



City of Palo Alto

City Council Staff Report

(ID # 11307)

Report Type: Informational Report

Meeting Date: 5/26/2020

Summary Title: 2019 Palo Alto TMA Annual Report

Title: 2019 Palo Alto Transportation Management Association Annual Report, 2019 Downtown Commute Survey, and 2020 Strategic Business Plan Summary

From: City Manager

Lead Department: Transportation Department

Recommendation

Staff recommends that Council receive this informational report containing the Final 2019 Annual Report, Fall 2019 Downtown Commute Survey, and 2020 Strategic Plan Summary of the Palo Alto Transportation Management Association (TMA).

Executive Summary

The Palo Alto TMA implements programs to reduce single-occupancy vehicle (SOV) trips to and from Palo Alto. The funding agreement between the Palo Alto TMA and the City of Palo Alto restricts the use of City funds to trip reduction programs in the Downtown area only and requires the TMA to report annually on the use of these funds. The attached Annual Report covers the 2019 calendar year, detailing how public funds were spent to support SOV trip reduction in Downtown including the results of the Fall 2019 Downtown Commute Survey. The attachment also includes a summary of the 2020 TMA Strategic Business Plan.

Background

Following direction from the City Council in 2013, staff worked to develop transportation demand management (TDM) strategies to encourage alternatives to solo driving as part of a multi-faceted effort to address traffic and parking concerns in the downtown area and the city at-large. The development of a TMA for Palo Alto was seen as a key component of this approach, which the City funded via a \$499,880 contract with consultants Moore Iacofano Goltsman, Inc. (CMR #4766 August 11, 2014). After the TMA was formed in January 2016, this contract continued to fund sub-consultant Wendy Silvani, who served as the TMA's part-time executive director. The TMA hired permanent part-time staff in April 2018. This executive director resigned due to family illness in July 2018, and the TMA was able to hire a new executive director immediately to provide continuity of leadership.

In June 2016, Council authorized the City Manager to formalize the provision of additional City funding for TMA programs by executing a funding agreement between the City of Palo Alto, the Silicon Valley Community Foundation (SVCF), and the Palo Alto TMA. Because the TMA was not yet an approved Section 501(c)(3) organization (its application was pending with the Internal Revenue Service), the TMA operated as a program of SVCF. SVCF held and administered a fund restricted to specific charitable purposes and had legal discretion and control over the restricted account. When the TMA received its formal 501(c)(3) status, SVCF ceased to be the organization's program sponsor and to act as the TMA's fiscal agent.

The City Council approved an agreement with the Palo Alto TMA and the Silicon Valley Community Foundation (SVCF) in June 2016 to provide \$100,000 in funding for TMA programs to reduce single-occupancy vehicle (SOV) commute trips to and from downtown Palo Alto. Under a subsequent amendment, the City provided an additional \$100,000 to support the TMA's work in 2017. The City Council adopted an FY18 budget that included \$480,000 for the Palo Alto TMA to continue to support its efforts to reduce SOV commute trips using a variety of strategies. An amended and restated agreement signed in 2017 incorporated this approved funding, extended the agreement's term and set forth the parties' obligations over the remaining years. This 2017 funding agreement delegated authority to the City Manager to amend the agreement to add funding if the Council chose to budget additional funds for future fiscal years and to remove the SVCF as a party once the TMA received IRS section 501(c)(3) nonprofit status and no longer required SCVF to act as the TMA's fiscal agent. In December 2018, the agreement was amended to incorporate additional funds allocated for FY19 and to reflect the fact that the SVCF no longer serves as the financial agent for the TMA now that the TMA is a non-profit.

In April 2019, the Council Finance Committee received a presentation from the TMA and provided feedback on the TMA Strategic Plan. On May 15, 2019, the Finance Committee recommended an increase in employee parking permit rates to provide the TMA additional funding of up to \$180,000, for a total of \$660,000 annually. On June 17, 2019, the Council voted to increase the FY20 budget recommendation by \$90,000 from the University Avenue Parking Permit Fund for a total amount of \$750,000. In July 2019, the agreement was amended to reflect the Council's appropriation of \$750,000 for FY20.

Discussion

This informational item transmits the 2019 TMA Annual Report (Attachment A), including commute program data, results and analysis of the Fall 2019 Downtown Commute Survey, and a summary of the 2020 Strategic Business Plan. These reports are required under the TMA's funding agreement with the City. In the past year, the TMA has used City funds to purchase transit passes for low-income workers, supporting their use of transit, and to subsidize other programs such as carpooling and ride-share aimed at increasing all downtown commuters' use of alternative modes of transportation.

Data from the 2019 Downtown Commute Survey is included in the TMA Annual Report and is one of two ways that the TMA has been measuring its effectiveness. Emulating SRPGo's "outreach-focused" commute survey, the TMA's Fall 2019 survey done in-house by TMA staff cost 40% less than using an outside vendor, and the methodology was successfully modified to increase program participation by downtown employees by 30% by encouraging respondents to directly enroll in TMA programs via links in the survey. Because this new outreach-focused methodology tripled the overall response rate, and especially those of service and technology commuters who were not yet participants in TMA programs, the survey data show an increase in downtown SOV commute mode share (52% in 2019 vs. 49% in 2018). For reference, the SOV rate in 2015 was surveyed to be 57%. Similarly, given the new survey methodology that captures more SOV commuters, the data show a decrease in transit usage (25% in 2019 vs. 27% in 2018). Transit mode share in 2015 was 18%. In addition to this survey, the TMA tracks the transit passes it distributes and commuter participation in a variety of other programs. Using this program-generated data, the TMA estimates that during the four quarters of 2019, over 300 daily SOV trips were converted to other modes through TMA programs. The peak quarter of January through March saw 386 daily SOV trips converted, and the lowest quarter of July through September reported 307 daily SOV trips converted. April through June and the final quarter of 2019 posted approximately 330 daily SOV trips converted using TMA programs.

The annual report also shares the outcomes of a privately funded \$100,000 pilot program that demonstrated the demand for the TMA's programs in the California Avenue Business District from March to October 2019. The successful program ran from March through October of 2019, encompassed 20 businesses, and quickly surpassed its goal of distributing 50 transit passes per month during its second month. The TMA Strategic Plan summary discusses growth areas for the organization including expansion to the California Avenue Business District pending City funding availability.

Policy Implications

The funding agreement between the City and the Palo Alto Transportation Management Association (TMA) requires that the TMA strategic plan be regularly updated. In addition, the transportation demand management (TDM) services provided by the TMA are consistent with the following Comprehensive Plan policies and programs:

Policy T-1.1 Take a comprehensive approach to reducing single-occupant vehicle trips by involving those who live, work and shop in Palo Alto in developing strategies that make it easier and more convenient not to drive.

Policy T-1.2 Collaborate with Palo Alto employers and business owners to develop, implement and expand comprehensive programs like the TMA to reduce single-occupant vehicle commute trips, including through incentives.

Program T1.2.1 Create a long-term education program to change the travel habits of residents, visitors, shoppers and workers by informing them about transportation alternatives, incentives and impacts. Work with the PAUSD and with other public and private interests, such as the Chamber of Commerce and Commuter Wallet partners, to develop and implement this program.

Program T1.2.4 Evaluate the performance of pilot programs implemented by the Palo Alto Transportation Management Association and pursue expansion from Downtown to California Avenue and other areas of the city when appropriate.

Program T1.2.6 Pursue full participation of Palo Alto employers in the TMA.

Policy T-1.13 Encourage services that complement and enhance the transportation options available to help Palo Alto residents and employees make first/last mile connections and travel within the city for daily needs without using a single-occupancy vehicle, including shuttle, taxi and ridesharing services.

Policy T-2.2 As part of the effort to reduce traffic congestion, seek ongoing funding and engage employers to operate and expand TMAs to address transportation and parking issues as appropriate in the City's employment districts.

Program T2.2.1 Work in partnership with the Palo Alto TMA and Stanford University to aggregate data and realize measurable reductions in single-occupant vehicle commuting to and from Downtown and in the Stanford Research Park.

Policy T-5.5 Minimize the need for employees to park in and adjacent to commercial centers, employment districts and schools.

Program T7.1.1 Expand transportation opportunities for transit-dependent riders by supporting discounts for taxi fares, rideshare services and transit, by coordinating transit systems to be shared by multiple senior housing developments, by maintaining a database of volunteer drivers and other transit options.

Resource Impact (as needed):

A total of \$750,000 was budgeted for FY20 from the University Avenue Parking fund. TMA funding for FY2021 will be considered in the annual budget process and is subject to Council approval.

Timeline

The funding agreement between the City and the TMA lasts through the end of Fiscal Year (FY) 2020 (June 30, 2020).

Environmental Review

This is an informational item, and no action will be taken, therefore no environmental review is required.

Attachments:

- Attachment A: 2019 TMA Annual Report, Survey, & 2020 Strategic Plan Summary



Calendar Year 2019 Annual Report

Version 1.08. Short URL to this document: <https://bit.ly/PATMA2019report>

By Steve Raney and Kruti Ladani

SUMMARY: '19 Annual Report & '20 Strategic Plan

This five-page summary provides Palo Alto staff and Council with the most important portions of the TMA's 2019 Annual Report and 2020 Strategic Plan. Included in this section: 1) How the TMA will help The City, 2) Cost-saving offers from the TMA to The City, 3) Requests for guidance, 4) The TMA's productive use of funds, 5) The Fall 2019 downtown commute survey.

Summary.1. 2020 Strategic Plan Summary: TMA will help The City achieve budget and policy objectives

The TMA will accelerate Palo Alto economic recovery from COVID-19

On multiple occasions, Council has requested special support for hard-hit local, service, and small businesses. The TMA is an essential part of The City's business support toolkit. The TMA is working hard to support current struggling businesses (for new teleworkers, we have added coaching and technical support office hours). Supporting University Ave and Cal Ave businesses is vital to getting the economy back on track. The TMA will accelerate economic recovery by providing Palo Alto with a competitive hiring advantage over cities without TMAs. Employers and employees testify¹ to the TMA's crucial role:

- "The PATMA subsidies are amazing. Thanks for helping reduce traffic and conserve energy!!!"
- "The TMA provides an amazing program! Having a Caltrain pass is SO HELPFUL, especially the days when I'm called off early. Before this program, there were days when I was paying more to get to work than I was making at work."
- "This is a fantastic program! I wish more cities would offer this assistance to people working in their cities. This is a great help!"
- "Without this program, I would not be able to work down here in Palo Alto. So KEEP this program ALIVE!"

Perceived employee risk starts when commuters leave their home, not just when they enter their office. The TMA will guide employers on safe return-to-workplace practices that increase employee confidence.

The TMA's groundbreaking federally funded social equity research² found indications that rehiring service workers will be unusually difficult because idled workers will move out of the Bay Area. "In the Bay Area from 2000 to 2015, there was a large displacement of African American and Latinx residents from the urban core to the far outer edge of the Bay Area. This displacement increased commute distances. Of the low-income people of color who moved during the period, *30 percent moved entirely out of the Bay Area.*"

The TMA will help deliver on the adopted City S/CAP Key Actions for Mobility:

MOB1 - Implement solutions and incentives to reduce SOV travel

MOB3 - Fund the TMA with the goal of reducing SOV commute-trips downtown by 30 percent

MOB5 - Provide incentives for the appropriate mode of travel

¹ Testimonials From PATMA's 2019 Downtown Commute Survey

² Appendix C, "Social Equity and Accessibility: Low-income Transit Pass Program," for City of Palo Alto's Fair Value Commuting Project, October 2019

As the economy recovers, the return by commuters to the workplace offers a unique opportunity to establish new commute habits and to reduce SOV. PATMA will exploit this habit-formation period to further distance post-COVID from business-as-usual.³

The TMA will provide employers with **Return-to-Workplace** commute consultation, helping employers provide safe options as the transportation system recovers.

In 2020, the TMA will utilize our entrepreneurial skills to develop a ground-breaking, cost-effective, scalable bike commute incentive program (also supporting scooters and skateboards and bike-to-transit) with leading-edge mobile trip verification and commuter wallet mobile payment technology. Commuter incentives will be directed to local Palo Alto merchants. We will pursue grant funding to strengthen the program.

Summary.2. 2020 Strategic Plan Summary: Cost-Saving and Strategic Offers by the TMA to The City

The TMA can develop a **98%-Accurate Business Registry** for The City, kept current by the month or quarter. The TMA developed a door-to-door process for the commute survey that yielded valuable data for an update of the Business Registry. The City Auditor Report found the current Business Registry dataset to be unreliable as did PATMA. Because of the extreme fiscal circumstances, The City may be able to negotiate a cost-reduction from the current contract.

- Such a registry will be a vital tool in gauging the strength of economic recovery within the city.
- A current contact person for each employer can allow the TMA to collect important public health information from businesses as well as provide more successful public health outreach to businesses.
- Such a registry will inform The City's analysis and deliberations about a Business Headcount Tax.
- The TMA will work closely with property managers and will have access to new tenants to help form green commute habits.

The TMA can lead a streamlined update of The City's **TDM Program, Ordinance**, and **SB743** implementation. Because of the extreme fiscal circumstances, The City may be able to negotiate a cost-reduction from the current contract.

- The TMA has analyzed best practices for TDM Programs, Ordinances, and SB743 implementation in ten nearby cities. The analysis covers fines, occupancy triggers, annual reporting, driveway count methodology, commute survey methodology, commute program expenditure reporting, and cost-efficacy reporting. We have identified the need to refine ITE Trip Generation in a post-COVID world with increased telework. Hence the TMA can lead a simple process to identify best practices from those cities. The TMA has unique expertise in next-generation employer commute program software that can provide a precise daily commute dashboard, calculating VMT/GHG for each employee with knowledge of commute mode and vehicle make/model/mpg.
- The TMA can convene the nearby cities and the Manzanita Talks effort to progress consensus towards consistent, standardized TDM Programs.
- Following the example of Santa Monica's TMA, the TMA can undertake the majority of the city's TDM Compliance work. SB743 implementation requires increased TDM Compliance effort.
- The TMA can develop Accela Smart City TDM Compliance workflow automation software, providing a sortable open-data dashboard with GIS parcel search. Residents Arthur Keller and Neilson Buchanon have championed transparent accountability for The City's TDM Program. Because of the extreme fiscal circumstances, The City may be able to negotiate a cost-reduction from the current contract.

Council's April 13, 2020 S/CAP transportation discussion included guidance by Mayor Fine, Councilmember Cormack, and City Manager Shikada on **congestion pricing** and behavioral "sticks." The TMA offers to provide a unique, streamlined pricing analysis where different policies are ranked on dimensions including {political viability, VMT/GHG impact, cost-efficacy, social equity, ease-of-implementation, and breadth of applicability}.⁴ Policies for consideration include: parking meters, gas tax increase, internal-combustion-engine-free electric-vehicle-only parking days, cordon charging (East Palo Alto and Mountain View have considered), mandatory work from home, per-mile Road User Charge, auto insurance that changes behavior, workplace SOV

³ The TMA is a thought-leader on the commute ramp up as shelter-in-place loosens and on post-COVID commuting, *Commuting after COVID-19: The pattern will change, but not dramatically*, https://medium.com/@steve_52928/commuting-after-covid-19-28cf16a6b9b0

⁴ "Rank Eight Congestion Reduction Pricing Policies via the Delphi Method," Steve Raney, ITS World Congress, #AM-SP0789, Nov 2017.

charge, workplace parking cashout, and capping SOV commuting at 50%. A stakeholder input process will comprise an essential part of the policy ranking.

Summary.3. 2020 Strategic Plan Summary: Requests for Policy and TMA Guidance from The City

In support of economic recovery and S/CAP, should The City modify the PATMA/City funding agreement to allow the use of City funds beyond downtown Palo Alto? Permissions would allow commute reduction in all of Palo Alto, including **Cal Ave** (excluding SRP).

In support of S/CAP and The City's **Bicycle + Pedestrian Transportation Plan** (with the unrealized 2012-20 goal to double bike commute trips):

- should staff be provided with discretion to leverage up to \$25,000 of TMA budget for use as "cost-sharing" or "matching funds" for grant proposals for cost-effective pilots?
- Should The City study conversion of City-controlled automobile parking spaces into secure bike parking?
- In the future, should The City initiate a Downtown Area Plan process with improvements for biking?

There is scant US precedent for TMAs generating fee-for-TDM-service, except where there is a government mandate. Council mandated that Hotel Parmani and the new Marriotts join the TMA. The President Hotel developers approached the TMA, and we developed a \$40K/year TDM program for them (should they obtain approvals). For approvals going forward, The City may enact more **join-the-TMA mandates**, ensuring that new buildings pay for themselves without City-provided TDM subsidy?

Eight out of twelve Bay Area TMAs operate shuttles. Over time, should The City transfer **shuttle operation** from The City to the TMA?⁵

Summary.4. 2019 Annual Report Summary: The TMA's Productive Use of City Funds in 2019

The TMA is very grateful for The City's generous FY2020 funding of \$750,000.

In our Annual Report, the TMA welcomes the opportunity to justify our existence every year. Our maturing TMA is taking more than 333 cars off the street: For the last quarter of CY2019, 333 cars were removed, 221.0 by the transit pass program, 9.9 by Scoop, 95.1 by Waze Carpool, and 7.3 by the Lyft after-hours program. We also proved the demand for our transit pass program on Cal Ave, resourcefully utilizing \$100,000 in private sector funding. Council pushed us hard for better metrics, so we developed industry-best metrics - Councilmember Filseth champions changing TDM from "effort-based" to "performance-based." Collaborating with the City, we have created an ongoing expert evaluation. In the entire industry, our Annual Report is unique in providing transparent, quantified analysis. The TMA is more than twice as cost-effective as adding a new \$33M parking structure and more cost-effective than the large employer TDM efforts. During SRPGo's 2019 presentation to Council, Mayor Fine asked SRPGo to adopt PATMA metrics.

In CY2019, the TMA:

- Lowered our hourly labor costs significantly. Our hourly costs are one-half of other Bay Area TMAs
- Decreased our management overhead percentage-of-expense significantly, down to a svelte 10.5%
- Lowered the cost of our annual commute survey by 40% while tripling the number of responses and increasing program adoption by 30%
- Brought in \$40,000 via a Federal Transit Administration Grant
- Brought in \$54,000 from Palantir
- Brought in \$50,000 from Facebook
- Collected more than \$30K in Board dues
- Modified our bylaws to allow fee-for-TMA-services in adjacent cities, offering our services to East Palo Alto nascent TDM effort.

We recruited a new TMA staffer, Kruti Ladani, who has exceeded expectations. We renewed our talented Board of Directors:

⁵ Altrans TMA Inc, providers of PATMA staffing, operates numerous shuttle services. In 2019, The Altrans Mountain View Community Shuttle carried 446,000 riders: [Annual 2019 Operations Report](#).

- bringing in five new Directors: Premier Property's Brad Ehikian, Westin's Amit Patel, Cal Ave restaurateur Zareen Kahn, Amazon/A9's Matthew Weinberg, and Palantir's Carmel Moyal,
- keeping The City's Michelle Flaherty,
- while seeing four directors depart: Lemonade's Rob George - who left to increase The City's employee retention and commute program, Palantir's Bob McGrew, Google's Lucy Noble, and IDEO's Jonah Houston.

At the staff and Board level, we have increased the TMA's diversity and expanded perspectives to cover a larger portion of The City.

As far as financial performance, in CY 2019, PATMA had \$848,887 in revenue with \$791,385 in expenses. 74% of our budget went straight to commuter subsidies.

No Bay Area TMA obtains city General Fund allocations. Some cities provide TMA funding via property-based improvement districts. To fund PATMA, Council raised downtown parking permit prices (user fees paid for by for-profit beneficiaries) and gave that increased revenue to the TMA. Compared to all other forms of U.S. TMA funding, this mechanism is the most-directly aligned with behavior change away from SOV commuting.

PATMA continues to occupy a unique position. In the entire US, one other city, South Bend, has joined Palo Alto in providing a full-subsidy transit pass program. Bloomberg Philanthropies is funding the South Bend pilot program that is one-quarter the size of Palo Alto's, providing transit passes and subsidized Lyft rides to late-night workers and employees with odd shifts.

Employers are spending millions on TDM. The 2021 FASTER regional 1% sales tax has a novel TDM provision where employers will be required to pay about \$360/year on non-SOV commuters and contribute the same \$360 (into a regional TDM funding pot) for each SOV commuter. The TDM provision will make this expenditure more transparent to the public. The TMA provided expert analysis/guidance on FASTER reporting/metrics to the regional ACT NorCal TDM association, SVLG, and Bay Area Council.

Summary.5. 2019 Annual Report Summary: Fall 2019 Downtown Commute Survey

SRPGo uses their commute survey as an outreach tool. States Jamie Jarvis, "Our survey is our number one engagement and outreach opportunity. That's why we emphasize continuing to increase the survey response rate." In 2019, PATMA converted the downtown survey also to be outreach-focused, generating program growth over the next three months of 31% for Waze Carpool, 38% for Transit Passes, and 70% for After-hours Lyft. The survey's motto, "Take the survey today, try a new mode tomorrow morning."

In previous years, EMC Research conducted the Commute Survey. In 2019, PATMA staff undertook the survey work in-house:

- tripling response rate from 486 to 1,471
- quadrupling the number of participating employers from 44 to 156.
- reducing the cost by 40% from \$38,500 to \$22,500
- generating more than 30% commute program growth.

To increase the response rate, TMA staff laboriously undertook block-by-block, door-to-door canvassing resulting in a dataset of 800 downtown businesses that was provided to The City to **help update the Business Registry**. The previous one-size-fits-all survey instrument created confusion as some employers have well-developed in-house TDM programs, and only some employees qualify for the TMA's low-income programs. In response, the TMA added survey branching to segment employees and also created custom surveys to meet the needs of different employers. The TMA went so far as to create employer-specific surveys for The City, Palantir, and A9 that combine employer program questions with TMA program questions. Within those three custom surveys, respondents were motivated to contact their employer or the TMA about specific programs. Further, the TMA enabled Palantir and A9 to bring the survey behind their firewalls so that they could meet their data protection/privacy requirements while still providing the same survey data to the TMA as other employers. PATMA's methodology is unique in the U.S.

The commute survey segments downtown into government, light office, service, and technology employers. Government and light office SOV mode share decreased from 2018 to 2019. Increased response rate within an

employer increases resultant SOV mode share because proud non-SOV commuters are the first survey responders. Service response rate tripled, and technology quadrupled, resulting in higher SOV mode share. Specifically for service employers, previous surveys focused on participating employers. Specifically for technology, a much wider variety of small, medium, and large tech employers participated in 2019, where small/medium do not have the internal TDM programs of larger employers.

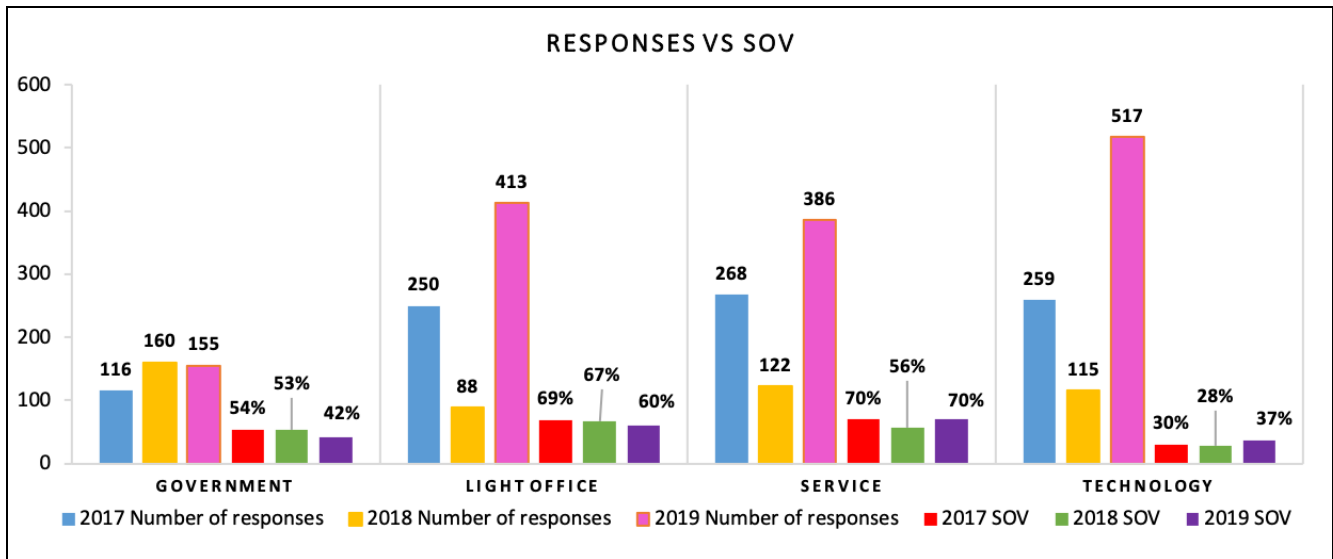


Figure Summary.1: Number of responses and SOV mode share by subtype, 2017-19

PATMA was happy to go well beyond the contractual requirements for the Annual Survey, surveying non-downtown City staff {MSC, Community Center, libraries, etc}. The City's downtown workers have 42% SOV commute mode share. As would be expected, non-downtown staff with fewer commute alternatives have 78% SOV share.

Summary.6. The rest of this annual report

The three numbered sections of the annual report cover:

- Program Results
- the Cal Ave Transit Pass Program Pilot
- Bike Love Active Modes Pilot.

Also, three appendices are provided covering:

- Commute Survey Details
- Downtown Employment Headcount
- the report entitled "Social Equity and Accessibility: Low-income Transit Pass Program," prepared for The City's Fair Value Commuting Project, part of the Federal Transit Administration's Mobility on Demand Sandbox program.

Section 1: Program Results

1A. Downtown Cars Removed, Commute Program Notes, Mode Shift, VMT/GHG Reduction

Commuters shifted from
SOV

PATMA Program	Q1 '18	Q2 '18	Q3 '18	Q4 '18	Jan-Mar'19	Apr-Jun '19	Jul-Sep '19	Oct-Dec '19
Transit pass subsidy	90.0	100.0	149.0	227.3	238.0	199.7	185.0	221.0
Scoop	43.2	42.4	52.5	50.4	73.6	64.5	38.4	9.9
Waze Carpool	10.8	17.3	32.7	44.1	65.5	52.6	75.6	95.1
Lyft	5.5	5.9	7.3	10.4	9.3	9.4	8.2	7.3
total	149.5	165.6	241.6	332.2	386.5	326.2	307.3	333.3
Transit/Lyft service mode shift	4.77%	5.29%	7.82%	11.89%	12.37%	10.46%	9.66%	11.42%
Scoop/Waze office mode shift	1.80%	1.99%	2.84%	3.15%	4.64%	3.90%	3.80%	3.50%

Vehicle Miles Traveled

PATMA Program	Q1 '18	Q2 '18	Q3 '18	Q4 '18	Jan-Mar'19	Apr-Jun '19	Jul-Sep '19	Oct-Dec '19
Transit pass subsidy	138,413	153,792	229,150	338,681	366,025	307,123	284,515	339,880
Scoop	51,910	52,623	64,131	60,582	87,033	79,949	47,639	11,927
Waze Carpool	15,050	20,236	83,527	106,752	72,785	112,063	141,010	153,183
Lyft	1,082	1,200	1,475	2,066	1,960	2,171	1,710	1,098
total VMT reduced	206,454	227,850	378,283	508,081	527,802	501,305	474,874	506,088
total lbs GHG reduced	187,047	206,432	342,725	460,321	478,189	454,183	430,236	458,516
metric tons reduced	85	94	155	209	217	206	195	208
societal benefit	\$43,562	\$48,076	\$79,818	\$107,205	\$111,366	\$105,775	\$100,199	\$106,785

Table 1.1: Cars removed by TMA Program, Mode Shift, VMT/GHG reduction

- “Transit/Lyft service mode shift” is the percentage of service workers that are served by PATMA programs. This is calculated as the number served divided by the number of downtown service workers, which was estimated as 2,000 by PATMA in 2017.
- “Scoop/Waze office mode shift” is the percentage of office workers that are served by PATMA programs and is calculated as the number served divided by the number of downtown office workers, which is estimated as 3,000 by PATMA in 2017.
- “Societal benefit” is calculated as \$0.21 per VMT reduced.⁶

In addition to reducing cars downtown, in 2019, the TMA proved the ability to eliminate 60 or more cars from Cal Ave.

⁶ FHWA's Allen Greenberg provides an estimated \$0.211 benefit for each VMT reduced, broken out as A) \$0.101 for broad societal benefit from the reduction of: congestion, crashes, criteria air pollutants, noise and GHG, and B) \$0.11 individual driver benefit from reduced gas and auto insurance costs. From “Designing pay-per-mile auto insurance regulatory incentives,” Transportation Research Part D: Transport and the Environment, Volume 14D, 2009, pages 437-445.

Notes on the Downtown public transit subsidy program for low-income workers

'19 Transit Pgm	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Passes Activated	240	245	229	214	198	187	183	184	188	196	223	244
New applications	22	28	0	0	0	0	0	16	11	23	50	28
Turnover	23	23	16	15	16	11	4	15	7	15	23	7
Percent turnover	9.6%	9.4%	7.0%	7.0%	8.1%	5.9%	2.2%	8.2%	3.7%	7.7%	10.3%	2.9%

Table 1.2: Clipper Card monthly transit passes activated by month, 2019

To avoid running out of funds, we stopped accepting applications mid-way through February, and we resumed again in August.

Notes on Waze Carpool and Scoop

Google's Waze Carpool participation rose during 2019, while Scoop ridership declined. The TMA decided to focus on the Waze Carpool, ending the Scoop program. The TMA is still very enthusiastic about Scoop's long-term prospects - Scoop partners, including SRPGo, indicate that substantial Scoop ridership can be achieved in other locations. The TMA negotiated a contract update with Waze, yielding higher costs in 2020 that are still cost-effective compared to other TDM programs.

As of the end of 2019, 85 downtown employers participate in the transit pass program:

Employer	Passes	Employer	Passes	Employer	Passes
Sheraton	35	Coconuts Caribbean	2	HanaHaus	1
Westin Palo Alto	30	Creamery	2	Heinichen's Garage	1
Coupa Cafe	20	Design Within Reach	2	Houzz (Medallion)	1
Apple	15	La Strada	2	Il Fornaio	1
Crepevine	10	Medallion rug Gallery	2	Institute for the Future	1
Oren's Hummus Shop	10	Old Pro	2	La Selva	1
Verve	9	Onigilly	2	Landmark theater	1
Dntn Kindercare	7	PAMF - MIDA Industries	2	Lemonade	1
Dntn Streets Team	7	Pizzeria Delfina	2	Local Union 271	1
Reposado	7	Rejuvenation	2	MacArthur Park	1
Comm. Pharm. Walgrns	6	Tacolicious	2	Mac's smoke shop	1
Whole Foods Market	6	Tam Tam Restaurant	2	Mills the florist	1
Buca di Beppo	5	The Pace Gallery	2	Nola Restaurant	1
Lytton Gardens	4	Union Bank	2	Palo Alto Bicycles	1
MNT Studio	4	Walgreens	2	Palo Alto Club	1
Patagonia	4	Apercen	1	Palo Alto Creamery	1
Patxis Pizza	4	Avenidas	1	PATMA	1
Webster House	4	b8ta	1	Peninsula Creamery	1
Cardinal Hotel	3	Bare Bowls	1	Premier Talent Partners	1
Clement Hotel	4	Bell's Book	1	Rangoon Ruby	1
Dan Gordon's	3	Bryant Street Gallery	1	Reservoir Engr Rsrch	1
Gobble	3	Cafe 220	1	Rose & Crown	1
Gong Cha	3	Comerica Bank	1	Salt & Straw	1
JOYA Restaurant	3	Connie Ho MD	1	Steam	1
Keen Garage	3	Footwear	1	Tamarine	1
The Hamilton	3	Garden Court Hotel	1	The Tap Room	1
AT & T	2	Gleim The Jeweler	1	Watercourse Way	1
Bistro Maxine	2	GW & Wade, LLC	1	Yayoi	1
Channing House	2				

Table 1.3: 85 downtown employers participate in the TMA's transit program

1B. Cost-efficacy: Annual cost per each employee shifted away from SOV

PATMA Program Efficacy	Oct-Dec '18, non-SOV cost/yr	Jan-Mar '19, non-SOV cost/yr	Apr-Jun '19, non-SOV cost/yr	Jul-Sep '19, non-SOV cost/yr	Oct-Dec '19, non-SOV cost/yr
Transit Pass Subsidy - pass outlay	\$1,572	\$1,708	\$1,429	\$1,719	\$1,577
Waze Carpool	\$1,224	\$777	\$1,026	\$714	\$568
Scoop Program	\$2,729	\$1,830	\$1,920	\$1,920	\$1,860
Lyft Program	\$1,855	\$2,088	\$2,282	\$2,399	\$2,331

Table 1.4: Cost for one year's worth of non-SOV commuting (or freeing up one parking space)

1C. 2019 Income Statement

INCOME	CY 2019	EXPENSES	CY 2019
City of Palo Alto	\$677,500	TMA Management	\$82,986
Fair Value Commuting (FTA MoD)	\$39,981	Program Operation Labor	\$49,634
Google	\$10,000	Transit Passes	\$347,587
Facebook	\$50,000	Cal Ave Transit Pilot Labor	\$24,929
Palantir	\$63,990	Cal Ave Transit Passes	\$69,555
SVCF	\$7,416	Scoop	\$99,448
TOTAL INCOME	\$848,887	Waze Carpool (Google)	\$48,398
		Lyft	\$24,989
CY 2019 SURPLUS	\$57,502	Commute Survey	\$22,450
Administrative overhead	10.5%	Fair Value Commuting Research	\$8,284
Direct commute benefits	\$589,977	Rent, office, insurance, legal	\$13,126
% Direct commute benefits	74.5%	TOTAL EXPENSES	\$791,385

Table 1.5: 2019 Income Statement

Section 2. Cal Ave Transit Pass Program Pilot

2A. Pilot Description and Results

Palo Alto Transportation Management Association's (PATMA's) downtown low-income worker transit pass program is the only such program in the US. It is crucial because of challenges including:

- 30% of Silicon Valley residents cannot meet their basic needs without financial assistance,
- ongoing displacement of low-income people from the urban core to the far outer edge of the Bay Area.

With the Cal Ave Transit Pass Program Pilot, PATMA purchased, distributed, and tracked transit passes for Cal Ave service workers making less than \$70,000 per year. We bought more than 50 passes per month, with the program operating for eight months from March-October 2019. We are very grateful to participating Cal Ave employers and to our two \$50,000 funders, Palantir, and Facebook.

Pilot boundaries encompassed people working at businesses and organizations at California Avenue, Town & Country Village, the area along El Camino Real, and school district offices. Transit options in the area include Caltrain, VTA 22, VTA 522, VTA 101, VTA 102, VTA 103, VTA 104, VTA 182, SamTrans ECR, and AC Transit Dumbarton Express.

With the Pilot, we answered our two research questions in the affirmative:

- In an area with a lower level of transit service than downtown, is there sufficient demand? (Yes)
- Can PATMA's downtown transit pass program scale to other locations staffed by different people and organizations? (Justine Burt and Kruti Ladani did an excellent job!)

We have yet to answer the question of whether we can find a permanent funding source to restart the program.

There is sufficient demand

Some people were skeptical, but we found that Cal Ave demand, though significantly smaller than downtown demand, was sufficient. With a modest outreach effort, demand grew to be one-fifth as big as downtown's demand. Coincidentally, Cal Ave Caltrain ridership is one-fifth as large as downtown.⁷ We also found that demand grew rapidly from nothing to 50 passes in only two months.

The PATMA transit pass program can be brought to new locations

With Joint Venture Silicon Valley's "[Manzanita Talks](#)," eight cities and eight major employers are exploring collaborative opportunities to reduce traffic. For current and new Transportation Management Associations, efficient organizational structures are being considered to share program knowledge and resources. Both of our Pilot funders are engaged in the Manzanita Talks.

To validate our second research question, we created a "mini-TMA" with separate staff and accounting. We trained two new staff and validated our training "cookbook." We verified that the complicated monthly workflow utilizing PATMA's transit pass backend could be spread. The Pilot operation ran relatively smoothly. Lessons learned from Cal Ave also benefited the downtown transit pass program. We conclude that PATMA can expand to new areas and that other cities involved in the Manzanita Talks can quickly adopt the unique PATMA transit pass program.

Is there funding to restart the Cal Ave program?

Our ongoing attempts to secure permanent public or private funding of \$10,000 per month to extend the program have not yet been successful. We will quickly restart the program if/when funding arises. In the interim, PATMA can provide fee-based commute program services to Cal Ave businesses.

One example of a funding mechanism is that of Downtown, where parking permit revenue funds commute programs. Permit rates were explicitly increased to fund the TMA.

2B. Program Feedback

"There are a couple reasons I really love having the pass. It takes the extra strain off my mind of remembering to purchase the pass every month because the program conveniently reminds me to renew the pass through the reminder texts. It's a huge relief to take the train instead of driving through the tough Bay Area traffic every day. And overall, I think my quality of life went up because now I have a little bit of extra money to save up every month! I just got engaged, so every bit helps. Thanks a lot!"

- Carmen Lew, PIP Printing

Says one staffer from Embarcadero Publishing: "I am very disappointed and saddened to learn the transit pass pilot program is ending."

⁷ Caltrain 2018 average weekday ridership was 1,693 for Cal Ave and 7,764 for downtown Palo Alto.

2C. Cal Ave transit program pilot metrics

2019 Cal Ave	March	Apr	May	June	July	Aug	Sept	Oct
Passes Activated	41	59	52	58	59	49	53	48
New applications	45	29	3	7	5	3	4	0
Turnover	0	11	10	1	4	13	0	5
Percent turnover		18.6%	19.2%	1.7%	6.8%	26.5%	0.0%	10.4%

Table 2.1: Cal Ave Monthly Metrics

20 businesses on California Ave participated in the Cal Avenue Transit Pass Pilot Program:

Employer	Transit passes per employer	% of program
Embarcadero Media	7	13.0%
La Bodeguita del Medio	7	13.0%
The Counter	6	11.1%
Zareen's	5	9.3%
Momentum for Mental Health	4	7.4%
Starbucks	4	7.4%
Massage Therapy Center	3	5.6%
PIP Printing of Palo Alto	3	5.6%
Country Sun Natural Foods	2	3.7%
Next Insurance	2	3.7%
Summit Bicycles	2	3.7%
Abbey Neuropsych Clinic	1	1.9%
Babka By ayelet	1	1.9%
Bank of the West	1	1.9%
Blossom Birth and Family	1	1.9%
Gott's Roadside	1	1.9%
Izzy's Brooklyn Bagels	1	1.9%
Kali Greek Kitchen	1	1.9%
Self Employed	1	1.9%
SpiceKit	1	1.9%
Grand Total	54	100.0%

Table 2.2: Participating Cal Ave Employers

Section 3: 2020 Bike Love Active Modes Program

Compared to other U.S. bike commute incentive programs, PATMA will develop, test, and implement a higher-tech program that recycles incentive dollars into local Palo Alto businesses. The program will be twice as cost-effective as PATMA's transit, Waze Carpool, and Lyft after-hours programs. Additionally, our program will incentivize scooter and skateboard commuting.

3A. The Need and Potential for a Bike Love Pilot

In the 2012 Bicycle + Pedestrian Transportation Plan (BPTP), the City of Palo Alto aspired to double bicycle use by 2020. This objective has not yet been achieved. Palo Alto's Sustainability & Climate Action Plan also supports increased biking.

Silicon Valley should be America's biking capital. According to SFMTA Executive Director Jeff Tumlin's keynote presentation at Joint Venture Silicon Valley's 2017 State of the Valley Conference,⁸ "American visitors to Amsterdam, Copenhagen and other European cities are startled to learn the bicycle is the dominant mode of commuting, despite the cold weather and challenging terrain. Why not Silicon Valley? We have a Mediterranean climate, a flat landscape, and a health-conscious population that cares about the environment." Joint Venture and the Silicon Valley Bicycle Coalition produced the *Silicon Valley Bike Vision* report, providing a vision for Silicon Valley becoming the national bike commuting leader and a roadmap for getting there.⁹ *Bike Vision* lists Palo Alto resident 2012 commute mode share as 8.6%, creating a BPTP 2020 doubling objective of 17.2%:

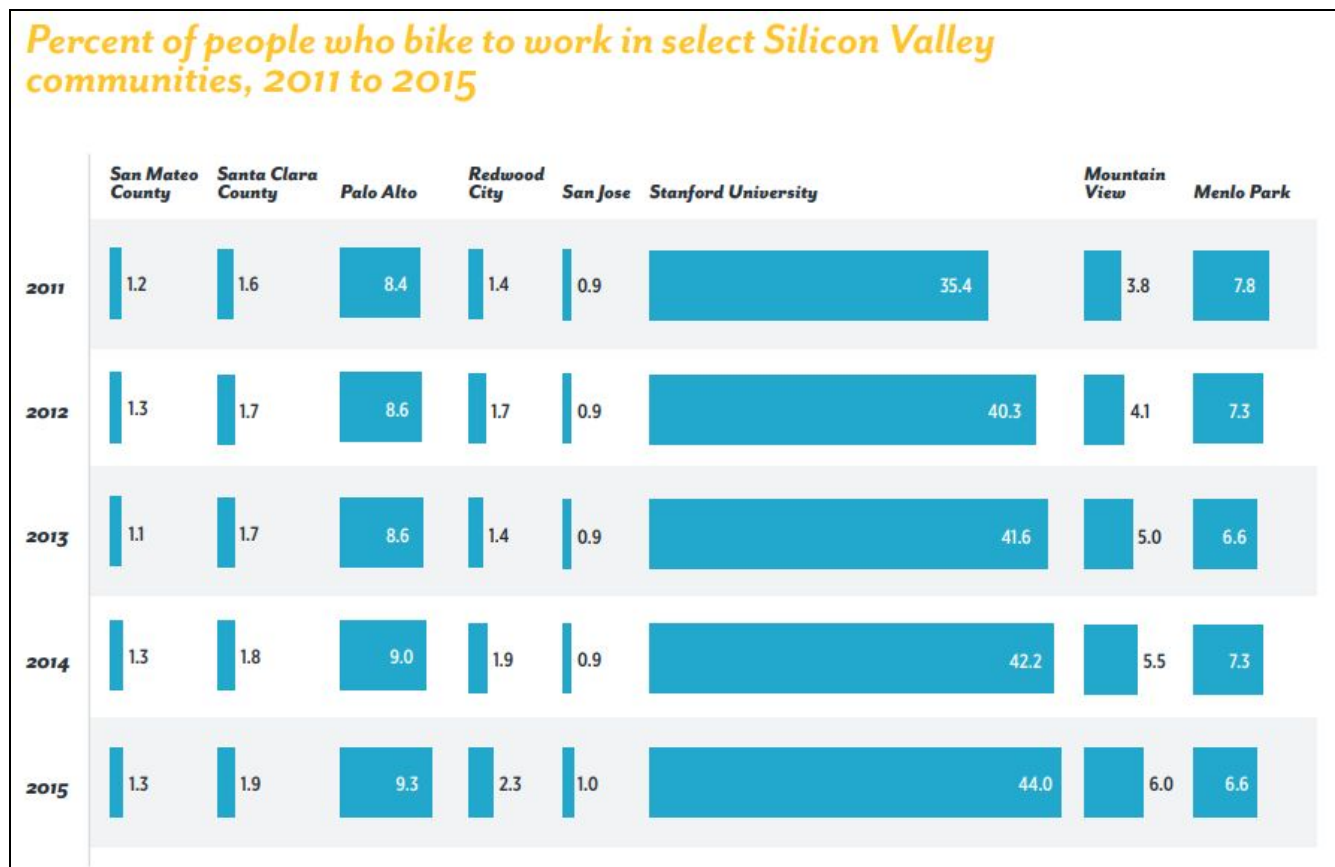


Figure 3.1: From *Silicon Valley Bike Vision*, page 21

⁸ JVSU 2017 State of the Valley Conference, <https://youtu.be/V8rV0ZUNrVE>.

⁹ *Silicon Valley Bike Vision* report, by JVSU and SVBC, <https://jointventure.org/publications/joint-venture-publications/1522-silicon-valley-bike-vision>.

According to the American Community Survey 2009, the bike commute mode share of workers commuting to Palo Alto jobs was 2.3%. The BPTP 2020 in-commute doubling objective is approximately 4.6%.

90K commute to PA	
SOV	76.3%
Carpool	9.3%
Transit	5.5%
Bike	2.3%
Walk	2.3%
Telework	3.3%
Source: ACS 2009	

Table 3.2: Palo Alto Bike In-commuting

The Need to Improve the Bike Network to Reduce Perceived Stress

There is a need to reduce the perceived stress of bike riding. In 2015, Google, Silicon Valley Bicycle Coalition, and Alta Planning teamed to create the *Google North Santa Clara County Bike Vision Plan*.¹⁰ To increase the attractiveness of bike commuting (and bike first/last mile to/from transit), the project pioneered a map-based analytics tool, the “Bike Network Stress Test,” to measure rider stress level by route. A mile biked on a high-stress street feels eight times longer than a mile biked on a protected bike lane:

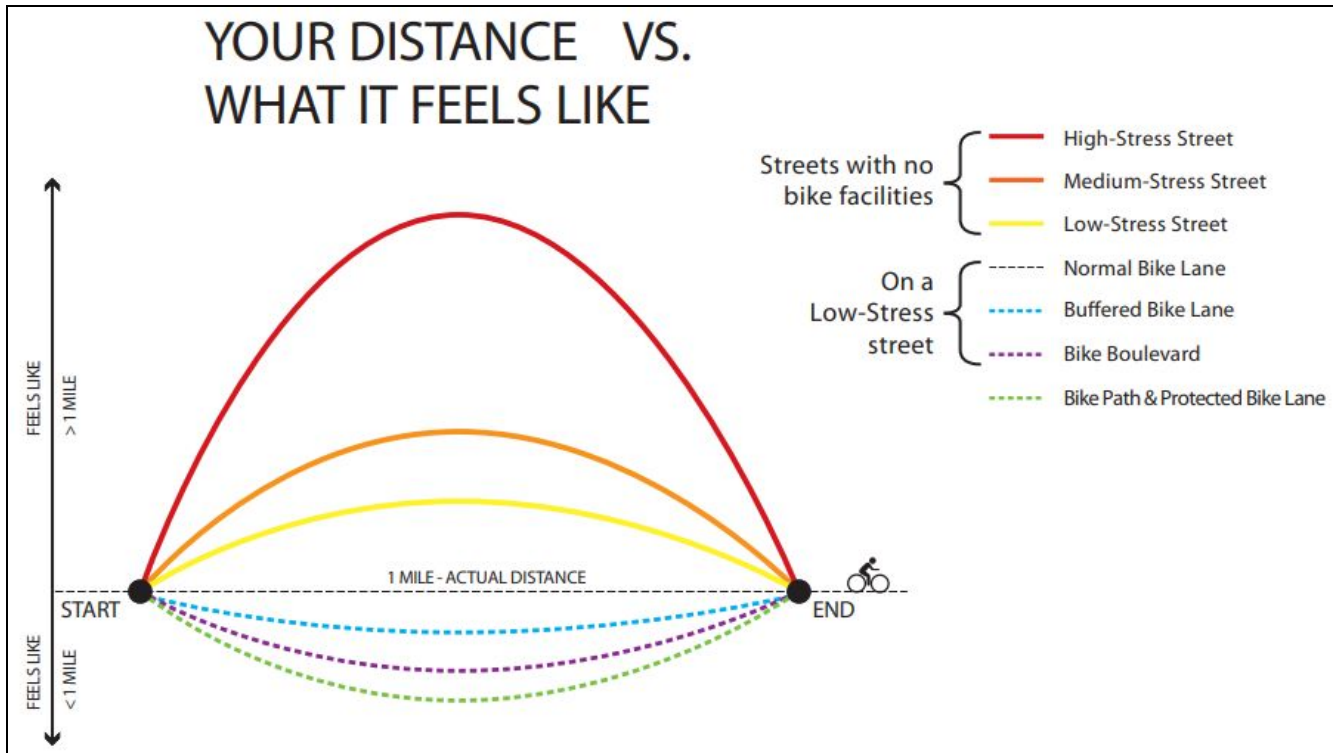


Figure 3.3: Google North Santa Clara County Bike Vision Plan, pg 20

The project identified low-cost techniques to mitigate high-stress points, with an overriding objective of making Silicon Valley as bike-friendly as Copenhagen. Key points from the Google Bike Vision Plan:

- The reasons people chose not to ride are varied, but a key factor is the state of today’s roads and bike network.

¹⁰ https://altaplanning.com/wp-content/uploads/Google-Bike-Vision-Plan_high_res.pdf.

- 60% of Silicon Valley's population can be classified as "Interested but Concerned" and will only bicycle on low-stress streets, having a low tolerance for high-stress streets or intersections.
- The Bike Network "4Cs:" Continuity, Connectivity, Convenience, and Completeness: Bike networks must be **continuous**: too many bike lanes in the United States disappear at intersections and other stressful spots. Bike networks must **connect**: a single gap in an otherwise complete bike route can discourage potential bicyclists. Bike networks must be **convenient**: people won't ride bikes to key destinations if they must go far out of their way. It is also not enough to provide a network of bicycle facilities without also considering what happens when a bike ride ends. A successful network includes sidewalks, safe intersections, and access to transit and bike parking. This design approach is sometimes called "**Complete Streets**."

To attract "Interested but Concerned," obstacles such as "high-stress streets" and "unfriendly intersections" must be overcome:

- High-stress streets are those with multiple lanes and speed limits of 35 mph or more. Many streets that have bike lanes are also high-stress; building traditional bike lanes on such streets isn't enough to get more people riding bikes. High-stress streets are often designed for driving speeds well above the posted speed limit, discouraging all but the most confident of bicyclists. High-stress streets can also act as barriers to bicycling, with easy crossings only possible at intersections with traffic lights.
- In addition to geographical barriers and high-stress streets, the design of intersections strongly influences who chooses to ride a bicycle. There are several ways intersections can be unfriendly to bicyclists:
 - Bike lanes end before reaching the intersection
 - Bike lanes merge across lanes of traffic
 - Freeway on-ramps or off-ramps
 - Uncontrolled crossings of multi-lane roads
 - High-speed right-turn lanes (aka slip lanes).

The faster Palo Alto can build out the BPTP, the faster biking will increase.

Bike Commuting is Poised to Double

E-bikes increase achievable commute distance: Some of Silicon Valley's major employers have promoted e-bikes to shift mode away from SOV on 5- to 10-mile commutes, the distance with the highest SOV rate. E-bike sales are skyrocketing in Europe,¹¹ with a 25% market share for electric bikes in Germany. Continued price/performance increases in the e-bike space will contribute to doubling biking.

Deloitte Insights forecasts that bike technology will explode in 2020¹², "Technological innovations are making bicycling more attractive to millions of commuters. Bicycling's upswing in popularity could mean cleaner air, less traffic, and healthier people for cities worldwide."

MTC region expects that biking will win the most mode shift away from SOV commuting. From the MTC Horizon Futures Final Report presentation, slide 18: "When it comes to achieving mode shift to address traffic congestion across the future planning scenarios, strategies that prioritized active transportation saw the most pronounced shifts in the regional model. Given the low cost relative to other investments studied, the benefit-cost ratio is greater than one in all three Futures and the equity scores suggested that lower-income individuals received a larger share of accessibility benefits than higher-income individuals, meaning this strategy advances equity outcomes too."

Recent bike infrastructure improvements help bike adoption. These include the Managers Mobility Partnership's Peninsula Bikeway¹³ and the new Highway 101 overpass bike bridge near IKEA.

¹¹ <https://www.bike-eu.com/sales-trends/nieuws/2019/08/e-bike-sales-skyrockets-across-europe-10136495>

¹² Deloitte Insights, Dec 2019 article *Cycling's technological transformation: Making bicycling faster, easier, and safer*, <https://www2.deloitte.com/us/en/insights/industry/technology/technology-media-and-telecom-predictions/2020/bike-technology-transformation.html>

¹³ <http://peninsulabikeway.com>

PATMA's GIS analysis supports the potential for PATMA's Bike Love to succeed. For "first mile by bike to transit," 80% of PATMA's target commuters live within three miles of Caltrain, VTA LRT + Caltrain, or Dumbarton Express.

Governor Newsome recently signed [a bill providing e-bike vouchers](#) to low-income individuals who trade in their car for an e-bike.

If the November 2021 FASTER regional 1% transit sales tax measure passes, it provides an enhanced TDM policy (~\$360/year/commuter or upwards of \$500M per year) to help scale non-SOV active modes.

Within this "commute behavior change" technology/investment space, ByCycling raised a substantial funding round based on the Bike Love business model. In addition, Crunchbase indicates GetMiles has raised \$6.1M from 19 investors. This demonstrates private sector validation.

The Bike Love software platform can scale to serve the proposed Subregional TMA and can scale to major employer commute programs.

Any new efforts by Palo Alto, such as initiating a Downtown Area Plan with bike improvements or increases to the availability of secure bike parking, will also contribute to increased biking.

3B. Bike Commute Incentive Programs: The State of the Art

In the U.S. TDM universe, two TMAs and eight employers provide the following bike incentives:

TMA	Bike Incentive	Notes
Atlanta's Cash for Commuters	\$5/day, max \$150	
Yolo County T.R.I.P.	\$25/mo, max \$75	
Employer (usually via paychecks)	Bike Incentive	Notes
Anonymous Major Employer	\$5/day	Habitual bikers earn more than \$1,200/year
Seattle Children's Hospital	\$3.50/day	Uses Luum commute software
Gates Foundation (Seattle)	\$3/day	Uses Luum commute software
Sony	\$2/day	
Ecology Action (Santa Cruz)	\$2/day	Uses online timesheets by Neon
Oregon Health & Science U.	\$1.50/day	Uses Luum commute software
Stanford U. Clean Air Cash	\$25/mo	
Tesla	daily incentive	Bike trips verified by Dero ZAP
Google	bike pumps/lights/jackets	Via RideAmigos connected to Strava

Table 3.4: U.S. TMA and Employer Bike Incentives

Our new bike commute program will provide incentives that are four times larger than those of any other TMA program in the U.S.

3C. PATMA Bike Love Concept and Feature Set

PATMA is developing a pilot with ByCycling (<https://www.cashbycycling.com/>) where the TMA, as a third party, can incentivize verifiable, geofenced active mode commutes to Palo Alto. TMAs cannot tap directly into employer payroll commute benefits, but TMAs can provide redeemable vouchers.

Commute.org has provided some Bike Love insights to PATMA based on Commute.org's experience with their Carpool 2.0 rewards program, where they use Scoop connected to the RideAmigos commute program platform.

Their commuters collect incentive points and then convert points into Tango gift cards for redemption via national brands.

There are multiple software platforms for bike commute incentives, Dero ZAP, Redwood Shores' GetMiles, RideAmigos with Strava, and Luum with Strava. For our commuter and backend requirements, ByCycling is the best fit. ByCycling's iPhone/Android app is already available and their software roadmap and business model align well with the TMA's aspirations.

The pilot will provide daily incentives for active mode commutes (bike, e-bike, scooter, e-scooter, skateboard, e-skateboard), up to \$600 per commuter per year. Earned incentive points are redeemable for iPhone/Android vouchers tied to individual local Palo Alto merchants that have capable "fintech point of sale (POS) terminals" such as Square terminals. By this means, incentives recycle into the Palo Alto economy. PATMA expects Bike Love to be the TMA's most cost-effective program.

Some commute incentive programs use plastic gift cards where the TMA is required to purchase an inventory of fixed denomination cards in advance of demand. The Bike Love pilot will pioneer "multi-merchant real-time any-denomination" iPhone/Android vouchers - as would be expected in a mobile phone "commuter wallet." POS software vendors such as Square, Clover, and Toast are just introducing the enabling API this year. Provided below is an example use case that was previously impossible to solve:

- The commuter has earned \$200 in Bike Love points. She dines at a participating downtown restaurant. The bill and tip come to \$127. In less than 60 seconds, the commuter launches the Bike Love app, selects the participating restaurant, enters \$127, a single-merchant QR appears, and the cashier scans the code.

Four "partner merchant" types will be supported, " such as:

- "commute-focused:" public transit including Caltrain, PA Bicycles, BikeHub/BikeLink Caltrain bike storage, Patagonia (for foul weather gear, etc.)
- "memory-making" merchants: {Reposado, Rooh, Mangosteen Nails & Spa, Watercourse Way, and Form Fitness}.
- "once-a-week" local merchants: {Zareen's, Coupa Cafe, Gong Cha, Oren's, Morsey Creamery,}
- "weekly shopping" at WFM and CVS.

The challenge of redeeming the substantial \$600 per year per commuter in Palo Alto will influence the merchants we select.

Active mode commutes will be verified by an iPhone/Android app that can distinguish mobile phone sensor data streams for active modes versus automobile travel. The accuracy of this emerging technology is improving each month. Commute endpoints must be inside designated geofences for a commute trip to be validated. The pilot will incent both active first-mile to transit and direct home-to-work active commuting. For first-mile bike commute to Caltrain stations, the software platform allows for the configuration of geofences around station areas. We have designed varied daily incentive amounts to maximize behavior change, higher in the first few weeks and during winter. Program participation will be limited to:

- SOV commuters that convert to active modes
- workers that change job locations and have to establish new commute habits.

Because of flat tires, commuting via bike is less reliable than via automobile. For commuters who prefer not to repair their flats, Bike Love will provide Lyft SUV to get the commuter to work and will also drop off the bike at PA Bicycles for repair.

The Bike Love pilot will implement a threaded Facebook chat board providing:

- advice on best bike gear from other program participants
- real-time updates: "commute issues this AM because of construction"
- a PATMA competition (vacation giveaway) in conjunction with a media outlet for the safest nighttime bike lighting
- software feature requests.

Upon enrollment, commuters will opt-in to having both ByCycling and PATMA access to their data. ByCycling and PATMA will jointly "own" the commuters.

The pilot will support technology, light office, government, and service workers. Specifically for service workers, cell phone ownership is now very high in the US, at 92% for non-high school graduates, 96% for Latinx commuters, and 95% for commuters earning less than \$30,000 per year.¹⁴ Feature-rich smartphone market penetration has increased from roughly 40% in 2011 to 80% in 2018. Cellphone and smartphone market penetration will likely increase each year. As far as any service workers being unbanked, Bike Love provides financial incentives without requiring a bank account.

Active mode commuting has some holistic hurdles. The TMA will advocate for:

- increasing the number of secure bike storage parking spaces, possibly converting City of Palo Alto automobile parking spaces into bike parking
- accelerating implementation of the BPTP to de-stress routes
- building multi-city bike corridors.

Appendix A: Commute Survey Details

A1. Downtown Commute Mode Share by Employment Subtype:

	SOV	Transit	Carpool	Bike	Walk	Telecommute	# of Responses
Government	42%	39%	8%	7%	1%	3%	155
Light Office	60%	18%	6%	4%	4%	8%	413
Service	70%	20%	4%	3%	2%	1%	386
Technology	37%	39%	5%	5%	4%	9%	517
“Overall” Weighted Total	52.3%	25.4%	4.7%	5.1%	4.1%	7.8%	weighted

Table A.1: Downtown mode share: by subtype and overall share, calculated with the following weighting: 13% Government, 25% Light Office, 28% Service, 34% Technology

Downtown Mode Share by Worksite:

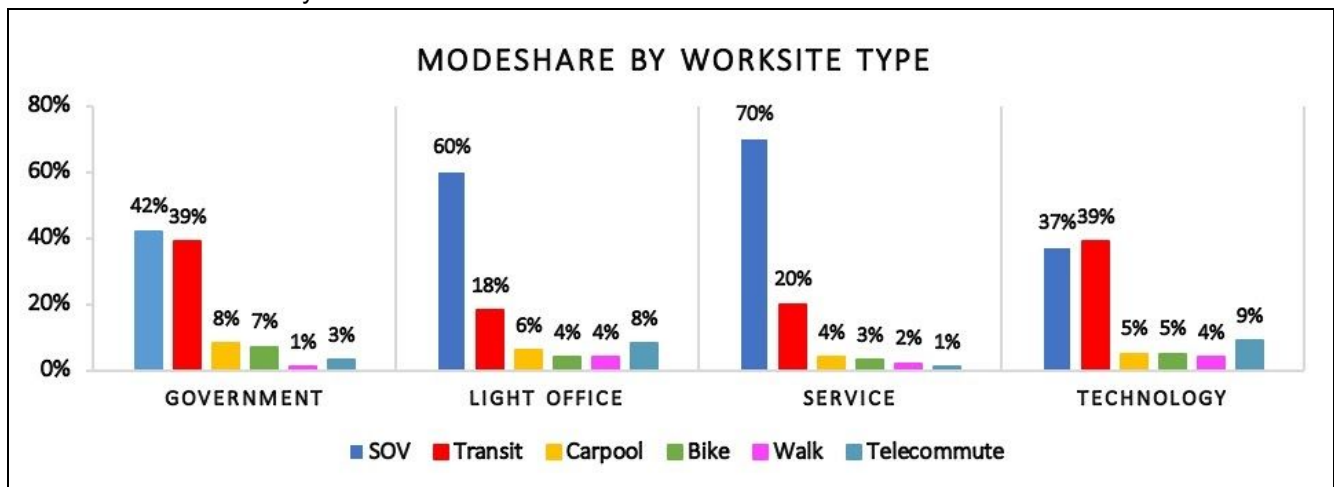


Figure A.2: Mode share by subtype

¹⁴ Pew Research Center: Internet and Technology's Mobile Fact Sheet: <https://www.pewinternet.org/fact-sheet/mobile/>

Government workers mode share. SOV has declined every year. n = 155

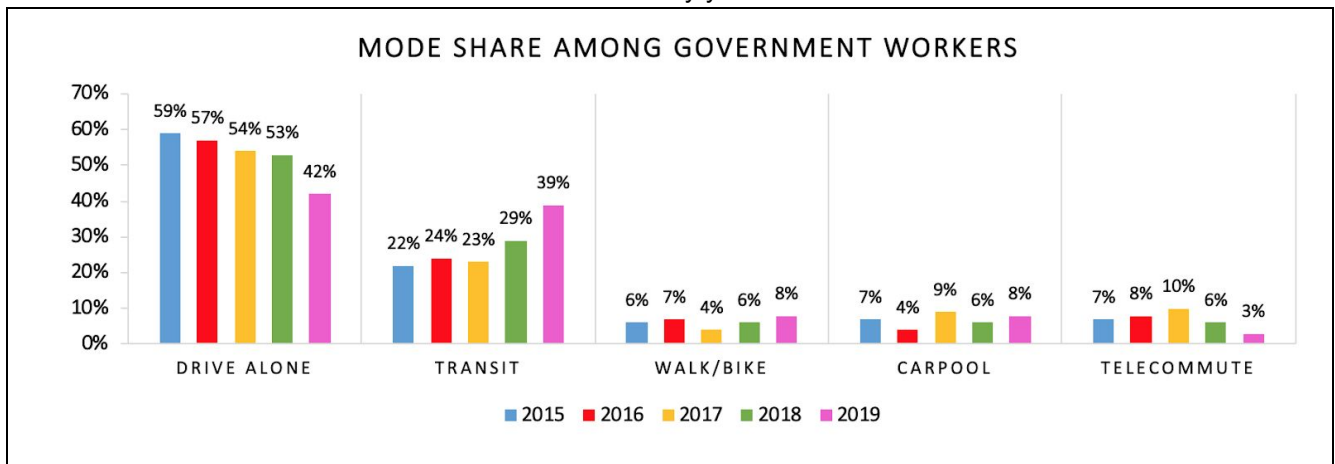


Figure A.3: Five-year Government commute mode share

Downtown government mode SOV decrease is caused by The City's change in benefits vendor that made non-SOV program enrollment easier. Also, the recently retiring City staff had higher SOV use, and recent City staff recruits have utilized transit at a higher rate.

Light Office workers mode share. SOV decreased in 2019. n = 413

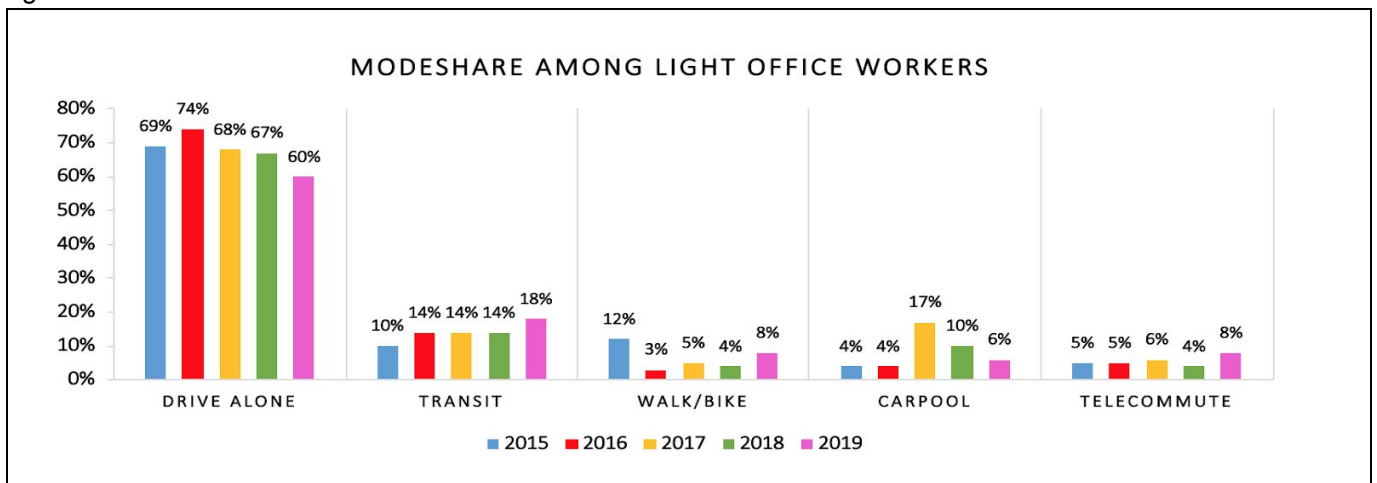


Figure A.4: Five-year Light Office mode share

Service workers mode share. n =386

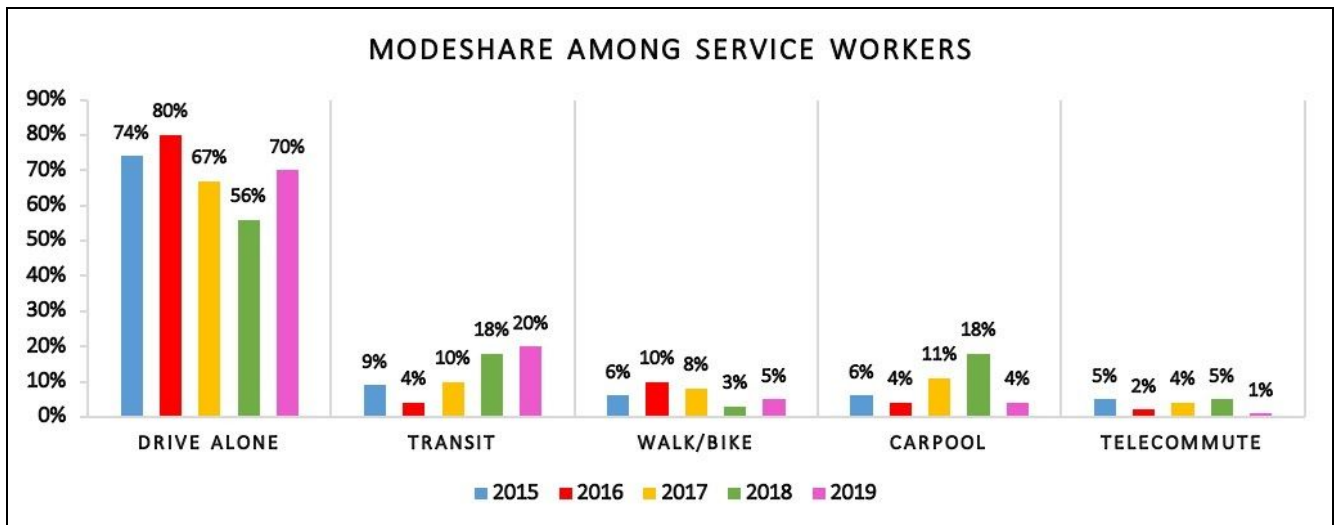


Figure A.5: Five-year Service Worker mode share

Tech workers mode share. n = 517

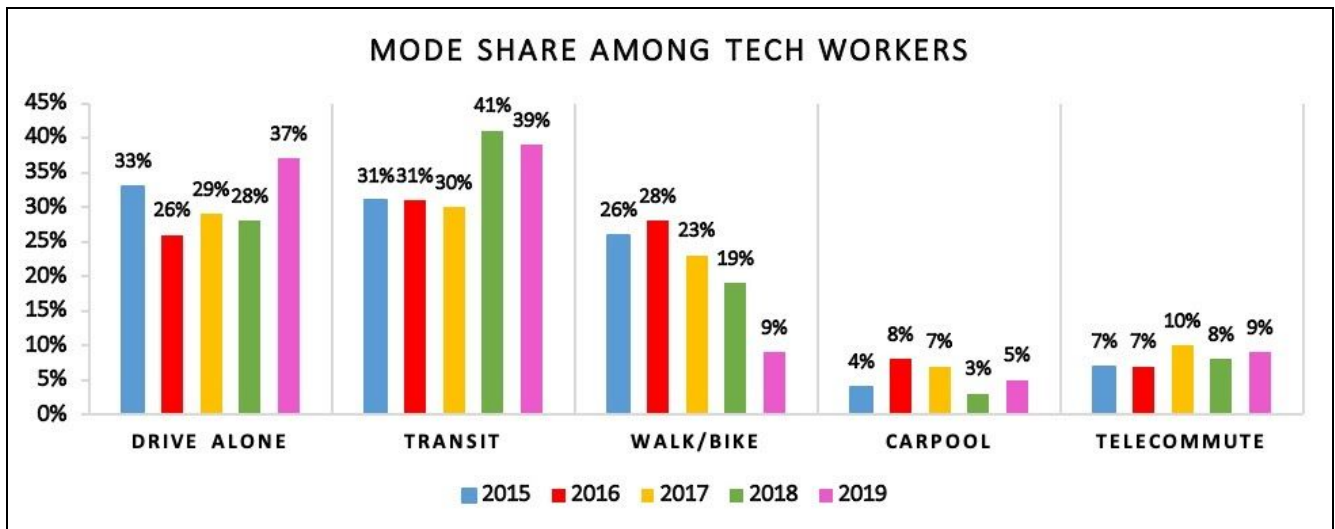


Figure A.6: Five-year Tech Worker mode share

A2. Overall Downtown Commute Mode Share

As explained in Appendix B, calculating downtown employment and employment share by our four employment subtypes is challenging. Using the weighting provided by the previous survey contractor, EMC, results in an increase in overall downtown SOV from 49% SOV in 2018 to 52.3% in 2019. The tripling of response rate from 2018 to 2019 was responsible for part of the increase because the first line of survey respondents are proud of taking SOV alternatives, and the larger the set of respondents, the more likely to attract SOV-first commuters.

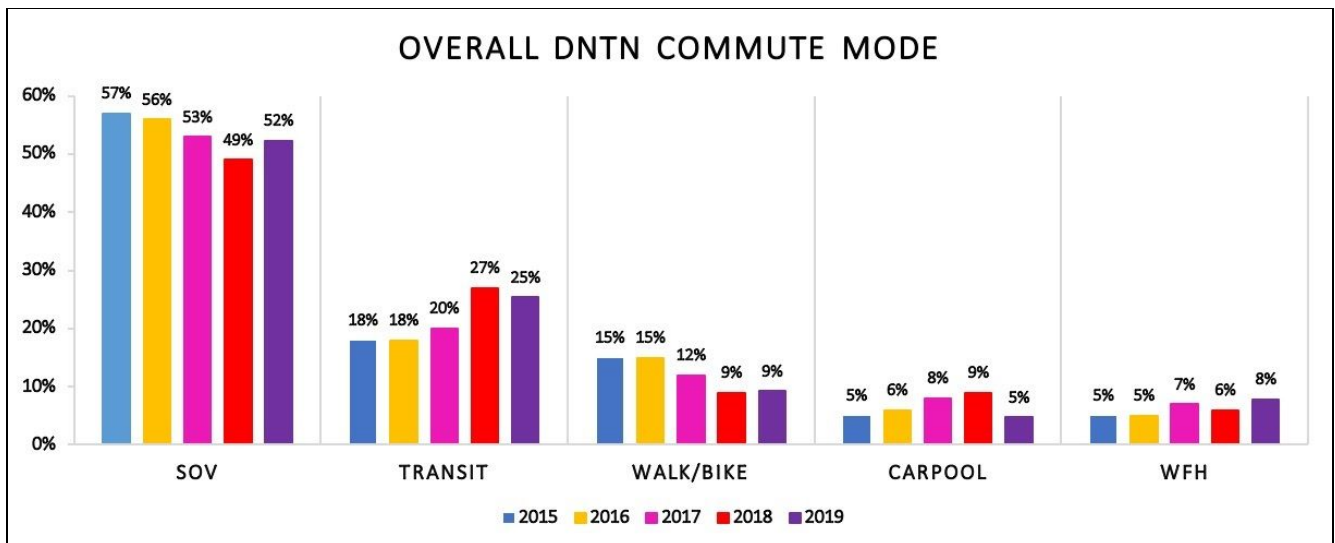


Figure A.7: Five-year Overall mode share

A3. Comparison of City Staff Downtown and Non-Downtown Commutes

PATMA was happy to go well beyond the requirements for The City's survey, surveying non-downtown City staff {MSC, Community Center, libraries, etc}. The City's downtown workers have 42% SOV commute mode share. As would be expected, non-downtown staff with fewer commute alternatives have 78% SOV share. Commuting by non-downtown staff is further broken down below:

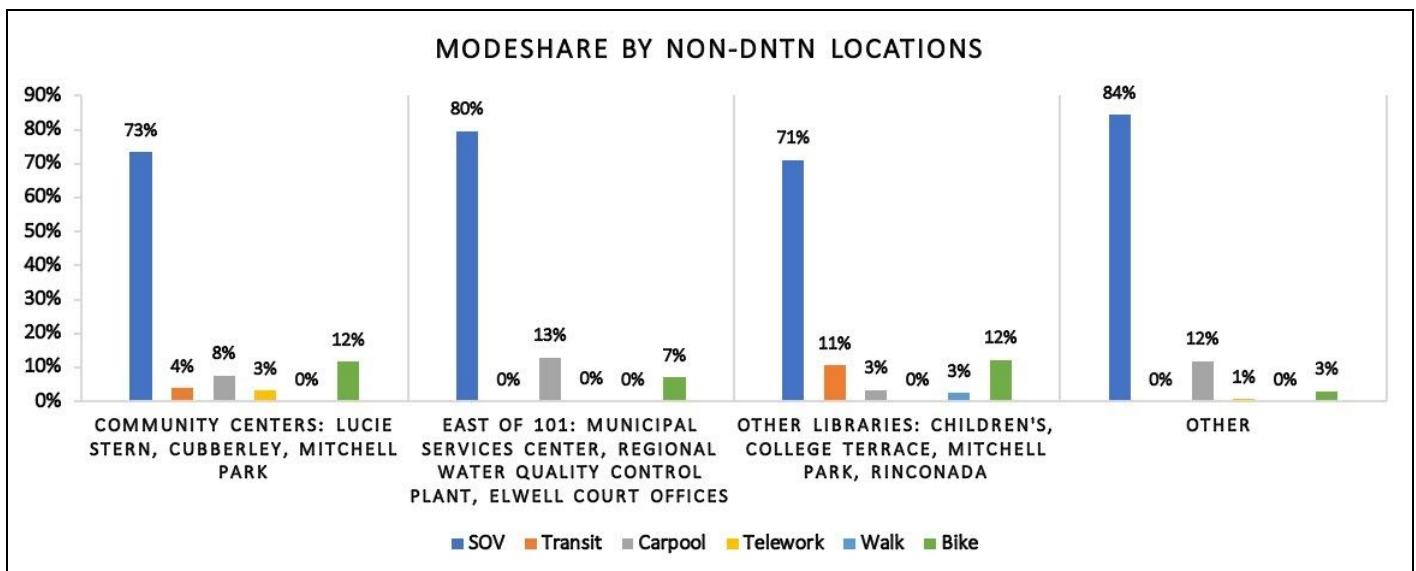


Figure A.8: City of Palo Alto mode share at non-downtown locations

Survey response from Fire Station and Foothills Park was 100% SOV. The number of staff that responded by location:

- Community Center respondents = 24
- East of 101 respondents = 68
- Fire Station respondents = 1
- Foothills Park respondents = 3
- Libraries respondents = 31
- Other respondents = 30

A4. Responses to the Commute Survey's Open-Ended Question

Some responses centered around:

- “Nothing would encourage me to take alternative transportation.”
- “Daycare drop-offs prevent non-SOV commuting.”
- Complaints about traffic & parking issues.
- “Having a car is required for work.”
- “Carpool matching takes too long.”
- “Transit is broken.”

Notable Comments About Commuting
<i>Truthfully, I gave up on finding a working transit solution and rented a room in Palo Alto. I spend 2-3 nights per week there, which is a surprisingly large quality-of-life improvement for me. (I own my place so moving is infeasible).</i>
<i>I am a native of the peninsula region. This entire region was planned from the 40's - 70's around single-driver cars ... no one projected the population density we now have in the Bay Area during this planning and road building period. Many people working in Palo Alto have jobs that require unforeseeable and substantial amounts of daily overtime work - this makes ridesharing or mass transit impossible. I support creating opportunities for various means of movement of people and goods - but I can say with the benefit of having driven in downtown Palo Alto for the past 30+ years that the downtown has become a morass of dangerous chaos. We have Uber/Lyft cars that stop dead without warning in the middle of moving traffic so that pedestrians can randomly lunge out into traffic or jump unexpectedly out of cars ... we have people driving motorized skateboards, bikes, scooters, and other odd devices in the middle of streets as if they were cars - yet they have nothing on them like turn signals or brake lights to convey their intentions or planned movements ... many of these motorized, single-human drivers do not obey traffic lights or well-settled vehicular laws ... they just dart aggressively and wildly into intersections without reference to lights or cars ... in many cases they move against the direction of traffic ... there are also numerous pedestrians who stand on corners where crosswalks allow for two, different choices of crossing ... they will loiter there (often waiting for Lyft/Uber cars) look down at their phones fixedly and leave drivers unclear and unable to move with green lights because their intentions are unclear ... the slavish pandering to all of this chaos at the expense of stable, orderly car traffic creates an overall atmosphere of stress and high-stakes anxiety in the downtown. I feel that if people are going to use means of movement in the downtown other than: (1) single user cars, (2) commuter shared cars, (3) motorcycles subject to M1/M2 licenses, (4) normal delivery vehicles, (5) law enforcement / emergency vehicles, (6) military / government vehicles, or (7) publicly-funded mass transit like municipal buses - that they should be forced to carry a form of license that obligates them to be tested periodically and held accountable for their behavior in public places and on public streets and roads. Finally, if tech companies are going to clog the key choke points to entry/exit to the downtown with high-density, double-deck buses, then I believe they should be compelled by the city to pay annual fees to defray the wear-and-tear on the city's streets and the usage of large amounts of publicly-funded areas for pickups/drop-offs of pedestrians.</i>
<i>I would love for you guys to give me a free car!</i>
<i>I'm currently looking to move because I can't afford the Dumbarton bridge crossing everyday. I have tickets from Fastrak. I can't afford the bridge toll.</i>

Table A.10: Selected Commute Survey Free-text Comments

A5. Fall Downtown Commute Survey Instrument



Palo Alto TMA, 355 Alma St, Palo Alto, CA 94301

Web/Paper Survey

Downtown Palo Alto Employees

2019 PATMA Commute Survey

Palo Alto Transportation Management Association (PATMA) is conducting this SHORT survey of employees in downtown Palo Alto to understand how you get to work. Your participation will help support our continuing efforts to improve commuter options and access to downtown Palo Alto.

Enter into a prize drawing at the end of this survey for a chance to win 1 of 10 \$25 gift cards to spend in downtown Palo Alto!

Please direct any questions or comments to connect@paloaltotma.org.

SECTION: COMMUTE MODE

Q1. How do you travel to work most often each day of the week? If you use more than one type of transportation, choose the one used for the LONGEST distance of your trip.

- o Drive Alone* includes driving with children, motorcycle, 1-passenger UberX/Lyft
- o Carpool** includes Scoop, Waze Carpool, traditional carpool, vanpool, UberPool, Lyft Line, dropped off
- o Transit*** includes Caltrain, SamTrans, VTA, AC Transit, corporate bus, Stanford/Palo Alto shuttles, etc.
- o Bike, etc.**** includes e-bike, e-scooter, skateboard

	Drive Alone*	Carpool**	Transit***	Bike, etc.****	Walk	Telecommute (work remotely)	Other
Monday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tuesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wednesday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thursday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Saturday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sunday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2. What city and postal zipcode do you get to work from?

Home City _____

Home Zip Code _____

Q3. Your employer's name and address:

We need this information to analyze commuting patterns for four different types of employers (service, technology, light office, and government).

Employer/Company Name: _____

Employer's downtown address (number and street): _____

The rest of the questions in this short survey are designed to improve your commute.

Q4. What is your annual salary?

- ☐ Less than \$70,000
- ☐ More than \$70,000 → Skip to **Q7**

SECTION: TMA PROGRAMS

DOWNTOWN TRANSIT PASS PROGRAM

(Answer if Q3 = less than \$70,000)

Q5. PATMA offers a transit pass program subsidy if you work in the downtown Palo Alto area. You can get a FREE transit pass if you commit to using transit 3 days per week!

PATMA will give qualified employees a Clipper Card loaded with your choice of a Caltrain, SamTrans, VTA or Transbay (Dumbarton Express) monthly pass. The monthly pass is good for unlimited trips within your pass parameters each month. As long as you use it for commuting 3 or more days per week, you can renew each month!

That's a value of \$800 to over \$1,800 per year! Plus, you'll save gas, parking headaches and other commute costs.

Sign up for the program here - bit.ly/patmaTransit.

Have questions? PATMA staff are available via instant SMS texting at (507)-339-4301 from 10am to 2pm between Sept 24 to Dec 15! You can also email us at connect@paloaltotma.org.

On a scale of 1-5, how well does this transit solution fit your needs?

- ☐ A great deal
- ☐ A lot
- ☐ A moderate amount
- ☐ A little
- ☐ None at all

LYFT AFTER-HOURS PROGRAM

(Answer if Q3 = less than \$70,000)

Q6. Sometimes, using transit isn't an option. If your shift in Downtown Palo Alto starts early or ends late here's how we can help!

We'll help with subsidized Lyft shared rides from your home directly to your job. Each month, PATMA will pay up to \$10 per ride for up to 15 rides per month, so you can take advantage of your annual transit pass! Leave your car (and the stress of parking) home!

Click here to learn more about the program - paloaltotma.org/programs and sign up here - bit.ly/patmaLyft.

Have questions? We're available instant SMS texting at (507)-339-4301 from 10am to 2pm between Sept 24 to Dec 15! You can also email us at connect@paloaltotma.org.

On a scale of 1-5, how well does this program fit for your work schedule?

- ☐ A great deal
- ☐ A lot
- ☐ A moderate amount
- ☐ A little
- ☐ None at all

CARPOOLING MOBILE APPLICATIONS

Q7. Earn extra \$\$\$ as a carpool driver or pay a lower fare as a rider through PATMA with Scoop or Waze Carpool. Now drive or ride in a carpool on your schedule.

To find out more about the apps and how these apps work, click on the links (and download the app and start using it) - paloaltotma.org/scoop and paloaltotma.org/waze.

Have questions? PATMA staff are available instant SMS texting at (507)-339-4301 from 10am to 2pm between Sept 24 to Dec 15! You can also email us at connect@paloaltotma.org.

On a scale of 1-5, how well does the above-mentioned carpooling solution fit your needs?

- ☐ A great deal
- ☐ A lot
- ☐ A moderate amount
- ☐ A little
- ☐ None at all

TRIP CONSULTATION

Q8. PATMA staff is happy to sit down and explain all your commute options with you.

PATMA staff is also available instant SMS texting at (507)-339-4301 from 10am to 2pm between Sept 24 to Dec 15! Let us know your home address and your work schedule. You can also email us at connect@paloaltotma.org.

Would you like help in planning your commute?

- ☐ Yes
- ☐ No

SECTION: FEEDBACK

Q9. Questions/comments? Issues/concerns about your commute? Let us know.

Q10. Thank you for completing the 2019 Palo Alto Commute Survey!

Please provide your name and email below to enter the prize drawing for a chance to win one of ten, \$25 gift cards for meals in Downtown Palo Alto!

Your email address will be used to notify you if you win the gift card and to contact you regarding your interest in PATMA programs. Your email address will not be shared with any other party.

First Name:

Last Name:

Email Address:

Appendix B: Downtown employment headcount

To obtain downtown employment headcount and split overall employment into four different employment subtypes, the TMA researched six conflicting datasets:

- EMC
- Census Transportation Planning Package
- Census On The Map
- Dun & Bradstreet's Hoovers data portal
- InfoGroup's dataset
- A PATMA Business Registry-based calculation.

All of the datasets have shortcomings, the geographical boundaries differ, and even the two Census datasets are not in agreement.

For PATMA's 2015-2018 commute surveys, the sophisticated survey research firm, EMC, via a proprietary methodology, calculated 9,500 downtown jobs in 2017 and 11,000 jobs in 2018. Given EMC's 13% government weighting, we would expect about 1,430 downtown government jobs. The actual is about 432, with 412 City of Palo Alto downtown staff and 20 US Postal Service workers. By this single calculation, EMC's numbers are off by 231%.

Census Transportation Planning Package (CTPP) provides data for downtown Census Tracts 5113.01 and 5113.02, leaving out Sheraton, Westin, and Sutter PAMF. 12,795 jobs in the two census tracts Using 2012-16 CTPP Table A202106 ("Occupation 25 Workers 16 years and over"), the downtown employment count is 12,795 jobs. CTPP can be split into 25 occupations or, using table A202104, 15 industries (A202104). These segmentations do not entirely correspond with our four employment subtypes.

2017 Census On The Map provides 20,632 downtown jobs for the two Census Tracts.

Dun & Bradstreet's Hoovers data portal provides information for the 94301 zip code. This overstates employment because Cal Ave, Town and Country, Castilleja School, and PAUSD are included. Hoovers' estimate is 7,139 jobs.

Another private sector dataset provider is InfoGroup. Their estimate is only 1,991 jobs for the two Census Tracts.

PATMA combined Dyett and Bhatia's 2014 employment density information¹⁵ with the Business Registry dataset. For employment density, Dyett and Bhatia state:

- "The median square feet per employee use for traditional office uses (including professional services) range from 315 square feet to 645 square feet based on the size of the establishment. Median employment density for retail uses including but not limited to gyms, yoga or pilates studios, garages and auto shops, salons, spas, art galleries, jewelry stores, bike shops etc. range from 430 square feet to 900 square feet depending on the size of the establishments and number of employees. The food service or restaurant establishments have a median square feet range of 150-to 600 square feet depending on their size and number of employees. All of these employment density ranges are within the expected ranges found in other similar communities."

Using this employment density, PATMA calculates 8,495 downtown jobs

¹⁵ Dyett and Bhatia memo on the Palo Alto Downtown Development Cap: Summary of Business and Employment Density Survey (2014): <https://www.cityofpaloalto.org/civicax/filebank/documents/45069>

Appendix C: Social Equity and Accessibility: Low-income Transit Pass Program

For City of Palo Alto's Fair Value Commuting Project, Part of the FTA Mobility on Demand Sandbox



Social Equity and Accessibility: Low-income Transit Pass Program Summary of Full Report

For the City of Palo Alto's Fair Value Commuting Project
Oct 7, 2019. by Steve Raney, Sana Ahmed, Kruti Ladani



The full report may be accessed at: <http://bit.ly/FVCequity>

Appendix C: Executive Summary

Silicon Valley Equity Challenges

The Bay Area, Silicon Valley (defined as San Mateo and Santa Clara Counties), and Palo Alto all face an equity challenge. Some of the major challenges include:

- 30 percent of Silicon Valley residents cannot meet their basic needs without public or informal financial assistance.
- From 2000 to 2015 in the Bay Area, there was a large displacement of African American and Latinx residents from the urban core to the far outer edge of the Bay Area. This displacement increased commute distances. Of the low-income people of color who moved during the period, 30 percent moved entirely out of the Bay Area.
- White Silicon Valley residents earn three times more than Latinx residents.
- From 1925 to 1950 Palo Alto had deed covenants preventing the sale of homes to non-whites.
- Palo Alto has only one-quarter as many Latinx residents as Santa Clara County, six percent versus 24 percent.

Equity-increasing Low-income Transit Pass Program

PATMA is a non-profit with about \$500,000 per year in revenue and matching expenses. PATMA's goal is to reduce commute trips by 30%. Downtown Palo Alto service worker SOV commute mode share was initially measured at about 70%, providing PATMA's largest immediate opportunity for trip reduction. Within the U.S. TDM Social Equity Subdiscipline, PATMA is undertaking two unique activities:

- Buying and managing monthly transit passes for more than 240 low-income commuters who work in downtown
- Undertaking door-to-door, in-person outreach to 300 downtown Palo Alto businesses, some with only a handful of workers. This can be characterized as "retail TDM." TDM scales more easily in the service of large employers, whereas PATMA outreach efforts are relatively labor-intensive.

PATMA low-income commuters are service workers at restaurants, hotels, Starbucks, CVS, Verizon Store, etc. The annual household income limit of \$70,000 reflects the high regional cost of living (Santa Clara County defines households earning less than \$84,000 as low-income).¹⁶ The average cost of transit passes for Caltrain, SamTrans, VTA, and AC Transit (Dumbarton Express) is about \$133 per commuter per month. The TMA works first with store managers who disseminate program information to their workers. Once a worker applies for the program, the TMA works directly with them to provide a Clipper transit fare card and then electronically add transit passes to their card every month. 66 out of 300 downtown businesses participate in the program.

Employers and employees find the program effective in addressing economic challenges:

- "Without this program, I wouldn't be able to work here. This is instrumental in helping people have a job out here."
- "Our hardest thing is hiring people. Alleviating an employee's cost of traveling to work by \$150/month is like getting a \$1/hour raise."
- "Being able to offer potential employees the TMA transit pass gives us a leg up to hire new employees. For some people, it's a deciding point about whether they will work here or not."

¹⁶ Joint Venture Silicon Valley report: [Poverty in the Bay Area](#), March 2015.

In a provided analysis of TDM program cost efficacy, the transit pass program is shown to be relatively cost-effective, but is not the most cost-effective program.

Obstacles such as higher need to trip chain (to access multiple jobs) and residential location make transit a more difficult option for service workers than for technology, light office, or government workers. Incremental solutions such as signal synchronization to speed transit will provide some relief.

Non-incremental solutions, such as building more affordable housing closer to jobs, are more difficult to bring about, but offer the hope of larger relief. Equity obstacles are unfortunately increasing for service workers. The PATMA transit pass program provides improved equity within a deteriorating equity situation.

Transit Pass Program Accessibility

PATMA's transit pass program provides monthly transit passes on four public transit operators, each of which is compliant with the Americans with Disabilities Act. The program provides strong accommodations for language and program information accessibility, and for commuters who are underphoned, unphoned, or unbanked.

Appendix C: Low-income commuter profile and their challenges

Downtown Palo Alto is a myriad of businesses and PATMA caters to about 240 commuters at these businesses. Each business is different in its employee operations and needs resulting in a specific commuter profile as explained in the subsequent paragraphs. Identifying the commuter profile helps to design the programs so that it best fulfills the needs of low-income commuters.

For one restaurant:

- Ten staff bike to work from East Palo Alto or Redwood City.
- 70% of staff use Spanish as their primary language.
- Because of the high cost of living, ten staff were priced all the way out of state.
- Tech companies are paying \$20/hour for dishwashers, a rate that restaurants have difficulty competing with.

For one healthcare employer:

- There was an evening mugging of a staffer right across the street from the facility.
- Five years ago, the majority of the staff lived in East Palo Alto, but since have been priced out to San Jose and the East Bay.
- Many staffers hold two jobs. Many have days with long hours.
- Some workers buy reduced price half-year on-street permits, but complain that permits are only available in parking zones with long walks in the cold of winter at night.

SOV-commuting employees at coffee shops, cellular stores, and drug stores often move their cars every two hours, frequently collecting multiple parking tickets per month. Throughout the day, the walk back from moving cars between colored zones gets longer and longer. While these employees qualify for reduced-price \$50 per half-year parking permits, there isn't much uptake. Barriers include:

- Unwillingness to envision six months at the same job
- Difficulty in completing the permit application process, especially for ESL employees
- Lack of availability of permits in convenient, nearby parking zones.

One frustrated bartender collected four parking tickets in a month and contemplated quitting. He knows he needs to move his car within 20 minutes but then he gets slammed with customers for about 45 minutes. When the customer rush lets up he goes to move his car only to find a ticket. The latest Downtown Palo Alto Commuter Survey was conducted October 2018 through December 2018, the respondents being employees of businesses located within Downtown Palo Alto. The survey was paper and web-based to increase participation from downtown businesses. The unique part of the survey was that it was provided in Spanish as well as English. The survey results showed downtown SOV trips have decreased while transit trips have increased. Details about the survey instrument, methodology and results of the Downtown Commute Survey can be found in the full report.

Service workers often work odd hours and long shifts, making it more difficult to find good transit options. On weekdays, Figure 1 shows that while the most common start time is 8 AM, workers start as early as 5 AM or even as late as 12 AM. Many of the start times occur outside of normal transit operating hours, creating an obstacle to using transit.

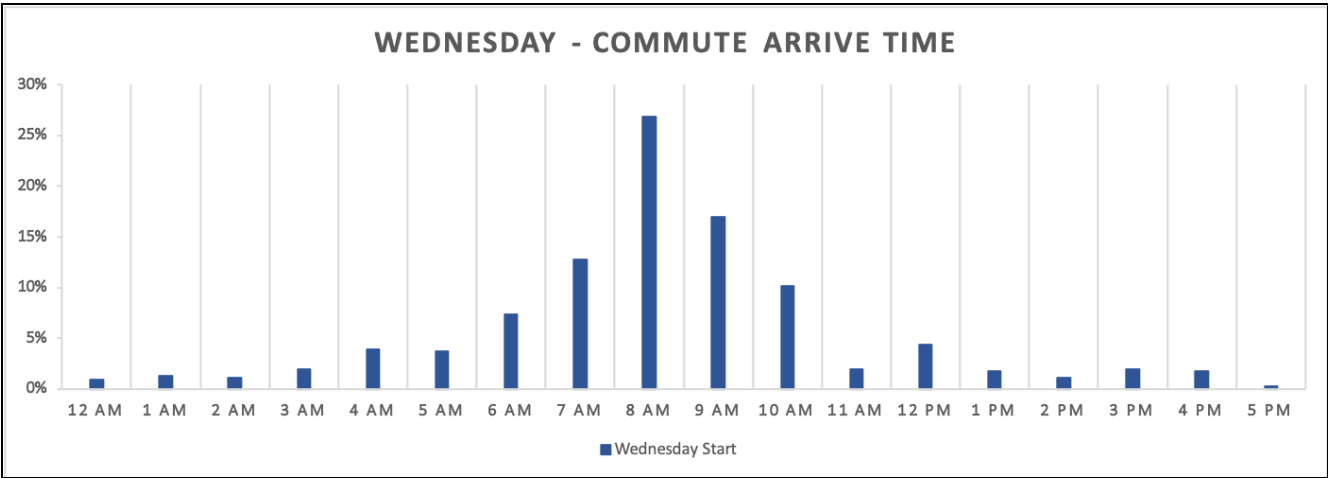


Figure 1

Appendix C: Testimonials from program participants

Portraits of some of the people we serve

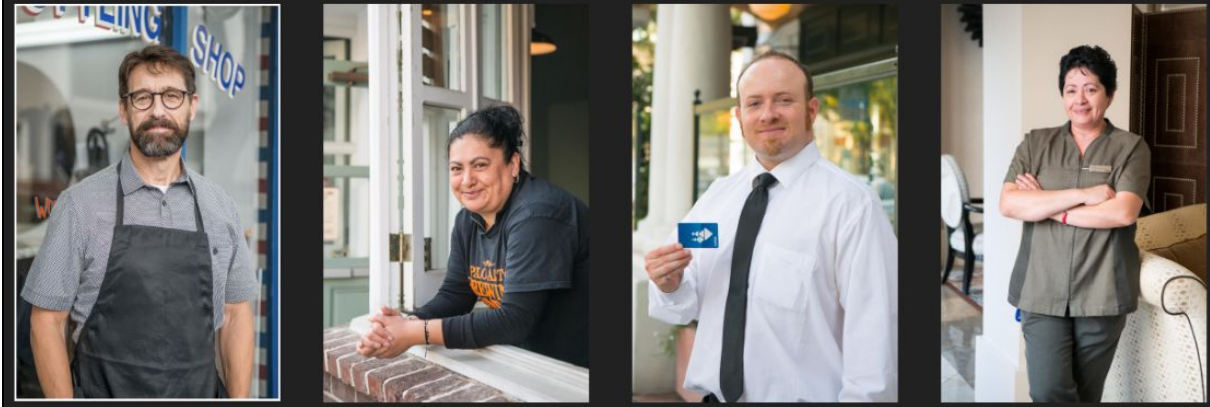


Figure 2

The PATMA transit pass program is changing the lives of low-income commuters and supporting a vibrant downtown by making it easier to recruit staff:

Person & Employer	Testimonial Quote
K, Palo Alto Bicycles	"Our hardest thing is hiring people. Alleviating an employee's cost of traveling to work by \$150/month is like getting a \$1/hour raise."
R, Il Fornaio	"Being able to offer potential employees the TMA transit pass gives us a leg up to hire new employees. For some people, it's a deciding point about whether they will work here or not."
Manager at Keen	"Without this program, I wouldn't be able to work here. This is instrumental in helping people have a job out here."
Manager at MacArthur Park	"I love when my employees take the train because then they're on time for their shifts. When they drive they're often late because they're stuck in traffic."
M, Sheraton	"I'm thinking of going back to school with the money I save from the TMA's transit pass."
I, Sheraton	"I'm going to go back to school since I'm now saving enough money on my commute."
M, Sheraton	"Taking the VTA bus then Caltrain gets me here faster than driving from San Jose. With the bus and train, I get here in 40 minutes. Driving can take one hour and 45 minutes."
L, The Westin	"The train is much faster than driving."
H, Community Pharmacy	"This allows me to save more money for pharmacy school next year. The Caltrain from Sunnyvale is faster and more relaxing. In the morning it's express to downtown Palo Alto. This pass is like Christmas."
S, Community Pharmacy	I live in Hayward and used to spend \$90/month on Dumbarton Bridge tolls. Now I'm much less stressed. It's so relaxing on the bus. I'm very happy and

	very grateful for this transit pass."
another Community Pharmacy employee	"I feel bad for people who drive and are stuck in traffic. The train is so much faster."
R, The Taproom	"The Caltrain from San Jose is much faster than driving and I get to relax on the way to work."
K, Il Fornaio	"I get off late at night and the Caltrain whizzes you home. Having another \$80/month makes a big difference, like the City is looking out for you. It's also convenient that I only have to tag on and off one trip and then not the rest of the month. That way if I'm running late for the train I can just jump on. That extra minute makes a difference between catching the train or missing it."

Table 3. Commuter/employer testimonials collected by Justine Burt on 11/15/18 and 11/29/18

Rave reviews

- "The pass works great. I really need it. Thank you!"
- "I really think this is a great program to which I am extremely grateful and it has been helping me out a lot."
- "It has been very helpful with my finances."
- "I am really happy using my transit pass. It helps me a lot everyday. It works perfect. I don't have to worry about finding a space to park my car. Thank you very much."
- "This is a really great benefit that helps our employees that otherwise would be fighting traffic to get to work. Plus it keeps them from having to move their car every two hours. Thank you!"
- "I love my pass. Thank you so much."
- "The transportation pass is perfect :) !!!"
- "The pass is working GREAT and I am truly grateful to have it! Thank you very much!"
- "The pass has been working very well for me. I have been able to commute from the South Bay each work day, because of the pass."
- "It's working out just fine for me. I never have any trouble with my clipper card. Thank you so much!"
- "The pass is awesome, thank you so much!"
- "It is a big help, thank you."
- "YES!!! RENEW!!!!"

Figure 4. Selected responses from October 2018 pass renewal emails and text messages

Appendix C: Annual income distribution of program participants

From the PATMA's transit pass program operational database, a histogram of the annual income of 556 transit program commuters who participated in the program at some point for one or more months is presented below. The median income is \$31,200 while the mean income is \$31,440. The histogram conveys that the majority of PATMA's participants lie in the \$25,000 to \$45,000 range depicting the importance of the transit pass program subsidy.

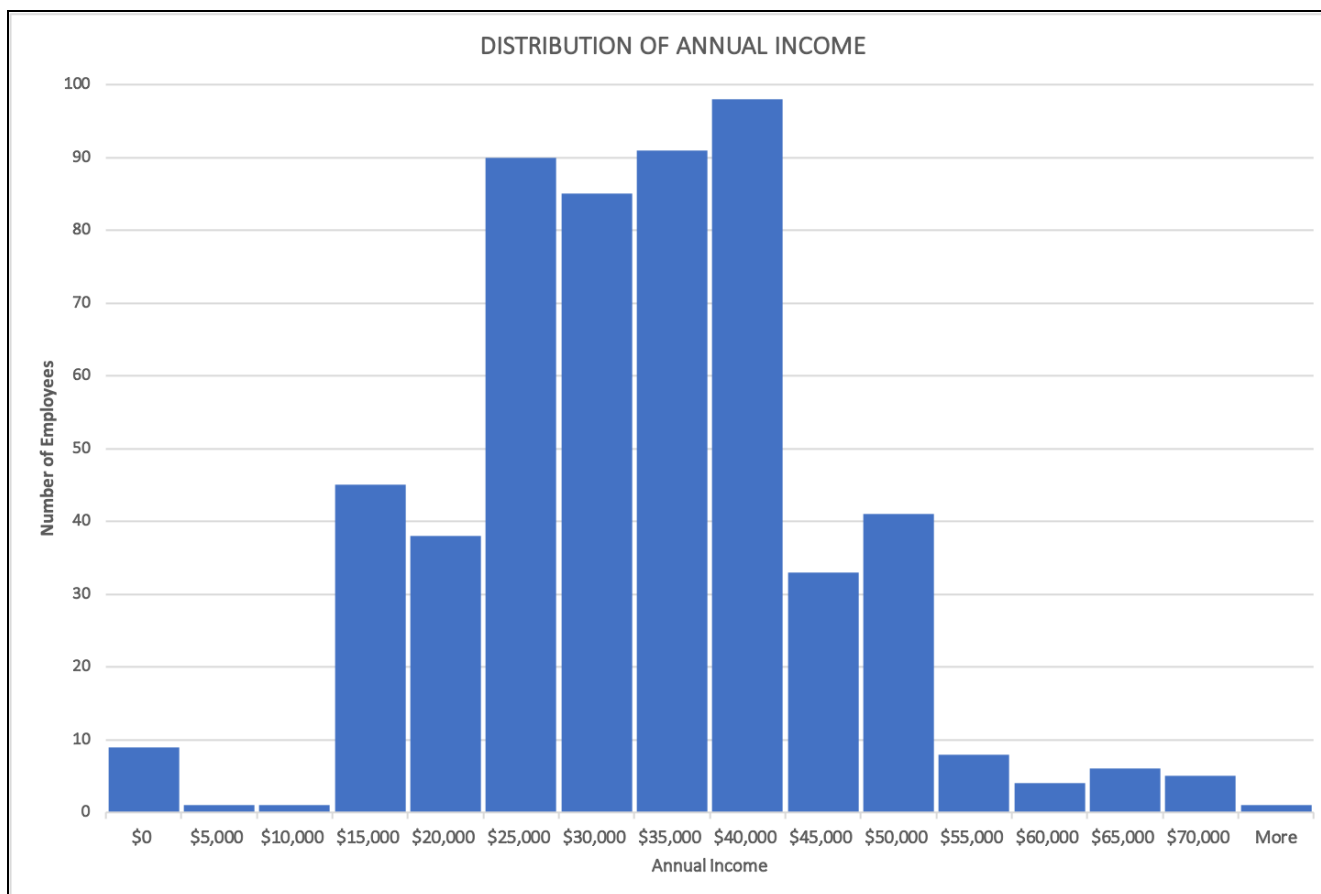


Figure 5

Appendix C: Historical turnover rates of program participants

Below is an Aug-Dec monthly tally of passes that were “activated,” meaning physically tagged at a Clipper Card reader at a train station or bus. Each month, a number of new applications for transit passes are processed. Each month there is “turnover,” where transit passes are not activated. Unused transit passes are refunded to the TMA. Some downtown businesses have a 200% annual turnover (16% each month) of employees, but the TMA’s transit pass program turnover is lower. Lower turnover rate means that the transit pass program subsidy also helps employers retain their employees by giving them a sustainable commute.

TRANSIT PASSES	Aug '18	Sep '18	Oct '18	Nov '18	Dec '18	Jan '19	Feb '19	Mar '19	Apr '19	May '19	Jun '19
Passes Activated	117	149	214	227	241	240	245	229	214	198	187
New applications	36	49	74	33	40	22	28	0	0	0	0
Turnover		17	9	20	26	23	23	16	15	16	11
Percent turnover		11.4%	4.2%	8.8%	10.8%	9.6%	9.4%	7.0%	7.0%	8.1%	5.9%

Table 6: Monthly turnover rate of transit pass program participants

Appendix C: Program utilization by transit operator

Between the four transit providers, 80% of revenue goes to SamTrans (Caltrain or SamTrans bus). A snapshot of June 2019 monthly transit pass outlay shows the percent of transit pass expenditure that goes to each transit provider:

Transit Operator	Passes	Percent	Expenditure
Caltrain	123	62%	\$19,503.00
VTA	36	18%	\$3,240.00
SamTrans	36	18%	\$2,361.60
Transbay DBX	3	2%	\$594.00
total	198	100%	\$25,698.60

Table 7: June 2019 Downtown Transit Pass Program

Appendix C: Cost-efficacy comparison with other TDM strategies

For comparison to PATMA programs, a sampling of non-PATMA program cost-efficacy is provided below. Cost-efficacy is measured by an employer's cost per year of reducing a single SOV commute. This can also be thought of as the cost of freeing a parking space. Caltrain's Go Pass program charges \$285/year for each employee, whether or not they use Caltrain, meaning that cost-efficacy is higher for employers with high Caltrain mode share. In addition to TDM programs, Row #8 provides an estimated annual cost of a new structured parking space to accommodate an SOV commute to downtown.

Row #	For comparison: TDM Program efficacy	Annual cost of non-SOV commute
1	Gates Foundation TDM: \$12/day SOV fee yields 32% SOV	-\$432
2	"Stanford-like" TDM: \$3/day SOV fee yields 50% SOV	\$0
3	Self-motivated bike or carpool	\$0
4	Go Pass for downtown TechCo at 35% Caltrain mode	\$814
5	Go Pass for Stanford campus @ 17% mode share	\$1,676
6	Go Pass for an employer with 10% mode share	\$2,850
7	Private express bus service from SF, 25 riders	\$3,508
8	New structured parking space (SOV commute)	\$3,908
9	Employer housing stipend to live close to work	\$10,000

Table 8: Calculation details are provided in the full report

Compared to typical US TDM program efficacy, PATMA is cost-effective.

PATMA Program Efficacy	Annual cost of non-SOV commute
Waze Carpool	\$1,224
Transit Pass Subsidy - pass outlay	\$1,572
Transit pass subsidy including staff time: \$2,072	
Lyft Program	\$1,855
Scoop Program	\$2,729

Table 9: calculation details are provided in the full report

Appendix C: Cost pressures and potential for cost reduction

Transit operator economic challenges will continue to result in increased costs for low-income commuters:

Monthly Pass Product	2018 Monthly Cost	2019 Monthly Cost	2020 Monthly Cost
AC Transit Transbay/Dumbarton	\$162.00	\$198.00	
Caltrain 2 Zone pass	\$163.50		\$187.50
Caltrain 1 Zone pass	\$96.00		\$120.00
SamTrans local service	\$65.60		
VTa standard service	\$80.00	\$90.00	

Table 10

PATMA met with Caltrain on November 7, 2018, to explore the potential for a discount, but the effort was unsuccessful. Starting around June 2019, Caltrain began offering low-income discounts for individual Caltrain trips, but not for monthly passes. Unfortunately, on a monthly basis, discounted individual trips are more expensive than monthly passes, consequently, Caltrain's program will not benefit PATMA finances.

Appendix C: Commute obstacles

From the 496 responses to the 2018 PATMA Commute Survey, these responses were split into four employer sub-types: 164 government workers, 137 light office workers, 79 service workers, and 116 technology workers. Service workers, compared to the other three employment sub-types, have higher obstacles to commute alternatives:

- 56% of service workers need to drive to work because they make other stops (second job, school, kids, errands) before or after work. One partial explanation is that service workers often have two jobs in two different locations.
- 38% of service workers need to drive to work because they use their car for meetings, deliveries, or other work-related tasks.
- 42% would rather not drive to work, but have no other good options.

As far as transit obstacles, service workers report:

- 47% would take transit to work if the service was faster or more frequent.
- 31% would take transit if parking at transit stops was available.
- 42% would take transit to work if it was easier to get to a transit stop (the first mile problem).

The Bay Area public transit system is fragmented¹⁷, with 27 different operators implementing uncoordinated fares, schedules, strategy, branding, user experience, and capital planning. Despite ongoing investment, per-capita ridership has been declining for years. Though Palo Alto is a major employment center, transit service suffers because it lies at the border of two county bus systems. In addition, ongoing economic pressure on VTA has led to route planning emphasis on their core, densest areas at the expense of the lower-density periphery.

Appendix C: Human/technical challenges and potential equity-increasing solutions

PATMA's transit subsidy program is labor-intensive and prone to both human and technology errors. Each month, about 15% of Caltrain monthly pass commuters "tag on but don't tag off," resulting in negative balances that can result in \$75 citations. PATMA intervenes on behalf of commuters to remedy negative balances and has also successfully appealed Caltrain citations.

Potential Incremental Solutions to help low-income transit commuters

- System improvements are underway that will benefit service workers and increase transit ridership. These include:
 - Dumbarton Corridor improvements
 - The Manager's Mobility Partnership's new north/south bike route
 - City of Palo Alto's bike/scooter share program
 - Palo Alto Transit VisionPlan Local Shuttle Service Enhancements
 - Improvements that could spring from the Sub-Regional TMA collaboration called the Manzanita Talks.
- Regional low-income discounts offer potential benefits to service worker commuters.
- The GIS maps in this report could provide some insights into potential new shuttle bus route possibilities.
- Reduced bike stress. A key factor preventing biking is the poor state of roads and the bike network. 60% of Silicon Valley's population is "interested but concerned" about biking and will only bicycle in low-stress conditions. Analysis and improvements are underway to de-stress biking.¹⁸

Potential non-incremental solutions to help low-income transit commuters

Solutions may include seamless public/private mobility, capping SOV commuting at 50%, robovans, ebikes, major Caltrain improvements, personal rapid transit, higher capacity freeways, and affordable housing production.

¹⁷ "Seamless Transit: How to make Bay Area public transit function like one rational, easy-to-use system," <https://www.spur.org/publications/spur-report/2015-03-31/seamless-transit>

¹⁸ Reduce Bay Area Commuting 25%, Section 7A. Bike route stress reduction.

Appendix C: TDM Social Equity Subdiscipline

The U.S. TDM Social Equity Subdiscipline is emerging, with only a few programs beyond PATMA's program. These include:¹⁹

- In dense urban centers where bike share is prominent, multiple programs offer subsidized membership to low-income travelers. Better Bike Share Partnership is a leading organization.
- The Chicago Individualized Marketing Go Programs, including Go Pilsen, focus on bringing residential TDM to five Chicago neighborhoods that are low-income and highly ethnically diverse. Locally-hired project Ambassadors persuade residents to increase walking, biking, and public transit.
- Los Angeles' People for Mobility Justice organization is a Black Indigenous People of Color (BIPOC) collective that corrects past discrimination in how public transportation benefits and burdens are allocated, maintained, and developed. Those who have had the least should be given the most. The organization educates different audiences, creating a safe learning environment to build consciousness around mobility justice.
- In Austin, Texas, the public housing authority offers a program called Smart Work, Learn, Play, which connects underserved communities with opportunities to increase their use of public transportation. The program recruits "mobility ambassadors" to meet residents where they are, provide one-on-one training on utilizing various tools to access transportation options and work together to advocate for transportation change with City officials.
- King County Metro's ORCA LIFT fare card provides low-income public transit subsidy based on household income. The four-person household maximum income is \$48K, one-person is \$24K.
- UC Berkeley's Parking & Transportation Department administers the Educational Opportunity Program to provide low-income, first-generation students with better opportunities to take advantage of TDM programs such as scooters and bike share. Being proactive to deliver new mobility services is one step to ensure equitable access to transit is provided and is more than just a "checkbox item."
- San Jose's Sacred Heart Community Service organization sponsors Bus Riders United for Transportation Revitalization, a committee of bus riders organizing for transportation justice, influencing transit agency policy and priorities for improved transit service and increased affordability.
- Oregon Health and Science University provides subsidized Lyft rides, without income qualification (but benefiting multiple low-income commuters), for people commuting between 7 pm and 5:30 am, up to \$15 per trip. "We launched this program just last spring and it has been very popular so far, offering a new option to many of our off-peak commuters."
- Research by Portland Metro is defining "How to better design TDM programs that serve communities of color."
- Pleasanton's Hacienda Business Park provides free Wheels local bus EcoPass to all workers and residents within the service area, without income qualification. "A large portion of the users of our transit pass program are service workers and employees with more limited means. The way that the local bus routes are structured, there are strong connections between the more affordable housing in the region (mostly found in Livermore) and the larger employment centers such as Hacienda. We think that this has provided a key piece of affordability for people who work in service industry jobs within Hacienda."
- Contra Costa Centre Transit Village subsidizes a portion of transit passes for low-income workers but does not fund 100% of those passes.

¹⁹ Thanks to the national transp-tdm listserv for listing other equity-increasing programs.

Appendix C: Service Equivalency for the mobility-impaired and other disabled

PATMA's programs are designed to be accessible to all so that no one is treated in a different or inferior manner. PATMA also accommodates changes in programs and services to help everyone equally. People with disabilities have to meet the essential eligibility requirements, such as income needed to participate in PATMA programs, wherever applicable, just like everyone else.

Disability entails having a physical or mental impairment that substantially limits one or more major life activities. According to the World Health Organization, the disabled represent 15% of the world's population. In 2017, approximately 21% of SamTrans bus riders were seniors or people with disabilities. PATMA's transit pass program provides monthly transit passes on four public transit operators, each of which is compliant with the Americans with Disabilities Act. Along with the operators, PATMA provides assistance to disabled passengers in obtaining the information they need. Outside of the transit pass program, disabled passengers may also avail themselves of paratransit services.

Caltrain for People with Disabilities²⁰

Caltrain is a wheelchair accessible commuter rail service. Customers can board at all wheelchair-accessible stations using either on-board lifts or an accessible ramp (depending on the type of train). Caltrain has boarding assistance areas where customers who need help boarding or finding a seat can wait. Conductors will look for passengers in this area and will offer assistance. All Caltrain commuter rail trains have at least one wheelchair accessible car. Caltrain allows service animals on the train.

Every train car has priority seats for seniors and people with disabilities. The seats are marked with a sign.

Caltrain offers free travel training to teach people with disabilities how to use the service. They contract with local disability organizations to provide one-on-one training to teach people how to use the service.

People with a disabled parking placard or with a current disabled license plate issued by the Department of Motor Vehicles may park for free at Caltrain parking lots.

Seniors and people with disabilities who present a Regional Transit Connection discount card, a Medicare card or a Department of Motor Vehicles Disabled Person Placard may ride Caltrain at approximately half fare.

SamTrans Bus for People with Disabilities²¹

SamTrans provides high quality service to people with disabilities to go to work, school, shopping or recreational activities.

²⁰ Information provided by SamTrans ADA Coordinator Tina Dubost

²¹ Information provided by SamTrans ADA Coordinator Tina Dubost

All SamTrans buses are wheelchair accessible with ramps or lifts. The Bus Operator can lower the bus (“kneel”) to make it easier to board.

All buses have an automated system that makes amplified announcements of major transfer points, intersections and destinations. An electronic message board on the bus displays the same information. External loudspeakers announce the route number and destination of the bus at all stops. An Operator will also announce stops that the customer requests.

Seats near the front of the bus are priority seating for seniors and people with disabilities. The seats are marked with a sign.

SamTrans offers free travel training to teach people with disabilities how to use the service. They contract with local disability organizations to provide one-on-one training to teach people how to use the service.

Seniors and people with disabilities who present a Regional Transit Connection discount card, a Medicare card or a Department of Motor Vehicles Disabled Person Placard may ride SamTrans at approximately half fare.

People who have a disability that prevents them from riding SamTrans some or all of the time may qualify for ADA paratransit. This service is pre-scheduled, demand response service that is comparable to the SamTrans bus service.

VTa bus and light rail for people with disabilities²²

VTa’s transit centers, shelters, and most bus stops are fully accessible. Guidance surface tiles and directional tiles are provided to guide pedestrians with visual disabilities using white canes. Lifts, ramps, and device spaces on buses are maintained at ADA standards to provide access for mobility devices. Most VTA bus stops and at all transit centers, bus stop poles are marked with raised letters and Braille that read “BUS”. VTA buses also audibly announce the line number and destination when the doors open at bus stops.

VTa ACCESS paratransit is complementary to the fixed-route transit and provided to eligible individuals. All transit services provide information in accessible formats (large print, Braille, audio tape) and PATMA provides assistance in obtaining the information.

AC Transit bus for people with disabilities²³

All AC Transit buses are equipped with the following accessibility features:

- Passenger lifts or ramps
- “Kneeling”, which lowers the first step several inches to make the first step easier
- Priority Seating near the front of buses, for persons with disabilities and seniors
- Two wheelchair securement locations per bus, each equipped with securement devices which hold the wheelchair safely in place.
- An onboard stop announcement system provides “next stop” audio announcements on many bus routes and the voice announcements are augmented by internal text-message signs. Sight- and hearing-impaired passengers on buses equipped with this system can rely on the onboard information to help them find a stop or destination.

²² <https://www.vta.org/go/accessibility>

²³ <http://www.actransit.org/actrealtime/rider-guides/accessibility/>

Appendix C: Language and program information accessibility

As far as language accessibility, several low-income downtown workers speak Spanish as their first language. For one restaurant downtown, 70% of staff use Spanish as their primary language. PATMA has a Spanish-speaking person on staff to make participation easier and for helping commuters succeed in using their passes. On several occasions, PATMA overcomes the language barrier using tools such as Google Translate to provide a seamless customer experience. Moreover, PATMA commute surveys are available in Spanish as well as English. PATMA can also provide interpreter services for language assistance other than Spanish. In addition, participating employers often assist their Spanish-speakers in navigating the program.

As far as program information accessibility, PATMA's web is accessible to an extent in that the images, text, graphics and site structure are prepared to increase performance with assistive technologies. For assistance with monthly pass renewals, PATMA can provide with assistance and communicate the renewal confirmations and such via phone. PATMA can also fill out transit pass applications on behalf of the commuter. Where PATMA struggles in providing accessibility services, specialists are hired to provide the best possible service. In addition, participating employers often assist their Spanish-speakers in navigating the program.

Appendix C: Service Equivalency for the unphoned and underphoned

The unphoned are those with no cell phone of any kind. The underphoned are those with a flip phone; a no-contract phone; another basic device that lacks important capabilities; or a phone with capabilities the owner cannot, or chooses not, fully to use. PATMA's monthly transit pass program workflow features communication with commuters to verify that they would like to renew their transit pass. This communication occurs using SMS or email. To date, no commuters have needed accommodation for the renewal process, but PATMA will collaborate with employers to address a communication deficit, should one arise.

Cellphone ownership is now very high in the US, at 92% for non high school graduates, 96% for Latinx commuters, and 95% for commuters earning less than \$30,000 per year.²⁴ Feature-rich smartphone market penetration has increased from roughly 40% in 2011 to 80% in 2018. Cellphone and smartphone market penetration can be expected to increase each year.

²⁴ Pew Research Center: Internet and Technology's Mobile Fact Sheet: <https://www.pewinternet.org/fact-sheet/mobile/>

	Own smartphone	Own cellphone
Race / ethnicity		
White	82%	96%
Black	80%	98%
Latinx	79%	96%
Annual Income		
Less than \$30K	71%	95%
\$30K-\$50K	78%	96%
\$50K-\$75K	90%	98%
\$75K+	95%	100%
Education		
Not high school graduate	66%	92%
High school graduate	72%	96%
Some college	85%	96%
College graduate	91%	98%

Table 11

Appendix C: Service Equivalency for the unbanked and underbanked

The unbanked are those with no checking, savings, or credit card account. The underbanked have an account but continue to rely on alternative financial services, like check cashing services, payday loans, pawn shops, or rent-to-own agreements. PATMA's transit pass program provides Clipper fare media cards to the unbanked and underbanked, eliminating their fare payment obstacles to utilizing public transit.