Executive Summary

Mode Share Shift Potential along the Caltrain Corridor

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In Collaboration with Adina Levin, Friends of Caltrain
As part of Stanford Universities Urban Studies 164: Sustainable Cities
March 2014

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Project Purpose

Project Goals

By collaborating with Friends of Caltrain, we investigated the mode share shift potential along the Caltrain Corridor. Firstly, we studied the commuting habits of the residents and employees who live and work along the rail corridor. Using data compiled from U.S. Census and American Community Survey (ASC) databases, we published maps and an online interactive applet that display this data. We analyze this data, and conducted a review of transportation management associations (TMAs) to prepare a collection of strategies designed to solve traffic congestion problems in Palo Alto.

Project Importance

One of the largest contributors to greenhouse gas (GHG) emissions in California is the transportation sector-- freight and personal trips. To meet ambitious state and regional goals for reducing greenhouse gas emissions, many cities and counties are looking at strategies to reduce the amount of single-occupancy vehicle (SOV) trips. We developed a tool to illustrate past changes in mode share, and assembled a collection of transportation demand management (TDM) strategies that municipal governments can implement to reduce SOV trips throughout the Bay.

The data, maps, online applet, and study will be disseminated to Friends of Caltrain, municipality governments along the corridor, relevant blogs, and other organizations that find our research a valuable resource for their current and future projects. Our final product will help further Friends of Caltrain's goals and impact change along the Caltrain corridor.

Our project helps Friends of Caltrain pressure Bay Area policy leaders, local governments, and the Caltrain board to establish a steady funding stream and increase train frequency by highlighting the potential shifts in commuting patterns. In addition, our TDM report comes at a time when company sponsored door to door shuttle services are coming under fire from media and local residents. Our study helps to address potential ways that Caltrain, partnering with city governments or smaller employers, could become a more attractive mode for commuting than the environmentally-friendly, albeit socially inequitable, shuttle systems that are becoming more prevalent within the San Francisco Bay Area.

Background on Community Organization

Friends of Caltrain, a Bay Area coalition of neighborhood groups, employers, and advocates, is a non-governmental organization that works to bolster the ridership of Caltrain. Friends of Caltrain was founded during the recent 2008 recession to help Caltrain find a stable, dedicated income source instead of relying on an ailing year-by-year budget. The organization mainly focuses on educational events to spread awareness about Caltrain's budget/future projects, and grassroots community organizing encouraging people to become civically engaged. In the past, Friends of Caltrain has effectively pressured political leaders to assess Caltrain's revenue funding,

spread awareness regarding important Caltrain community meetings, and heavily pushed for a blended High Speed Rail system.

Literature Review

Prior studies have been conducted regarding Caltrain ridership, but none focusing on historic commuting mode share patterns for areas surrounding the Caltrain stations. There have been many studies regarding the environmental costs and benefits of TDMs and their best practices, but none zeroing in on the best funding mechanisms or surveying methodology. For a complete review of existing literature related to TDMs and TMAs, see our Transportation Demand Management document.

Methodology

The Caltrain mode share maps were constructed using U.S. Census data from 1990, 2000, and 2010, and American Community Survey data projecting from 2008 to 2012. The collection of maps visualizes the shift in mode share for residents and employees who live and work within ¼ mile, ½ mile, 1 mile, and 2 miles of each Caltrain station. This data was downloaded from online databases including Social Explorer and Census Transportation Planning Tools. Information for residents was available for each Census block group from 1990, 2000, and 2012. Information for employees was available for each Census tract from 2010. After compiling the data, ArcGIS was used to join the data to a basemap of San Francisco, San Mateo, and Santa Clara counties. With ArcGIS, weighted population numbers and mode share percentages were calculated for residents and employees who live and work within fixed radii of each Caltrain station. The final GIS shapefiles were then uploaded to ArcGIS online, where final maps and an interactive web application were assembled. By displaying these people's commute patterns, we will be able to tell a narrative of changing mode shares along the Peninsula.

A transportation demand management study was conducted to understand the funding mechanisms, successful practices and policies, and survey methodology of existing TMAs. First, we met with Aaron Aknin from the City of Palo Alto to discuss our approach and receive advice for how to conduct our research. After finalizing a list of 13 TMAs that we hoped to learn more about, we solicited telephone interviews with a capture rate of 5/13. We successfully interviewed associations in Contra Costa County, Pleasanton, CA, Boulder, CO, and Arlington, VA. A list of questions pertinent to organizational structure, funding sources, TDM programs, and survey data was compiled prior to the interviews, and can be found in the appendices of our TDM report. The interviews lasted roughly 30-45 minutes. With this information, we compiled a formal report that issues policy recommendations for the City of Palo Alto and the greater San Francisco Bay Area. This paper will hopefully serve as a manual for Bay Area small businesses, local governments, and transit agencies to glean ideas for their TMAs and TDMs.

Community Outreach

In addition to fulfilling the general course requirements and meeting with our assigned community partner, we have multiple opportunities to engage with other organizations and the greater community. Our final community outreach schedule can be found in Appendix 2.

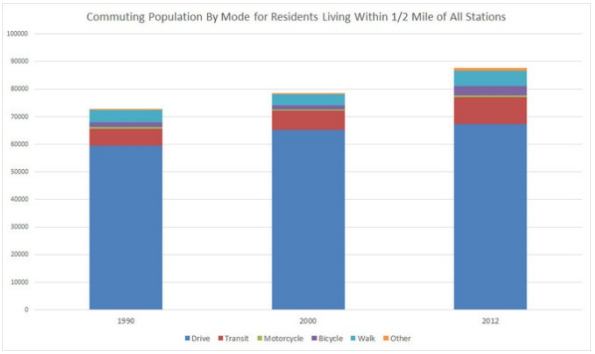
Project Deliverables

The data (both map form and Excel spreadsheet form), findings, and TDM study are all available for download on the weebly website.
Our maps show the following:

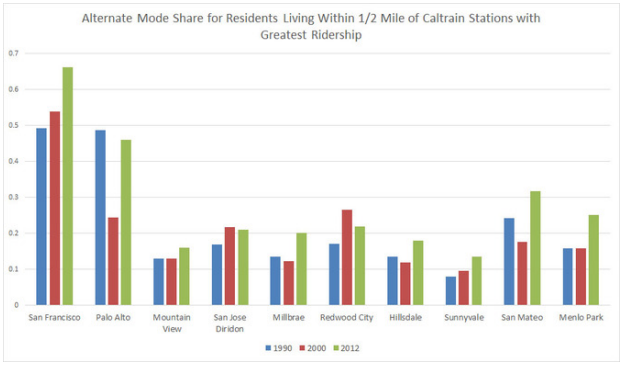
- Commute-to-Work Mode Share for people who **live** in a ¼, ½, 1, and 2 mile radius from each Caltrain station from 1990, 2000, and 2012.
- Commute-to-Work Mode Share for people who **work** within ¼-mile, ½-mile, 1 mile, and 2 miles of each Caltrain station from 2010.

Findings- Changes in Historic Commute-to-Work Patterns

There are several trends that the maps visualize quite well. The following charts focus on populations within 1/2 mile of each Caltrain station. This roughly corresponds to a five-minute walk, the industry standard for a comfortable walking distance.

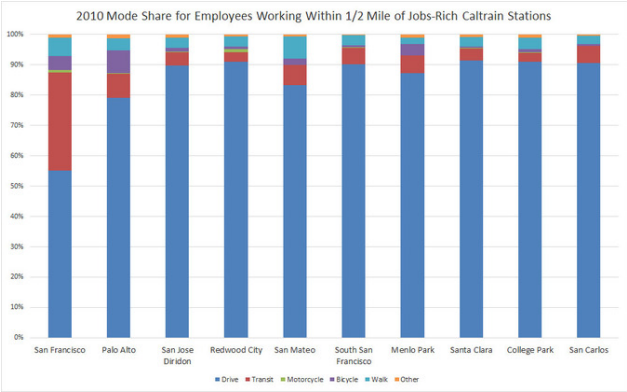


The graph to the right shows the total number of daily commutes for all residents living within 1/2 mile of Caltrain stations. Unsurprisingly, residents who drive to work comprise the largest mode, while those who take an alternative mode (transit, motorcycle, bicycle, walk, other) are in the minority. While from 1990 to 2012, the number of driving commutes increased by roughly 8,000 trips per day, the number of alternative mode commutes also increased by about 8,000 trips per day. Thus, we can conclude that use of alternative transportation is gaining among residents who have access to Caltrain.



For the Caltrain stations with the greatest ridership, the chart to the left shows changes in the alternate transportation mode share for residents from 1990, 2000, and 2012. For most of the stations, the percentage of commuters using an alternative mode of transportation spiked between 2000 and 2012. The mode shares for Palo Alto and San Mateo nearly doubled, and San Francisco, Millbrae,

Hillsdale, and Menlo Park also enjoyed notable increases. This further corroborates the trends seen above: alternative transportation modes are becoming more popular for residents with access to Caltrain.



Finally, the bar graph above shows the ten Caltrain stations with the most employees working within 1/2 mile of the station. Upon comparison, the alternative mode share for employees working near Caltrain appears to be significantly below the levels seen for residents living nearby. Therefore, we conclude that policy to encourage alternative transportation use should include residents but focus on employees.

Findings- Transportation Demand Management Study

To see the complete summarized table of the findings from the telephone interviews conducted with TMAs in Contra Costa County, CA; Pleasanton CA; Boulder, CO; and Arlington County, VA, see Appendix 3. The findings from the interviews and research can be applied to Palo Alto, and the entire San Francisco Bay Area.

Policy Recommendations

The most effective and useful tool for influencing the commuting behavior of employees has been the introduction of subsidized transit passes. This policy alone reduced the number of SOV trips by over 50% in Boulder, CO. When employers can buy subsidized transit passes in bulk, employees take advantage of public transportation without having to pay a dime. Therefore, we encourage that transit passes be made available to the largest number of commuting workers possible for TMAs in the Bay Area. We also urge Bay Area transit agencies to lower the cost of these transit pass programs. Currently, an employer needs to have ~83 employees, and a considerable profit margin, to have the transit pass program be economic. We recommend Caltrain to expand the transit pass program to include small businesses, and neighborhood groups as well.

In addition, through our data we discovered many jobs-rich or housing-rich stations with little Caltrain service and low ridership. We believe Caltrain should increase service to College Park and Santa Clara, to jobs-rich stations with little service. In addition, there are a few stations with low ridership despite being housing-rich with large populations

surrounding them. In particular, we found the South San Francisco, Capitol, and Tamien stations falling into this category. We recommend policy leaders to redesign these areas with pedestrian and bike access to the station prioritized, as they currently only accommodate passengers arriving by automobile.

For the entire listings of our findings and recommendations from the Transportation Demand Management study, please see our complete

Conclusion

The goals of this project were to assess the historical trends in alternative mode share for populations living and working in proximity to Caltrain stations, and to recommend policy so Bay Area leaders could encourage more commuters to pursue alternative transportation modes in the future. With our interactive map application, we determined that while there has been a recent spike in alternative mode use for residents who live near Caltrain, employees who work near train stations do not share the same usage levels. Therefore, we conclude that policy implemented in the Bay Area should include residents but target employees. Most strongly, we recommend that TMAs along the Caltrain corridor introduce subsidized transit passes for employers to purchase for employees. We also found that TMAs focusing on individual businesses when setting TDM policy tend to have the most success. We advise TMAs in the Bay to have a point person (or people) that reach out to businesses in their respective jurisdictions. Finally, we advise Caltrain to boost its service to stations with high job density--College Park and Santa Clara--and redesign stations where land use patterns impede access to the platform--South San Francisco, Capitol, and Tamien.

Our next steps are to disseminate our information and findings broadly. In addition to sharing our data with Friends of Caltrain, we hope to pass our findings along to the TMAs that we interviewed over the past weeks, the City of Palo Alto, other municipalities and organizations in the Bay Area, and online blogs and journals that report on transportation issues. By publicizing our website, maps, and data, we increase the chances of researchers and policymakers applying our findings as they pursue their own projects. While our work has been fruitful and educational, it is not the end game: work must be done to encourage a shift to alternative transportation modes, and our project is only one piece of the puzzle.

APPENDICES

APPENDIX 1- Contact Information

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APPENDIX 2- Community Outreach Schedule

Thursday, Feb. 6	Meet with Aaron Aknin, Assistant Director, Palo Alto Planning and Transportation Commission • Discuss transportation challenges Palo Alto faces and considered TDM strategies to alleviate them
Wednesday, Feb. 19	Attend Caltrain Citizens Advisory Committee in San Carlos
Monday, Feb. 24	Attend Palo Alto City Council Meeting on TDM Vote
March 18th, 2014	Follow-up meeting with Aaron Aknin • Ask for feedback on and discuss our research

APPENDIX 3- TDM Study Summary Matrix

NAME	SCOPE OF TMA	FUNDING SOURCES	SERVES	SUCCESSFUL PROGRAMS	SURVEY MATERIAL
Contra Costa Centre Transit Village	-125 acres -6,000 participating employees -30% use an alternate mode	$267,000/ year Property tax collected from landlords based on square footage	-Employees	-Subsidies for transit passes -Greenfleet: bike rental program -Car rental program	Employee feedback collected every three years
Hacienda Business Park, Pleasanton, CA	-17,000 employees -4,000 transit passes -20,000 transit rides / month	$172,000/ year Property tax collected from landlords based on acreage	-Employees -Moving towards increased resident participation	-Free transit passes for all employees -Bus routes and shuttles tailored to employees	-Data from transit providers about ridership for employees with passes
GO Boulder, Boulder, CO	-101,808 residents live in county -70,000 ecopasses distributed	$5.7M / year $650,000 to TDM division Dedicated sales tax (0.75%) in City of Boulder	-Employees -Residents -Students -Has become the cultural norm	-Subsidized EcoPass transit pass program for residents, employers, and students -Paid parking	-Boulder Valley Employee Survey -Boulder Resident Travel Diaries -Every three years
Arlington County Commuter Services, Arlington, VA	-Shifts 40,100 auto trips from SOV to alternate modes per day	$10.9M / year 40% collected from sale of transit tickets 40% CMAQ 10% state fund	-Employees -Employees not living in Arlington County -Residents	-Arlington Transportation Partners: work with businesses to craft unique TDM programs	-Mobility Lab, online research database -Rotating survey groups every 5 years