

Expanding Transit Access in Alameda County: Policy Recommendations for the First-Mile, Last-Mile Problem

Amy Fong
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Executive Summary

Alameda County is diverse in geography, cultures, and demographics. As a result, it requires a diverse transportation system to meet the needs of its unique communities and residents. Though the higher population density communities of Alameda County such as Berkeley and Oakland are well-served by existing public transportation services such as AC Transit fixed-route buses and commuter rail Bay Area Rapid Transit (BART), lower population density communities such as Pleasanton, Dublin, and Union City have different transportation requirements. As a result, the Transit Planning Committee of the Alameda County Transportation Commission must project and analyze the impacts that innovate new transportation policies and technologies may have for those residents of Alameda County who need alternatives to traditional buses or rail.

The four primary criteria necessary to conduct such a policy analysis are the effectiveness, cost-efficiency, equity, and political feasibility. Without meeting all four of these criteria to some extent, a policy alternative is simply not appropriate. Effectiveness and cost-efficiency can be projected using data and information from previous implementations of similar transportation policies, while equity and political feasibility rely on the particular demographics of the residents of Alameda County. These criteria are applied to several possible policy alternatives, and the resulting projects reveal that no one policy fulfills Alameda County Transportation Commission's mission and goals. As a result, the final policy recommendation fuses two alternatives, subsidies for private, on-demand rideshares and the development of a public on-demand shuttle. These policies are to be implemented sequentially: first, subsidies have a low start-up cost as demand and awareness for such services is low, and following a widespread preference for transit use in Alameda County, on-demand shuttles such as the AC Transit FLEX shuttle will perform more effectively and efficiently than subsidized private rides. The outcome of the subsidies to increase transit demand is necessary to ensure that the on-demand public shuttles will be accepted and successful by the public, so implementations of this policy recommendation span multiple years.

Introduction: Transportation Needs in Alameda County

The Alameda County Transportation Commission (Alameda CTC)'s mission is to fund and deliver transportation projects which expand access to the rest of the Bay Area and create a vibrant and livable county.¹ There are many forms of transportation available to residents of the county, including bus lines operated by the Alameda-Contra Costa Transit District (AC Transit), commuter rail operated by the Bay Area Rapid Transit (BART), service by on-demand ridesharing providers such as Uber Technologies Inc. and Lyft, traditional private cabs, bikeshare programs, and miles of highways and local roads. Yet, in spite the diversity in forms of transportation, too many people in the county still rely primarily on private automobiles in order to make their most frequent trips such as their weekday commutes. In Alameda County, 75% of commuters are using private vehicles or taxis to get to work. Only 13% take public transportation and 7% walk or bike. Of the 13% who take public transportation, a significant proportion is likely to drive to and park at a transit stop in order to access that station.² The problem that the Alameda CTC faces is that too few people in Alameda County use public transportation in order to access their intended destinations, particularly during their weekday commutes, when traffic congestion on local roads and state highways in the county is at its worst. Not only does this congestion indicate a lack of access in the county, it has negative manifestations in the form of air pollution, noise pollution, safety to pedestrians, and thus the vibrancy of the communities of Alameda County. Furthermore, when commuters choose private vehicles transit agencies face higher operating costs per rider and as a result public transportation becomes decreasingly economically viable. This is reflected in the 20 percent decrease in service cost efficiency, measured in cost per rider, reported by AC Transit from 2010 to 2015.³ Meanwhile, traffic congestion, measured by commuter delay due to traffic, has increased by 70 percent in the Bay Area during those same years.⁴

¹ The Countywide Transportation Plan (2016), <http://www.alamedactc.org/CountywideTransportationPlan>.

² US Census Bureau (2015), Commuting Characteristics in Alameda County, CA, 2011-2015 American Community Survey 5-Year Estimates, <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.

³ Statistical Summary of Bay Area Transit Operators (2016), http://mtc.ca.gov/sites/default/files/Statistical_Summary_2015.pdf

⁴ Time Spent in Congestion: Vital Signs (2016), <http://www.vitalsigns.mtc.ca.gov/time-spent-congestion>.

This underutilization of public transportation and resulting excess demand on the road system during weekday commutes may be caused by an array of different factors. These factors depend on the individual and their lifestyle. For instance, working parents may value the ease and flexibility that only a privately-owned vehicle can provide to their demanding and oft-changing schedules. However, there is also a large body of commuters whose decisions about how to commute are driven largely by convenience, and thus are more flexible and open to alternative forms of transportation. In other words, these commuters would be willing to take public transportation to work if it was easier to get to public transportation from where they live. A comparison of travel distance to the nearest transit stop and proportion of commuters who use public transportation throughout Alameda County reveals this relationship between accessibility and willingness or ability to use public transportation.⁵ This problem is also sometimes referred to as the first-mile/last-mile problem in transportation planning, and there are many transportation agencies around the country and the world which are concerned with this very problem in their own constituencies. A second group which stands to gain from investment in solutions to the first-mile/last-mile problem is those who do not own cars and must rely on public transportation whether or not it serves them well. As such, this problem represents an opportunity for the Alameda CTC to improve the access to and quality of public transportation for a large, diverse group of residents.

In order to define the scope of this analysis, the desired outcome is narrowed to increased access to BART stations in Alameda County, because for many people considering transit, BART is their first and best option. However, it is important to recognize that transportation needs in the Bay Area are rapidly changing with the advent of autonomous vehicles and other advancements in technology which may dramatically alter both what people expect from their transportation system and what transportation agencies are able to provide to their users.

⁵ PolicyMap, Distance in Miles from Nearest Rail Station, 2009, Percent of Commuters Using Public Transit, 2011-2015 (2017), <http://ucberkeley.policymap.com/maps>.

Defining Criteria for Alternative Impact Analysis

There are numerous ways to evaluate transportation projects and the benefits or costs they bring to a community. Furthermore, it is crucial to evaluate such projects from several different perspectives, as different groups or members of a society may be impacted differently by certain policies and actions. As demonstrated by the Alameda CTC's mission statement, there are multiple goals sought from investments in the county's infrastructure and transportation system. Some of these goals, such as economic competitiveness and congestion reduction, can be summarized with performance measures like the gross metropolitan product of the region or travel time delay due to congestion. Other goals, like vibrancy, livability, or environmental justice are not so easy to quantify. An additional challenge to effective policymaking is that these goals may sometimes compete with each other and other times complement each other. For instance, improving the throughput of a road in the congested downtown area of a city serves improves the experience for drivers who save travel time at the expense of pedestrians' and bicyclists' safety and environment.

This policy analysis will employ four distinct criteria: effectiveness, efficiency, equity, and political feasibility. The former two, effectiveness and efficiency, are "hard" criteria: they can be measured and compared with quantitative data and analysis. The latter two, equity and political feasibility, are "soft" criteria: they are a measure of the social values of a community. Effectiveness is measured by how many new BART passengers a policy implementation will induce. Efficiency is measured by the cost per new BART passenger. Effectiveness and efficiency are sometimes related to each other, but are not redundant. It may be possible that a highly effective solution is also efficient because it is a large cost that will induce many new riders, leading to a low cost per passenger. However, some solutions may have high effectiveness and low efficiency: they induce many new BART passengers but at a high cost per new passenger. Conversely, some solutions may have low effectiveness and high efficiency: they do not induce many new BART passengers but they are low cost. The equity of a solution will be measured by the diversity of new passengers to BART stations. The political feasibility of a solution will be measured by the likelihood that the community and the public will approve of a solution and think it is an appropriate investment by the county.

Alternatives for the First-Mile, Last-Mile Problem

This analysis will define and evaluate five policy alternatives: building more parking at BART stations, increasing the frequency or number of bus routes in certain parts of Alameda County, subsidizing the cost of private, on-demand rideshares that access transit stations, the implementation of a publicly-owned and operated on-demand shuttle that accesses transit stations, and letting current trends continue by doing nothing. Each of these alternatives will be evaluated by how effectively, efficiently, equitably, and feasibly they can meet the needs of Alameda County residents who currently lack transit access.

Alternative 1: Build more BART parking

Building more parking at BART stations will allow more people to access transit, by driving their cars to a BART station, and taking BART for the remainder of their trip. This is already a very common way that people access BART stations. Nearly all BART stations in Alameda County provide a few thousand parking spaces, including the Ashby, Castro Valley, Coliseum, Dublin/Pleasanton, Fruitvale, Hayward, Lake Merritt, Macarthur, North Berkeley, Rockridge, San Leandro, South Hayward, Union City, West Dublin/Pleasanton, and West Oakland stations. Furthermore, the BART website states that these stations are full by 7 to 8 am on a typical weekday, in spite of recent parking price increases.⁶

Evidently, the demand exists for more parking at BART stations. Therefore, it is projected that even building thousands of new parking spaces at any BART station would bring in nearly just as many new BART riders. This alternative would be highly effective, as “demand for parking at BART stations exceeds the number of spaces available, with a waiting list for parking permits as long as 3,800 drivers.”⁷ The stations which would attract the most new riders with increased parking are likely those in the southern part of Alameda County, such as Castro Valley, Dublin/Pleasanton, Hayward, San Leandro, South Hayward, Union City, and West Dublin/Pleasanton, because these areas have the currently least BART access by traditional transit such as bus service. Assuming that across these 7 stations 5,000 new parking spaces are

⁶ San Francisco Bay Area Rapid Transit District, Parking: What are the parking options at my station? (2017), <https://www.bart.gov/guide/parking>.

⁷ Richards, G., “Roadshow: BART trying to squeeze in more parking spaces” (2016), <http://www.mercurynews.com/2016/10/14/roadshow-more-parking-at-new-bart-stations/>.

added, a large proportion of people parking in these new spots are new BART riders, the alternative of adding more BART parking will bring at least 4,000 new BART passengers. However, this alternative is also high cost. The Bay Area is “the home of the most dire parking construction expenses in the mainland US, running up \$38K for a single underground parking spot, or \$29K for one above ground.”⁸ Given that new BART parking would likely be above ground, the cost of 5,000 new spaces would cost \$145,000,000, or \$35,250 per new transit rider.

Building more parking at BART stations is not an equitable solution. It is only a solution for drivers; it leaves out increased access for those who rely on transit, pedestrians, and bicyclists. In fact, building more parking comes at the expense of pedestrians and bicyclists: it makes it more difficult for them to access a transit station when it is surrounded by abundant parking, and it makes the station less safe. Furthermore, it is a solution that favors those who already own cars; it is of no use to people who cannot afford cars and are likely those who need enhanced transit access the most. It is because this solution is so low in equity that it is also not politically feasible. Bay Area interest groups such as TransForm have a long history of opposing generous parking lot plans and advocating for reduced parking minimums, and they have been successful in changing the political and public perception of how much parking is necessary: nowadays in the Bay Area, “Developers are often required by cities to commission a parking study to demonstrate the feasibility of reduced parking on a site.”⁹ This is because transportation and city planners commonly agree that increasing parking only increases congestion and disadvantages pedestrians and bicyclists. Evidently, a proposed solution of building *more* parking at BART stations in the name of increasing transit access would be met with scrutiny by many in the transportation community.

Alternative 2: Provide More Traditional Bus Service

Based on the results of the 2015 BART Station Profile Survey, in Alameda County BART stations, on average 6% of people access the station by bus. Across the seven most suburban BART stations, Castro Valley, Dublin/Pleasanton, Hayward, San Leandro, South Hayward, Union

⁸ Brinklow, A., “It costs \$38,000 to create one parking space in San Francisco” (2016), Curbed San Francisco, <http://sf.curbed.com/2016/6/8/11890176/it-costs-38000-to-create-one-parking-space-in-sf>.

⁹ TransForm California, Greentrip Parking Database, <http://www.transformca.org/greentrip/parking-database>.

City, and West Dublin/Pleasanton, access by bus is an even smaller proportion - just 4%. Presumably, if bus services were increased to the stations from the surrounding suburban and low density neighborhoods, more residents would access these stations by bus. In general, increasing bus service does result in increased bus ridership, which indicates that this solution would be somewhat effective. For instance, in the Portland, Oregon metropolitan area, “bus ridership has been growing pretty consistently over the last year since we started adding back service that was cut during the recession.” As a result, “rides on buses were up 4% overall, and up 5.4% on our Frequent Service lines.”¹⁰ In Alameda County, AC Transit’s weekday ridership is 180,000 people per day, or about 1200 people per bus line over 151 different routes.¹¹ Given that 3 new routes are added in the aforementioned neighborhoods, and that these are likely to be less popular than the highest performing AC Transit routes in higher density parts of the county, it is projected that this alternative could increase BART access by about 500 people per route, or 1500 people total. Bus routes on average cost AC Transit \$2.6 million dollars per year to operate, so three new bus routes could increase AC Transit’s operating costs by at least \$7.8 million dollars per year, or a cost of \$5,200 per year per new transit rider.¹²

This solution will be equitable because bus riders are disproportionately low income relative to all commuters. From 2008 AC Transit Rider Survey, “Altogether, approximately 72% of adult respondents were from low income households, with 42% from extremely low-income households.”¹³ As a result, this alternative will serve the populations which need transit access the most, and bring more diversity and justice to the overall transit system in the Bay Area. Because of the popularity of bus transit from an environmental justice standpoint, new bus routes may be politically feasible. There is rarely opposition to increased bus services by AC Transit; if anything, a common critique of AC Transit is that their coverage of lower density parts of the Bay Area and Alameda County is currently lacking. However, it is unlikely that AC Transit

¹⁰ Lum, B., “More Service Brings More Riders: Adding Up TriMet’s Ridership Stats” (2015), <http://howweroll.trimet.org/2015/04/21/more-service-more-riders-trimet-ridership-continues-to-grow/>.

¹¹ AC Transit, Ridership, Bus Fleet and Service (2017), <http://www.actransit.org/about-us/facts-and-figures/ridership/>.

¹² AC Transit, Budget (2017), <http://www.actransit.org/about-us/facts-and-figures/budget/>.

¹³ Blash, L., “2008/2009 On-Board Rider Survey—System-wide Results” (2010), Public Research Institute, <http://www.actransit.org/wp-content/uploads/2008-09-On-Board-Rider-Profile-for-public-use.pdf>.

leaders will see this alternative as the best use of additional funds provided to increase transit access, thus decreasing the alternative's political feasibility. On the other hand, it is likely that transportation advocacy group TransForm will be in favor of this alternative, as evidenced by the statement: "by 2019, we want at least four BRT [bus rapid transit] lines up and running in the Bay Area, with three more under construction and every major bus route evaluated for ways to improve service."¹⁴ Although bus rapid transit is not the same thing as traditional bus service, it's likely that any interest groups in the Bay Area would be excited by the possibility of adding more transit services to Alameda County, especially in neighborhoods where many people currently travel or commute by car. Finally, perhaps the post telling measure is the result of recent ballot measures to increase investment in AC Transit. In 2016 Measure C1 in Alameda County proposed an extension a current tax to "preserve essential local public transportation services" and was approved with 82% of the popular vote.¹⁵ Assuming that people's attitudes on Measure C1 are indicative of their willingness to invest in future investment of AC Transit and extensions of AC Transit's service area and frequency, this alternative is quite politically feasible.

Alternative 3: Subsidize On-Demand Rideshare Trips

According to the 2015 BART Station Profile Survey, about 21% of BART riders access stations by taxi.¹⁶ It is likely that if the cost of taxis and on-demand rideshares such as Uber and Lyft were lowered, even more people would use these services to access BART stations. Several cities and transit agencies around the United States have attempted to achieve this outcome in the last year by subsidizing the cost of on-demand rideshare trips that access transit. For instance, for the Pinellas Suncoast Transit Agency (PSTA) of Pinellas County, Florida found that "in areas with few [bus] riders, paying for part of a private ride was cheaper than running a bus. The program will cost \$40,000 a year, or about a quarter the cost of the two bus lines it

¹⁴ TransFrom California, Bus Rapid Transit (2017), <http://www.transformca.org/landing-page/bus-rapid-transit>.

¹⁵ Voter's Edge California, "California General Election Ballot and voting information for Alameda County" (2016), http://votersedge.org/ca/en/ballot/election/area/42/measures/measure/2472?election_authority_id=1#measure-opinion.

¹⁶ San Francisco Bay Area Rapid Transit District, Station Profile Study (2017), <http://www.bart.gov/about/reports/profile>.

replaced.”¹⁷ This figure, coupled with the PSTA’s report that “PSTA is providing a \$5 discount per trip under the program”¹⁸ reveals that they believe 8,000 trips to transit per year will be provided by on-demand ride shares during this program. Assuming that at least half of these trips will be new transit riders whose cost of taking on-demand rideshare and then public transportation will become lower than the cost of driving, this type of program is expected to bring in on the order of 4,000 new riders in a year, each using the service twice a day, at the cost efficiency of \$20 per new rider. Furthermore, in Alameda County the Livermore Amador Valley Transit Authority (LAVTA) is developing a similar program called Wheels on Demand. The LAVTA estimates that “In the first year of operation, daily ridership on East Dublin Wheels on Demand is estimated to be 50 passengers per day (25 in each direction). By the third year of operation, this could be up to 100 passengers per day. The estimated subsidy costs to LAVTA for East Dublin Wheels on Demand, assuming a \$5 subsidy per trip, is projected to be approximately \$64,000 (~12,750 annual passengers).”¹⁹ The LAVTA’s back of the envelope calculation assumes that each rider will use the service twice a day, resulting in about 6,375 rides a day. Again, assuming that about half of these riders will be new BART riders, this alternative will create around 3,000 new BART rides with a cost efficiency of \$21 per new rider per day, which is consistent with the PSTA cost efficiency. Over a year with 250 working days, this amounts to \$5,250 per new rider.

Those these programs are financially attractive for transit agencies, because these pilot programs are very recent, there remains several questions about the equity of a transportation system which fuses the public and private sector. For instance, these on-demand ridesharing services can currently only be accessed with a smartphone, and those transit riders who own smartphones are likely to be higher income than the typical transit rider. Furthermore, these services are not always accessible to those riders who rely on wheelchairs or other mobility aids. For example, a Chicago disability rights group in 2016 sued Uber and cited the data that “Uber provided nearly 2 million rides in Chicago in June of last year alone. But it says Uber gave just 14

¹⁷ Brustein, J., “Uber and Lyft Want to Replace Public Buses” (2016), <https://www.bloomberg.com/news/articles/2016-08-15/uber-and-lyft-want-to-replace-public-buses>.

¹⁸ Pinellas Suncoast Transit Authority, PSTA Expands Transit Partnership with Uber, Lyft Across Pinellas County (2016), <http://www.psta.net/press/10-2016/directconnect/index.php>.

¹⁹ Wheels, Wheels On Demand Demonstration Project (2016), <http://www.wheelsbus.com/services/wheels-on-demand/>

rides to motorized wheelchair users over a four-year period starting in 2011.” Additionally, they showed that “Both Uber and rival Lyft, which allow customers to use a cellphone app to pay drivers who use their own cars, have argued previously that they are technology, not transportation firms, and so aren't subject to the ADA, considered landmark legislation in bids for equal rights for the disabled.”²⁰ Evidently, these rideshare services cannot currently provide the same level of transit access to those with mobility impairments as traditional transit does; by the 2015 revision to the Americans with Disability Act “transportation entities [like AC Transit are specifically required] to make reasonable modifications/accommodations to policies, practices, and procedures to avoid discrimination and ensure that their programs are accessible to individuals with disabilities.”²¹ Additionally, these private on-demand rideshare services are prone to setting “fare surges” during peak periods of demand, which is especially likely during morning and evening commutes. If these types of programs replace traditional, fixed-price transit in Alameda County, it is very possible that even given a subsidy to transit riders, these services will become too expensive for lower-income and other disadvantaged riders to depend on. Additionally, it appears that in Alameda County the public perception of rideshare services like Uber and Lyft is mixed. In recent history, Uber has been involved in multiple prominent scandals, including allegations by employees of sexual harassment, intellectual property theft, underpaying its drivers, and other nontransparent business practices.²² Not only is the public perception of Uber and Lyft already generally negative, but also several different interest groups would oppose the implementation of a subsidy for on-demand ridesharing, even in the name of increasing transit access. These groups will likely include disability rights groups, taxi driver unions, and even other public transportation agencies. For instance, the San Francisco Municipal Transportation Agency has made it publicly known that they believe Uber and Lyft cars have had

²⁰ Tarm, M., “Disability rights group sues Uber over wheelchair access” (2016), <https://www.usnews.com/news/business/articles/2016-10-13/disability-rights-groups-sues-uber-over-wheelchair-access>.

²¹ AC Transit, “AC Transit Implements ADA “Reasonable Modification” Rules” (2015), <http://www.actransit.org/2015/08/18/ac-transit-implements-ada-reasonable-modification-rule/>.

²² Carson, B., “Uber's unraveling: The stunning, 2 week string of blows that has upended the world's most valuable startup” (2017), <http://www.businessinsider.com/uber-scandal-recap-2017-3>

a profound negative effect on traffic congestion in downtown San Francisco.²³ It's likely that the Alameda CTC is aware of other public agencies in the Bay Area who wish to increase regulation on these companies in order to limit the amount of traffic congestion they add to cities, and will be hesitant to add to their growth in Alameda County.

Alternative 4: Implement Publicly Operated On-Demand Shuttles

Traditional, fixed-route transit does an excellent job in high population density areas where many people live within walking or biking distance of a bus stop, but it often fails in low population density areas because it is underutilized and thus cost inefficient. This underutilization of transit is both a symptom and a cause of incomplete transit access in low density communities. An alternative designed by transit agencies and inspired by on-demand ridesharing services is the on-demand shuttle. It is made possible by new technologies that optimize routes over multiple riders and makes it possible for a publicly operated shuttle to pick riders up and drop them off without having to walk to and wait at a bus stop. This is more attractive to many than traditional transit because fares remain low and reliable. In the Bay Area, this has already been tested with measured success by the Santa Clara Valley Transportation Authority (VTA). According to a radio interview with the agency, "the VTA hasn't released official ridership numbers. VTA spokesperson Hendler Ross says they're 'pleasantly surprised with how well it's working' but estimates that 'a few dozen people a day in the morning and in the afternoon commute times that are using it.'" This might have amounted to roughly 60 new transit riders. AC Transit has also piloted their own similar program, which is also currently having mixed success: "In its first month of operation, AC Transit's Flex service is off to a slow start, Coffee said. He averages about 10 riders in the morning each day on his Newark route, and another Flex shuttle operator, Robin York Thornton, said she averages around 15 passengers during the afternoon shift. Two Flex buses operate during each shift."²⁴ However, it seems that the low ridership is due to lack of rider awareness about the new program than lack of interest,

²³ Rodriguez, J., "SF blasts Uber, Lyft for downtown traffic congestion" (2016), <http://www.sfexaminer.com/sf-blats-uber-lyft-downtown-traffic-congestion/>.

²⁴ Baldassari, E., "Tired of waiting for the bus? AC Transit's Flex service allows customers to order rides outside regular schedules." (2016), <http://www.mercurynews.com/2016/08/17/tired-of-waiting-for-the-bus-ac-transits-flex-service-allows-customers-to-order-rides-outside-regular-schedules/>.

as it was discovered that “At the Union City BART station, where the [AC Transit] Flex shuttle is able to pick up passengers without pre-existing reservations, many people waiting for the bus said they had never heard of the service.”²⁵ It seems that these publicly funded pilots generate less media coverage than public-private partnerships with Uber, Lyft, and other ridesharing services and thus commuters are less likely to know it is an option for them. Furthermore, public transit agencies don’t appear to be heavily advertising these programs. As a result, it is projected that with more publicity, these programs could bring as many new riders to transit stations as public subsidies to on-demand rideshares, given that transit agencies scale their operations enough to meet the demand for such services. Because this model of on-demand shuttles resembles paratransit in that it picks up and drops off passengers at their needed destinations and origins, the cost-efficiency of on-demand shuttles will be similar to paratransit cost-efficiency. However, in general the on-demand shuttle cost will be less than the paratransit cost because the vehicles will not need to be have specialized equipment as passengers who require such equipment can still use paratransit services to get around. From the Pioneer Valley Transit Authority Paratransit Service Analysis Study, the cost per ride of paratransit is \$24, it’s estimated that given new riders will make 2 rides in a day, the cost per new passenger is about \$40.²⁶ Over a year with 250 working days, the cost per rider is \$10,000/new rider.

Much like with on-demand rideshare applications, on-demand shuttles will not be as accessible to a diverse population as traditional transit is, but on-demand shuttles will have a wider accessibility than private on-demand rideshares. For instance, the AC Transit Flex Shuttle can be booked by a phone call or desktop, tablet, or mobile application.²⁷ Furthermore, these shuttles can be used in tandem with paratransit shuttles which will allow for more Americans with Disabilities Act (ADA) accessibility. On-demand public shuttles will also be politically attractive in the same way that any investment in public transit agencies is likely to be accepted by the residents of Alameda County. Interest groups who are in support of sustainable

²⁵ Baldassari, E., “Tired of waiting for the bus? AC Transit’s Flex service allows customers to order rides outside regular schedules.” (2016), <http://www.mercurynews.com/2016/08/17/tired-of-waiting-for-the-bus-ac-transits-flex-service-allows-customers-to-order-rides-outside-regular-schedules/>.

²⁶ Pioneer Valley Transit Authority, Paratransit Service Analysis Study (2014), <http://www.pvta.com/media/pdfs/PVTAParatransitFinalReport.pdf>

²⁷ AC Transit, AC Transit FLEX (2017), <http://www.actransit.org/flex/>

transportation will be in favor of on-demand shuttles because they can move up to 25-30 people at once to public transportation stations, reducing vehicles on the road due to both being more space-efficient than on-demand rideshares which can only carry 4 to 6 passengers at a time and creating more transit trips.

Alternative 5: Let Current Trends Continue: Do Nothing

Congestion is worsening in the Bay Area. Traffic congestion has increased by 70% between the years of 2010 and 2015.²⁸ Coupled with rising traffic congestion and more vehicles on the road, BART rider is starting to decrease in 2017: BART “weekday trips were down a little more than 4 percent, and weekend trips were down slightly more than 2 percent, compared with the same month last year.”²⁹ As a result, should the Alameda CTC take no action to create first-mile, last-mile transit connections for the residents of Alameda County, it is very likely that rather than gaining new transit users in the coming years, transit users will continue to decline. This results in no effectiveness of this alternative because not only are no new transit riders added to the system, some are lost. Not only that, but as fewer riders use public transportation, the cost to operate transit services in Alameda County will continue to rise, making the public transportation system in the Bay Area as a whole less and less cost efficient.

As an alternative, doing nothing is not equitable for Alameda County residents either. By allowing private automobile use to commute to grow in the coming years, the Alameda CTC would be signaling that the needs of pedestrians, bicyclists, and people who rely on public transportation are less important than automobile drivers as they begin to dominate the transportation network. Furthermore, the safety of communities and of pedestrians and bicycles will be compromised as more automobiles on congested roads contribute to more crashes. As reported by the National Highway Traffic Safety Administration in 2016, pedestrian and bicyclist safety decreases disproportionately as car driving increases: “Pedestrian deaths shot up 10 percent last year and bicyclist deaths 13 percent — more than other types of victims,” while “Driving increased in 2015 too, but by 3.5 percent — not enough to explain the rising death

²⁸ Time Spent in Congestion: Vital Signs (2016), <http://www.vitalsigns.mtc.ca.gov/time-spent-congestion>.

²⁹ Baldassari, E., “BART ridership slumps; board mulls service cuts, fare increases” (2017), <http://www.eastbaytimes.com/2017/02/23/bart-ridership-continues-to-decline-board-mulls-service-cuts-fare-increases/>

toll.”³⁰ Many groups will be opposed to inaction by the Alameda CTC to work to increase transit access for its residents, including sustainable and accessible transportation advocates, other public agencies that coordinate with the Alameda CTC like the Metropolitan Transportation Commission, AC Transit, and BART, advocates for bicyclist and pedestrian transportation safety and justice like Walk Oakland Bike Oakland and California Walks, and more. As a result, it would be very politically unattractive and politically infeasible for the Alameda CTC to allow current trends to continue.

Comparing the Trade-Offs Between Different Alternatives

Because none of the proposed alternatives are the clear best solution to increasing transit access in Alameda County, trade-offs between different criteria must be made in order to design a policy solution that best serves the needs of Alameda County. The Outcome Matrix that follows summarizes each alternative’s performance in each criterion.

³⁰ Schmitt, A., “U.S. Traffic Fatalities Rising Fast — Especially Pedestrian and Cyclist Deaths” (2016), <http://usa.streetsblog.org/2016/07/01/u-s-traffic-fatalities-rising-fast-especially-pedestrian-and-cyclist-deaths/>

Criteria

	Effectiveness	Efficiency	Equity	Feasibility	
<i>definition</i>	<i>No. of new riders</i>	<i>\$/new rider/year</i>	<i>High to low diversity of new riders</i>	<i>High to low probability of community and political acceptance</i>	
Alternatives	More Parking	4,000	\$35,250	low	low
	More Traditional Bus Service	1,500	\$5,200	high	medium
	Subsidize On-Demand Rideshare	4,000	\$5,250	low	medium
	Public On-Demand Shuttle	4,000	\$10,000	high	high
	Do Nothing	Fewer than zero: riders lost	Not applicable	low	low

The alternative of adding new parking to BART stations can be eliminated because it is not only the least cost-efficient alternative, but also the least politically feasible alternative. Similarly, the alternative of doing nothing can be eliminated because not only is it going to lead to decreased transit access for Alameda County, it is politically infeasible. Furthermore, although expanding traditional bus service in certain parts of Alameda County is cost efficient relative to other alternatives, it is simply not effective enough to meet the growing demand for reliable transit access.

The newer proposed alternatives and strategies for increasing transit access, subsidizing on-demand rideshares and providing an on-demand public shuttle similar to paratransit have

more nuanced trade-offs and the better alternative between the two is not obvious. Both alternatives are similarly effective, since the two alternatives would serve the same types of people and the same areas. Although subsidizing rideshares is more cost-efficient because it requires no investment in new shuttles or hiring new labor, it is far less equitable and politically feasible than a public on-demand shuttle because it lacks accessibility for the mobility-impaired and because some ridesharing services have reputations for mistreatment of their employees and patrons. Additionally, it is not clear what the impact of ridesharing services is on traffic congestion in cities, but a common opinion in the Bay Area by transportation agencies is that they have a negative impact and actually increase the number of cars that are on a road at any given time. On-demand public shuttles do not face this drawback because they have a capacity up to 5 times that of a private automobile, and thus likely do decrease the number of vehicles on the road when they are being utilized by many people. Furthermore, on-demand public shuttles are more accessible and equitable for Alameda County residents, especially those who are mobility-impaired, low-income, or do not have access to the internet and smartphones.

It's also important to consider how the criteria may change in the long-term. For instance, all the cost-efficiency measures are calculated using the cost of an alternative per passenger per year. However, transportation investments are often planned and made over many years. For instance, the cost of subsidizing on-demand ride shares will never decrease in cost-efficiency because this shifts the delivery of the service into the private sector. However, the cost of private shuttles is more expensive at first because it requires investment in new shuttles and a higher cost of labor, but over many years as the service becomes more popular and operational efficient, the cost per rider would decrease.

Final Policy Recommendation

The ultimate recommendation for the Transit Planning Committee of the Alameda County Transportation Commission is a two-phased policy. This multi-faceted approach is necessary because there is no best alternative across all criteria, but two alternatives combined over the short- and long- term is projected to lead to the most favorable outcome.

In the short-term, the ideal solution to increasing Alameda County transit access is to subsidize private, on-demand ridesharing services such as Uber and Lyft. Passengers can receive

discounted rides from these services in partnership with the Alameda CTC when their trips begin or end at a transit station. This will incentivize more people to use transit for at least a portion of their total trip because their cost and time of taking transit will decrease as compared to driving a private vehicle which would be more expensive, or taking a traditional fixed-route bus which would take more time. As this program popularizes, more and more travelers in Alameda County will be interested and willing to consider taking transit for more of their trips; their lifestyles will adapt to using more transit and fewer private vehicles to get around. Transit agencies such as AC Transit and BART will increase their revenues over this period of time as more riders are paying fares as a result of the public-private partnership between the Alameda CTC and private, on-demand ridesharing services. Once this program grows significantly to meet the demand for the thousands of residents of Alameda County who currently would be willing to use transit but lack appropriate access, it will be less cost-efficient to administer. In the long run, it will not be cost effective to subsidize thousands of private rides each day, but in the next one to two years as this policy is still in its infancy, the cost per new rider is tremendously efficient relative to other alternatives. The budget for the first phase of the budget should be designed in anticipation of a significant increase in demand from the recent, short-lived pilot programs, because the cost of the program will grow proportionately to the number of people benefitting from it. At the point that demand for this transit connection has grown to be unsustainable for the rideshare subsidy, the second phase of this policy solution should take its place.

In the few years that demand and attention is growing for on-demand transit connection, funding should be provided to AC Transit to continue to develop their AC Transit FLEX program, which is their public, on-demand shuttle service that they have begun piloting as of the Spring of 2017. In this time, the funding should be used to ensure that there will be enough AC Transit FLEX shuttles in a few years to meet the demand that was previously met by rideshare subsidies. These public shuttles have always had the potential to provide effective and efficient transit access in the low-density communities that need it the most, but their only shortcoming has been a lack of demand and publicity. People who are willing to use these services do not, simply because they do not know it exists. However, in a few years as more Alameda County residents grow to rely on transit rather than private vehicles for transportation, the AC Transit FLEX

shuttles will be hugely successful. They will be far more cost-efficient than the private on-demand rideshare subsidies because as demand for the service grows, the cost of the program remains steady. This is because the shuttles are much more effective and efficient at transporting large groups of people than individual rideshares. It is projected that when demand is high enough, these shuttles will actually begin to earn revenue, unlike many traditional bus services which actually have a net loss of money per rider. In the long run, over the next couple decades, as population density increases across Alameda County, this policy will need to be evaluated once again, as the cost-efficiency, effectiveness, equity, and political feasibility of all alternatives will change to reflect the changing demographics of the county. However, it is clear based on this policy analysis that in the short-term of one to two years and the long-term of 5 to ten years, this combination of policy alternatives will indeed meet the goals of the Alameda County Transportation Commission. The county's residents will have access to better quality transit connections that will save them time and money, and people of all backgrounds and socioeconomic statuses will benefit. The mobility and livability of the county will grow in response to the immense improvement in the accessibility and equity of public transportation.

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