THE BAY AREA TRANSPORTATION PROBLEM

The Bay Area is second only to the Los Angeles Metro area in traffic congestion. Each auto commuter spends an extra 100 plus hours in traffic each year costing individuals, businesses and governments countless lost hours, opportunities and dollars.[1] Our region is expected to add 2 Million residents in the next 20 years[2], exacerbating the need to add sustainable transportation capacity as quickly as possible.

Transportation is increasingly unaffordable in the Bay Area, especially for those with low incomes. In the US the poorest 20% spend 30% of their income on transportation, contrasting with the same group in the EU spending only 7.5% on transportation.[3]

Our streets are unsafe and those using active modes are disproportionately impacted.[4] These injuries and deaths represent a significant cost to our cities and counties. It is estimated that for every $1 spent on bike infrastructure the region saves $2.80 on health care costs.[5]

Currently, 5.5% of trips are made by walking or bicycling in our region[6]. At the same time, 50% of trips are 3 miles or less[7]--presenting a monumental opportunity to convert these shorter trips to biking, walking, and micromobility trips.

THERE IS A SOLUTION

A transformational investment in people-first mobility over the next decade will result in a sustainable and equitable transportation system for the Bay Area. Our goal is that active modes including walking, biking and micromobility comprise 20% of trips by 2030. The infrastructure, programs, and policies required to transform our region are rapidly deployable, low cost, and will have a high impact on mode shift.[8]

We can create a world-class bicycle and pedestrian network throughout the Bay Area and allow many of the 60% of “interested but concerned” residents to shift auto trips to bicycling and multi-modal trips.[9] This investment will also stimulate local economies, reduce greenhouse gas emissions, and save local governments significant costs associated with traffic collisions and negative health outcomes from inactivity.[10] Furthermore, low-stress bicycle and micromobility networks will support increased transit use by providing a critical first/last mile solution[11].

We need a Bay Area where most people choose active transportation, micromobility, and transit because it is easy, cheap, fun, safe, healthy, and more equitable, where:

- Transportation choices are easy and abundant
- Streets are designed for, and enjoyed by, all people
- The most vulnerable people are prioritized
- It is safe and attractive for people of all ages and abilities to walk, bike, and scoot to transit
- Transportation options integrate seamlessly, are intuitive to use, and are low cost
- Low income communities have the same level of transportation options as affluent communities
- Technology helps to support a healthy, active lifestyle

The development of affordable electric-assist bicycles and other micromobility devices are creating, by their enormous popularity, a unique opportunity to realize this ambitious vision, as they enable longer distance trips and enable a broader user-base for micromobility. Studies show that users adopting e-bikes double their average trip length compared to conventional bicycles, reduce auto trips by half, and maintain an equivalent amount of physical activity compared to conventional bicyclists.[12]

To accomplish this transformational mode shift, there will need to be significant investment in infrastructure, education, and programs to drive active transportation and micromobility forward. In addition, policy changes will be required on a regional level. This level of investment in money and political change is what will be required for our cities and region to meet their ambitious climate goals.

REGIONAL INFRASTRUCTURE AND PROGRAM NEEDS

1. Infrastructure

The proposed investment will complete a network of safe[13] and protected bicycle and micromobility infrastructure and pedestrian improvements throughout the Bay Area over the coming decade. This network will make safe bicycle and micromobility trips possible locally, between cities, to reach regional destinations, and to integrate with transit as a key first and last mile solution. This infrastructure should serve all current and future micromobility devices and should include both comprehensive wayfinding and protected intersections.[14]

Transformative infrastructure investment is estimated at $13.2 Billion:

Estimate	
$6B	Rapid implementation of networks of low stress bikeway networks in cities throughout the Bay Area, creating first and last mile connectivity for transit and regional bikeway networks.[15] Emphasize access to transit, employment centers, and schools.
$5B	Complete the Bay Trail and a regional network of connected separated bicycle and micromobility paths.[16]
$1B	Separated active transportation facilities to cross freeways and other barriers.[17]
$1.2B	Upkeep and maintenance of the above facilities.[18]
$13.2B	

2. Programs & Education

Education and programming will ensure rapid mode shift with an incremental investment beyond regional infrastructure costs.

Safe routes to school and other education programs enhance investment in infrastructure by shifting travel choices. Nationally, safe routes programs result in a 40% increase in children

walking and biking to participating schools, as well as a significant decline in injuries and collisions.[19]

Open streets is another program that creates lasting mode shift. These one-day events open city streets to people to walk, bike, scoot, roller blade, dance and have fun. Los Angeles has made its CicLAvia program, where 7 miles or more of LA streets are closed to cars and open to people, a cornerstone of their goal to cut auto trips in half by 2035, and has already seen 1.6 million participants and resulting improvements to air quality.[20]

In addition, programs based in neighborhoods and low income communities such as earn-a-bike programs, family and adult bicycle education, and community bicycle workshops or hubs support the efficacy of school-based and open streets programs by creating an environment where families bike together and help to overcome barriers to bicycling in the most vulnerable communities. These education programs increase confidence for those interested but concerned cyclists and result in more trips by bicycle.[21]

Transportation Demand Management (TDM) policies have significant potential impact on active transportation mode share with no cost to local governments. By requiring large employers to provide active transportation benefits such as free bike share passes and incentives for walking and biking to work, employers can have a direct impact on employees travel choices. Studies show that these programs are effective in shifting to more sustainable modes. [22]

Transformative programmatic investment is estimated at $2.1B over 40 years:

Estimate	**Investment**
$600M	Schools to develop and implement safe routes to schools programs, and requirements to incorporate bicycle and micromobility skill education in school curriculum.[23]
$500M	Implement open streets programs, through cities and community-based organizations.[24]
$1B	Programs that support low-income communities, community bike shops, public awareness and behavior change campaigns, and neighborhood mobility hubs.[25]
No Cost	Enhance the existing region-wide Transportation Demand Management (TDM) program for large employers with requirements that employers invest in bicycle infrastructure on their campuses and provide programs and bike subsidies for their employees.
$2.1B	

3. Fare Integration and Micromobility Subsidies

Integrate micromobility platforms and devices (bikes, scooters, etc) into transit platforms, passes, and fares across the region. Travel through and across our communities should be seamless to the user, requiring only one card and with all resources available on one digital platform. Transit passes purchased by employers for their workers should include micromobility-share options.

As a complement to means-based transit discounts or incentives, extending discount or incentives to the same population of low income, student and senior users will allow for seamless affordable transportation throughout our region to those who need it most. Additional incentives for this population to access e-bikes will make active transportation options available to those in suburban and rural parts of our region.

Transformative investment is estimated at $1.2B over 40 years:

Estimate	**Investment**
$720M	Fund student, senior and low-income discount fares for use of micromobility systems.[26]
$300M	Create and fund a program to subsidize the purchase or rental of e-bikes for students, seniors, and low-income people.[27]
$1.02B	

REGIONAL POLICY RECOMMENDATIONS

Leveling the modal playing field

Our current transportation model encourages people to choose to drive because of the many hidden subsidies auto-owners receive. To encourage the use of transit, active transportation, and micromobility:

- Incentivize cities, developers, and employers to right-size parking and charge appropriate market rates for car storage on publicly and privately owned land throughout the region.
- Incentivize cities to eliminate parking minimums for new and existing development and unbundle the cost of parking from residential and commercial space so only those who need to use parking will pay for it.
- Incentivize development requirements that increase active transportation infrastructure, such as district-tailored maximum parking requirements, secure and short-term bike parking requirements, addition of protected bicycle facilities in key corridors in the vicinity of the project, etc.
- Incentivize city and regional agencies to implement congestion pricing in downtowns and tolls on bridges and highways.

Equity

The cost of transportation keeps people stuck in poverty. To create systems that are more equitable:

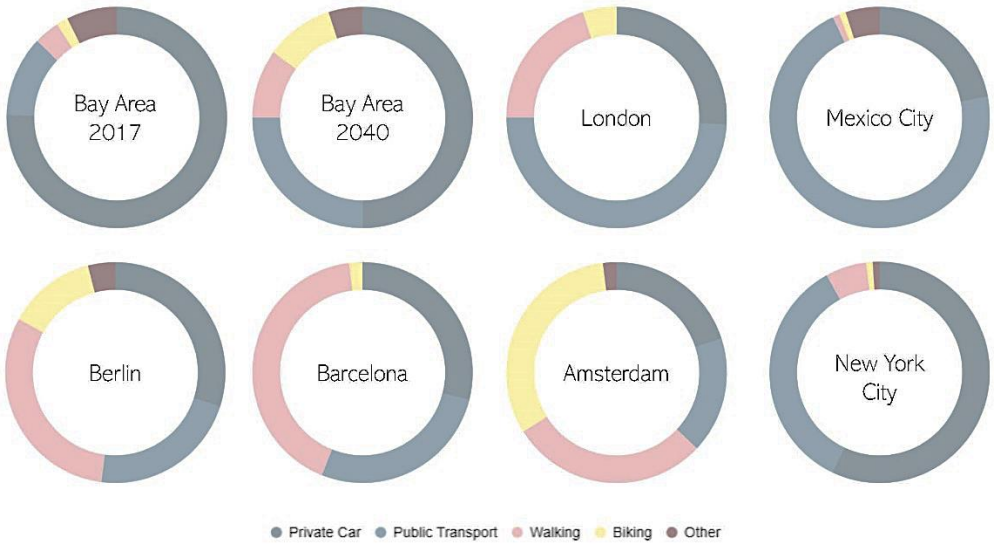
- Fund programs that expand transit and micromobility access to low income community members. Fund in-person assistance, eligibility, cash payment, and learning centers in local communities to help people take advantage of these new opportunities.
- Incentivize cities to deliver disproportionately more transportation services and infrastructure in underserved neighborhoods than it does in more affluent areas, and ensure that the infrastructure is universally accessible (i.e. accessible to people of all ages and abilities).

- Tie infrastructure funding to requirements that local-community members are engaged in transportation planning.
- Fund low income resident, student, senior transit/micromobility incentives, and enact policies that require micromobility companies to encourage equitable distribution of their services.

CONCLUSION

With this suite of transformational investments, we could shift more than 500,000 daily commute trips to walking, biking and scooting trips at peak hours. If e-bikes comprise 200,000 of these trips at 9 miles (the average distance of an e-bike trip that replaces a car trip[28]) and 300,000 are non-electric at 3 miles, then Bay Area roadways would see a reduction of 2.7 million vehicle miles traveled, per day. Annually, this represents a decrease of 702 billion miles traveled, which translates into a reduction of 625 billion pounds of CO2 emitted each year (or over 300,000,000 tons).[29]

This transformational investment in people-first mobility over the next decade will result in a sustainable and equitable transportation system for the Bay Area, one that prioritizes the low-cost active modes of walking, biking and micromobility. Future generations will appreciate being able to easily and safely use active modes for their trips, as well as the resulting cleaner air and reductions in greenhouse gas emissions. The Bay Area will join the ranks of other world-class regions around the globe.



Source: ACS 2017, Deloitte City Mobility Index

ARUP

This Framework is endorsed by the following groups: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LINKING CORTE MADERA & MILL VALLEY


NAPA COUNTY
BICYCLE
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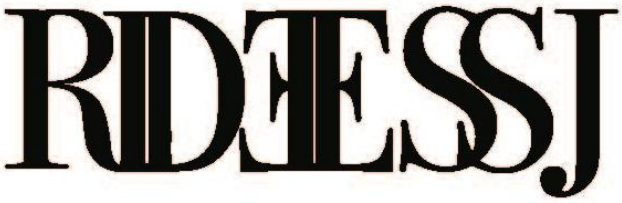
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[1] 2019 Urban Mobility Report from The Texas A&M Transportation Institute
[2] 2016 SPUR Report "Fossil-Free Bay Area", page 6, https://www.spur.org/sites/default/files/publications_pdfs/SPUR_Fossil_Free_Bay_Area.pdf
[3] The High Cost of Transportation in the United States, 2019, from the Institute for Transportation and Development Policy

[4] For instance, in San Francisco severe injuries to pedestrians and bicyclists make up 50% of total transportation related crashes, while making up only 27% of mode share. Injury data from Vison Zero SF report San Francisco Severe Traffic Injury Trends: 2011-2017. Mode share reported for 2017 by SFMTA: 2% bicycle and 25% walking.
[5] Maizlish, N. A., Woodcock, J. D., Co, S., Ostro, B., Fairley, D., & Fanai, A. (2011). Health Co-Benefits and Transportation-Related Reductions in Greenhouse Gas Emissions in the Bay Area—Technical Report.
[6] According to MTC's Vital Signs 2016 ACS data 3.7% of Bay Area trips are by walking and 1.8% by bike.
[7] MTC Vital Signs 2016 ACS data: http://www.vitalsigns.mtc.ca.gov/commute-mode-choice
[8] Many cities have had dramatic results from rapid implementation of networks including Seville with a 400% increase in cycling, and a 60% decrease in collisions, following a one year build out of a 40-mile network. Cities in North America include Calgary, Edmonton, Houston, Austin, New Orleans, Providence, San Jose. From Toole Design presentation Rapid Implementation, 2019.
[9] Portland Bureau of Transportation (2009), Four Types of Cyclists: Sixty percent of our population is interested in biking but concerned for their safety. Separated facilities alleviate those concerns.
[10] One study in New Zealand found that investment in active transportation infrastructure paid of 11:1 just in terms of health benefits and reduction to injury and emissions. Chapman, R., M. Keall, P. Howden-Chapman, M. Grams, K. Witten, E. Randal, and Woodward. A Cost Benefit Analysis of an Active Travel Intervention with Health and Carbon Emission Reduction Benefits. International Journal of Environmental Research and Public Health, Vol. 15, No. 5, 2018, p. 962. https://doi.org/10.3390/ijerph15050962
[11] A Washington, D.C. study found that the Capital Bikeshare program had a positive effect on transit use around peripheral stations on the network: https://doi.org/10.1177%2F0361198119849407
[12] M. Gaupp-Berghausen, E. Dons, et. al. (2019). Physical activity of electric bicycle users compared to conventional bicycle users and non-cyclists: Insights based on health and transport data from an online survey in seven European cities.
[13] Compared with wide streets with parked cars, protected bike lanes have a 90% lower injury rate, according to a study published in the American Journal of Public Health. http://cyclingincities.spph.ubc.ca/injuries/the-bike-study/
[14] See https://nacto.org/2019/05/20/dont-give-up-at-the-intersection/
[15] 3,000 miles at $2M per mile (cost estimate per San Jose's Horizon Transformational Project analysis).
[16] 1,200 additional miles of paths to bring regional network to 3,000 miles, including paths on the west span of the Bay Bridge, San Mateo bridge, Oakland-Alameda Bike/Ped bridge, SF's Market Street and regional corridors such as El Camino Real on the Penisula and San Pablo Avenue in the East Bay. Cost estimate from MTC Bay Trail group.
[17] 50 dedicated bike/ped freeway crossings at $20M each.
[18] $30M/yr for 40 years is $1.2B (cost estimate per San Jose's Horizon Transformational Project analysis).
[19] From the Safe Routes to School National Partnership website.
[20] Press release from CicLAvia (June 21, 2019) CicLAvia Celebrates Its Role Inspiring a Healthy, Sustainable L.A. as New Route Propels it Over 200 Miles Traveled.
[21]Post-class survey data collected by Bike East Bay shows significant increases in frequency of bicycle trips taken after adult and family bicycle education programs.
[22] A New York region study found that such incentives have a positive effect on active mode shares: https://doi.org/10.1016/j.tra.2017.02.009
[23] $15M/year for 40 years (cost estimate per interview with Brett Hondorp at Alta Planning on 8/19/19).
[24] For three large cities: 12 annual events at $50K each; and 98 smaller cities: 4 annual events at $25K each.
[25] Budget of $500K per year for 40 years for each of 50 neighborhood bicycle centers.
[26] This estimates 120,000 people (the means based transit subsidy group at MTC estimates 40-80k people at 11% mode share and we plan to get to 20% modeshare which means 80-160k riders). Allocating $150/person per year over 40 years.
[27] $750 rebate or rental subsidy for 10,000 per year for 40 years = 400,000 people.
[28] MacArthur, John, Christopher Cherry, Michael Harpool and Daniel Scheppke. A North American Survey of Electric Bicycle Owners. NITC-RR-1041. Portland, OR: Transportation Research and Education Center (TREC), 2018. https://dx.doi.org/10.15760/trec.197
[29] https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle