Equitable Access to Transportation in Downtown Palo Alto and Redwood City

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Executive Summary

This project was undertaken to gather data that would inform the Palo Alto Transportation Management Association (TMA) and the Redwood City government on how to improve sustainable transportation in their respective downtowns. (See **Figure 1** for Palo Alto downtown). Methods of analysis included conducting qualitative in-person surveys about transit preferences and incentives in Palo Alto, and performing cross-tabulations on prior survey data for Redwood City.

Results from the Palo Alto employee and employer surveys show that most employees who drive repark their cars every few hours. These employees were categorized as direct commuters and transfer commuters, based on whether their commutes would require transfers between transit agencies. The subsidy would be more difficult to administer for transfer commuters due to the confusing price structure for transfers between agencies. Of those employees who would most benefit from transit use, SamTrans would be the best transit agency to subsidize. Survey findings show that small business managers don't imagine they could reduce single-occupancy vehicle (SOV) trips because they employ too few employees to make a difference. This report builds on the survey findings to create three plausible Palo Alto TMA budget allocations for the transit subsidy pilot program they plan to implement. This report also includes key marketing messages to best convince both employers and employees of the value and significance of using public transit.

The Palo Alto survey had limitations. We were not able to interview more than four employers. Thus it is important not to over generalize the findings or claims of employers as it may not pertain to all businesses in Palo Alto. Additionally, most of the employees surveyed were client-facing personnel.

For Redwood City, we found that the most popular incentives for taking transit were financial incentives or flexible schedules for city employees, and GoPasses or other discounted transit passes for employees of other businesses. We also found that the employees least likely to be receptive to any incentives are those who work long or irregular hours. While these findings could be useful in beginning an incentive plan, we recommend similar cross-tabulation analysis of other extant surveys conducted for Redwood City employees, which asked more questions e.g. about employee demographics, worksite size, and business sector.

Project Purpose

Background

Assembly Bill 32 requires California to reduce its greenhouse gas emissions to 1990 levels by 2020. This bill was passed exactly a decade ago to transition California to a sustainable, low-carbon future. In keeping up with this cleaner vision, many cities and non-governmental organizations have taken steps to curb greenhouse gas emissions. The lofty goal that California has set for itself touches upon other social aspects such as equitable access to transit and fragmentation within the transit system. This project was conceived to aid in addressing these issues locally, by collecting data that will inform the Palo Alto TMA and Redwood City as they both implement transportation demand management (TDM) programs to meet the needs of Bay Area commuters.

Community Partners

Our primary community partner was Friends of Caltrain, a nonprofit that works for sustainable transportation along the Caltrain corridor. Started in 2010 as a zero-budget organization and granted non-profit status in 2013, Friends of Caltrain aims to create a stable funding source for Caltrain, while supporting its modernization (e.g. electrifying trains) and integration into the larger public transit network in the Bay Area. Our primary contact at Friends of Caltrain was Adina Levin, Friends of Caltrain's co-founder and Executive Director and a member of the steering committee for the Palo Alto Transportation Management Association.

The Palo Alto TMA is a nonprofit founded in early 2015 with the goal reducing the number of solo drivers by 30% by 2018, alleviating parking problems, and increasing the equity of transit subsidies. In May 2015, the TMA conducted a preliminary survey of downtown Palo Alto businesses to obtain data on employee transportation preferences and demographics. The TMA's next steps will be to plan programs to facilitate and encourage the use of public transit by commuters to the downtown. Wendy Silvani was our primary contact with the Palo Alto TMA. She oversaw the portions of the project specific to downtown Palo Alto.

Redwood City is in the preliminary stages of developing a TMA and would like to model its TMA on Palo Alto's. However, its goals differ in that Redwood City is not addressing a current problem, but rather is hoping to avoid congestion and transit inequity in the future as the number of businesses and employees in Redwood City's downtown district grows. Our primary contact in Redwood City was Jessica Manzi, Senior Transportation Coordinator in the Redwood City Community Development Department.

Map

Figure 1: Palo Alto Downtown

Project Goals

The end goal of this project is to reduce the number single occupancy vehicle trips. Getting solo drivers off of California roads serves two purposes: minimizing peak-hour traffic congestion and curbing air pollution. The largest demographic group that drives alone are low-income workers. Therefore, one can have the greatest impact on reducing the number of single occupancy vehicles by increasing equitable access to public transportation. This project serves to synthesize data that would inform the Palo Alto TMA and Redwood City

enabling them to tailor their TDM programs to best suit the needs of low-income workers in their respective downtowns.

Implications and Significance

While tech is perhaps the most visibly growing industry in Silicon Valley, high-salaried tech jobs are not the fastest growing sector for employment. 67% of the projected job growth in Silicon Valley is expected to be in the service sector, specifically jobs paying less than $50,000 annually. As such, this project's main objective was to gather data that would allow the Palo Alto TMA and Redwood City to design their TDM programs for low-income workers.

This project is significant because the Palo Alto TMA is on the verge of establishing a transit-pass subsidy pilot program. If the pilot program successfully launches to numerous employers in the near future, there will be markedly less traffic congestion in downtown Palo Alto. A successful pilot program will not only help the Palo Alto TMA receive funds but would inform Redwood City as it starts its own TMA.

This report provides Redwood City with a clear direction for their continued data collection and TMA planning process. By synthesizing, summarizing, and visualizing the survey data provided, this report illuminates gaps in the existing data.

This project benefits a traditionally underserved demographic and alleviates some of the environmental and economic injustices present in the current transportation system. The result would be improved equity and more sustainable lifestyles for commuters throughout the Peninsula and across the Bay.

Literature Review

We used a variety of sources to inform our project about the context of transportation planning in the Bay Area as a whole, transportation planning in Redwood City and Palo Alto, and identified gaps in the literature, particularly around equitable transportation in Redwood City and Palo Alto.

The Plan Bay Area (2014) and SPUR Seamless Transit (2015) reports provided the context of transportation planning in the Bay Area. Plan Bay Area is a plan approved by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) to guide the next few decades of urban planning in the Bay Area. The 2008 Senate Bill 375, the Sustainable Communities and Climate Protection Act of 2008, targets emissions from cars and light trucks and calls for metropolitan areas to develop Sustainable Communities Strategies, which resulted in the formation of the plan (ABAG and MTC 2014). Moreover, SB 375 sets the goals of reducing greenhouse gas emissions by 7% per capita by 2020 and 15% per capita by 2035. Plan Bay Area describes the growth in the Bay Area that must be accommodated while addressing these goals. By 2040, 9.3 million additional people will live

in the Bay Area. 32% of new households will be very low income and 25% of new households will be low income. From 2010 to 2040, 1.1 million jobs will be created. Within Palo Alto and Redwood City, there will be a 33% increase in jobs. These growth projections describe large challenges for urban planning but also great opportunities for sustainable development. The MTC and ABAG expect $292 billion in revenue to spend through 2040. Much of it will be spent on maintaining existing transit systems (55%) and roadways (32%), and there is a lack of funding for transit replacement and expansion. SPUR's Seamless Transit report identifies more challenges and problems facing transit in the Bay Area, such as connectivity between transit agencies, the limitations of Clipper technology for fare payments, gaps and duplication in transit service, and limitations with monthly passes (Amin and Barz 2015). The problems that the report identifies surfaced in our project as well.

We also researched the background of our community partner organizations and individuals to understand the context of our project. We looked at the history of Friends of Caltrain, the Palo Alto Transportation Management Association, and the Redwood City, as well as the past work of Adina Levin, Wendy Silvani, and Jessica Manzi, who work for the respective organizations. Although our project does not focus specifically on Caltrain, the Friends of Caltrain is advocating for a comprehensive transit network and equitable access to transportation. Redwood City did not have much information about their transportation planning, which makes sense given that they just started looking into the issue. The Palo Alto TMA is further ahead in terms of planning. In 2015, Palo Alto City Council set a goal of reducing SOV trips by 30% in three years (Community Meeting, Palo Alto TMA 2015). The Palo Alto TMA created a 3 year plan to help the City of Palo Alto reach this goal. In its first year, the TMA created a steering committee, which helped define the mission, purpose, and area of focus. The TMA was officially established as a non-profit in late 2015. The TMA is currently planning and launching TDM programs. Our project with the Palo Alto TMA provided findings and recommendations for the first TDM programs. Our work plays a crucial role in getting the programs launched and should have a lasting impact on SOV trip reductions.

Our project builds upon previous work and research on transportation in Redwood City, Palo Alto, and the surrounding region. In 2014, a previous Sustainable Cities group partnered with Friends of Caltrain to investigate mode share shift potential along the Caltrain Corridor (Dembo and Schreiber 2014). Redwood City has conducted several surveys on commute patterns: the Employee Transportation Survey, Commute.org 2014 Profile Survey, SamTrans Last Mile Project, and Connect Redwood City 2014 survey. The Palo Alto TMA summarized their findings in the Downtown Palo Alto Mode Split Survey (Downtown Palo Alto Mode Split Survey, Palo Alto TMA 2015). These findings provided helpful information about the commute patterns in the two cities and allowed us to infer possible areas for targeting SOV trip reductions. We noted that none of the data specifically isolated income as a variable, which is a gap in knowledge that is helpful for addressing the needs of low and lower income commuters. As Agyeman and Evans assert in their paper *Toward Just Sustainability in Urban Communities*, sustainable development must work towards social justice and equity, not just

economic vitality and environmental protection (Agyeman and Evans 2003). For our project, we centered our work on environmental justice and tried to ensure that recommendations addressed the needs of low income commuters.

Methodology

Palo Alto Surveys

We collected data by surveying employees and employers of small businesses in downtown Palo Alto in the area indicated by Figure 1. In addition to surveys for the employer and employee, we had an employee demographic questionnaire and a cover letter for employers. We conducted these surveys both in-person and over the phone, and conducted one focus group with a group of employees. Most of the surveys were done by approaching employees directly to ask if there was any interest in participating in the survey. Regardless of whether we were able to interview anybody, we offered to leave a cover letter explaining the research project and providing contact information for follow-up with employers. In some cases, we were able to arrange times with business owners to conduct surveys in person or over the phone.

We made an effort to conduct most of our surveys in-person in order to get a more authentic sense of the interviewee responses, since much of the survey was qualitative. As a result, we were limited by the time that we had available to go to downtown Palo Alto to conduct fieldwork, and had fewer surveys than we potentially could have collected. Moreover, our method of approaching employees without prior notice was not as efficient as it could have been, since we spent a lot of time waiting for employees or employers to be available to approach for the survey. The single focus group was the most productive use of our time, as we were able to survey eight to twelve employees within an hour. Our data may have been more comprehensive if we had known how many employees would be participating in the focus group. We were overburdened by the sheer number of respondents.

The employee survey consisted of three sections: an introduction -- where we explain the purpose of the survey and ask for permission to audio-record -- commuting-specific questions, and employer-based commuting benefits. The employer survey consisted similarly of three sections. The first section was an introduction where we explain the purpose of the survey and the overall goal of the Palo Alto TMA transit-pass subsidy pilot program. We additionally asked for permission to audio-record. The second employer survey section consisted of the the following topics (some topics omitted for brevity): employee work hours, full/part time ratio, types of shifts, locations employees commute from, main transportation modes used by employees, any employment commuting benefits offered by the business, and if employee had any morale or work impacts caused by commuting. The last section was about the subsidy program and meant to gauge how willing the employers would be to take on the subsidy after the pilot trial ends. Both employee and employer

interview surveys lasted around twelve minutes per survey. We didn't end up using the Spanish versions.

The main disadvantage of this survey is that it was not quantitatively rigorous. We were not able to interview enough employers for the findings to be statistically significant, but the City of Palo Alto already has data that informed our qualitative findings. Our survey captured the qualitative information well, since we were able to record employees' and employers' desires and thoughts regarding the program.

The Palo Alto TMA suggested we interview restaurants, retail, and small service businesses. The individual companies we surveyed were chosen quasi-randomly. Staff size, business hours and business types were all taken into consideration. We aimed to interview mostly small businesses (less than 20 employees), with wide-ranging business hours that were non tech-centric, because these are more likely to employ low-income workers. We interviewed 23 employees and 4 employers as indicated by the asterisks (*) below. We has a focus group from the Garden Court hotel where we interviewed 12 employees.

 The employees surveyed were from:
- Restaurants
    - Gelato Classico
    - Fraiche
    - Philz Coffee*
    - Gong Cha
    - Prolific Oven
- Retail
    - Keen
    - Palo Alto Sport Shop and Toy World
- Other
    - Aquarius Theatre*
    - Garden Court Hotel*
    - Gate Cleaners* (employer only)

Redwood City Crosstabs

For Redwood city, two surveys, both conducted in 2015 by 511.org, were used in this analysis; one surveyed city employees, and the other surveyed employees of other other employers downtown. For both surveys, respondents from only four counties (Alameda, San Mateo, Santa Clara, and San Francisco) were included in the analysis. Respondents from other counties (Santa Cruz, San Joaquin, Marin, Contra Costa, Placer, Stanislaus, and Sacramento) were considered outliers, as responses from those counties were relatively few (n = 21 out of 203 for city employee survey, n = 1 out of 138 for general employee survey), and additional barriers to transit use associated with traveling greater distances could skew the data in ways unrepresentative of the greater population.

Deliverables

Palo Alto Employer and Employee Survey

The Palo Alto TMA has proposed a budget of $80,000 for the transit-pass subsidy pilot program. The table below (Budget Allocation A) is a sample distribution of the $80,000 over a six-month period. The currency figures are on a monthly basis.

Two people expressed that getting to Caltrain is a barrier, but using a bus transfer could help. Additionally, out of 14 respondents who agreed to know which transit agency was most applicable to their commute, 8 respondents would need a transfer from Caltrain to VTA/ SamTrans. For people who only need to travel within one Caltrain zone, it's cheaper to use a two-zone pass, which includes free transfer to VTA and SamTrans, than it is to buy both a bus pass and a one-zone Caltrain pass. Thus we decided to use two-zone Caltrain in this budget proposal allocation, even for one-zone users. Out of the 14 employees who agreed to know their most pertinent transit agency, seven would be commuting from East Palo Alto. Thus we decided to offer higher level of transit passes for SamTrans in this budget allocation.

Budget Allocation A

	Original Cost	Employee Cost	**Subsidy**	**# of passes**	*% of Budget*
SamTrans	$66	$26	**$40**	**170**	*50*
VTA	$70	$30	**$40**	**85**	*25*
Caltrain (2-zone)	$140	$65	**$75**	**45**	*25*
				300	***$81,450***

In Budget Allocation B, we simply increased the number of Caltrain subsidized passes. Out of the 24 employees interviewed, 14 would need to use Caltrain to commute to work from their

home cities. We still kept a large number of SamTrans to accommodate the large number of East Palo Alto commuters.

Budget Allocation B

	Original Cost	Employee Cost	**Subsidy**	**# of passes**	*% of Budget*
SamTrans	$66	$36	**$30**	**150**	*33.3*
VTA	$70	$25	**$45**	**40**	*13.3*
Caltrain (2-zone)	$140	$50	**$90**	**80**	*53.3*
				270	***$81,000***

For this allocation, we proposed adding an option for 1-zone Caltrain passes to be more cost efficient with the TMA budget. Two of the employees said that they did not need a bus transfer to use the Caltrain pass, so the TMA can offer the option of 1-zone passes to commuters living in Palo Alto's zone who do not need bus transfers.

Budget Allocation C

	Original Cost	Employee Cost	**Subsidy**	**# of passes**	*% of Budget*
SamTrans	$66	$36	**$30**	**180**	*40*
VTA	$70	$25	**$45**	**45**	*15*
Caltrain (2-zone)	$140	$60	**$80**	**60**	*35*
Caltrain (1-zone)	$85	$40	**$45**	**30**	*10*
				315	***$81,450***

Palo Alto Marketing Messages

Based on the survey responses we received from employees and employers, we made recommendations on how to market the transit pass subsidy program to employees and employers.

For Employees
- ● Avoid traffic and parking problems
    - ○ Over half of surveyed employees reported these problems negatively affected their happiness or performance at work
- ● The transit pass has no usage limits and can be used for personal matters
    - ○ A large number of surveyed employees reported they would use the pass outside of work

For Employers
- ● Employees want transit benefits
- ● Driving can affect employees' happiness and performance at work
- ● Small businesses can and should participate too, because they are part of solution
    - ○ Two small business owners (one of which declined to be surveyed) did not think their participation would make a difference to congestion or sustainability efforts

Based on these recommendations for marketing messages, we created sample fliers and postcards to distribute to employees and employers. The fliers are included with this report as separate attachments.

Redwood City Employee Crosstabs

Tables 1 and 2 show which cross-tabulations were created for the city employee survey and the general employee survey, respectively. These were based on: a) what cross-tabulations had already been done, if any, b) the list of cross-tabulations created from a similar survey conducted with employees in Downtown Palo Alto in 2015, and c) the researcher's best judgement of what relationships were most informative to investigate.

Graphs have been included along with finding descriptions, when helpful. All cross-tabulations for both survey datasets are presented in full in Appendices A (city employees) and B (general employees). Not all response options are shown; if the number of respondents who selected an option was fewer than 5, that option has been eliminated for the sake of visual simplicity. Options for which the responses numbered fewer than 10 have been printed in grey, as the groups with greater response rates are more likely to be representative and thus should be the focus of any analysis. For cross-tabulations that include possible incentives to use transit, only data from respondents who drove 3 or more days in the Monday-Friday work week (for city employees) or who specified driving alone as their primary mode of transportation (general survey) were included in analysis.

Table 1. Cross-tabulations for City Employee Survey

	Mode	Home County	Work Start Time	Choice Factors	Barriers to Transit
Mode					
Home County	X				
Work Start Time		X			
Barriers to Transit		X			
Potential Alternatives		X		X	
Incentives to use Transit				X	X
Commute distance	X (by 511.org)				

Table 2. Cross-tabulations for General Employee Survey

	Mode	Commute Distance	Home County	Choice Factors	Barriers to Transit
Mode					
Commute Distance	X				
Home County	X				
Barriers to Transit			X	X	
Potential Alternatives			X		
Incentives to use Transit		X	X	X	X

Results and Recommendations: City Employees

Incentives to Use Transit
Barriers to Using Transit x Incentives to Use Transit

- Within all barrier groups with n > 10, the most popular overall incentives (financial, flexible schedule) were highly popular (mean 24%, minimum 17%, maximum 29%).
- The 3rd most popular incentive varied more amongst barrier groups, but Guaranteed Ride Home and help finding carpool partners were both popular amongst most barrier groups.
- For those who simply prefer driving, financial incentives and flexible scheduling are the most popular, with Guaranteed Ride Home and help finding carpool partners tied for 3rd.

Factors Considered when Choosing to Drive x Incentives to Use Transit
- Within the two most popular factor groups (time, convenience), the most popular overall incentives (financial, flexible schedule) were highly popular (>22% both factor groups).
- Financial incentives were ranked by a higher percentage of respondents in all factor groups (mean 28%, minimum 20%, maximum 39%) than was a flexible schedule (mean 22%, minimum 11%, maximum 33%).
- People like to be compensated for lost time—the most common overlaps were financial incentives with time or convenience factors.
- Flexible scheduling was ranked 2nd for all factor groups except the stress factor group (n = 18), which ranked help finding carpool partners 2nd and flexible scheduling 3rd. This group also showed the strongest preference for financial incentives (39%).

General Conclusions for Incentives
- Financial and Flexible Scheduling are not only the most popular choices, but are the most popular across nearly all barrier and factor groups. By providing financial incentives or offering flexible work schedules, Redwood City would reach a wide range of employees, regardless of what barriers to using transit they face, or what factors currently encourage them to drive to work.

Current Transit Mode
Current Mode x Home County
- Driving alone is the most common mode for all counties (mean 70% of of trips per Monday-Friday work week, minimum of 61%, maximum of 76%).
- 60% of all car trips were made by people in San Mateo County (56% of respondents).
- Most carpool trips were (58%) made by people in Alameda County (19% of respondents)
- Transit trips, as percentage of all trips, were approximately equal for San Francisco (31% of trips), San Mateo (32%), and Santa Clara (29%) counties, but far less common in Alameda (7%).
- On average, commuters from all counties traveled 3-4 days/week by car, with the highest number of car days per week in San Mateo (3.76) and Santa Clara (3.64). San Francisco commuters drove the least (3.05 days per week).

- On average, the number of transit trips per week was less than 1 for all counties, with the highest average in San Francisco (0.90 days per week) and the lowest in Alameda (0.11).

General Conclusions for Current Mode
- Even commuters coming from places with theoretically good transit access (particularly San Francisco) do not necessarily take advantage of it.
- Even people coming from nearby do not tend to walk or bike.
- Commuters from Alameda are the most likely to carpool; efforts to help commuters find carpool partners may be best targeted to this group.
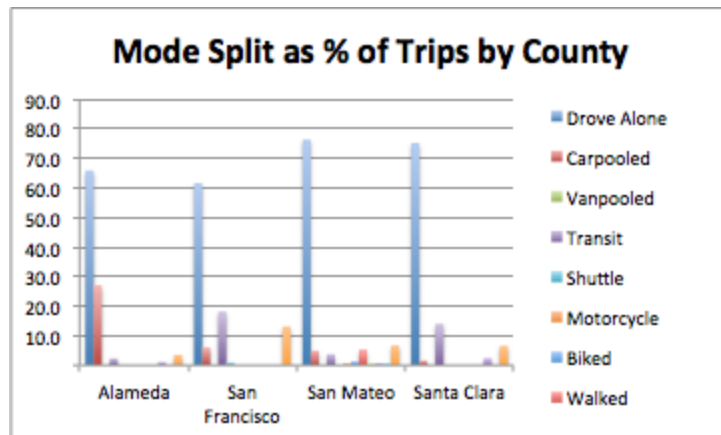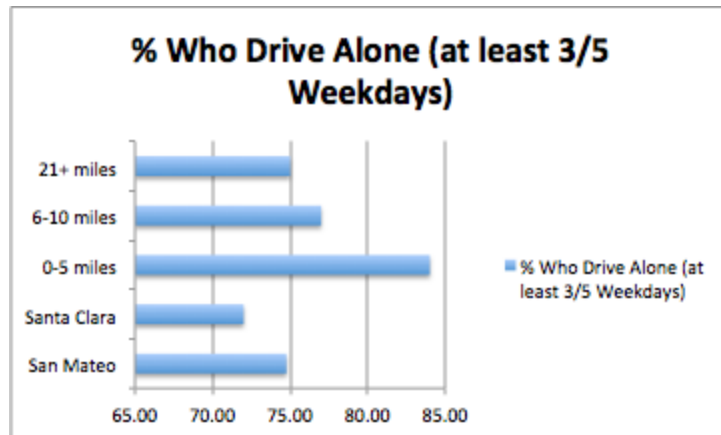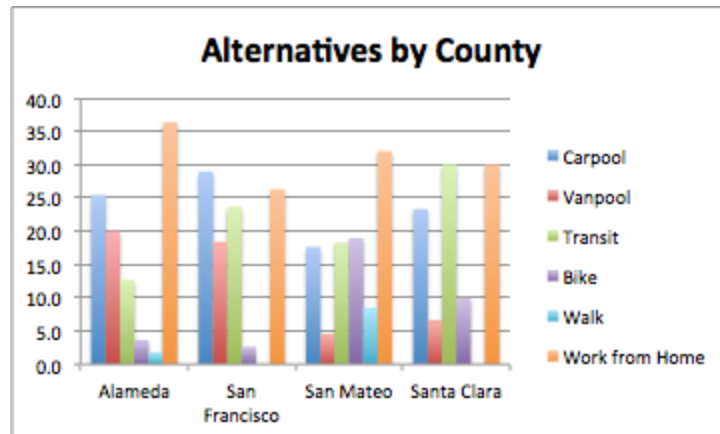

<u>Alternatives to Driving Alone</u>
Home County x Potential Alternatives
- The most popular incentive was working from home, which was favored fairly equally by all four counties (mean 31% of county total, minimum 26%, maximum 36%).
- 93% of potential walkers and 83% of potential bikers are from San Mateo County, but but working from home is still the most popular choice for that county (32%) while walking is the least popular (8.5%).

- Carpooling is a more popular alternative than transit in San Francisco County (29% versus 24%) but not for Santa Clara County (23% versus 30%). Given the theoretical accessibility of public transit in San Francisco, this is a surprising finding; however, it could be related to the overall length of commute and time tradeoffs, proximity of residences to the main transit lines (e.g. Caltrain), or the relatively small sample size of respondents from San Francisco (11% of all respondents).

Factors Considered when Choosing to Drive x Potential Alternatives
- Those who consider the desire to run errands during the day, or on the way to and/or from work, favor working from home as an alternative to driving (44.6% of factor group).
- Those who are concerned about safety and/or want to do errands feel transit is the least desirable alternative (18% for safety group, 15% for errands group).
- 22% of those who might walk are also want to run errands during their day.
- Carpooling is greatly favored over transit by those who consider environmental impacts (38% versus 22%) and cost (28% versus 21%). However, transit is slightly favored by the convenience, reliability, and errand-running groups.

General Conclusions for Potential Alternatives
- Working from home and carpooling are good alternatives for commuters from all counties and across all factor groups.
- Allowing San Mateo commuters to work from home would save the most car trips.
- Carpooling may be seen as a better choice than transit by some because of the cheaper out-of-pocket cost, and comparable (or greater) perception of sustainability.

Work Start Time
Home County x Work Start Time
- 67% of commuters who begin work before 6am, and 30% of those who begin work between 6 and 7am, are from Alameda County. Alameda is also the county with the highest rate of solo drivers.

- Most commuters start work between 7 and 9am, with the greatest concentration (73%) in San Mateo County.

General Conclusions for Work Start Time
- Early morning options from Alameda county should be investigated, perhaps with a drill-down by city to determine what options are available in terms of transit. If transit is not an option, efforts to help early-morning Alameda commuters find carpool partners may be worthwhile.

Barriers to Using Transit

Home County x Barriers to Using Transit
- Lack of good routes/schedules is the most cited barrier for Alameda (23%) and San Francisco (28%). The highest *number* of respondents citing a lack of good routes/schedules were from San Mateo (30 respondents, 15% of San Mateo responses).
- For San Mateo County, the most cited barrier is wanting to do errands (23%).
- For Santa Clara, the most cited barrier is working late or irregular hours (28%).
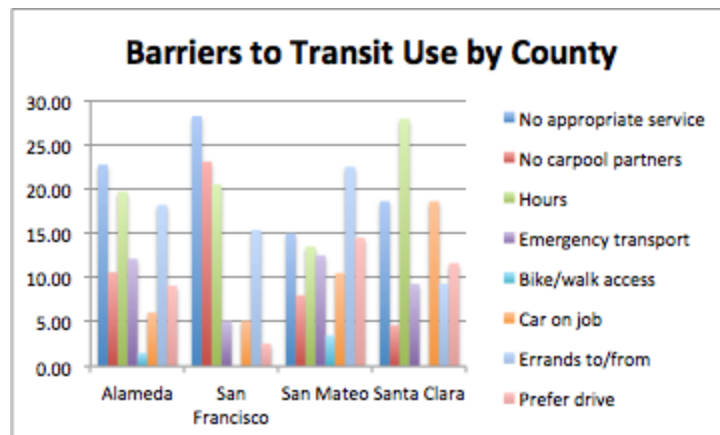
General Conclusions for Barriers (including Barriers x Incentives, above)
- Barriers do not necessarily predict incentive preference. For example, Guaranteed Ride Home was cited as a good incentive by only 19% of those who felt that needing transportation in an emergency was a barrier to using transit. Similarly, help finding carpool partners was cited as a good incentive by only 20% of those who felt that finding carpool partners was a barrier to not driving alone.
- The perceived quality of transit routes/schedules varies somewhat regionally, but not extremely.
- The biggest perceived barriers vary by county

Results and Recommendations: General Community

Incentives to Use Transit
Barriers to Using Transit x Incentives to Use Transit
- ● Those who work late or irregular hours tend to feel that no incentive would be enough to stop them from driving (19%). This pairing had the highest number of hits (10) of all barrier-incentive pairs.
- ● Trip planning resources are a popular incentive amongst people for whom transit service does not provide a suitable schedule or route (23% of barrier group).
- ● The GoPass is very popular amongst those for whom transit is too expensive (32% of barrier group) or too far away from their homes (24%). It is also popular amongst those who have difficulty finding carpool partners (25%), and prefer the GoPass to assistance finding partners. However, this barrier group is relatively small (n = 12) and thus these results may not be significant.

Factors Considered when Choosing to Drive x Incentives to Use Transit
- ● The GoPass is the most popular incentive amongst those who consider cost (31% of factor group), convenience (16%), and reliability (15%).
- ● Those who have never considered an alternative might be persuaded best by help finding carpool partners, a GoPass, or financial incentives (all 18% of factor group).

Home County x Incentives to Use Transit
- ● 24% of commuters from San Francisco County considered the GoPass a good incentive.
- ● For Santa Clara county, general financial incentives were more popular than the GoPass (25% versus 20%) though this relationship was reversed in all other counties.
- ● Help finding carpool partners popular amongst San Francisco commuters (17% of county responses).

Commute Distance x Incentives to Use Transit
- ● Bike paths are the most popular incentive for short-distance commuters (17% for 1-4.9 miles, 14% for 5-9.9 miles). Secure and safe bike parking is less popular, and is only cited by those with commutes less than 5 miles.
- ● The Go Pass is a good incentive for all distances except 1-4.9 miles (selected by 5% of that group), and is most popular amongst commuters who travel 5-9.9 miles (selected by 22%).
- ● Guaranteed Ride Home is the most popular choice for commuters traveling 10-14.9 miles (21%).
- ● A general financial incentive is the most popular for commuters traveling 15-49.9 miles.

General Conclusions for Incentives
- ● People with irregular or late working hours will be hard to reach with any incentive.

- The GoPass would help the most people (45), mostly concentrated in those who consider convenience when choosing to drive (20).
- Guaranteed Ride Home and general financial incentive are more broad-reaching than GoPass, but do show differences for distance groups. GRH would best be marketed to commuters traveling 1-15 miles, and financial incentives would best be marketed to commuters traveling more than 15 miles.
- In general, help finding carpool partners is far less popular amongst the general downtown employee base than it is with city employees.

Barriers to Using Transit

Factors Considered when Choosing to Drive x Barriers to Using Transit
- There is a high degree of overlap between those who work late or irregular hours, and those who consider convenience (29 people).
- Convenience is the largest factor group (177 people), and the biggest barriers to that group are late or irregular hours (16%), a lack of good transit routes or schedules (12%), and transit being too slow (13%).

Home County x Barriers to Using Transit
- For commuters from San Francisco County, the distance to a transit stop (33%) and transit being too slow (33%) are both common barriers.
- For commuters from Alameda County, transit routes and schedules (25%) and transit service being too slow (25%) are the biggest barriers.
- Late and irregular hours are fairly evenly represented across all counties (mean 17%, minimum 13% in Alameda, maximum 21% in Santa Clara).

General Conclusions for Barriers to Using Transit
- Inconvenience is a big issue across the board; it is both considered as a factor for mode choice and seen as a barrier.
- Working late or irregular hours is also a widespread barrier.

Current Mode and Potential Alternatives

Home County x Potential Alternatives
- Commuters from San Mateo County see a wide array of viable alternatives, particularly shuttles (17%), Caltrain (15%), telecommuting (16%), and biking (16%).
- Santa Clara County and San Francisco County both prefer Caltrain to all other options (33% and 31% respectively).
- No one from San Francisco selected telecommuting as a possible alternative.
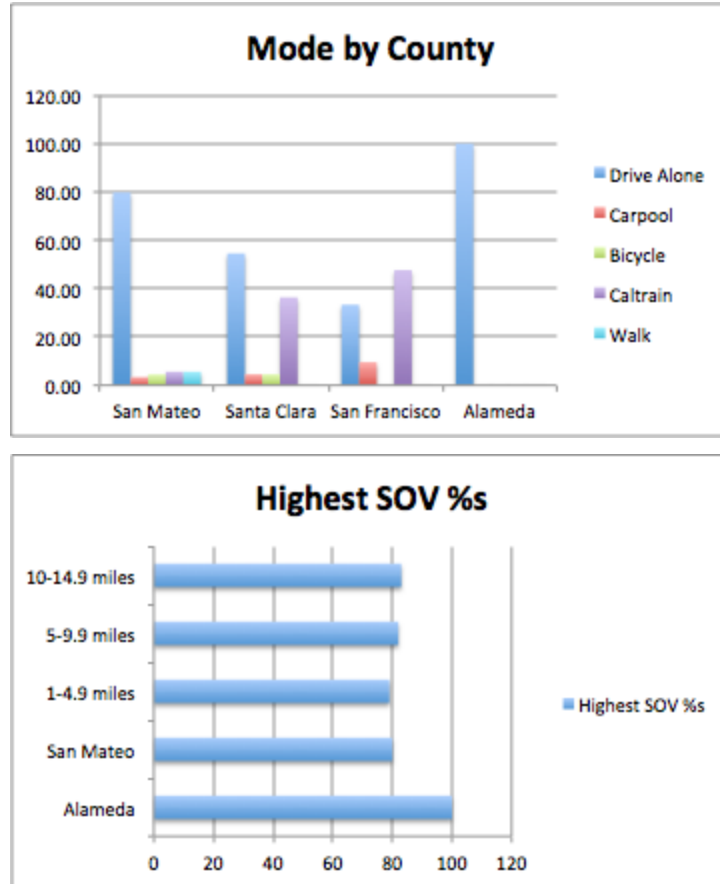
Alternatives by County
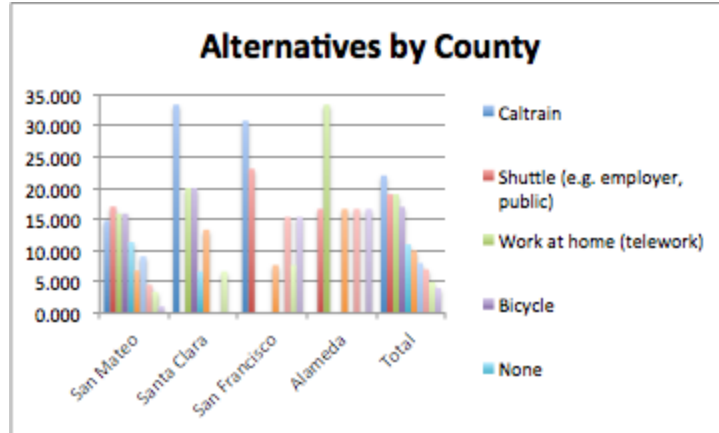
Current Mode x Commute Distance
- Driving is the most common mode for all distances except 25-49.9 miles, for which the most common mode is Caltrain (47%, with driving at 44%). For all other distances, the mean percentages of drivers was 77%, the minimum 65% (15-24.9 miles), and the maximum 83% (10-14.9 miles).
- Caltrain was also popular amongst commuters traveling 15-24.9 miles (30%).

% Mode by Distance
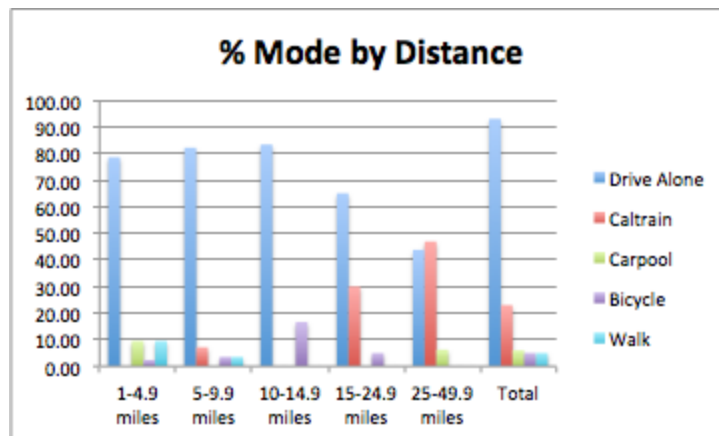
Current Mode x Home County
- All respondents from Alameda County drive.
- Everyone who walks is from San Mateo County (unsurprising, due to possible short commute distances).
- Santa Clara County has a more diverse mode split than San Mateo County, and 36% of commuters from Santa Clara take Caltrain.
- San Francisco County has more Caltrain users (48%) than any other county, and Caltrain is also the most common mode for commuters from San Francisco.
- San Francisco County has a higher percentage (9.5%) of carpoolers (though not higher raw numbers) than any other county.

Mode by County

Highest SOV %s

General Conclusions for Current Mode and Potential Alternatives

● Driving is universally the most common mode, but some there is some variation by county and distance.

● Commuters from San Francisco may be a good group on which to focus caltrain benefits; many San Francisco commuters either take Caltrain, or cite it as a possible alternative.

● Certain incentives, while primarily only affecting San Mateo users, may still be worth pursuing because the greatest number of downtown employees are from San Mateo County.

General Recommendations for Future Efforts

The data from these two surveys are helpful in identifying potential trends in employees' transit needs and preferences. However, the sample sizes for both surveys was relatively small, and some questions that may be of interest were not asked in either survey. We recommend conducting additional surveys to reach a greater number of employees downtown, and/or conducting a similar cross-tabulation analysis on the data from the Commute.org survey (Commute.org Topline Report, 2014), which both has a larger sample size (n = 1029) and a more extensive list of questions. Notably, that survey asks

respondents about the size (i.e. number of employees) of their worksite, whether they have a fixed or flexible work schedule, and how strongly they feel about driving. Similar questions were also asked in Palo Alto's 2015 mode split survey, and yielded helpful information. The Commute.org survey also includes useful questions not addressed by the Palo Alto survey, including income level, distance from the respondent's home to a transit stop, and improvements or worsening factors in the respondent's commute.

A comparison of driving rates and/or potential alternatives by business sector would also be a useful analysis. This can be done with the data from the general downtown employee survey, but more work would be required to code the surveyed businesses by sector.

Given the low response rates amongst almost all city employee groups for the Guaranteed Ride Home option, Redwood City may want to more actively promote this benefit to city employees. Low response rates could be related to a lack of awareness of the benefit or how to use it. Any other benefits provided to city employees should likewise be rigorously advertised. It may also be worthwhile to consider purchasing GoPasses for city employees; though not all employees would use the pass, it was a popular enough incentive that many could benefit from that option.

Conclusion

Our project provided the City of Palo Alto and the City of Redwood City with information that will guide future steps. The Palo Alto TMA will be launching a transit subsidy program based on our findings and analysis, including proposed budget allocations and marketing messages. Our Redwood City findings inform areas for further research and analysis of existing data, as well as providing direction for initial TDM strategies. Redwood City has to design and implement a TDM program, which will make use of our analysis. The Palo Alto TMA's transit subsidy program addresses the needs of low-income workers by providing both subsidized or free passes for those who can take transit, and subsidized rides with a carsharing enterprise called Scoop for those who cannot take transit. Our marketing materials will be used to advertise these subsidy programs to both employees and employers. With further research and effort, Palo Alto and Redwood City can expand and implement new TDM programs to address the needs of more commuters.

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