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Dealing with parking issues on an urban campus: The case of UC Berkeley

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ABSTRACT

Many transportation planning studies focus on mode-of-transportation as a static variable, not accounting for a range of user decisions such as miles traveled or (if driving) the duration of time between departure and arrival. Existing research into parking decisions investigates factors that determine or underlie mode choice decisions (Shoup and Willson, 1992; Vaca and Kuzmyak, 2005; Willson and Shoup, 1990). However, these studies do not address specific interventions tied to less driving and to projected reductions in greenhouse gas GHG emissions, This study looks at dynamic variables to see how parking price reforms, traveler information systems and incentives affect an increase in the use of public transit and non-motorized modes among the faculty and staff at UC Berkeley. Through a stated preference survey this study assessed the participants' responsiveness to changes in pricing and information to reveal how a campus population can (1) search less for parking, (2) drive fewer days per week and (3) switch modes entirely. The University is one of the largest regional employers in the San Francisco Bay Area, generating consistently close to 50,000 daily trips to the campus (Riggs, 2009; Wilmot, 2012). Data from transportation surveys and geographic information systems (GIS) technology showed the percent of faculty or staff within walkable distance or bikeable distance (36%), or in areas that are transit accessible (48%). Regression analysis also indicates that social factors and incentives can have a strong pull on driving behavior. This means that focusing on such transportation demand management programs can result in fewer vehicle miles traveled and greenhouse gas emissions along with a more equitable and accessible campus environs. It also justifies the need for campus to systematically document and benchmark commuting behavior.

1. Introduction

University and corporate campuses face the challenge of maintaining parking supply while meeting the transportation access demands of their communities. Parking availability enables the daily interactions among student, faculty and staff, but generates high fiscal and environmental costs. Consequently, campuses, especially in urban areas, must balance adequate provision of parking with land constraints and increased vehicle trips to campus. Major public institutions must balance competing needs for parking supply, sustainability goals and budget constraints, but how can they do so in a cost-effective manner that leverages existing assets and strengths? What models can be used and lessons can be learned for urban campuses wanting to press for a greater share of non-automotive transport. What type of tools can be the most effective for campuses that are not currently pursing transportation demand management (TDM) strategies? What type of data gathering and benchmarking are most effective?

To this effect this study employs the case of the University of California, Berkeley (UC Berkeley or UC) as an example in how campuses can analyze supply and address both mobility and sustainability goals in a fiscally constrained environment. After providing background on the campus, this study evaluates the UC Berkeley campus using descriptive statistics, crosstabs and logistic regression to analyze the factors that were most likely to dissuade or influence driving behavior consistent with the guiding questions provided above, explores the kids of tools that urban campuses might use to influence mode shift. This takes advantage of a cross-campus stated preference survey that offers both travel mode and individual characteristics. This is followed by pragmatic policy suggestions that campuses can use a roadmap for benchmarking and improving their own TDM strategies through data gathering and benchmarking.

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2. Background

UC Berkeley is the largest employer in its count, and is a major public research institution with a daily population of approximately 36,000 students and 10,000 faculty and staff. Its main campus on the eastern shore of the San Francisco Bay Area, occupies 178 acres of a hillside east of Downtown Berkeley. The campus could be likened to a small town or a large corporate campus. Transportation plays a large role in campus functionality. As with other universities, UC Berkeley needs to adopt parking and transportation systems that facilitate accessibility while helping to create the interactions that make college campuses vibrant places of intellectual exchange and innovation.

The City of Berkeley has supported the use of alternative modes of transportation since the 1960s. The university, long criticized for causing traffic congestion and parking shortages, has responded to city pressure to minimize its impacts since the 1980s (Deakin et al., 2004). UC Berkeley efforts to reduce drive-alone rates include increased parking fees and promotion of ridesharing and transit use (Deakin, 1982).

As seen in Fig. 1, the University currently has a drive-alone rate of 26%. Many of its campus members walk, bicycle and take transit on a regular basis. However, faculty, staff and students have different travel patterns. As shown by Fig. 1, about 44% of faculty and staff report driving alone to campus, compared to 6% of students who generally live closer to campus. One factor complicating faculty/staff transport is that growth in University employment has outpaced affordable residential opportunities within Berkeley. But in spite of relocation trends among University employees, drive-alone rates have declined over the past two decades (Nelson\Nygaard, 2010).

Several factors explain the trend in commute behavior among campus employees. First, downtown Berkeley, and the western periphery of the University, is served efficiently by Bay Area Rapid Transit (BART), several Alameda-Contra Costa County Transit District (AC Transit) bus lines, and an extensive network of bicycle facilities. Second, the main campus is geographically and topographically suitable to walking and bicycling. Finally, the Parking & Transportation (P&T) division of the University provides programs to manage travel demand from single-occupancy vehicles. These programs for faculty and staff include pre-tax transit purchase and subsidies, discount parking permits for carpools, and an unlimited AC Transit bus pass.

Campus strategies for TDM, first implemented in 1989 under the New Directions in Transportation Plan, are unchanged. Alternative transportation services for faculty and staff are still called the campus' New Directions program (UC Berkeley, 2013). However, due to mismanagement and funding problems, P&T has been unable to continue the marketing and public information element of the New Directions plan since the Berkeley TRiP (Transit, Ridesharing and Parking) outreach program was disbanded in 2003. In spite of the declining campus drive-alone rate, P&T faculty and staff continue to be concerned about adequate parking provision. Most recently, the lack of a formalized outreach strategy, coupled with University plans to expand into parking facilities, has led it to major controversy over the declining parking supply.

Because of University construction projects, campus parking inventory has been declining, particularly surface parking lots, which are ideal candidates for academic buildings or housing. The number of parking spaces on the UC campus has dropped from roughly 6500 in 2009 to approximately 5700 marked and stacked parking spaces reserved for campus permit holders during regular work hours. At the same time student and faculty/staff populations have maintained a relatively consistent size since 2005, hovering around 35,000 and 12,000 respectively. Space availability is out of balance and many times available spaces are not readily visible (or available) to users leading to locational shortages as is seen in two locations depicted in Fig. 2.

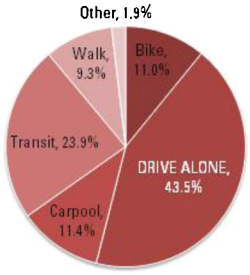
In spite of incremental decreases to the supply, parking permit prices have remained constant since the fees last adjusted downward in 2009 to accommodate economic downturn. The two employee monthly permit rates are $90 for regular parking privileges, and $124 for a wider range of parking options. The least expensive regular off-campus monthly rates in private and city-owned structures range between $150 and $195, demonstrating that P&T prices its' parking below market rate. With the exception of the debt service on the University's newest Underhill structure

Faculty - Staff Primary Mode

	Faculty	%	Staff	%	TOTAL	%
Bike	114	19.6	171	8.6	285	11
Drive Alone	227	39	897	44.9	1124	43.5
Carpool	47	8.1	247	12.4	294	11.4
Transit	101	17.3	489	24.5	590	23.9
Walk	84	14.4	156	7.8	240	9.3
Other	9	1.5	40	2	49	1.9
	582	100	2000	100	2582	100

Student - Primary Mode

	Undergrad Student	%	Graduate Student	%	TOTAL	%
Bike	56	5.7	333	25	389	16.8
Drive Alone	41	4.1	99	7.4	140	6
Carpool	6	0.6	30	2.3	36	1.6
Transit	104	10.5	413	31.1	517	22.3
Walk	779	78.6	441	33.2	1220	52.6
Other	5	0.5	14	1.1	19	0.8
	991	100	1330	100	2321	100



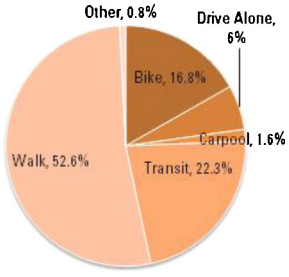


Fig. 1. Campus mode share (2012 UC Berkeley Campus Travel Survey; Kuo, 2013).