CITY OF MOUNTAIN VIEW

# *City of Mountain View Shuttle Study*

October 2019


TMD
TRANSPORTATION MANAGEMENT & DESIGN, INCORPORATED

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# Introduction

The City of Mountain View is committed to proactively working toward its goal of reducing greenhouse gas (GHG) emissions while ensuring sustainability and equitability and improving the quality of life for all residents. In 2009 and 2010 the City Council adopted community-wide and municipal operations carbon targets, setting a bold overall target of an 80 percent reduction of the 2005 emission levels by 2050. A significant shift in transportation usage is critical to meeting this target, and the City has identified reducing the mode share of single-occupancy vehicle (SOV) trips as a primary strategy. In order to change consumer behavior, convenient, affordable transportation alternatives, including effective public transit service, must be funded and promoted.

Since 2015, the City of Mountain View has partnered with Google to offer free service on the Mountain View Community Shuttle. Google has committed to continue funding the Community Shuttle through 2024, with overall management of operations shifting to the City. This commitment provides the City with an opportunity to evaluate the service's role in the local and regional transportation networks and build a sustainable framework for its long-term success.

The Community Shuttle compliments the other public transportation providers serving the City of Mountain View. The Santa Clara Valley Transportation Authority (VTA) provides fixed route bus service throughout Santa Clara County, accommodating both internal trips within Mountain View and regional trips to adjacent communities in Santa Clara County. The Mountain View Transportation Management Association's (MVTMA) MVgo shuttles connect Caltrain with major employers throughout the City and all services are open to the general public. Caltrain is a regional rail service operating between San Francisco and San Jose with limited service extended to Gilroy and has two stations within Mountain View.

This *Shuttle Study* assesses existing transit service conditions in Mountain View so the City can determine demand and strategize how to best address that demand in the short and long terms. To evaluate existing conditions, this study identifies existing services, explores their effectiveness, and offers findings from community and stakeholder engagement processes. This study is one component of a broader planning process, which will continue with the identification of service alternatives and development of a preferred service plan.

This report summarizes the work completed thus far – including a review of prior studies and reports, a market analysis, an assessment of existing transit conditions, and takeaways from stakeholder interviews and a community survey. This report also introduces upcoming work including possible service alternatives and financial considerations.

# Review of Prior Studies and Reports

A review of related studies and planning efforts provides important context to understanding existing transit services in Mountain View. Two studies considered especially relevant to this study include findings from Caltrain's 2016 onboard survey and the final report issued by the Mountain View City Council's Environmental Sustainability Task Force, which met from 2017 through 2018.

## 2016 On-Board Survey by Caltrain

Caltrain is a commuter rail line operating on the San Francisco Peninsula and through the Santa Clara Valley, providing service to communities between San Francisco and San Jose (with select trips to Gilroy). Connectivity to Caltrain service is a critical component of a functioning transit network in Mountain View. A key finding of the 2016 Caltrain on-board survey was the demand for first/last mile connections to the Mountain View Transit Center, which is served by both Caltrain and the VTA Green Line light rail, as well as the San Antonio Caltrain station.

At the time of the 2016 Caltrain survey, the Mountain View Transit Center supported about 4,500 daily boardings and a comparable number of alightings (arriving passengers). First/last mile needs differ based on whether the customer is accessing (outgoing) or egressing (arriving) the station.

Most of the customers accessing Caltrain at the Mountain View Transit Center are Mountain View residents (72 percent), with other riders traveling from adjacent areas of Los Altos, Sunnyvale, and Cupertino. For Mountain View customers using Caltrain to access destinations outside of the city, approximately one-third are accessing Caltrain service using the park-and-ride facility. Other access modes included walking (23 percent), drop-off (22 percent), biking (15 percent), and transfer from other transit service (8 percent). Park-and-ride demand exceeds the supply of spaces, and approximately two-thirds of customers biking to the Mountain View Transit Center take their bike on the train. Given the location of the Mountain View Transit Center, drop-offs, biking, and transfers from other transit service could potentially account for larger access mode shares in the future.

For customers arriving in Mountain View (approximately 1,800 during morning peak hours), about 40 percent are connecting to shuttle and bus service at the Mountain View Transit Center. Walking and biking account for 24 and 15 percent of egress, respectively. Another 18 percent are transferring to VTA light rail service. Planned improvements to the Transit Center facilities should increase the capacity for public and private shuttle service.

With the planned expansion of Caltrain service, ridership at Mountain View Station is expected to more than double, increasing the demand for first/last mile service to the Mountain View Transit Center. Demand is also expected to increase at the San Antonio station, though potentially at a lower rate.

## Final Report of the 2017-2018 Environmental Sustainability Task Force 2

In September 2017, the Mountain View City Council formed an advisory body tasked with evaluating the City's existing sustainability efforts and adding capacity to City sustainability staff's outreach, advocacy, and regional collaboration efforts. The Environmental Sustainability Task Force 2 (ESTF-2) was comprised of community members who live and/or work in Mountain View. After ten months of community engagement, plan review, and brainstorming, ESTF-2 issued its final report of 36 recommendations to meet the City's sustainability goals.

The ESTF-2 report recommendations address the rising emissions challenge from multiple fronts: transportation; buildings and land use; circular economy; outreach, regional collaboration, and advocacy; measurement and metrics. With transportation accounting for 60 percent of the total GHG emissions generated in Mountain View, some of the highest-priority recommendations were related to shifting the transportation mode split away from single occupancy vehicles.[1]

[1] *Final Report of the 2017-2018 Environmental Sustainability Task Force.* City of Mountain View, 2018, p. 9. Accessed online: http://laserfiche.mountainview.gov/WebLink/0/edoc/219376/ESTF-2%20Sustainability%20Recommendations%20Report%20-%20June%202018%20-%20FINAL.pdf

Among the highest-priority recommendations, three were focused on transportation:

- Priority #2: Revolutionize transportation in Mountain View
- Priority #5: Solve the local solo-trip problem: Pilot discounted pooled ridesharing
- Priority #12: Solve the local solo-trip problem: MV Shuttle 2.0 and 3.0

Other lower-priority recommendations related to transportation included:

- Restrict parking to encourage and fund alternative modes
- Support bicycling as a primary mode of transportation
- Expand EV charging infrastructure on public property and rights-of-way
- Expand transportation demand management (TDM) to all of Mountain View
- Implement group-buy programs to expand personal electric vehicle (EV) adoption

The clear message from the ESTF-2 report is that single-occupancy vehicle driving must be decreased but, to accomplish this, Mountain View must offer viable alternatives. Furthermore, with the commute trips accounting for less than a third of trips and less than half of all vehicle miles traveled (VMT), mobility alternatives must provide for trips all day and for all purposes. Addressing the "solo-trip problem" involves two components: piloting discounted pooled ridesharing (Recommendation T4B) and providing transit service via MV Shuttle (Recommendation T4A). City staff did not recommend pursuing T4B however did support T4A.

This Mountain View Shuttle Study directly addresses Recommendation T4A of the ESTF-2 report. Its recommendation for leveraging existing MV Shuttle service included redesigning routes, expanding coverage and frequency, and expanding hours of operation/service span. These suggestions will be taken account in the future recommendation phase of this study.

## Market Analysis

Population and household density data from the 2017 American Community Survey (ACS) were used as the foundation for mapping transit propensity across the City of Mountain View. Transit propensity is a measure of the likelihood of a person or population to use transit services. Certain demographic groups are considered more likely to use transit service than the general population. Demographic predictors include:

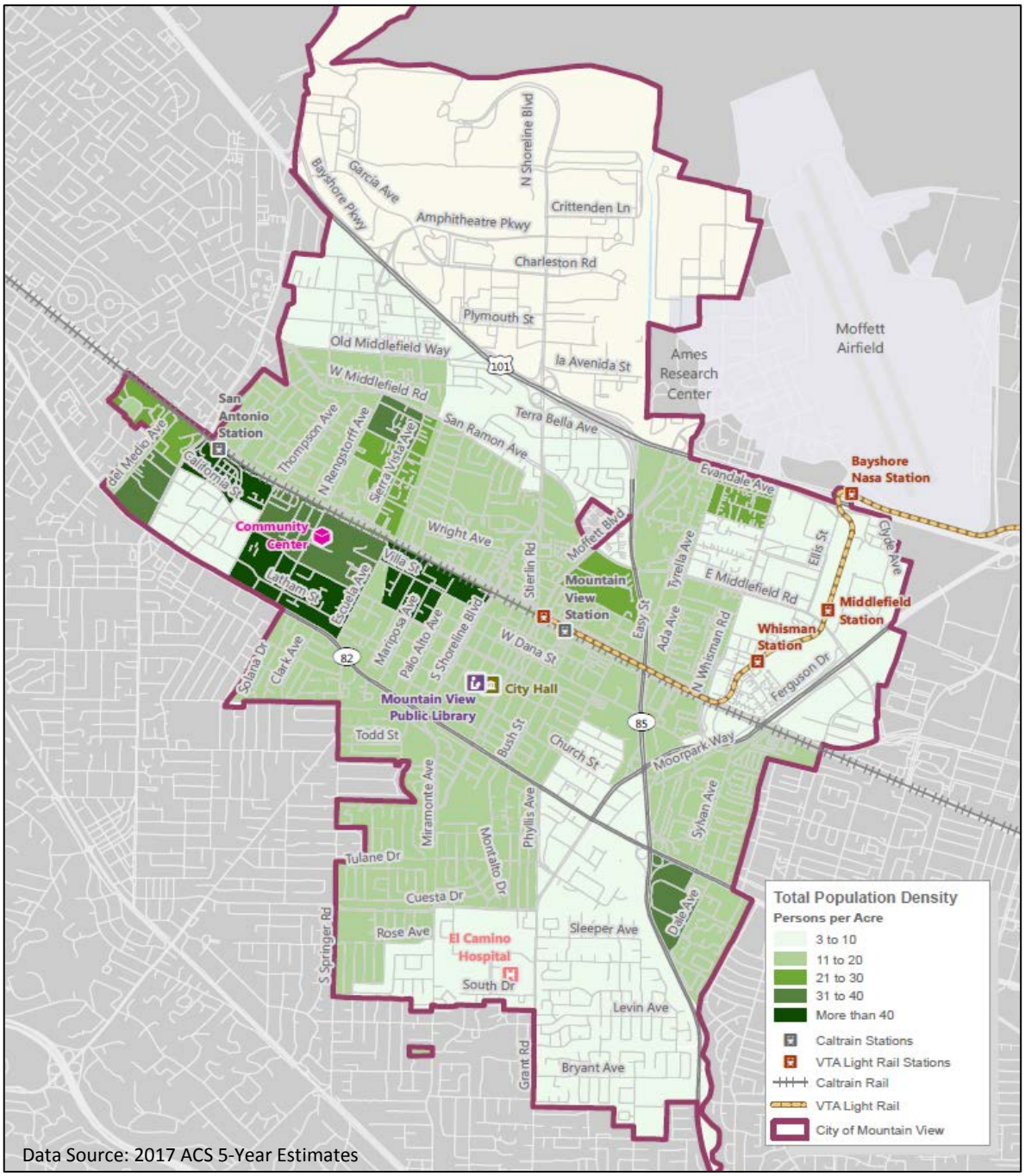
- Minority populations
- Low-Income Households
- Zero-Vehicle Households
- Youth/Populations Age 18 and Under
- Seniors/Populations Age 65 and Over

The distribution of these populations can indicate areas with greater mobility needs or transit dependence. The following maps show the current geographic distribution of these key demographic groups that may be more likely to use and/or rely on transit.

## Population Density

Higher density of population is more conducive to transit usage, making transit more effective in these areas. Most of Mountain View has the moderate density typical of suburban communities. Pockets of higher density (more than 40 persons per acre) are located west of Downtown, between the Caltrain line and El Camino Real. See Figure 1. Multi-family housing is more prevalent in these neighborhoods than other areas of the city. Current zoning is likely to sustain this pattern with the exceptions of North Bayshore and possibly the Whisman area, where local plans call for the introduction of medium- to high-density housing.

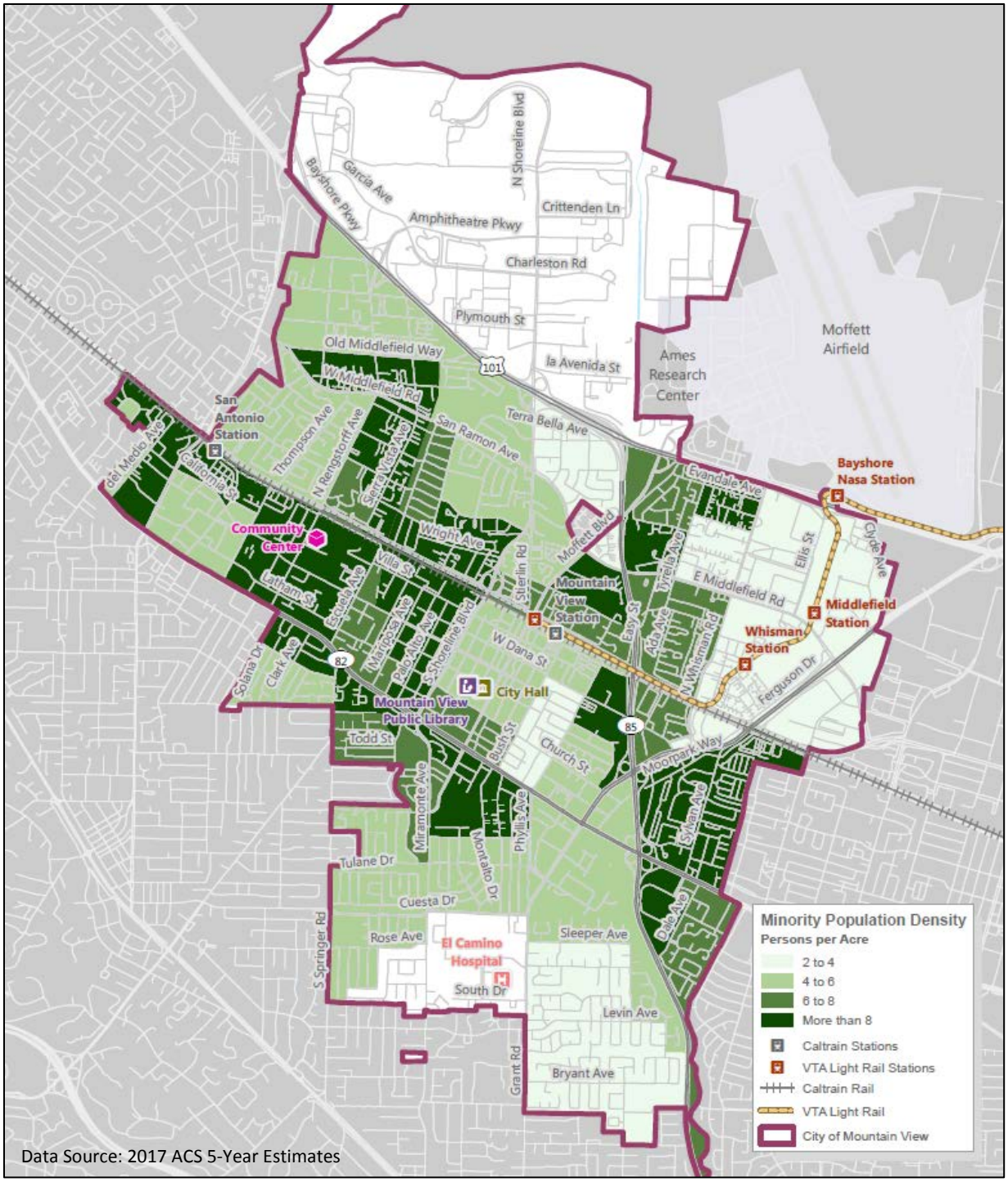
*Figure 1: Map of Population Density*



## Minority Population

Mountain View is a diverse community, with minority residents living across the city. Most census block groups have a minority population density of at least four persons per acre. However, unlike other demographic groups, the census block groups with the highest density of minority populations are spread throughout the City.

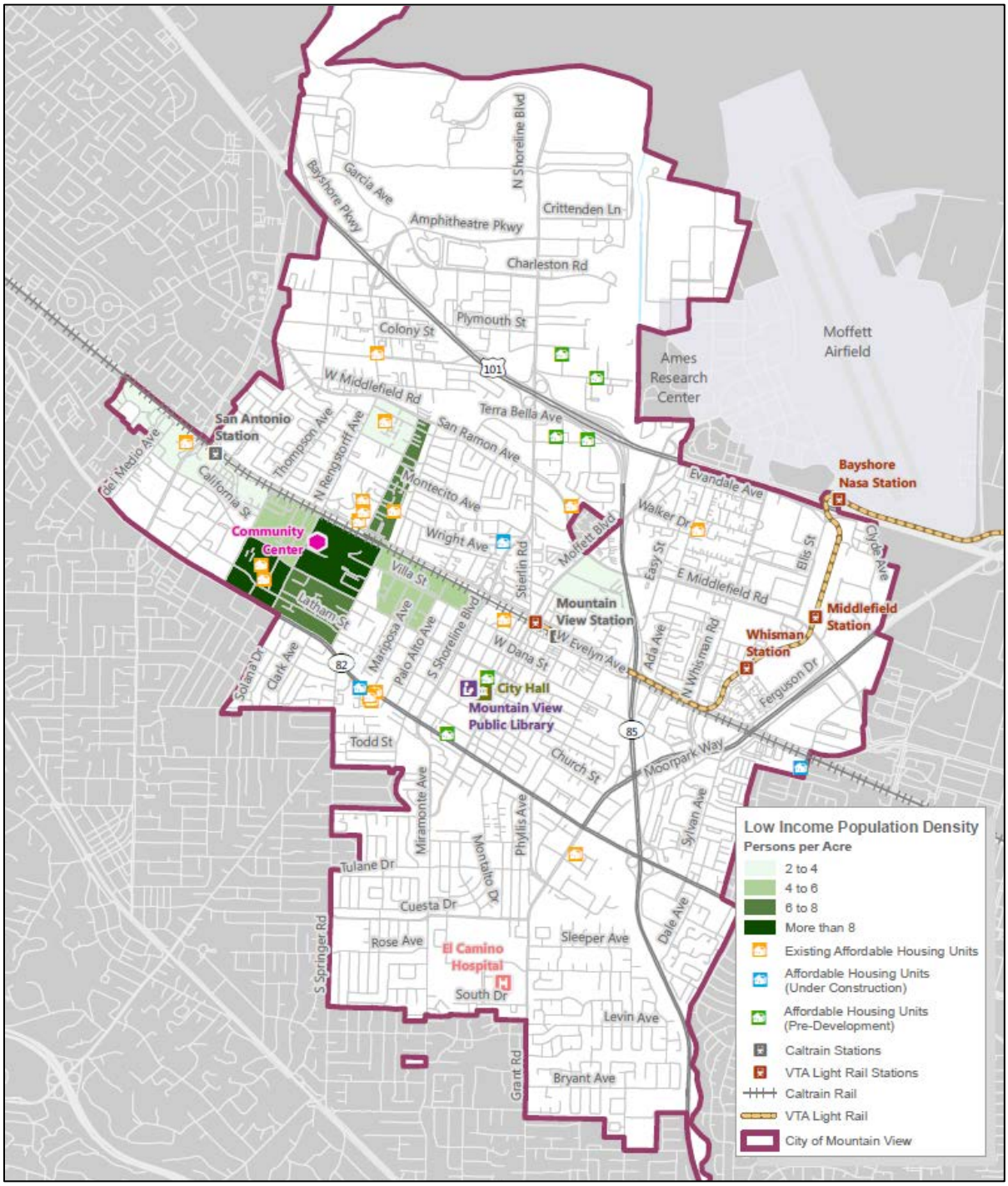
*Figure 2: Map of Minority Population Density*



## Low-Income Households

Low-income households are most dense in two areas: east and west of Rengstorff between the Caltrain line and El Camino Real. The census block group with the next-highest density is a narrow block group bounded by Sierra Vista, Middlefield, Permanente Creek, and the Caltrain line. Three subsidized housing projects under construction are located outside of the denser low-income block groups identified in dark and medium green in Figure 3.

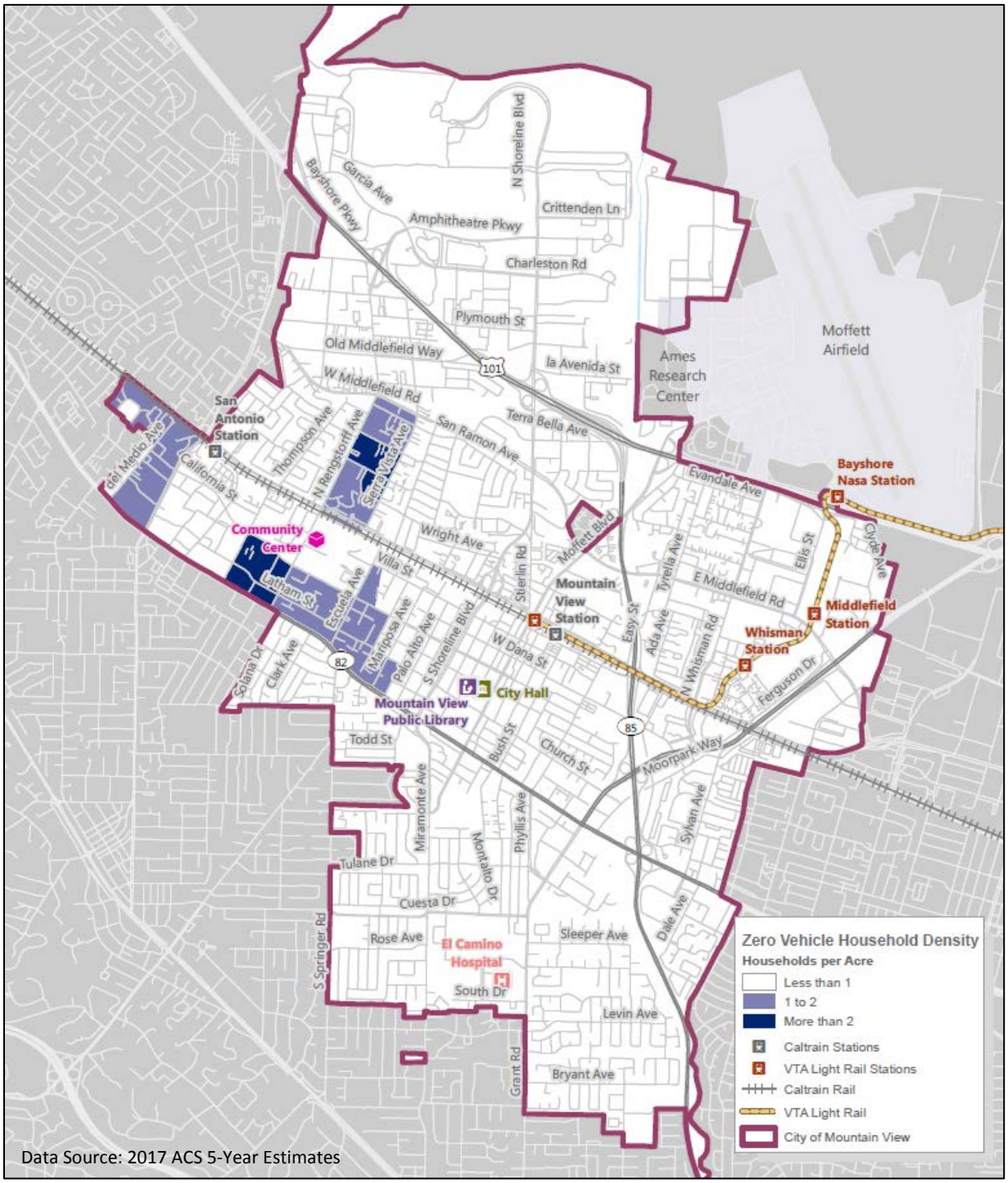
*Figure 3: Map of Low-Income Household Density*



## Zero-Vehicle Households

Six percent of households in Mountain View do not have access to a personal vehicle. These households are concentrated in three discrete areas west of Downtown and more closely match the population density map than the low-income or senior population density maps.

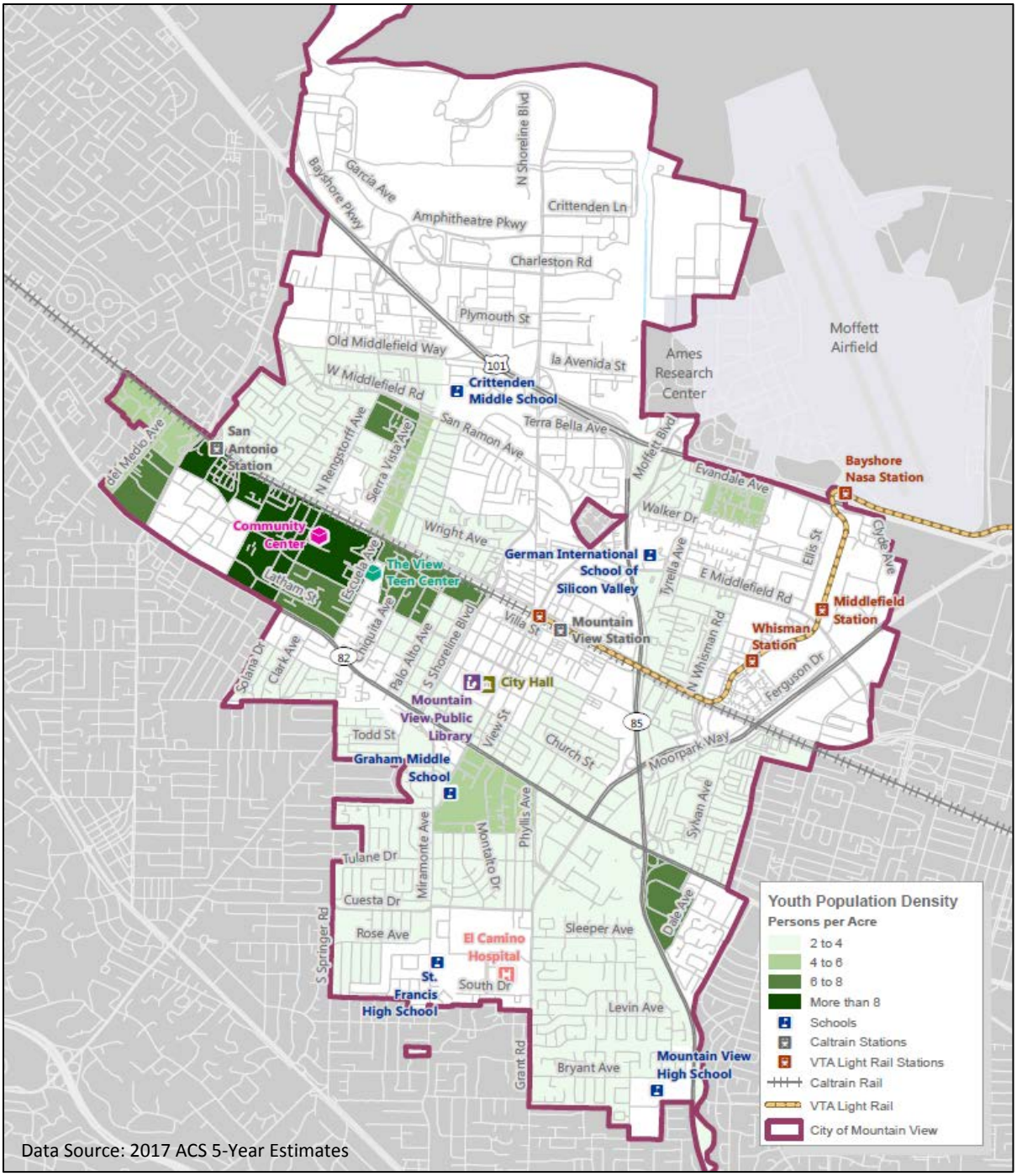
*Figure 4: Map of Zero-Vehicle Household Density*



## Youth/Populations Age 18 and Under

Youth population density correlates with overall population density. Twenty one percent of Mountain View's population is under the age of 19. Areas where multi-unit housing is the dominant residential form have the highest concentration of youth. However, most households in lower-density neighborhoods, where single-family homes are more prominent, are also likely to include children within the household.

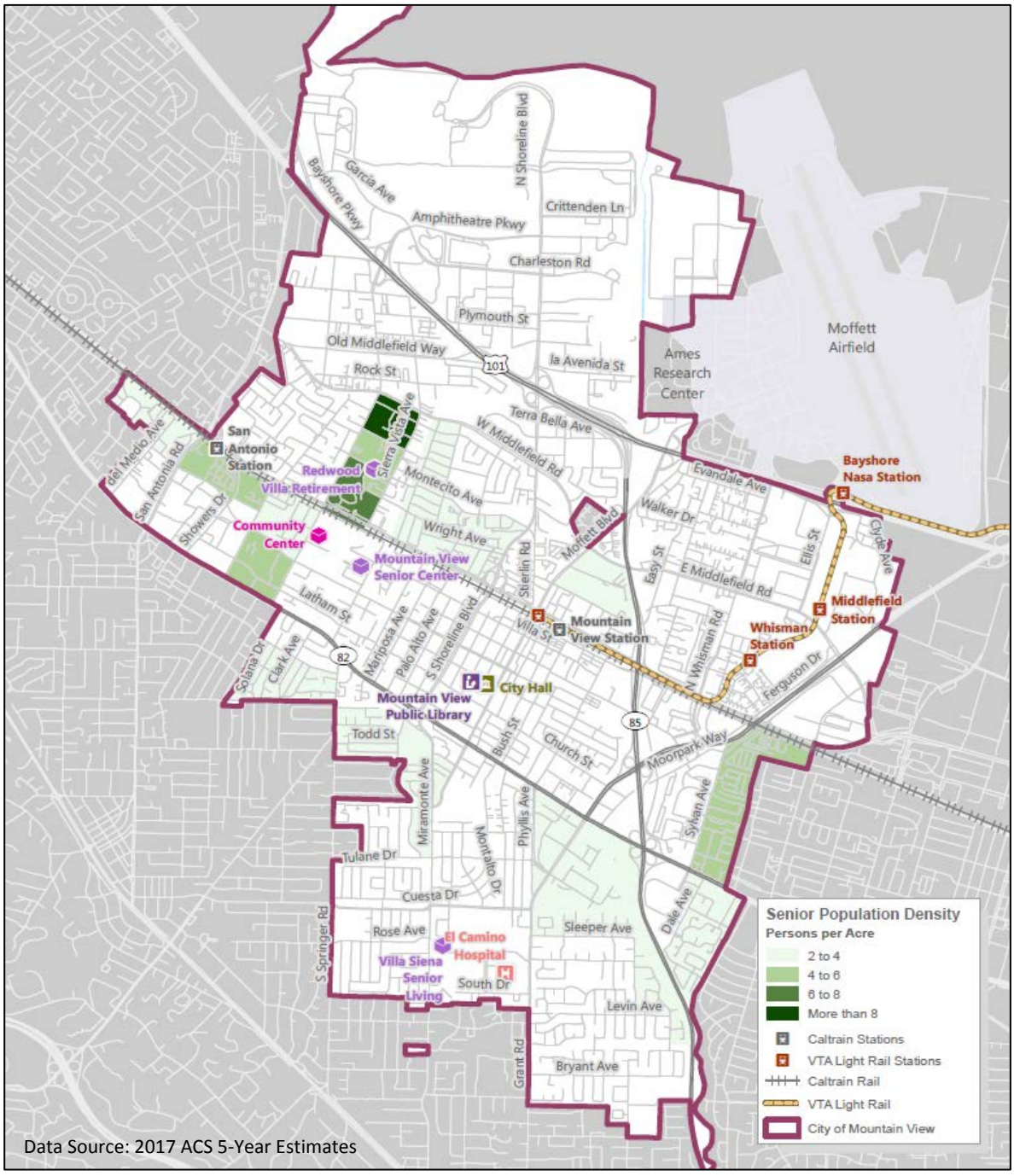
*Figure 5: Map of Youth Population Density*



## Seniors/Populations Age 65 and Over

Mountain View's population skews younger, with seniors (age 65 and older) accounting for just 11 percent of the city's population. The highest concentration of seniors is in the census block group bounded by Rengstorff, Middlefield, Sierra Vista, and the Caltrain line. Monte Vista Apartments – which includes 149 subsidized units for seniors and persons with disabilities – is located on Grant Road, south of El Camino Real. This area is in a census block group that otherwise does not reflect high senior population density; however, the Shuttle stop closest to these apartments is one of the busier stops.

*Figure 6: Map of Senior Population Density*



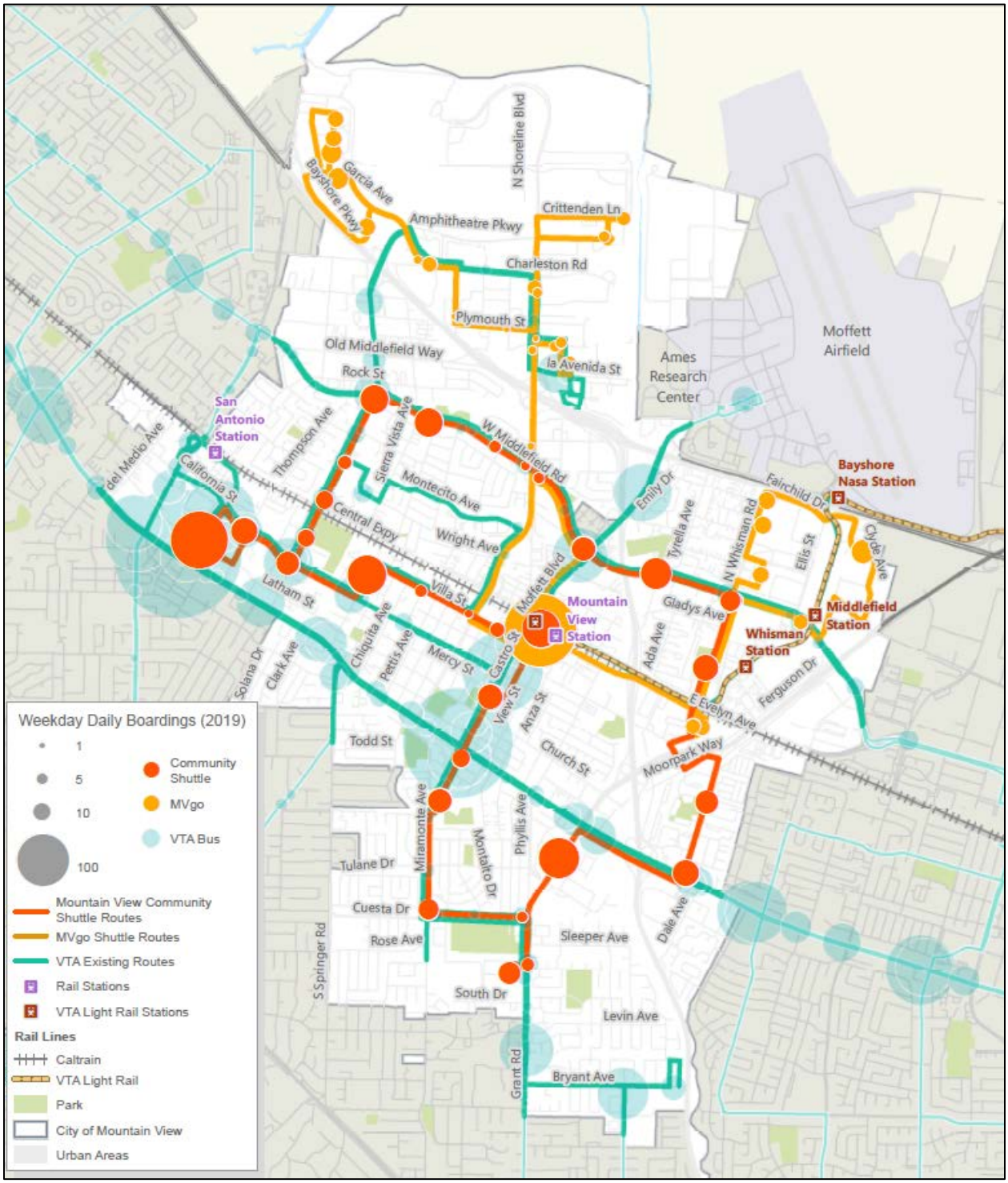
Data Source: 2017 ACS 5-Year Estimates

## Existing Transit Service Conditions

Due to its location within the Bay Area, the City of Mountain View is served by multiple transit providers. In addition to regional service by VTA bus and light rail and Caltrain commuter rail, Mountain View is also served by the Mountain View Community Shuttle, the focus of this study, and the MVgo shuttle. Several key destinations are served by multiple transit providers, such as the Mountain View Transit Center, which serves as the Mountain View station for Caltrain and VTA light rail, as well as the San Antonio Station and Middlefield Road. See Figure 7 for the comprehensive map of transit services and ridership in Mountain View.

With each transit provider operating independently, under its own governance and funding structures, service schedules have not been synced to optimize multimodal connections. As VTA–the main provider of transit service in Santa Clara County–plans to restructure its local bus service in late 2019, it is important to develop an integrated transit plan for the City to ensure all Mountain View residents have easy access to public transportation.

*Figure 7: Map of Current Transit Service and Ridership in Mountain View*



## Mountain View Community Shuttle

A partnership between Google and the City of Mountain View, the Mountain View Community Shuttle was designed as a pilot program to provide free transportation connections between residential neighborhoods and key destinations in Mountain View as well as connections to the regional transportation network. In 2019, Google announced it was extending funding of the current Community Shuttle operations through 2024.

The current fleet consists of four all-electric, 16-seat shuttle vehicles, each equipped with a wheelchair lift, exterior bicycle racks, and free on-board Wi-Fi. The shuttles operate in a bi-directional loop every day between 10 AM and 6 PM, with 30-minute frequency on weekdays and 60-minute frequency on weekends. Trips in the clockwise direction are considered the Grey route, while counterclockwise is the Red route. See service summary in Table 1.

*Table 1: Community Shuttle Service Spans and Frequencies*

| Route | Weekdays | | Weekends | |
|---|---|---|---|---|
| | Frequency in Minutes | Service Span | Frequency in Minutes | Service Span |
| **Gray Route (Clockwise)** | 30 | 10 AM - 6 PM | 60 | 10 AM - 6 PM |
| **Red Route (Counterclockwise)** | 30 | 10 AM - 6 PM | 60 | 10 AM - 6 PM |

The initial routing, which is still in effect today, connects most major destinations within the City, including: city offices, libraries, medical offices, shopping centers, entertainment venues, and parks and recreational facilities. On weekends, the route is slightly adjusted to serve the movie theater located off Shoreline Blvd. Of the 50 Community Shuttle stops, those with the highest activity (across both the Gray and Red routes) include: San Antonio Center, Mountain View Transit Center, the Senior/Teen Center, and the intersection of Grant and El Camino Real, near Monte Vista Apartments. Average weekday boardings are summarized in .

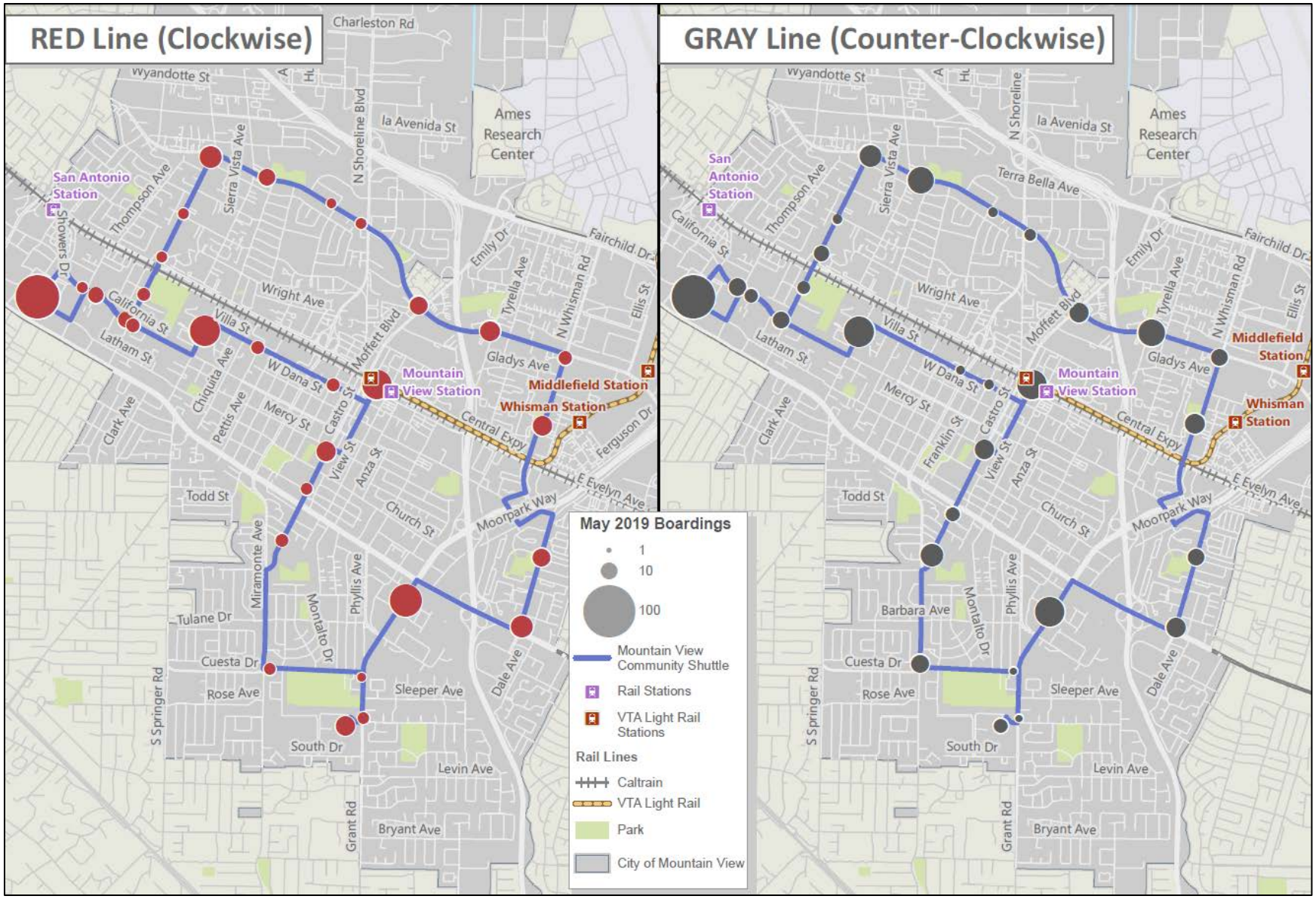
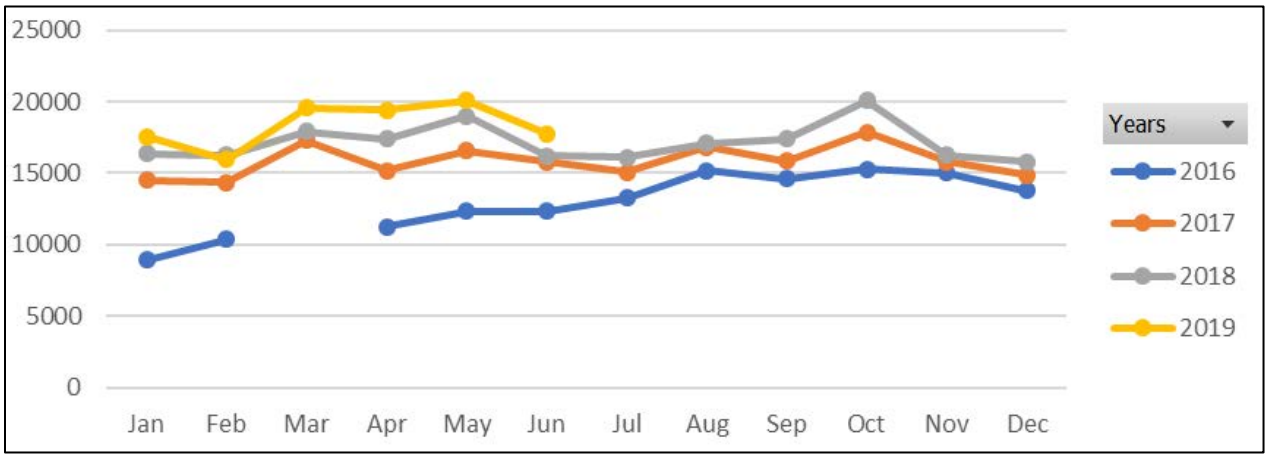



*Figure 8: Average Weekday Boardings for Community Shuttle by Route/Direction*

The Community Shuttle has seen a consistent year-over-year increase in boardings, as shown in . The Shuttle's highest monthly ridership occurred in October 2018 (20,088/month, 648/day), with its next three highest months in 2019: May (20,066/month, 647/day), March (19,554, 631/day), and April (19,403/month, 647/day).

*Figure 9: Community Shuttle Boardings per Year*




A strong indicator of a transit system's productivity is boardings per service hour: the total boardings within a given period divided by the total number of service hours operated by all buses within that same period. The Community Shuttle has logged impressive boarding per hour statistics. In May 2019 weekday productivity was an average 27.0 passengers per service hour (pph). The Community Shuttle has stronger performance than all VTA routes operating in the City, more details shown in Table 3. With less frequency, weekend productivity for Community Shuttle dropped to 17.9 pph on Saturdays and 15.3 pph on Sundays. Lower weekend productivity is typical/expected for most transit operations, with lower service levels on weekends.

## Santa Clara Valley Transportation Authority (VTA)

VTA service accounts for the most boardings of all transit providers operating in Mountain View. VTA averages 3,609 daily weekday riders across seven fixed-route services. Routes 22 and 522, which offer 24-hour service on El Camino Real, carry the highest number of boardings. This is due, in part, to very frequent service. The combined Route 22-522 frequency on the El Camino Real corridor provides service every six to eight minutes, providing residents with convenient connections at the Palo Alto and Eastridge Transit Centers. Other key stops on VTA service are in Downtown Mountain View, at the Mountain View Transit Center (Caltrain and VTA stations), and near the middle and high schools. VTA service operating in Mountain View is summarized in Table 2.

*Table 2: VTA Mountain View Service Spans and Frequencies*

| Service and Route Number | Route Description | Weekday | | Saturday | | Sunday | |
|---|---|---|---|---|---|---|---|
| | | Frequency in Minutes (High/Low) | Service Span | Frequency in Minutes (High/Low) | Service Span | Frequency in Minutes (High/Low) | Span |
| Frequent Bus: **Route 22** | Palo Alto Transit Center to Eastridge Transit Center via El Camino | 15 / 60 | 24-Hour | 15 / 60 | 24-Hour | 15 / 60 | 24-Hour |
| Local Bus: **Route 32** | San Antonio Shopping Center to Santa Clara Transit Center | 30 / 60 | 5:45 AM - 8:30 PM | 60 | 8:45 AM – 6:00 PM | – | – |
| Local Bus: **Route 34** | San Antonio Shopping Center to Downtown Mountain View | 60 | 9:30 AM - 3:30 PM | – | – | – | – |
| Local Bus: **Route 35** | Downtown Mountain View to Stanford Shopping Center | 30 / 60 | 5:45 AM - 10:00 PM | 45 / 60 | 8:15 AM – 9:00 PM | 60 | 8:15 AM - 8:15 PM |
| Local Bus: **Route 40** | Foothill College to Shoreline & La Avenida | 30 / 60 | 6:00 AM - 10:00 PM | 40 - 45 | 8:00 AM - 7:00 PM | 60 | 9:30 AM - 6:30 PM |
| Local Bus: **Route 81** | Moffett Field/Ames Center to San Jose State University | 30 / 60 | 6:00 AM - 9:00 PM | 60 | 9:30 AM - 6:15 PM | – | – |
| Rapid Bus: **Route 522** | Palo Alto Transit Center to Eastridge Transit Center | <15 / 20 | 5:00 AM - 11:00 PM | 15 / 20 | 6:00 AM - 11:00 PM | 15 / 20 | 6:00 AM - 10:00 PM |
| Light Rail: **Green Line 902** | Mountain View to Winchester | 15 / 30 | 5:00 AM - 12:30 AM | 30 | 6:00 AM - 12:30 AM | 30 | 6:00 AM - 12:30 AM |

### *2019 Service Changes*

In 2017, VTA adopted the *Next Network Plan*, a system redesign aimed at increasing ridership and improving the system's cost-effectiveness by improving the frequency on several routes. Due to changes in VTA's financial outlook in early 2019, the agency began developing a new transit service plan for Fall 2019 to complement the BART San Jose Berryessa service extension. The changes made in the *2019 New Transit Service Plan* provide some beneficial service improvements but also have some negative implications for routes operating within Mountain View. Service changes to VTA routes in Mountain View are summarized in Table 3.

*Table 3: VTA Productivity and Service Changes by Route*

| Service and Route Number | Route Description | FY19 Q2 Productivity (pph) | Proposed Changes, *2019 New Service Plan* |
|---|---|---|---|
| Mountain View **Community Shuttle** | Internal circulator within the City of Mountain View | 27.0 | Under review as part of this study |
| Frequent Bus: **Route 22** | Palo Alto Transit Center to Eastridge Transit Center via El Camino | 25.2 | No Changes |
| Local Bus: **Route 32** | San Antonio Shopping Center to Santa Clara Transit Center | 14.5 | Merge with Route 35; Discontinue segment on Middlefield Road west of Moffett |
| Local Bus: **Route 34** | San Antonio Shopping Center to Downtown Mountain View | 9.4 | Discontinued |
| Local Bus: **Route 35** | Downtown Mountain View to Stanford Shopping Center | 12.2 | Merge with Route 32 |
| Local Bus: **Route 40** | Foothill College to Shoreline & La Avenida | 19.6 | Route extended along Shoreline Blvd. |
| Local Bus: **Route 81** | Moffett Field/Ames Center to San Jose State University | 15.9 | Segments replaced by new route |
| Rapid Bus: **Route 522** | Palo Alto Transit Center to Eastridge Transit Center | 20.5 | No Changes |

### *Ridership Impacts*

Collectively, the service changes will eliminate service on Middlefield Road west of Moffett as well as on Montecito Ave. between Rengstorff and Shoreline. Service will also be eliminated on Escuela Ave. and Villa St. west of Shoreline. Positive outcomes of the service change include new all-day service along Shoreline Blvd. between the Mountain View Transit Center and the North Bayshore area.

The VTA service provided on Villa and Escuela that will be discontinued operates in one direction with only six trips each weekday. The Community Shuttle serves the entirety of this segment. The Community Shuttle also provides service along most of the segment on Middlefield Road that will lose VTA service. Unfortunately, the Community Shuttle has a shorter service span and cannot accommodate trips to

destinations in Sunnyvale or Santa Clara. It also does not serve the segment of Middlefield Road between Rengstorff and San Antonio. There will be no replacement service along Montecito, however, prior to the service change VTA only operated six trips per day on weekdays only, with minimal ridership. Based on analysis of the VTA service changes, only 19 customers will be more than a quarter-mile walking distance to a current or alternative bus stop. Figure 10 shows the VTA's proposed new alignments (purple) and discontinued routes (blue) within Mountain View. Despite these changes, Mountain View's key destinations will still be served by transit as seen by Figure 11.

*Figure 10: Ridership Impacts of VTA 2019 New Transit Service Plan*

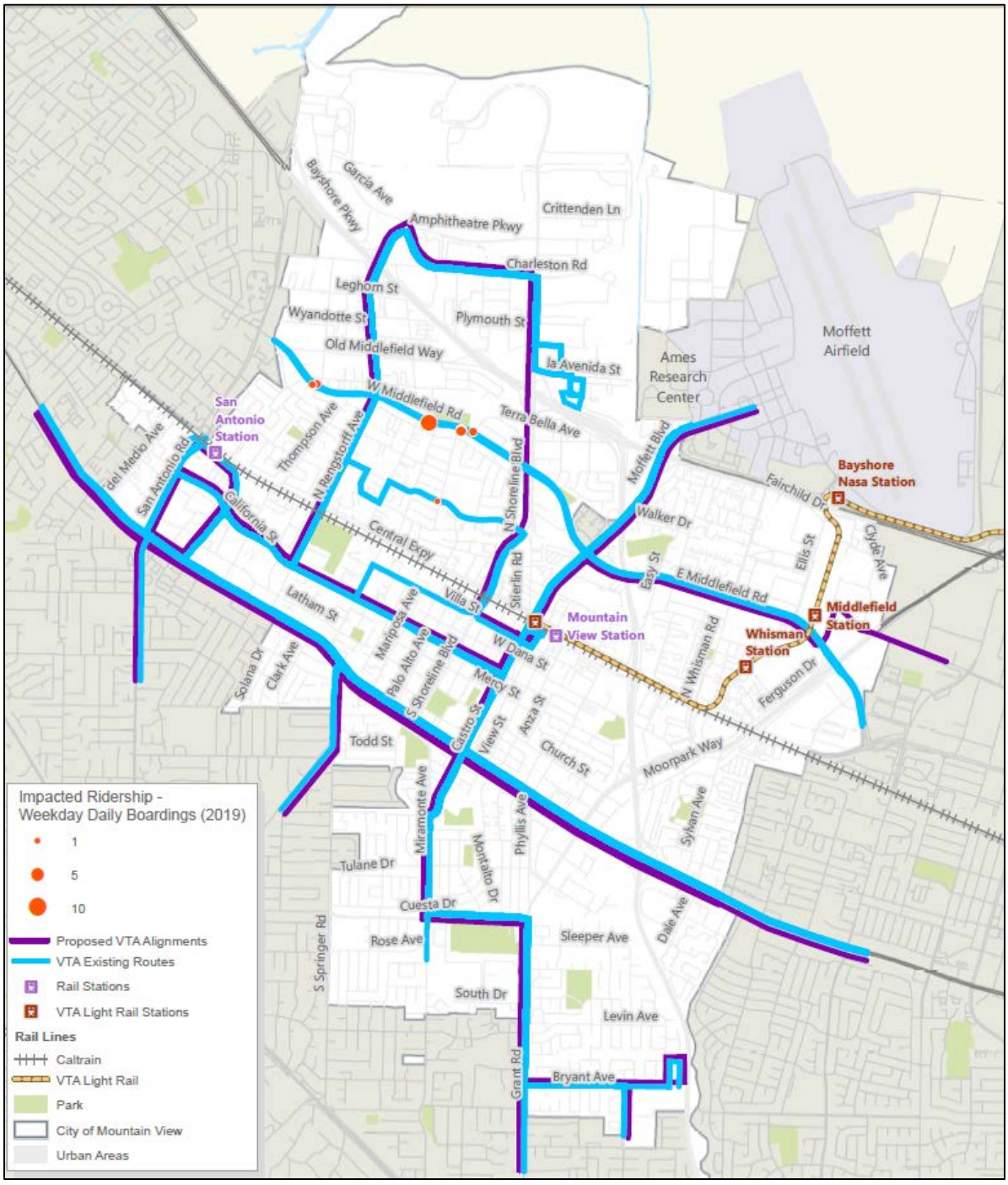
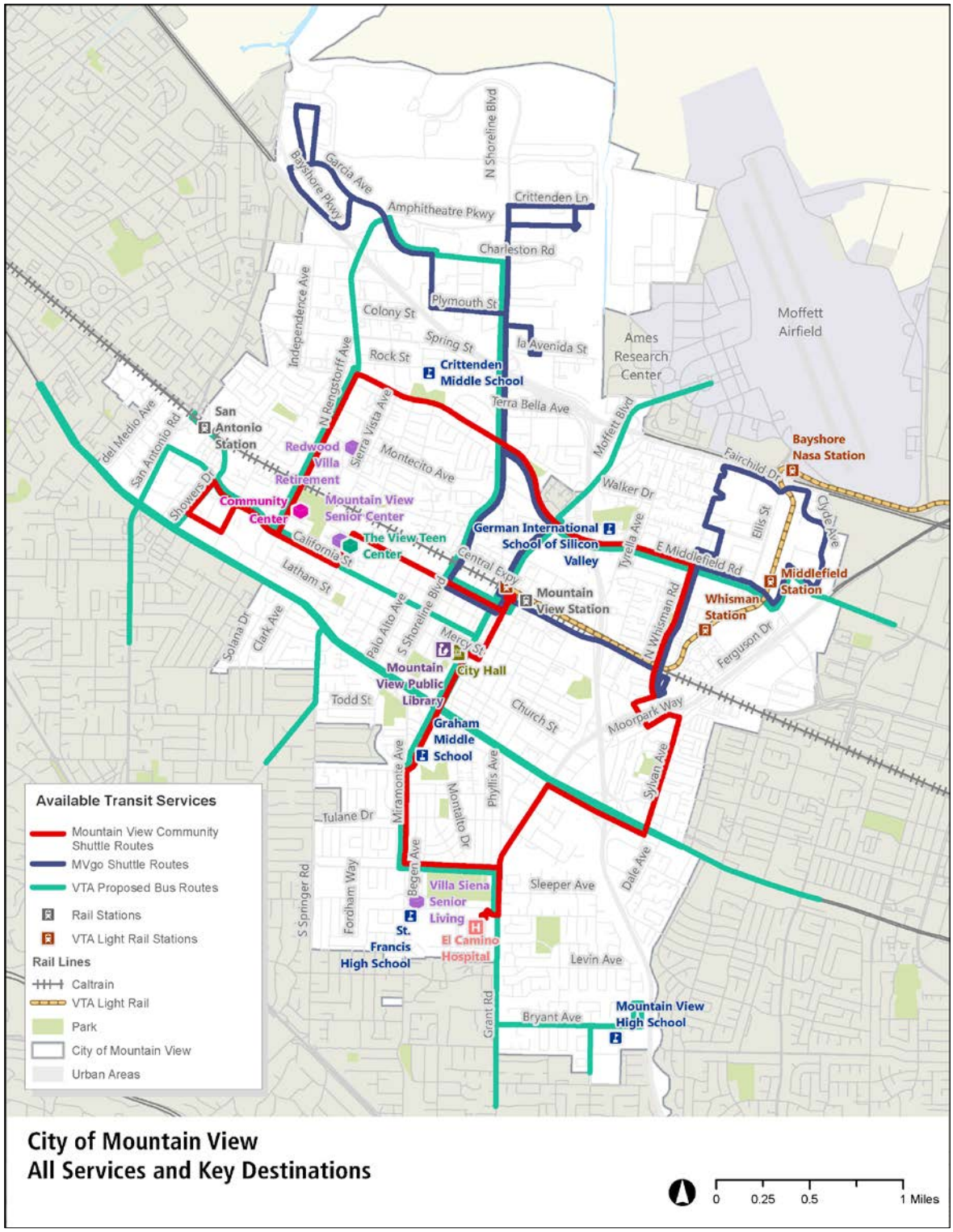


*Figure 11: Map of Future Transit Service in Mountain View*



## MVgo

The MVgo shuttle service is operated by the Mountain View Transportation Management Association (MVTMA), a nonprofit organization supported by Mountain View businesses and landowners. MVTMA was established to reduce traffic on Mountain View streets, and the shuttle service is an important step toward that goal. All three MVgo shuttle routes operate between the Mountain View Transit Center and employment areas in the City during weekday commute hours. Spans and frequencies are summarized in Table 4. MVgo averages between 400 and 500 riders per day and about 9,000 to 10,000 riders per month. Every month of 2019[2] has seen a 10 to 20 percent decrease in ridership compared to the same month in 2018.

*Table 4: MVgo Service Spans and Frequencies*

| Route | Weekday | | Saturday | | Sunday | |
|---|---|---|---|---|---|---|
| | Frequency | Span | Frequency | Span | Frequency | Span |
| **East Bayshore** | 15 - 30 | 7:15 AM - 10:15 AM, 3:30 PM - 8:30 PM | – | – | – | – |
| **West Bayshore** | 20 - 30 | 6:45 AM - 10:45 AM, 3:00 PM - 8:30 PM | – | – | – | – |
| **East Whisman** | 15 - 25 | 7:15 AM - 10:45 AM, (Clockwise), 3:45 PM - 7:45 PM (Counter-Clockwise) | – | – | – | – |

## Caltrain

Caltrain is owned and operated by the Peninsula Corridor Joint Powers Board. Caltrain serves more than 30 stations between San Francisco and the City of Gilroy. The two Caltrain stations located in Mountain View–Mountain View Station and San Antonio Station–are considered the main transportation hubs within the City. Spans and frequencies for Caltrain service are summarized in Table 5.

*Table 5: Caltrain Service Spans and Frequencies*

| Route | Weekday | | Saturday | | Sunday | |
|---|---|---|---|---|---|---|
| | Frequency (High/Low) | Span | Frequency (High/Low) | Span | Frequency (High/Low) | Span |
| **Northbound Service** | 10 / 60 | 4:45 AM - 10:50 PM | 30 / 90 | 7:30 AM - 10:50 PM | 30 / 90 | 9:00 AM - 10:30 PM |
| **Southbound Service** | 10 / 60 | 6:00 AM - 1:30 AM | 30 / 90 | 9:30 AM - 1:30 AM | 30 / 90 | 9:30 AM – 11:00 PM |

[2] As of June 2019, the most recent data available at the time of this report's publication.

# Stakeholder Interviews and Community Survey

To gather community input for this study, Mountain View held stakeholder group discussions and distributed a community survey. These outreach efforts were designed to gather feedback on local transit and shuttle services and will be used in the service planning process to design transit service that is optimized for Mountain View residents, employees, and visitors. Stakeholder discussions focused on seniors and students, acknowledging their unique transportation needs, which often fall outside of typical commute patterns/hours.

## Stakeholder Interviews

Three stakeholder interviews were conducted to inform this study. To provide additional context to the City's sustainability goals the ESTF-2 taskforce contributed their input and suggestions. Additionally, the Youth and Senior Advisory Committees to the City Council were contacted to represent the needs of Mountain View youth and seniors.

**Environmental Sustainability Task Force 2 (ESTF-2)**: The feedback from ESTF-2 was closely aligned with the findings they issued in their final report in June 2018. Discussion participants communicated the importance of reducing SOV trips to meeting the City's sustainability air quality goals. Participants suggested improved coordination between Caltrain and VTA to strengthen transit service and said first/last mile connections to the Caltrain stations are critical to reducing or eliminating SOV trips to and from park-and-ride facilities. Another recommendation was introducing local transit service connections to Shoreline Park and the Sunday Farmers Market.

**Youth Advisory Committee (YAC)**: The youths participating in this discussion asked for shuttle extensions to Mountain View High and Los Altos High. Students reported VTA buses reaching maximum load and having to leave students behind. They suggested additional service supplementing VTA service could address the needs of these students. Students who use shuttle service reported that it otherwise generally met their needs, though they would like to see improved frequency.

**Senior Advisory Committee (SAC)**: Instead of a formal meeting with the SAC, it was decided that interested seniors participating in activities at the Senior Center provide input. The seniors participating in this discussion focused on a longer service span both in the morning and early evening. Many activities at the Senior Center begin before 10 AM and some participants would like to use the shuttle to go out to dinner. Service to additional destinations such as Shoreline Park and unserved residential neighborhoods was also raised.

The youth and environmental sustainability groups both expressed a desire for more frequent service (every 15 to 20 minutes) and a longer service span. While seniors would also like more frequent service, a longer service span was the consensus top priority. Another shared concern was the accessibility of the service. Discussion participants reported a lack of information/publicity as a barrier to usage. For example, members of the ESTF-2 group were not aware that the MVgo shuttles were open to the public.

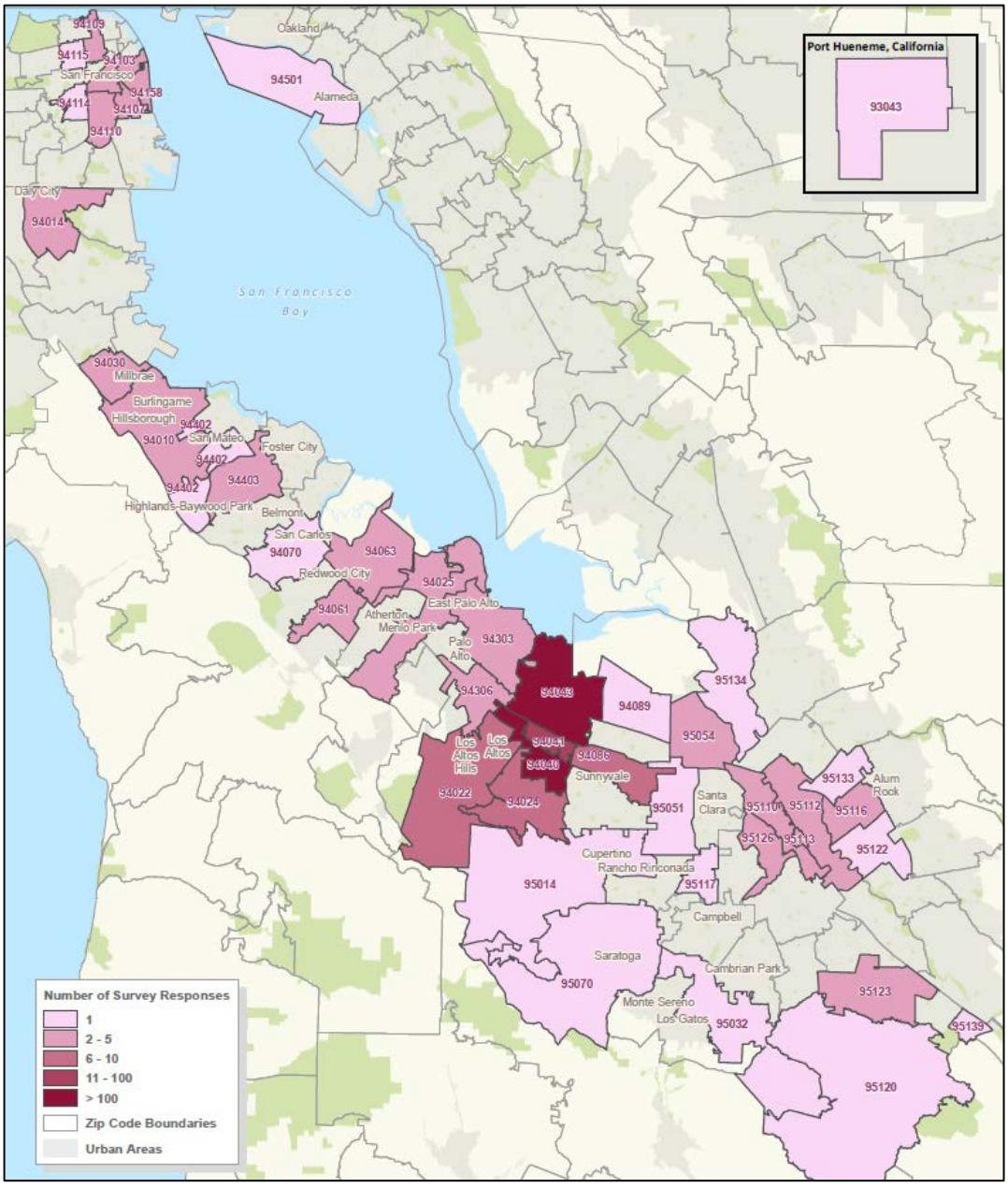
## Community Survey

The survey was designed to gauge the mobility needs of residents, non-resident employees, and visitors to Mountain View. The survey was open for about one month, from July 29 to August 30, 2019. In addition to publishing digital and paper advertisements, a link to the survey was distributed to local schools and posted on the City's social media outlets. Paper copies were also available at locations throughout Mountain View: City Hall, Public Works, the City Library, the Mountain View Community Center and Senior Center, and The View Teen Center.

### *Respondent Distribution*

In total, 628 people responded to the survey, with residents of ZIP codes 94040, 94041, and 94043 accounting for 70 percent of responses. (See Figure 12 for a map of the response distribution across the Bay Area by ZIP code.) Youth respondents (under 19 and over the age of 10) accounted for 10 percent of total responses. Eleven percent of all respondents and 13 percent of Mountain View respondents were seniors (ages 65 and older). Familiarity with the Mountain View Community Shuttle was higher among Mountain View residents (74 percent) when compared to all survey respondents (68 percent). Among Mountain View residents, 87 percent of those over age 65 were familiar with the shuttle and 71 percent of youth respondents indicated familiarity with the Community Shuttle.

*Figure 12: Survey Responses by ZIP Code*



### *Frequent Transit Usage by Provider*

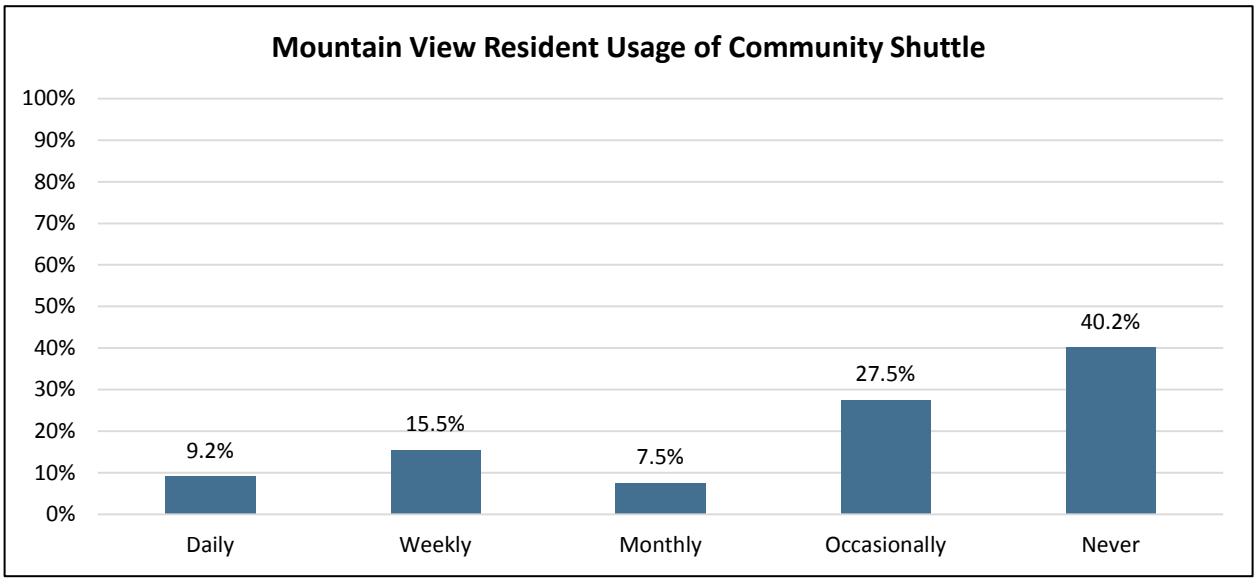
Respondents were asked which regional transit services they used at least once a week. Of all listed services (Community Shuttle, Caltrain, VTA bus/light rail, and MVgo shuttle), Caltrain had the most responses, as shown in Table 6.

*Table 6: Respondent Transit Usage by Provider*

| Service Provider | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| **Caltrain** | 36.2% | 29.5% | 17.3% | 8.1% |
| **Community Shuttle** | 22.1% | 24.7% | 32.1% | 29.3% |
| **VTA Bus/Light Rail** | 20.3% | 19.9% | 9.8% | 26.3% |
| **MVgo Shuttle** | 12.9% | 6.9% | 6.3% | 0.0% |

While the Mountain View Community Shuttle was the second most frequented form of transit among all respondents (22.1 percent) and City residents (24.7 percent), it was the most frequented form of transit for Mountain View seniors (32.1 percent) and youth (29.3 percent). Figure 13 shows the breakdown of Community Shuttle usage by all Mountain View residents. Less than ten percent of Mountain View respondents reported using the Community Shuttle daily.

*Figure 13: Mountain View Resident Usage of Community Shuttle*




### *Factors Contributing to Transit Use*

Respondents were asked how changes to ten different service factors would impact their transit usage. Table 7 summarizes the results of respondents who indicated a change in the factor would make it "extremely likely" or "somewhat likely" they would use transit more frequently. The most influential factors were improved frequency, proximity to preferred destinations, longer service span, and proximity to home/trip origin. While the data for all respondents compared to Mountain View residents

were largely similar, there were noticeable trends among Mountain View seniors and youth, compared to the general populations. Overall, every factor was less likely to encourage City seniors to ride transit more frequently than the total respondent population, with the exception of providing more comfortable vehicles and bus stops. Youth respondents indicated accessible information and improved safety would make them more likely to use transit at a higher percentage than all City responses.

*Table 7: Factors Contributing to Transit Usage*

| Factors | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| **More Frequent Transit** | 91.5% | 90.7% | 80.8% | 92.7% |
| **Transit Closer to Places I Want to Go** | 90.0% | 90.0% | 83.3% | 90.2% |
| **Extended Transit Hours** | 85.3% | 86.0% | 76.9% | 81.0% |
| **Transit Closer to Home** | 80.1% | 80.1% | 75.0% | 80.0% |
| **Better Connections to Regional Transit** | 74.3% | 72.7% | 66.0% | 64.1% |
| **Traffic Congestion** | 60.8% | 59.6% | 56.9% | 58.5% |
| **Easier to Find/Understand Transit Information** | 56.0% | 54.9% | 50.0% | 73.2% |
| **Gas Price Increase** | 40.7% | 39.4% | 34.0% | 39.5% |
| **Vehicles and Bus Stops More Comfortable** | 40.1% | 38.5% | 46.0% | 40.5% |
| **Safer Transit** | 38.0% | 38.0% | 30.0% | 51.4% |

### *Mountain View Community Shuttle Interest by Time of Day and Day of Week*

The Community Shuttle currently operates daily between 10 AM and 6 PM. This service span limits trip-making to midday and late afternoon trips. The survey asked respondents about the time of day and day of week they would be most interested in using transit service. The afternoon peak (between 3 and 7 PM) was the most popular time of day across all groups. The second most in-demand service period was the morning peak (between 6 and 9 AM). While most of the afternoon peak (three of the four hours) is covered by the current service span, none of the morning peak is covered. Respondents also indicated a sizable demand for transit service in the evening, after 7 PM. Responses are summarized in *Table 8.*

These results indicate that the current service span is not serving the full range of customer demand throughout the day. Expanding service earlier into the morning would enable students and commuters to use the shuttle for their trip to school or connection to Caltrain, respectively. Service later into the evening would capture regional commuters returning home to Mountain View after 6 PM on Caltrain or VTA as well as connecting non-resident employees in Mountain View to Caltrain outbound service at later hours.

*Table 8: Customer Demand by Time of Day*

| Time | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| **6am - 9am** | 59.1% | 58.7% | 41.1% | 66.7% |
| **9am - 12 Noon** | 50.0% | 53.6% | 64.3% | 23.8% |
| **12 Noon - 3pm** | 46.4% | 49.7% | 67.9% | 45.2% |
| **3pm - 7pm** | 78.5% | 79.0% | 69.6% | 83.3% |
| **7pm - Midnight** | 45.4% | 50.3% | 41.8% | 14.3% |
| **Midnight - 6am** | 6.0% | 7.2% | 3.6% | 0.0% |
| **Never** | 4.1% | 1.8% | 3.6% | 0.0% |

Community Shuttle service on weekdays generated the most interest, compared to weekend days, across all response groups (all survey respondents, City residents, City seniors, and City youth). See Table 9. Saturday service was more popular than Sunday service among all respondents, City residents, and City seniors. While a vast majority of City youth were interested in weekday service, only about a quarter (28.6 percent) showed interest in Saturday or Sunday service.

*Table 9: Customer Demand by Time of Day*

| Day | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| **Weekday** | 87.4% | 88.9% | 89.1% | 90.5% |
| **Saturday** | 56.8% | 63.7% | 70.9% | 28.6% |
| **Sunday** | 49.8% | 55.9% | 49.1% | 28.6% |
| **Never** | 4.3% | 2.1% | 3.6% | 2.4% |

### *Minimum Shuttle Frequency*

Consistent with industry-wide findings, Mountain View survey respondents indicated that improved service frequency was the factor most likely to encourage them to use transit more often. (See Table 7) The survey asked respondents to select the minimum frequency required for them to use the Community Shuttle. The service currently operates every 30 minutes on weekdays and every 60 minutes on weekends, and the survey findings indicate that the shuttle would need to operate at least every 15 minutes to be considered attractive to the majority of respondents. (About 47 percent indicated 15-minute frequency as their threshold, 32 percent would accept 30-minute, and 3 percent indicated 60-minute frequency was sufficient for them to use shuttle service. Combined, nearly 83 percent of respondents would use service that operates every 15 minutes or less frequently, representing the majority of respondents.) In our outreach, seniors placed a higher priority on longer service hours over frequency improvements.

*Table 10: Minimum Shuttle Frequency for Customers to Consider Shuttle Service*

| Frequency | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| **Every 10 minutes** | 13.5% | 13.6% | 1.8% | 21.4% |
| **Every 15 minutes** | 47.2% | 45.3% | 41.8% | 45.2% |
| **Every 30 minutes** | 32.2% | 36.3% | 49.1% | 31.0% |
| **Every 60 minutes** | 3.3% | 3.0% | 1.8% | 0.0% |
| **None of the above** | 3.8% | 1.8% | 5.5% | 2.4% |

## *Usage of Transportation Network Company (TNC) Services*

To better gauge the transportation landscape in Mountain View, survey respondents were asked how often they used services from TNCs such as Uber and Lyft. A majority of all respondents, City residents, City seniors, and City youth indicated they had either never used a TNC service or used them less than once a month. For those who do utilize TNCs, 'One to three times a month' seems to be the most common frequency. Those ages 65 and older (seniors) and between 10 and 18 (youth) used TNCs less than the average respondent and City resident, with zero percent of City seniors and 7.1 percent of City youth using Uber or Lyft at least once a week.

*Table 11: Frequency of TNC Usage*

| Frequency | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| **Every day** | 1.8% | 0.9% | 0.0% | 0.0% |
| **A few times a week** | 11.4% | 10.5% | 0.0% | 7.1% |
| **One to three times a month** | 24.4% | 24.1% | 13.0% | 19.0% |
| **Once a month** | 8.5% | 8.4% | 7.4% | 9.5% |
| **Occasionally, less than once a month** | 37.3% | 39.0% | 40.7% | 40.5% |
| **Never** | 16.6% | 17.1% | 38.9% | 23.8% |

## *Access to Caltrain and VTA Light Rail Services*

When asked how they access Caltrain and VTA light rail stations, walking and driving oneself were the most popular responses among all survey respondents (36.7 percent and 25 percent, respectively) and City residents (42.8 percent and 25.5 percent, respectively). City youth and seniors also reported walking or driving oneself as the top two responses, though these cohorts were more likely to use the Community Shuttle or be dropped off than other response groups.

*Table 12: Most Commonly Used Access Modes for Caltrain and VTA Service*

| Method | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| **Walk** | 36.7% | 42.8% | 41.2% | 38.9% |
| **Drive myself** | 25.0% | 25.5% | 27.5% | 27.8% |
| **Bike/scooter** | 10.0% | 10.2% | 2.0% | 5.6% |
| **Carpool/dropped off** | 8.8% | 8.3% | 15.7% | 13.9% |
| **MVgo Shuttle** | 6.5% | 1.2% | 2.0% | 0.0% |
| **Mountain View Community Shuttle** | 6.5% | 6.4% | 11.8% | 13.9% |
| **Take an Uber/Lyft/Taxi** | 5.6% | 5.7% | 3.9% | 2.8% |
| **VTA bus or light rail** | 4.9% | 4.3% | 0.0% | 5.6% |
| **Company Shuttle** | 0.2% | 0.0% | 0.0% | 0.0% |

## *Top Destinations*

Respondents were also asked to list destinations in the City of Mountain View that they would access via transit. Top destinations included: Downtown, San Antonio Center, Mountain View Transit Center (Caltrain Station), Mountain View High School, and Mountain View Civic Center. The Community Shuttle serves all of these locations except for Mountain View High School, which was listed by 46 percent of City youth. Popular destinations not currently served by the shuttle included: Shoreline Park, Rengstorff Center, Los Altos High School, and Googleplex.

*Table 13: Top Destinations Accessed by Transit*

| Destinations | All Respondents | All MV Residents | MV Seniors (Age 65+) | MV Youth (Ages 10-18) |
|---|---|---|---|---|
| Downtown | 28.7% | 30.5% | 29.5% | 20.5% |
| San Antonio Center | 25.8% | 28.8% | 29.5% | 7.7% |
| Mountain View Caltrain Station | 21.0% | 18.0% | 8.2% | 0.0% |
| Mountain View High School | 9.9% | 11.9% | 1.6% | 46.2% |
| Mountain View Civic Center | 9.3% | 11.0% | 13.1% | 5.1% |
| Grant Park Plaza | 7.4% | 9.0% | 14.8% | 0.0% |
| El Camino Hospital | 7.0% | 7.0% | 14.8% | 2.6% |
| Shoreline Park | 6.2% | 8.4% | 6.6% | 10.3% |
| Century Cinema 16 | 5.8% | 6.1% | 3.3% | 5.1% |
| Rengstorff Center | 5.2% | 6.7% | 11.5% | 5.1% |
| Los Altos High School | 3.5% | 3.5% | 0.0% | 12.8% |
| Crittenden Middle School | 3.3% | 4.7% | 0.0% | 15.4% |
| Miramonte Avenue & Cuesta Drive | 3.3% | 4.1% | 9.8% | 2.6% |
| Cuesta Park | 3.1% | 3.8% | 0% | 0.0% |
| Googleplex | 3.1% | 3.5% | 1.6% | 0.0% |
| German International School of Silicon Valley | 3.1% | 2.6% | 0.0% | 5.1% |

### *Free Response Feedback*

The survey also included two free response questions soliciting suggestions for improving the overall transit experience in Mountain View as well as connections to regional service (Caltrain, VTA light rail). Key trends among survey responses included:

- Improving weekend/weekday frequency,
- Installing/enhancing amenities (ex: add bus shelters and benches),
- Extending service hours (earlier morning/later night),
- Improving safety,
- Enhancing first/last mile services,
- Improving on-time performance, and
- Better public information for transit services (common response among City youth).

## Proposed Service Options

As the City of Mountain View moves forward in its transit evaluation process, several transit service improvement strategies can be considered to determine how to optimize service and resources to meet community needs. In particular, these strategies could focus on improvements for the travel needs of the senior and youth population as well as first and last mile connections to regional transit. Potential service options include:

- **Extend service hours**. A major criticism of the Community Shuttle is the limited hours of operation. Expanding the span of service hours, at least on weekdays, could make the Community Shuttle more functional for commuters, students, and other customers traveling during earlier morning and evening hours.
- **Increase frequency**. More frequent service was the top result for all survey respondents when asked about factors that would influence more transit use. Increasing frequency from every 30 minutes to every 15 minutes will increase ridership, although system productivity may drop slightly with the additional investment of resources.
- **Reduce redundancies between services.** Currently the Community Shuttle duplicates a VTA route between El Camino Hospital and the Mountain View Caltrain Station. Although the shuttle does not charge a fare, whereas VTA does, eliminating overlapping service could free up resources to serve other transit needs.
- **Fill service gaps.** Despite the success of the Community Shuttle, there are deficiencies in access that could be addressed by modifying existing routes. For example, access to the senior and teen centers is circuitous from all areas north of Caltrain. Although service along Montecito did not generate significant ridership for VTA, its function for local trip-making could be considered.
- **Improve connections to regional service.** The limited service span of the Community Shuttle precludes customers from using the shuttle to access Caltrain for most traditional commute trips, primarily due to the lack of morning peak hour service. Many customers relying on transit for first/last mile connections cannot effectively use the full regional network due to the Community Shuttle's limited hours. Furthermore, many residential areas north of the Caltrain line and along El Camino Real do not have direct access to the Caltrain stations through existing VTA and shuttle service.

- **Enhance First/Last Mile Connections.** Strategies for addressing the increased demand for first/last mile connections include:
  - Higher levels of MVgo service to employment centers such as North Bayshore and East Whisman, which could include larger vehicles and potentially a BRT service model.
  - Use of on-demand transit service for local residents to access the Mountain View Transit Center, increasing the number of drop-offs and reducing demand for parking spaces at the park-and-ride facility.
  - Continued expansion of enhanced bicycle and pedestrian facilities.

- **Explore the potential applications of microtransit.** For many lower density neighborhoods, conventional fixed-route service isn't viable because it would yield very little productivity. New mobility options may be more financially practical for serving these areas.
- **Coordinate or integrate local shuttle service.** MVgo schedules and routes are determined by MVTMA members, however, the shuttles are open to the public and often function as a local transit service. Mountain View should consider opportunities for integrating or better coordinating services to achieve operational efficiencies and provide more frequent and/or more extensive service.
- **Grow public awareness through improved communication.** With multiple regional, local, and private transit options in Mountain View, a coordinated communication or marketing strategy could improve service legibility to customers. This could include better integrated branding. To replace SOV trips, transit must be both perceived as convenient as well as truly convenient, in practice. A map or rider guide reflecting all service providers operating within, through, and near Mountain View with and clear fare and transfer information could improve public understanding. Furthermore, an integrated web presence, pulling information from all providers into a central location would be useful for local customers and visitors, alike. This was a repeated concern from younger residents, so the City might also consider outreach/education events and rider training activities coordinated with the local schools.

## Financial Considerations

With Google's full support, funding for operation of the current Community Shuttle service has been secured through 2024. This funding should sustain existing service levels for the next five years. Any planned service changes must be cost-neutral or remain contingent on acquiring additional funding sources. Extending service hours, improving frequency, or adding routes would all require additional vehicles and, thus, additional funds. Opportunities to secure funding for short-term improvements and/or the long-term costs of sustaining the service after 2024 include:

- **City of Mountain View Measure P:** The City's Measure P, a per-employee business tax, is estimated to generate $6 million per year. City Council has indicated it will spend 80 percent of this revenue on transportation for infrastructure and shuttle operations. This could be a stable operating revenue source for shuttle service. However, since Google is only committed to funding the shuttle until 2024, it may be more strategic to set this revenue aside for sustaining operations after Google funding ends in 2024.
- **VTA Measure B Sales Tax Transit Operations Program**: Two programs within the Measure B Transit Operations Program include:

- Expand mobility services and affordable fare programs for seniors, persons with disabilities, students and low-income riders.
- Support new/innovative transit service models to address first/last mile connections and provide transit services for the transit dependent, vulnerable populations and paratransit users that is safe and accountable.

Both enhancements to the Community Shuttle or new mobility options to provide access to Caltrain could be funded through this program, however the amount of funds are limited. Funds will be distributed through a highly competitive discretionary grant program and each grant will be for a limited time frame requiring resubmitting applications periodically to sustain successful services.

**Bay Area Air Quality Management District Vehicle Trip Reduction Grant Program:** A competitive program within the region, grant funding under this program supports several community and rail feeder shuttles throughout the Bay Area. Enhancements to the Community Shuttle service or new mobility options to provide connections to Caltrain would both be eligible for these funds. As with Measure B, the amount of funds are limited, so funds will be distributed through a highly competitive discretionary grant program and each grant will be for a limited time frame requiring resubmitting applications periodically to sustain successful services.

- **Fares:** Customers currently ride Community Shuttle service for free. Establishing a fare would generate revenue to be re-invested in providing better and/or continued service but could also negatively impact ridership if the fare is unaffordable to customers, decreasing access and customer perception of convenience. These ridership losses might be made up if the service improvements are implemented concurrently and are effective in attracting more riders.

  There are also costs to introducing a fare, including the capital cost of procuring/installing fare collection systems and the operating cost of their ongoing maintenance. New cashless systems that utilize smart phones and/or smart cards are likely the most cost effective, though these solutions require equity considerations for unbanked riders and those without smartphones.

## Conclusion

The City of Mountain View is well-positioned to tackle its goal of reducing SOV trips by increasing transit ridership/usage. With regional providers connecting Mountain View to other communities/destinations in the Bay Area, the City's primary tasks are providing effective connections to these services as well as local service.

The community outreach efforts conducted for this study demonstrated that residents will use transit if it is easy to understand and easy to use. A key opportunity for growing transit ridership is through improved frequency and span that better match the service levels of regional providers like Caltrain and VTA, ensuring the first/last mile connection that makes transit attractive for all trip purposes at all times of day. Employees commuting to the Mountain View area for work would also benefit from earlier shuttle service so they can utilize transit for both their morning and evening commute. It is rare for a commuter to use transit for only one half of their trip—if they can't use transit to get to work, they likely won't use it to get home from work.

Increasing frequency, span of service and connectivity are also desired by seniors and youth for internal trips within Mountain View. For example, many activities at the Senior Center begin before 10 AM and

access from areas north of Caltrain requires long circuitous routing. Seniors also expressed a desire for slightly later service. While the shuttle is not designed for school trips, youth participants expressed frustration with crowding on VTA that resulted in students not being picked up. Mountain View youth also desire better late afternoon and early evening service to accommodate after school activities.

The next step in the City's planning process is identifying service alternatives. The survey results and stakeholder feedback have provided a clear case for the specific transit demands of different user groups and helped shape some preliminary service options. Funding short-term service improvements and any level of service beyond 2024 is the City's key challenge. A preferred service plan must provide options that correlate to the level of funding the City chooses to pursue and the sources it is ultimately able to tap.