

DRISI

CALTRANS DIVISION OF RESEARCH,
INNOVATION AND SYSTEM INFORMATION

TRANSFORMING IDEAS INTO SOLUTIONS

Research

Results

Modal

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Project Title:

Integrating Micromobility with Public Transportation

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Task Manager:

Bradley Mizuno
Transportation Engineer (Electrical)
bmizuno@dot.ca.gov

Integrating Micromobility with Public Transportation

Continuing research on designing public transit stations to enhance access to first/last mile mode choices.

WHAT WAS THE NEED?

This project built upon a previous project titled, Designing Public Transit Stations to Enhance Access to First/Last Mile Mode Choices. The research team has conducted site surveys of 19 Bay Area Rapid Transit (BART) rail stations in the California Bay Area, which are served by seven shared micromobility operators (See Image 1). In the previous project, the researchers explored the ways in which the built environment can support first- and last-mile transit mode choices with their partners at BART. Due to COVID-19, BART ridership dropped 90%, which had an impact on this first phase of the work as it was not possible to observe normal travel behavior in 2020. Many micromobility operators plan to expand their Bay Area fleets in summer 2021, which will be a great opportunity to continue this timely research.

WHAT WAS OUR GOAL?

This new project continued stakeholder interviews, update ArcGIS map files (bicycle lane, operator zones, transit stations) (See Image 2), explore travel behavior, and monitor best practices to increase micromobility and public transit ridership in a post-COVID-19 environment.

WHAT DID WE DO?

This project has three main research objectives:

1. **Bay Area Micromobility Transit Map:** The researchers continued their work with the University of California, Davis Center for Regional Change to map the bicycle facilities around 19 BART stations in the Bay Area in the operation zone of seven micromobility operators.



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- 2. Bay Area Stakeholder Interviews and Surveys:** Conversations with key stakeholders will help the researchers to consider the challenges that public transit managers experience to keep various micromobility systems organized and available at their transit stations to provide a last-mile solution. The researchers interviewed transit and micromobility operators and planners and surveyed micromobility users. The researchers also interviewed government, industry, and community stakeholders to gather more context for understanding the audit and survey results.
- 3. BART Station Micromobility Inventory:** In 2020, the researchers surveyed the physical features of 19 BART stations. In this research, they returned to the 19 BART stations and see how micromobility has changed with COVID-19 recovery efforts.

WHAT WAS THE OUTCOME?

Station audits counted arrivals to and departures from the stations on personal or shared micromobility vehicles and number and types of micromobility vehicles parked at each type of parking facilities. Results revealed use of personal micromobility nearly tenfold higher than the use of shared micromobility, including nearly three times as many personal electric vehicles (e-bikes and e-scooters) than shared electric vehicles. Most types of secure personal micromobility parking facilities were relatively well-used, but outdoor racks were mainly used for shared micromobility. Interesting anecdotal observations during the audits included that many travelers took their personal bikes onboard BART trains rather than storing them and (non-folding) scooters were often brought into stations despite a policy against it (currently only folding scooters are allowed).

An online survey of BART and micromobility users (focusing on shared micromobility users) explored the influence of environmental design features at and around stations on facilitating first and last mile connections. Personal safety and security emerged as the key challenges. Participants conveyed the

need for better bike lanes in station neighborhoods and better lighting and visibility of pathways and less crime at stations.

Another challenge is shared vehicle availability. A large majority of users said they had on occasion been unable to find a vehicle to get to the station or get home from the station. Nearly half said shared vehicles were always difficult to find around their destination stations and more than half said there was insufficient parking at their destination stations for shared micromobility.

Interviews with government, industry, and community stakeholders were conducted to gather more context for understanding the audit and survey results. For example, stakeholders explained the issues with access to shared vehicles at stations seem to mainly center on market challenges for the industry. It is costly for operators to rebalance vehicles to ensure adequate numbers at transit stations and other strategies are more profitable. Government and industry stakeholders recognized a need for greater subsidies for operators or other service models to streamline micromobility and transit connection and make it more affordable.

WHAT IS THE BENEFIT?

This research covered environmental audits at 18 BART stations to count arrivals, departures, and parked personal and shared micromobility vehicles, an online survey of BART and micromobility users, and interviews with government, industry, and community stakeholders. This research showed that in the California Bay Area, the prevalence of personal micromobility currently dwarfs rates of shared micromobility use, and that includes a burgeoning segment of transit users connecting with their own e-bikes and e-scooters. Successes and challenges were highlighted, and recommendations made for station design, including greater availability of shared micromobility vehicles, more affordable secure parking for personal micromobility vehicles, better signage and wayfinding. Beyond the station



proper, there is a need for protected bike lanes and consistent design standards for bike facilities throughout the region.

LEARN MORE

Bay Area Micromobility Transit Map View ArcGIS, online at:
<https://arcg.is/1jPmXm>

Final Report:
<https://escholarship.org/uc/item/4fm8z1ct>

IMAGES

	City				Fleet Model
	San Francisco	Berkeley	Oakland	San Jose	
BART Stations	Embarcadero	North Berkeley	Rockridge	Berryessa / North	
	Montgomery	Downtown Berkeley	MacArthur		
	Powell	Ashby	W. Oakland		
	Civic Center		19th		
	16th		12th		
	24th		Lake Merritt		
	Glen Park		Fruitvale		
	Balboa Park				
Operator					bike
Lyft Bay Wheels (262 stations and 2,600 bikes)	4,000 ebikes	yes	yes	yes	e-bike
Spin	1000				e-scooter
Lime	1000		1000		e-scooter
Bird / Scoot	1000		1000		e-scooter
Gruv			200		e-scooter
Razor				yes	e-scooter
Revel	432 (soon)		1000		e-scooter
Total Permitted Operators	5	1	5	2	
Total Permitted Vehicles	3000	?	3200	?	

Image 1: Bike, e-bike and e-scooter share (docked and undocked) operators permitted in San Francisco, Berkeley, Oakland, and San Jose, July 2020

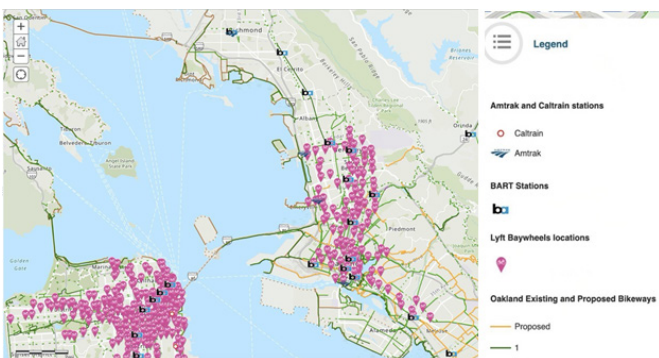


Image 2: Bay Area Micromobility Transit Map View ArcGIS

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