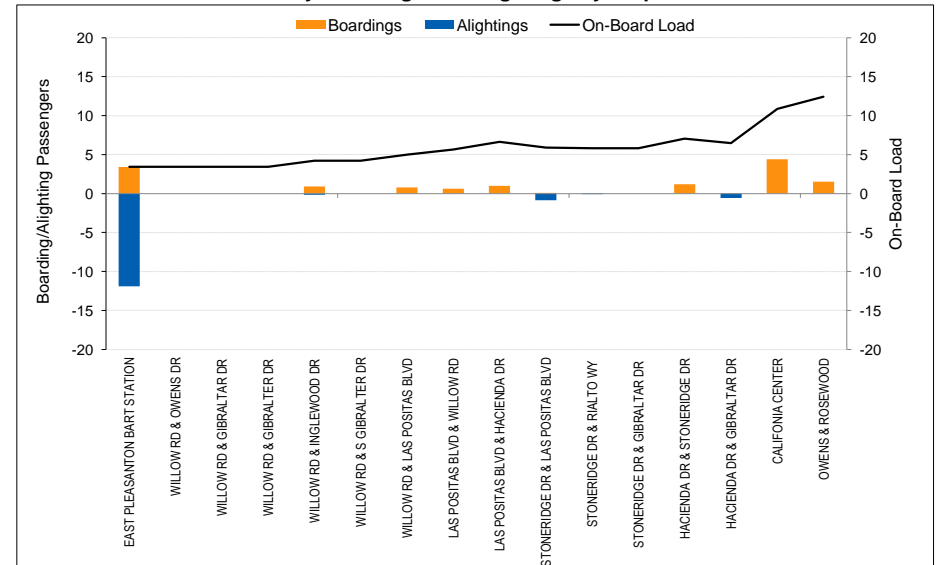
Weekday Boardings and Alightings by Stop - Clockwise




Weekday On-Board by Stop and Time Period - Anti-Clockwise

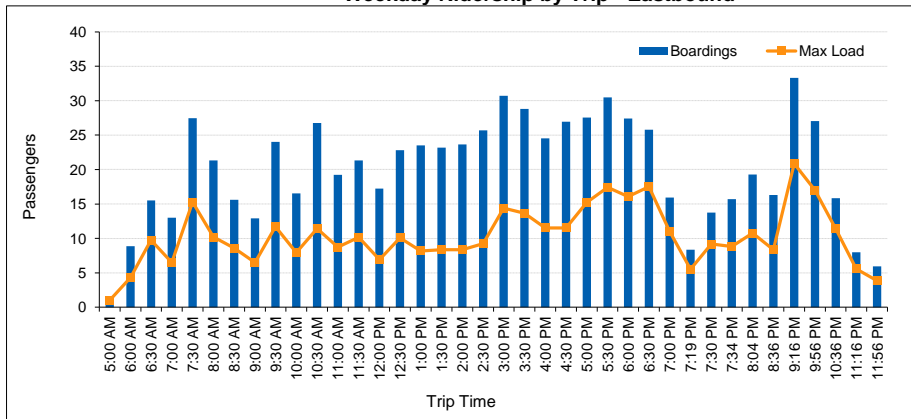


Weekday Boardings and Alightings by Stop - Anti-Clockwise

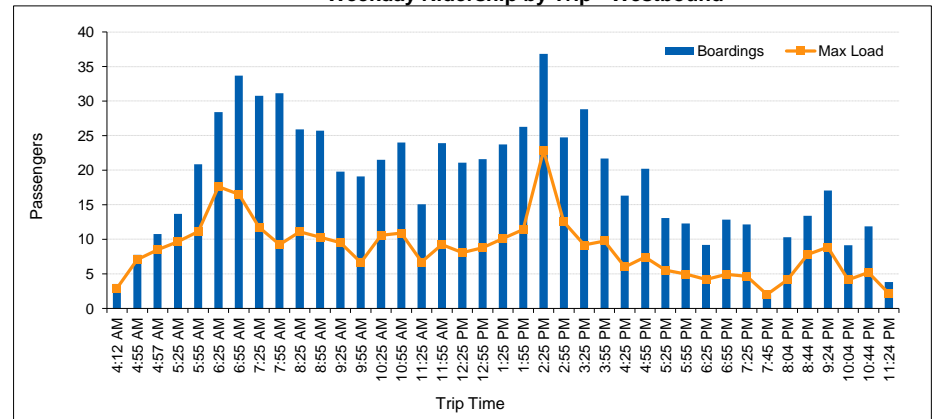


Route 10 Weekday					Route Productivity Summary				Route Operations Summary						
					Activity		Service	Productivity	On-Time Performance			On-Board Load			
					Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction	
															Total
Total					1,485	1,483	71.6	20.8	81%	3%	17%	340	OWENS DR & HACIENDA DR &	E	
Eastbound					762	763	36.1	21.1				340	OWENS DR & HACIENDA DR &	E	
Westbound					724	721	35.5	20.4				291	SANTA RITA RD & BLACK AVE &	W	
By Segment															
1 STONERIDGE MALL 0 to DUBLIN BLVD & GOLDEN GATE DR 0					28	16	2.6	10.7							
2 DUBLIN BLVD & GOLDEN GATE DR 0 to EAST PLEASANTON BART STATION 0					26	21	4.1	6.2							
3 EAST PLEASANTON BART STATION 0 to SANTA RITA RD & VALLEY AVE 0					530	487	14.2	37.4							
4 SANTA RITA RD & VALLEY AVE 0 to NEAL ST & FIRST ST 0					182	209	8.7	20.8							
5 NEAL ST & FIRST ST 0 to STANLEY BLVD & VALLEY MEMORIAL HOSPITAL 0					222	220	15.1	14.7							
6 STANLEY BLVD & VALLEY MEMORIAL HOSPITAL 0 to LIVERMORE TRANSIT CENTER 0					238	233	10.7	22.4							
7 LIVERMORE TRANSIT CENTER 0 to EAST AVE & XAVIER WY 0					162	193	9.7	16.7							
8 EAST AVE & XAVIER WY 0 to EAST AVE & SOUTH VASCO RD 0					97	103	6.5	15.0							
By Time Period															
Early AM					37	37	4.1	9.0				26	SANTA RITA RD & STONERIDGE DR	W	
AM					273	272	10.4	26.2				65	OWENS & ANDREWS &	W	
Midday					535	535	20.8	25.7				123	SANTA RITA RD & BLACK AVE &	W	
PM					294	294	10.4	28.3				73	OWENS DR & ROSEWOOD DR &	E	
Eve					185	186	13.1	14.2				78	EAST PLEASANTON BART STATION	E	
Night					162	161	12.8	13				64	OWENS DR & ROSEWOOD DR &	E	

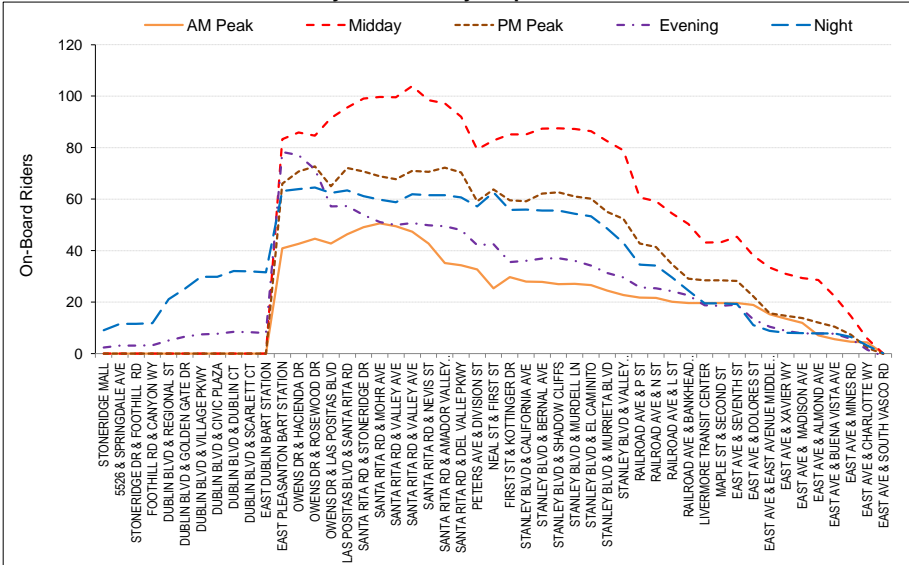
Weekday Ridership by Trip - Eastbound



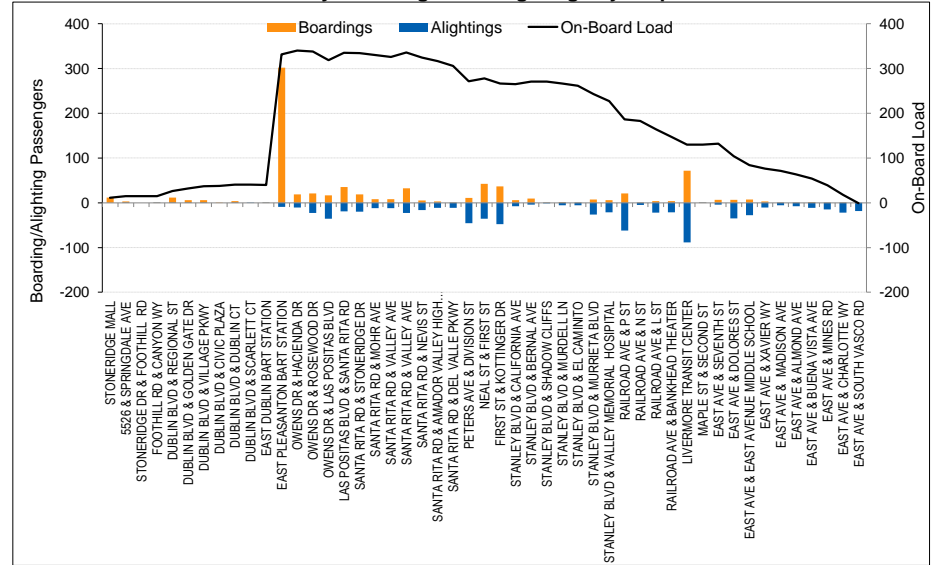
Weekday Ridership by Trip - Westbound



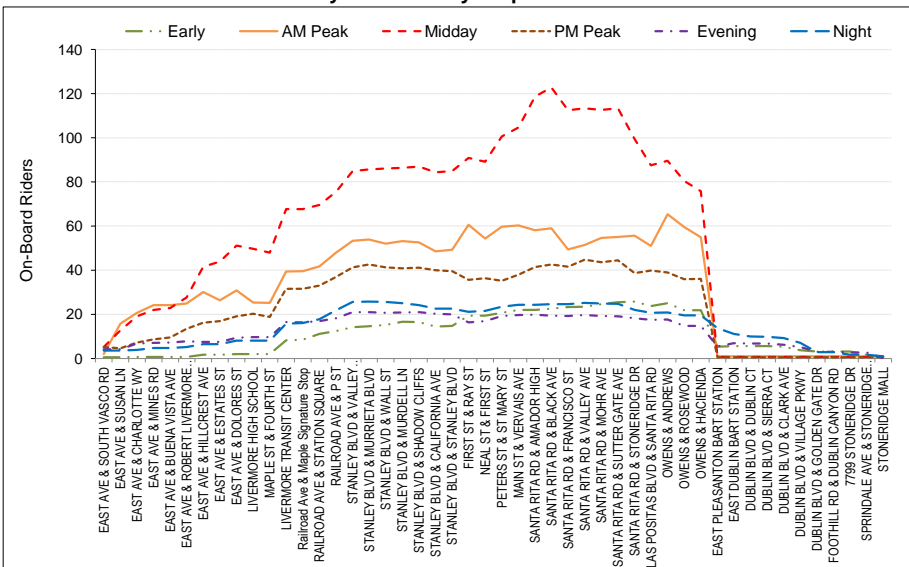
Weekday On-Board by Stop and Time Period - Eastbound



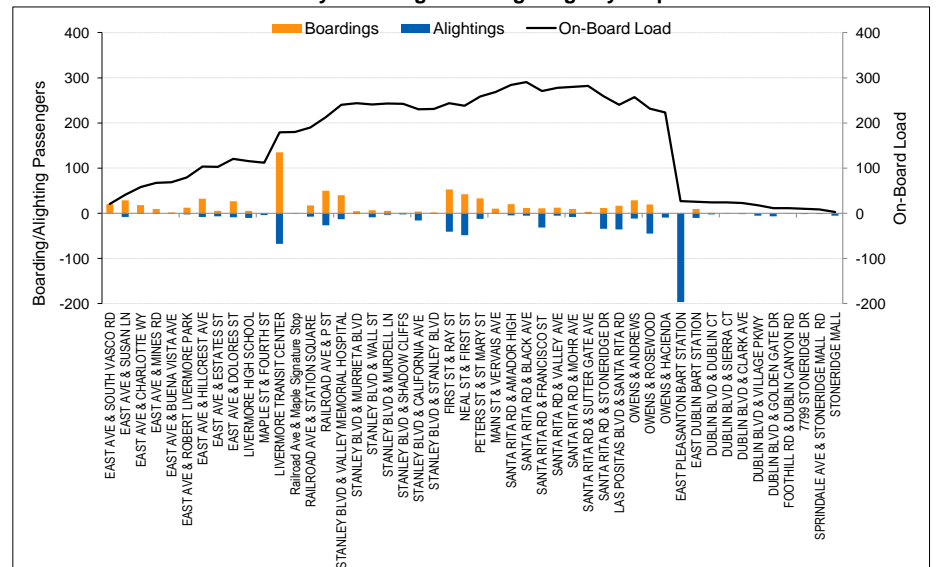
Weekday Boardings and Alightings by Stop - Eastbound




Weekday On-Board by Stop and Time Period - Westbound

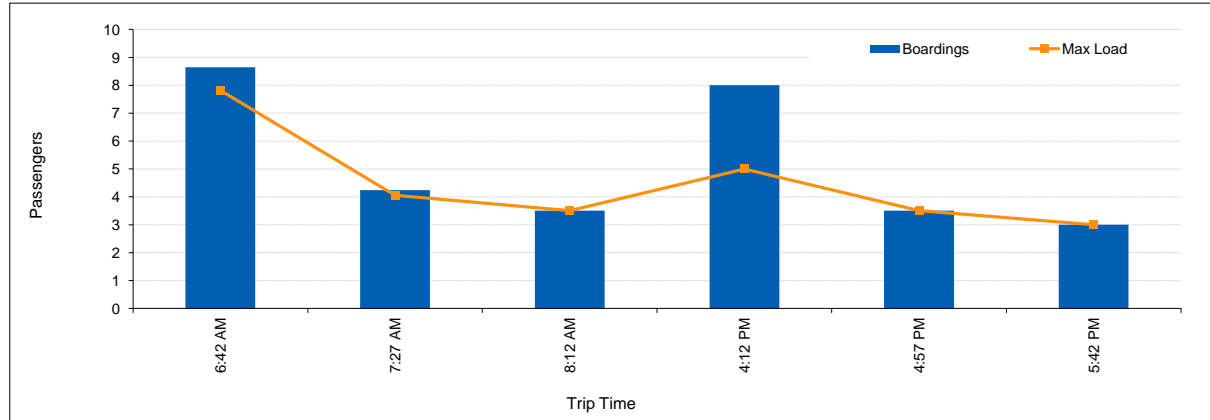


Weekday Boardings and Alightings by Stop - Westbound

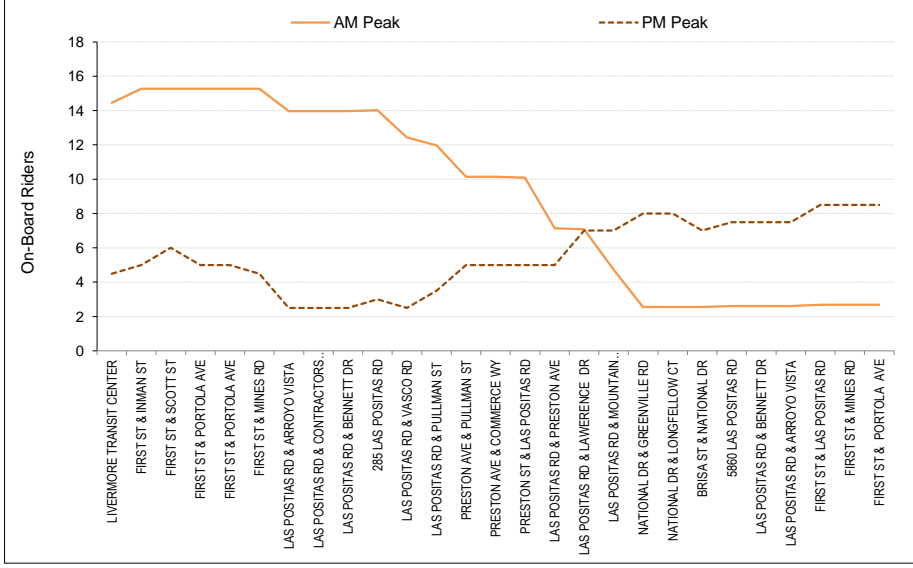


Route 11 Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
Total		31	31	3.6	8.6	74%	5%	21%	21	FIRST ST & SCOTT ST &	L
By Segment											
1	LIVERMORE TRANSIT CENTER 0 to LAS POSTIAS RD & ARROYO VISTA 0	21	13	0.5	42.6						
2	LAS POSTIAS RD & ARROYO VISTA 0 to LAS POSITAS RD & VASCO RD 0	1	3	0.4	1.5						
3	LAS POSITAS RD & VASCO RD 0 to NATIONAL DR & GREENVILLE RD 0	6	12	0.8	7.8						
4	NATIONAL DR & GREENVILLE RD 0 to FIRST ST & LAS POSITAS RD 0	2	3	1.0	1.6						
5	FIRST ST & LAS POSITAS RD 0 to FIRST ST & PORTOLA AVE 0	1		0.9	1.2						
By Time Period											
AM		16	16	1.8	9.1				15	FIRST ST & INMAN ST &	L
PM		15	15	1.8	8.1				9	FIRST ST & LAS POSITAS RD &	L

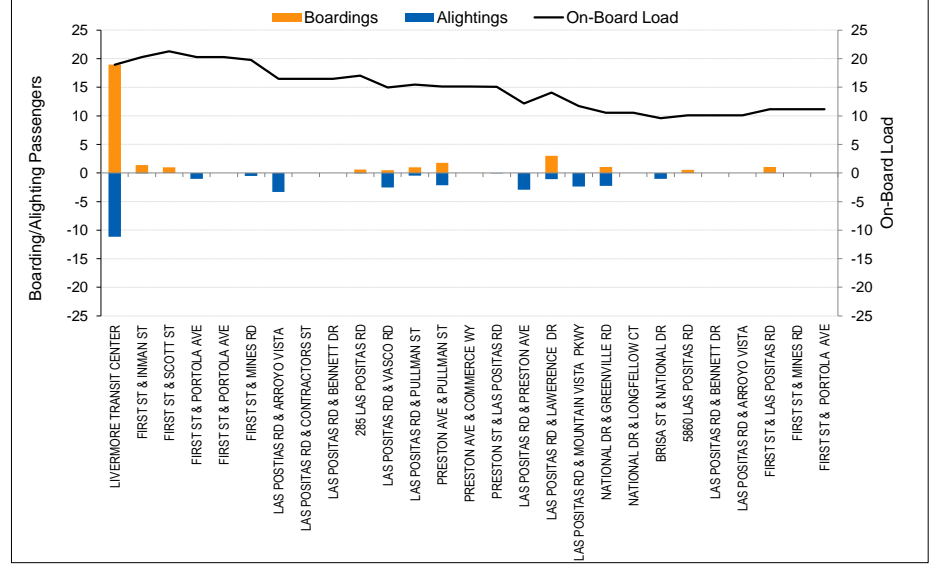
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop

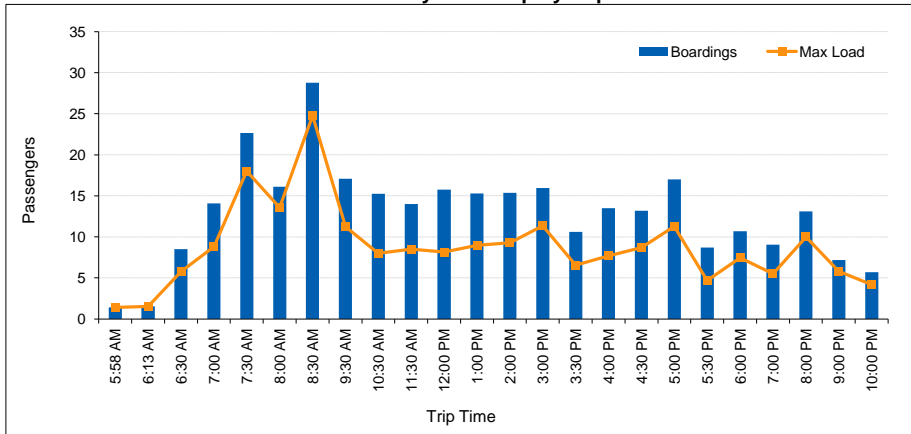


Weekday Boardings and Alightings by Stop - Loop

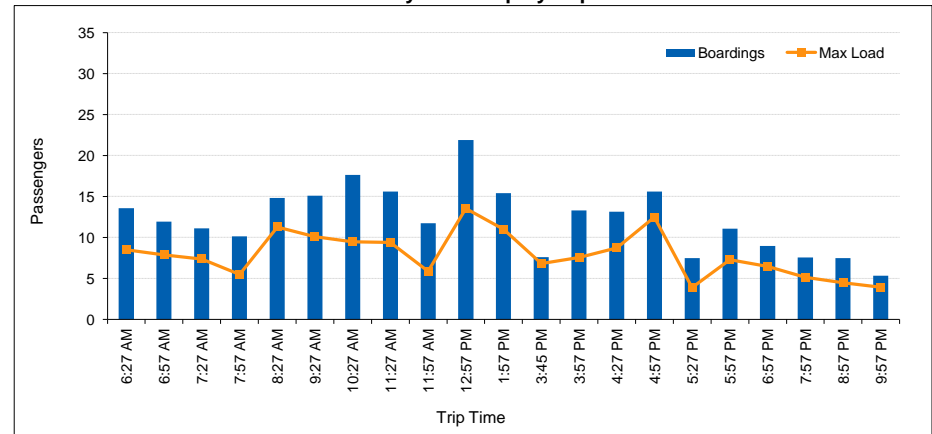


Route 12 Weekday	Route Productivity Summary				Route Operations Summary					
	Activity	Service	Productivity	On-Time Performance			On-Board Load			
	Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
	Total	567	532	30.5	18.6	78%	1%	21%	166	NORTH CANYON PLWY & CONSTIT
Eastbound	310	275	16.0	19.4				166	NORTH CANYON PLWY & CONSTIT	E
Westbound	256	256	14.5	17.7				131	DUBLIN BLVD & GRAFTON ST &	W
By Segment										
1 EAST DUBLIN BART STATION 0 to DUBLIN BLVD & FALLON GATEWAY 0	219	181	6.8	32.2						
2 DUBLIN BLVD & FALLON GATEWAY 0 to LAS POSITAS COLLEGE 0	115	101	7.5	15.3						
3 LAS POSITAS COLLEGE 0 to AIRWAY BLVD PARK & RIDE 0	69	89	6.4	10.6						
4 AIRWAY BLVD PARK & RIDE 0 to STANLEY BLVD & VALLEY MEMORIAL HOSPITAL 0	70	55	6.0	11.7						
5 STANLEY BLVD & VALLEY MEMORIAL HOSPITAL 0 to LIVERMORE TRANSIT CENTER 0	94	106	3.8	24.9						
By Time Period										
AM	155	145	7.5	20.7				70	DUBLIN BLVD & KEEGAN EB &	E
Midday	190	180	8.4	22.6				51	NORTH CANYON PKWY & TRIAD D	W
PM	136	131	7.6	17.8				49	RUTAN DR & SONIC AVE &	E
Eve	60	50	4.2	14.4				22	DUBLIN BLVD & JOHN MONEGO C1	E
Night	26	26	2.8	9				10	LAS POSITAS COLLEGE &	E

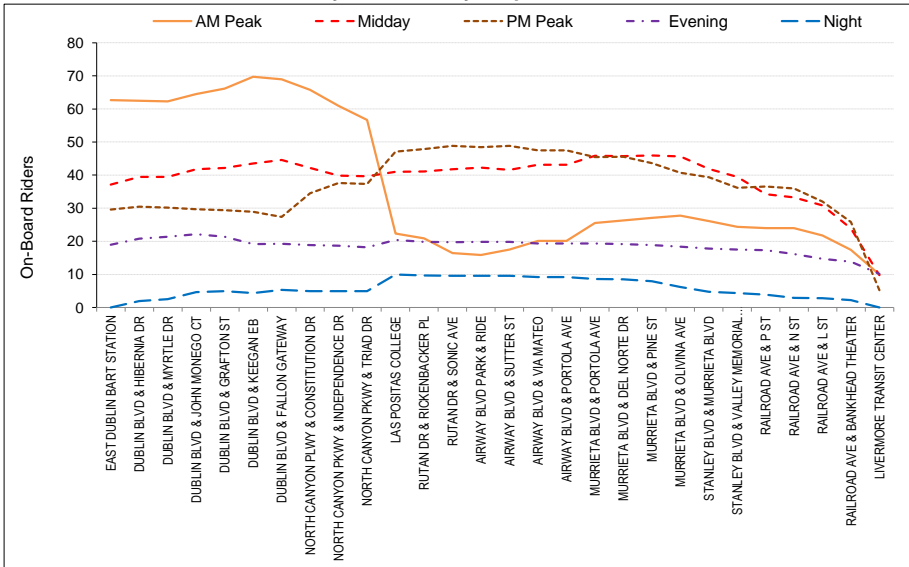
Weekday Ridership by Trip - Eastbound



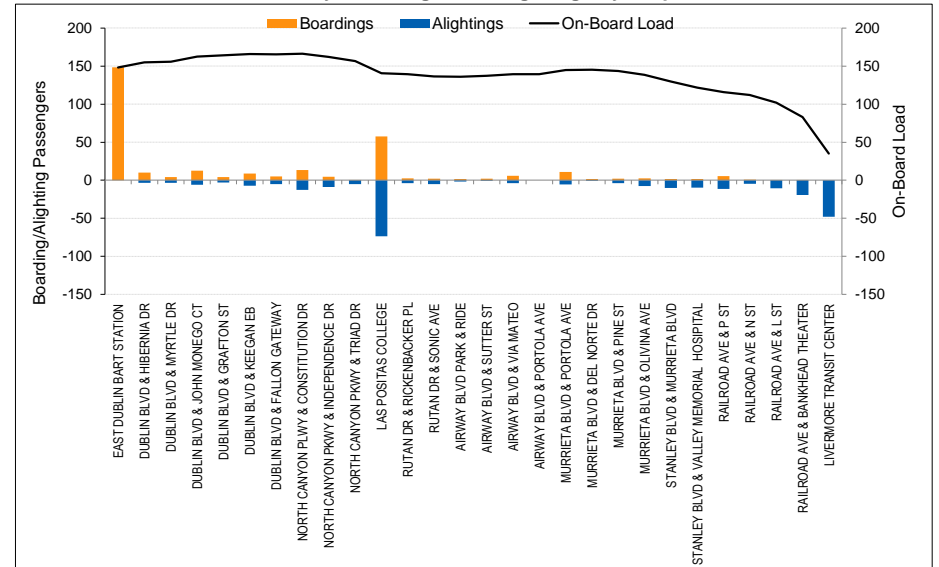
Weekday Ridership by Trip - Westbound



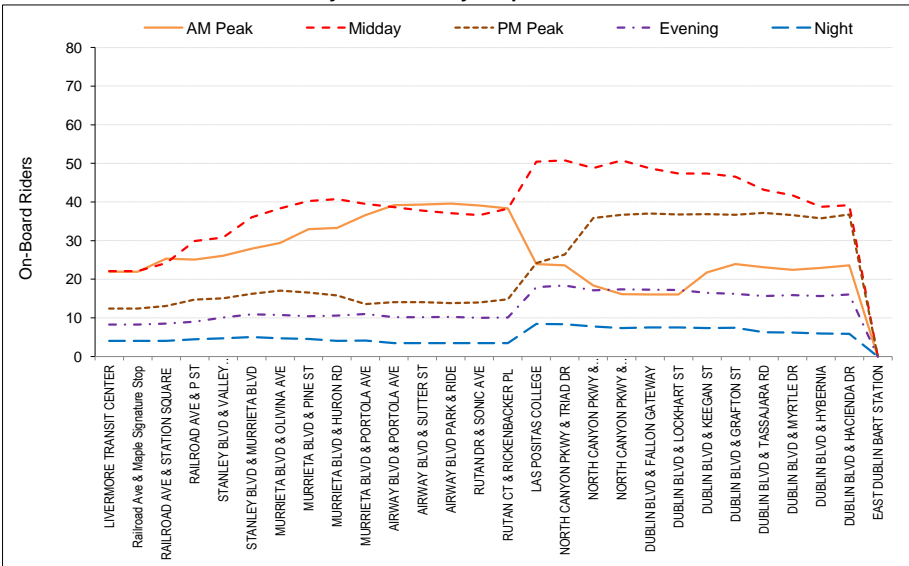
Weekday On-Board by Stop and Time Period - Eastbound



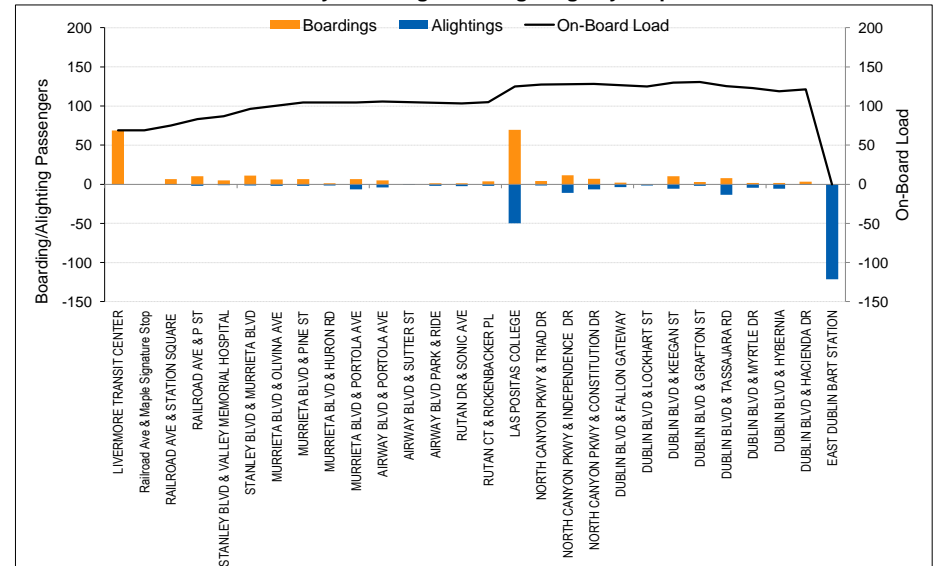
Weekday Boardings and Alightings by Stop - Eastbound




Weekday On-Board by Stop and Time Period - Westbound

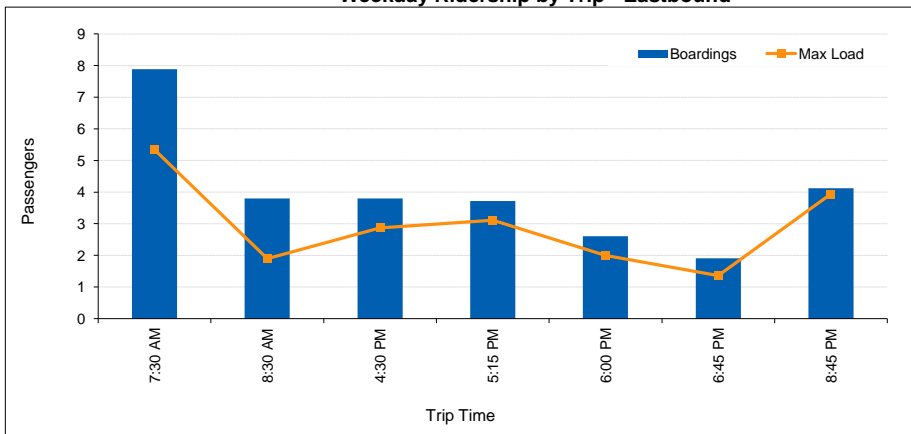


Weekday Boardings and Alightings by Stop - Westbound

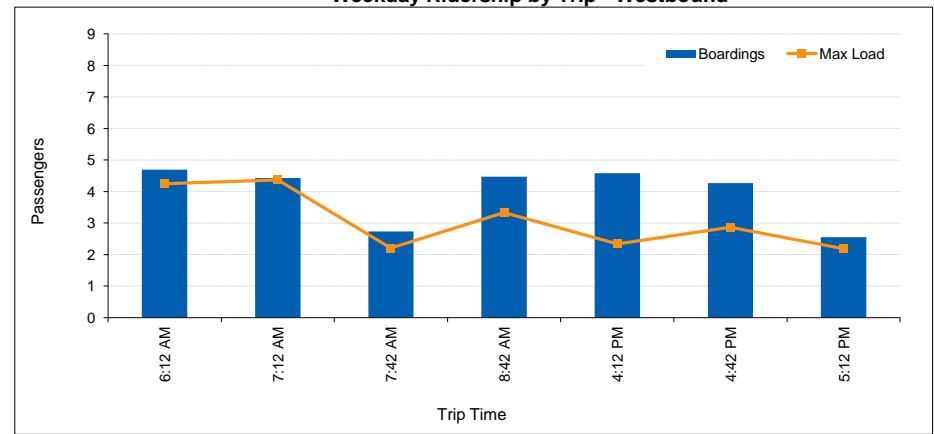


Route 12X Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		56	56	7.2	7.7	63%	0%	36%	21
Eastbound		28	28	3.7	7.5				17	KITTYHAWK RD & FORD DEALER &	E
Westbound		28	28	3.5	7.9				21	RUTAN CT & RICKENBACKER PL &	W
By Segment											
1	EAST DUBLIN BART STATION 0 to KITTYHAWK RD & ARMSTRONG ST 0	21	28	2.6	8.1						
2	KITTYHAWK RD & ARMSTRONG ST 0 to AIRWAY BLVD PARK & RIDE 0	6	5	1.4	4.6						
3	AIRWAY BLVD PARK & RIDE 0 to STANLEY BLVD & VALLEY MEMORIAL HOSPITAL 0	17	9	2.0	8.4						
4	STANLEY BLVD & VALLEY MEMORIAL HOSPITAL 0 to LIVERMORE TRANSIT CENTER 0	12	15	1.3	9.2						
By Time Period											
AM		28	28	3.1	8.9				14	AIRWAY BLVD PARK & RIDE &	W
PM		19	20	2.6	7.3				7	RUTAN CT & RICKENBACKER PL &	W
Eve		5	5	1.0	4.5				3	KITTYHAWK RD & FORD DEALER &	E
Night		4	4	0.5	8				4	KITTYHAWK ST NISSEN DR &	E

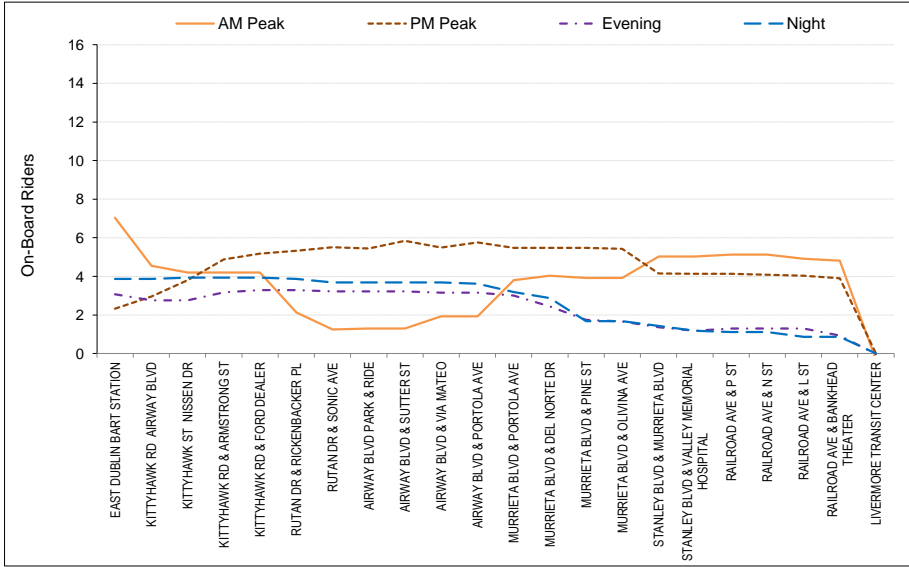
Weekday Ridership by Trip - Eastbound



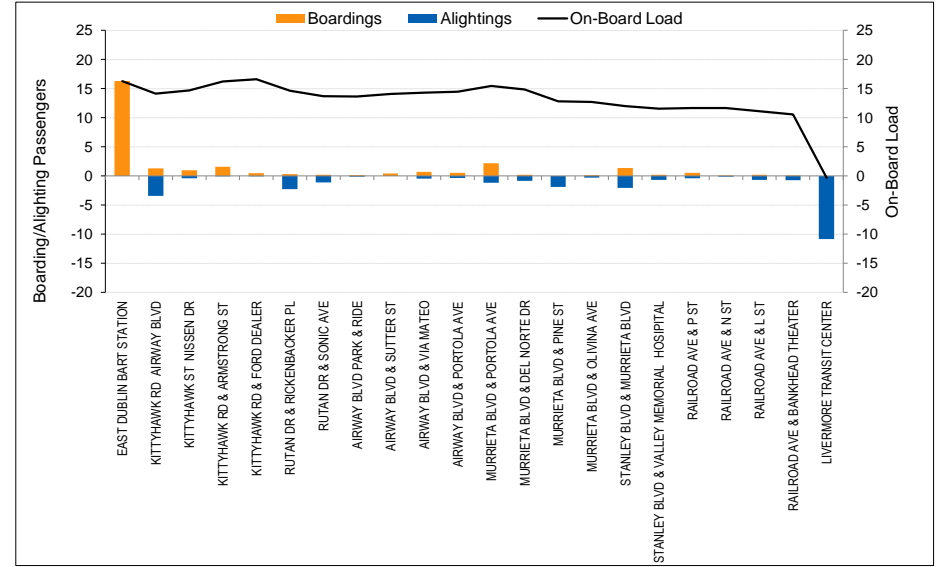
Weekday Ridership by Trip - Westbound



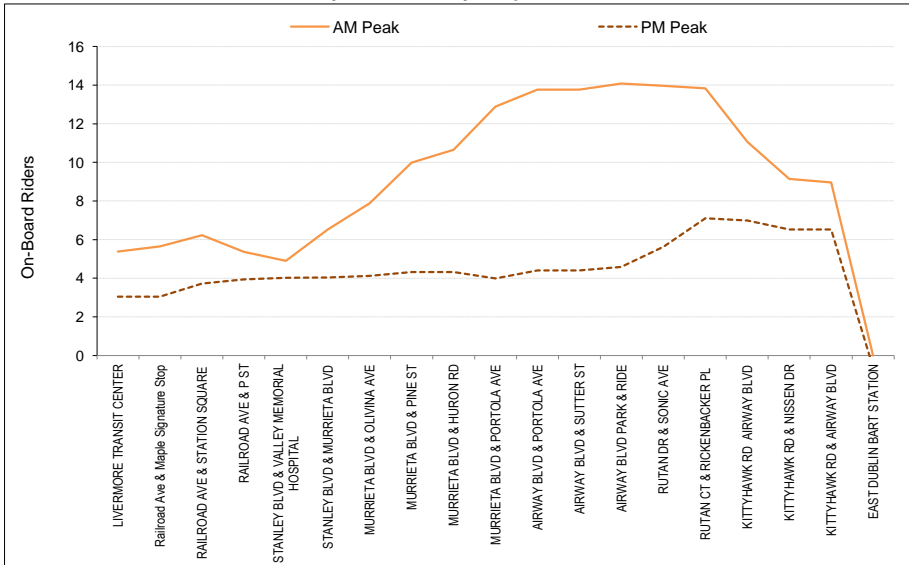
Weekday On-Board by Stop and Time Period - Eastbound



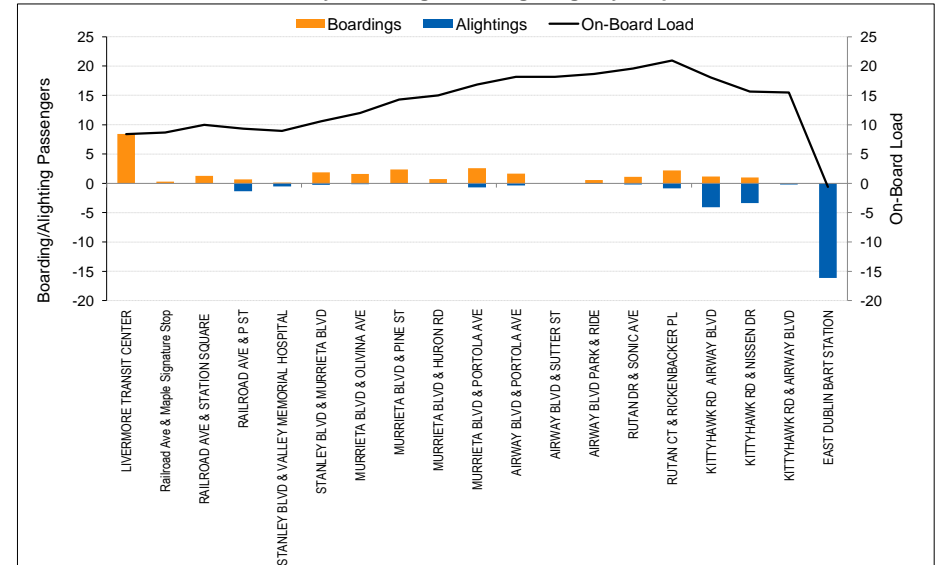
Weekday Boardings and Alightings by Stop - Eastbound




Weekday On-Board by Stop and Time Period - Westbound

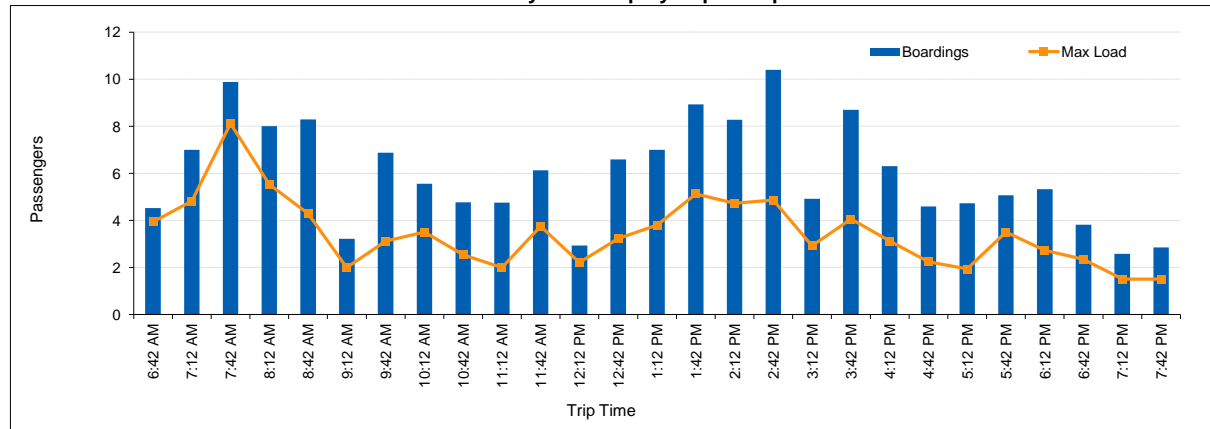


Weekday Boardings and Alightings by Stop - Westbound

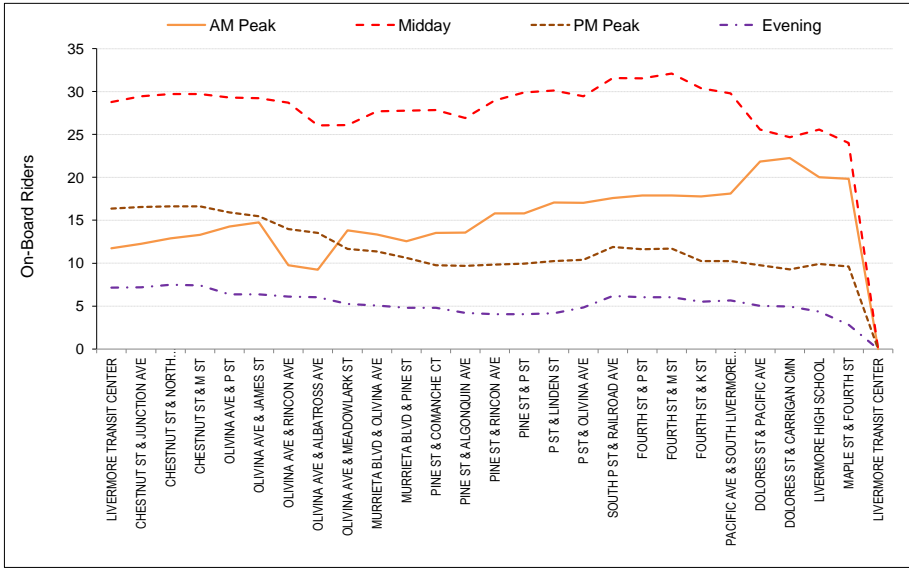


Route 14 Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		162	162	10.5	15.4	76%	3%	21%	68
Loop		162	162	10.5	15.4				68	FOURTH ST & M ST &	L
By Segment											
1	LIVERMORE TRANSIT CENTER 0 to MURRIETA BLVD & OLIVINA AVE 0	89	32	2.7	32.8						
2	MURRIETA BLVD & OLIVINA AVE 0 to PINE ST & P ST 0	18	16	1.4	13.6						
3	PINE ST & P ST 0 to FOURTH ST & P ST 0	22	14	1.8	12.4						
4	FOURTH ST & P ST 0 to PACIFIC AVE & SOUTH LIVERMORE AVE 0	3	6	1.5	1.7						
5	PACIFIC AVE & SOUTH LIVERMORE AVE 0 to LIVERMORE HIGH SCHOOL 0	26	29	1.2	22.6						
6	LIVERMORE HIGH SCHOOL 0 to LIVERMORE TRANSIT CENTER 0	4	65	1.5	2.8						
By Time Period											
AM		38	38	2.0	18.9				22	DOLORES ST & CARRIGAN CMN &	L
Midday		75	75	4.7	16.2				32	FOURTH ST & M ST &	L
PM		34	34	2.3	14.7				17	CHESTNUT ST & NORTH LIVERMO	L
Eve		15	15	1.5	9.5				7	CHESTNUT ST & NORTH LIVERMO	L

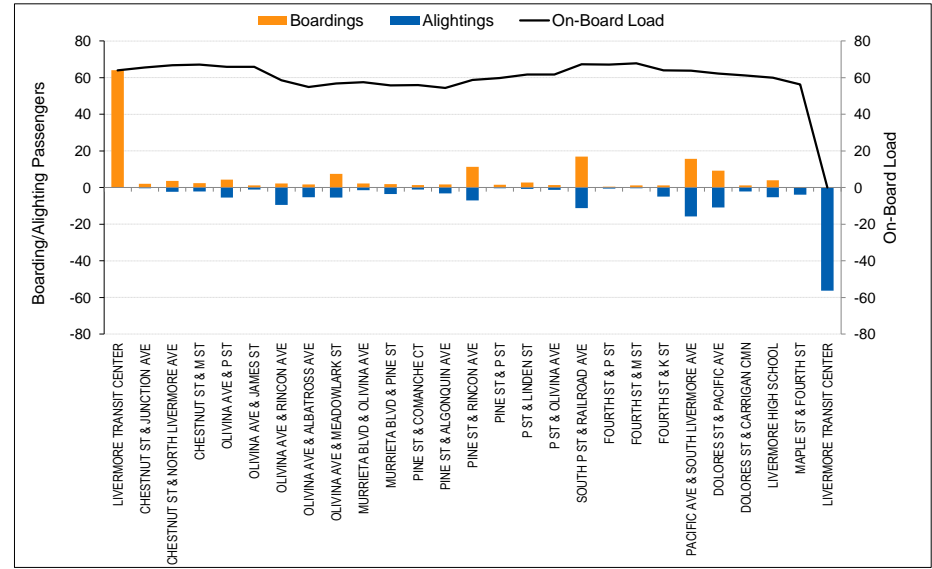
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop

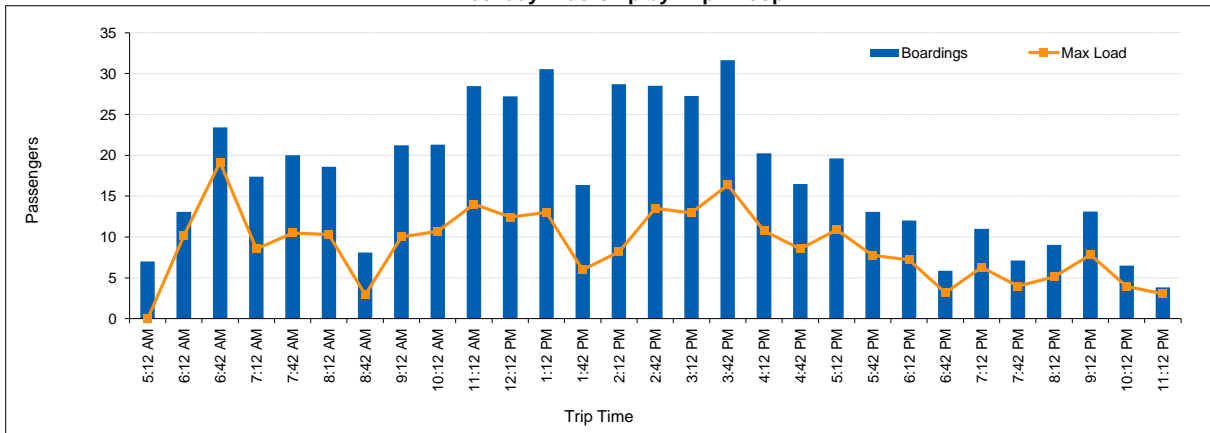


Weekday Boardings and Alightings by Stop - Loop

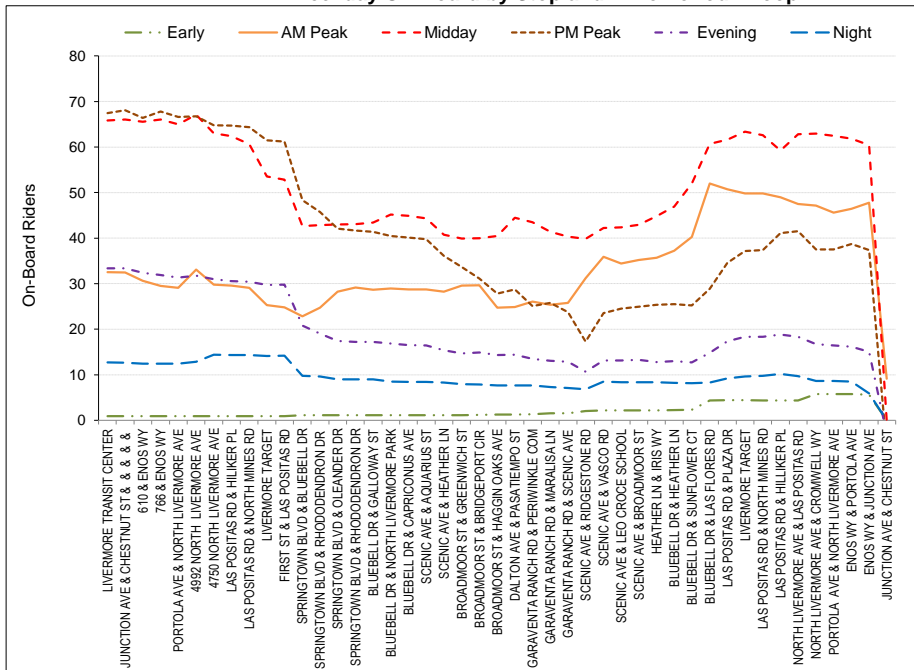


Route 15 Weekday				Route Productivity Summary				Route Operations Summary					
				Activity		Service	Productivity	On-Time Performance			On-Board Load		
				Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
Total				507	507	22.7	22.3	75%	3%	22%	213	JUNCTION AVE & CHESTNUT ST &	L
Loop				507	507	22.7	22.3				213	JUNCTION AVE & CHESTNUT ST &	L
By Segment													
1	LIVERMORE TRANSIT CENTER 0 to LAS POSITAS RD & HILIKER PL 0			253	50	3.4	74.9						
2	LAS POSITAS RD & HILIKER PL 0 to BLUEBELL DR & GALLOWAY ST 0			27	90	4.0	6.8						
3	BLUEBELL DR & GALLOWAY ST 0 to DALTON AVE & PASATIEMPO ST 0			11	36	3.0	3.8						
4	DALTON AVE & PASATIEMPO ST 0 to BLUEBELL DR & LAS FLORES RD 0			89	64	5.5	16.2						
5	BLUEBELL DR & LAS FLORES RD 0 to LAS POSITAS RD & HILIKER PL 0			68	26	2.9	23.5						
6	LAS POSITAS RD & HILIKER PL 0 to JUNCTION AVE & CHESTNUT ST 0			58	240	3.9	14.9						
By Time Period													
Early AM				7	7	0.8	9.1				6		L
AM				92	83	3.8	24.1				52	BLUEBELL DR & LAS FLORES RD &	L
Midday				182	182	6.2	29.4				67	4992 NORTH LIVERMORE AVE &	L
PM				144	150	4.9	29.3				68	JUNCTION AVE & CHESTNUT ST &	L
Eve				58	61	4.7	12.4				33	LIVERMORE TRANSIT CENTER &	L
Night				23	23	2.3	10				14	4750 NORTH LIVERMORE AVE &	L

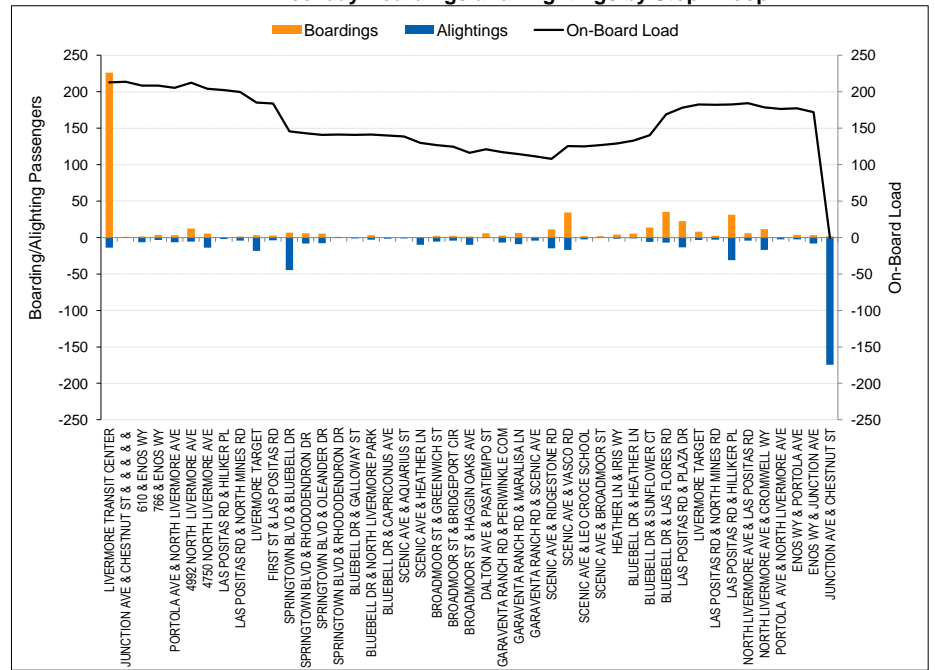
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop

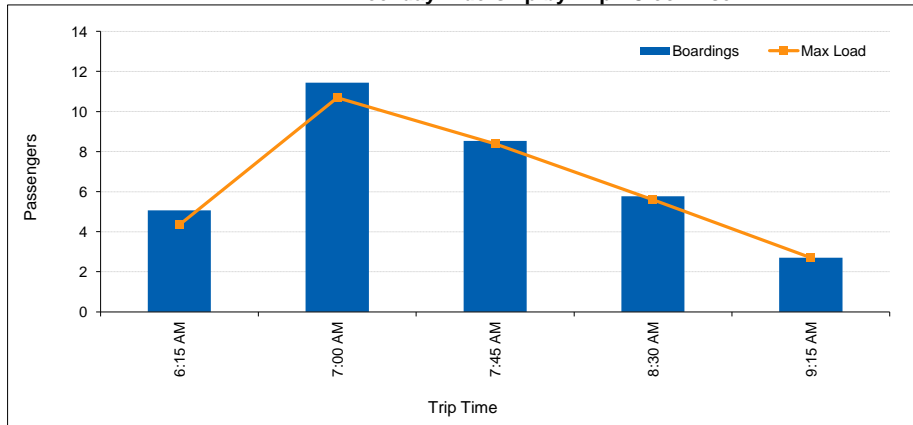


Weekday Boardings and Alightings by Stop - Loop

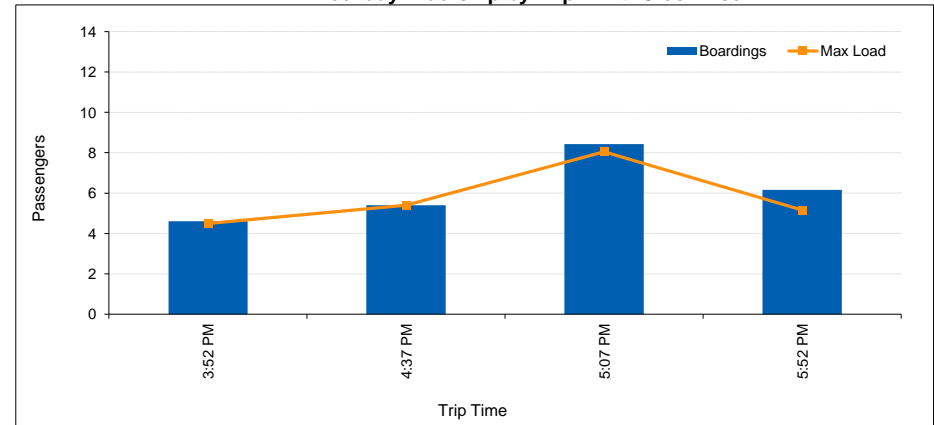


Route 20X Weekday					Route Productivity Summary				Route Operations Summary					
					Activity		Service	Productivity	On-Time Performance			On-Board Load		
					Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
					Total					58	58	5.2	11.1	82%
Clockwise					34	34	2.8	11.9				32	EAST DUBLIN BART STATION &	C
Anti-Clockwise					25	24	2.4	10.1				23	LAS POSITAS RD & MOUNTAIN VIS	A
By Segment														
1	EAST DUBLIN BART STATION 0 to LAS POSITAS RD & MOUNTAIN VISTA PKWY 0				32	24	2.8	11.6						
2	LAS POSITAS RD & MOUNTAIN VISTA PKWY 0 to VASCO RD & BRISA ST 0				10	12	0.7	13.1						
3	VASCO RD & BRISA ST 0 to EAST AVE & SOUTH VASCO RD 0				4	12	0.6	6.3						
4	EAST AVE & SOUTH VASCO RD 0 to FIRST ST & MINES RD 0				10	8	0.6	16.9						
5	FIRST ST & MINES RD 0 to LIVERMORE TRANSIT CENTER 0				2	2	0.5	4.3						
By Time Period														
AM					31	31	2.4	12.9				29	EAST DUBLIN BART STATION &	C
Midday					3	3	0.4	6.2				3	EAST DUBLIN BART STATION &	C
PM					18	18	1.7	10.8				18	LAS POSITAS RD & MOUNTAIN VIS	A
Eve					6	6	0.7	8.4				5	LAS POSITAS RD & VASCO RD &	A

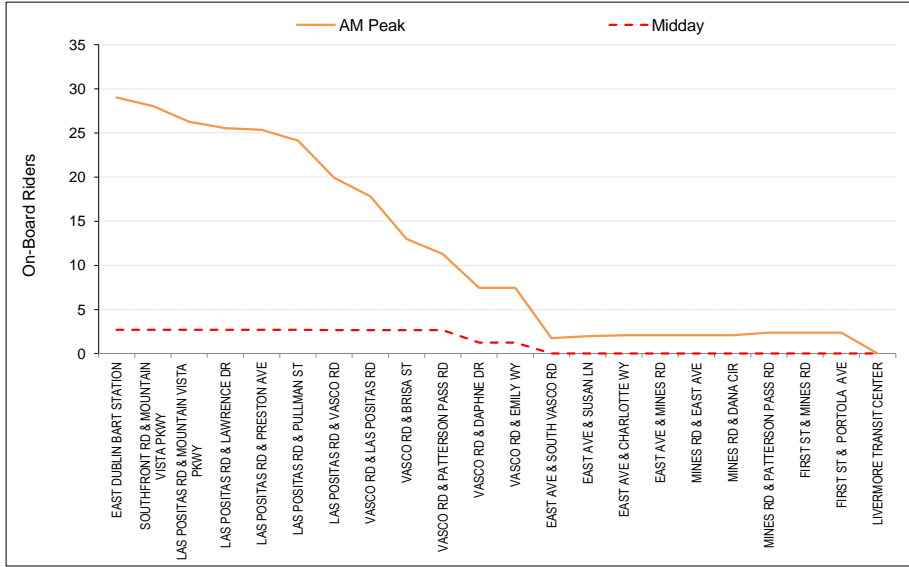
Weekday Ridership by Trip - Clockwise



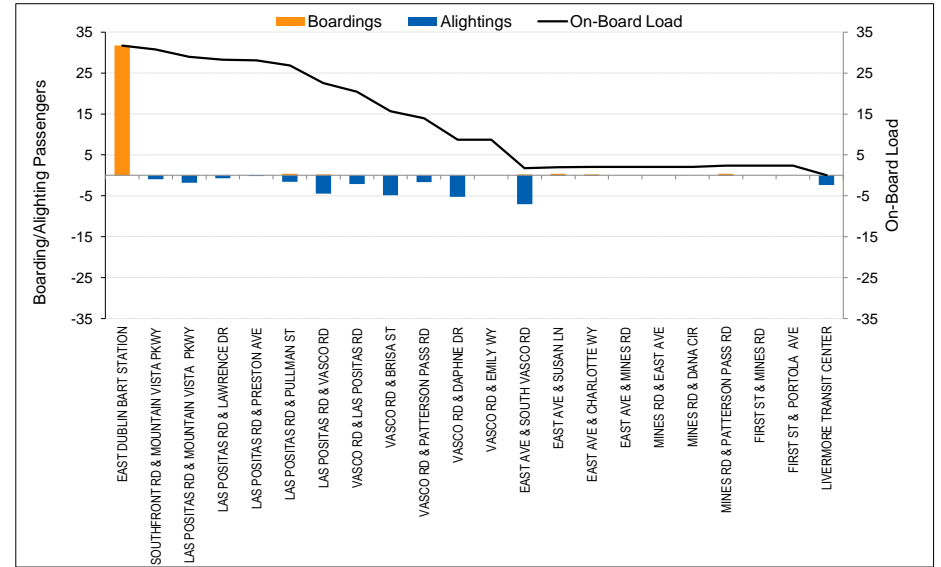
Weekday Ridership by Trip - Anti-Clockwise



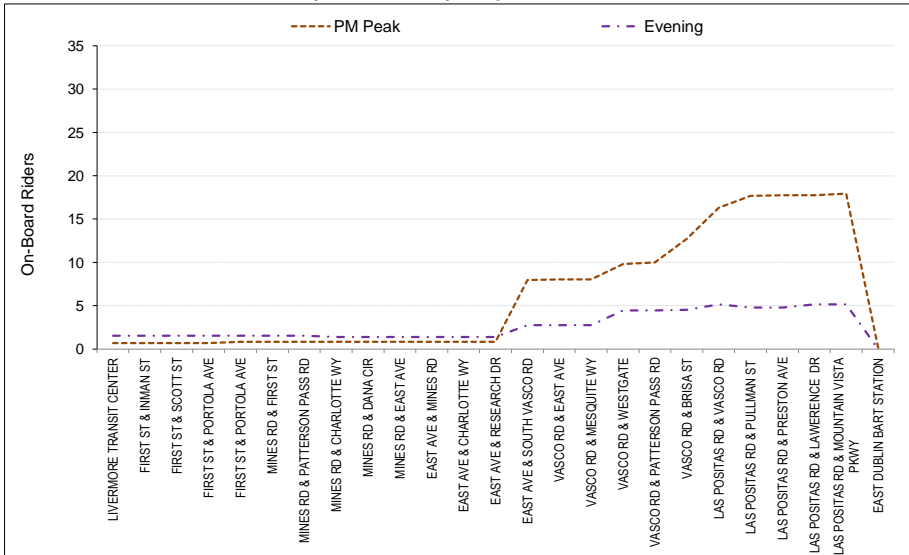
Weekday On-Board by Stop and Time Period - Clockwise



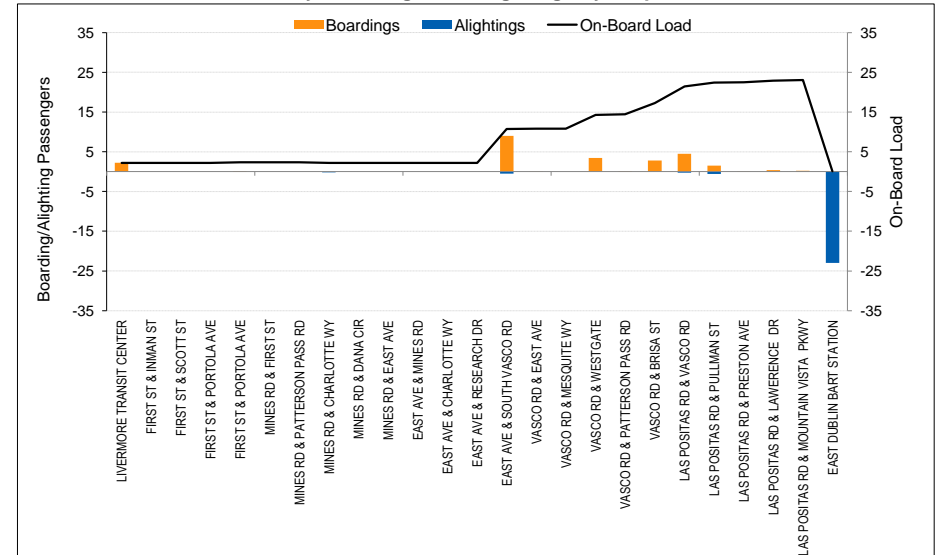
Weekday Boardings and Alightings by Stop - Clockwise




Weekday On-Board by Stop and Time Period - Anti-Clockwise

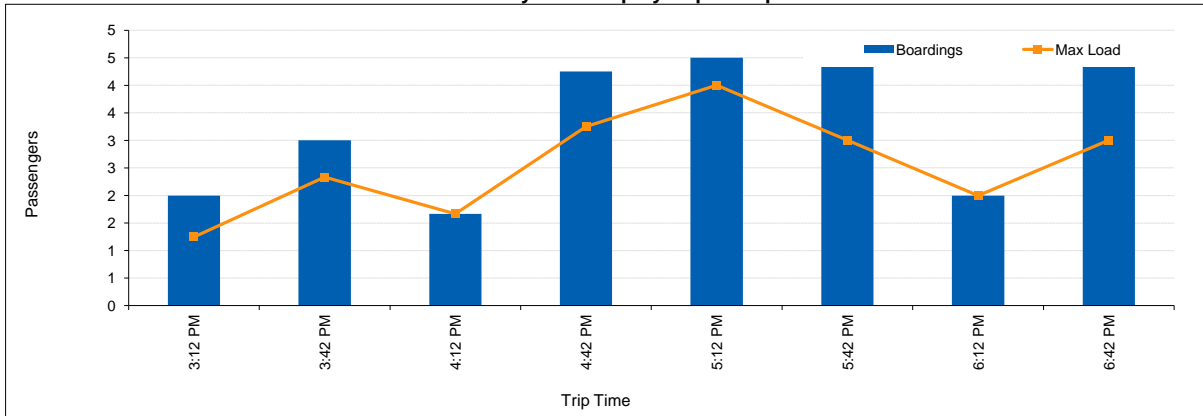


Weekday Boardings and Alightings by Stop - Anti-Clockwise

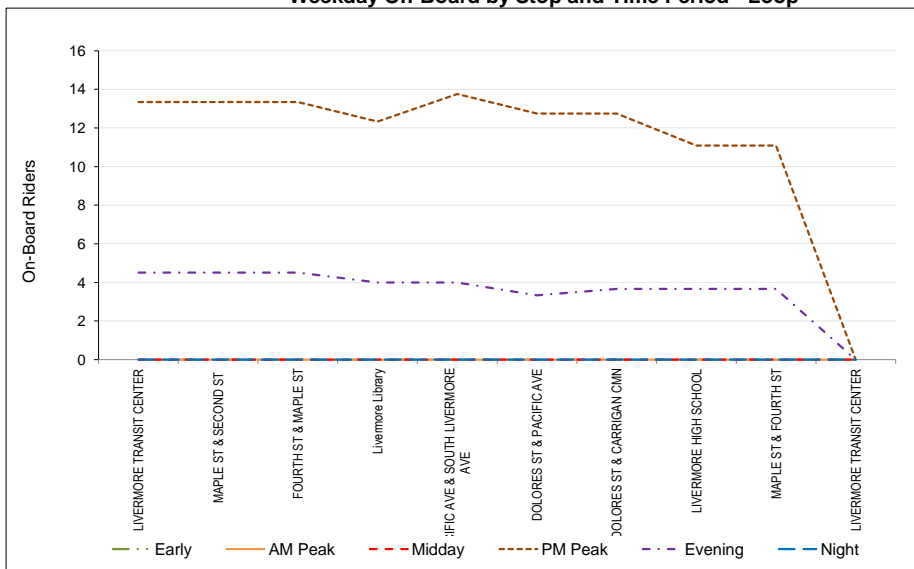


Route 51 Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		26	26	2.0	13.0	98%	0%	2%	18
Loop		26	26	2.0	13.0				18	LIVERMORE TRANSIT CENTER &	L
By Segment											
1	LIVERMORE TRANSIT CENTER 0 to Livermore Library 0	18		0.9	19.1						
2	Livermore Library 0 to LIVERMORE HIGH SCHOOL 0	8	10	0.7	12.4						
3	LIVERMORE HIGH SCHOOL 0 to LIVERMORE TRANSIT CENTER 0		16	0.4							
By Time Period											
	PM	20	20	1.5	13.2				14	PACIFIC AVE & SOUTH LIVERMORE	L
	Eve	6	6	0.5	12.7				5	LIVERMORE TRANSIT CENTER &	L

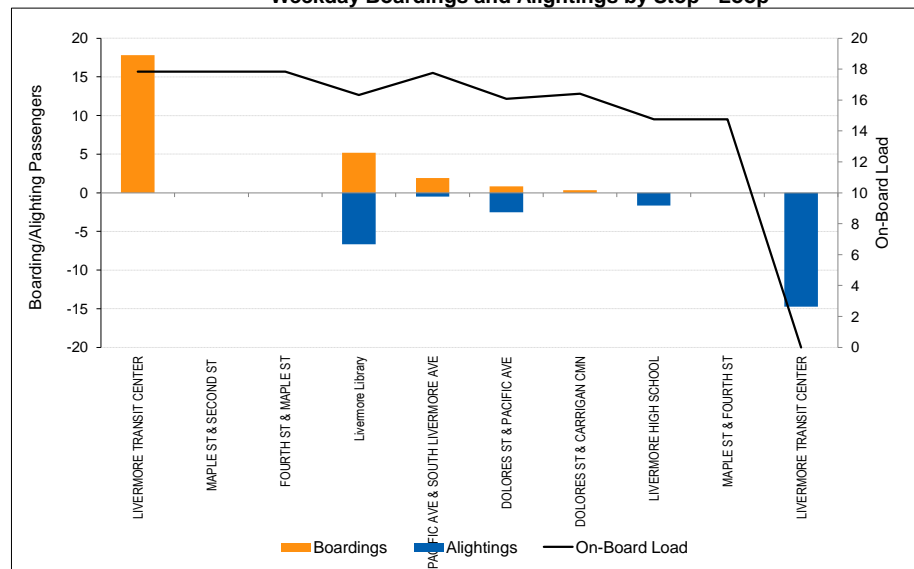
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop

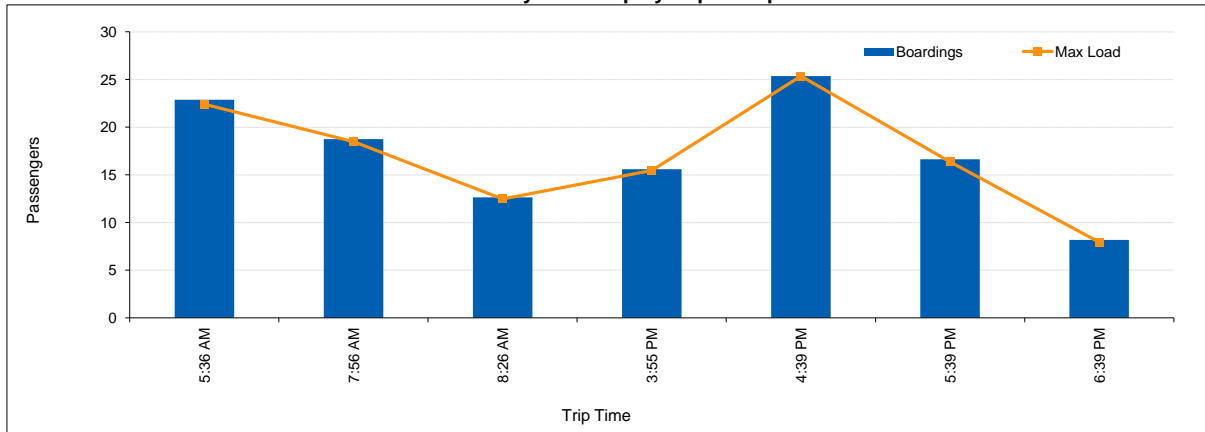


Weekday Boardings and Alightings by Stop - Loop

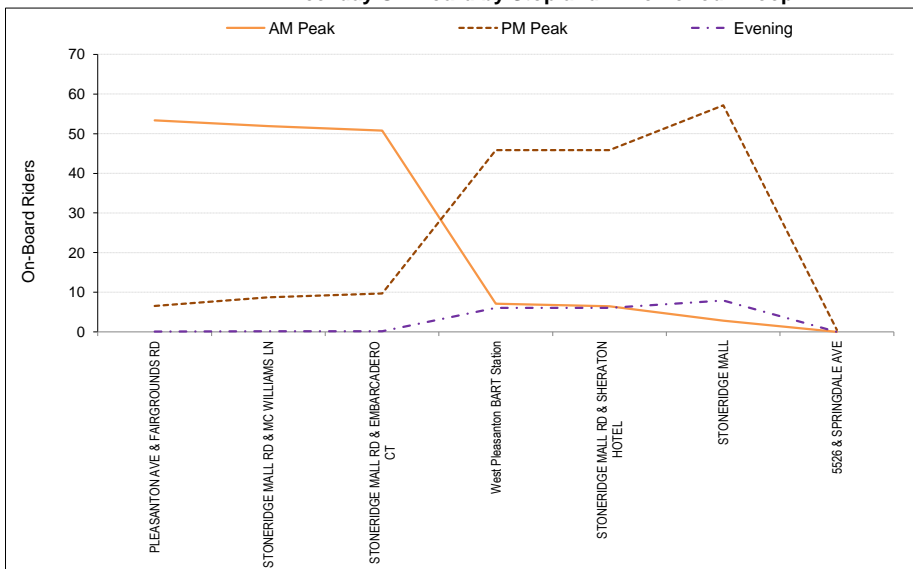


Route 53 Weekday				Route Productivity Summary				Route Operations Summary						
				Activity		Service	Productivity		On-Time Performance			On-Board Load		
				Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location		Direction
Total				120	120	3.7	32.3	92%	3%	5%	68	STONERIDGE MALL &	L	
By Segment														
1	PLEASANTON AVE & FAIRGROUNDS RD 0 to STONERIDGE MALL RD & MC WILLIAMS LN 0			60		1.3	47.4							
2	STONERIDGE MALL RD & MC WILLIAMS LN 0 to West Pleasanton BART Station 0			3	3	0.2	13.7							
3	West Pleasanton BART Station 0 to STONERIDGE MALL 0			43	45	0.8	52.3							
4	STONERIDGE MALL 0 to 5526 & SPRINGDALE AVE 0			14	72	1.4	10.0							
By Time Period														
AM				54	54	1.5	35.8				53	PLEASANTON AVE & FAIRGROUND	L	
PM				58	57	1.6	36.4				57	STONERIDGE MALL &	L	
Eve				8	8	0.6	13.2				8	STONERIDGE MALL &	L	

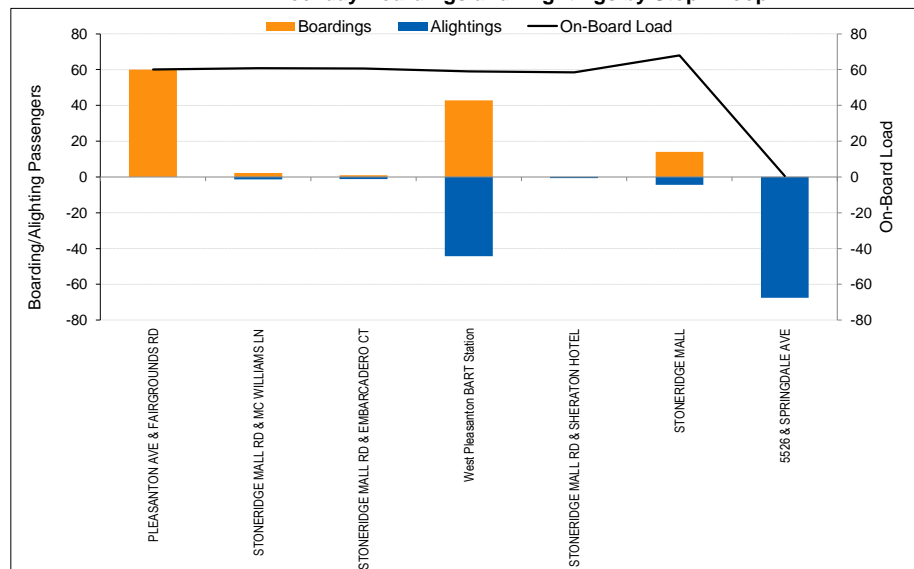
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop



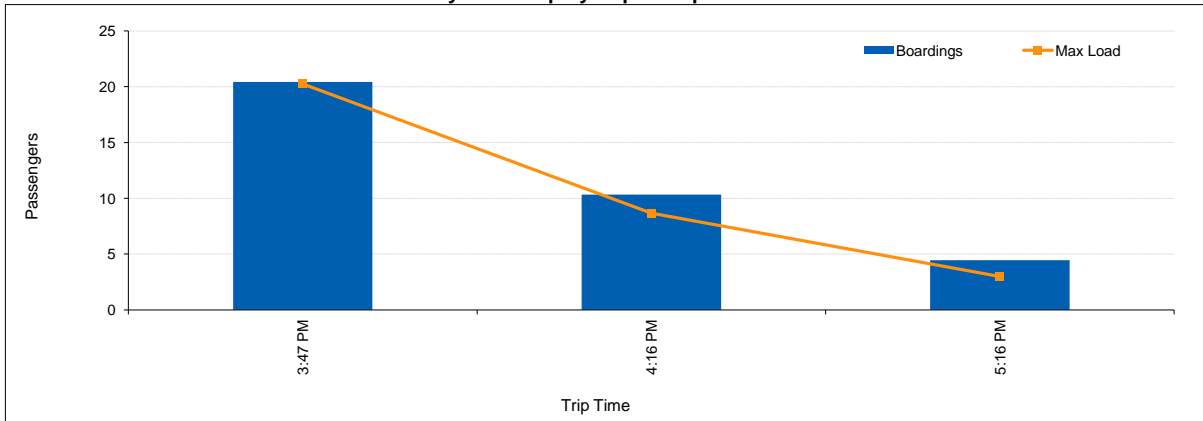
Weekday Boardings and Alightings by Stop - Loop



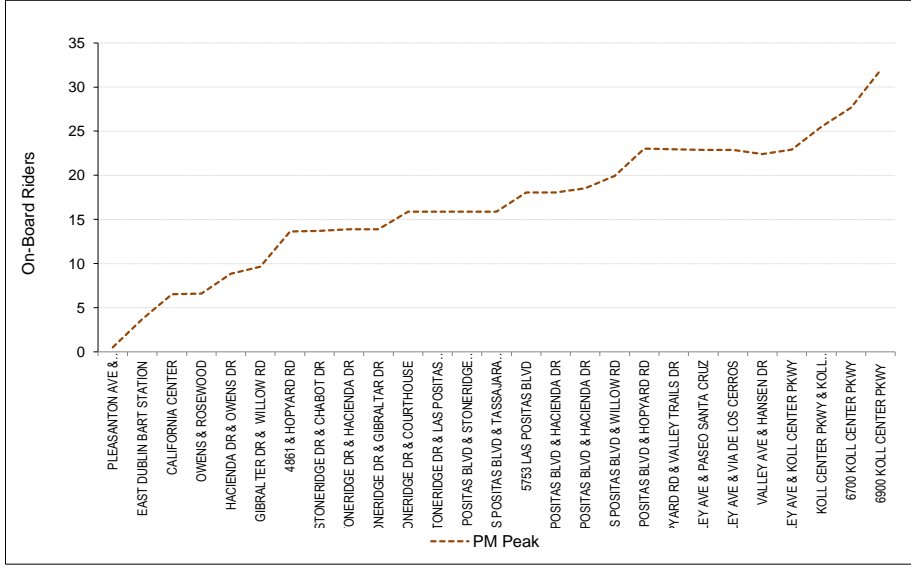
Route 54 Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		35	35	2.5	14.2	70%	11%	18%	32
By Segment											
1	PLEASANTON AVE & FAIRGROUNDS RD 0 to EAST DUBLIN BART STATION 0	1	32	1.0	0.5						
2	EAST DUBLIN BART STATION 0 to CALIFORNIA CENTER 0	6	2	0.1	37.4						
3	CALIFORNIA CENTER 0 to STONERIDGE DR & LAS POSITAS BLVD 0	12	0	0.5	24.5						
4	STONERIDGE DR & LAS POSITAS BLVD 0 to KOLL CENTER PKWY & KOLL CENTER DR 0	8	1	0.4	17.4						
5	KOLL CENTER PKWY & KOLL CENTER DR 0 to 6900 KOLL CENTER PKWY 0	9		0.3	25.8						
By Time Period											
PM		35	35	2.5	14.2				32	6900 KOLL CENTER PKWY &	C

Note: Only includes ridership data for PM trips. Data for AM trips was unavailable.

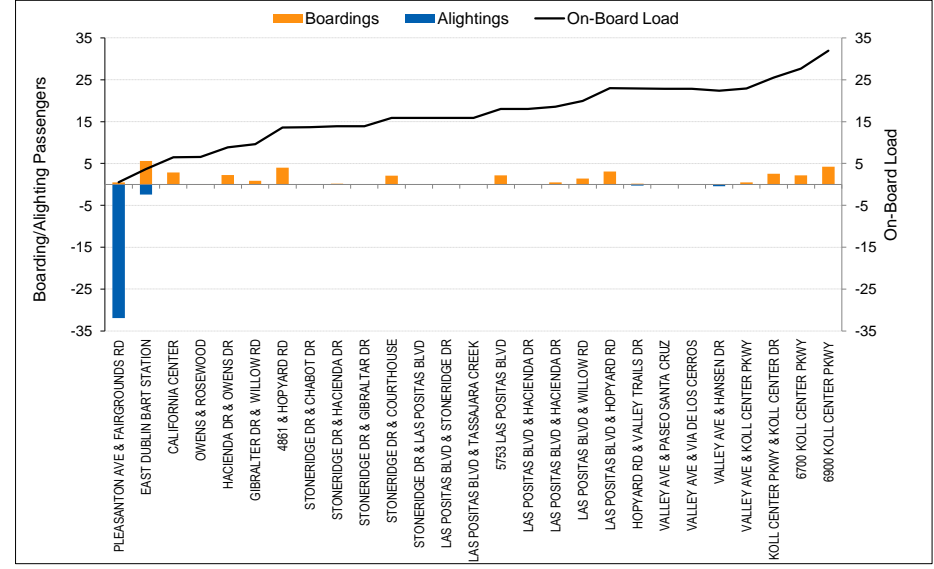
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Clockwise



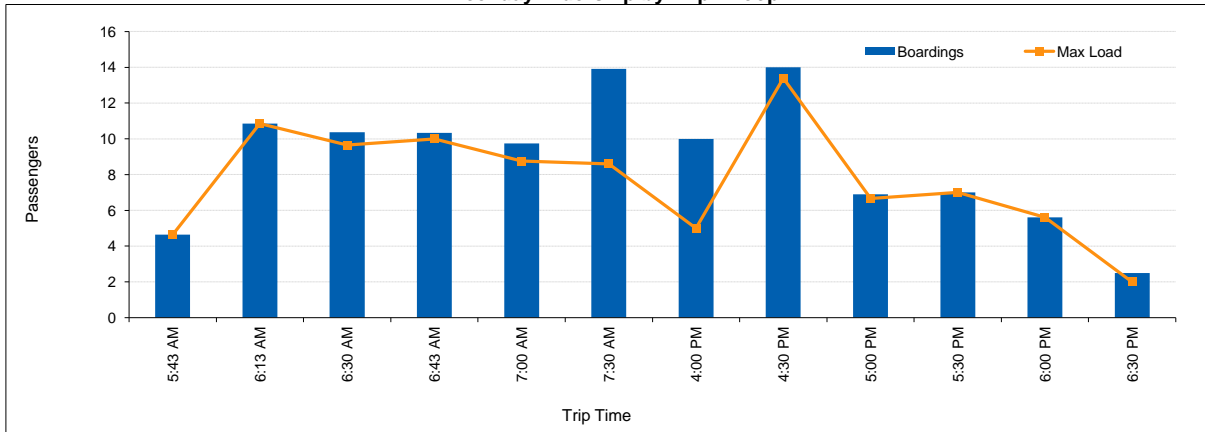
Weekday Boardings and Alightings by Stop - Clockwise



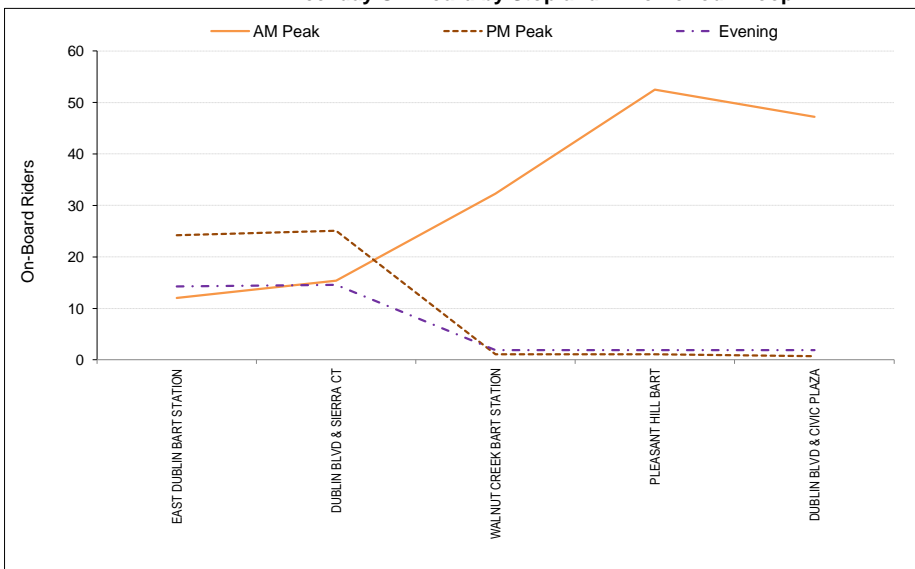
Route 70X Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
		Total		106	73	13.1	8.1	57%	0%	43%	55
By Segment											
1	EAST DUBLIN BART STATION 0 to WALNUT CREEK BART STATION 0	55	17	4.3	13.0						
2	WALNUT CREEK BART STATION 0 to PLEASANT HILL BART 0	30	50	2.2	13.8						
3	PLEASANT HILL BART 0 to DUBLIN BLVD & CIVIC PLAZA 0	21	6	1.7	12.5						
By Time Period											
	AM	60	20	6.1	9.7				52	PLEASANT HILL BART &	L
	PM	31	39	4.2	7.4				25	DUBLIN BLVD & SIERRA CT &	L
	Eve	15	14	2.7	5.5				15	DUBLIN BLVD & SIERRA CT &	L

Note: Ridership data missing for some trips.

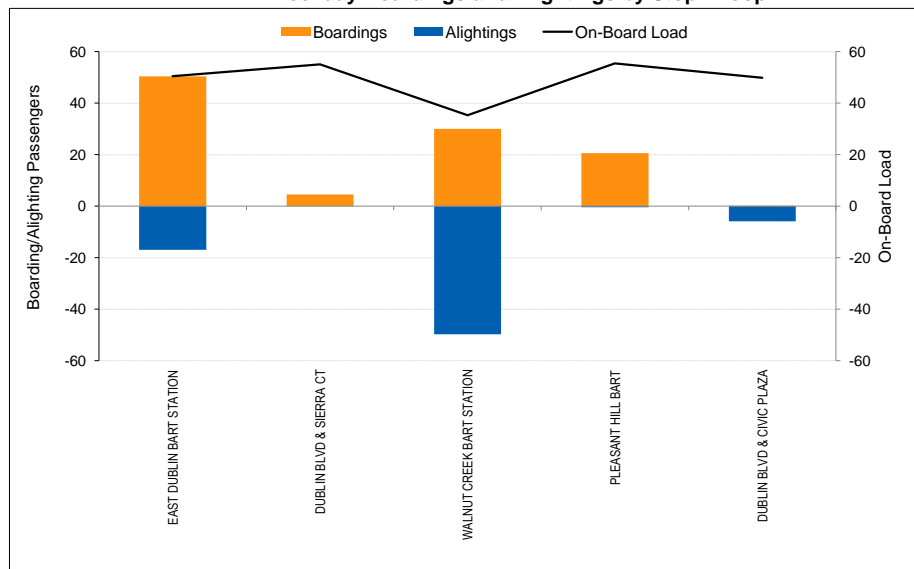
Weekday Ridership by Trip - Loop




Weekday On-Board by Stop and Time Period - Loop

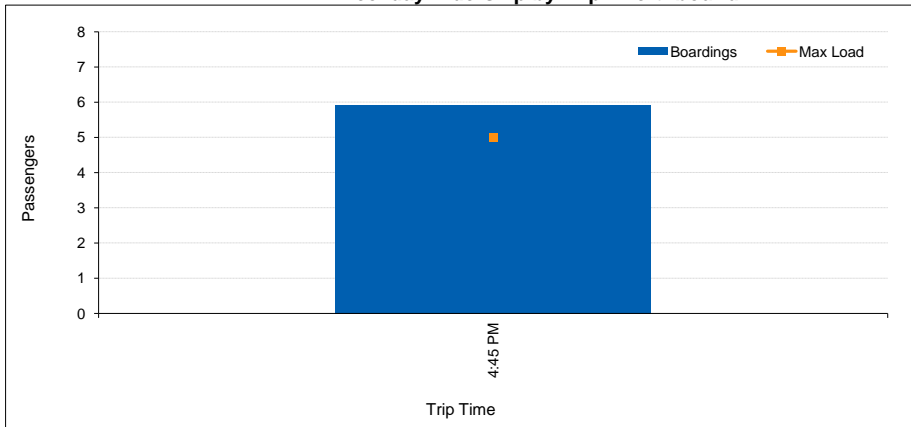


Weekday Boardings and Alightings by Stop - Loop

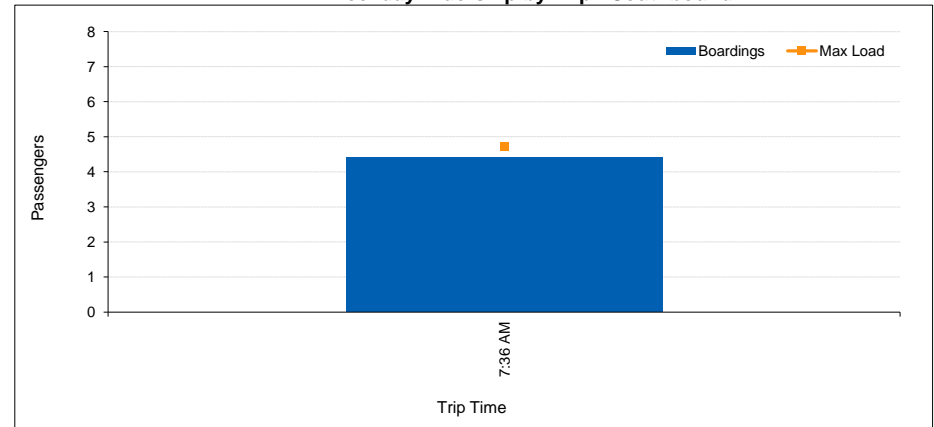


Route 70XV Weekday		Route Productivity Summary				Route Operations Summary					
		Activity		Service	Productivity	On-Time Performance			On-Board Load		
		Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
Total		10	10	2.1	4.8	35%	0%	65%	5	STONERIDGE MALL &	N
Northbound		6	5	1.1	5.2				5	STONERIDGE MALL &	N
Southbound		4	5	1.0	4.4				5	WALNUT CREEK BART STATION &	S
By Segment											
1	EAST DUBLIN BART STATION 0 to STONERIDGE DR & HOPYARD RD 0	1	0	0.2	2.7						
2	STONERIDGE DR & HOPYARD RD 0 to JOHNSON DR & COMMERCE DR 0	0	0	0.2	1.8						
3	JOHNSON DR & COMMERCE DR 0 to STONERIDGE MALL RD & MC WILLIAMS LN 0		1	0.3							
4	STONERIDGE MALL RD & MC WILLIAMS LN 0 to STONERIDGE MALL 0	3	4	0.2	13.8						
5	STONERIDGE MALL 0 to WALNUT CREEK BART STATION 0	4	0	0.9	4.6						
6	WALNUT CREEK BART STATION 0 to PLEASANT HILL BART 0	2	4	0.3	6.3						
By Time Period											
AM		4	5	1.0	4.4				5	WALNUT CREEK BART STATION &	S
PM		6	5	1.1	5.2				5	STONERIDGE MALL &	N

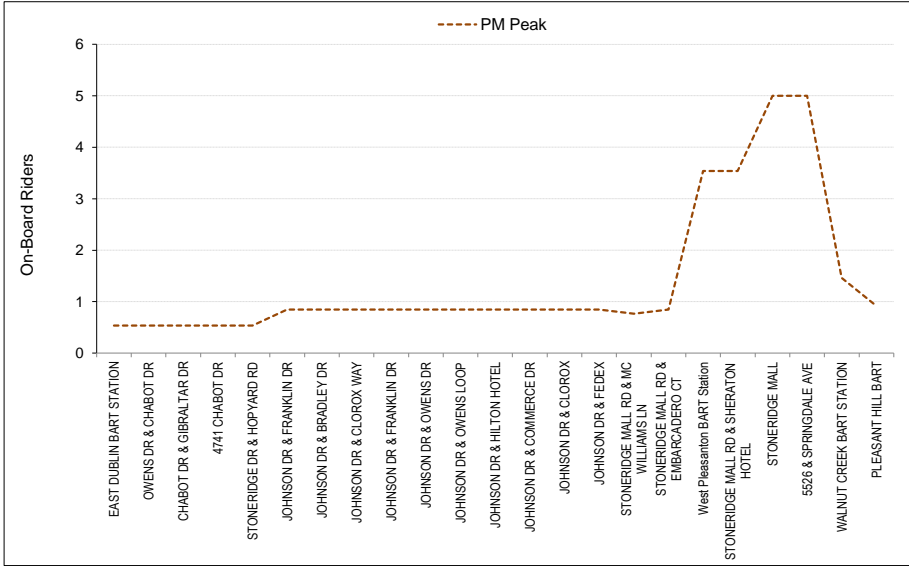
Weekday Ridership by Trip - Northbound



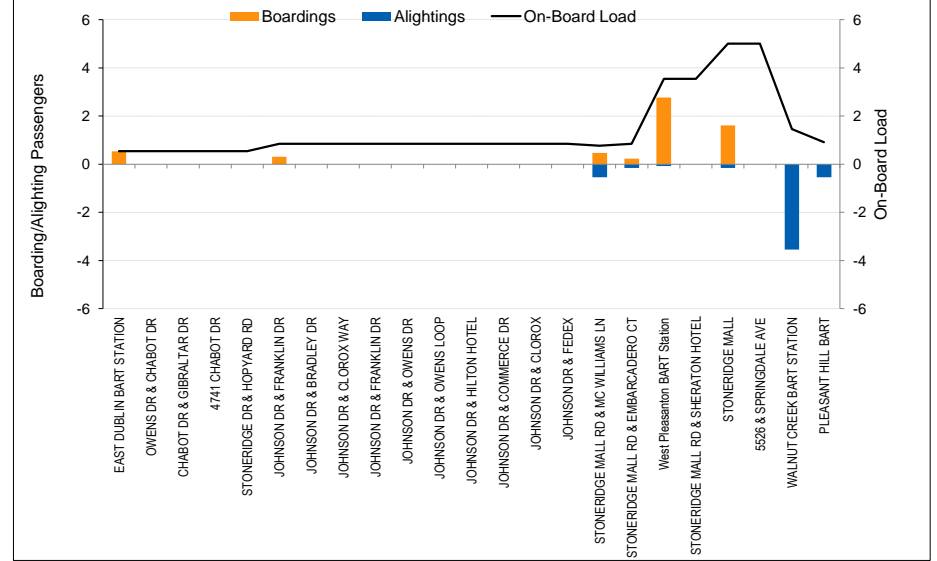
Weekday Ridership by Trip - Southbound



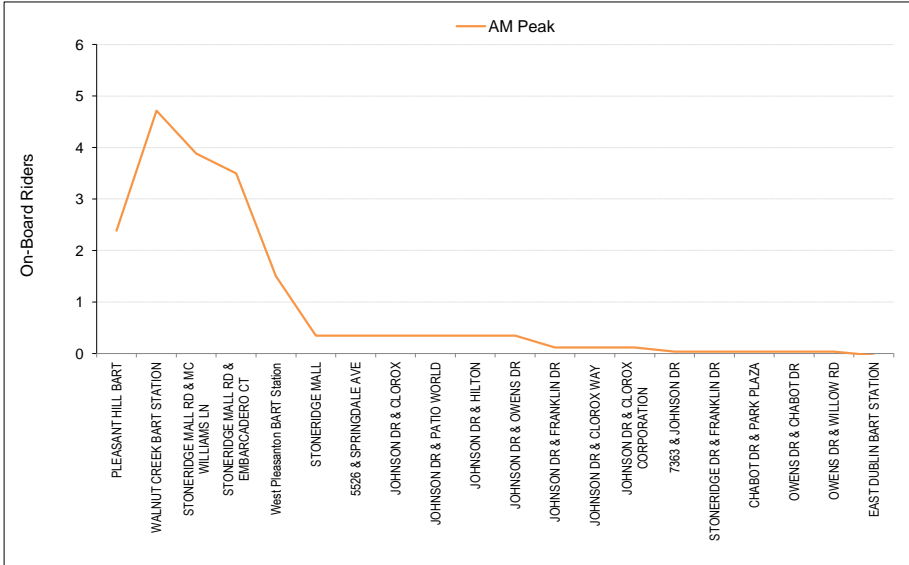
Weekday On-Board by Stop and Time Period - Northbound



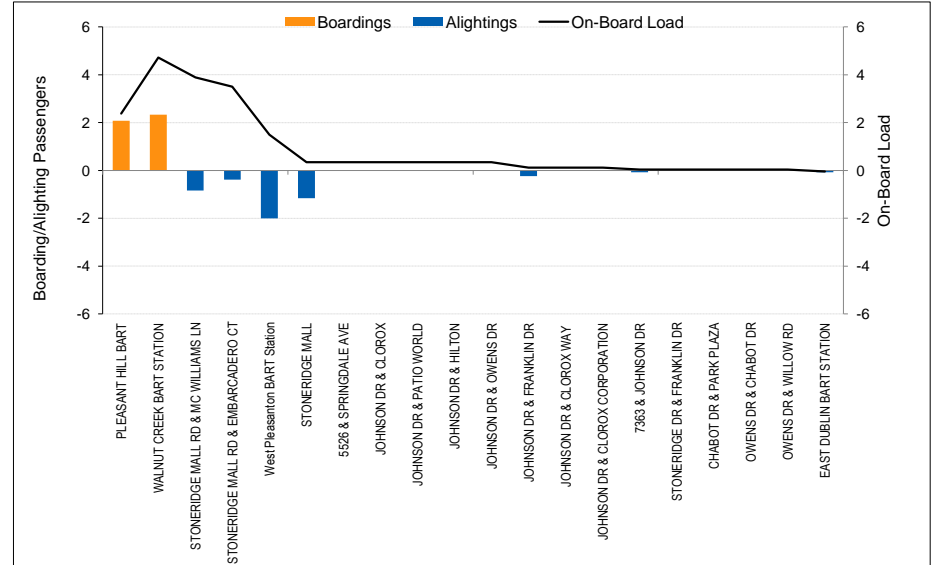
Weekday Boardings and Alightings by Stop - Northbound



Weekday On-Board by Stop and Time Period - Southbound



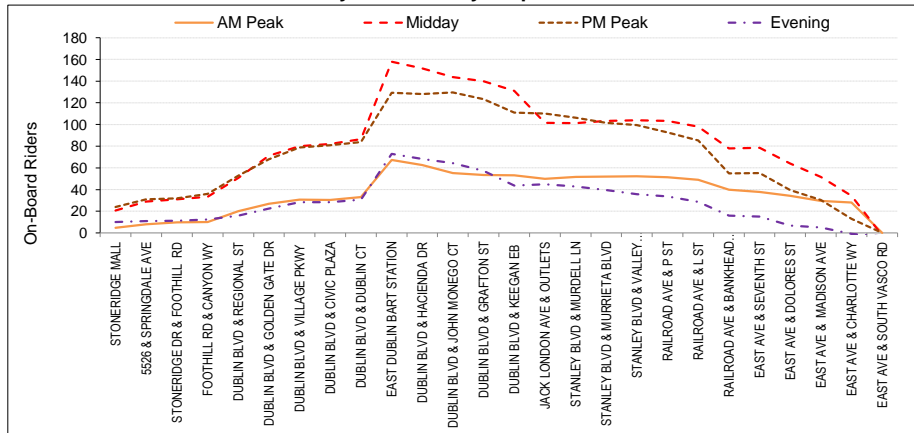
Weekday Boardings and Alightings by Stop - Southbound



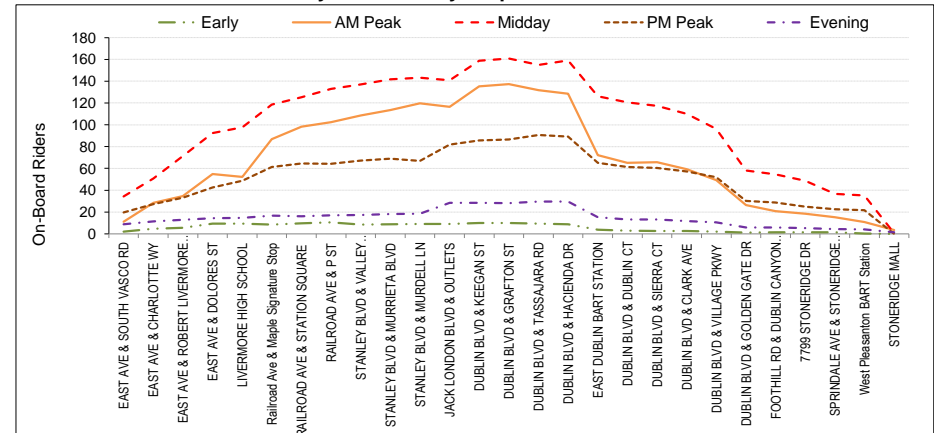
Route Rapid Weekday	Route Productivity Summary				Route Operations Summary					
	Activity	Service	Productivity		On-Time Performance			On-Board Load		
	Boardings	Alightings	Service Hours	Boardings per Service Hour	% On-Time	% Early	% Late	Max Passengers On Board	Max Load Location	Direction
Total	1,664	1,664	111.6	14.9	81%	1%	18%	428	EAST DUBLIN BART STATION &	E
Eastbound	809	815	53.7	15.1				428	EAST DUBLIN BART STATION &	E
Westbound	855	849	57.9	14.8				423	DUBLIN BLVD & GRAFTON ST &	W
By Segment										
1 STONERIDGE MALL 0 to EAST DUBLIN BART STATION 0	464	640	39.5	11.8						
2 EAST DUBLIN BART STATION 0 to DUBLIN BLVD & KEEGAN EB 0	495	317	22.6	21.9						
3 DUBLIN BLVD & KEEGAN EB 0 to STANLEY BLVD & MURDELL LN 0	72	114	21.1	3.4						
4 STANLEY BLVD & MURDELL LN 0 to RAILROAD AVE & BANKHEAD THEATER 0	335	252	11.0	30.5						
5 RAILROAD AVE & BANKHEAD THEATER 0 to EAST AVE & SOUTH VASCO RD 0	297	341	17.4	17.1						
By Time Period										
Early AM	17	17	1.0	16.0				11	RAILROAD AVE & P ST &	W
AM	348	344	24.4	14.2				137	DUBLIN BLVD & GRAFTON ST &	W
Midday	683	685	48.2	14.2				161	DUBLIN BLVD & GRAFTON ST &	W
PM	448	448	24.8	18.1				130	DUBLIN BLVD & JOHN MONEGO CT	E
Eve	169	171	13.2	12.8				73	EAST DUBLIN BART STATION &	E



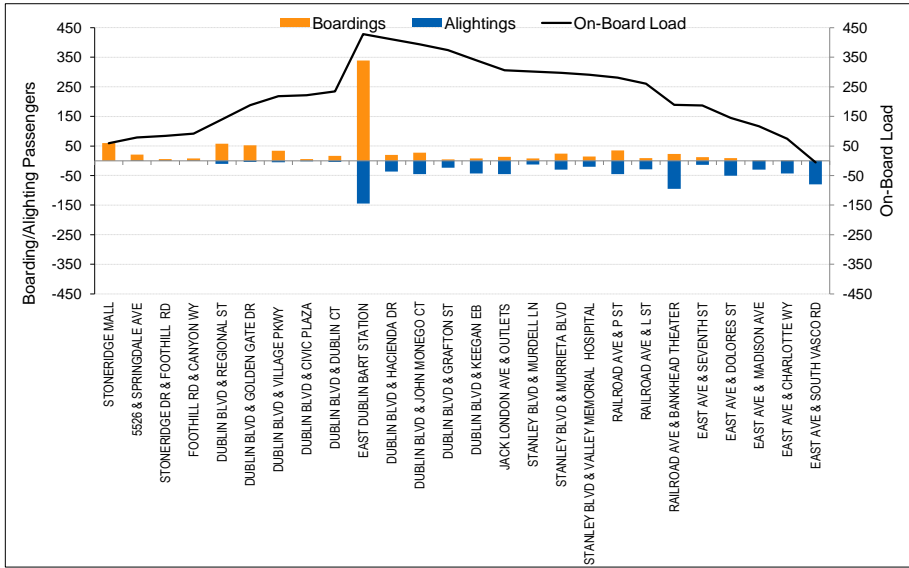
Weekday On-Board by Stop and Time Period - Eastbound



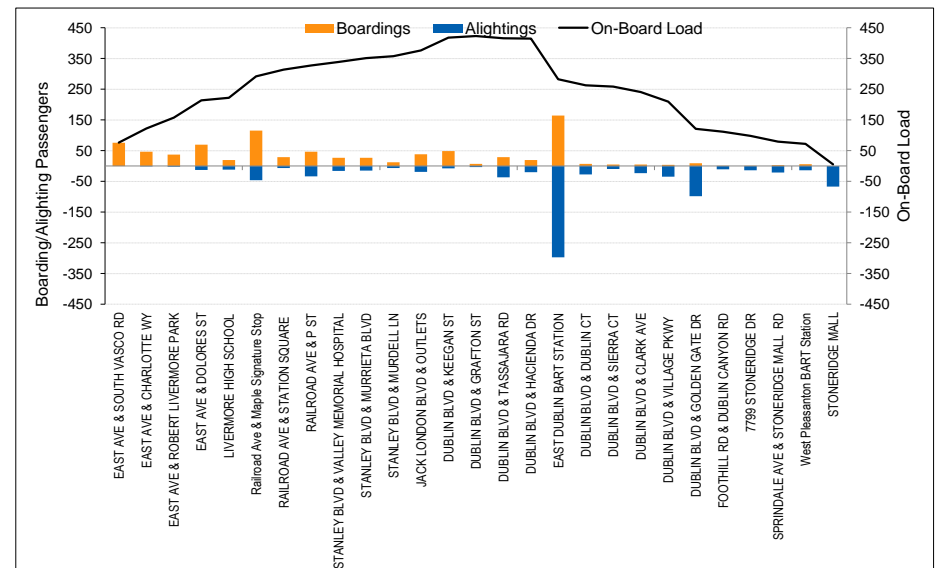
Weekday On-Board by Stop and Time Period - Westbound



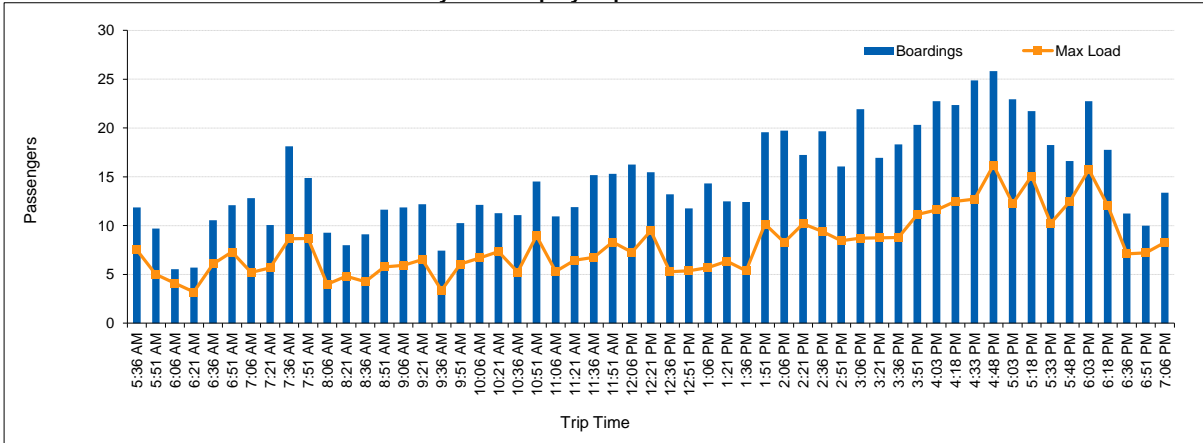
Weekday Boardings and Alightings by Stop - Eastbound



Weekday Boardings and Alightings by Stop - Westbound



Weekday Ridership by Trip - Eastbound



Weekday Ridership by Trip - Westbound

