

CHAPTER 06

HOPE & HARM OF EMERGING MOBILITY

The evolution of the emerging mobility industry has captured the imagination of transportation officials, the media, technology entrepreneurs, and individual travelers, while raising complicated questions about accessibility and the racial and economic equity implications of these services. This chapter examines the ways in which emerging mobility services and practices perpetuate economic and racial inequities as well as how they might further economic and racial equity goals.



Source: City of San José

POTENTIAL HARM OF EMERGING MOBILITY

Despite their potential benefits, emerging mobility services and existing business practices have the potential to expand existing racial and economic disparities in the absence of proper planning and policies.

DIGITAL DIVIDE AND RESTRICTIVE USER REQUIREMENTS

Common features of emerging mobility services, including contactless payment systems and the need for internet and cell data for mobile applications, present significant barriers to the equitable adoption of emerging mobility. Limited access to internet service or wireless data in certain communities may prevent people from reserving rides using a mobile app or website. This disproportionately affects BIPOC, low-income, unhoused, and formerly unhoused communities. As of 2017, Black, Latinx, and low-income families were more likely to lack internet access compared to other groups.³¹ Even those with digital access may not feel comfortable interacting with technology for mobility services, due to unfamiliarity, mistrust, or concern over privacy and personally identifiable information. For example, older adults are less likely to use the internet than younger people—between 2000 and 2013, the percentage of Americans using the internet increased from 50 to 86%, while internet usage among seniors rose from 14 to 59% in part due to lower levels of computer literacy.³² Similarly, people who do not have access to a credit card or traditional financial services or are unbanked may be unable to use emerging mobility

services, as they usually require a credit card for payment. According to the Federal Deposit Insurance Corporation (FDIC), in 2017, unbanked and underbanked rates were higher among the unhoused community and households with the following characteristics: lower-income, less educated, Black and Hispanic-Latino, with disabled working-age household member, and with volatile income.³³ City regulations are requiring more emerging mobility services to offer alternative payment options including cash-based options, PayPal, money orders, and prepaid cards. But processes to use these alternatives are not always user-friendly and differ among providers.

People without driver's licenses or state IDs also face challenges in accessing emerging mobility services such as shared bikes, scooters, and cars that require proof of identification. These requirements are particularly challenging for undocumented individuals, youth, and individuals experiencing housing insecurity.³⁴ In the future, licensing may be less relevant as emerging mobility services may become automated, which would reduce the need for individuals to drive themselves.

³¹ City of San José (2017). Digital Inclusion Strategy Report.

³² McDonough, C., The Effect of Ageism on the Digital Divide Among Older Adults. Department of Economics, University of Massachusetts Lowell. February 2016.

³³ Figliozzi, M., & Unnikrishnan, A. (2021). Home-deliveries before-during COVID-19 lockdown: Accessibility, environmental justice, equity, and policy implications. Elsevier, Transportation Research Part D 93, 15–16.

³⁴ Golub, A., Satterfield, V., Serritella, M., Singh, J., & Philips, S. (2019). Assessing the barriers to equity in smart mobility systems: A case study of Portland, Oregon. Case Studies on Transport Policy, 7(4), 689-697. <https://doi.org/10.1016/j.cstp.2019.10.002>.

INEQUITABLE VEHICLE DEPLOYMENT

Underserved communities, particularly people with low incomes and BIPOC communities, are less likely to be able to afford reliable vehicles or have access to frequent, fast, useful public transit service, bicycle facilities, and other transportation options, which presents major barriers to economic success.³⁵

Geographic inequities are exacerbated when services are not available where they live. For example, early iterations of carshare and bikeshare programs across the nation did not emphasize siting in lower-income communities and BIPOC communities.³⁶ Bikeshare stations were implemented in “densely populated, higher income, mixed-use areas with good bicycle infrastructure” to support utilization targets and generate sufficient revenue to cover operating expenses.³⁷

The City has taken steps to ensure wide distribution of bike share and shared scooters. It requires scooter companies to deploy at least 20% of its vehicles in equity priority areas and has worked with the region’s bikeshare provider, Bay Wheels, to ensure that station-based and electric bikes are deployed in low-income areas and BIPOC communities. While some providers have made efforts to site stations in low-income neighborhoods, failing to create connections between the new stations and the broader transportation system limits their usefulness.³⁸ Simply having a station available will not expand a community’s mobility if that station is located too far from the rest of the network or if there is not supportive infrastructure, like bike lanes, to enable connections to other transportation services and destinations they want to travel to.

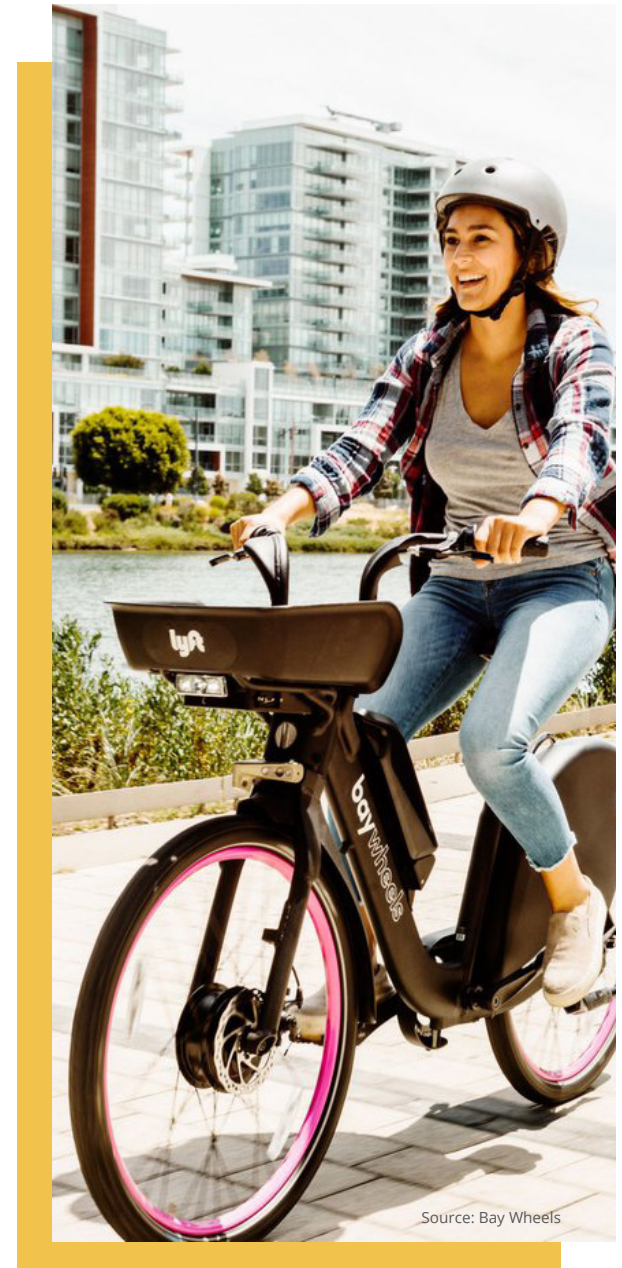
The City’s efforts to deploy shared scooters and bikes more broadly is a good first step. But usage is unlikely to increase without targeted community education designed and executed in partnership with communities.

35 Allen, J. (2019, May). Equitable E-Mobility. 32nd Electric Vehicle Symposium (EV532), France.

36 Fleming, K. L. (2018). Social Equity Considerations in the New Age of Transportation: Electric, Automated, and Shared Mobility. *Journal of Science Policy & Governance*, 13(1).

37 Schmitt, Angie. (2012). Why Isn’t Bike-Share Reaching More Low-Income People? *StreetsBlog USA*. Accessed 2 Feb 2016.

38 Ibid



Source: Bay Wheels

NEED FOR INCLUSIVE MARKETING AND OUTREACH

San José's community-based organizations and community leaders cite the lack of culturally inclusive marketing and outreach as a key barrier for emerging mobility use among low-income households and historically marginalized populations. Although these groups may be able to access and reserve vehicles, there is a perception that services were not designed to meet their needs.³⁹ Marketing materials, which historically display users who are young and white, reinforce that perception. Recent research has found that people who

are non-English speaking highlight the lack of outreach in languages other than English as a reason they are less likely to use emerging mobility.^{40 41} Although only 42% of California's population is white, nearly 70% of hybrid and alternative fuel vehicle owners are white. This suggests cleaner vehicles, supportive incentives, and outreach campaigns meant to reduce barriers to access, such as affordability, have not been designed for low-income households and people of color.

39 Shaheen, S., Bell, C., Cohen, A., & Yelchuru, B. (2017). *Travel Behavior: Shared Mobility and Transportation Equity* (pp. 16–20). U.S. Department of Transportation.

40 Ibid

41 Fleming, K. L. (2018). *Social Equity Considerations in the New Age of Transportation: Electric, Automated, and Shared Mobility*. *Journal of Science Policy & Governance*, 13(1).



Source: Winter Consulting

Veggielution First Saturday pop-up event.

EXPANSION OF THE GIG ECONOMY AND INDEPENDENT WORKFORCE

In the early years of emerging mobility, app-based industries like transportation network companies (TNCs), such as Uber and Lyft, recruited part-time drivers who valued flexible work hours and wanted to take advantage of their cars to generate additional income. These drivers typically held other jobs, were in school finishing degrees or were working from home. Since then, the driver profile has diversified; some drivers drive full time, work for multiple emerging mobility providers, and make substantial investments in their vehicle to perform this work.⁴² Hiring independent contractors for TNCs has also become a widespread practice amongst emerging mobility providers.

Despite rapid industry growth in the past decade, hourly driver pay is still low. Many emerging mobility providers, particularly ride-hailing companies, courier network services,⁴³ and micromobility companies, heavily depend on the availability of large pools of independent contractors to minimize customer wait times for trips, deliveries, and charged scooters. In the case of ride-hailing, when there are more drivers available than people needing rides, people experience reduced wait times. At the same time, having more drivers than passengers needing rides also means many drivers must compete for rides. This business model, which prioritizes the passenger's convenience and access to the service, reduces driver trips per hour, making it difficult to earn a reliable income. Rides (and income) are not guaranteed, and take-home pay can be less than what is advertised or promoted when accounting for the company's

commission, gas, and vehicle maintenance. While studies on driver wages have been mixed, net income is notably less considering independent contractors - not emerging mobility providers - are responsible for registering, insuring, fueling, and maintaining their own vehicles.

Independent contractors are not provided benefits such as employer-provided health insurance, retirement savings plans, unemployment insurance, and paid sick leave that are typically extended to full-time employees. With the passing of California's Proposition 22, app-based transportation and delivery companies (including emerging mobility providers) must provide some benefits to independent contractors, such as higher minimum wages, compensation for vehicle maintenance, and a health care stipend. These benefits, however, may not be accessible to all independent contractors on a given platform. For example, drivers must be reimbursed 30 cents per mile for expenses (notably lower than the state and federal rate of 56 cents per mile), but that benefit does not apply to delivery workers on bike or foot.

As of August 2021, a state Superior Court judge ruled Proposition 22 to be unconstitutional and unenforceable for two reasons: 1) The proposition was determined to infringe on the state legislature's power to regulate compensation for workers' injuries; and 2) language aimed to prevent drivers from forming a union also violates a provision in the state constitution that requires laws to be limited to a single subject. Ride-hailing company Uber has said it will appeal this decision. As of the writing of this document, the decision of the Superior Court stands.

⁴² Parrott, J., & Reich, M. (2018). An Earnings Standard for New York City's App-based Drivers: Economic Analysis and Policy Assessment. The New School Center for New York City Affairs.

⁴³ Courier network services are on-demand delivery services that use online applications or platforms to facilitate the delivery of goods. This may include heated meals, groceries, and home supplies.

AUTOMATION AND ELECTRIFICATION IMPACTS TO LABOR FORCE

While many studies agree vehicle automation will substantially change employment options and the economy, there is a lack of consensus on when that change will occur and at what scale. The outcome depends on a variety of factors, such as the pace of technical development, adoption of vehicle sharing, and its impact on personal mobility and freight.



Source: Getty Images

Though the timing remains uncertain, automation will likely cause some job loss, expand some existing jobs, and create new jobs.⁴⁴ People who “are employed to design, manufacture, sell, and service vehicles (approximately 3 million jobs) and related infrastructure” represents almost 5% of all GDP.⁴⁵ These jobs will continue to exist in the future with automation and may grow, though the nature of the work may change. For example, ride-hailing and courier network service companies, which have heavily invested in automation in recent years, may need people to monitor and maintain automated fleets and respond to maintenance or operational issues in the same way that micromobility service providers do now.⁴⁶ Mechanics will need to be retrained to inspect and repair advanced sensors and other components that are absent from conventional vehicles. If AVs are electric, mechanics will also need to learn to install and maintain batteries and charging infrastructure.

In addition to manufacturing jobs, automation is also expected to significantly impact the goods movement industry. Automated trucks have been available since the early 2000s and were quickly adopted by third-party logistics companies because they dramatically reduce labor costs associated with hiring driving staff.⁴⁷ According to the Bureau of Labor Statistics, approximately 1.9 million people work as heavy and tractor-trailer truck drivers in the U.S. Jobs in this sector are expected to grow in the near-term due to anticipated increases

in freight volumes. In the long-term, however, driving jobs are expected to decrease. Some studies suggest that all segments of a delivery trip, from jobs at the origin (e.g., preparing and packaging items at a warehouse facility) and delivery ends of the supply chain (e.g., delivering the package from a warehouse facility to a person’s door) to the long-haul driving portions, will see automation eventually displace human workers.⁴⁸ AVs are also expected to negatively affect the competitiveness of small, independent trucking and distribution companies.

Workers most vulnerable to job displacement as a result of automation, namely those in manufacturing, warehousing, and trucking, may not currently have the skills needed for new jobs or might not live in the areas where new jobs arise.⁴⁹ While automation is expected to affect workers at all levels to some degree, low-income workers in particular have the least financial capacity to successfully adjust. Cities, labor representatives, community advocates, and the automotive industry need to identify strategies to achieve a just transition to an automated and electric future. Likewise, more research is needed to understand the potential residual impacts of widespread automation, job displacement, and economic change on housing.

44 Groshen, E., Helper, S., MacDuffie, J. P., & Carson, C. (2018). Preparing U.S. Workers and Employers for an Autonomous Vehicle Future. *Securing America’s Future Energy (SAFE)*.

45 Wang, X. (2019). Preparing the public transportation workforce for the new mobility world. In *Empowering the New Mobility Workforce* (pp. 221–243). Elsevier Inc. <https://www.sciencedirect.com/science/article/pii/B9780128160886000109?via%3Dihub>

46 Ibid

47 Brown, A., Safford, H., & Sperling, D. (2019). Historical perspectives on managing automation and other disruptions in transportation. In *Empowering the New Mobility Workforce*. Elsevier Inc.

48 Ibid

49 Fleming, K. L. (2018). Social Equity Considerations in the New Age of Transportation: Electric, Automated, and Shared Mobility. *Journal of Science Policy & Governance*, 13(1).

HOPE OF EMERGING MOBILITY

Emerging mobility's success in addressing economic and racial disparities will rely on effective policies, partnerships, and community engagement.

As noted by TransForm's Framework for Equity in New Mobility (2017), "The new mobility conversation has focused too much on technology and too little on human impact. We must humanize the role of emerging mobility technologies by addressing the current and historically unaddressed needs of those left out of transportation improvements." To do so, pilot and demonstration projects can be implemented that test concepts and encourage practices that strive to meet the needs of underserved communities. Pilot and demonstration projects, such as those described in Chapter 5 and in the following sections, can help to identify and address barriers for underserved communities and establish mutually beneficial partnerships between emerging mobility companies and public agencies.

CONNECTIONS TO TRANSIT, JOBS, AND PUBLIC SERVICES

The broad range of emerging or new mobility services and technologies offers promising opportunities to increase transportation options and, by extension, access to jobs and essential services, including education, health services, grocery stores, and discretionary travel for social purposes.^{50 51 52}

Interactions between new mobility and public transit are complex. Literature on this topic is mixed in terms of whether the share of trips taken on transit or by bicycling and walking is reduced by the introduction of new mobility. The literature generally indicates that in urban environments, ride-hailing probably reduces transit ridership overall. In more suburban

environments such as San José, ride-hailing has been shown to support public transit by serving as an effective feeder system.⁵³ More affordable options could also potentially compete with personal vehicle ownership and encourage public transit trips over other trip types.⁵⁴ Some transit agencies and social service agencies are partnering with ride-hail companies to provide on-demand paratransit and subsidized non-emergency medical transportation, in an effort to improve service for users and decrease costs for agencies.⁵⁵ Others have partnered with ride-hailing companies in pilot programs that connect major job centers such as airports to transit services.

50 Fedorowicz, M., Bramhall, E., Treskon, M., & Ezike, R. (2020). *New Mobility and Equity* (pp. 10–27). Urban Institute.

51 Ricci, A. (2019). *Socioeconomic Impacts of Automated and Connected Vehicles*. The National Academies of Sciences, Engineering, and Medicine, 78–90. <https://doi.org/10.17226/25359>

52 Greene, Solomon, Graham MacDonald, Olivia Arena, Tanaya Srini, Ruth Gourevitch, Richard Ezike, and Alena Stern. 2019. *Technology and Equity in Cities*. Washington, DC: Urban Institute.

53 Stiglic, Mitja and Agatz, Niels A.H. and Savelsbergh, Martin and Gradišar, Miro, *Enhancing Urban Mobility: Integrating Ride-Sharing and Public Transit* (July 5, 2016).

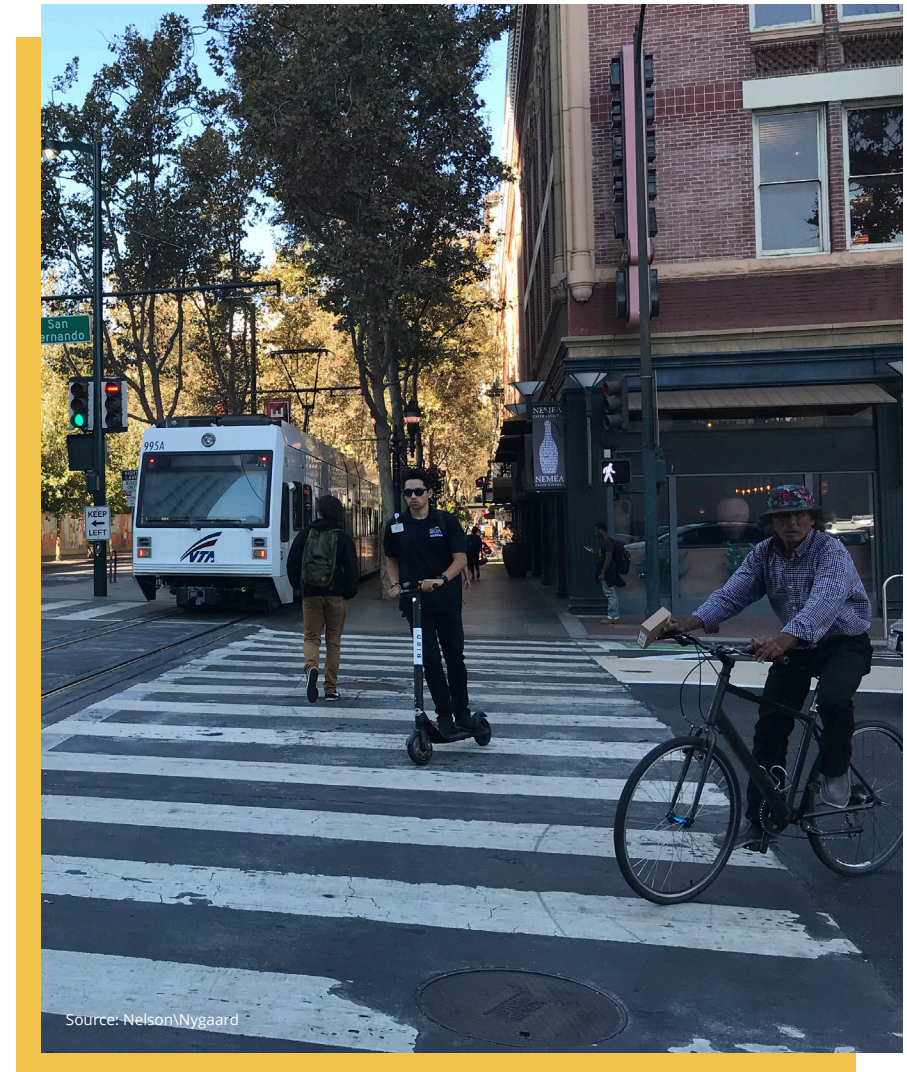
54 Rodriguez, G., Bailey-Campbell, P., Bittner, J., Shriber, J., Constantine, S., & Coyner, K. (2020). *Prioritizing Equity, Accessibility and Inclusion Around the Deployment of Automated Vehicles* (NCHRP Project 20-113F; Preparing for Automated Vehicles and Shared Mobility: State-of-the-Research Topical Paper #5, pp. 6–20). Transportation Research Board.

55 Greene, Solomon, Graham MacDonald, Olivia Arena, Tanaya Srini, Ruth Gourevitch, Richard Ezike, and Alena Stern.

FILLS GAPS IN THE TRANSPORTATION NETWORK

During the COVID-19 pandemic, service providers helped address transportation challenges by offering free and/or reduced pricing and partnerships with essential services to support critical workers, seniors, and people with disabilities. Policymakers and emerging mobility providers should continue to think creatively about how to provide accessible transportation options, especially for people who have been left out in the past.

Emerging mobility has also been used to fill gaps by supplementing, or in some cases, wholly replacing, existing transportation systems. In both rural and urban areas, city agencies and transit providers leverage ride-hailing services and their dispatching technology to provide on-demand non-emergency medical transportation trips. By providing increased access to medical appointments and easing the demand for ambulances for non-emergency medical transportation, ride-hailing or on-demand shuttles can help reduce stress on emergency response services and healthcare costs for persons with disabilities. A study found that ride-hailing for non-emergency medical transportation likely helped reduce wait times for ambulances for emergencies.⁵⁶ ⁵⁷ Another study found that if emerging mobility were to help people with disabilities miss fewer medical appointments, \$19 billion annually in healthcare expenditures would be saved.⁵⁸ For emerging mobility services like ride hailing or microtransit to adequately address community needs, particularly for seniors and people with disabilities, education and training are necessary.



⁵⁶ Moskatel, L., & Slusky, D. (2017). Did UberX Reduce Ambulance Volume? Department of Medicine, Scripps Mercy Hospital.

⁵⁷ Though the study argues ride-jailing for non-emergency medical transportation trips likely helped to reduce wait times based on their modeling, it did not provide an estimate of how much wait times were reduced because the data used in this study as provided by a national agency did not catalogue wait times for ambulances.

⁵⁸ Claypool, H., Bin-Nun, A., & Gerlach, J., (2017). Self-Driving Cars: The Impact on People with Disabilities. The Ruderman Family Foundation. Accessed https://rudermanfoundation.org/wp-content/uploads/2017/08/Self-Driving-Cars-The-Impact-on-People-with-Disabilities_FINAL.pdf.

EXPANDING SUSTAINABLE MOBILITY OPTIONS

Emerging mobility modes are often more sustainable options than personally owned combustion engine vehicles because they often are shared and/or electric. The shared model allows people to travel without having to own a personal vehicle, bike, or scooter, which, with increased adoption, can help reduce the amount of land dedicated to parked vehicles. Electrification of all forms of transportation substantially reduces transportation related GHG emissions. As electric mobility options and their supporting infrastructure become more accessible and affordable, sustainable travel options may become more commonplace and can be a critical tool in advancing local and state climate initiatives.

POWERING DATA-INFORMED DECISION-MAKING

Mobility data is essential for planning, regulating, and actively managing complex, interconnected transportation networks. Mobility data may be gathered using traditional methods like field observations or surveys, or through technology-driven methods like sensors, cameras, and data shared by private mobility providers. Collecting mobility data, while a significant upfront investment, enables increased, long-term efficiencies. With the ability to actively monitor existing conditions and trends, cities can identify problems and adopt policy changes more quickly. Cities and mobility providers can also establish public-facing portals with aggregated data to share information with their communities about what is happening on their streets. This helps cities increase transparency, build understanding within communities, and promote accountability for ongoing projects.



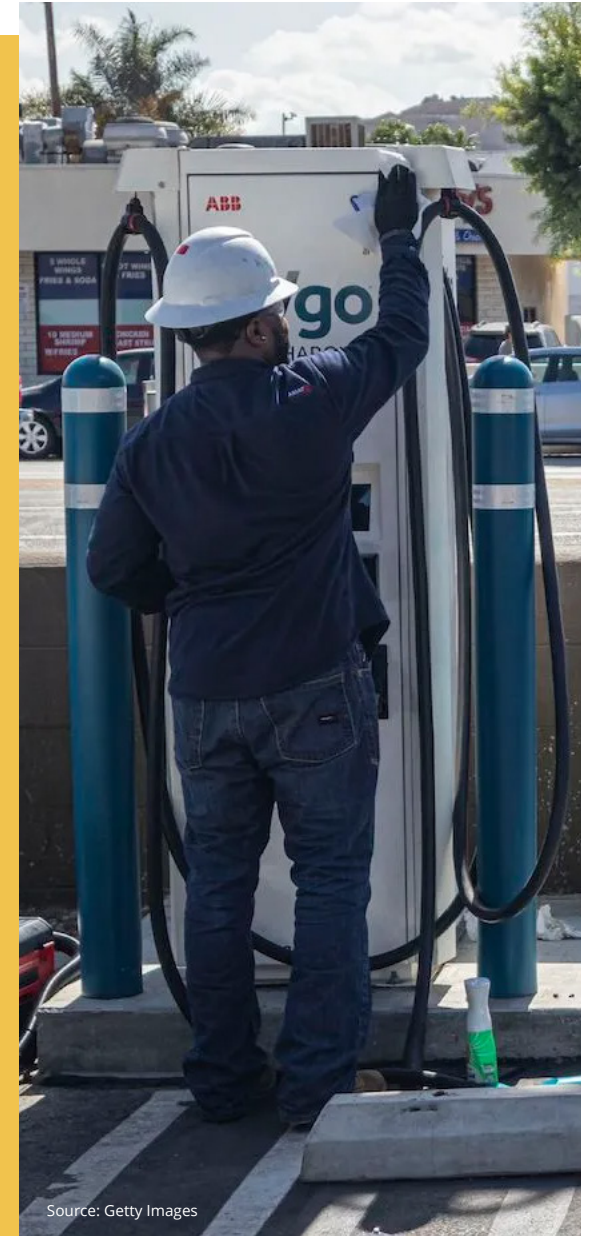
Source: Nelson\Nygaard

WORKFORCE DEVELOPMENT INITIATIVES

In recent years, several cities, such as San Francisco, New York, and Sacramento, have created workforce development programs geared toward upskilling workers, particularly within vulnerable communities, to mitigate the impacts of anticipated job loss and job displacement that are driven by an increasingly technology-driven economy. While some examples of such programs exist in San José, more is needed. In Santa Clara County, work2future, which operates as a workforce development board, provides residents with coaching and professional skill building training. SJ Works, a strategic initiative of the San José Mayor’s Office, creates employment opportunities for at-risk and underserved youth. In 2020, work2future and SJ Works also offered a paid internship program that focused increasingly on private-sector placements with employers in high-growth sectors such as manufacturing, financial services, and information technology. In general, workforce development programs and focus areas vary depending on local needs. Technology-focused workforce development programs generally fall into three categories:

- **Independent contractor support** where organizations provide targeted training and guidance to independent contractors who engage in online, on-demand work;
- **Work-based learning programs** where workforce development organizations partner with private mobility companies and public agencies to prepare K-12, career technical, and higher education students for transportation technology-focused jobs;
- **Digital upskill programs** where public agencies partner with third-party education companies to subsidize and develop training courses focused on advanced data analytics, coding, or IT support.

While not as common as the categories described above, there are opportunities for private mobility companies to collaborate directly with community partners to develop new models for workforce development. Additional information and specific examples of workforce development initiatives, including lessons learned and outcomes, can be found in the Appendix.



Source: Getty Images

MOBILITY WITHOUT DISPLACEMENT

Emerging mobility services create options that can help people complete the trips they need.

However, there is a perception and real fear of emerging mobility and transportation infrastructure investments being a catalyst for displacement. While a connection between emerging mobility and displacement has not been confirmed through research, throughout this process community members have expressed mistrust toward private mobility companies. They see these services as tailored to white, affluent users, as well as tourists and employees who visit but do not live in the city. These services are typically placed in their neighborhoods without their consultation. This mistrust stems from longstanding cycles of disinvestment and sudden investment in neighborhoods experiencing change.

Disinvestment over long periods of time can lead to disconnected and segregated communities that have less access to critical resources in their neighborhoods. But sudden investments can also have harmful, lasting impacts. These investments, sometimes seen as “helping” or “revitalizing” communities by planners, policymakers, and elected officials, often do not involve or consider people already living in the community. Studies have shown that in dense coastal cities, a sudden injection of public dollars in historically disinvested communities can result in notable shifts in cost of living, increased density, and, depending on the type of investment, displacement of current residents.⁵⁹ In the case of investment-

driven residential displacement, studies have consistently demonstrated patterns of wealthier, more educated, and whiter residents moving into previously disinvested neighborhoods, while people who move out are often renters, poorer, and/or people of color.⁶⁰ Examples of this phenomena are seen in places like the Hayes Valley neighborhood and the Mission District in San Francisco, and South Gate, a city just southwest of downtown Los Angeles. This is harmful to the people who move away as well as the communities they leave behind. It can also increase greenhouse gas emissions by forcing those who leave to commute long distances to retain better paying jobs in Silicon Valley.

“ YOU SEE A SCOOTER OR A LYFT BIKE IN MY NEIGHBORHOOD AND YOU KNOW IT DOESN’T BELONG THERE. WE’RE NOT USED TO SEEING THIS KIND OF STUFF IN OUR NEIGHBORHOOD. ”

– San José Community Leader

⁵⁹ National Community Reinvestment Coalition, *Shifting neighborhoods: Gentrification and cultural displacement in American cities*, March 2019.

⁶⁰ Derek Hyra, *The Back-To-The-City Movement: Neighborhood Redevelopment and Processes of Political and Cultural Displacement*, June 2014.

INVESTMENT WITHOUT DISPLACEMENT

To reduce the risk of displacement, policymakers, planners, and private mobility providers must consider who is burdened and who benefits from future investments in transit, highways, street repaving programs, bikeways, and the expansion of emerging transportation options. Fear of displacement, of not being able to afford to remain in their homes due to rising housing costs, may prevent investment in BIPOC communities entirely, resulting in a continued cycle of funding infrastructure and programs in predominantly white communities. To stop this negative cycle, government agencies can adopt the following strategies to counteract displacement.^{61 62 63 64}

- Encourage inter- and intra-agency collaboration. For example, consider how emerging mobility can support greater access to “high quality transportation options,” to meet Affirmatively Furthering Fair Housing (AFFH) requirements and allow the development of affordable housing in wealthier, more resourced neighborhoods.
- Institutionalize meaningful, sustained community engagement to co-create solutions and commit to funding services that meet community needs.
- Understand the difference between investment and displacement.
- Understand what systems and policies need to be in place to allow investment in existing communities to occur safely.
- Support policies that allow people to stay in their current neighborhoods.

- Acknowledge, own, and leverage power to enact desired outcomes.
- Build wealth in the community through every decision.
- Employ culturally and context-sensitive engagement tactics to share resources and gather insights from the disability community and those experiencing language access barriers.

Similarly, private mobility partners can adopt the following strategies to better align service offerings with community goals and help reduce the risk of displacement:

- Hire local residents—at all levels, not just in street team positions.
- Market to BIPOC and immigrant communities and collaborate with these communities on the design and execution of those marketing programs.
- Enact internal equity policies and accountability measures.
- Partner with community members and community-based organizations.
- Include payment options that expand access among unbanked or lower-income community members.
- Understand demographics of users.
- Be transparent with data when working with government.

61 Greater Communities. Prevent Displacement Policy Fact Sheet. 2007.

62 PolicyLink. Equitable Development Toolkit. 2018.

63 Mission Anti-Displacement Coalition (MAC). <http://medasf.org>

64 The Chicago Rehab network. The Nathalie P. Voorhees Center for Neighborhood and Community Improvement.