SAN JOSÉ
EMERGING MOBILITY ACTION PLAN

Appendix

CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY
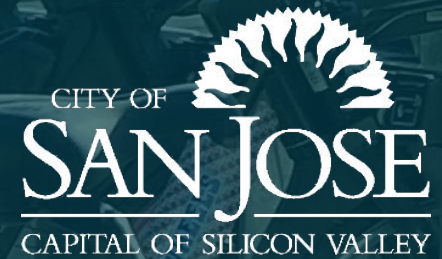
2022

APPENDIX A
EXISTING CONDITIONS

NELSON NYGAARD

MEMORANDUM

To: Laura Stuchinsky, San Jose Department of Transportation

From: Nelson\Nygaard

Date: April 30, 2021

Subject: **San Jose Emerging Mobility Action Plan Task 2 Summary Memo**

TASK 2.1 DATA COLLECTION SUMMARY

Spatial Analysis of Disadvantaged Communities

Data Sources and Overview of Methodology

The analysis of disadvantaged communities relied on 2018 American Community Survey 5-Year (ACS) estimates of demographic characteristics at the Block Group level. We supplemented the demographic data with geographic data that described the extent of various transportation infrastructure across San José and the surrounding area. The transportation infrastructure data was collected from multiple sources including the City of San José, Valley Transportation Authority, and Zip Car.

We geographically defined each transportation infrastructure type, including active transportation, public transit, shared mobility, and freight transportation. Active transportation included bicycle infrastructure. Public transit included bus, light rail, and park and ride locations. Shared and clean mobility included bike share, car share, and electric vehicle charging stations. This data helped estimate access and benefits of the transportation network. Freight transportation represented a negative externality. It included the noise and air pollution footprint for freight rail, the 2040 roadway freight network, and the airport.

Crashes are another negative impact of the transportation system. We mapped traffic crashes to assess safety outcomes and identified major arterial surface streets with a high concentration of crashes.

We established a buffer area to define the impact area for access and externalities. The buffer distance varied according to the specific infrastructure type. For bicycle infrastructure, shared and clean mobility, and bus access, we used a buffer of 1/8 mile, as the propensity to walk to these destinations is fairly low. The buffer was slightly larger (1/4 mile) for light rail. The travel sheds for Caltrain stations and park and ride lots are larger and we used a 1-mile buffer. We used a 1/2-mile buffer for noise and air pollution impacts from freight based on the extent of the direct impacts.

Once these areas were defined, we calculated the demographic characteristics from the Census data for the impact area using an area weighted average. For this, we multiplied the population of the Block Group by the percentage of area that was impacted (i.e., within the buffer) in the Block Group. We then summed the impacted population for the City for each demographic group for comparison. The Census demographic characteristics we used were Black, Asian, and Latinx residents, populations with limited education (adults without a high school diploma), households in poverty, and households with Limited English Proficiency.

By calculating average densities of demographic groups, we estimated the impacts for the total population of each group, which we used to answer two questions:

- What percentage of the city's population of a particular group (e.g. Black people) live within one of the impact areas (buffers)?
- What percentage of the population within the impact area is of a particular group?

We used the answers to these questions to comment on the pressing issues:

- Do some communities within San José have less access to transportation infrastructure?
- Do some communities endure the effects of noise and air pollution or traffic violence to a greater extent than others?

Key Trends

Additional findings and spatial analysis maps are detailed in the Just Movement slide deck, Slides 29-41, included in Exhibit A.

In comparison to the white population, Asian, Black, and Latinx residents are disproportionately affected by freight impacts. Similar impacts are seen for low-income and LEP households and residents without a high school diploma.

Transit access is relatively even across all demographic groups, with Black residents and those without a high school diploma having greater access, along with low-income and LEP households. Disadvantaged communities have access to high frequency bus service but less access to light rail service. It is important to note that access to a transit stop does not directly mean access (comfortable, reliable, efficient) to the desired destination. Additionally, it does not account for a potentially higher demand for public transit among the populations we focused our analysis on.

Access to bicycle infrastructure is generally even except for Latinx communities who have less access than the rest of the city.

Deployment of micro-mobility services is concentrated in communities in North and East San José. This may favor disadvantaged communities, however, usage is relatively lower for these communities indicating possible barriers for use beyond deployment, such as poor infrastructure or limited credit card/bank access.

Access to clean and shared mobility services is limited in San José. Although there does not appear to be great disparities among different populations, we did not have usage data to confirm that disadvantaged populations are not experiencing other barriers to using these services.

Policy and Planning Frameworks

As part of Task 2.1, the project team reviewed past and current transportation planning, policy, and pilot or initiative documents relevant to this process, particularly recent efforts within the City's low-income and disadvantaged communities of color. As part of the review, the team identified current values and principles for mobility and identified common themes and challenges from past studies, particularly as they relate to equity.

Common **values** and **principles** for mobility planning identified across plans include:

- Expand transportation affordability, options, and the use of sustainable alternatives in historically underserved communities.

- Facilitate travel between neighborhoods, to jobs, and to community destinations by walking, biking, transit, and other shared options.

- Make improvements to the bicycle, pedestrian, and transit networks and center improvements around the most vulnerable populations first.

- Leverage partnerships with non-profit, public, and private entities to test new products, programs, and services and to advance the City's goals.

Common **challenges** for mobility planning as it relates to equity include:

- Increasing access to services and meeting the needs of the community without exacerbating displacement.

- Residents may be interested in new services but may not be aware of how to access them or what funding/payment plans are available.

- Transit service is limited, unreliable, and does not serve neighborhoods and destinations where community members want to go.

- Traffic conditions (e.g., high vehicle speeds, limited compliance) create unsafe and unwelcoming environments for walking and biking.

The Emerging Mobility Action Plan will build on past efforts to collaborate with the community from start to finish.

The following section provides a summary of each document reviewed as part of this plan as well as gaps with regards to equity and communities of interest.

Access & Mobility Plan (DRAFT)

The Access & Mobility Plan (AMP) provides a roadmap to achieve the transportation goals of the Envision 2040 San Jose General Plan and Climate Smart San Jose. The project is also designing a digital Decision Support System (DDS) to both evaluate progress and inform adjustments along the way. The project team is coordinating with the AMP team on an ongoing basis to ensure alignment across goals and key performance indicators and to ensure racial equity considerations are reflected in the

AMP. The plan is currently in development and is scheduled for adoption in Summer 2021.

San Jose Electric Mobility Roadmap (2020)

The Electric Mobility roadmap provides direction on how the City can reach key goals for electrifying vehicles. The Roadmap discusses two ways to reduce emissions from passenger vehicles: 1) Expanding shared and electric transportation options such as public transit, fleet vehicles, and emerging mobility services such as ridehailing, carsharing, and micromobility; and 2) Advance the adoption of electric vehicles for trips usually made with a car, SUV, or truck.

Equity-centered values and principles highlighted in this plan include increased access to EVs and shared mobility options for residents who cannot or choose not to drive and meeting community needs by leveraging partnerships to expand mobility options. The plan also acknowledges the

Sidewalk Riding Prohibition Technology Evaluation (2020)

The City required all e-scooter operators that received a Shared Micro-Mobility Permit to participate in an evaluation process to demonstrate technology they developed to prevent the use of e-scooters on sidewalks. The sidewalk prevention technology was tested on several streets in downtown and evaluated based on progress towards performance benchmarks. While no operator has fully met this requirement, the City is exploring additional measures to prevent sidewalk riding and to minimize sidewalk clutter.

Ending Displacement in San Jose: Community Strategy Report (2020)

In 2018, City Council called for the development of strategies to combat gentrification and displacement, which prompted the development of the Ending Displacement in San Jose: Community Strategy Report (2020) and the Citywide Residential Anti-Displacement Strategy. The strategy includes recommendations for preventing, mitigating, and decreasing displacement in San José as informed by targeted outreach and engagement. Information from this plan informed the historical research of San Jose neighborhoods that are risk of or are experiencing ongoing gentrification.

En Movimiento East SJ Transportation Plan Outreach Summaries (2019/2020)

En Movimiento: A Transportation Plan for East San Jose is a community-driven transportation plan is a community-driven transportation plan that provides a roadmap for implementing multimodal transportation improvements that are reflective of the priorities of East San Jose. The project team reviewed outreach summaries of four rounds of targeted community engagement to understand common concerns to using non-automobile modes and to understand the types of improvements East San Jose residents would like to see.

Autonomous Vehicle Strategy Memo (2017)

The Autonomous Vehicle Strategy Memo establishes guiding principles for testing and implementing autonomous vehicles in San Jose and provides an overview of autonomous vehicle efforts in San Jose, including past AV demonstration pilots.

San Jose Transportation Barrier and Benefit Resident Survey Memo (2017)

This memo summarizes the results of a mail survey of residents living in downtown San Jose. The survey sought to identify residents' perceived barriers to and benefits of using transit, biking, walking, and carpooling over driving alone for commuting. Roughly 40 percent of all survey respondents (346) identified as a person of color.

The list below highlights the top perceived barriers to and benefits of each mode.

Walking

- The top barrier was distance. Concerns about safety were also common.

- The top benefit was exercise. Related themes included walking being good for one's mood and good for the environment. Social aspects of walking were rated relatively low.

Public Transit

- The top barrier was transit taking too long. Logistical concerns and safety concerns also were common.

- The top benefit was not worrying about parking. As was the case for walking, the environmental benefit was rated high.

- The benefit of being able to nap, read, or work while on transit was rated high. Taken together, this benefit and the top barrier (transit taking too long) underscore the value that downtown residents place on their time.

Biking

- The top barrier was the danger of riding in traffic, followed by concern about theft. A lack of bike lanes was also rated high.

- The top benefit was exercise, which was also the top benefit associated with walking. Once again, the environmental benefit was endorsed.

Carpooling

- The top barrier was preference for using one's own car.

- The top benefit was carpooling being good for the environment. These views were prevalent with regard to other modes as well.

Buena Vista Community Identified Issues

The project team reviewed summary notes provided by the City from outreach activities involving the Buena Vista neighborhood. Community identified several transportation-related issues, including:

- Traffic safety (e.g., speed cars, cars not obeying stop signs)

- Safety concerns about children walking and biking in the streets
- Scooters on sidewalks make it difficult for strollers and residents with disabilities to pass
- Limited transit service during off-peak and poor reliability

Historical Research

The project team conducted historical research to better understand how past local, state, and federal policy decisions have shaped the experiences of the City's disadvantaged communities of color and their relationship with the City. This effort involved analyzing historical events that span from the City's founding to the present day. While primarily focused on transportation-related policies, this analysis also explored the long-term effects of landmark housing, land use, and labor policy decisions that have come to inform how transportation systems are shaped and experienced by residents in the present day. Findings from this research inform and supplement the spatial analysis of the City's disadvantaged communities conducted as part of Task 2.1.

Results of this analysis are summarized in the Just Movement Slide Deck (Exhibit A). The list below highlights relevant slides that elaborate on each topic area:

- Overview of Historical Research approach and its connection to other aspects of the project [**Slide 14**]

- Timeline of historic events and local, state, and federal policy decisions that exacerbated housing-, labor-, and transportation-related inequities [Slide 15]

- The long-lasting impacts of redlining and highway construction on neighborhood composition, access to services, and risk of gentrification within certain areas in San José [**Slide 16**]

- Summary on the history of Silicon Valley, its relationship to the City, and current impacts to the region and the City's labor force [**Slide 17**]

- Summary of the City's Residential Anti-Displacement Strategy [**Slide 18**]

Interviews with Community Leaders, conducted as part of Task 3.1 and will be submitted as part of reporting requirements following the end of Task 3, complemented the existing conditions analysis and historical research.

Synthesis of Citywide Survey

The project team worked with the Equity Task Force to review and inform the citywide online survey and to promote the survey to communities of interest. The online survey will officially close on May 14th. Preliminary results are included in the Exhibit B.

TASK 2.2 MDS COMPLIANCE ASSESSMENT & MDS ACTION PLAN

MDS Compliance Assessment

Introduction

As one of the founding cities for the Open Mobility Foundation (OMF)[1], the City of San José (the City) is at the forefront of emerging mobility. San José currently leverages MDS[2] for planning and enforcement, including in field data validation, public emergencies, establishing geofence restrictions (both temporary and permanent), and deployment monitoring for micromobility devices.

This brief and current state assessment will provide a snapshot into the existing conditions of San José's MDS use, highlighting key use cases and proofs-of-concept that illustrate the benefits of MDS for meeting the various mobility needs of residents. Also included will be key challenges for the future and opportunities for MDS to be more broadly applied for City transportation and mobility needs.

Current State Assessment Matrix

To determine the existing state of MDS activity at the City of San José, activities are divided into four individual lenses, comprising the Current State Assessment Matrix. By viewing the existing processes through a variety of lenses, San José can identify risks and opportunities for improvement to support the exciting evolution of the operational future of MDS. The four lenses include technology, compliance, process, and organization:

Technology (high-level)	1. BlueSystems operates an external MDS dashboard for the City of San José. This dashboard includes data visualization at the neighborhood, ZIP code, and census tract geography level. The City leverages visualized data to monitor compliance requirements identified in operator permits. 2. Today, the City can see data visualization, but they cannot access or download the data from the BlueSystems dashboard. 3. Operators leverage agency[3] to send notifications to the City of device activity in the public right-of-way (PROW)

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[1] https://www.openmobilityfoundation.org/

[2] https://www.openmobilityfoundation.org/about-mds/

[3] https://github.com/openmobilityfoundation/mobility-data-specification/tree/main#endpoints

	4. San José staff leverage digital policy 4 to enhance mobility access, equity, and travel patterns that best serve the City's residents and visitors.
Compliance	1. San José DOT typically leverages an education-based approach with operators, instead of immediately issuing compliance citations and/or ticketing. If the DOT team discovers errors or nuances in data provided by operators, a warning is provided.
	2. In addition to digital compliance checks on data feeds, the City has sent out staff to conduct in-field validation. This validation focused on e-scooter parking compliance on sidewalks and roads. The initial in-field validation confirmed that between 94% of all micromobility devices were parked correctly on City streets and sidewalks. 5
	3. With this research in mind, San José will include new compliance requirements for permitted operators beginning July 1, 2021 at the start of the new fiscal year and launch of the annual permit program.
	4. Beginning on July 1, 2021, operators will receive compliance violation tickets in two-week groups. The first violation $100, second is $200, and third (and each subsequent violation) are $300. Operators may accumulate fines as a result of these requirements.
Process	1. The City currently obtains limited non-MDS data from operators, including 311 complaints, number of unique riders, incidents, equity measures, and low-income community access, however, the City cannot effectively integrate data from multiple sources given resourcing constraints. These non-

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4 "'Digital policy' is the term used to signify the expression of municipal policies in a digital space. For example, MDS is a digital tool that allows officials to create, communicate and enforce transportation policies digitally."

5 San Jose Presentation to the Transportation Committee and Environmental Committee, Nov. 2019

	MDS data requests are outlined in the *City of San José Shared Micro-Mobility Permit Reporting Guidelines*[6]
	2. There are additional reporting guidelines for Kiwibot, a new robotic delivery vehicle that is piloting in the City, who provide a data dashboard for monthly reports.
	3. Vehicle trip data does help the City identify right-of-way concerns, such as oversaturation of vehicles in a certain area. The City also uses de-identified trips to understand ridership trends and utility of services - all of which inform safety improvements and planning efforts.
	4. Operators provide a monthly report with non-MDS data, including ridership counts, device counts, etc.
Organization	1. Historically, Andrea Arjona Amador has been the point of contact for BlueSystems and the San José micromobility program.
	2. San José DOT is currently seeking applicants for the Micromobility Program Coordinator role.
	3. Escooter permits are currently granted for three operators in the City: Bird, Link, and Lime, and the number of operators is limited at 3 with a maximum of 1,000 vehicles.
	4. On July 1, 2021, a new permit program with new compliance and data measurements will be launched with selected providers.

Challenges

As a result of a rapidly expanding emerging mobility market and a result of the COVID-19 pandemic, the City has encountered a few policy challenges:

1. **Open Standard Awareness** - based on initial community feedback, and prior input from key stakeholders, residents and visitors in the City have minimal knowledge of open standards, including the importance and benefit of leveraging MDS as a common language for mobility planning.

2. **Multiple Data Sources** - internally, the SJDOT teams encounter multiple mobility data sources (from operators and otherwise) that are not processed through a common language on a shared platform.

3. **Dedicated Resources** - similar to other major cities in the United States, the City has a gap in dedicated resources to manage and direct the micromobility permit

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[6] https://www.sanjoseca.gov/home/showpublisheddocument?id=67740

program, resulting in a gap in understanding trends and conducting additional qualitative outreach.

4. **Data Access** - currently, the City does not have a public data portal inclusive of micromobility trip data or trends.

Opportunities

MDS allows cities like San José to generate valuable insights through a shared notification vocabulary and to communicate policy directly to commercially operated transportation companies in real time using code. This is called "digital policy." Today, it enables San José to manage dockless scooters. Future use cases are highlighted below:

Near-Term Opportunities

1. **Delivery Bots -** Currently, the City contracts Kiwibot[7] to provide robotic delivery service in a small geographic area of the City. The city is planning to expand this pilot program with the potential to bring on additional vendors in the near future.

2. **Car Share -** This mode of transportation will provide key travel trends in the city related to parking. The City would like to bring these vendors onto an MDS-based system to enhance shared vehicle parking pattern insights.

3. **Shared Mopeds -** This mode of transportation is similar to scooters, but at a larger geographic scale. This mode is of particular interest for Communities of Concern as it emerges as a realistic transportation alternative and the City would like to link these vehicles to an MDS-based system for data insights and analysis.

4. **Bikeshare -** MTC currently manages ebikes and they are not managed through a permit program with the City. As of today, the City does not receive any ebike location notifications via MDS, but the ebike access program in the Bay Area is one of the most successful in the U.S., opening up a door for real opportunity for the City to better understand how they are used within City limits.

Long-Term Opportunities

5. **Urban Air Mobility: Freight -** UAM expansion would allow the City to solicit and integrate community feedback on land use planning for aerial delivery in City airspace that could most impact them (noise; emissions; time of day usage) while testing equity policies to increase access to service benefits such as essential commodities delivered to community hubs. Through UAM, the City can also leverage existing data technologies that communicate flight information to operators, that can then be linked to an MDS instance. The City could also use digital policy to communicate rules and incentives to operators.

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7 https://www.kiwibot.com/

6. **Taxis -** Taxi expansion to an MDS instance would allow the City to better understand shared vehicle travel patterns in the public right of way within City limits. As taxis are a regular alternative to TNCs and personal, private, vehicles, data insights and transportation patterns would be critical information the City can leverage to execute better short-term and long-term planning on the roadway for access and parking.

In addition to future mode expansions, the City has opportunities to change the following:

1. Qualitative data analysis through rider surveys and continued outreach; for example, qualitative input can help the city better understand safety concerns

2. Equity analysis and pricing strategy to better serve communities of concern

3. An improved data visualization platform that can provide insight into and across multiple modes of transportation through MDS (i.e. scooters, bikes, Kiwibot). Additional data visualization will provide more insight into corrals, parking locations and trends, and additional modes of transportation when onboarded at the City.

4. Partnership incentive opportunities through shared resources like medical centers, schools, and universities.

A summary of the City's current approach to MDS are included in Exhibit A (slides 82-90).

TASK 2.3 BACKGROUND RESEARCH SUMMARY

Assessing the State of Emerging Mobility in San Jose

San Jose offers a variety of shared mobility services, which include a range of multimodal options consisting of emerging mobility services as well as other shared transportation options such as transit. Shared mobility options in San Jose include VTA light rail and bus, Uber and Lyft ride-hail, Zipcar carshare, Bay Wheels bike share, and several scooter share companies. The coexistence of these services allows for them to complement each other and support a variety of trip needs.

Slides 51 to 58 of the Just Movement Slide Deck (Exhibit A) provides an overview of emerging mobility options formerly and currently offered in San Jose with high-level assessments of the City's progress in installing EV charging infrastructure and the expansion of urban delivery, logistics, and e-commerce.

- **Uses cases** for emerging mobility [Slide 51]
- **EV Charging Infrastructure** [Slides 53 and 54]
- Summary of **shared mobility services** and concerning business practices [Slide 55]
- Overview of **Senior and Disabled Mobility** in San Jose [Slide 56]

- Summary of former and existing **Mobility Pilots and Programs** in San Jose [Slide 57]
- Summary of **Urban Delivery, Logistics, and E-Commerce** trends in San Jose [Slide 58]

Trends in Emerging Mobility, Technology, and Business Practices

The following section provides a summary of changes anticipated to occur over the next five to eight years associated with emerging mobility trends, technologies, and business models. Informed by research conducted in Task 2.1, this section calls attention to how these emerging trends might impact the transportation network and individual users. Detailed descriptions of each trend are included in the Just Movement Presentation, which can be found in the Exhibit A.

- **Congested Curb**. Mobility, access, delivery, and place functions will continue to compete for limited space at the curb. [Slide 60]
- **Transit Agencies Becoming Mobility Providers**. Transit agencies are expanding their portfolio to mobility services beyond rail and rubber tire services. [Slide 61]
- **Plan-Book-Pay**. The mobility user experience will be improved through digital and physical integration. [Slide 62]
- **E-Commerce and Hyper-Convenient Delivery**. On-demand goods delivery will become increasingly prevalent and expected by consumers. [Slide 65]
- **Electrification and Mobility**. Mobility of all forms, from micromobility to transit and cars, will be electrified. [Slide 66]
- **On-Demand Mobility in Various Forms**. The mobility ecosystem is rapidly evolving with new modes, new product features, and new ways to get a vehicle. [Slide 67]
- **Automation and Mobility**. Autonomous technology will support a shared mobility system and on-demand goods delivery. [Slide 68]
- **Urban Aerial Mobility**. Urban aerial mobility could be leveraged to transport people and deliver essential goods such as medical supplies and fresh produce. [Slide 69]
- **Contactless Mobility**. People are likely to seek out socially distanced ways to travel in the near- to mid-term. [Slide 70]
- **Impact to Local Jobs**. The nature of work will continue to change as we shift towards an automated, tech-driven workplace. [Slide 71]
- **Impacts on Public Space**. Limited right-of-way is shared with new uses and demands, including shared mobility, EV infrastructure, automated delivery vehicles, and more. [Slide 72]

- **Impacts on Existing Revenue**. Demand for on- and off-street parking and ticketing is declining, creating opportunities to explore different funding sources. [Slide 73]

Impact on Jobs

The project team conducted research and a literature review to understand the impacts of electrification, shared mobility services, and automated passenger and delivery vehicles on jobs. Key findings are summarized below and will inform additional research on emerging mobility impacts to labor, racial equity, and economic justice, which will be conducted as part of the literature review in Task 4.2.

Shared Mobility Impacts

- The development of new mobility systems often goes hand-in-hand with the development of new types of labor and jobs.

- The arrival of micromobility services has led to the expansion of the independent contractor workforce—many companies hire contractors to pick-up, charge, perform maintenance, and deploy devices on a daily basis. In certain markets, companies have also hired full-time staff to oversee and carry out on-the-ground operations. This is the often the case in larger markets where government agencies have regulations in place.

- As of 2015, only 0.5% of people in the U.S. were or had been gig economy workers, a category that includes many workers besides TNC drivers. The emergence of this part-time, gig economy has left many people without access to benefits like employer-provided health insurance and retirement savings plans that are often only extended to full-time employees. While the gig economy workforce accounts for a small fraction of the nation's overall workforce, the expansion of automated transportation could expand the number of gig economy jobs in the form of in-vehicle service providers.

Electrification Impacts

- With millions of passenger EVs sold and investments in the EV sector on the rise, California is looking to increase the availability of EVs and EV charging stations. Transportation electrification is also taking hold across all vehicle types, including fleets, electric buses, and trucks. This expansion of the EV industry has led to the creation of new jobs and different forms of manufacturing jobs.[8]

- Several studies suggest widespread adoption of electric vehicles will create many more jobs than the number of jobs lost by the shift away from the internal

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8 Preparing the Workforce for Automated Vehicles (American Center for Mobility) (2018)

combustion engine. [9] However, those jobs will require skillsets different to those of the existing workforce. Mechanics, for instance, will need to learn how to install and maintain batteries and electric charging infrastructure.

<u>Automated Passenger/Delivery Vehicle Impacts</u>

- There is currently much debate on whether automation will lead to a large-scale 'jobless future' through the displacement of workers or whether a jobless future will be averted by the creation of jobs that currently do not exist. [10]

- It's also likely that as automation expands and intensifies, jobs resulting from these changes will require different skills than those possessed by displaced workers. This may result in a skills gap between different groups of employees.

- The impact of automation will also have varying impacts on different employment sectors. For example, AV delivery vehicles may change the skills required in the trucking industry, however, the role of the driver will shift from vehicle control to monitoring. Automation may be exclusive to highway driving whereas driving in cities may still require a degree of direct human control.

- New jobs might be created by vehicle automation, but these new jobs might be sited in different locales to where the technology is operating.

- One of the largest industries in San Jose is manufacturing (16% of the city's total employment), which will likely face changes as automation and driverless trucking expands. [11]

Indicators of Gentrification

The project team conducted a literature review of scholarly articles to understand indicators of gentrification and factors that create obstacles for existing communities. This research informed a set of proposed strategies for public agencies and its partners to counteract gentrification as well as the spatial analysis performed in Task 2.1. The following section provides a summary of key findings from the literature review.

9 New Technologies, Productivity, and Jobs: The (Heterogenous) Effects of Electrification on US Manufacturing (November 2020)

10 Driverless: Intelligent Cars and the Road Ahead (Lipson, H., Kurman, M.) (2019)

11 The Employment Impact of Autonomous Vehicles (U.S. Department of Commerce) (2018)

Studies of gentrification have consistently observed the following in changing neighborhoods [12] [13] [14]:

- Disproportionate change in increased socioeconomic status

- Commercial and retail character

- Increased market value and higher spending on mortgage and rent

- Decreased vacancy

- Increased owner occupancy

- Increased and sudden reinvestment

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 of these neighborhoods are often poorer, renters, and/or people of color. [15] Neighborhoods at risk of or are experiencing gentrification have historically been subjected to discriminatory housing policies like redlining and racial covenants. These racially-driven policies, whose long-term effects are still experienced today, have come to determine which communities receive targeted public investments and which communities, often those with low-income residents and people of color, are barred access to those benefits.

Sudden investments in these historically disinvested neighborhoods also contribute to neighborhood change. These investments, seen as "helping" or "revitalizing" communities, may fail to consider or involvement current residents living in the neighborhood. Studies have shown that in dense coastal cities, a sudden injection of public dollars in historically disinvested communities can result in shifts in cost of living, increased density, and depending on the type of investment, displacement of current residents.

Strategies to Counteract Gentrification

What can government do?

- Engage other agencies and intergovernmental collaboration (Intersectionality in action)
- Institutionalize meaningful, sustained community engagement to co-create solutions
- Understand the difference between investment and displacement

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[12] Urban Institute. *Leading Indicators of Gentrification in D.C. Neighborhoods*. (2001)

[13] SPARCC, *The Urban Displacement Replication Project*, (October 2020)

[14] Center for Community Innovation. *Investment and Disinvestments as Neighbors: A Study of Baseline Housing Conditions in the Bay Area Peninsula*. (January 2020)

[15] National Neighborhood Indicators Partnership. *Guide to Measuring Neighborhood Change to Understand and Prevent Displacement* (2019)

- Support policies that allow people to stay in their current neighborhoods
- Acknowledge, own, and leverage your power to enact desired outcomes
- Build wealth in the community through every decision

What can partners do?

- Hiring—at all levels not just in street team positions
- Marketing toward Black and immigrant communities
- Equity policy and accountability (including data)
- Partnering with community members and community-based organizations
- Payment options to tackle gaps in access among unbanked or lower income community members.
- Understanding demographics of users
- Transparency of data when working with government

Impact on Existing Revenue

Emerging mobility providers and evolving technologies present known and unknown risks to traditional revenue sources for public agencies and cities, such as parking revenue. Trends such as electrification and TNC usage may impact economics of other public goods, such as farebox recovery for transit systems. Conversely, new sources of data and management of systems present opportunities for increased revenue collection, through mechanisms such as permits or curb management.

- San Jose saw an increase in parking citation revenue in 2019, of 600,000. This may not align with the general trends of parking fine revenue, as Covid-19 shifted the way people move significantly.[16] Revenue increases from former years were often results of increased enforcement, rather than increased demand and use of parking.[17]

- Revenue impacts from parking (not citations) were not examined, as Covid and related policies (such as proposed and implemented parking fee waivers) affected calculations. These impacts will be analyzed through the project with input from the City and community

- Overall, trends indicate reduction in parking revenue and revenue from enforcement for cities due to shifts in travel behavior and emerging mobility options

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[16] https://www.sanjoseca.gov/home/showdocument?id=44756

[17] https://www.sanjoseca.gov/home/showpublisheddocument?id=4832

- Simultaneously, opportunities for new revenue generation, or increased revenue from traditional sources, exist, including:

  o Automated enforcement of short term curb management and usage (fees for loading, violations, etc.), increasing enforcement efficiency by up to 500%[18]

  o Permit fees for new forms of mobility, such as micromobility

  o Fees and taxes for sales of mobility services, such as the City of Chicago TNC fee

  o Congestion pricing and tolling fees

  o Opportunities to price data, such as collecting taxes or fees for usage of data by private providers

- Further analysis of potential impacts and opportunities specific to the City of San Jose will need to consider the services sought, prioritized needs and areas, and the structure of programs and projects created (such as subsidies, cost of services, permits and fees, etc.).

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[18] https://www.automotus.co/

EXHIBIT A

JUST MOVEMENT
LEARNING FROM OUR PAST TO MOVE ALL SAN JOSEANS FORWARD

CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY

Background Research for the
San José Emerging Mobility Action Plan

January 2021

WELCOME TO
SAN JOSÉ

San José Emerging Mobility Action Plan

Just Movement: Learning from Our Past to Move All San Joseans Forward

CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY

LOOKING BACK TO MOVE FORWARD

San José is developing a plan to prepare for the changing mobility landscape. We will prioritize Black, indigenous, and people of color to reflect their unique lived experience in San José. To do this, we are building a framework that elevates community voices and centers racial and social equity in Emerging Mobility policy and programs.

Planning for a future of equitable mobilities requires the City and community to reflect on the past. *Just Mobility* tells a story about how San José's communities have and continue to experience impacts of mobility infrastructure and policy decisions. Where are we in the story?

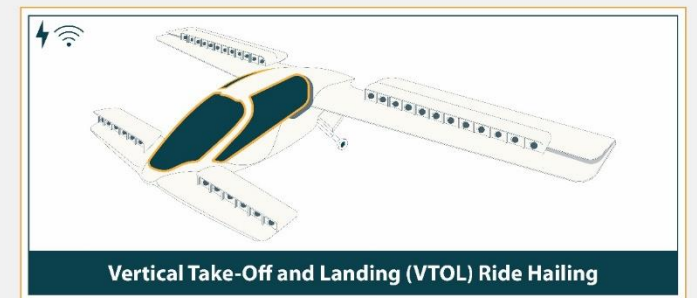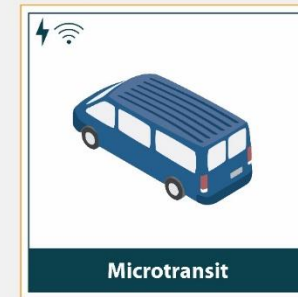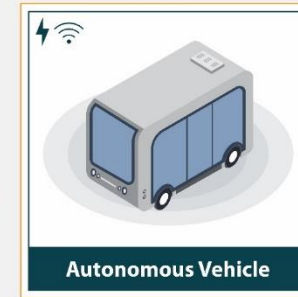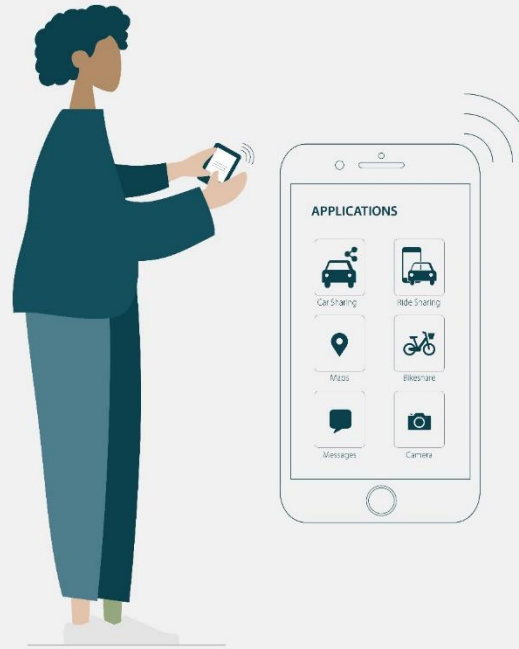| 01 Welcome to San José	02 The History of Infrastructure and Mobility	03 The Hope and Harm of Emerging Mobility	04 Data, Community, and the City

WHAT IS EMERGING MOBILITY?

People want to move freely in ways that meet their needs, their means, and their abilities. **Emerging Mobility can connect people to places, goods, and information** using new services, products, and technologies. Focused on solving problems and fixing gaps, Emerging Mobility responds to the way that people want to move.

Emerging Mobility is shared, electric, connected, and can be autonomous.

EMERGING MOBILITY LANDSCAPE TODAY

Micromobility

Ride Hailing

Autonomous Vehicle

Car Sharing

Microtransit

Urban Freight

Vertical Take-Off and Landing (VTOL) Ride Hailing

STAYING AHEAD OF MOBILITY TECHNOLOGY

We are building an equity-centered Action Plan to understand, adapt to, manage, and partner with emerging mobility models. Our challenge is to center your experiences, needs, and priorities as we prepare for unknown shifts in transportation technology and business models.

Mobility technologies are new services, devices, tools, or information systems that support the free movement of people and goods. Maybe it's a new way to connect you to VTA. Or it might be a new method developed by the community to better connect people to real-time transportation information.

Mobility technologies are rapidly changing, and the San José Department of Transportation has the responsibility to guide and manage these services to ensure they are serving the public interest and addressing mobility challenges across the city's communities.

BUILDING A ROADMAP WITH COMMUNITY

› **Understand historic trends** in mobility investment to identify areas that have been institutionally underserved and learn from community members about how this shaped their experiences

› **Evaluate current distribution** of Emerging Mobility options and data available to track the city's performance metrics at the intersection of mobility and equity

› **Connect historic trends** in community investment, Emerging Mobility access to date, and potential risk factors that can exacerbate gentrification and displacement of communities through the introduction of Emerging Mobility options

› **Work with the community** to identify if, where, and how emerging mobility might serve their needs

WE HAVE BIG PLANS

We start the planning for Emerging Mobility with the outcomes we want to achieve. The outcomes are encoded in several foundational plans. **Envision San José 2040** is San José's General Plan. Adopted in 2011, it sets forth a vision and comprehensive roadmap that guides the future character and quality of development in San José through 2040. The plan establishes policies on topics that impact the city as a whole including, economic development, environmental stewardship, land use, and transportation.

Envision San José 2040
General Plan and Community Values

Create a San José that is vibrant, inclusive, safe and equitable

Climate Smart San José
Pillars and Strategies

Access & Mobility Plan
Goals and Outcomes

WE HAVE BIG PLANS

Climate Smart San José outlines how San José is doing its part to address climate change. It's a communitywide initiative for reducing air pollution, saving water, and improving quality of life. As one of the first detailed city-led plans for reaching targets of the international Paris Agreement, it sets ambitious goals for renewable energy, water, transportation, and local jobs.

Envision San José 2040
General Plan and Community Values

Climate Smart San José
Pillars and Strategies

A Sustainable & Climate Smart City

A Vibrant City of Connected & Focused Growth

Access & Mobility Plan
Goals and Outcomes

An Economically Inclusive City of Opportunity

WE HAVE BIG PLANS

The **San José Access and Mobility Plan** outlines strategies to bring to life transportation goals set out in Envision 2040 San José General Plan and Climate Smart San José. It develops and identifies projects, policies, and programs to advance tangible goals like increased walking, biking, and transit use, less driving, and reimaging streets designed for people, not cars.

Envision San José 2040
General Plan and Community Values

Climate Smart San José
Pillars and Strategies

Access & Mobility Plan
Goals and Outcomes

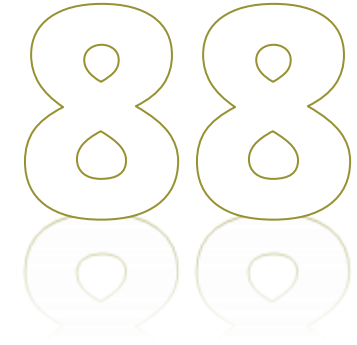|	
Less Driving	Access for All
Transportation Happiness	Transportation Safety
Clean the Air	20-Minute Neighborhoods
Connected Neighborhoods	Moving the Economy
Plan for the Future	

WE HAVE CLEAR DIRECTION

Today, 24% all trips in San José were taken by bike, foot, or transit. If we make the right moves, we will see more people walking, biking, and taking transit by 2050.

24

Percent of trips
taken by bike,
walk, and transit
today

60

Percent of trips
taken by bike,
walk, and transit
by 2040

88

Percent of trips
taken by bike,
walk, and transit
by 2050

WE ARE SETTING NEW PRECEDENTS

In recent years, San José has made progress in planning more thoughtfully by engaging community members to ensure their needs and desires are reflected in adopted plans and policy. These recent mobility planning efforts have illuminated key values, principles, and common challenges in San José.

Common values and principles for mobility planning include:

• Expand transportation affordability, options, and the use of sustainable alternatives in historically underserved communities.

• Facilitate travel between neighborhoods, to jobs, and to community destinations by walking, biking, transit, and other shared options.

• Make improvements to the bicycle, pedestrian, and transit networks and center improvements around the most vulnerable populations first.

• Leverage partnerships with non-profit, public, and private entities to test new products, programs, and services and to advance the City's goals.

Common challenges for mobility planning include:

• Increasing access to services and meeting the needs of the community without exacerbating displacement.

• Residents may be interested in new services but may not be aware of how to access them or what funding/payment plans are available.

• Transit service is limited, unreliable, and does not serve neighborhoods and destinations where community members want to go.

• Traffic conditions (e.g., high vehicle speeds, limited compliance) create unsafe and unwelcoming environments for walking and biking.

The Emerging Mobility Action Plan will build on past efforts to collaborate with the community from start to finish.
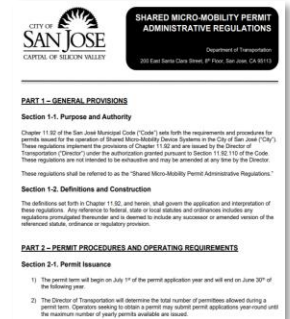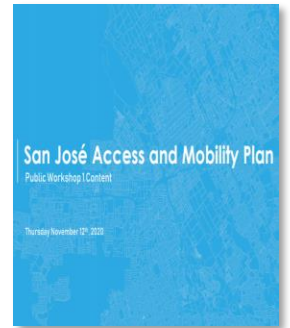
OUR VISION FOR MOBILITY

Mobility is a human right.

The City of San José seeks to ensure all people have safe, affordable, reliable, and sustainable transportation options to access the opportunities and resources necessary to thrive. People should move freely, and communities should achieve their full potential.

HOW WILL WE ACHIEVE THE VISION?

› **Center Racial Equity** to guide an understanding of community needs and develop solutions in partnership with communities

› **Steward Our Streets** by effectively managing right-of-way to support a safe environment for all mobility options

› **Make Public Mobility Accessible** to community members by modernizing mobility options

› **Advance our Climate Goals** by expanding opportunities for more people to access sustainable, safe, affordable, and reliable shared auto and non-auto alternatives

› **Build Partnerships** to ensure we advance racial equity and develop new services and service models that solve existing and future challenges

HISTORY AND STORIES FIRST
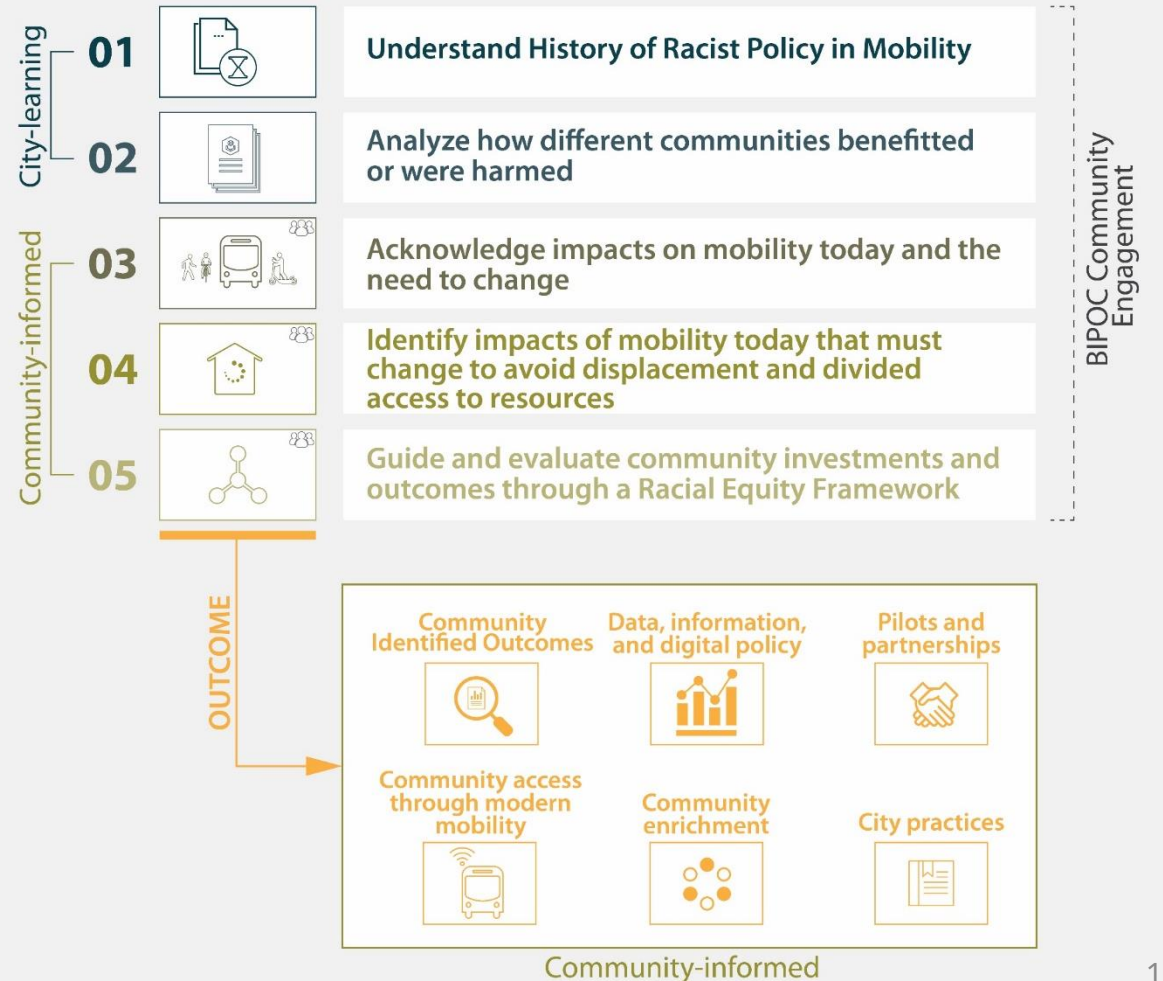
Historical Research and Learning Process

This project seeks to develop a BIPOC community-informed policy and investment framework that will facilitate a shift towards equitable access to mobility options. This framework will focus on potential strategies that can be achieved through Emerging Mobility and transportation technology.

This framework will serve as a template for future mobility efforts to foster collaborative, community-based, and equitable processes.

HISTORICAL RESEARCH AND LEARNING PROCESS
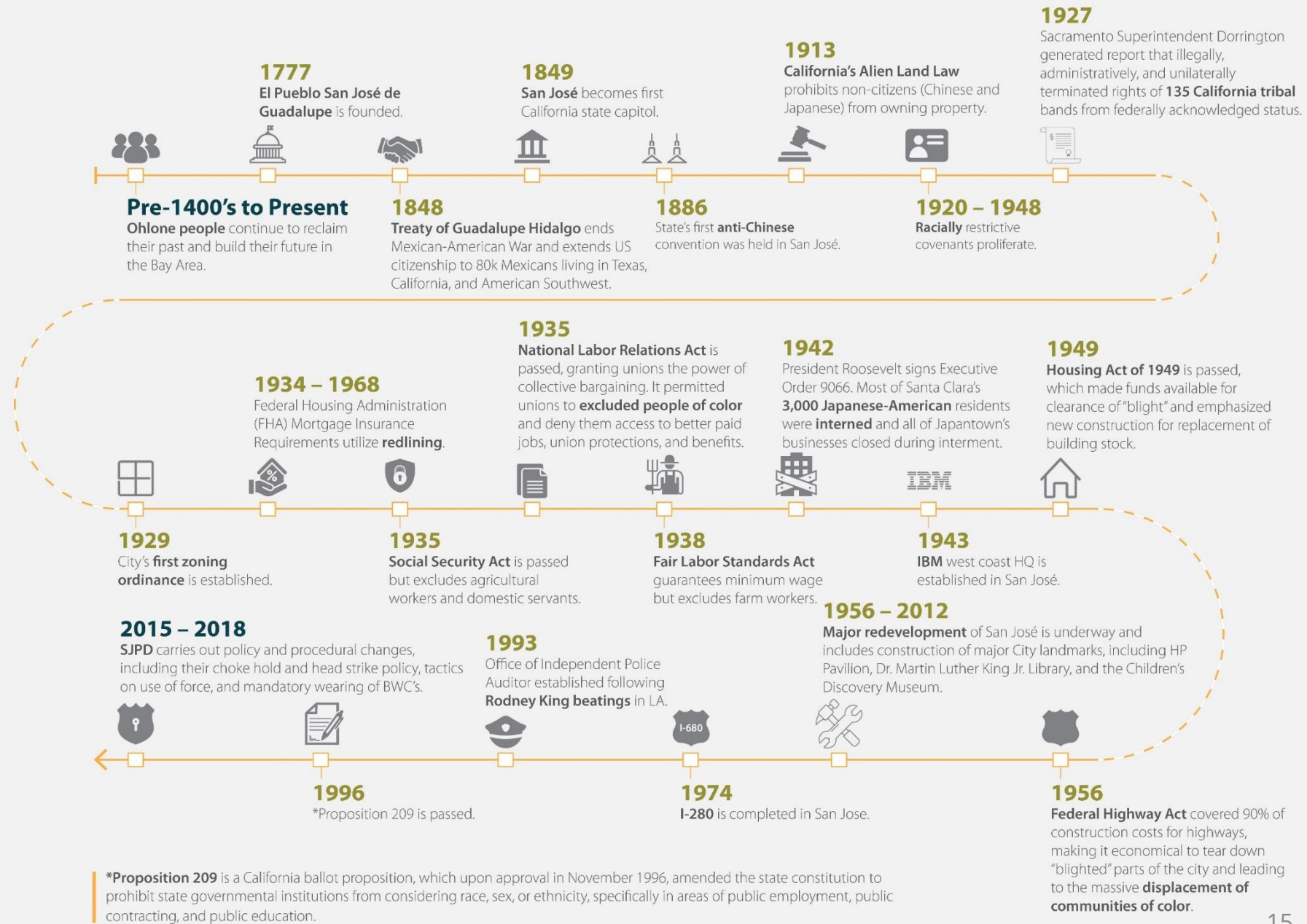
MOBILITY VISION

The City of San José seeks to ensure all people have safe, affordable, reliable, and sustainable transportation options to access the opportunities and resources necessary to thrive. People can move freely, and communities can achieve their full potential.

City-learning

01 Understand History of Racist Policy in Mobility

02 Analyze how different communities benefitted or were harmed

Community-informed

03 Acknowledge impacts on mobility today and the need to change

04 Identify impacts of mobility today that must change to avoid displacement and divided access to resources

05 Guide and evaluate community investments and outcomes through a Racial Equity Framework

BIPOC Community Engagement

OUTCOME

Community Identified Outcomes

Data, information, and digital policy

Pilots and partnerships

Community access through modern mobility

Community enrichment

City practices

Community-informed

HISTORIC DRIVERS OF INEQUITY

Occupation, destabilization, and reconciliation

Past and current policy decisions at the federal, state, and local levels have impacted communities differently. The inequities identified in San José today are tied to the history of the policies that facilitated it.

1777
El Pueblo San José de **Guadalupe** is founded.

1849
San José becomes first California state capitol.

1913
California's Alien Land Law prohibits non-citizens (Chinese and Japanese) from owning property.

1927
Sacramento Superintendent Dorrington generated report that illegally, administratively, and unilaterally terminated rights of **135 California tribal bands** from federally acknowledged status.

Pre-1400's to Present
Ohlone people continue to reclaim their past and build their future in the Bay Area.

1848
Treaty of Guadalupe Hidalgo ends Mexican-American War and extends US citizenship to 80k Mexicans living in Texas, California, and American Southwest.

1886
State's first **anti-Chinese** convention was held in San José.

1920 – 1948
Racially restrictive covenants proliferate.

1934 – 1968
Federal Housing Administration (FHA) Mortgage Insurance Requirements utilize **redlining**.

1935
National Labor Relations Act is passed, granting unions the power of collective bargaining. It permitted unions to **excluded people of color** and deny them access to better paid jobs, union protections, and benefits.

1942
President Roosevelt signs Executive Order 9066. Most of Santa Clara's **3,000 Japanese-American** residents were **interned** and all of Japantown's businesses closed during interment.

1949
Housing Act of 1949 is passed, which made funds available for clearance of "blight" and emphasized new construction for replacement of building stock.

1929
City's **first zoning ordinance** is established.

1935
Social Security Act is passed but excludes agricultural workers and domestic servants.

1938
Fair Labor Standards Act guarantees minimum wage but excludes farm workers.

1943
IBM west coast HQ is established in San José.

1956 – 2012
Major redevelopment of San José is underway and includes construction of major City landmarks, including HP Pavilion, Dr. Martin Luther King Jr. Library, and the Children's Discovery Museum.

2015 – 2018
SJPD carries out policy and procedural changes, including their choke hold and head strike policy, tactics on use of force, and mandatory wearing of BWC's.

1993
Office of Independent Police Auditor established following **Rodney King beatings** in LA.

1996
*Proposition 209 is passed.

1974
I-280 is completed in San Jose.

1956
Federal Highway Act covered 90% of construction costs for highways, making it economical to tear down "blighted" parts of the city and leading to the massive **displacement of communities of color**.

Proposition 209 is a California ballot proposition, which upon approval in November 1996, amended the state constitution to prohibit state governmental institutions from considering race, sex, or ethnicity, specifically in areas of public employment, public contracting, and public education.

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PAST POLICY, LONG-LASTING IMPACTS

Federal, state, and local policy decisions have had long-lasting impacts that are still felt today. The practice of redlining, driven by racial discrimination in mortgage lending in the 1930s, shaped the demographic and wealth patterns of our communities and informed where transportation investments were made and who benefited from them. New development in the latter half of the 20th century was overwhelmingly pushed outward and organized around new roads as a result of the National Highway Act. These new roads expanded mobility for suburban homeowners while destroying and displacing urban communities, primarily communities of color. The construction of highways gutted many cities, with whole neighborhoods torn down and isolated by huge interchanges. Neighborhoods marked "hazardous" (red) or "definitely declining" (yellow) on Home Owners' Loan Corporation (HOLC) maps are concentrated in and around Downtown and East San José, and are bisected by US 101, I-280, I-680 and its interchanges.

Today, neighborhoods marked red or yellow are still more likely than other areas to be comprised of lower-income and BIPOC residents.* These same neighborhoods face greater risks of displacement with the rise of median home values, resulting in greater changes in economic activity and the transformation of their downtowns. In San José, more than 80% of gentrifying areas were previously rated as "hazardous" or "definitely declining" by the HOLC.** These communities are being pressured to make hard choices: secure lower cost housing but higher transportation costs elsewhere or stay and grapple with higher cost housing and lower transportation costs near the urban core.

*National Community Reinvestment Coalition. *HOLC "Redlining" Maps: The Persistent Structure of Segregation and Economic Inequality.* March 2018
**Urban Displacement Project. *The Legacy of Redlining.* Accessed via: https://www.urbandisplacement.org/redlining
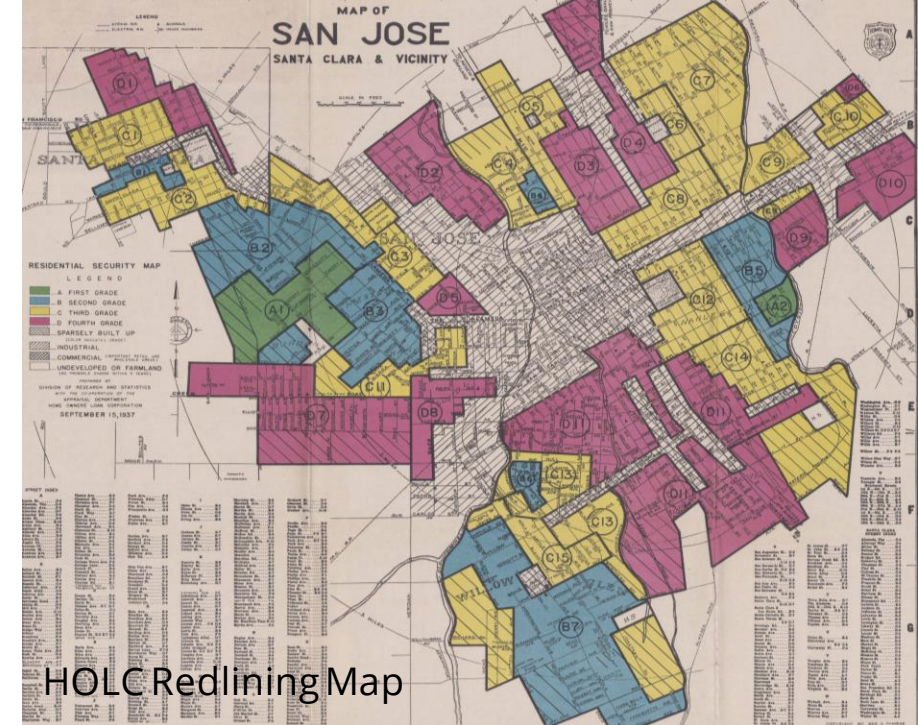
HOLC Redlining Map
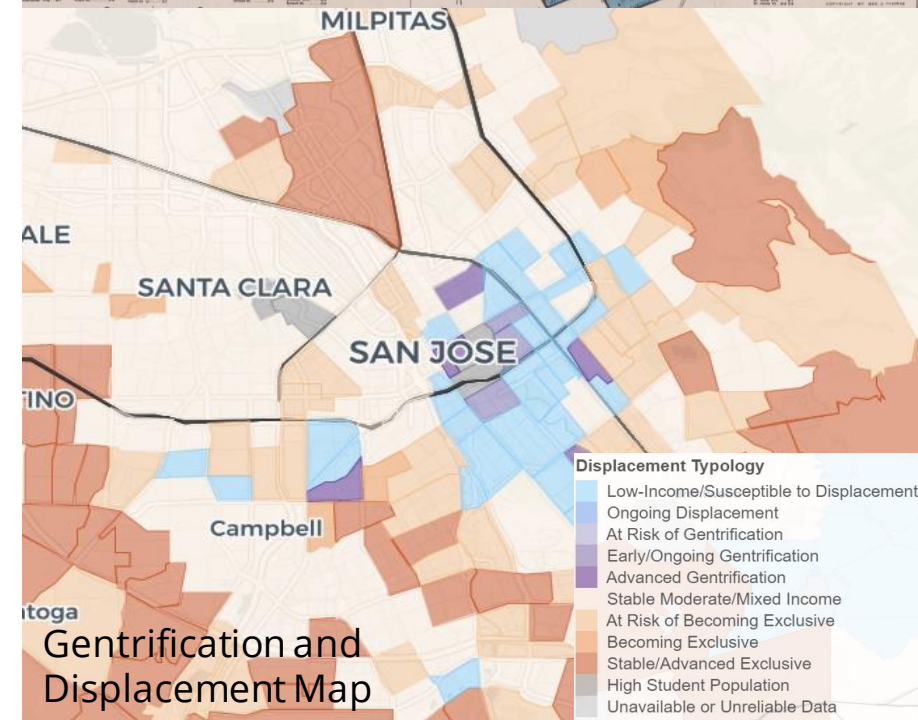
Gentrification and Displacement Map

SILICON VALLEY AND THE LABOR FORCE

Labor relations constructed along racial and social lines, although changing, underpin the development of San José and its economy. Historical narratives of San José often focus on the city's rapid shift from an agricultural to a high-tech economy in the 1950s and 1960s while overlooking the Black and Latinx experience (both past and present) during recent decades of transformation. After World War II, several pioneering tech companies including IBM opened offices in and flocked to San José and nearby cities due to the proximity to Stanford, UC Berkeley, and UC Santa Cruz. What followed was a shift in investment away from seasonable cannery labor towards year-round industrial employment that privileged white and oppressed BIPOC and immigrant workers.

Today, Silicon Valley's success and growth remains dependent on low-wage workers who are barred access to worker protections, benefits, and fair wages. This "shadow workforce," largely comprised of BIPOC and immigrant workers, now outnumber full-time staff at places like Google and Amazon. More broadly, today's tech industry remains out of reach for Black and Latinx communities in the area, even though a sizeable portion of computer science majors at nearby universities are students of color. In addition, the gradual decline of STEM degrees among Black students, which had been increasing in the 20th century, is likely tied to the decline in affirmative action programs, a national movement that began in California[1].

Just mobility must accrue both mobility benefits and pathways to workforce development and economic freedom. While BIPOC and immigrant communities have previously been excluded from these pathways, there are opportunities with emerging mobility to reverse these trends.

[0] Raconteur. *Is Silicon Valley using culture fit to disguise discrimination?* March 2019. Accessed via: https://www.raconteur.net/hr/diversity-inclusion/silicon-valley-discrimination/

[1] Ashely Smart. *After Years of Gains, Black STEM Representation is Falling. Why?* September 2020. Accessed via: https://undark.org/2020/09/11/after-years-of-gains-black-stem-representation-is-falling-why/

[2] Reveal News. *Here's the clearest picture of Silicon Valley's diversity yet: It's bad. But some companies are doing less bad.* 2019. Accessed via: https://revealnews.org/article/heres-the-clearest-picture-of-silicon-valleys-diversity-yet/

Men's Job Titles by Race [2]

	Professionals	Managers	Executives
White	38.7%	46.5%	58.7%
Asian	25.9%	17.9%	16.3%
Latino	3.4%	3.6%	2.1%
Black	1.8%	1.5%	1.0%

Women's Job Title by Race

|	Professionals	Managers	Executives
White	13.8%	18.2%	14.6%
Asian	11.6%	7.8%	4.5%
Latino	1.6%	1.6%	0.8%
Black	1.1%	0.9%	0.4%
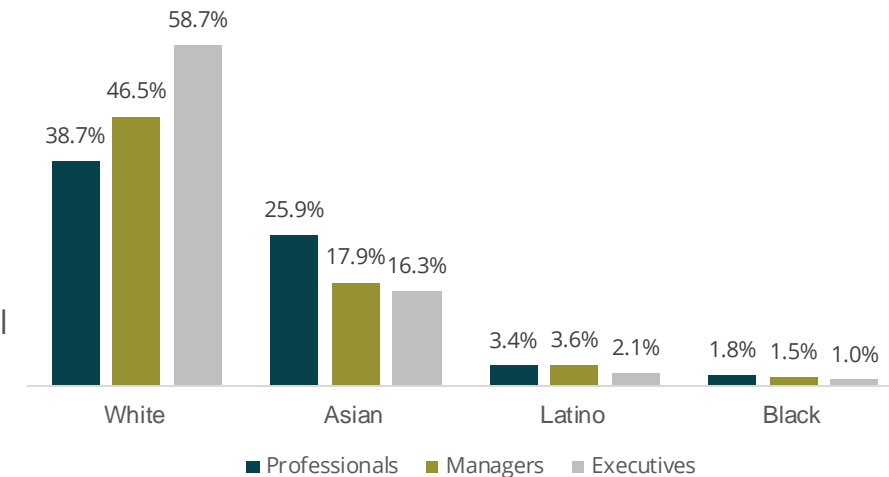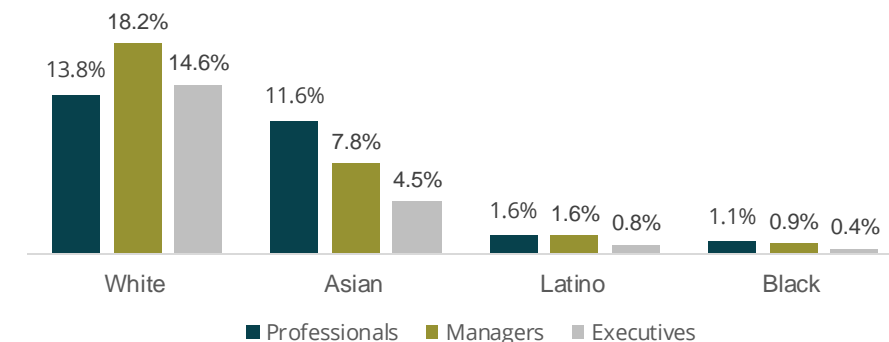
WORKING TOWARDS EQUITY

Residential Anti-Displacement Strategy

While our work has just begun, San José has already taken tangible steps towards challenging historic inequities. In 2018, City Council called for the development of strategies to combat gentrification and displacement, which prompted the development of the *Ending Displacement in San Jose: Community Strategy Report (2020)* and the Citywide Residential Anti-Displacement Strategy. The strategy includes recommendations for preventing, mitigating, and decreasing displacement in San José. Strategies currently in progress include:

- Conducting a public land survey and partner with the state

- Establishing anti-displacement and displaced tenant preferences for affordable housing

- Conducting a feasibility study of innovative housing solutions

- Increasing and expand homelessness prevention

- Implementing no net loss of naturally affordable housing per SB 330

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KEY QUESTIONS
THE EMERGING MOBILITY ACTION PLAN WILL ADDRESS
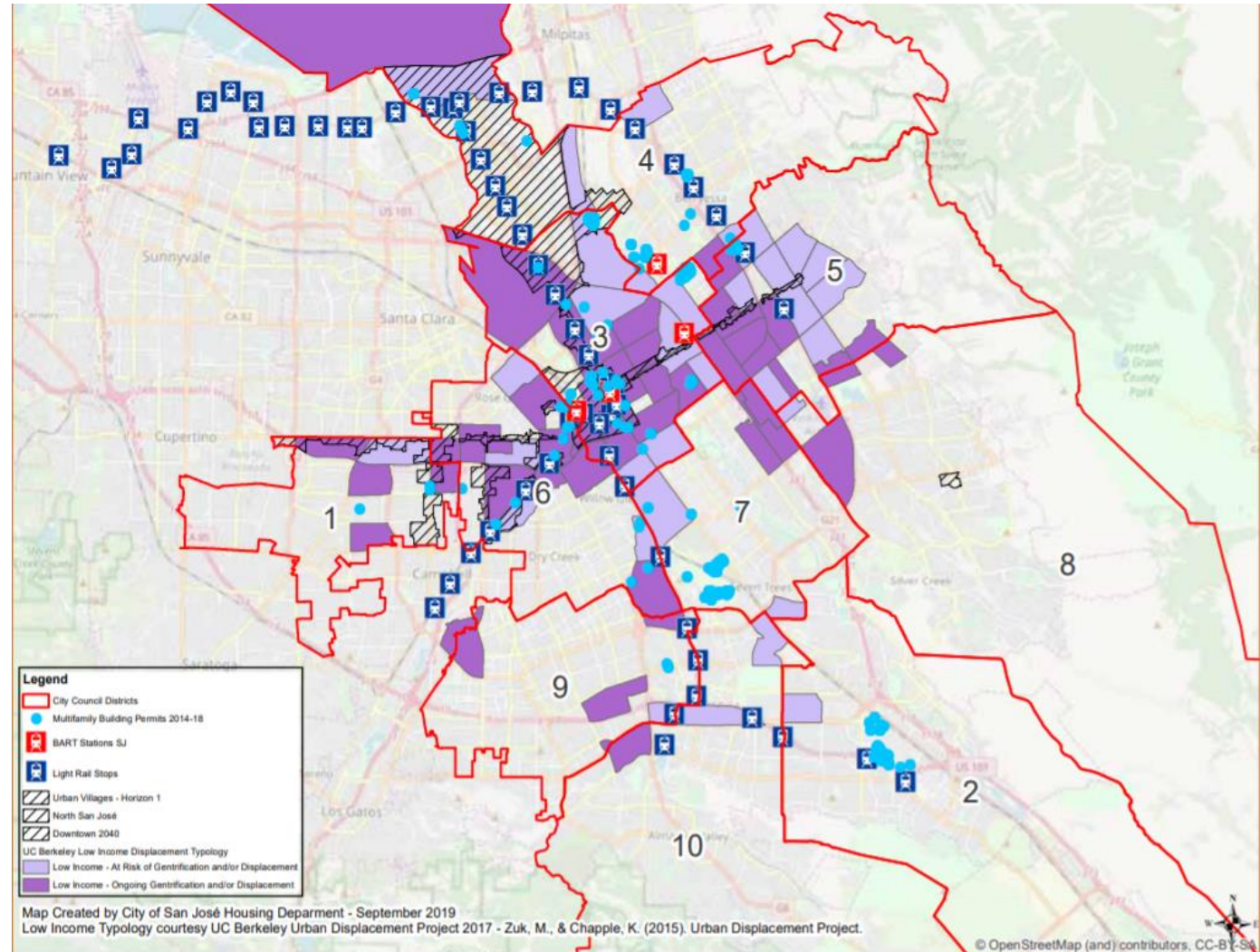
QUESTIONS WE ARE ASKING

1. **Outcomes:** Is Emerging Mobility and mobility future work aligning with our goals and outcomes? Do our goals address the needs of BIPOC communities?

2. **Past Planning:** What was the past paradigm in policy and planning in San José? How has that impacted BIPOC communities?

3. **Mobility Needs:** What are the major needs of BIPOC communities today, and how can mobility serve them?

4. **(Dis)Service:** How are disadvantaged communities served (and not served) by transportation infrastructure and mobility options today?

QUESTIONS WE ARE ASKING

5. **Mobilities Emerging Today:** How have Emerging Mobility models operated and been accommodated in San José?

6. **Emerging Trends:** What emerging trends could impact and benefit BIPOC communities and how the City stewards its streets?

7. **Data and the City:** Considering data will guide how the future of Emerging Mobility and services in disadvantaged communities are managed, what is the current state of practice in San José and other cities—including quantitative and qualitative data?

8. **Eyes and Ears:** What has previous community engagement work told us already about existing conditions and needs in disadvantaged communities? How would the community like the City to interact with them to generate insights, ideas, and narratives in the long term?

JUST MOVEMENT
LEARNING FROM OUR PAST TO MOVE ALL SAN JOSEANS FORWARD

Background Research for the
San José Emerging Mobility Action Plan

CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY

January 2021

THE STORY OF
INFRASTRUCTURE AND MOBILITY

San José Emerging Mobility Action Plan

Just Movement: Learning from Our Past to Move All San Joseans Forward

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01	02	03	04
Welcome to San José	The History of Infrastructure and Mobility	The Hope and Harm of Emerging Mobility	Data, Community, and the City

THIS IS A STORY OF
TWO SAN JOSÉS

A STORY OF TWO SAN JOSÉS

How do different residents experience San José?

A STORY OF TWO SAN JOSÉS

How do different residents experience San José?

There are discrepancies in access to mobility options and resources. Some San Joseans are well-connected, hyper-mobile, choice-laden, and have access to resources while others are disconnected, impoverished, disinvested, and marginalized. BIPOC communities are concentrated in different neighborhoods. Understanding where different populations live, and the level of investment found in those communities provides an understanding of the resources, benefits, or hazards people in different parts of San José are exposed to.

Overwhelmingly, BIPOC communities have less access and resources available, hence the focus on improving access for BIPOC residents to eliminate inequities moving forward.

MOBILITY OVER MODE

Past Policy Decisions and Mobility Access Today

This analysis focuses on learning about the options people have for traveling. Though the analysis is separated by mode of transportation, each was analyzed to understand how they contribute to people's mobility. Key questions include:

- What is the existing mobility infrastructure?
- What are the gaps in service or barriers to access, and how do they vary between communities of San José?
- What mobility needs are unmet and how can they emerging mobility help meet them?

DEMOGRAPHIC SPATIAL ANALYSIS

The existing conditions/equity analysis explores a range of impacts and assesses if the populations of concern are likely to experience a disparate impact because of proximity to transportation infrastructure. We start by looking at geographic patterns and distributions of six population groups:

- Black
- Latinx
- Asian
- Limited English Proficiency
- Limited Educational Attainment
- Households in Poverty

Then we explored potential negative impacts and externalities and access to the transportation system for these groups. We evaluated each population individually because impacts may differ for different populations. By mapping population densities and mobility infrastructure, we begin to identify where access is limited, and who experiences disparate impacts.

For each potential impact, we defined a buffer to determine the area impacted. We then calculated the population within the buffer based on the proportion of the area of the block group within the buffer. We estimated that proportion of the block group's population resides in the buffer. To determine if these population groups experience disparate impacts (i.e., were over or underrepresented in the buffer areas), we compared the percentage of the population group impacted to the percent of the total population impacted.

LEGEND

DEMOGRAPHIC DENSITY
1 DOT = 100 PERSONS

- Asian
- Black
- Hispanic
- Poverty
- Less than HS Education
- Limited English

TRANSPORTATION FEATURES

Streets
Freeways

JURISDICTIONAL BOUNDARIES

City Limits
Neighboring Cities

OTHER FEATURES

Parks
Water Bodies

DEMOGRAPHIC SPATIAL ANALYSIS

Race and ethnicity and educational attainment are individual demographic characteristics that may impact the way a person experiences the transportation system. This series of maps shows the geographic distribution for these demographics across the City, pointing to areas where a greater proportion of a population lives.

The maps show the percentage of each population that lives in each block group. Areas that have darker shading are areas where a greater portion of the population lives. These maps were created using Census/ACS data at the block group level. The number of people within a demographic segment in each block group was divided by the total number of people in that demographic group in San José to calculate the percentage for each population.

The presence of multiple demographic groups helps identify communities that may face multiple layers of oppression.

LIMITED EDUCATIONAL ATTAINMENT
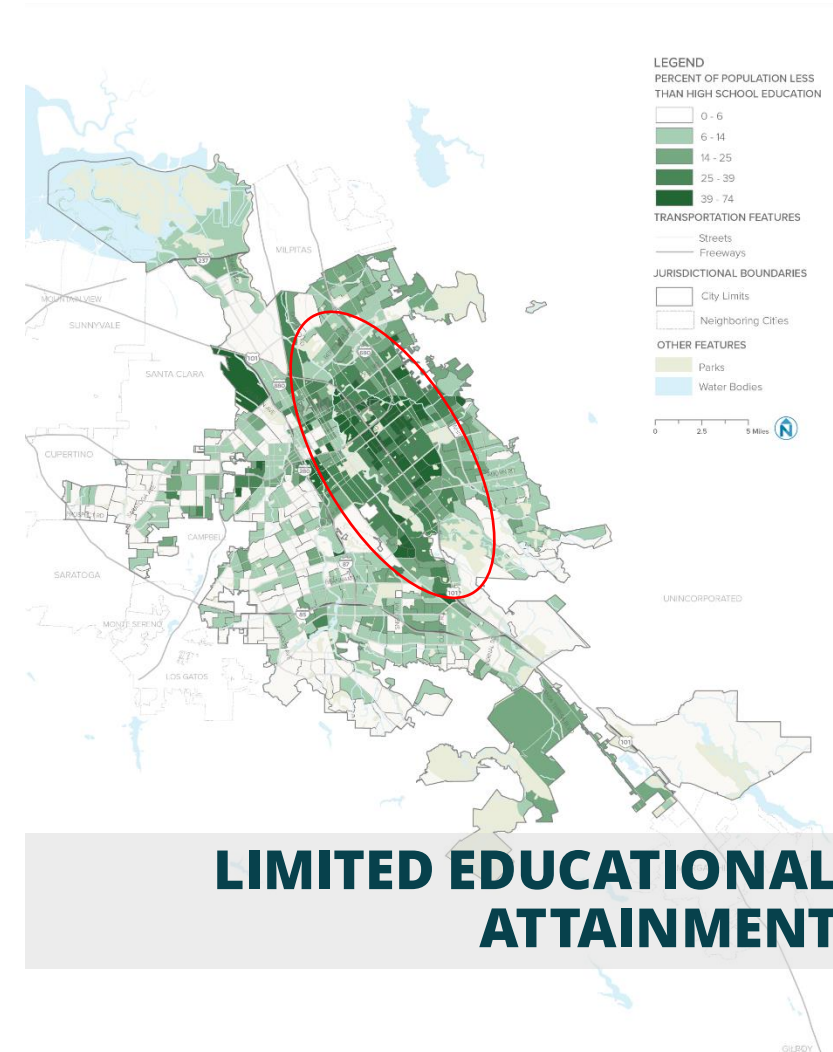
DEMOGRAPHIC SPATIAL ANALYSIS

Communities mapped are primarily concentrated in Berryessa, East San José, and West San José.

BLACK POPULATION

LATINX POPULATION

ASIAN POPULATION
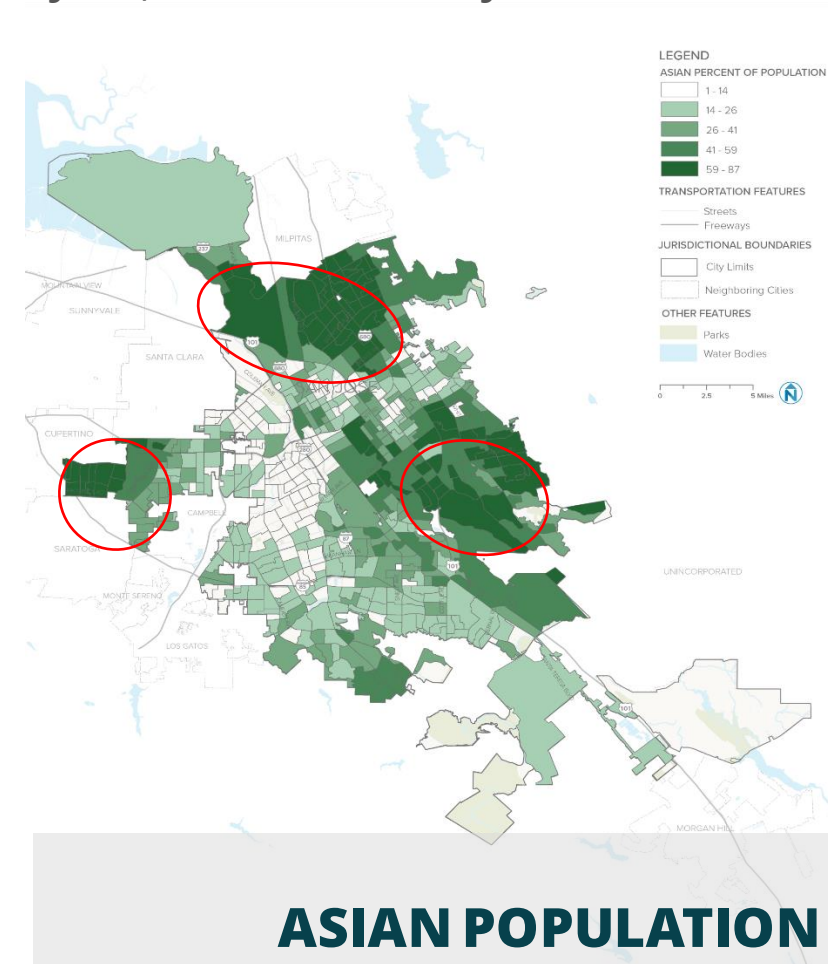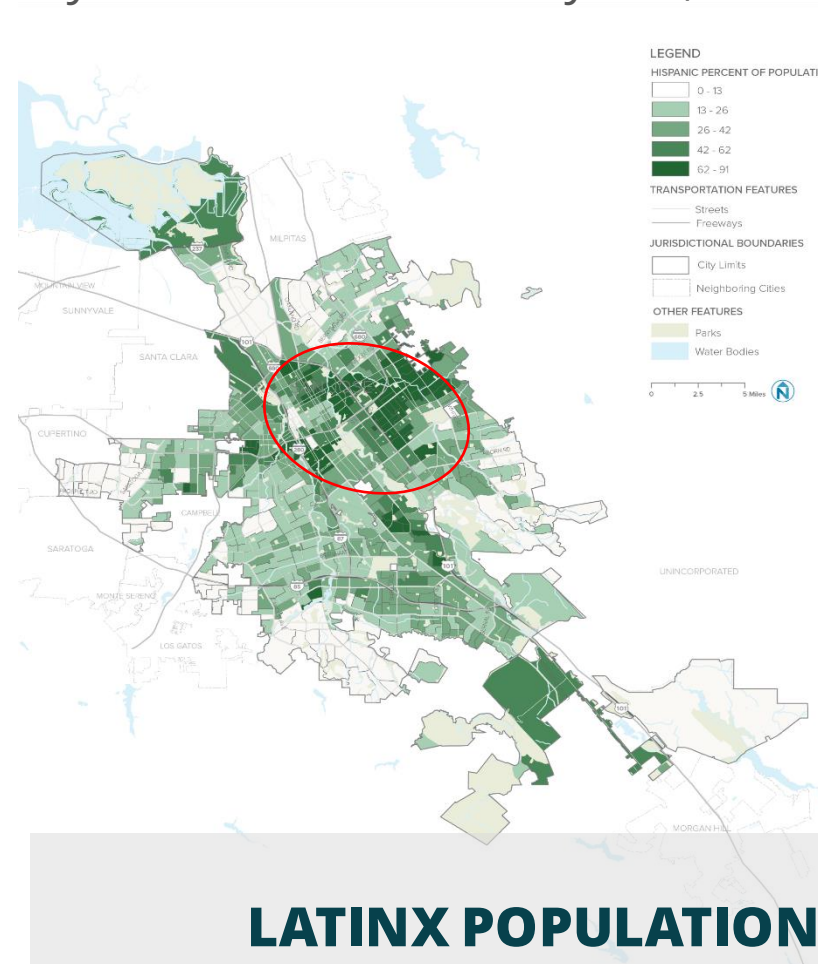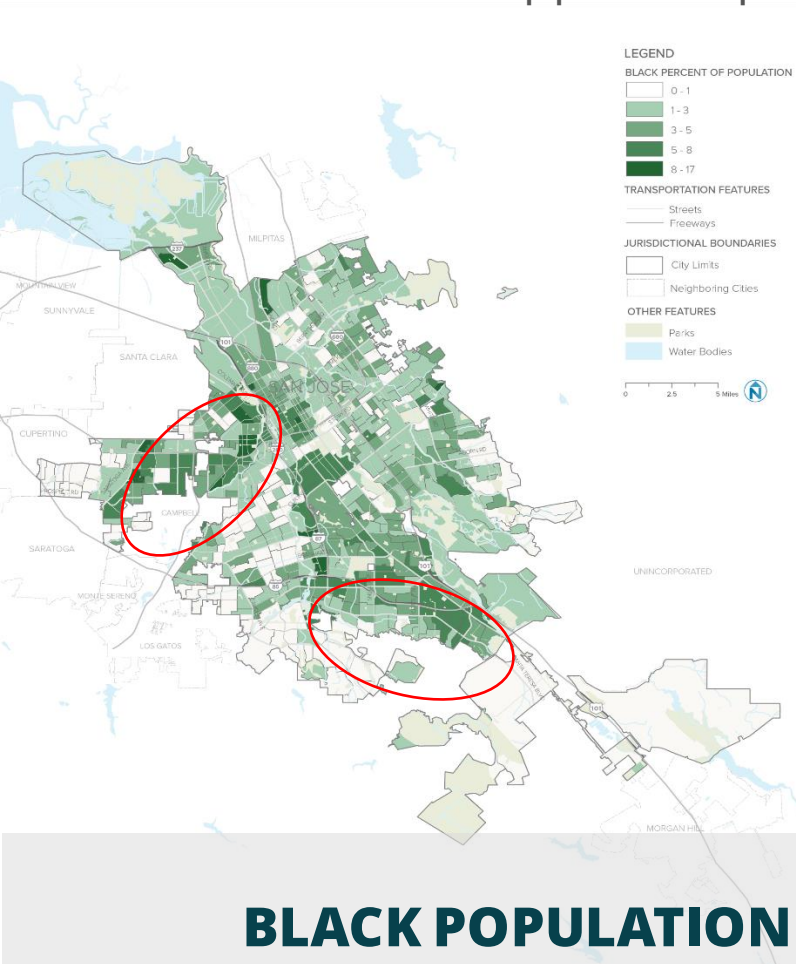
The percentages in each map have different ranges, due to the consideration of each demographic group independently. The ranges are based on quintiles for that demographic group, and not for the whole population. These maps demonstrate geographic distribution of each population and should not be used as a comparison across groups.

DEMOGRAPHIC SPATIAL ANALYSIS

The presence of multiple factors helps identify communities that have less access to resources.

LIMITED ENGLISH PROFICIENCY

HOUSEHOLDS IN POVERTY
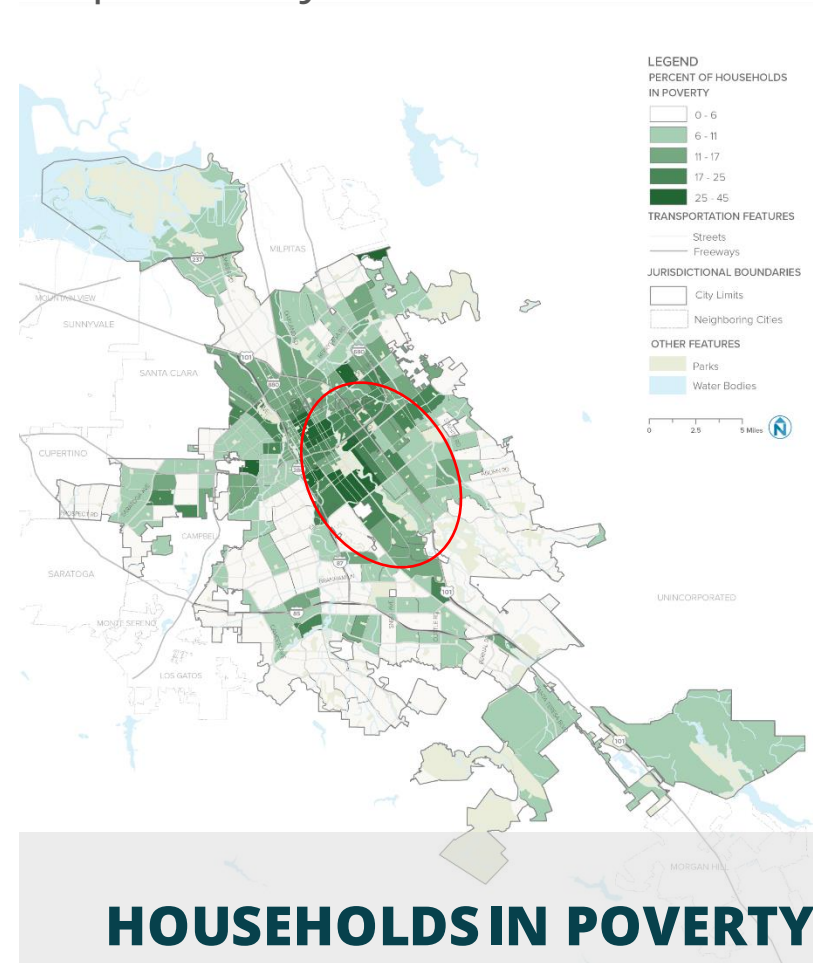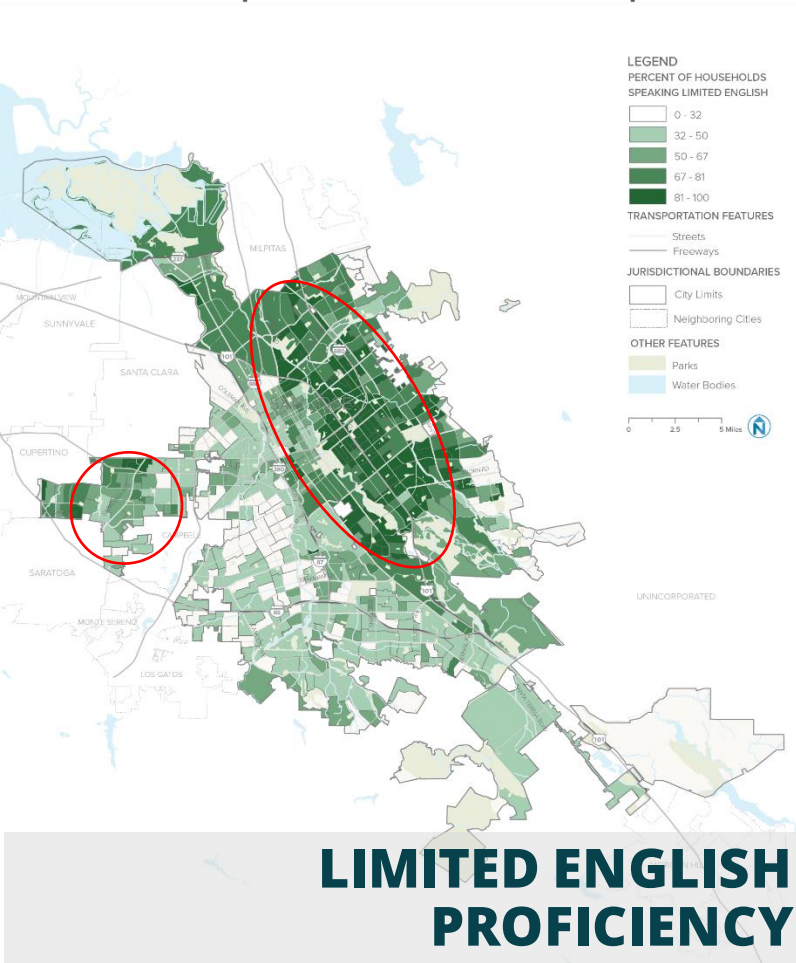
There are the highest numbers of Limited English Proficiency households in Berryesa and East San José. Households with incomes below the poverty level are more prevalent in and around Downtown and the Japantown communities of San José.

COLLISION MAPPING

Physical safety impacts can differ between different demographic groups, however, crash data lacks demographic information (aside from gender). Still, mapping collisions helps understand where they have happened most frequently. This can identify locations and contributing factors and inform where investments should be made to create safer streets.

Documented crashes may not tell the whole story, especially for people walking and bicycling, since near-misses are not captured. Pedestrian and bicycle crashes are critically important because they tend to be more severe and are generally undercounted.

Conversations with the community will help affirm crash data and expand our understanding of where street safety is a concern.

There are multiple hotspots in East San José, revealing a concentration of high-crash streets. All the populations of concern are overrepresented in areas adjacent to VZ corridors, high-speed arterials, and high crash areas.
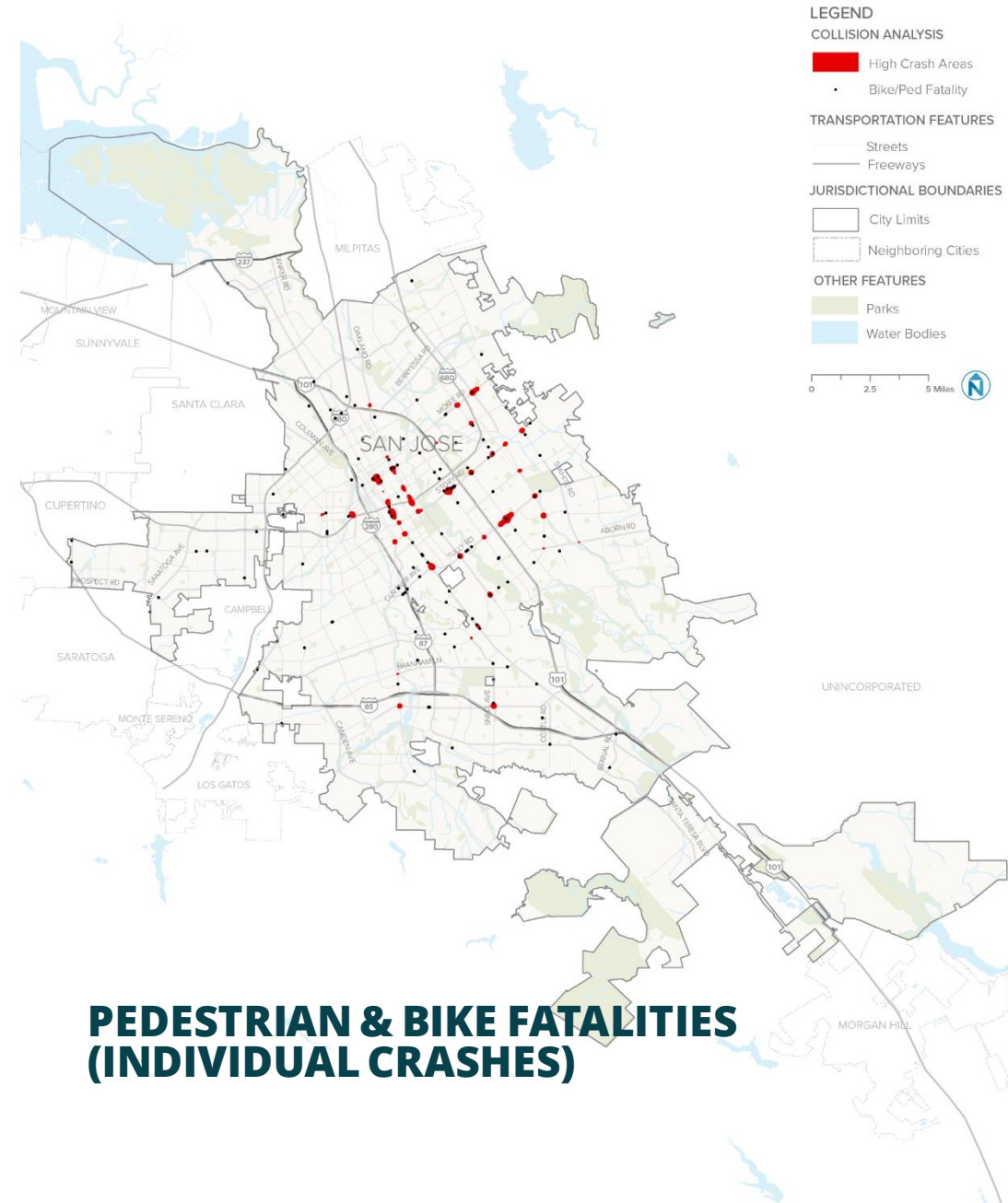
PEDESTRIAN & BIKE FATALITIES (INDIVIDUAL CRASHES)

EXPOSURE TO FREIGHT-RELATED IMPACTS

Proximity to freight routes and industrial land uses exposes residents to noise and air pollution. Freight routes are concentrated through the middle of San Jose, and in East San José. All the populations of concern are overrepresented in the freight buffer area and are disproportionately exposed to freight impacts. For example, 40 percent of residents living within the freight impact area are Asian although only 32 percent of San José's residents are Asian.

Freight Impacts

Note the different colors of the chart. Light blue represents individual demographic characteristics to be compared to the total population. Dark blue represents household characteristics to be compared to total households.
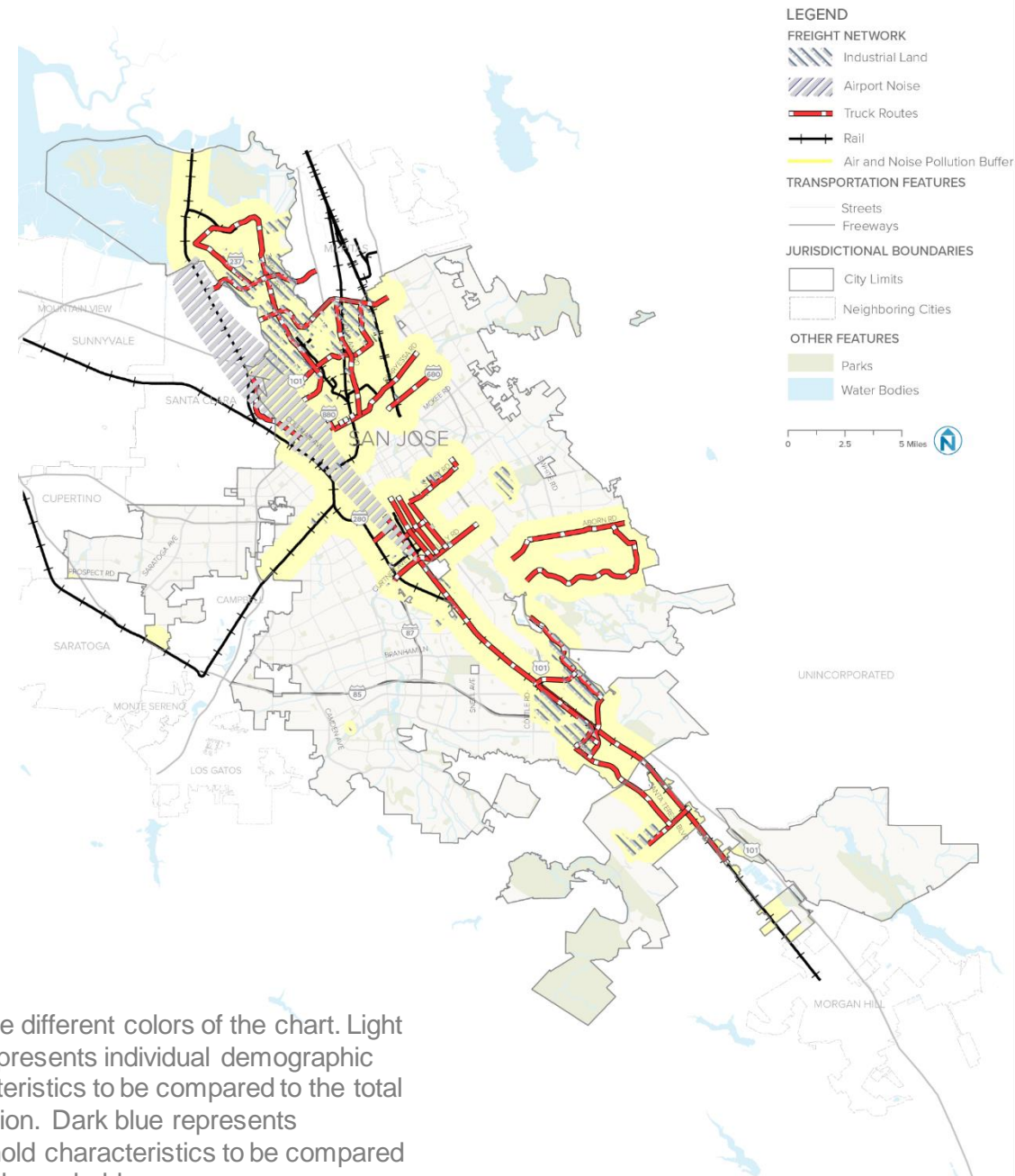
NETWORK CONNECTIVITY

Network connectivity considers a number of factors (in graphic below) to explain how connected a street network is and therefore how easily it is to get from one point to another efficiently. More connectivity in the street network means residents have more ways to get where they need to go. It also makes it easier to accommodate people walking, bicycling, riding transit, or driving. We looked at the number of intersections per square mile to estimate network connectivity. The analysis shows a greater density of intersections in some parts of the Berryessa and East San José suggesting a higher network connectivity than in other areas. In addition to network connectivity, transit, sidewalks, and bicycle facilities must be present to extend the benefits of a comprehensive mobility network. The density of intersections may not reflect the lived experience.

Network Connectivity Comparison

1 Square Mile
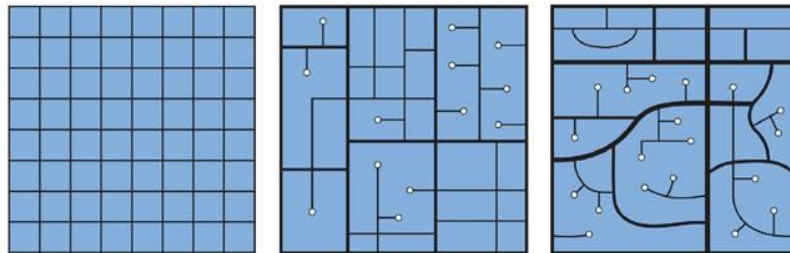
Grid Type	Grid	Fused-Grid	Curvilinear
Block Length	660'	Varies	Varies
Intersection Density	81	53	56
Links	144	88	94
Nodes	81	66	75
Connectivity Index	1.77	1.33	1.25

LEGEND

INTERSECTION DENSITY PER SQ. MI.
- 0 - 87
- 87 - 189
- 189 - 310
- 310 - 557
- 557 - 988

TRANSPORTATION FEATURES
- Streets
- Freeways

JURISDICTIONAL BOUNDARIES
- City Limits
- Neighboring Cities

OTHER FEATURES
- Parks
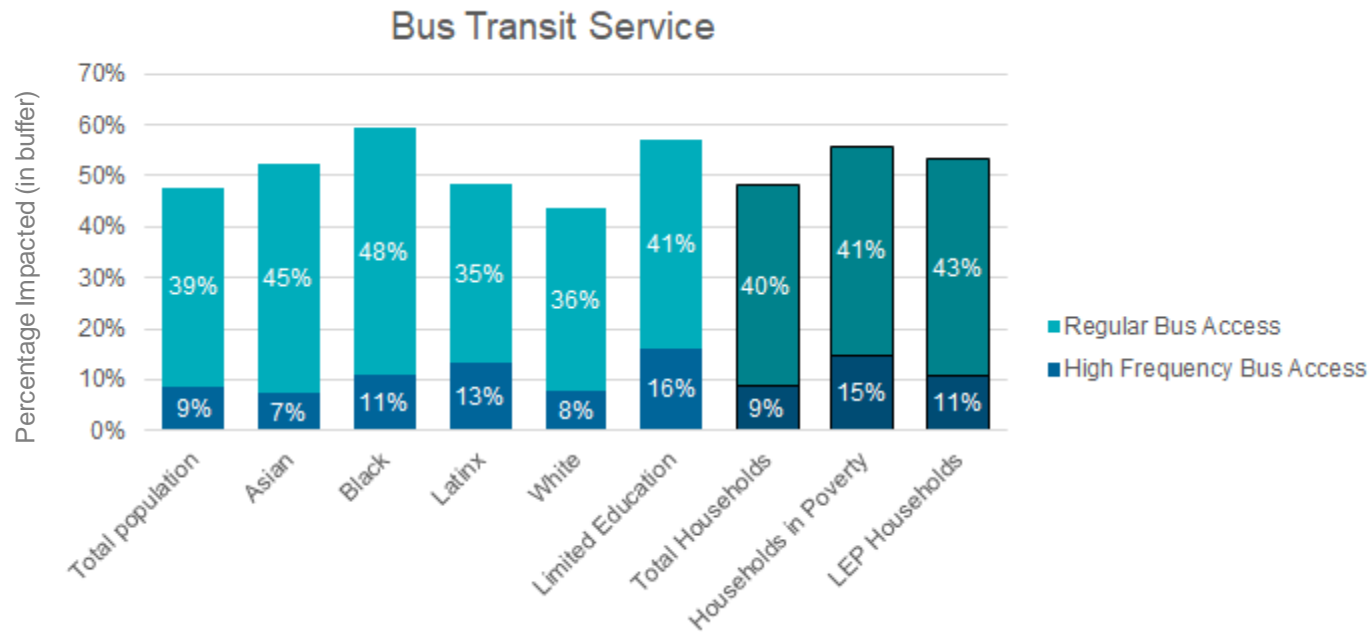- Water Bodies

0   2.5   5 Miles
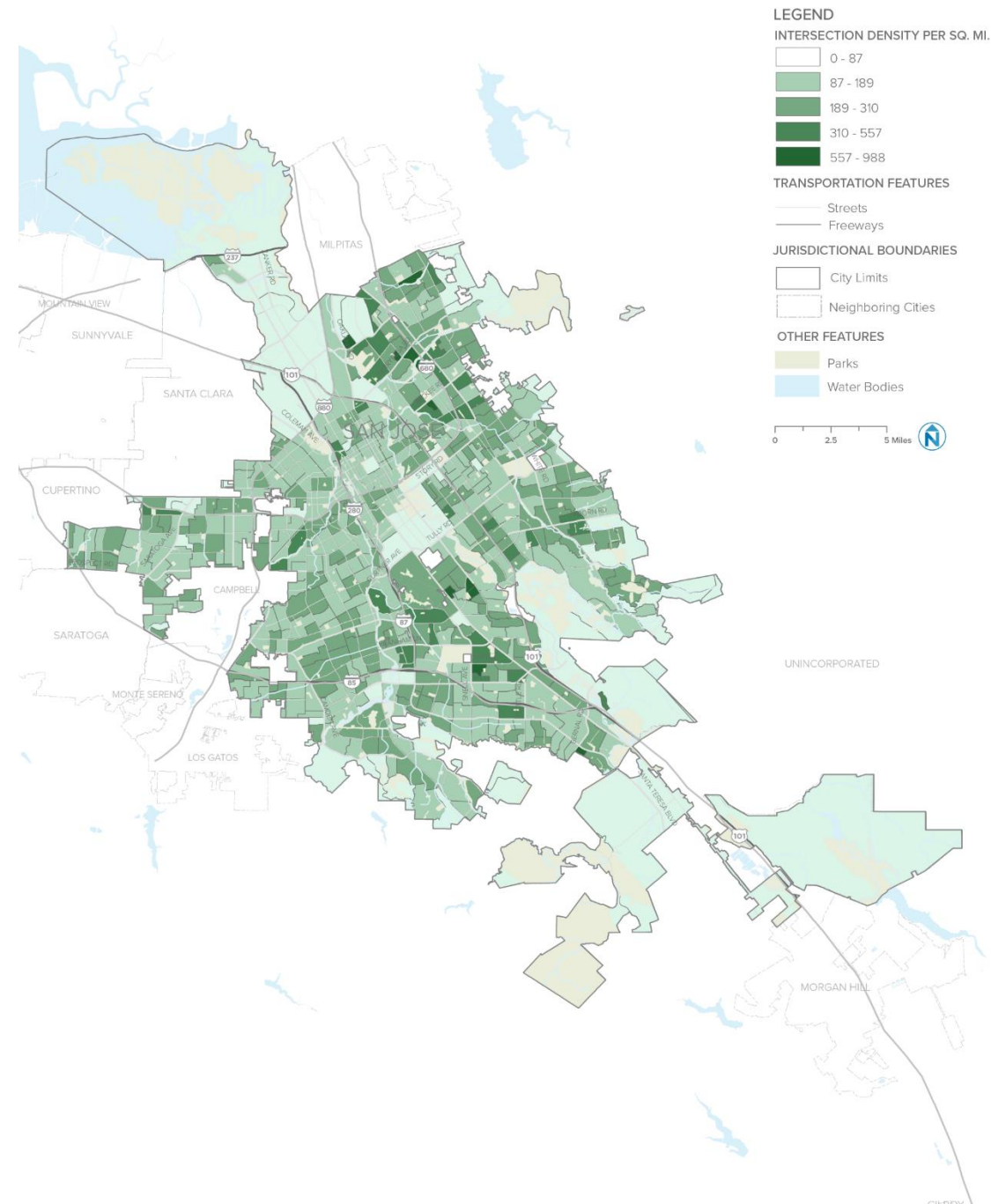
TRANSIT ACCESS

Transit access is defined as the time required to walk or drive to a station. Walk access is a 3-minute walk to a bus stop or 5-minute walk to a light-rail station and auto access is a 1-mile drive to a park & ride station. In general, there is relatively even coverage across San José, and the demographics identified typically appear to have more access than the general population. However, access, does not mean that public transit is available when you need it or travels where you need to go.
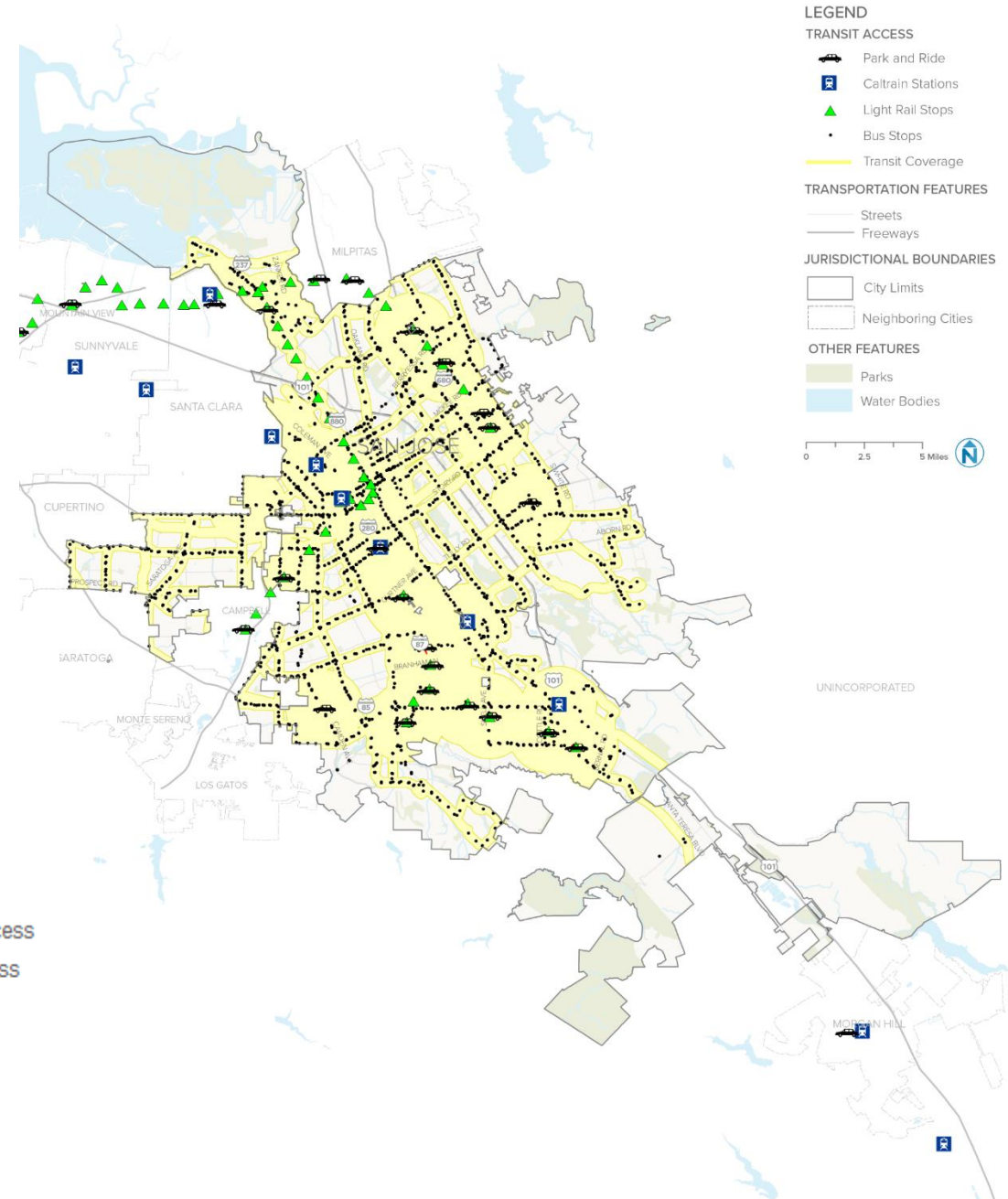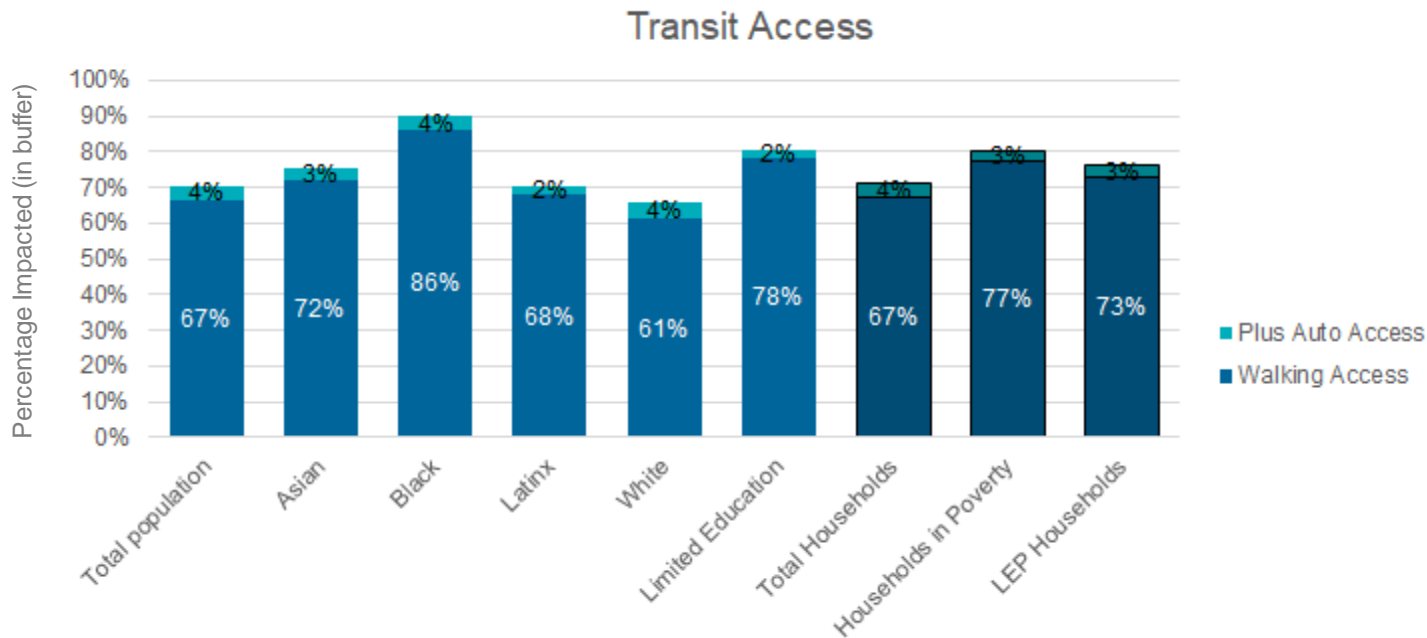
TRANSIT SERVICE

Mapping and analyzing rapid and frequent bus service provides a more complete picture of the access provided to populations of concern. The demographic groups identified typically had greater access to regular and high frequency bus service when compared to the general population. Between 9 and 16 percent of each population of concern has access to high frequency bus service. But, again, there is a question if the bus line goes where and when area residents want to travel. This trend was not reflected for light rail service, where selected demographics had less access. Rail station areas are often seen as opportunities for investment, which may lead to unequal benefits in the community.

Bus Transit Service

Regular Bus Access
High Frequency Bus Access

LEGEND

TRANSIT SERVICE
Express
School Tripper
Local
Frequent
Rapid
Light Rail - Blue Line
Light Rail - Green Line
Light Rail - Orange Line
Light Rail - Purple Line
Light Rail - Yellow Line

TRANSPORTATION FEATURES
Streets
Freeways

JURISDICTIONAL BOUNDARIES
City Limits
Neighboring Cities

OTHER FEATURES
Parks
Water Bodies

UNINCORPORATED

ACTIVE TRANSPORTATION INFRASTRUCTURE

San José has a growing bicycle network, and many communities across the City have access to facilities. Facilities vary in level of comfort, with bicycle paths (Class 1) that are fully separated, bicycle lanes (Class 2) with dedicated road space, and bicycle routes (Class 3) that share travel lanes with other vehicles. Access to Class 1 and Class 3 facilities is generally even and network access is most dependent on Class 2. While that's the case, people may feel discouraged to bike in Downtown and East San José due to chaotic traffic conditions and drivers failing to notice cyclists. Lack of wayfinding and educational campaigns around bicycle infrastructure may also deter new riders from using these facilities. Each population is overrepresented in areas with bicycle network access except the Latinx population. This reflects less proximity to bike lanes for the Latinx community. Additionally, access does not equal connectivity – as the network continues to grow, gaps in existing facilities and in the general network will need to be addressed to make it easier for people to bicycle to their destinations.

Bicycle Network Access
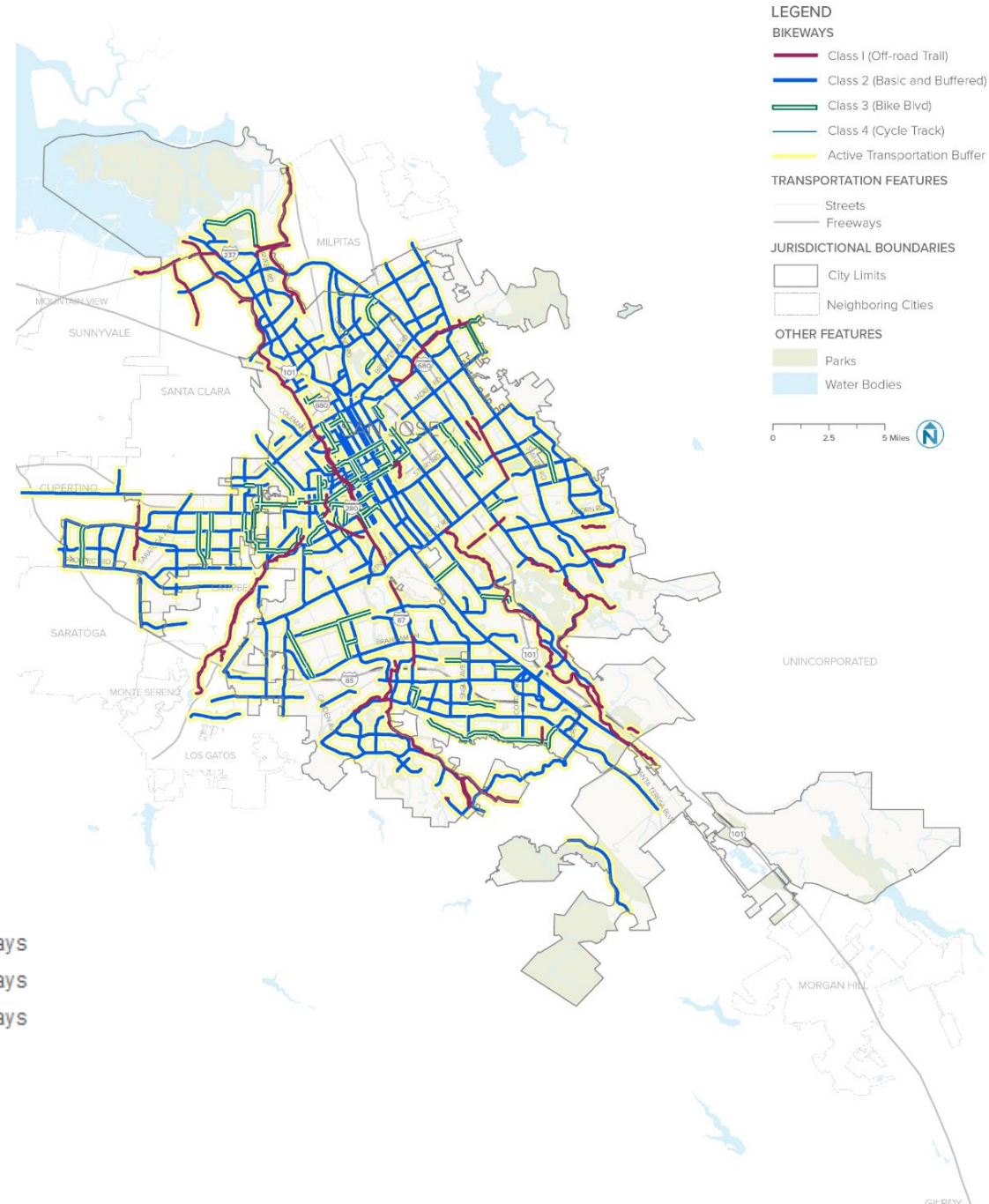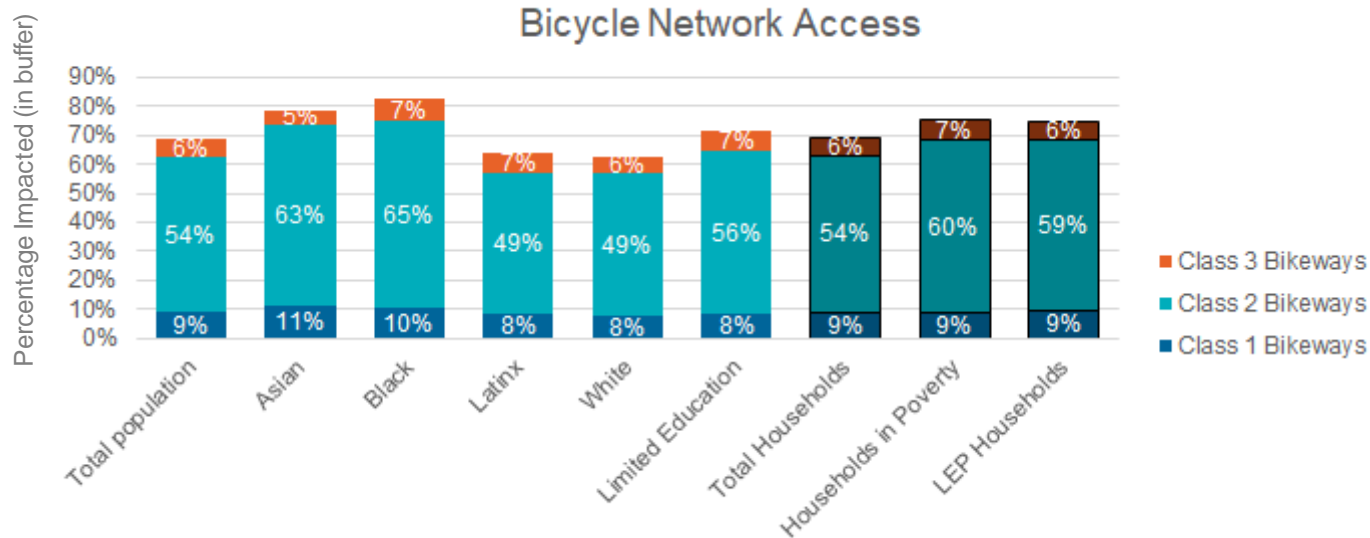
MICROMOBILITY USE

Micromobility refers to small, personal mobility devices such as scooters or bikes. It is often discussed in the context of shared devices. San José's shared micomobility options include bike share and scooter share. Bike share will be discussed in the next section.

Scooter share activity is most concentrated in Downtown San José and surrounding communities. Highways and arterials are likely barriers to activity beyond that area. Although communities in North and East San José see higher rates of deployment (companies put more scooters here) than other areas, activity remains fairly low. As we would expect, the areas of greatest deployment are the areas where the most trip originate from. The opposite is also true. An exception is the eastern part of the city. District 5 had more deployed vehicles than District 8 but less trips than District 8. District 8 is also a lot larger (area). There is a similar situation with District 4 (in relation to District 5).

Additional challenges may include level of comfort or access to micromobility devices due to limited access to traditional forms of banking.
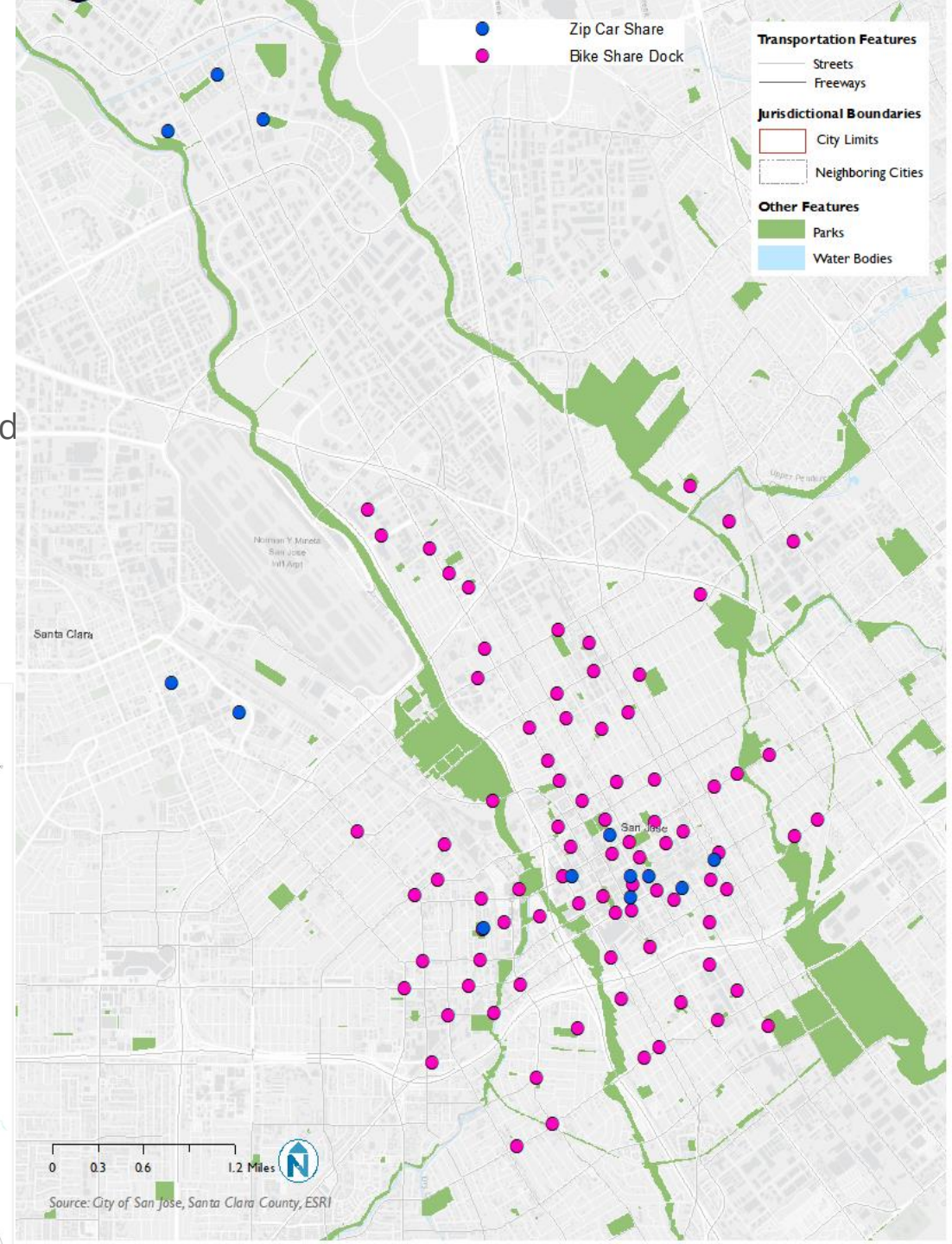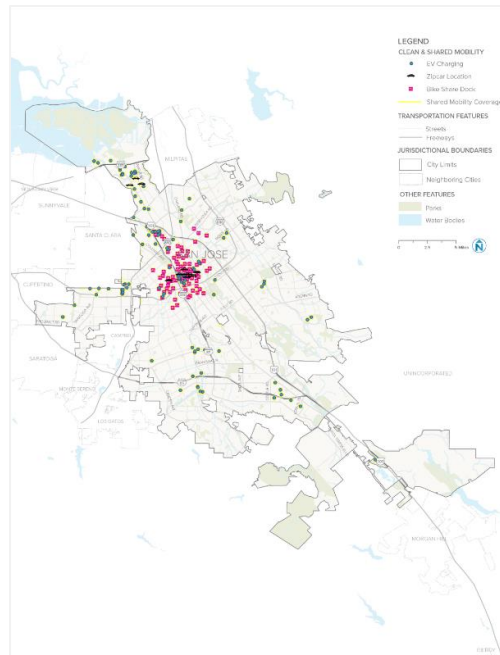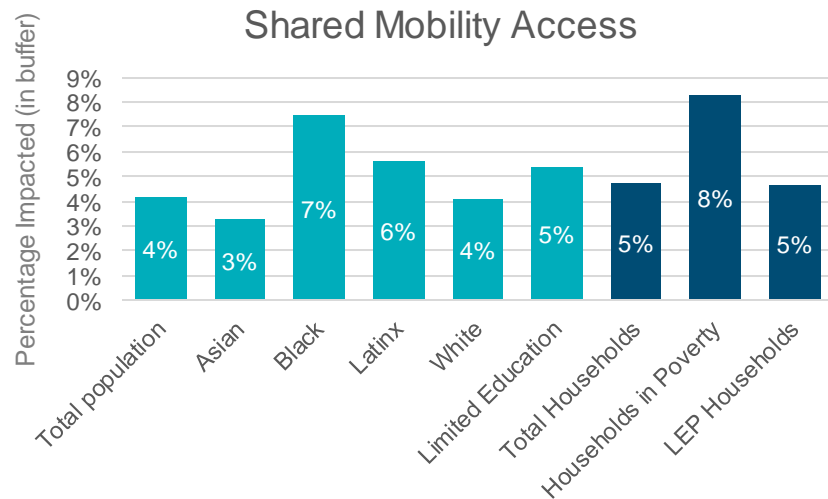

DEPLOYMENT

TRIP ORIGINS
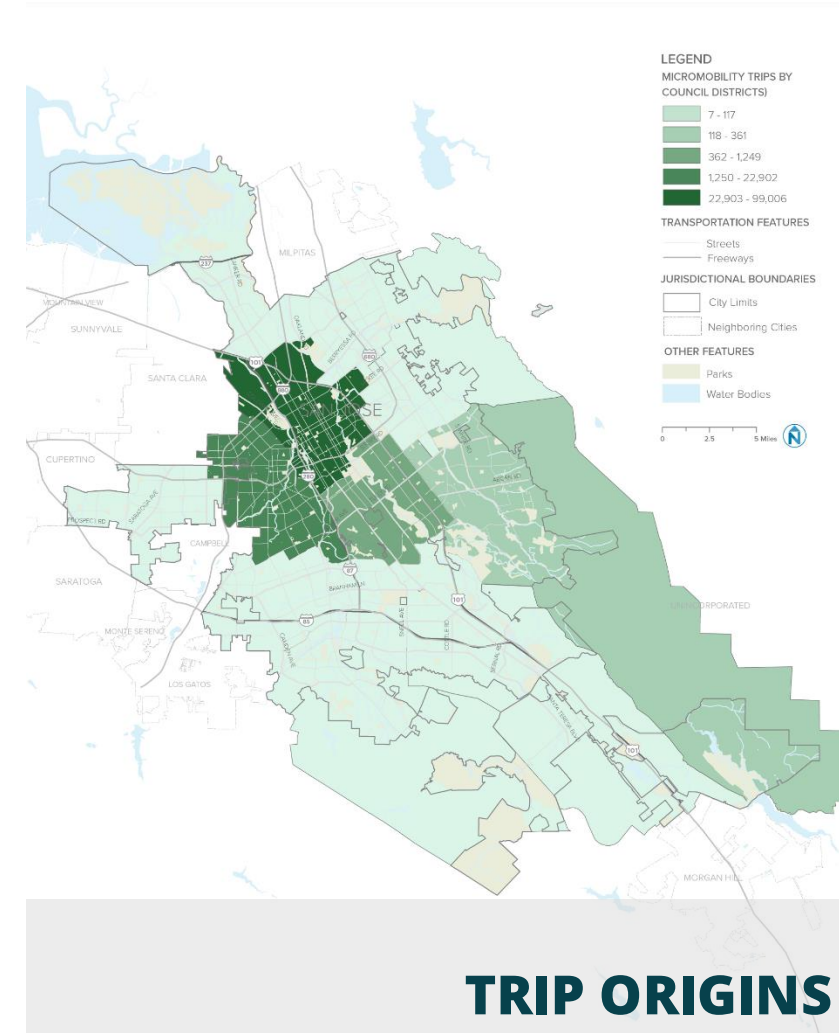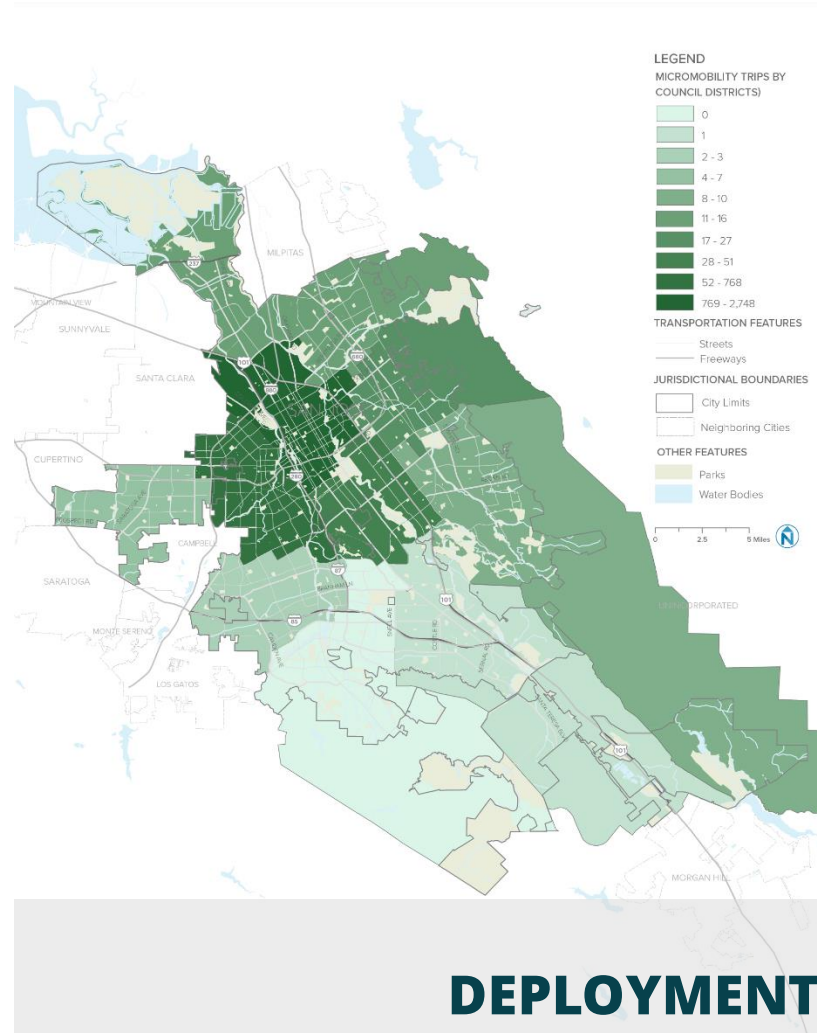
SHARED MOBILITY

Bike share and car share services are concentrated in downtown and surrounding communities. These modes of shared mobility have a small footprint and only four percent of the City's population live in proximity to stations for these shared mobility services.

The identified demographic groups have comparable access to bike and car share as the general population, with the Black population and households in poverty having greater access. Usage, however, cannot be confirmed without rider information.

Access to credit and banking enables these modes but is not captured in these maps. The FDIC reported that 1.9% of San Jose was unbanked in 2019. In 2017, 13% of the population was underbanked (this data point is not available for 2019).


Shared Mobility Access chart:

Category	Percentage Impacted (in buffer)
Total population	4%
Asian	3%
Black	7%
Latinx	6%
White	4%
Limited Education	5%
Total Households	5%
Households in Poverty	8%
LEP Households	5%

Legend (map):
- Zip Car Share
- Bike Share Dock

Transportation Features
- Streets
- Freeways

Jurisdictional Boundaries
- City Limits
- Neighboring Cities

Other Features
- Parks
- Water Bodies

Source: City of San Jose, Santa Clara County, ESRI

0   0.3   0.6   1.2 Miles

CLEAN MOBILITY

San Jose has the highest electric vehicle share in the country. EVs were 20% of new vehicle registrations in 2019, about 20,000 vehicles (according to the International Council on Clean Transportation).

EV charging stations are clustered throughout the community but are visibly less concentrated in East San José.

Three percent of the City's population lives in proximity to EV charging stations. The identified demographics have comparable access to charging stations as the general population and the white population. Still, this does not reflect EV ownership or use among these communities.

EV Charging Station Access

MOBILITY WITHOUT DISPLACEMENT
MOVE PEOPLE AROUND, NOT OUT
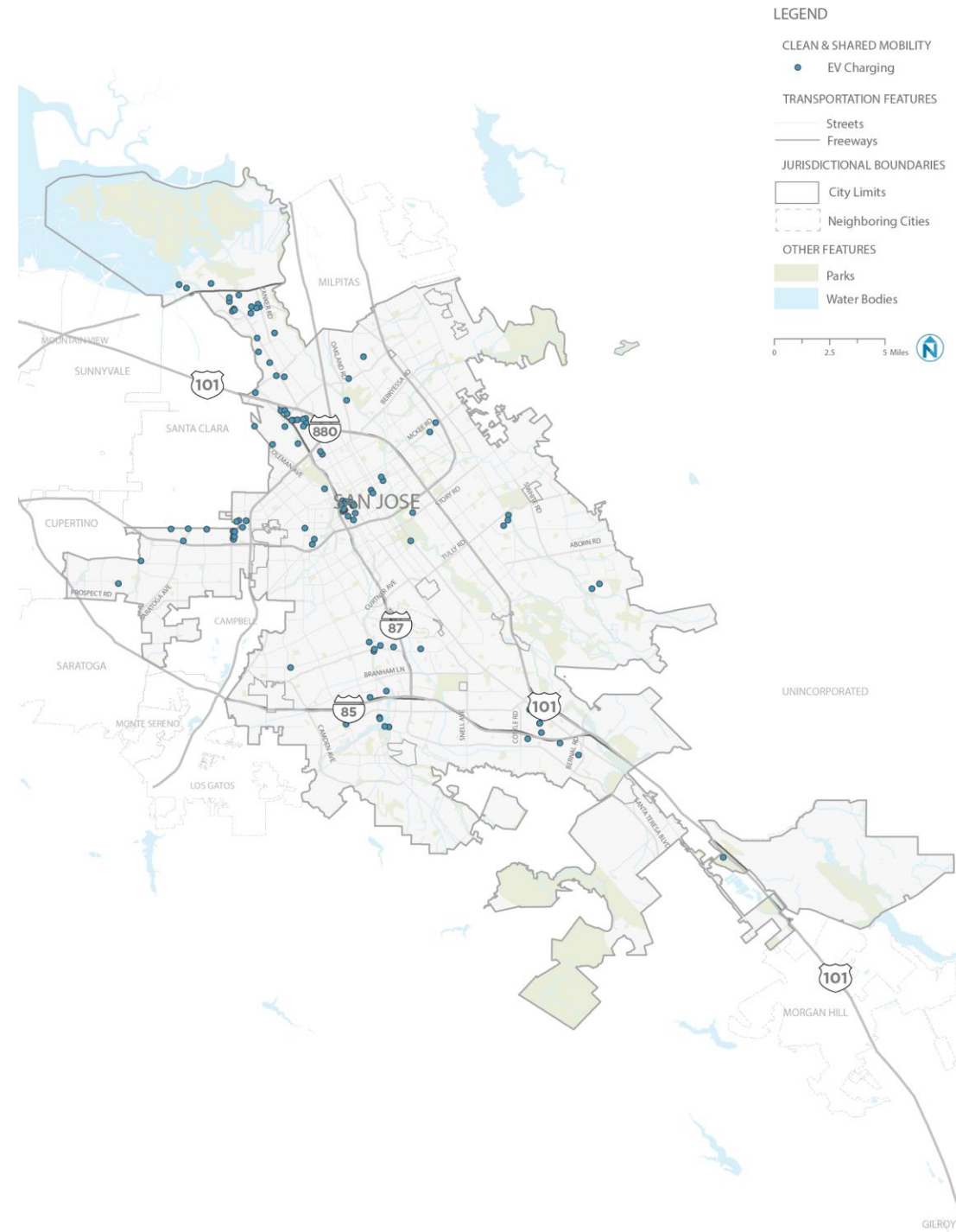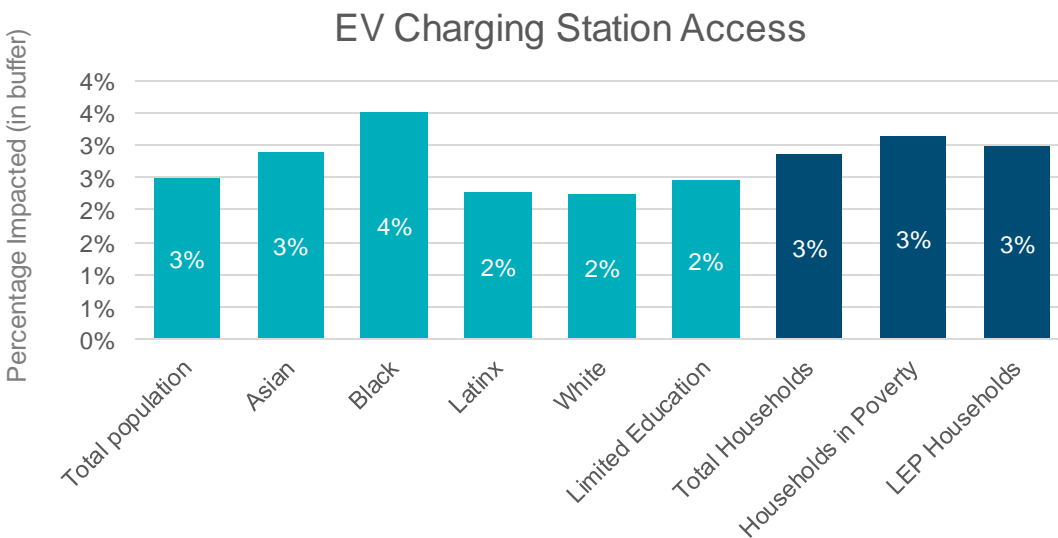
GAPS IN INVESTMENT IN BIPOC COMMUNITIES

Generally, BIPOC communities have comparable access in terms of proximity to bus service and bicycle infrastructure, are less likely to live near rail service stations, areas where investments are likely to happen, and have greater exposure to the negative impacts of air pollution, noise pollution, and areas with crash hot spots. However, impacts vary depending on where you live in San José, creating different experiences across BIPOC communities.

New mobility services create options that can help people complete the trips they need but may also drive investments in a way that raises concerns for displacement.

KEY FACTORS OF DISPLACEMENT

Investment must be thoughtful to avoid displacement

DISINVESTMENT OVER LONG PERIOD OF TIME LEADS TO...	SUDDEN INVESTMENT CAN...
Disconnected communities	Fail to consider or involve people already in community
Segregation	Be portrayed as "helping" or "revitalizing" community
Communities becoming haves and have nots	Increase costs of living in a community
Low-income people and people of color having less access to critical resources in their neighborhoods	Cause shifts to more density
	Displace/push people out

MOBILITY INVESTMENTS FOR WHOM?

We need to ask...

› Who burdens and who benefits from investments in:
  - Transit
  - Highways
  - Street repaving
  - Bike lanes and trails
  - More emerging modes (e.g., shared dockless, electric vehicles, etc.)

› How might mobility investments contribution to displacement?

› What is the impact to individuals?
  - Understanding individual mobility needs
  - Understanding individual reactions and impacts

STRATEGIES TO COUNTERACT GENTRIFICATION

What can government do?

› Engage other agencies and intergovernmental collaboration (Intersectionality in action)

› Institutionalize meaningful, sustained community engagement to co-create solutions

› Understand the difference between investment and displacement

› Support policies that allow people to stay in their current neighborhoods

› Acknowledge, own, and leverage your power to enact desired outcomes

› Build wealth in the community through every decision

STRATEGIES TO COUNTERACT GENTRIFICATION

What can partners do?

› Hire local residents—at all levels not just in street team positions

› Market towards BIPOC and immigrant communities

› Enact equity policy and accountability (including data)

› Partner with community members and community-based organizations

› Include payment options to tackle gaps in access among unbanked or lower income community members

› Understand demographics of users

› Be transparent with data when working with government

THE HOPE AND HARM OF
EMERGING MOBILITY

San José Emerging Mobility Action Plan
**Just Movement: Learning from Our Past to Move
All San Joseans Forward**

CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY

LOOKING BACK TO MOVE FORWARD

San José is developing a plan to prepare for the changing mobility landscape. We will prioritize Black indigenous, and people of color to reflect their unique lived experience in San José. To do this, we are building a framework that elevates community voices and centers racial and social equity in Emerging Mobility policy and programs.

Planning for a future of equitable mobilities requires the City and community to reflect on the past. *Just Mobility* is resource that tells a story about how our communities experience and have been impacted mobility, infrastructure, and policy. Where are we in the story?

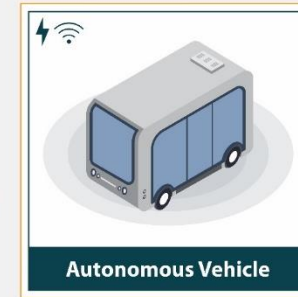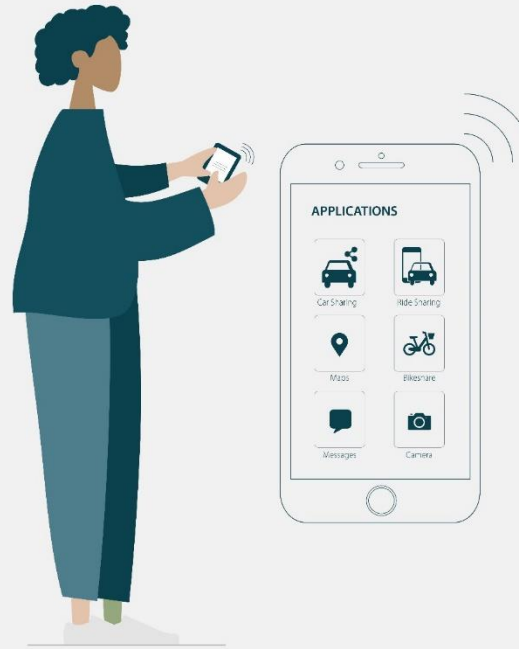| 01 Welcome to San José	02 The History of Infrastructure and Mobility	03 The Hope and Harm of Emerging Mobility	04 Data, Community, and the City

WHAT IS EMERGING MOBILITY?

People have an inherent desire to move freely in ways that meet their needs, their means, and their abilities. **Emerging Mobility connects people to places, goods, and information** using new services, products, and technologies. Focused on solving problems and fixing gaps, Emerging Mobility responds to the inherent way that people move.

Emerging Mobility is shared, electric, connected, and can be autonomous.

EMERGING MOBILITY LANDSCAPE TODAY

Micromobility

Ride Hailing

Autonomous Vehicle

Car Sharing

Microtransit

Urban Freight

Vertical Take-Off and Landing (VTOL) Ride Hailing
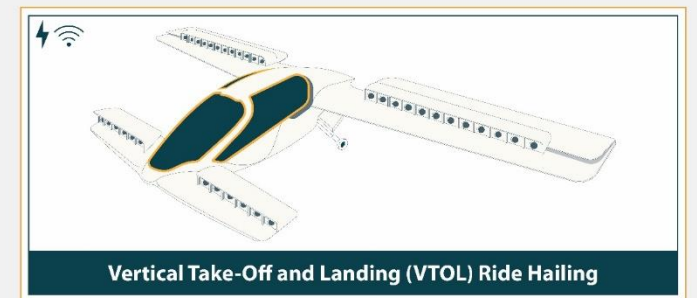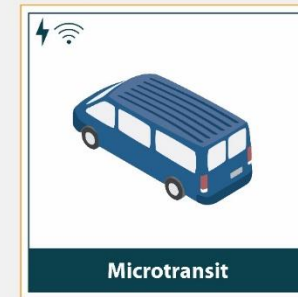
THE CASE FOR EMERGING MOBILITY

Solutions to real problems

› **First- and last-mile connections**: Facilitating access to VTA, BART, and Caltrain

› **Expanding sustainable mobility options**: Providing sustainable travel options for people, utilizing shared and electric devices/vehicles

› **Sustainable alternatives for goods delivery**: Reducing freight vehicles and associated congestion/emissions by utilizing emerging delivery services to deliver packages to your doorstep

› **Powering data-informed decision-making**: Informing where services or investments are needed with data made available through new tools

› **Workforce development**: Developing new opportunities for new skilled jobs to support new mobility services

› **Fills gaps during COVID**: Providing safe and affordable commute options for healthcare and essential workers during COVID-19

SHARED MOBILITY IN SAN JOSÉ

Shared mobility services include a range of multimodal transportation options, consisting of emerging mobility services as well as other transportation options that people share with others, including public transit. A suite of shared mobility services operate in San Jose, including VTA light rail and bus, Uber and Lyft ride-hail, Zipcar car share, Bay Wheels bike share, and several scooter share companies. The co-existence of these services allows for them to complement each other and support a variety of trip needs, to the extent they are accessible by all.
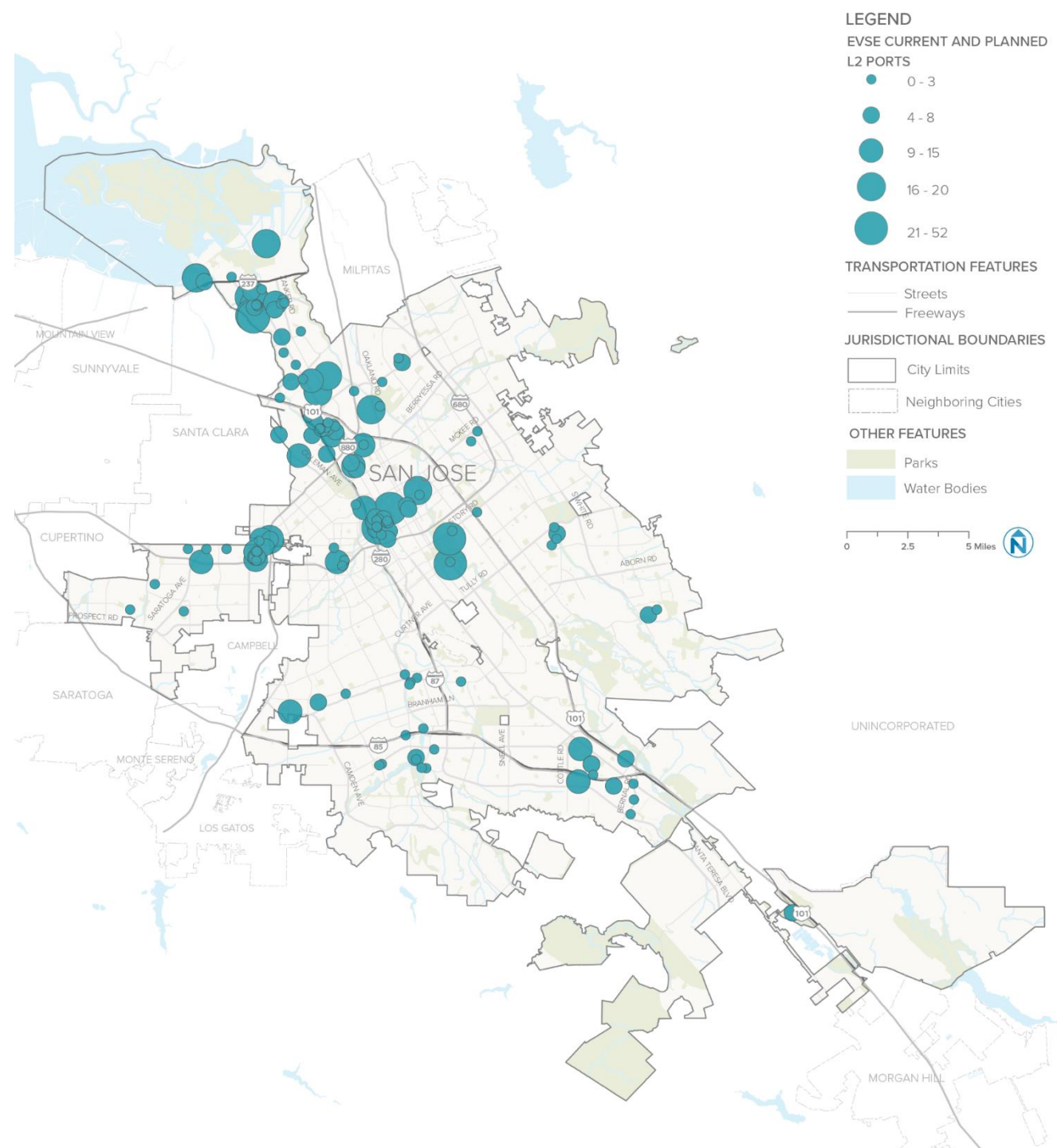
EV CHARGING INFRASTRUCTURE

San José's *Electric Mobility Roadmap (2020)* provides direction on how the city can reach key goals for electrifying vehicles while expanding access to all. It expands on the City's involvement in the American Cities Climate Challenge and focuses on reducing emissions for passenger vehicles. In addition to increasing access to shared and electric transportation options like transit, ridehailing, carsharing, and micromobility, it outlines strategies for speeding up the adoption of electric vehicles for trips typically made with a car or SUV.

Among other things, the roadmap analyzes where electric vehicles are currently located, determines the number of charging stations needed to support *Climate Smart's* growth targets, and identifies priority areas for siting additional chargers that would expand access to electric vehicles. As of early 2020, there were 900 existing and 340 committed non-residential charging ports located throughout the city. This inventory includes private, public, private workplace, public workplace, fast charging ports, and Tesla's proprietary charger network.

Level 2 (L2) chargers operate at 208-240 volts, which translates to 18 to 28 miles of range per hour. An average EV can be fully charged in 8 hours or less using an L2 charger. L2 chargers are commonly used for at-home charging and can be found in parking garages, grocery stores, and workplaces. Most of San José's L2 chargers are concentrated in Downtown and North San José.

LEGEND

EVSE CURRENT AND PLANNED
L2 PORTS
- 0 - 3
- 4 - 8
- 9 - 15
- 16 - 20
- 21 - 52

TRANSPORTATION FEATURES
- Streets
- Freeways

JURISDICTIONAL BOUNDARIES
- City Limits
- Neighboring Cities
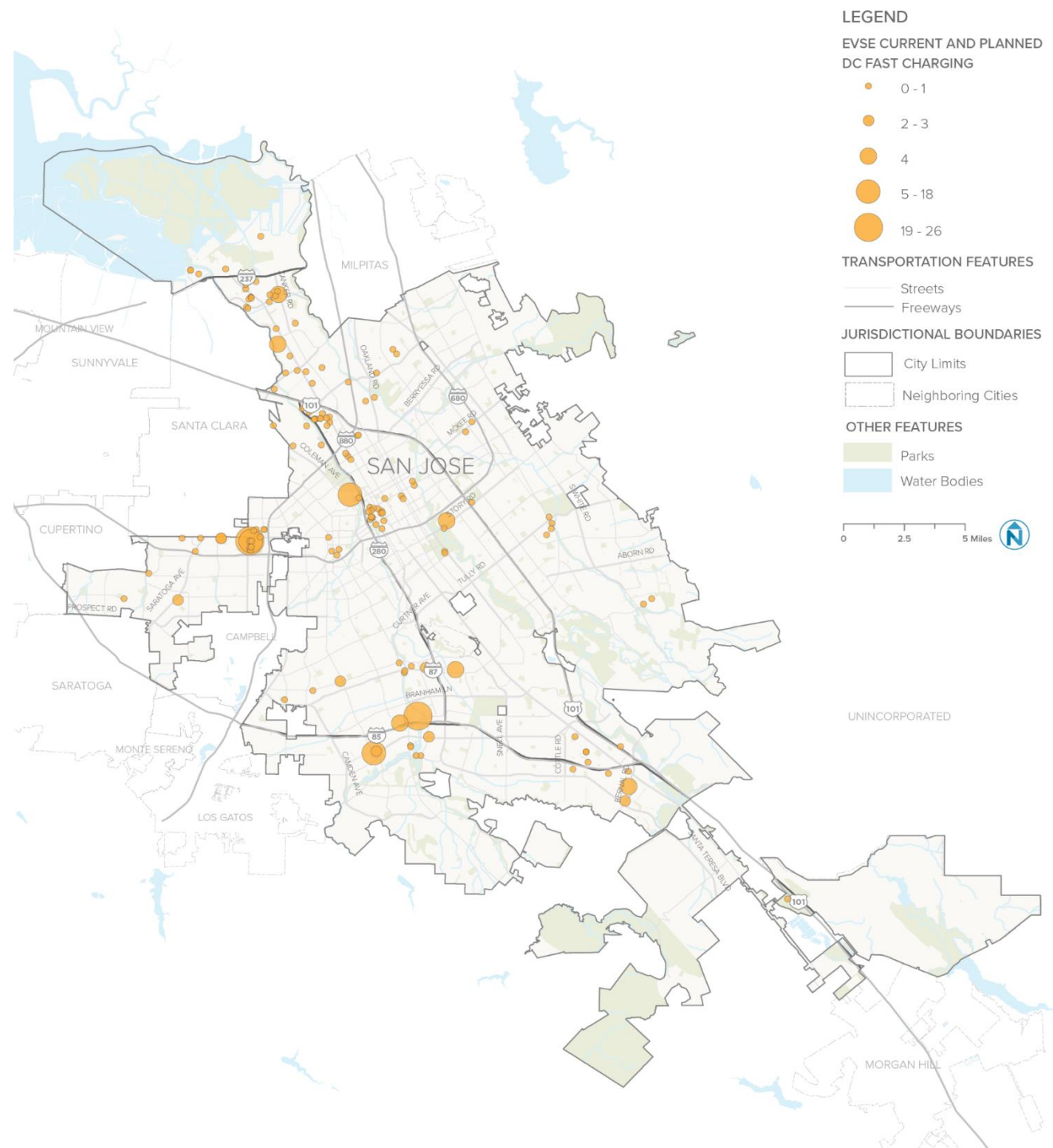
OTHER FEATURES
- Parks
- Water Bodies

EV CHARGING INFRASTRUCTURE

Direct Current Fast Chargers (DCFC) are the fastest chargers available and are designed to fill an EV battery to 80% within 20 to 40 minutes. Due to their high cost, DCFCs are intended for commercial or industrial locations. Most of San José's DCFCs are located in Downtown, West San José, and near Willow Glen.

According to experts, the ideal ratio of vehicles to charger ports for San José , using estimates developed by the California Energy Commission is:

- 20 to 1 (Level 2) for workplace chargers

- 28 to 1 (Level 2) for public chargers

- 245 to 1 (Fast Chargers)

Based on these ratios, the City needs a total of 5,496 charging ports by 2025 and 4,091 by 2022. The City also needs to significantly expand the geographic areas where charging is publicly accessible, including in low-income and BIPOC communities and neighborhoods with high concentrations of rental and multi-family housing. Adoption of both new and used EVs in California's disadvantaged communities (DACs), which are census tracts that suffer from a combination of economic barriers and environmental burden, occurs at very low rates compared to all EV sales. In addition to the lack of access to both private and public charging infrastructure located near multi-family housing, the high, upfront cost of EVs and lack of knowledge regarding the ease of accessing EV incentives remain key barriers for widespread EV adoption amongst BIPOC communities.

LEGEND

EVSE CURRENT AND PLANNED
DC FAST CHARGING
- 0 - 1
- 2 - 3
- 4
- 5 - 18
- 19 - 26

TRANSPORTATION FEATURES
— Streets
— Freeways

JURISDICTIONAL BOUNDARIES
City Limits
Neighboring Cities

OTHER FEATURES
Parks
Water Bodies

0   2.5   5 Miles

SHARED MOBILITY SERVICES AND CONCERNING PRACTICES

› Use of the Public Right of Way
  - Amount of value gained by private corporations vs. public benefit in terms of fees, congestion, curb space, and sidewalk space

› Misleading Marketing Practices
  - Marketing materials highlighting diversity, inclusion, and accessibility vs. real-world barriers to accessing services (e.g., people with disabilities, credit and smartphone access)

› Predatory Employment Practices
  - Benefits
  - Pay
  - Hours

SENIOR AND DISABLED MOBILITY IN SAN JOSÉ

VTA ACCESS is the transit agency's ADA paratransit service which acts as a 'safety net' for people with disabilities who are unable to independently use fixed-route transit services in some or all situations. ADA paratransit is a shared-ride service, and travel times are comparable to VTA's fixed-route bus service. However, the cost to use the service is higher than standard bus or light rail fares for seniors and disabled persons, and is far higher if users need same day service or to reschedule a missed return ride. The program provides eligible riders with door-to-door rides in accessible vans, cutaways (small buses), and sedans operated by a contractor, MV Transportation.

MOBILITY PILOTS AND PROGRAMS

San José continues to find new ways help San Joseans get to where they need to go through pilots and programs that leverage new technology, partnerships, and business models. Programs that serve BIPOC communities include:

Shared Micromobility Permit Program: The Shared Micromobility Permit Program allows approved technology companies to operate shared electric scooters in the public right-of-way. City staff developed proposed regulations based on extensive outreach involving key stakeholders such as VTA, downtown associations, council districts, and public safety agencies. Operators are required to offer a low-income membership or fee reduction program to individuals experiencing financial constraints. Operators are also required to maintain 20% of their operations in Communities of Concern.

BayWheels/Lyft Healthcare Worker Program: Bay Wheels, the Bay Area's bikeshare operator, offers a discount membership program for healthcare and critical workers during COVID-19. As part of this effort, Bay Wheels also expanded its service area in San José in order to include Kaiser Santa Teresa and surrounding medical offices. Nearly 60% of stations in San José are located in Communities of Concern.

One-way Vehicle Sharing Program: The City is developing rules to allow companies to offer one-way shared moped and car services in San José. This effort, spurred by Climate Smart San José, seeks to expand clean transportation options for those who don't or can't afford to own a car. The program will require both a low-income discount membership program and at least 30% of the operators' initial service area must encompass all or parts of census tracts designated as Communities of Concern.

Mercedes-Benz Autonomous Vehicle Pilot: In 2019, San José partnered with Mercedes-Benz and Bosch to develop an app-based ridesharing service and to test autonomous vehicles' potential to address safety and quality-of-life concerns in an urban environment. Monitored by safety drivers, the program shuttled a small group of passengers between West San José and downtown. The program was halted in early 2020 due to COVID-19.

Local organizations also are offering related programs, including:

TransForm Mobility Hubs Pilot with First Community Housing: MTC and TransForm received a $2.25 million grant from CARB to design and implement carsharing, EV chargers, and mobility hubs at affordable housing developments. The pilot focuses on 3 mobility hubs in disadvantaged communities in Oakland, Richmond, and San José . The goal is to increase access to economic opportunity, medical facilities, schools, parks, and grocery stores for low-income residents while also reducing vehicle trips and GHG emission to meet the stat's broader climate goals. The San José project is sited at Betty Ann Gardens, a 76-unit multifamily affordable housing development located in Berryessa and owned by First Community Housing.

URBAN DELIVERY, LOGISTICS, AND E-COMMERCE

Urban delivery, logistics, and e-commerce space also have expanded in San José. The City recently partnered with Kiwibot to test on-demand, semi-autonomous robots. The goal of the pilot is to understand how the City can maximize potential transportation, environmental and equity benefits of technologies such as this and minimize or eliminate potential adverse impacts. The City will collaborate with Kiwibot on pilots that test, among other things, whether the service is suitable for all city streets and whether or how they might address the needs of low-income and elderly residents, populations who do not typically use on-demand courier services.

Several businesses are also testing the use of micro-fulfillment centers in San José. In 2019, a Safeway grocery store partnered with Takeoff Technologies to retrofit the backroom of its store with automated technology to expand its capacity for fulfilling on-demand grocery deliveries. Micro-fulfillment centers increase efficiency by mitigating some of the logistical barriers associated with the last mile of grocery delivery. It combines a store's proximity to customers with the automation of a large warehouse.

Most recently, Amazon purchased more than 17 acres of industrial land along San José's Monterey Road corridor near downtown, which will serve as a distribution hub and fulfillment center. The company also leased the Little Orchard Distribution Center, a warehouse on little Orchard Street, and plans to use it as a delivery station. While these recent acquisitions can spur meaningful job growth in the region, the Amazon expansion may have consequences for freight congestion, curbside management, and workforce development that remain unaddressed.

EMERGING
TRENDS

CONGESTED CURB

Mobility, access, delivery, and place functions will continue to compete for limited space at the curb.

Curb space is at a premium in most city centers, especially during times of peak demand. Changes in the way people use and access the curb (such as pickup/drop-off and deliveries) create new conflicts and a constant level of demand that is difficult to predict and plan for. Decisions about how to manage the curb and provide access for deliveries, passenger pickup and dropoff, and non-automotive modes shape the way a street is used and can either help reduce congestion or contribute to it.

Because new mobility modes are all on-demand, most of the entering and exiting of the vehicle occurs on the street, impacting curbside access and congestion. For micromobility, the curb is not only an access point, but also serves as an area for vehicle storage, charging, and occasionally travel. At the same time, e-commerce and courier services are also competing for the curb for food and package pickup and delivery, for temporary parking of vehicles, and occasionally for the staging of packages. This amounts to the development of a highly contested space where the efficiency, comfort, and financial feasibility of multiple modes rely on fluid integration of ever-increasing demands.

TRANSIT AGENCIES BECOMING MOBILITY PROVIDERS

Transit agencies are expanding their portfolio to mobility services beyond rail and rubber tire services.

Transit agencies traditionally have been focused on providing rail and rubber tire services. Evolving technology and new modes of transportation are enabling a paradigm shift that has the potential to extend the reach of public transit. With the ability to trip plan and potentially integrate fares, on-demand services, such as bike and scooter share, are increasingly becoming integrated with other transit offerings. Specifically, micromobility can play a vital role by providing first/last mile trip options, which can help to facilitate a seamless experience for the rider by extending the reach of traditional bus and rail networks.

Some transit agencies have already begun to integrate micromobility into their portfolios. For example, in 2020, Capital Metro and the City of Austin partnered to create MetroBike with the goals of extending the reach of public transit, introducing bike share as a part of the family of transit services, and ensuring long-term financial viability for bike share.
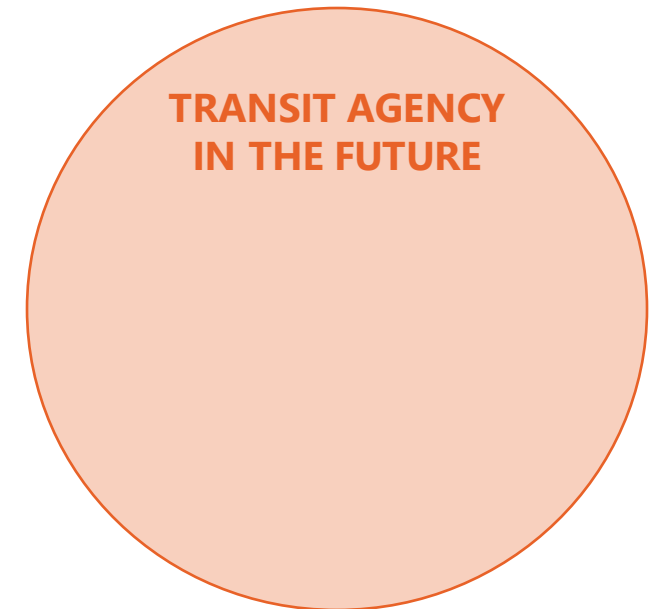
TRANSIT AGENCY IN THE PAST

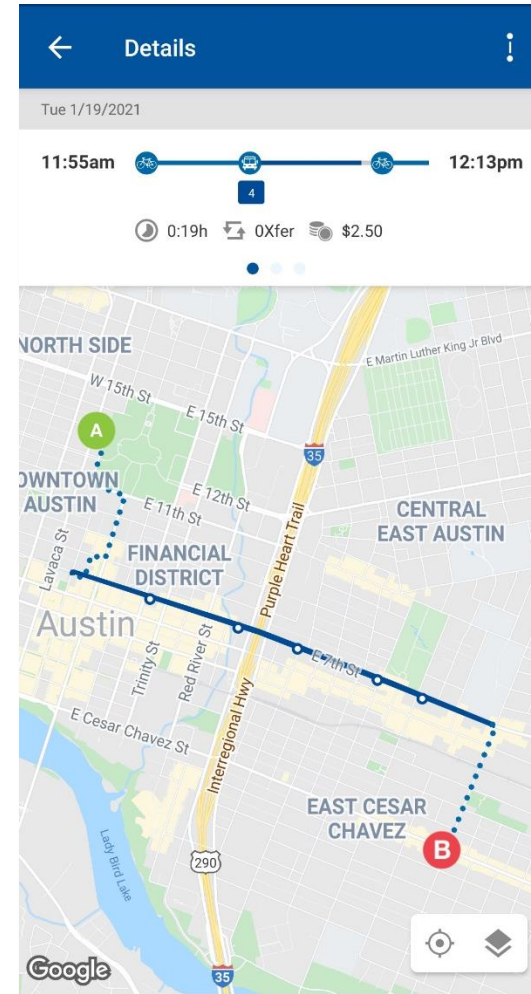**TRANSIT AGENCY IN THE FUTURE**
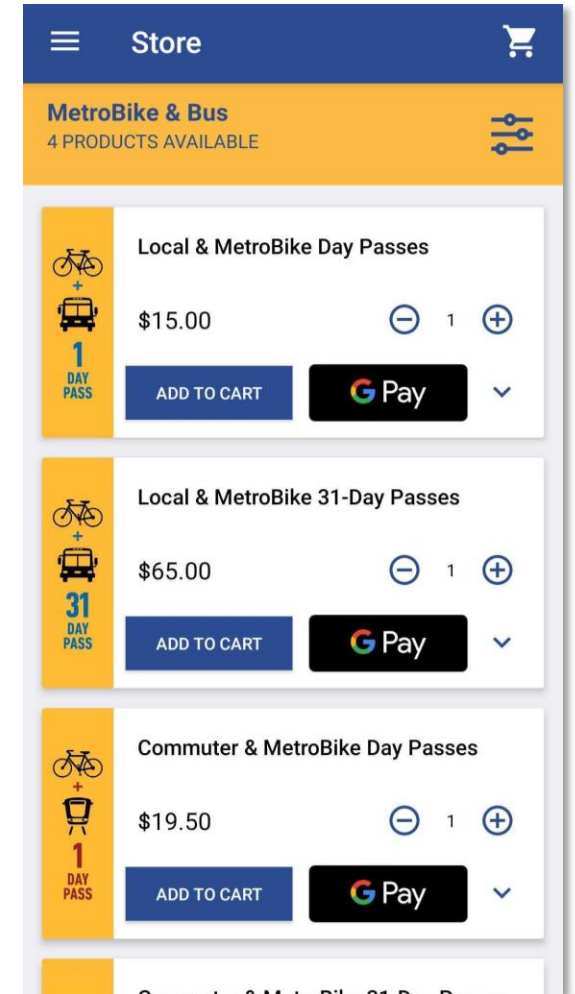
PLAN-BOOK-PAY

The mobility user experience will be improved through digital and physical integration.

Digital wallet

Multimodal trip planning

Bundled payment

PLAN-BOOK-PAY
The mobility user experience will be improved through digital and physical integration.

Mobility as a Service (MaaS) is a concept that makes shared mobility and public transit available at the click of a button. MaaS enables people to plan, book, and pay for their transportation in a centralized platform. MaaS uses technology to provide individuals with control over their mobility without needing a personal vehicle, making it easier for people to transition away from driving alone. It holds the potential for optimization of transportation choices at a systemwide level, through behavioral nudges and incentives that urge app users to make travel choices in response to real-time conditions in the transportation system.

Achieving MaaS is an incremental process that requires coordination between multiple agencies and private providers. MaaS relies on open data between both public and private providers, a strong public transit system, and interoperable trip planning and payment systems. A true MaaS system has yet to be actualized in the U.S. and the benefits are still uncertain.

INTEGRATING TRAVEL ACROSS CALIFORNIA

Caltrans' Cal-ITP initiative seeks to establish a statewide framework for multimodal transportation integration.

Infrequent riders

Value - efficiency

Mix of public transit, ride-hailing, car-sharing, possibly bike/scooter
Current Payment Options:
Cash, bank card, app

Discounted Fares

Value - cost

Primarily public transit or personal car
Current Payment Options:
Clipper/Compass/TAP Card

Commuters

Value - consistency

Primarily public transit; occasionally uses private operators for first/last mile connections
Current Payment Options:
Clipper/Compass/TAP Card, bank card

Income Discounts

Value – access/equity

Current Payment Options:
Clipper/Compass/TAP Card, cash

E-COMMERCE AND HYPER-CONVENIENT DELIVERY
On-demand goods delivery will become increasingly prevalent and expected by consumers.

Shortened guaranteed delivery windows and the expansion of demand-responsive delivery services have pushed the boundary of consumer choice and convenience. Now, consumers who can afford these services can purchase just about anything and have it delivered to their door within hours of placing their order. App-based delivery services like goPuff, DoorDash, UberEats, GrubHub, and Instacart offer same-day delivery for hot meals, groceries, and everyday items. Third-party logistics companies like UPS, Amazon, and FedEx are introducing innovations such as route optimization tools and cargo bikes to increase delivery efficiency in urban centers.

The downside of hyper-convenience is increased curbside congestion and vehicle miles traveled on neighborhood streets. In addition, the industry has taken drastic measures to safeguard profits and existing business models designed to keep labor costs low. In 2020, several companies collectively spent $200 million to support California Proposition 22, which maintains the status quo of defining app-based transportation and delivery drivers as independent contractors.*

*LA Times. *Hundreds of millions have been spent on Prop. 22.* October 2020.

ELECTRIFICATION AND MOBILITY
Mobility of all forms, from micromobility to transit and cars, will be electrified.

Mobility of all forms, from micromobility to transit and cars will be electrified. Electrification of transportation offers a path toward reducing GHG emissions; however, it also poses several equity concerns that must be proactively addressed.

- **Not all people benefit equally from electrification.** Electric vehicle and micromobility charging stations often are not sited in areas with low adoption rates. This approach typically excludes low-income neighborhoods and perpetuates the inequities in who can access to clean transportation options.

- **High, upfront costs are a barrier**, particularly for electric vehicles. While many state and local electric vehicle-supportive incentives are directed towards disadvantaged communities, uptake remains low due to insufficient outreach and lack of awareness of these programs. This barrier to entry further segregates electric vehicle ownership.

- **Driving perpetuates high Vehicle Miles Traveled (VMT) and single-use land use patterns.** Such land use patterns disproportionately impact communities of concern by reinforcing segregation and limiting both economic and physical mobility. Even if all vehicles become electric vehicles, an automobile-oriented culture and its associated impacts could continue to persist without further intervention.

ELECTRIC BUSES

Source: VTA

COMMUNITY-CONTROLLED CAR SHARE

Source: Self Help Enterprises

MICROMOBILITY CHARGING

Source: Spin

ELECTRIC TRAINS

Source: Caltrain

CURBSIDE CHARGING

Source: Wikimedia Commons

ON-DEMAND MOBILITY IN VARIOUS FORMS
The mobility ecosystem is rapidly evolving with new modes, new product features, and new ways to get a vehicle.

On-demand mobility services is not a new concept. Over the past 10 years we have seen new types of mobility services entering the market. Existing business models and product features are also evolving to adapt to changing demands and regulatory environments. Now more than ever, consumers are demanding personalized transportation solutions that are affordable, safe, and convenient. This has spurred the innovation of various on-demand mobility options. In the past two years alone, micromobility, in the form of electric scooters, bikes, and mopeds, has seen tremendous growth and utilization in cities across the world.

AUTOMATION AND MOBILITY

Autonomous technology will support a shared mobility system and on-demand goods delivery.

The expansion of research and city-led pilot programs suggest the full-scale deployment of autonomous vehicle (AV) technology is inevitable. Cities around the world are piloting AV shuttles to support first- and last-mile connections to shared mobility systems, on-demand goods delivery, and the collection of traffic-related data on vehicle movements and roadside infrastructure. Many of these pilots involve private companies and automobile makers, who are heavily involved in shaping AV technology, regulations, and safety standards. Widespread deployment of fleet-based and ownership-based models will occur gradually and will likely start in low-density areas that have limited pedestrian and cycling activity, a supportive regulatory environment, and agreeable weather.

URBAN AERIAL MOBILITY

Urban aerial mobility could be leveraged to transport people and deliver essential goods, such as medical supplies and fresh produce.

Urban Aerial Mobility is quickly evolving to become a viable alternative to land-based mobility options. In the past decade, technology and third-party logistics companies like UPS and FedEx have partnered with cities all over the world to test autonomous drone delivery of small packages, food, and medical supplies in urban settings. By replacing many deliveries currently made by a traditional delivery vehicle, urban aerial mobility has the potential to change last mile delivery logistics for smaller and lighter packages.

CONTACTLESS MOBILITY
People are likely to seek out socially distanced ways to travel in the near- to mid-term.

The COVID-19 global pandemic has profoundly impacted many aspects of daily life, including transportation. As cities across the country implemented shelter-in-place orders, people largely avoided non-essential travel, which has led to significant shifts in travel behaviors. Due to its open-air nature, personal and shared micromobility is proving to be a relatively attractive transportation option during the pandemic. More people are trying electric bikes and scooters for the first time, including critical workers who still need a viable commute option to travel to and from work. This notable uptick in micromobility usage likely stems from the need to socially distance, a hesitancy to be in confined spaces, and reduced transit service. People using micromobility are traveling more in afternoon and evening hours, which suggests that trip purposes may be expanding beyond commuting to include errands or leisure trips. People are using shared micromobility for longer trips as well. This trend suggests increased micromobility use due to a hesitancy to use transit or increased use for recreational trips on new open streets or protected facilities. It may also reflect increased adoption by critical workers with non-conventional work schedules, who have been provided free or reduced costs memberships in many cities.

IMPACTS TO LOCAL JOBS
The nature of work will continue to change as we shift towards an automated, tech-driven workplace.

Historically, the development of new technologies have transformed the workforce and created new and different types of jobs. There is currently much debate on whether automation and electrification will lead to a large-scale, jobless future through displacement of workers or whether a jobless future might be countered by creation of jobs that currently do not exist.

It's likely that as automation expands and intensifies, jobs resulting from these changes will require different skills than those possessed by displaced workers. This may increase the skills and wage gap between different groups of employees. When jobs are created by automation, they may be located at a distance from where the technology or service is deployed. Manufacturing, one of the largest industries in San Jose (16% of the workforce), will likely experience changes as automation and driverless trucking expands.

As electrification expands, the auto industry will need to change and adapt. Traditional jobs that support the industry, such as car repair, parts suppliers, and recycling/reclamation companies, may need to rethink how they operate.

Sources:
- *New Technologies, Productivity, and Jobs: The (Heterogenous) Effects of Electrification on US Manufacturing (November 2020)*
- *Preparing the Workforce for Automated Vehicles (American Center for Mobility)*
- *Driverless: Intelligent Cars and the Road Ahead (Lipson, H., Kurman, M.)*
- *The Employment Impact of Autonomous Vehicles (U.S. Department of Commerce)*

IMPACTS ON PUBLIC SPACE
Limited right-of-way is shared with new uses and demands, including shared mobility, EV infrastructure, automated delivery vehicles, and more.

The public right-of-way is shifting away from private vehicle storage towards people-oriented spaces. Cities are repurposing metered parking spaces for parklets, plazas, shared micromobility corrals, and electric vehicle charging equipment. As new uses and demands continue to vie for limited space, cities are taking a more active role stewarding their street. The COVID-19 pandemic has inspired communities to rethink public space, prompting opportunities to use traffic lanes to accommodate people walking and biking. These programs have become impromptu pilots for reimaging streets as human-centered spaces for gathering.

IMPACTS ON EXISTING REVENUE

Demand for on- and off-street parking and ticketing is declining, creating opportunities to explore different funding sources.

To the extent that new mobility options facilitate people's ability to travel without a car and new services require demanding space for docking, traditional revenue streams such as parking (on-street and off-street), ticketing, and vehicle registration fees are likely to decline. This provides an opportunity to rethink funding strategies and better align them to the City's goals. Many cities are already experimenting with converting parking spaces to alternative uses. Washington D.C., for instance, recently completed a pilot that allows a variety of on-demand commercial uses, including TNCs, food delivery drivers, and commercial deliveries, to pay for and reserve curb space. Traditional parking revenue was replaced with loading zone reservations while simultaneously addressing curbside congestion.
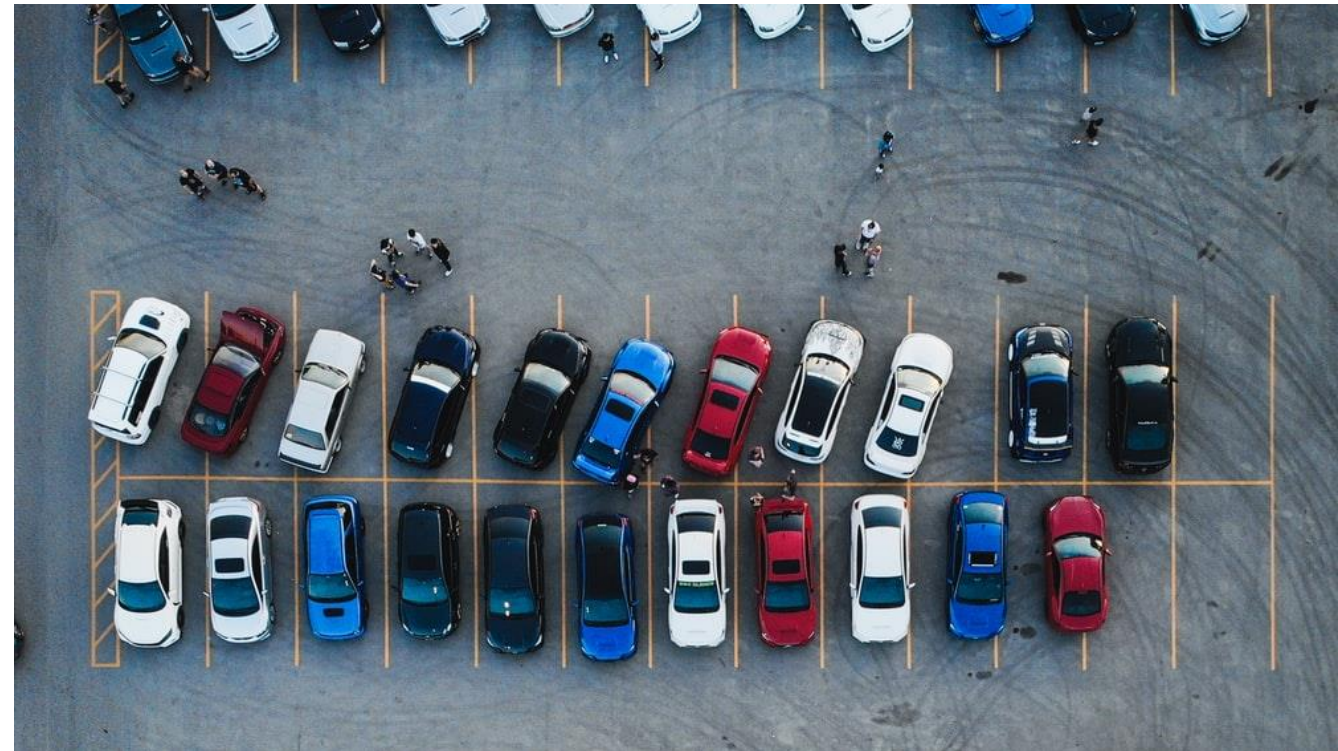
DATA, COMMUNITY, AND THE CITY

San José Emerging Mobility Action Plan
Just Movement: Learning from Our Past to Move All San Joseans Forward

LOOKING BACK TO MOVE FORWARD

San José is developing a plan to prepare for the changing mobility landscape. We will prioritize Black indigenous, and people of color to reflect their unique lived experience in San José. To do this, we are building a framework that elevates community voices and centers racial and social equity in Emerging Mobility policy and programs.

Planning for a future of equitable mobilities requires the City and community to reflect on the past. *Just Mobility* is resource that tells a story about how our communities experience and have been impacted mobility, infrastructure, and policy. Where are we in the story?

| 01 Welcome to San José | 02 The History of Infrastructure and Mobility | 03 The Hope and Harm of Emerging Mobility | 04 Data, Community, and the City |

DATA FOR THE PUBLIC

Data is the **common thread** underpinning Emerging Mobility services and technologies. Data is used to **connect people to places** and **make informed decisions** about where and how to serve communities. Mobility data is **a new kind of infrastructure** that San Jose manages, protects, and leverages for the public good.

BRIDGING THE GAP BETWEEN COMMUNITY NEEDS, EQUITY, AND EMERGING MOBILITY

The City is a playing a role regulating and partnering with mobility providers and will use data to help measure equity outcomes.

› *Payment*: Is there a cash option?

› *Education and outreach*: Is there a requirement?

› *Workforce development*: Can local-hire be required?

› *Deployment*: Is racial and economic equity core to deployment strategy?

› *First/last mile:* Is emerging mobility being used to increase access to transit-poor communities?

› *ADA Accessibility:* Does emerging mobility provide options for people with disabilities?

› *Enforcement*: Are there plans to increase enforcement around emerging mobility and conflicts with other modes? Do these plans consider inclusivity, racial equity, and policing reform work?

› *Digital Divide:* Does emerging mobility address the digital divide and some communities' lack of access to technology to utilize service?

ENCODING POLICY INTO
DIGITAL TOOLS

DEFINING THE POLICY LANDSCAPE

At the core, a city has three street stewardship functions

Any city has three stewardship functions which revolve around policy: plan and express policy, regulate and enforce policy, operate and achieve policy. This stewardship is traditionally viewed as stewardship of the public realm. For the last 100+ years, beginning with the first stop sign, local governments have discharged this stewardship using devices and instruments from the Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD, issued by the Federal Highway Administration of the U.S. Department of Transportation, specifies standards for signs, road markings, and signals. Technology companies show the limitations of this status quo. The fundamental issue is that tech companies operate in both the physical realm and the digital realm. This then leads to the idea that city stewardship is needed in the **digital realm** as it is present in the **physical realm**.

The digital public realm is a less fixed, more **dynamic** medium for the exchange of information with potential to address the dynamic demand for our limited physical environment. Cities have long been working to manage and regulate the public right-of-way, embedding information in the built environment for a very long time. Markers on buildings, pavement striping, curbside signs and wayfinding, for example, serve as either a temporary or permanent record of public policies, rules, and regulations. These are guides to the expected use of our physical world. How the physical public right-of-way is used is a good model as we consider what a real digital public right-of-way might be like.

DEFINING THE POLICY LANDSCAPE

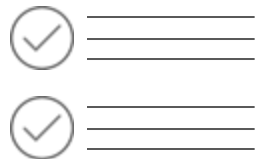## At the core, a city has three street stewardship functions
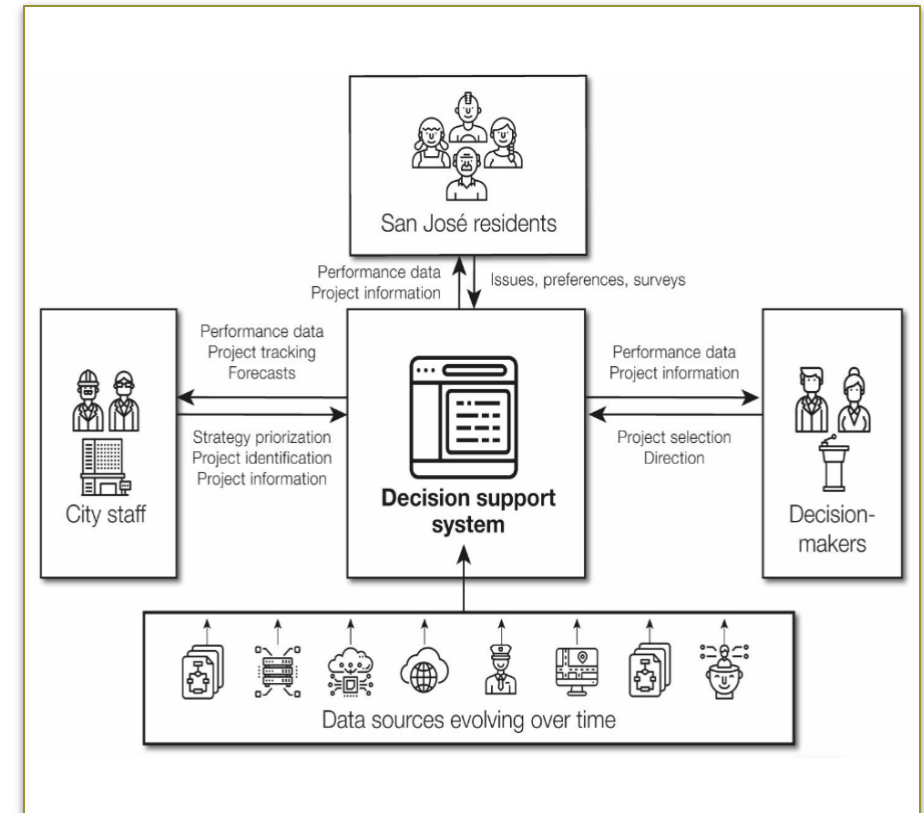
Public Realm* Stewardship Functions

Plan and Express Policy
Land use, where to invest, what to invest

Regulate and Enforce Policy
Ensuring all those operating in the public right-of-way align with policy-based outcomes

Operate and Achieve Policy
Orchestrate the public right-of-way to ensure safety and balance among use

The public realm is comprised of both the **physical realm and **digital** realm. Leveraging policy that influences both realms is critical for success in the public right-of-way.*

EXISTING SAN JOSÉ APPROACH TO MDS

Operational Compliance at the Forefront

To understand San José approach to MDS, we synthesized materials defining applications of MDS agency and real-time data provided by the City. Today, San José is using MDS to ensure operational compliance by two dockless mobility operators (Bird & Lime). There may be opportunities to expand to additional operators in the future.

San José currently leverages MDS for **planning and enforcement**, including in-field data validation, public emergencies, establishing geofence restrictions (both temporary and permanent), and deployment monitoring.

Initial **goals** for MDS include

- Procuring a system that can help the City manage micromobility and eventually other modes,

- Understanding operations in communities of concern,

- Developing incentives to drive equity that are based on real need, and

- Improving alignment with permit costs and structure.

The City currently partners with Blue Systems to help manage the technical integration relationship with mobility providers. Current challenges include limited staff resources to handle the procurement, set-up, and management of tools.

EXISTING SAN JOSÉ APPROACH TO MDS

Operational Compliance at the Forefront

To ensure operational compliance by permitted mobility operators, San José leverages the **Mobility Data Specification (MDS)**. Through MDS, operators can send notifications that enable many use cases:

1. **Field Data Validation**
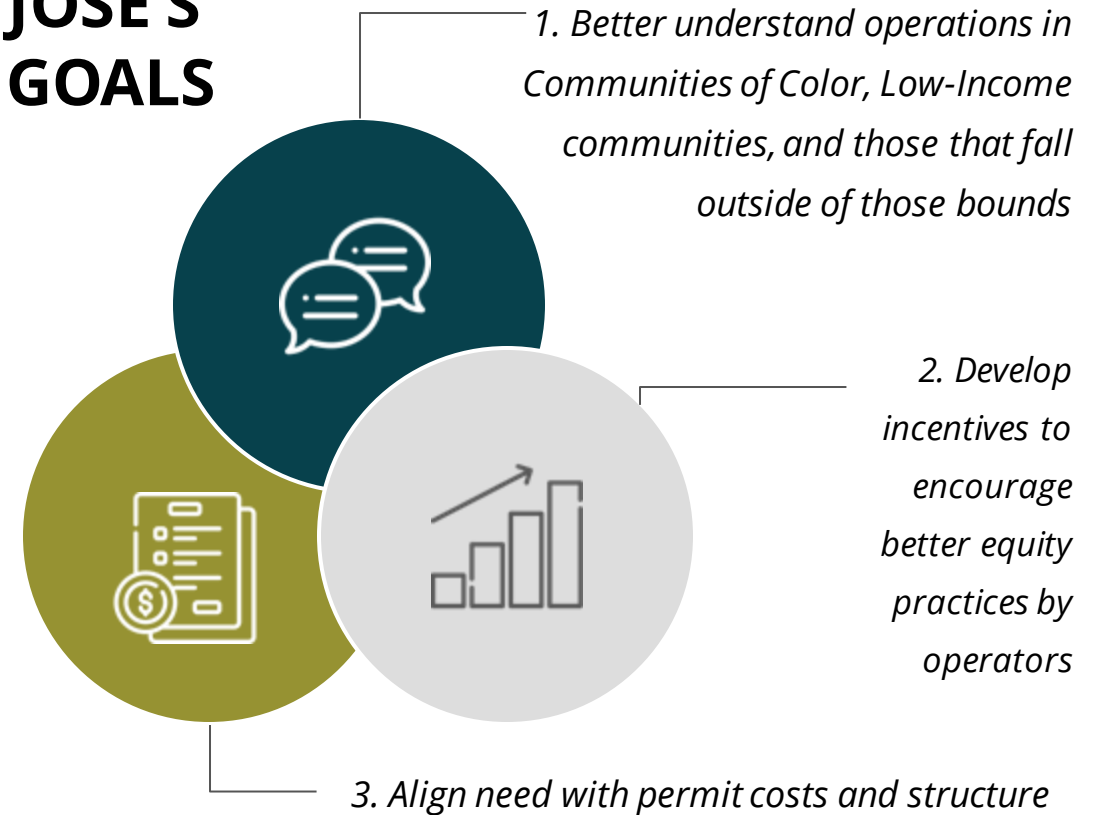
2. **Emergency Management**

3. **Geofences**
   (Temporary and Permanent)

4. **Deployment Monitoring**

SAN JOSE'S MDS GOALS

1. Better understand operations in Communities of Color, Low-Income communities, and those that fall outside of those bounds

2. Develop incentives to encourage better equity practices by operators

3. Align need with permit costs and structure

USING MDS DIGITAL POLICY TO IMPROVE TRANSPORTATION EQUITY

Equity is multi-modal and interconnected throughout San José. MDS Digital Policy provides a technology-forward avenue to promote and measure equity with commercially operated transportation companies operating in the San José public right-of-way. It is important to note that MDS does not automatically tell us what underserved communities want, but it is flexible enough to address shared community interests and needs in ways that traditional signs/paint could not. For example, community engagement and other data observed through MDS can help to inform what the right incentives are. Once incentives are determined, these can be implemented through MDS Digital Policy. Some examples include:

- Pricing incentives (e.g. equity zones)

- Availability of devices / modes in traditionally underserved areas, expressed as density of devices, access time, or other metrics that address the mode and community concerns.

- Avoiding oversaturation in specific geographies

- Avoiding drive-through burden with other modes (safety, emissions)

- Flag high-traffic areas to prioritize for additional protected infrastructure

- Address community complaints quickly/efficiently through 311 integration

USING MDS DIGITAL POLICY TO IMPROVE TRANSPORTATION EQUITY

MDS will help San Jose achieve equity goals through the implementation of digital policy by addressing community needs in ways that **traditional physical infrastructure cannot.** Through community engagement, San José can better understand mobility needs and define effective incentives to address those needs through MDS Digital Policy.

Establish Pricing Incentives

Device & Mode Availability

Prioritize Safety & Emissions

Address Complaints Efficiently

Equity Use Case: **Taxi**

- Reflected as **the wait time for a passenger pickup** in a geography
- Strictly a function of driver behavior, not rider behavior
- Area of transportation that has historically lacked equity
- Could inform new taxi regulations requiring wait time compliance

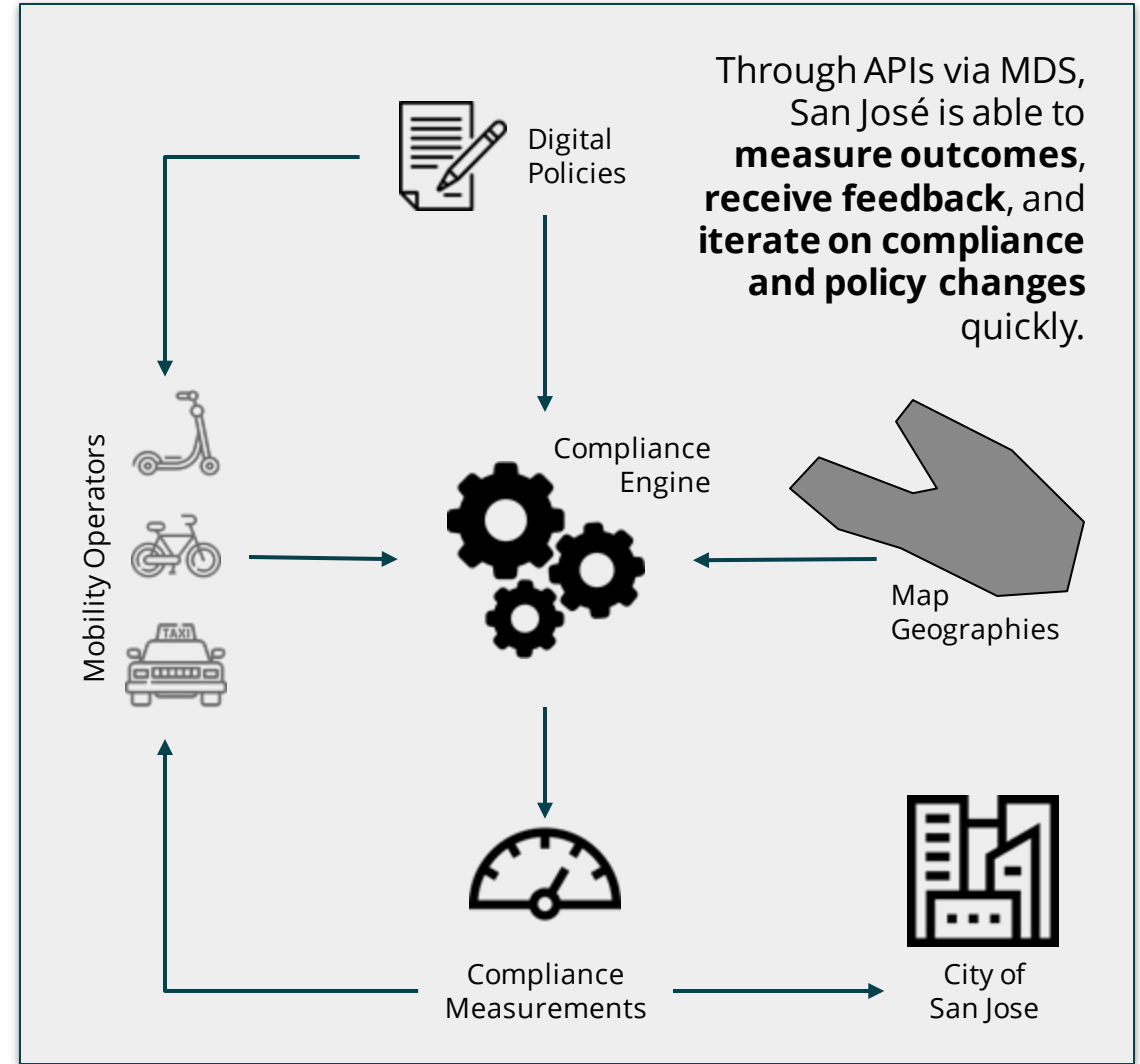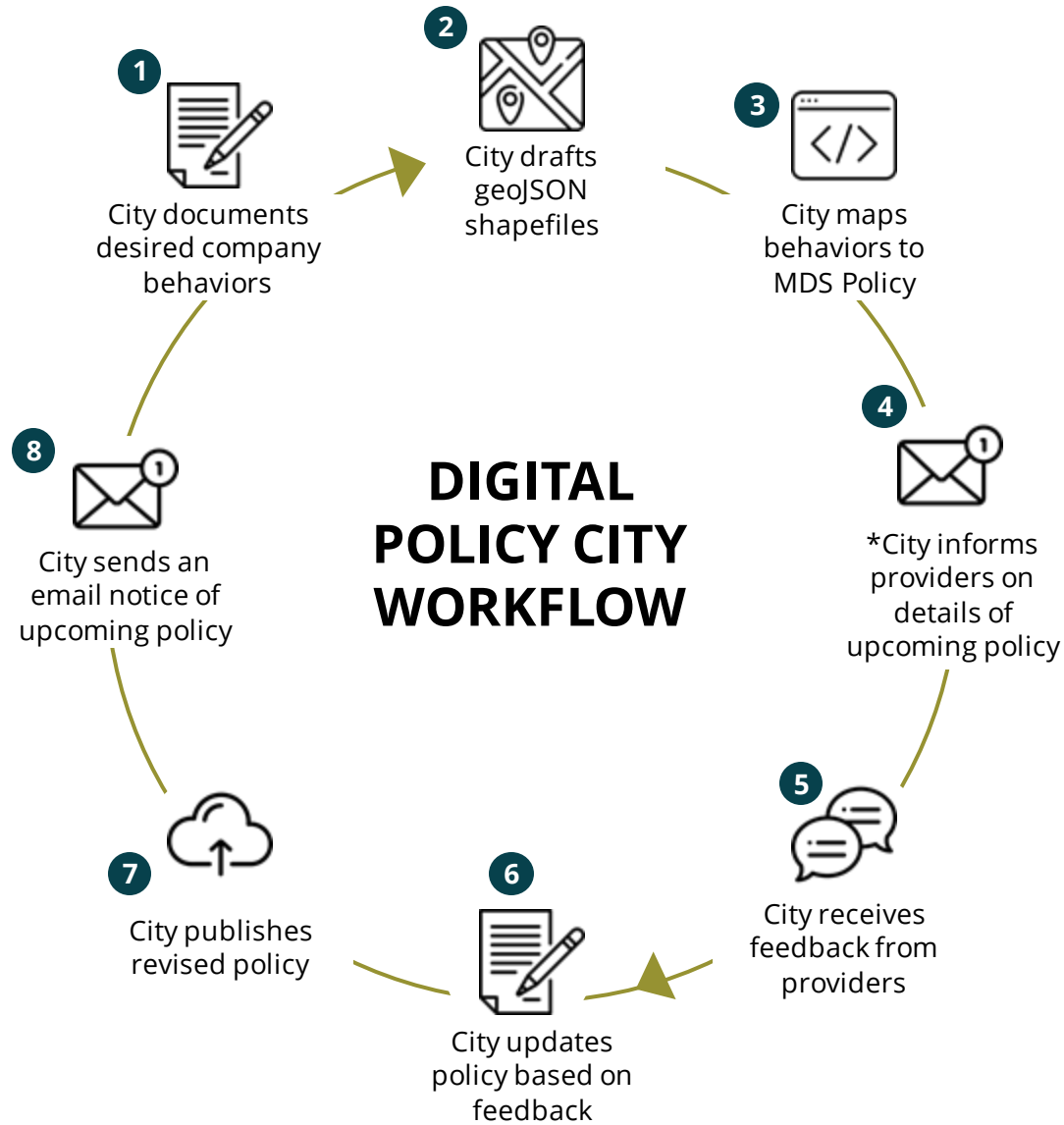## Equity Use Case: **Micromobility**

- Transform **vehicle deployment by geography** into a more readily interpretable metric (avg. access distance to locate a device)
- Distribution of access over time is more insightful than a single point
- Could allow comparisons across providers of compliance

SAN JOSÉ MDS COMPLIANCE CONCEPTUAL OVERVIEW

The next slide illustrates the internal city process for publishing digital policy as a circular motion because San José will be able to iterate and update policies until the desired outcomes are reached, taking into account feedback from mobility providers and the community.

San José has the opportunity to further leverage MDS Digital Policy to better measure permitted operator compliance to published policies. Through this system, San José will build city-developed datasets in which they have 100% confidence. Most importantly, San José has the ability to manage compliance with mobility providers through policy that is flexible and accurate enough to reflect feedback and desires from residents and visitors.

SAN JOSÉ MDS COMPLIANCE CONCEPTUAL OVERVIEW

DIGITAL POLICY CITY WORKFLOW

1. City documents desired company behaviors
2. City drafts geoJSON shapefiles
3. City maps behaviors to MDS Policy
4. *City informs providers on details of upcoming policy
5. City receives feedback from providers
6. City updates policy based on feedback
7. City publishes revised policy
8. City sends an email notice of upcoming policy

Mobility Operators

Digital Policies

Compliance Engine

Map Geographies

Compliance Measurements

City of San Jose

Through APIs via MDS, San José is able to **measure outcomes**, **receive feedback**, and **iterate on compliance and policy changes** quickly.

*Currently, **Blue Systems** helps manage technical data integration while San Jose manages permitting of devices.

POLICY CHALLENGES & OPPORTUNITIES

Policy challenges include getting operators onboard with data standards and sharing data with community members who can play a key role in validating and shaping decision-making for the right incentives based on need. Other challenges include integrating data and information from multiple sources (e.g., surveys, Kiwibots, e-scooters, 311 complaints, equity measures), administrative limitations, and finding more affordable and sustainable ways to provide accessibility to the city.

The City of San José collects trip data. Vehicle data may help the city identify right-of-way concerns, such as oversaturation of vehicles in a certain area. The City can use de-identified trips to understand ridership trends and utility of the services, to inform safety improvements and other planning efforts.

POLICY CHALLENGES & OPPORTUNITIES

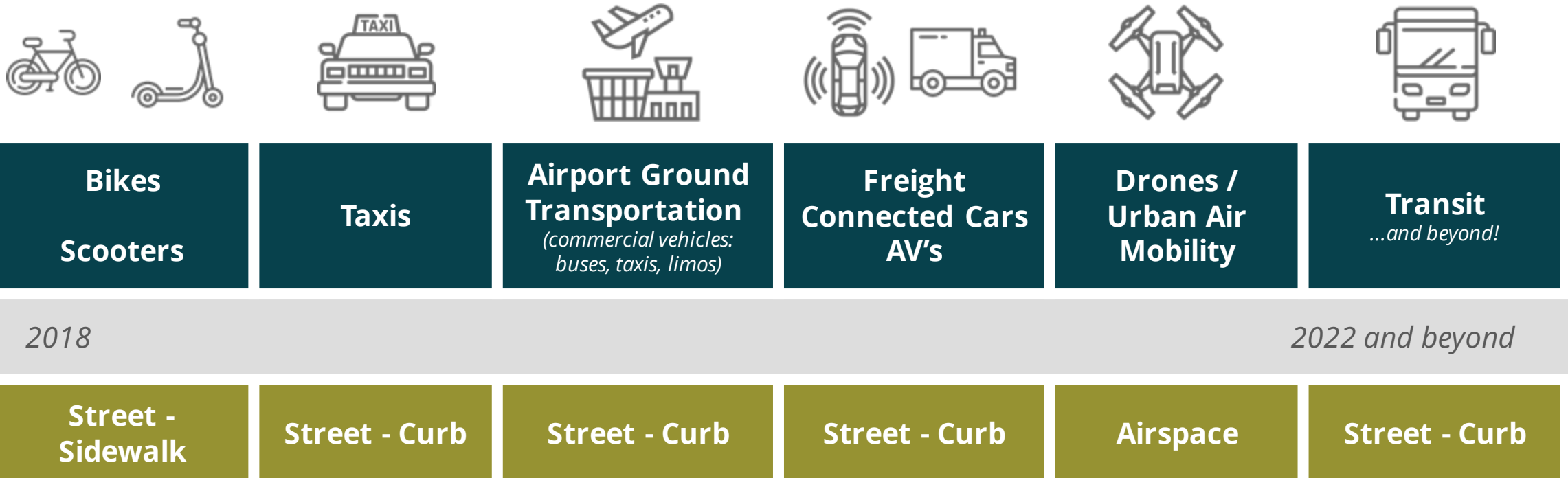| CURRENT CHALLENGE	DIGITAL POLICY OPPORTUNITY
Open Standard Awareness	• Increase in access to knowledge, resources • Community-based incentives • Public right-of-way stewardship discussions
Multiple Data Sources	• Streamlined data processing through APIs • Single source of truth on a shared platform • Adjustable policy to reflect qualitative data
Dedicated Resources	• Additional personnel can address gaps and determine overall trends through planning • Conduct additional qualitative outreach
Data Access	• Company notifications help San José identify public right-of-way concerns • K-anonymized trips provide ridership trends overall • Provide data in the San José Open Data Portal

EXTENDING MDS TO OTHER MODES

Digital Policy is Growing in Scope and Size Over Time

MDS allows municipal agencies to generate valuable insights through a shared notification vocabulary and to communicate policy directly to commercially operated transportation companies in real time using code. Today, it enables cities to manage dockless scooters, bikes, and taxis. Tomorrow, that could be buses, autonomous cars, drones, and whatever else the future may hold.

EXTENDING MDS TO OTHER MODES

Digital Policy is Growing in Scope and Size Over Time

MODES	Bikes Scooters	Taxis	Airport Ground Transportation *(commercial vehicles: buses, taxis, limos)*	Freight Connected Cars AV's	Drones / Urban Air Mobility	Transit *...and beyond!*
	2018					2022 and beyond
ASSETS	Street - Sidewalk	Street - Curb	Street - Curb	Street - Curb	Airspace	Street - Curb

OMF — OPEN MOBILITY FOUNDATION

Governed by cities, the **Open Mobility Foundation** develops and promotes technology used in commercial products that either use the public right-of-way (PROW) or that help government entities manage the PROW. The City of San José is a **founding OMF member** and continues to support regularly through Ramses Madou's leadership.

EXHIBIT B

MEMORANDUM

To: Laura Stuchinsky, San Jose Dept of Transportation

From: Toole Design, Nelson\Nygaard, San Jose Dept of Transportation

Date: June 1, 2021

Subject: San José Emerging Mobility Action Plan Survey Memo

BACKGROUND

As a part of the development of the *San José Emerging Mobility Action Plan*, the project team conducted a survey to gain insight into the travel preferences and mobility challenges facing people in San José, especially for emerging and non-traditional modes of transportation. As racial equity is central to the *Emerging Mobility Action Plan,* the survey sought to discern demographic patterns for these issues based on race, ethnicity, and income.

This memo explains the development and deployment of the survey, summarizes the findings, and outlines key takeaways for ongoing planning efforts. It is important to note that this was not a scientific survey given the steep challenges in securing a representative and high (more than 50%) response rate, particularly in historically disadvantaged communities. The percentage responses cannot be generalized with any certainty. But, the responses may be viewed as an indication of the perspectives and concerns of San Jose residents and communities. These finding will be reviewed by the Emerging Mobility Action Plan's Equity Task Force and the City's communities for their accuracy and usefulness.

SURVEY DEVELOPMENT

The survey tool was developed in collaboration with City staff and the Equity Task Force, a nine-person advisory group comprising community-based organizations and community leaders who represent many of the City's disadvantaged communities. The survey tool relied heavily on multiple choice options. It was designed to take approximately 15 minutes to complete.

The survey was organized into three sections:

- The first section asked questions about the respondent's transportation needs, including how difficult and expensive they find transportation and what modes they typically use.

- The second section focused on preferences for various transportation modes and barriers to using emerging mobility options.

- The third section asked questions about demographics, including race and ethnicity, age, gender, education, and income.

The survey responses revealed the survey participants' perspectives on emerging mobility as well as more traditional modes. Figure 1 shows the specific modes that were asked about in the survey.
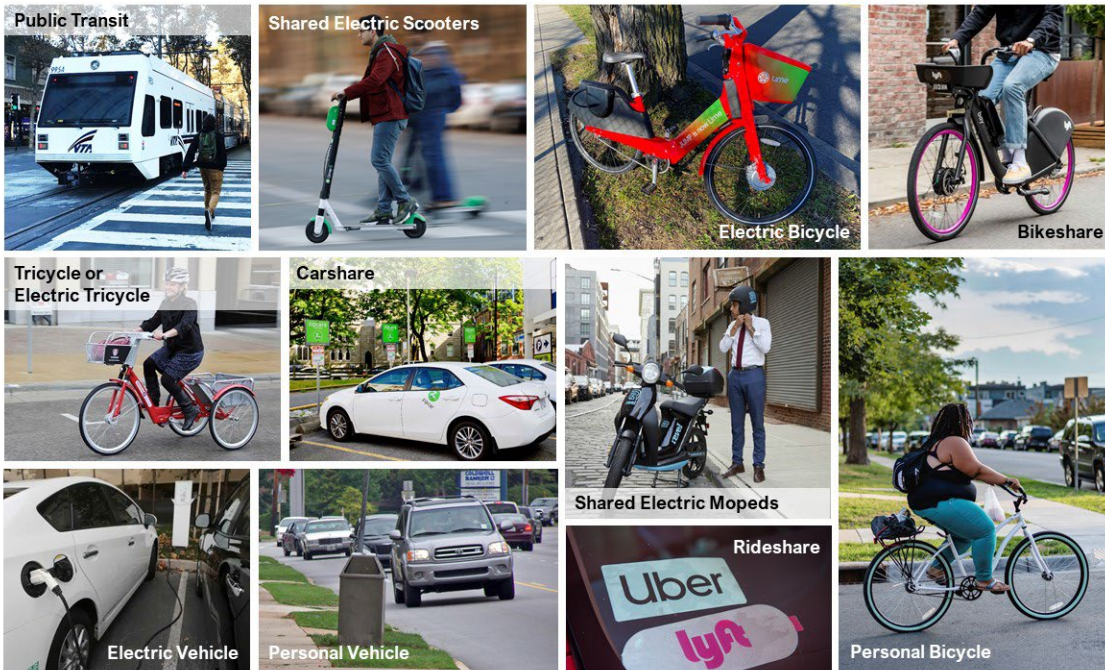
Figure 1 Traditional and emerging transportation options. This graphic was used in the survey.

Survey participants were asked if they knew about each transportation option, if they knew about them but did or did not use them, or if they used them. Additionally, if they knew about the option but did not use it, they were asked why (multiple choice). This series of questions provides a basis for understanding modal trends across San José.

Due to privacy concerns, location data was not collected; however, respondents were given the option to take a separate questionnaire that was linked at the end of the survey. This questionnaire asked for the respondent's zip code and was intended to be used to assess the geographic reach of the survey. Unfortunately, few responded completed the second questionnaire.

For a full list of the questions, please see Appendix B.

SURVEY DEPLOYMENT

The survey was open for five weeks from April 8, 2021 through May 15, 2021. To address language barriers, the survey was provided in five languages: English, Spanish, Vietnamese, Farsi, and Tagalog, and was reviewed by the Equity Task Force. The Task Force played a critical role in distributing and promoting the survey to the City's Black, Indigenous and People of Color (BIPOC) communities as well as other disadvantaged communities. One of the City Council offices included the survey link in its district newsletter to its constituents. The survey was also posted on the *Emerging Mobility Action Plan* website (movesanjose.org) and on San José's social media accounts.

There were a substantial number of responses with IP addresses outside of San José, including outside California and some international. In several instances, numerous responses were

generated from one IP address minutes apart, suggesting they were produced by a robot. We anticipate this may be due to the survey having been posted online with no access restrictions. After some discussion among the project team, we made the decision to remove all IP responses outside the SF Bay Area, reducing the number of completed responses from 821 to 320. More information on how the data was processed is provided in the Appendix.

ANALYSIS OF RESPONSES

As noted above, this is not a scientific survey. At the same time, many of the patterns observed in the survey reflect ones observed in other surveys and conversations with San José' community members. Some of the demographics of the respondents mirror those of the city at large, such as age and income distribution. Others do not, such as the educational attainment of respondents and the proportion who identified solely as White.

The survey responses will be reviewed by the EMAP Equity Task Force and the community at large for accuracy and usefulness.

Demographics of Respondents

Similarities between respondents and the city

- Income: Half of those who responded said that their annual household income was $100,000 or more, a proportion consistent with the city (54%). The rest of the respondents were spread fairly evenly across six lower income brackets, ranging from $0 to $99,000, with slightly more earning between $50,000 to $74,999 per year. That pattern is also consistent with the city*.*

- Age: The respondents were distributed across four age groups (18-34, 35-49, 50-64, and 65 and older) in proportion to their representation in the city.

Dissimilarities between respondents and the city

- Gender: The proportion of respondents that were women was slightly higher than the proportion in the city: 57% rather than 50%.

- Education: A high proportion of respondents (74%) reported having a college degree-- Associate, Bachelor's or graduate--as compared to 62%.

- Racial/Ethnic Identity: It is difficult to compare the racial/ethnic distribution of the respondents with that of the city, as the survey invited respondents to choose all of the groups with which that they identified. But, the respondents who identified themselves solely as White (as opposed to one of several identities) were over-represented in comparison to their proportion in the City (40% of respondents versus 26% in the city).

Note: All of these comparisons rely on data from the U.S. Census' 2019 American Community Survey (ACS) for the City of San José with the exception of educational attainment. For this topic, the most comparable census data was for the San Jose *urban area*, which includes the northern portion of Santa Clara County.

A breakdown of responses by annual household income, education and race/ethnicity are shown below. More tables are included in the appendix.
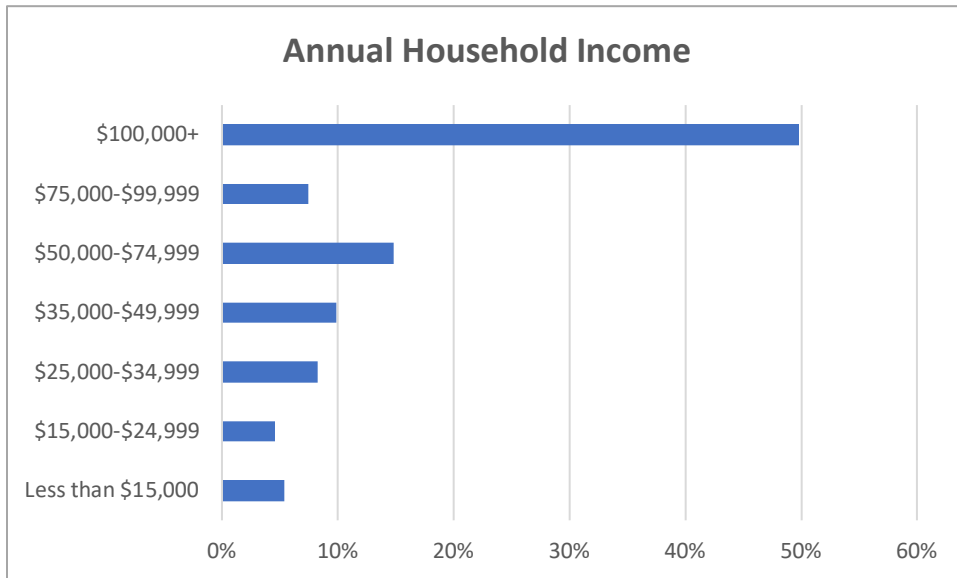
Figure 2: Annual Household Income
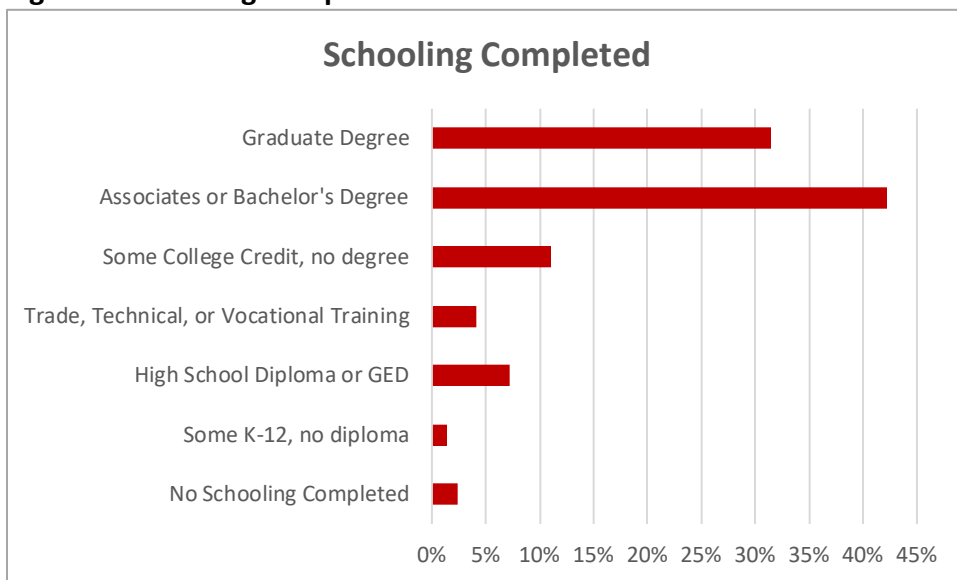

Figure 3: Schooling Completed

Figure 4: Race/Ethnicity

Respondents could select multiple options in response to a question about which races or ethnicities they identified with, consequently the total responses for this question exceed 320. "All" includes all responses for that racial/ethnic identity, whether that was the respondent's sole identify or one of several selected.
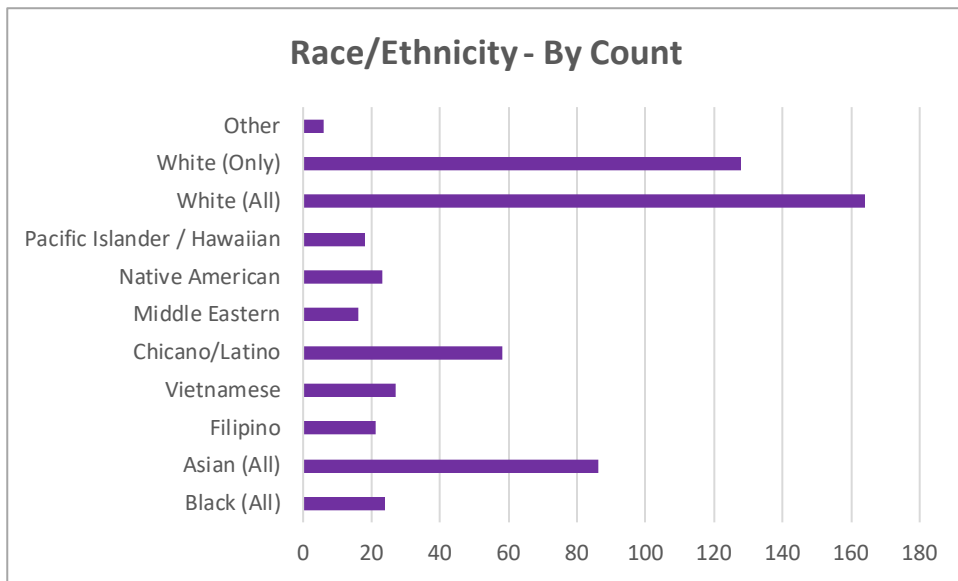

Table 1: Race/Ethnicity by Count (Cut? Drop bar chart?)

Race/Ethnicity	Count
Black (All)	24
Asian (All)	86
Filipino	21
Vietnamese	27
Chicano/Latino	58
Native American	23
Pacific Islander / Hawaiian	18
White (All)	164
White (Identified only as White)	136
Middle Eastern	16
Other	6

Transportation Mode Use

Despite the high cost associated with owning and maintaining a vehicle, the vast majority of the respondents (84%) owned or leased a car, including many with limited means.

More than 60% of respondents in households earning less than $50,000 per year owned or leased a car. According to U.S. Department of Housing and Urban Development, as of April 1, 2021, a three-person household—the average in San Jose – earning $74,600 or less a year would be considered very low income and eligible for low-income housing; It's $58,000 for a one-person household. Fully 94% of respondents whose household income was between $50,000 and 99,000 per year owned or leased a car, as high as households earning $100,000 or more annually. Yet at $106,000 per year, a three-person household would be considered low income.
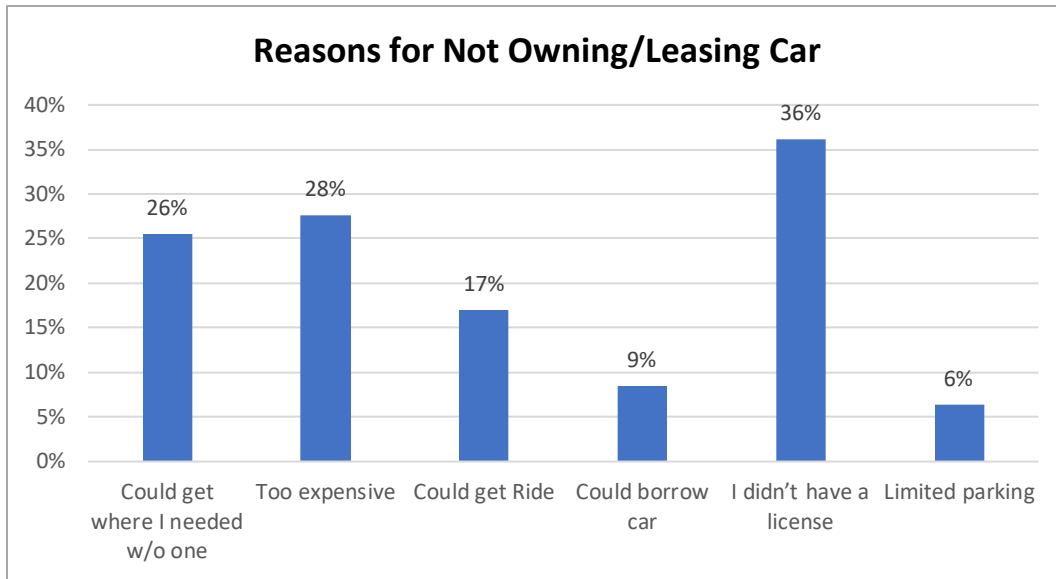
Figure 5: Own/Lease a Car
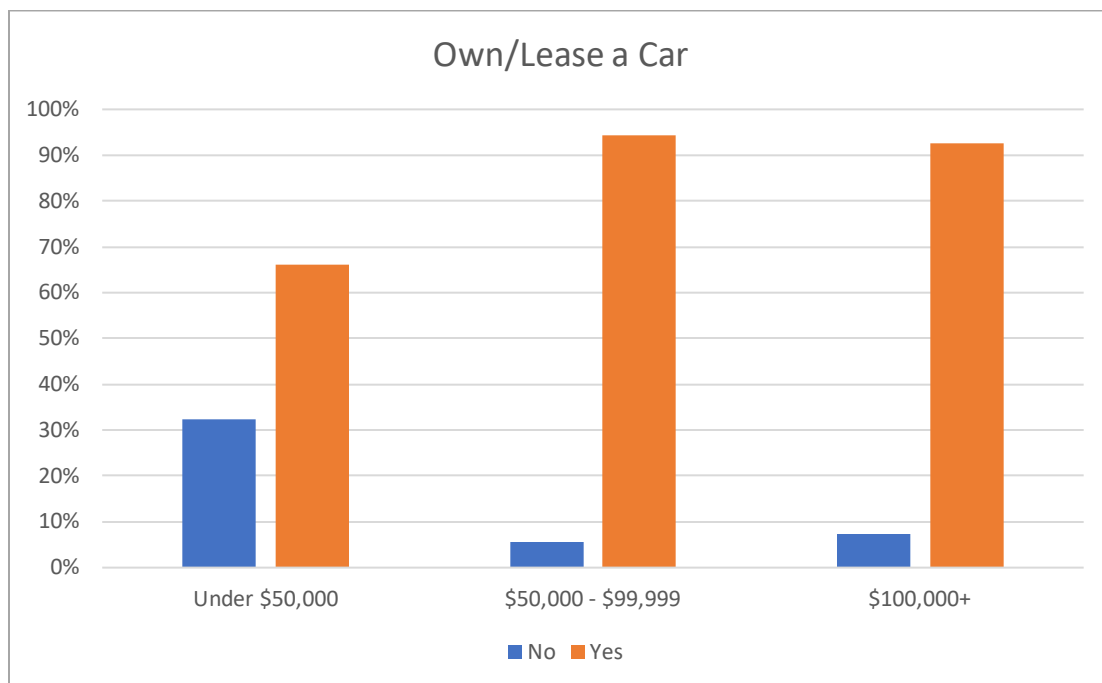
High levels of car ownership/leasing appeared to be fairly consistent across racial/ethnic groupings, ranging between 83% to 94% (See appendix).

As might be expected, the largest percentage of respondents who did not own or lease a vehicle were those earning less than $50,000 per year: 65%. But, 26% were those earning more than $100,000 per year. Hence, the reasons given for not owning a vehicle (Figure 6) represent both ends of the income spectrum.

The primary reason given was not having a driving license. Slightly more than a quarter of respondents said it was too expensive and/or they could get where they needed to without a vehicle. Parking was the least frequent reason given. Respondents could select more than one option.

Figure 6: Reasons for Not Owning/Leasing a Car

Reasons for Not Owning/Leasing Car

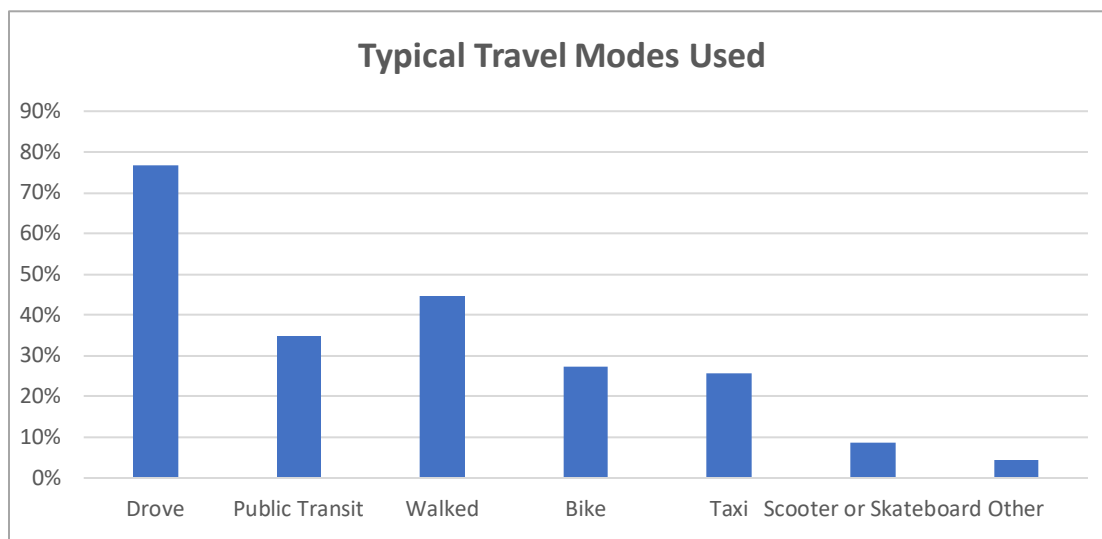| Category	Value
Could get where I needed w/o one	26%
Too expensive	28%
Could get Ride	17%
Could borrow car	9%
I didn't have a license	36%
Limited parking	6%

Transportation Modes Preferences

Consistent with the high rate of vehicle ownership/leasing, the majority of respondents (77%) said that pre-COVID they typically drove to get around the city. Respondents did use other modes for some of their trips. The survey asked respondents what their typical mode of travel was, however they were invited to select all modes used without prioritization. Consequently it is difficult to determine which modes, other than vehicles, were the primary ones used.

No more than 30% of respondents said they used public transit as a typical way that they get around. Similarly, slightly less than 30% said they typically used bikes, taxis or ride-hailing services. Interestingly, more than 40% listed walking as one of their typical modes.

Figure 7: Typical Travel Modes Used Pre-COVID

Typical Travel Modes Used

Mode	Value
Drove	77%
Public Transit	35%
Walked	45%
Bike	27%
Taxi	26%
Scooter or Skateboard	9%
Other	4%

Not surprisingly, the higher the income, the more people drive. What is notable is how similar driving rates are across income levels given how expensive it is to own and maintain a vehicle. Public transit usage is more typical among respondents earning less than $50,000 per year, but also among those earning more than $100,000 per year. Walking and biking have a clear connection to income; more higher-income respondents reported using these modes.

Figure 8: Typical Travel Modes by Income
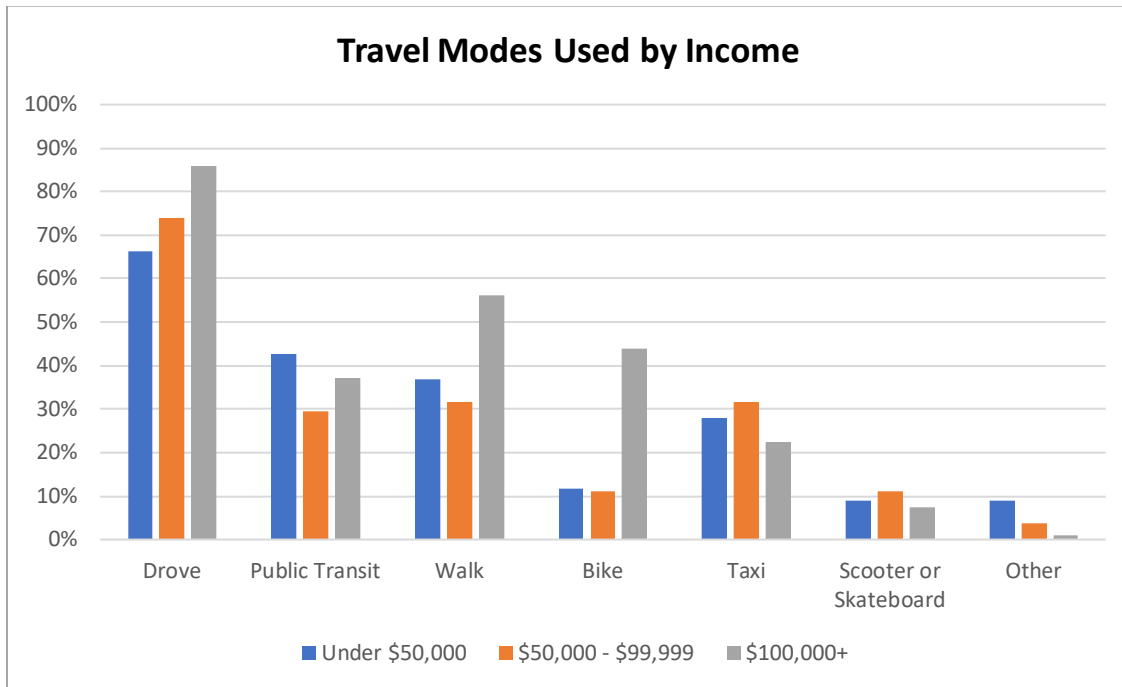
There were other variations noted among the respondents by gender, age and race/ethnicity. For example:

- Men biked at nearly twice the rate as women, a pattern that has been fairly consistent in U.S. biking studies.

- Younger respondents, those 18-34 years old, used public transit at nearly twice the rate of all the other age groups, while the 35-49 age group biked at approximately twice the rate of all the other age groups.

- Those who had some college or trade school education or less, were far less likely to drive than those with college degrees (an approximately 20 percentage point difference)

- Respondents who identified as Black drove at a far lower rate than those who identified as Asian (All), Chicano/Latino, and/or Caucasian (between 17 to 40 percentage points lower). (See appendix for more details).

Transportation Challenges

Ease of Travel in the San Jose-Area

Approximately 40% of respondents said that it was somewhat or very difficult to get where they needed to go pre-COVID, while 28% said it was somewhat or very easy. There was a bit more variation by age and income. Nearly half of respondents (46%) between the ages of 18 and 49 and nearly half (47%) of respondents earning less than $50,000 per year said it was somewhat or very difficult to get where they needed to go. (See appendix)
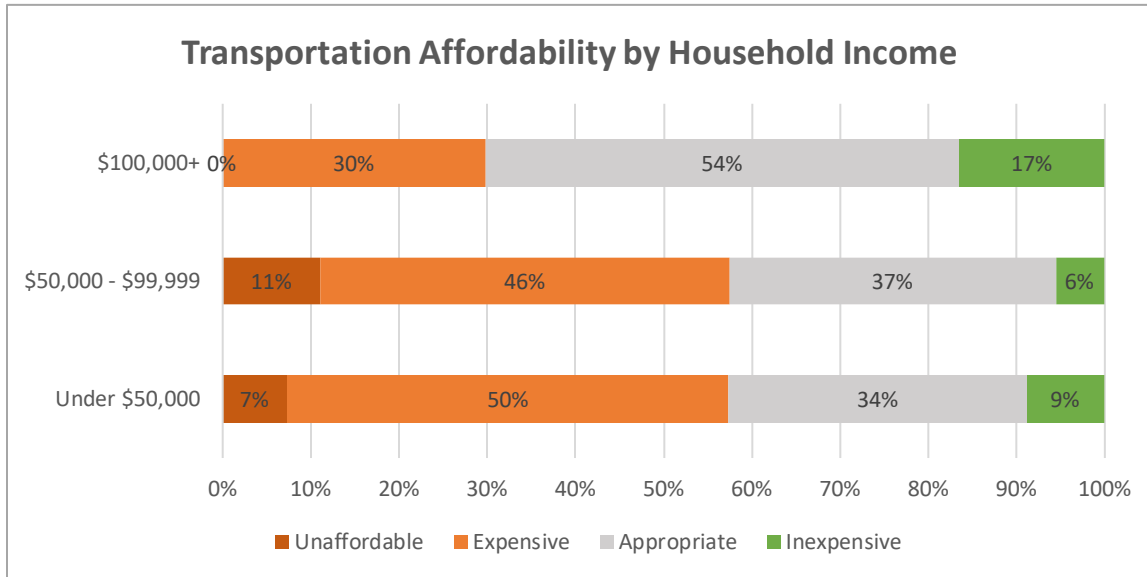
Figure 9: Ease of Travel

Ease of Travel

- Somewhat/Very Difficult — 40%
- Neither Difficult nor Easy — 31%
- Somewhat/Very Easy — 28%
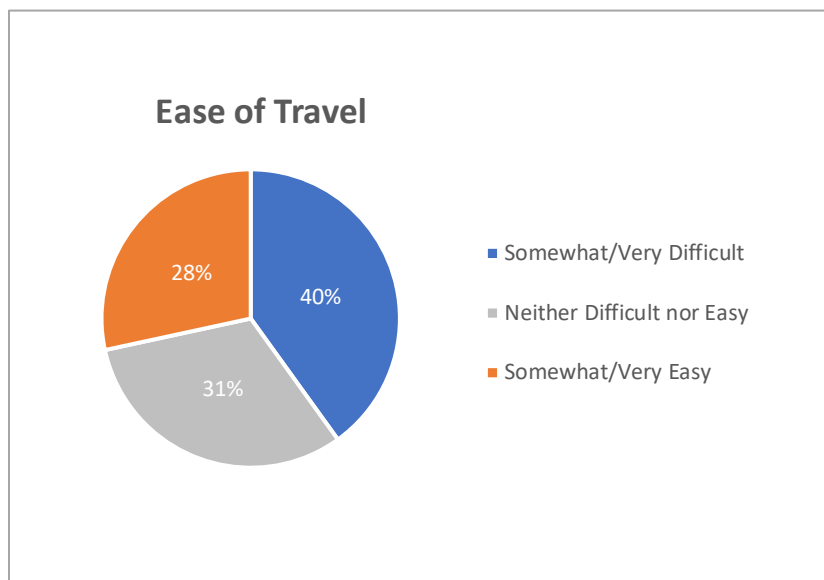
Transportation Affordability

Taken as a whole, the majority of respondents thought that transportation costs per-COVID were appropriate or inexpensive. That is because 71% of those earning $100K or more held that view.
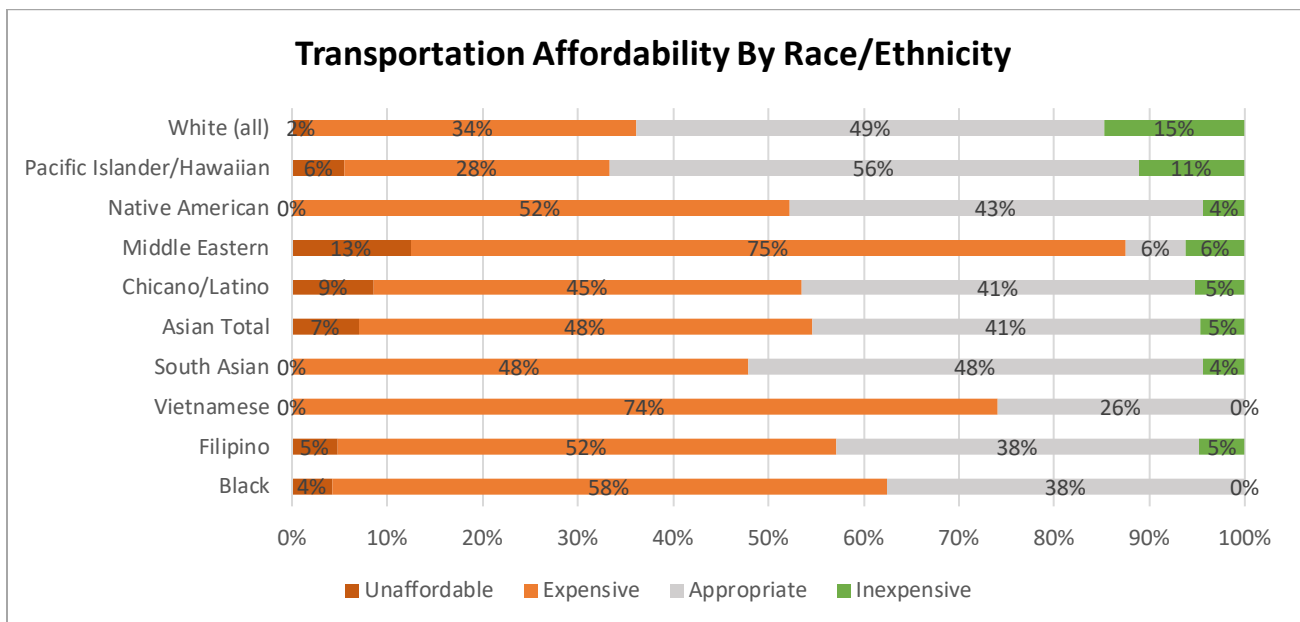
The majority (57%) of respondents earning less than $100,000 per year held the opposing view: transportation was expensive or unaffordable. That is likely because a very high percentage of these respondents own or lease a car (66% of those earning less than $50,000 per year and 94% of those between $50,000 and $99,999). Although more than a third of these respondents also said they typically use public transit and walk, it appears that many respondents felt that they need a vehicle to get where they need to go.

Figure 10: Transportation Affordability by Household Income

Transportation Affordability by Household Income

Income	Unaffordable	Expensive	Appropriate	Inexpensive
$100,000+	0%	30%	54%	17%
$50,000 - $99,999	11%	46%	37%	6%
Under $50,000	7%	50%	34%	9%

With the exception of respondents who identified as White and Pacific Islander/Hawaiian, a near or clear majority of respondents identified with the other racial/ethnic groups characterized their transportation costs as expensive or unaffordable. Eighty-eight of Middle Eastern respondents said that transportation was expensive or unaffordable. The primary outreach to the Middle Eastern community was done through Pars Equity Center, a member of the Equity Task Force, which provides legal and social services to Persian-speaking and other new immigrants. So, the survey results likely reflect the experience of relatively new immigrants rather than the entire Middle Eastern community.

Figure 11: Transportation Affordability by Race/Ethnicity

Transportation Affordability By Race/Ethnicity

Race/Ethnicity	Unaffordable	Expensive	Appropriate	Inexpensive
White (all)	2%	34%	49%	15%
Pacific Islander/Hawaiian	6%	28%	56%	11%
Native American	0%	52%	43%	4%
Middle Eastern	13%	75%	6%	6%
Chicano/Latino	9%	45%	41%	5%
Asian Total	7%	48%	41%	5%
South Asian	0%	48%	48%	4%
Vietnamese	0%	74%	26%	0%
Filipino	5%	52%	38%	5%
Black	4%	58%	38%	0%

Limitations Posed by Mode Preferences

While nearly half of all respondents said that they experienced no transportation difficulties, that view was primarily voiced (69%) by those earning more than $100,000. Those earning less than $99,999 said that transportation challenges created numerous limitations for them and their families, including the ability to save money, get to medical appointments, get to work, find more affordable housing, and visit friends and family. For those earning less than $50,000, saving money, getting to medical appointments, and buying groceries regularly were significant limitations. Respondents could select more than one option.

Figure 12: Limitations Posed by Transportation Difficulties by Income
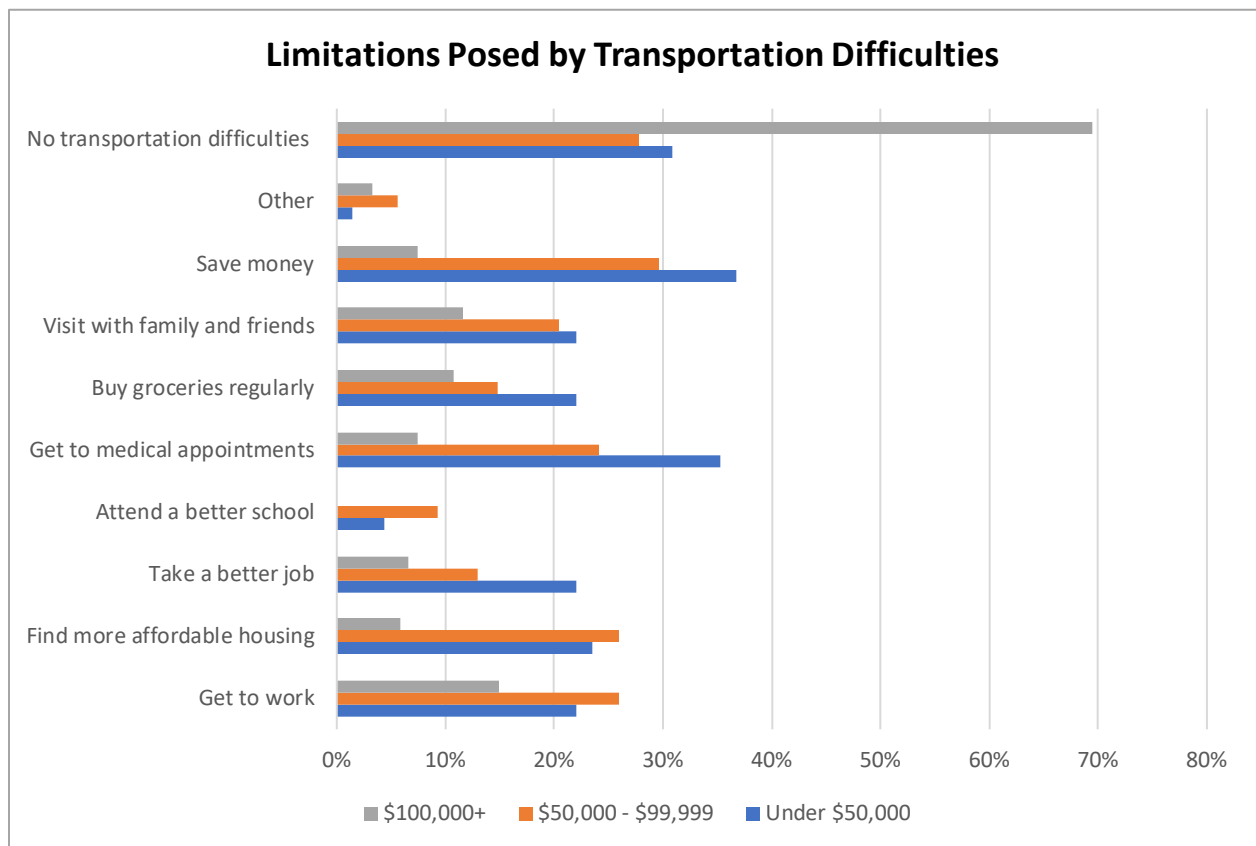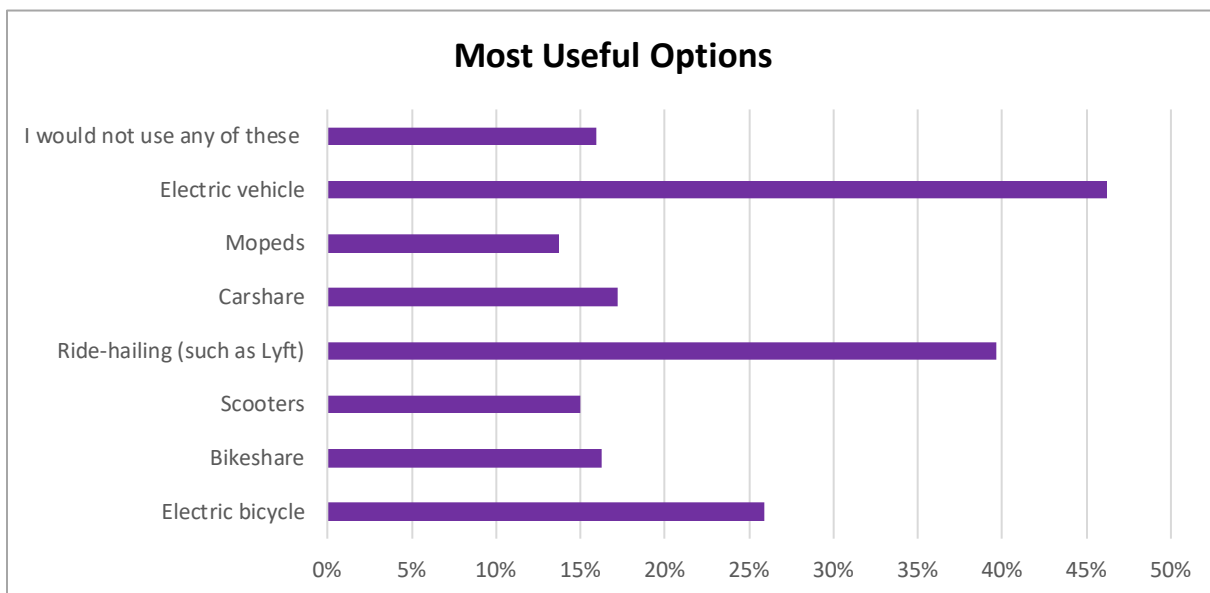

New Mobility Options

Most respondents said they were familiar with personal vehicles, public transit and bicycle, even when they didn't use them. Respondents were less familiar with electric vehicles as well as shared bikes, scooters and cars. Forty percent of respondents said they were unfamiliar with shared mopeds and electric tricycles.

Figure 32: Use of and Familiarity with New Mobility Options

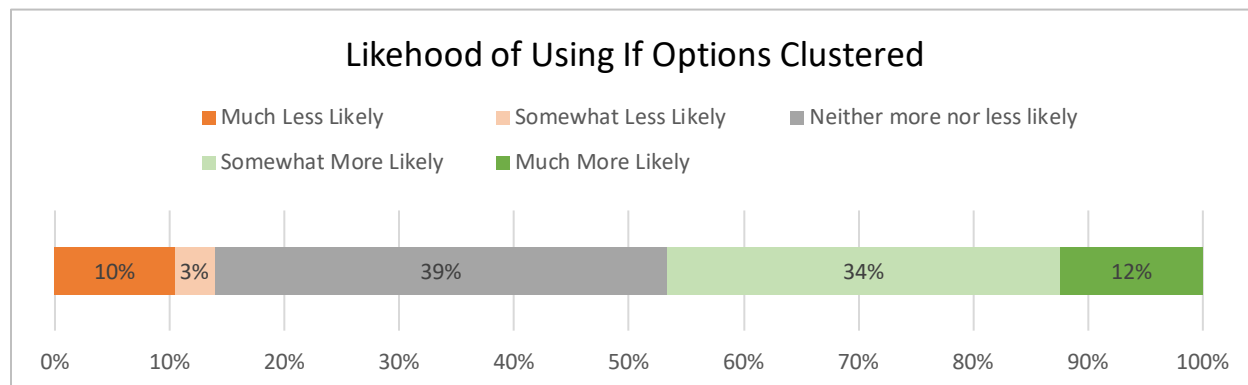**Use of and Familiarity with New Mobility Options**
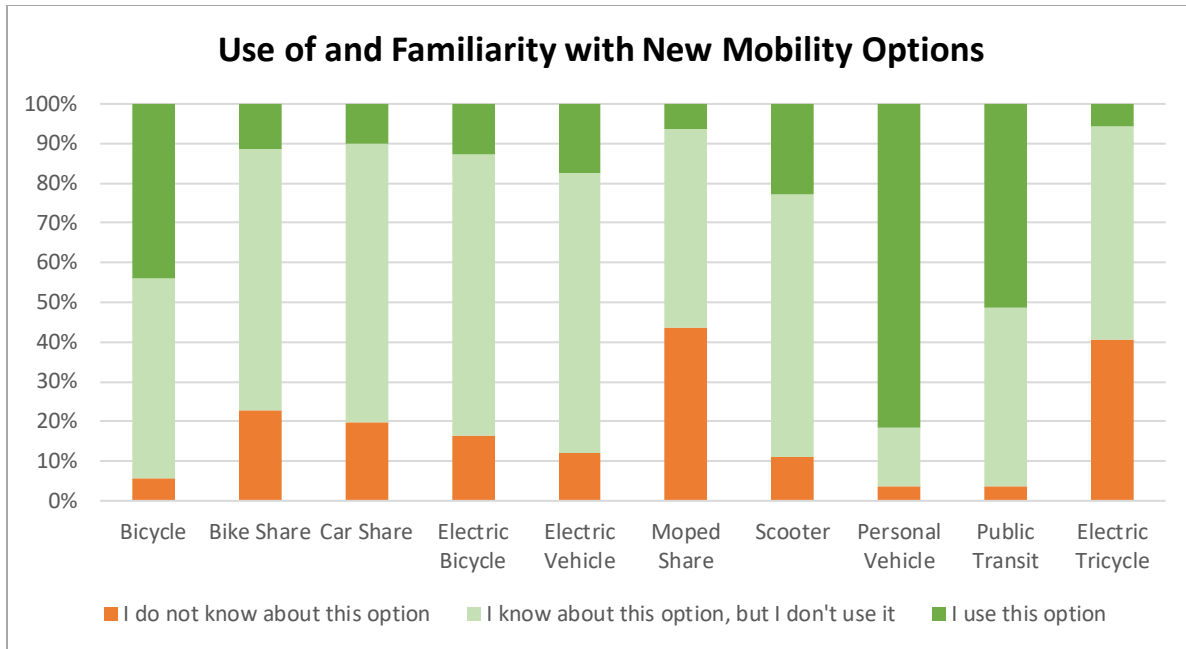
Respondents indicated that the transportation options that would be most useful to them--assuming the service was easy to use, convenient and affordable--were electric vehicles (46%); ride-hailing services (40%); and to a lesser extent electric bicycles (26%). Only a small percentage (14% to 17%) thought shared bikes, scooters, cars or mopeds would be useful.

Figure 13: Most Useful Options
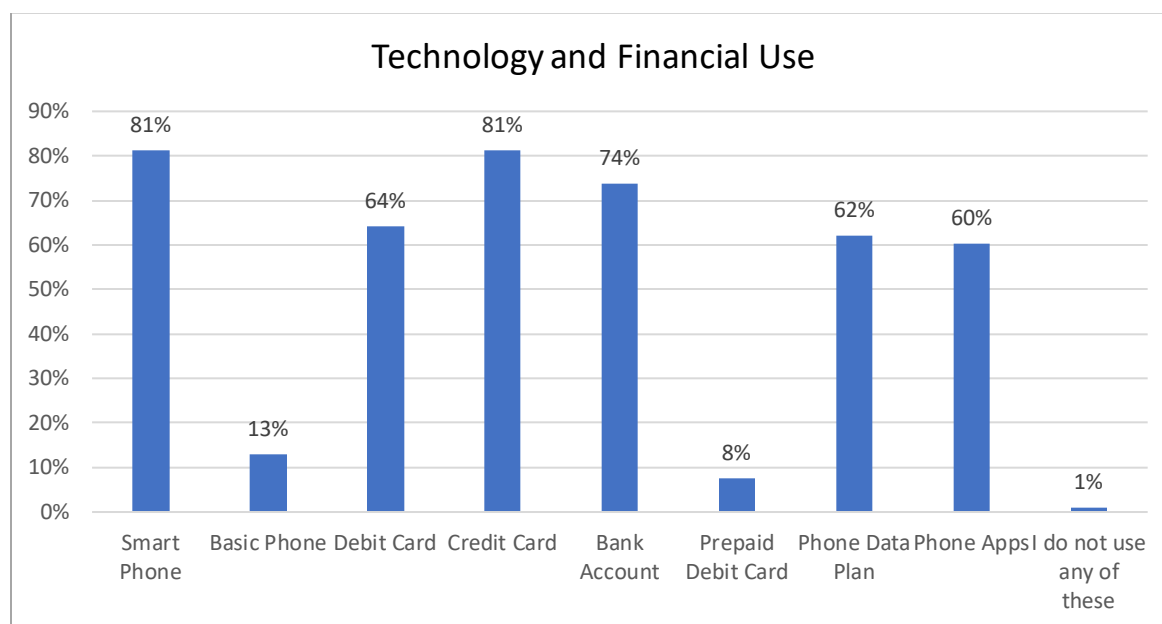

Most Useful Options

Nearly half (46%) of respondents said they were likely (somewhat and much more likely) to use new mobility options if they were available at the same location. More than a third said it would make no difference.

Figure 14: Likelihood of Using if Options Were Available at The Same Location

Likelihood of Using If Options Clustered

Legend: ■ Much Less Likely ■ Somewhat Less Likely ■ Neither more nor less likely ■ Somewhat More Likely ■ Much More Likely

| 10% | 3% | 39% | 34% | 12% |

(Axis: 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%)

Potential Impediments to Using New Mobility Options

The vast majority of respondents said they had access to smart phones, data plans, and financial tools. Only 13% said they relied on a basic phone. Eight percent said they used a pre-paid debit card. One percent said they did not use any of these tools. There may be more variance in experience by income and race/ethnicity.

Technology and Financial Use

Category	Value
Smart Phone	81%
Basic Phone	13%
Debit Card	64%
Credit Card	81%
Bank Account	74%
Prepaid Debit Card	8%
Phone Data Plan	62%
Phone Apps	60%
I do not use any of these	1%

CONCLUSION

Key Takeaways

While there are limitations to this survey, many of the findings are consistent with qualitative information provided by community leaders and information from other studies.

- <u>Heavy reliance on personal vehicles</u>: Despite the high cost to own and maintain a car, a majority of respondents--including those in income brackets eligible for low-income housing—own or lease a car. Fully 94% of respondents earning between $50,000 and $99,999 per year and 66% of those earning less than $50,000 are making the sacrifice to own or lease a car. The majority in both groups say driving is a typical means of travel. Clearly, these respondents and their families feel they don't have viable alternatives.

- <u>Lower income respondents and families pay a high price:</u> A majority of respondents in both lower income brackets said transportation costs were expensive or unaffordable and that transportation difficulties were imposing serious limitations on them and their families, including saving money, getting to medical appointments, finding more affordable housing and getting to work. However, more than a quarter of both lower-income groups said they or their family did not have transportation difficulties.

- <u>New Mobility Preferences- Most Useful</u>: Of the mobility options offered, respondents showed a clear preference for those most similar to their primary mode of travel— electric vehicles and ride-hailing. Like conventional cars, they offer on-demand, door-to-door service and can be used for longer-distance trips. Electric bikes were a distant third choice. All of the other options were shared and less familiar to the respondents.
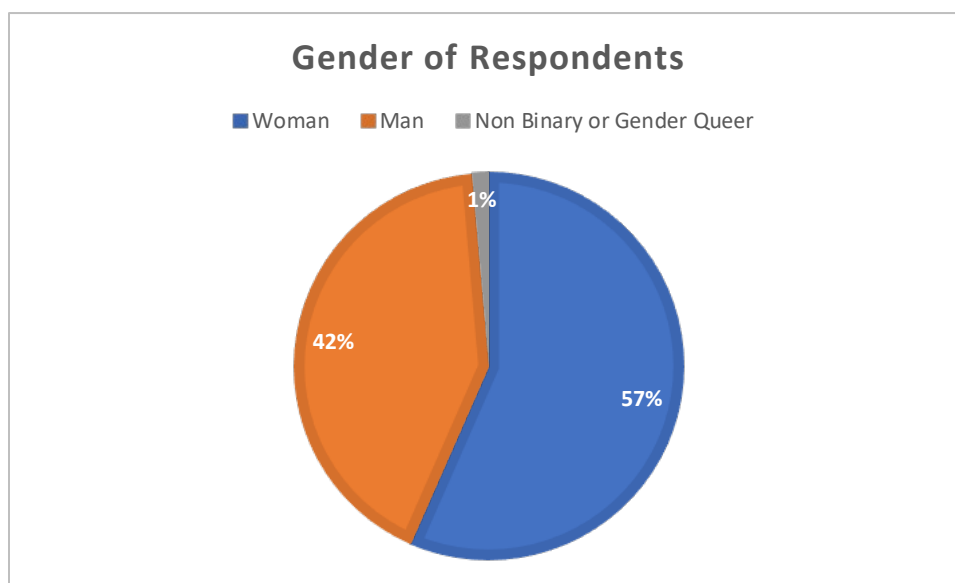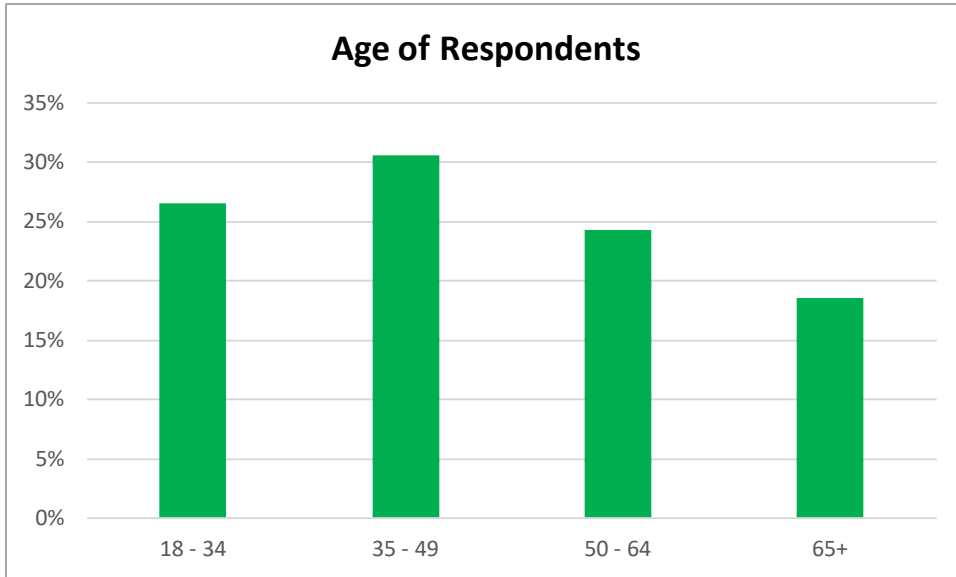
APPENDIX

Data Cleaning and Processing

Before analyzing the data, we merged and cleaned the data from the five surveys. The survey data and the zip code questionnaire data were handled separately, and merged datasets were created for both. We then removed responses from IP addresses outside of the San Francisco Bay Area. We used R, a statistical programming language, to translate the multilingual responses into a code that was the same across all the surveys. This comprehensive dataset became the source for the analysis. The data was imported onto R / R Studio for coding (an open-source tool for using *R*, a programming language for statistical computing and graphics). We primarily used the "dplyr" package and the "case_when" function to code the multilingual answers. The "case_when" function produced an output based on a condition. When the data allowed, responses were detected by the presence of a text string. For example, detecting text in any language for the response "Drive or was driven" would automatically produce the "DRIVE" code output. This ensured efficient coding in languages across different alphabets. For questions that output multiple responses, however, all translated responses were included in the argument along with their respective code.
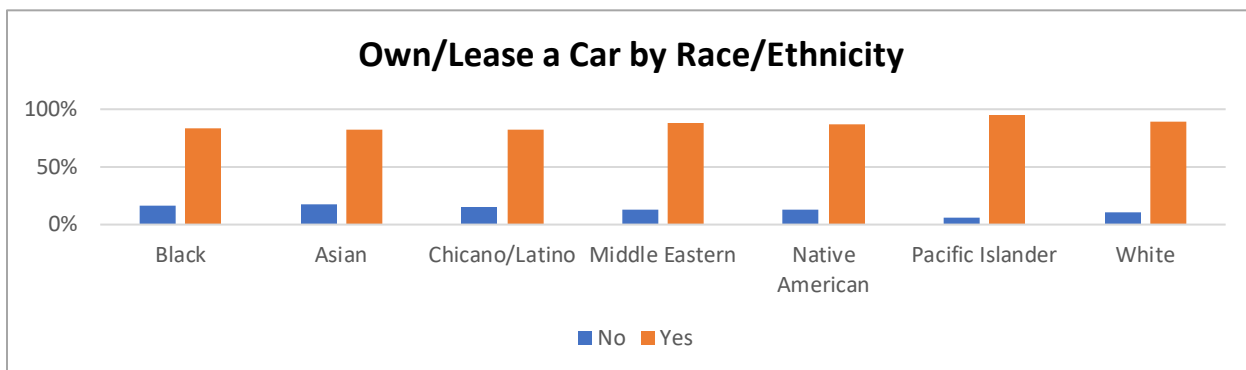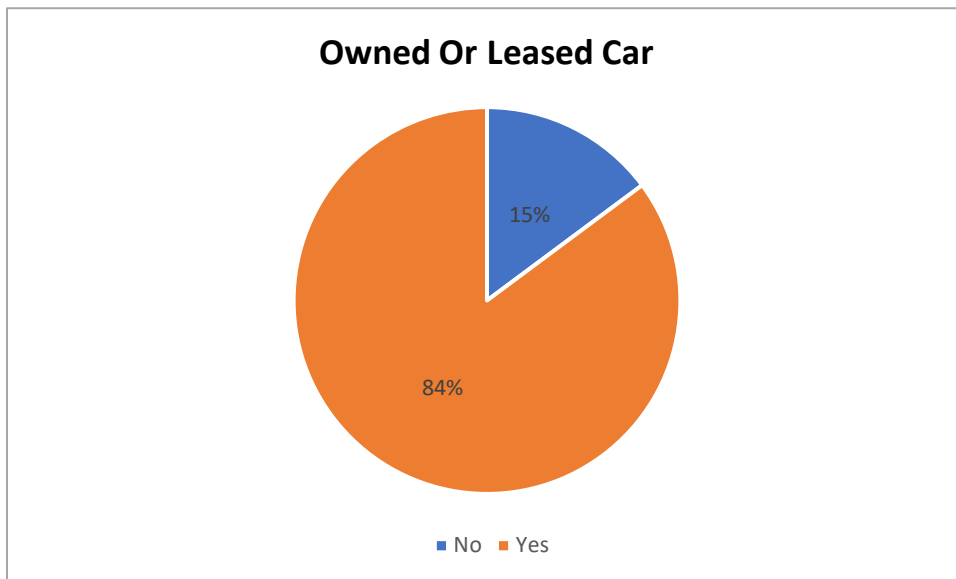
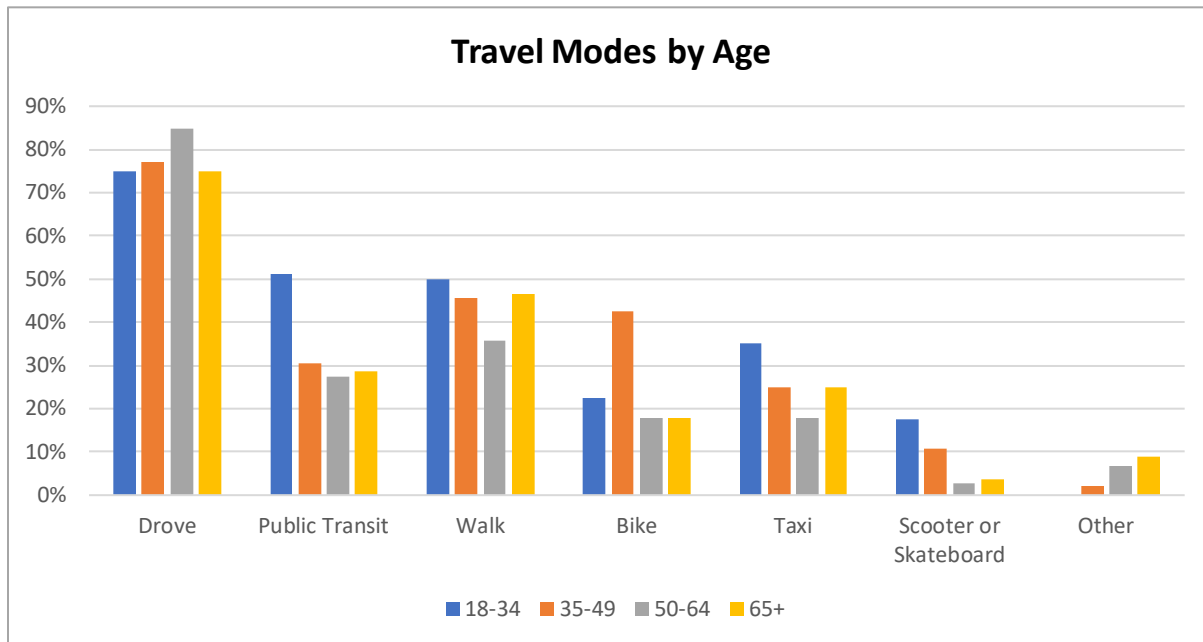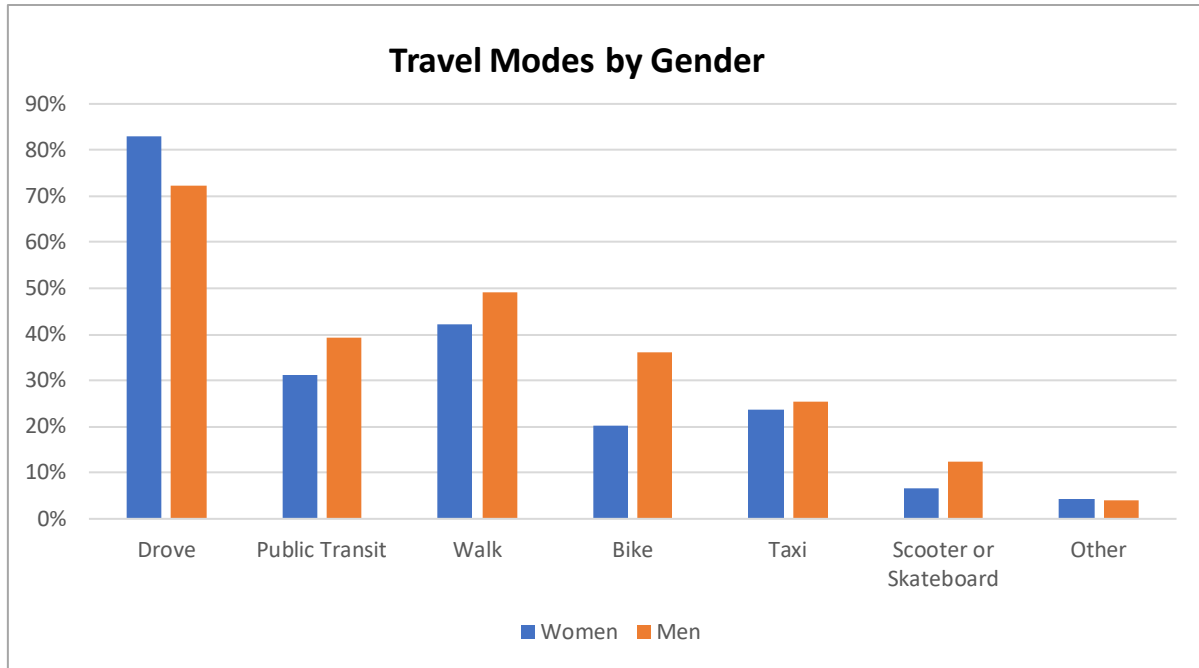# Additional data

Demographic tables

Age of Respondents

Car Ownership/Leasing

Owned Or Leased Car

15%

84%

■ No ■ Yes

Own/Lease a Car by Race/Ethnicity

Black   Asian   Chicano/Latino   Middle Eastern   Native American   Pacific Islander   White

■ No ■ Yes

Modes of Travel

Travel Modes by Gender

Travel Modes by Age

Travel Modes by Income

Legend: ■ Under $50,000 ■ $50,000 - $99,999 ■ $100,000+

Travel Modes by Education

Legend: ■ HS or Less ■ Trade or Some College ■ Associates or Bachelor's Degree ■ Graduate Degree

Travel Modes by Race/Ethnicity

Legend: Black, Asian (all), Chicano/Latino, White All

Ease of Travel

Ease of Pre-Pandemic Travel

-40%   28%

Ease of Pre-Pandemic Travel By Age

Age	Very/Somewhat Difficult	Very/Somewhat Easy
65+	-27%	38%
50 - 64	-32%	27%
35 - 49	-46%	26%
18 - 34	-48%	28%

Very/Somewhat Difficult   Very/Somewhat Easy
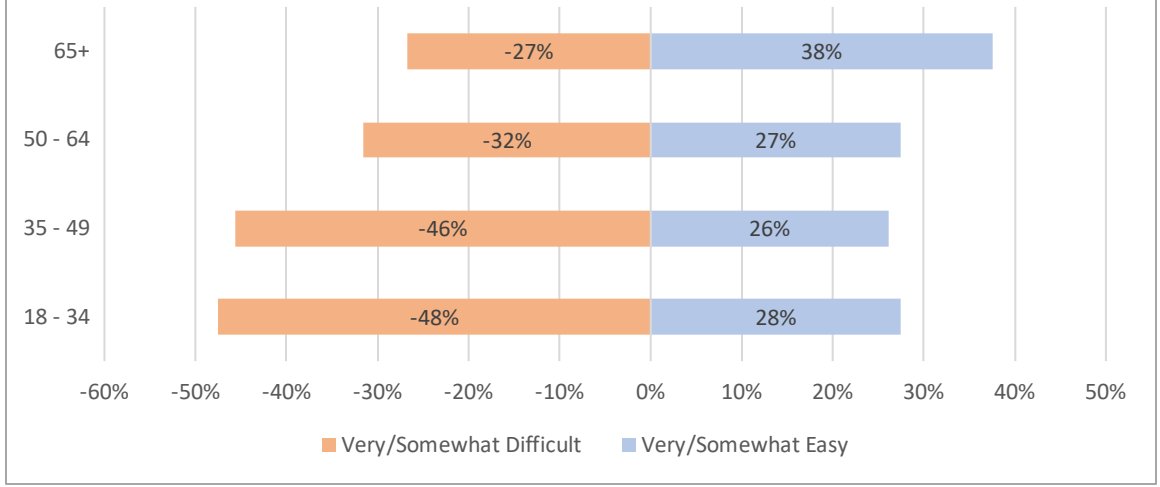
Ease of Pre-Pandemic Travel By Income

Income	Very/Somewhat Difficult	Very/Somewhat Easy
$100,000+	-36%	29%
$50,000 - $99,999	-35%	33%
Under $50,000	-47%	31%

Very/Somewhat Difficult   Very/Somewhat Easy

Limitations Posed by Transportation Difficulties by Race/Ethnicity

Legend: White All, Pacific Islander Hawaiian, Native American, Middle Eastern, Chicano / Latino, Asian All, Vietnamese, Filipino, Black

Categories: No transportation difficulties, Other, Save money, Visit with family and friends, Buy groceries regularly, Get to medical appointments, Attend a better school, Take a better job, Find more affordable housing, Get to work