US-101 MOBILITY ACTION PLAN

JUNE 2020

US-101 Mobility Action Plan Project Management Team

Susy Kalkin
City/County Association of Governments of San Mateo County

Becky Frank and Erik Alm
Caltrans

Michelle Go, Toshi Shephard-Ohta, and Krute Singa
Metropolitan Transportation Commission

Tiffany Chao and Tony Harris
pointC, LLC

Rachel Hiatt and Yana Waldman
San Francisco County Transportation Authority

Millie Tolleson, Gwen Buckley, Christy Wegener, April Chan, and Jessica Epstein
San Mateo County Transit District

Joe Hurley
San Mateo County Transportation Authority

Brent Pearse
Santa Clara Valley Transportation Authority

Chris Lepe
TransForm

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TECHNICAL ADVISORY GROUP

Cities:

City of Belmont
City of Burlingame
City of Foster City
City of Mountain View
City of Palo Alto
City of Redwood City
City of San Carlos
City of San Francisco
City of San Mateo
City of Santa Clara
City of South San Francisco
City of Sunnyvale

Counties:

San Francisco County
San Mateo County Express Lanes Joint Powers Authority
San Mateo County Health

Regional:

Caltrain

STAKEHOLDER ADVISORY GROUP

Major employers

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Genentech
Google
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SF Giants
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Stanford University

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Commute.org
Mission Bay TMA
Palo Alto TMA

Advocacy, Policy, and Multi-jurisdictional Government Organizations

Bay Area Council
Friends of Caltrain
Menlo Park Chamber of Commerce
Moffett Park Business Group
Peninsula Mobility Group
Redwood City - San Mateo County Chamber of Commerce
San Mateo Area Chamber of Commerce
San Mateo County Economic Development Association (SAMCEDA)
San Mateo Paratransit Coordinating Council
Silicon Valley Bicycle Coalition
Silicon Valley Independent Living Center
Silicon Valley Leadership Group
SPUR
Youth Leadership Institute of San Mateo County

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Community Leaders,

In late 2018, we came together as representatives from San Francisco, San Mateo, and Santa Clara Counties, the Metropolitan Transportation Commission, Caltrans, and TransForm to identify and prioritize equity-based, non-infrastructure investments to improve travel time reliability, prioritize high-capacity mobility options like buses and carpooling, and foster healthy and sustainable communities along the US-101 corridor.

The US-101 from San Francisco to Silicon Valley is an essential link in our region supporting economic activity and access between and across the communities. It is also one of the most congested corridors in the region. Over the next several years, new high-occupancy vehicle and express lanes will be either planned or constructed on US-101 in all three counties.

Infrastructure investments alone will not solve congestion and its indirect impacts on communities. The US-101 Mobility Action Plan (US-101 MAP) identifies almost 60 actions that public, private, and non-profit sector leaders can take over the next five years to leverage the investment we are already making in infrastructure.

As of this writing, the COVID-19 public health crisis has substantially changed travel trends throughout our region and has had significant adverse economic impacts, particularly for those with the fewest resources. Reduced congestion and the use of active transportation modes associated with the public health crisis provides a chance to reimagine how we move around the region, allocate the finite space we have for all transportations modes, and advance air quality, climate change, and equity goals. Remote working, walking, and bicycling have emerged as crucial transportation demand management (TDM) and mobility strategies for keeping businesses running. It continues to be important to improve the public transit experience for all people who rely on transit to access essential jobs and services in our communities. The actions in US-101 MAP are adaptable to these shifting mobility priorities and remain useful to addressing the needs of the corridor.

We look forward to working with community leaders throughout the three counties to realize this plan's bold vision, while remaining flexible and open to new approaches in times of uncertainty.

How to use this report

The MAP lays a foundation for action along the corridor. Chapter 1 sets a framework for the need for action and Chapter 2 summarizes the project's goals and performance metrics. Chapter 3 highlights how the MAP team engaged with stakeholders along the corridor and what we heard. Chapter 4 provides the full list of actions and summarizes how the actions were assessed for mobility performance, equity, and implementation. Finally, Chapter 5 describes how the action list will be promoted and advanced in the future.

Readers are encouraged to visit appendices to find full details on how to select and implement the actions best suited to specific project goals or community needs. Resources are available in the appendices of this document and for download in a sortable format on the project website at www.101mobilityactionplan.com.

- Appendix C identifies the potential for each action to influence certain performance metrics
- Appendix D outlines the ways in which implementers should incorporate equity into each action
- Appendix E includes an assessment of the relative cost, readiness and likely implementing entities for each action

Tony Tavares, *Director, Caltrans District 4*

Sandy Wong, *Executive Director, C/CAG*

Andrew Fremier, *Deputy Executive Director, Operations, MTC*

Tilly Chang, *Executive Director, SFCTA*

Jim Hartnett, *General Manager/CEO, SamTrans and SMCTA*

Jeff Hobson, *Interim Executive Director, TransForm*

Nuria Fernandez, *General Manager/CEO, VTA*

US-101 MOBILITY ACTION PLAN

Contents

CHAPTER 1: THE NEED FOR ACTION

US-101 connects San Francisco, the Peninsula, and Silicon Valley. It is an important piece of the regional and local transportation network, serving as an essential link to support regional economic activity and access between communities. The purpose of the US-101 Mobility Action Plan (MAP) is to build on infrastructure and mobility improvements already planned and identify near-term policies, programs, and technological solutions that address unreliable and inequitable mobility challenges on the corridor today. To do so, **regional coordination across jurisdictional, county, and transit service area lines is needed**. The MAP engaged with a broad set of decision makers to identify actions centered around equity-based, non-infrastructure improvements to increase access, support the economy, and enable social mobility. These improvements will respond to five foundational problems:

1. *US-101 is **not moving as many people** as it could*
2. *Travel time on US-101 is **unpredictable***
3. *Worsening congestion **reduces the number of jobs accessible in 30 minutes***
4. *US-101 causes **public health burdens and mobility constraints** for nearby communities*
5. *Congestion, unpredictability, health, and limited transportation options present challenges for all – **but low-income households, shift-based workers, and caretakers are more vulnerable***

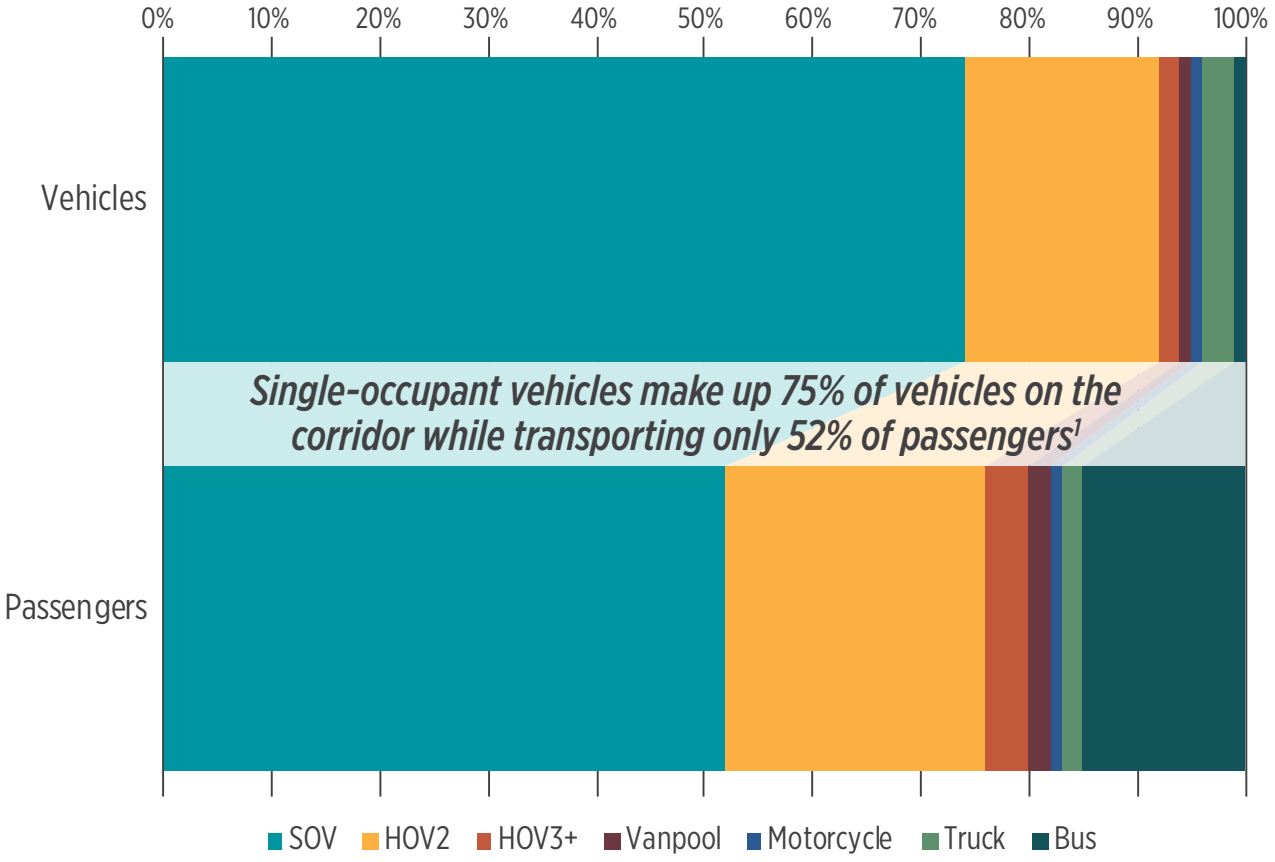
Problem 1: US-101 is not moving as many people as it could

The number of people that US-101 can carry is based on a combination of factors, including the total number of travel lanes, the speed of traffic, and the number of people in vehicles using those lanes. Right now, with most of the travel lanes occupied by single occupancy vehicles (SOVs), the total vehicle count is high, while the number of people is low and the peak hour volumes lead to low speeds.

Current traffic conditions mean that high occupancy vehicles like buses, shuttles and carpools must travel at slow speeds along with SOVs. The current configuration of the corridor does not provide any incentive for travelers to use transit or carpool. As a result, anyone with the means to drive their own car is likely to continue to do so, resulting in an increasingly inefficient corridor.

Figure 1. Vehicles vs. Passengers on US-101

Assumes 30 Passengers per Bus and 8 Passengers per Vanpool. Source: MTC, 2015



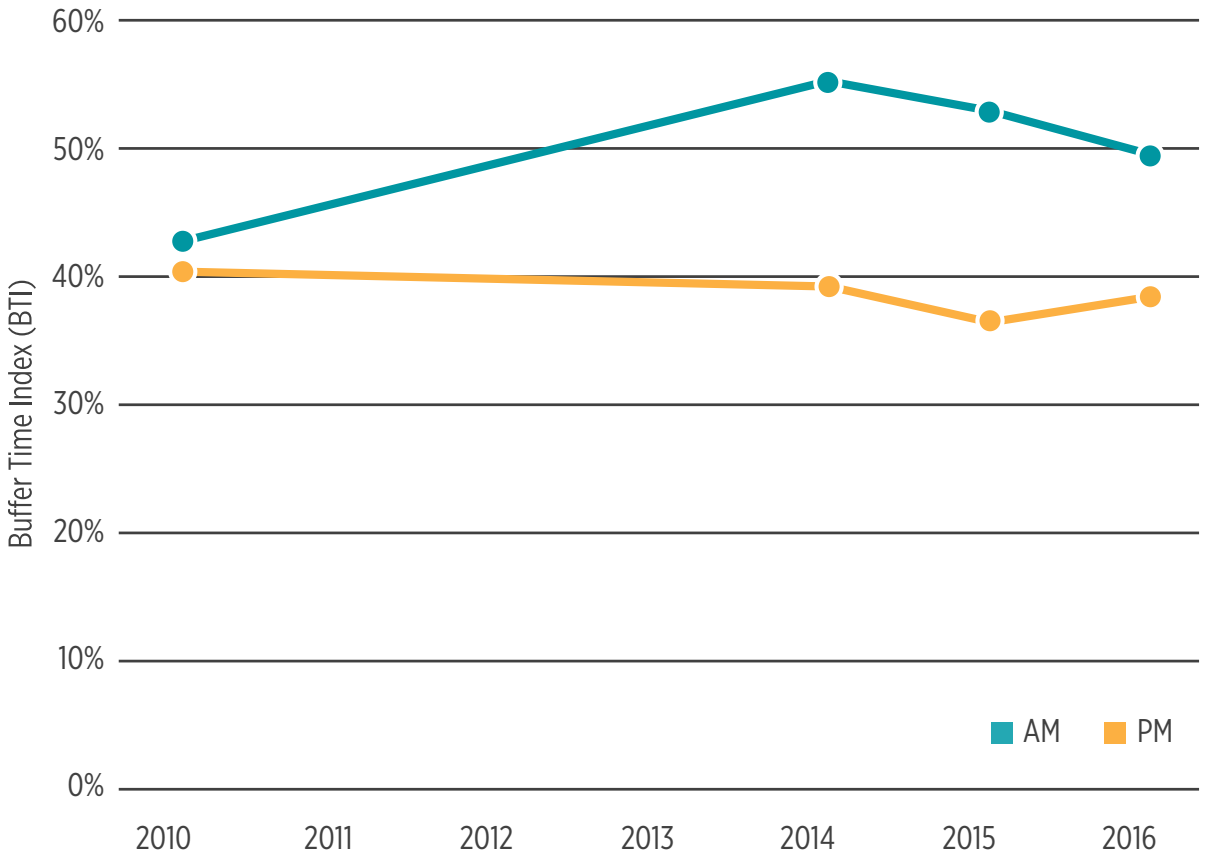
AT THE PEAK HOUR, 78% OF ALL VEHICLES ON US-101 ARE CARRYING ONLY ONE PERSON [2]

Problem 2: Travel time on US-101 is unpredictable

Corridor residents, workers, and visitors cannot depend on US-101 to meet their travel needs if travel times are unpredictable. Congestion and other disruptions frequently cause delays in the corridor, forcing travelers to make adjustments to their schedules to avoid being late. Arriving late is particularly challenging for people with strict start times for work or school, and for parents who must pick up kids on time.

Today, during morning and afternoon commute hours, travelers driving northbound on US-101 have to add between 40 and 50% more time to their trip, compared to free flow conditions, to ensure they will arrive on time. The Buffer Time Index (BTI) is a measure of the amount of additional time that a driver needs to assume for an on-time arrival at the desired destination.

Figure 2. US-101 Northbound Buffer Time Index
Source: MTC Vital Signs



TRAVELERS DRIVING ON US-101 TYPICALLY ADD 25% TO 55% MORE TRIP TIME TO ENSURE THEY ARRIVE ON TIME [3]

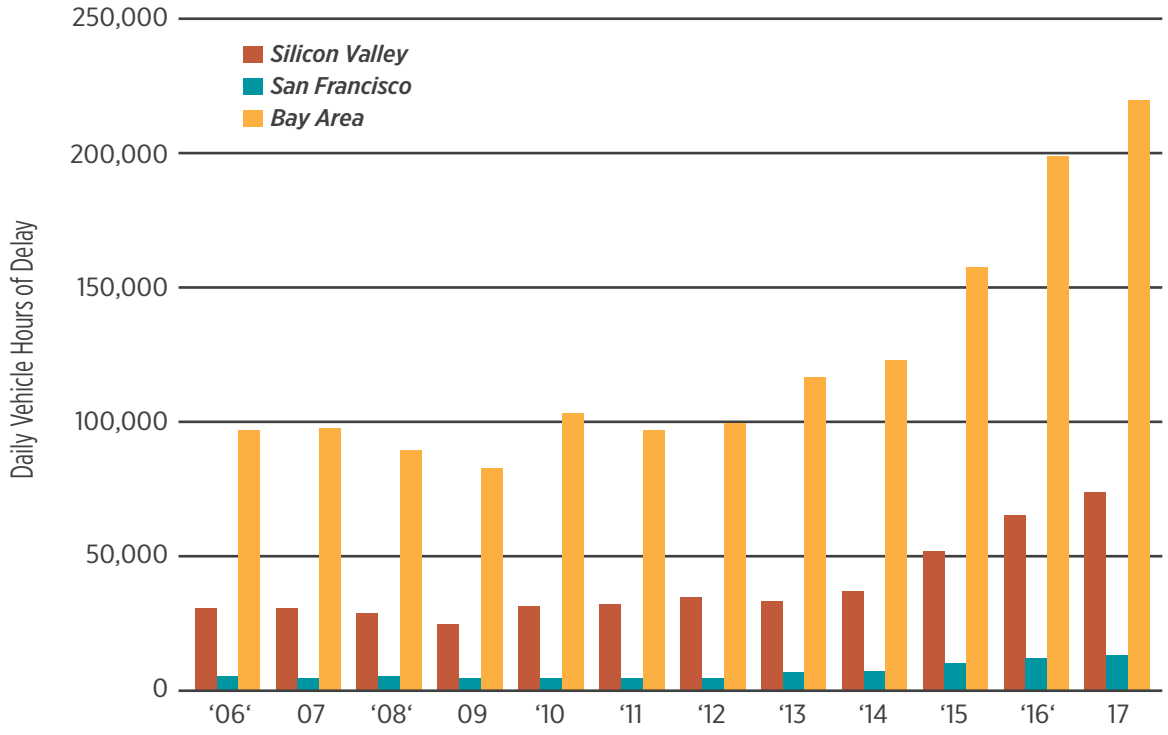
Problem 3: Worsening congestion reduces the number of jobs accessible in 30 minutes

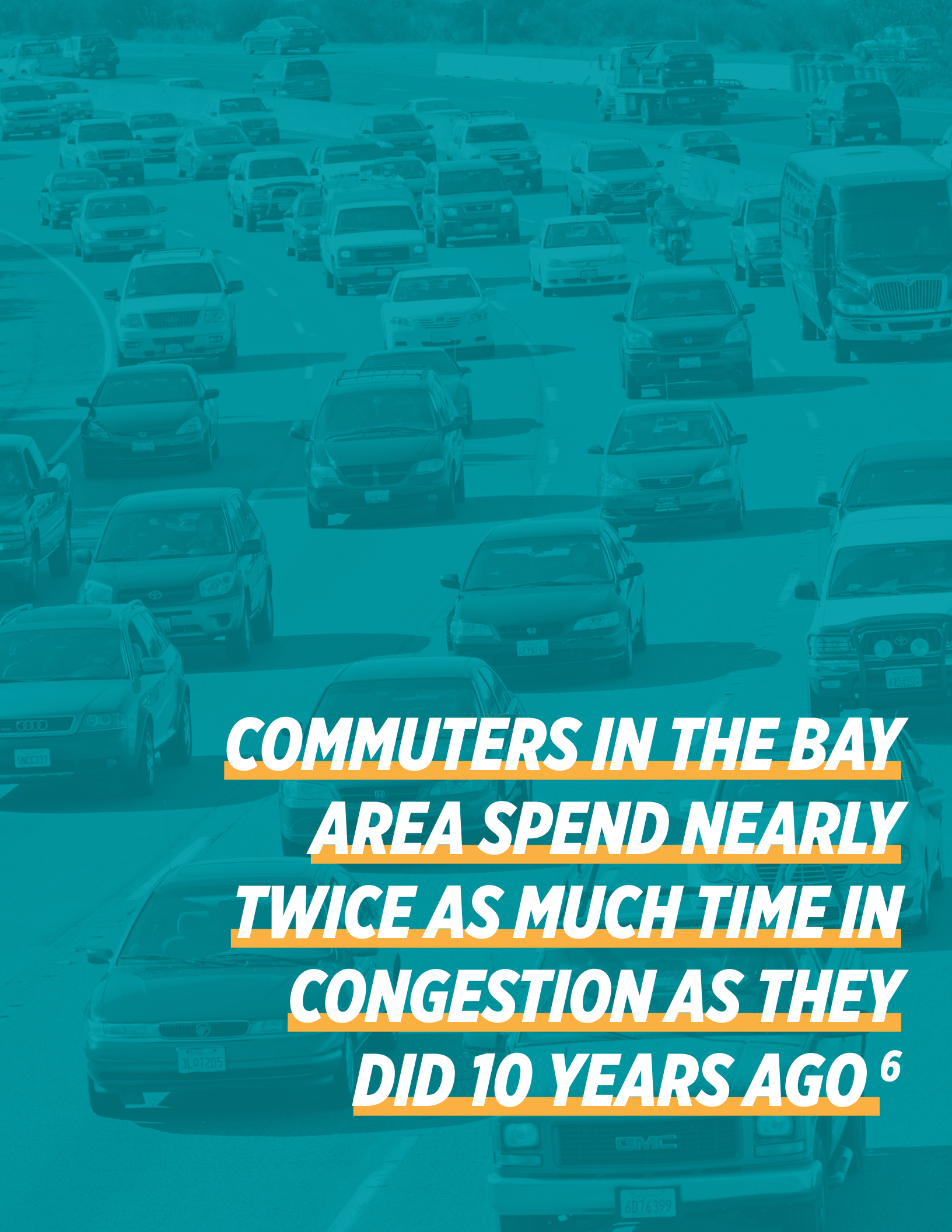
Not only does congestion make travel more difficult, expensive, and unpleasant, it limits access for everyone. When US-101 is congested, it puts jobs, services, friends, family, and activities out of reach.

Regionally, commuters experience nearly twice as much delay today as they did in 1998 and US-101 is no exception.[4] Congestion in the US-101 corridor is worst near highway interchanges, particularly those near access points for bridges to the East Bay. US-101 near San Francisco International Airport, the San Mateo and Dumbarton Bridges, and CA-85 interchanges all experience recurring congestion during peak hours. Average travel times on transit have been and remain higher than 30 minutes. The duration of average transit trips increased at a higher rate (about 16% higher than 10 years ago[5]) than travel by other modes.

Figure 3. Daily Vehicle Hours of Delay

Source: Joint Venture Silicon Valley Institute for Regional Studies





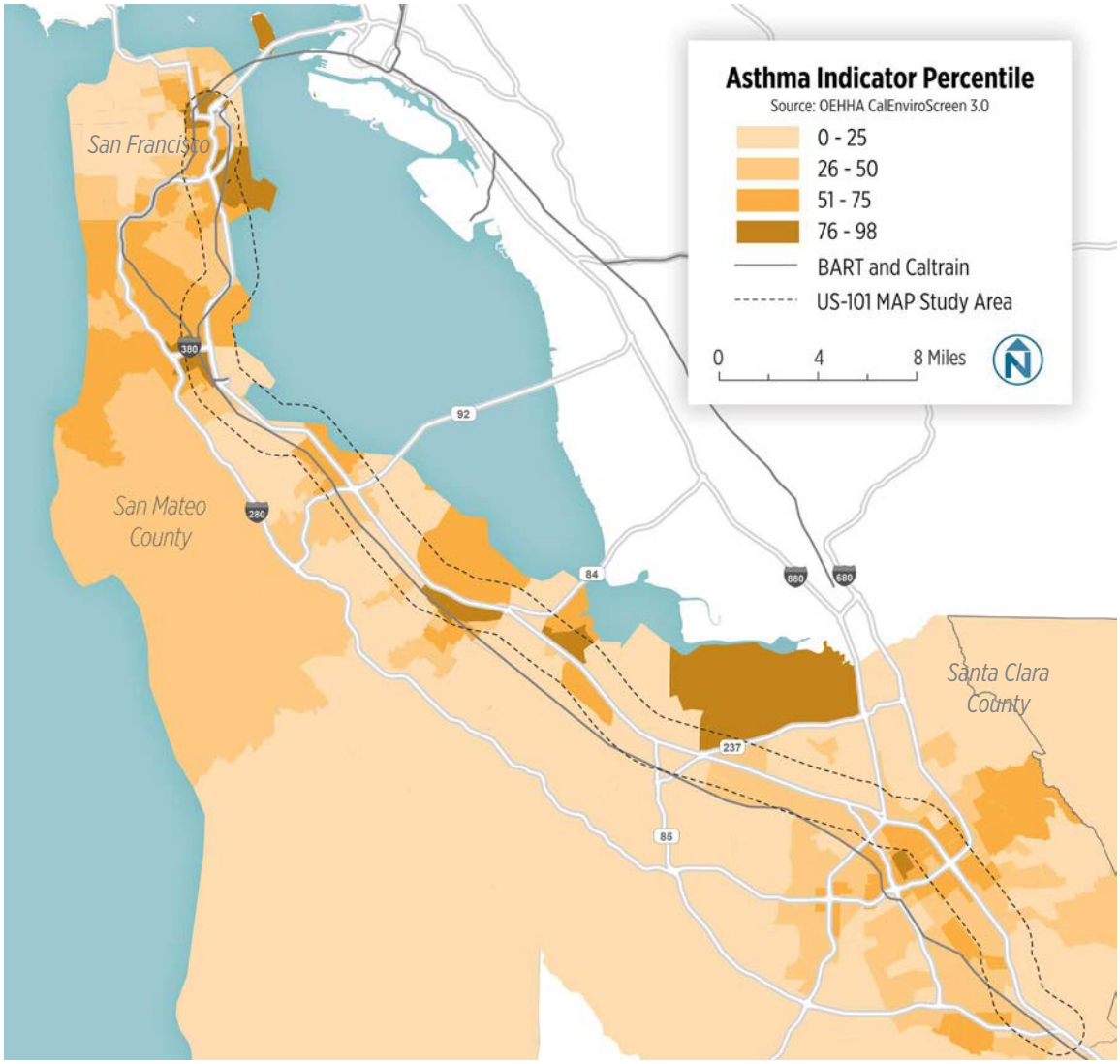
COMMUTERS IN THE BAY AREA SPEND NEARLY TWICE AS MUCH TIME IN CONGESTION AS THEY DID 10 YEARS AGO [6]

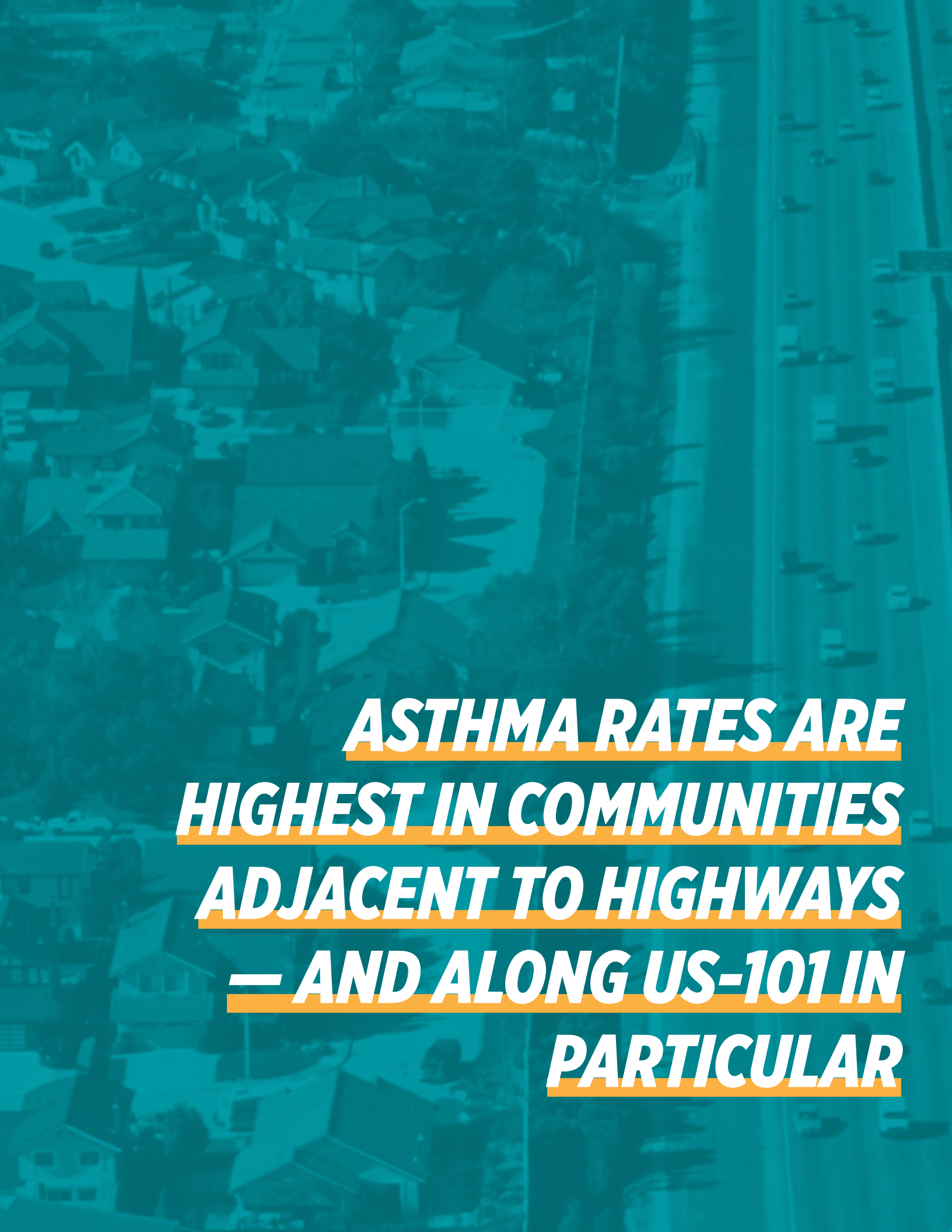
Problem 4: US-101 causes public health burdens and mobility constraints for nearby communities

Living close to US-101 presents persistent problems for residents. Health impacts caused by auto congestion and air pollution are experienced in higher concentrations in communities of color.[7] Additionally, the highway itself can be a barrier that limits access and makes biking and walking difficult or unsafe.

In the US-101 corridor, asthma rates are especially high at highway interchanges where congestion tends to build up. Traffic volumes are highest in communities with highway access points, which poses increased health and safety challenges for residents and makes it especially difficult to get around without a car.

Figure 4. Asthma Rates in the Bay Area
Source: California OEHHA CalEnviroScreen 3.0





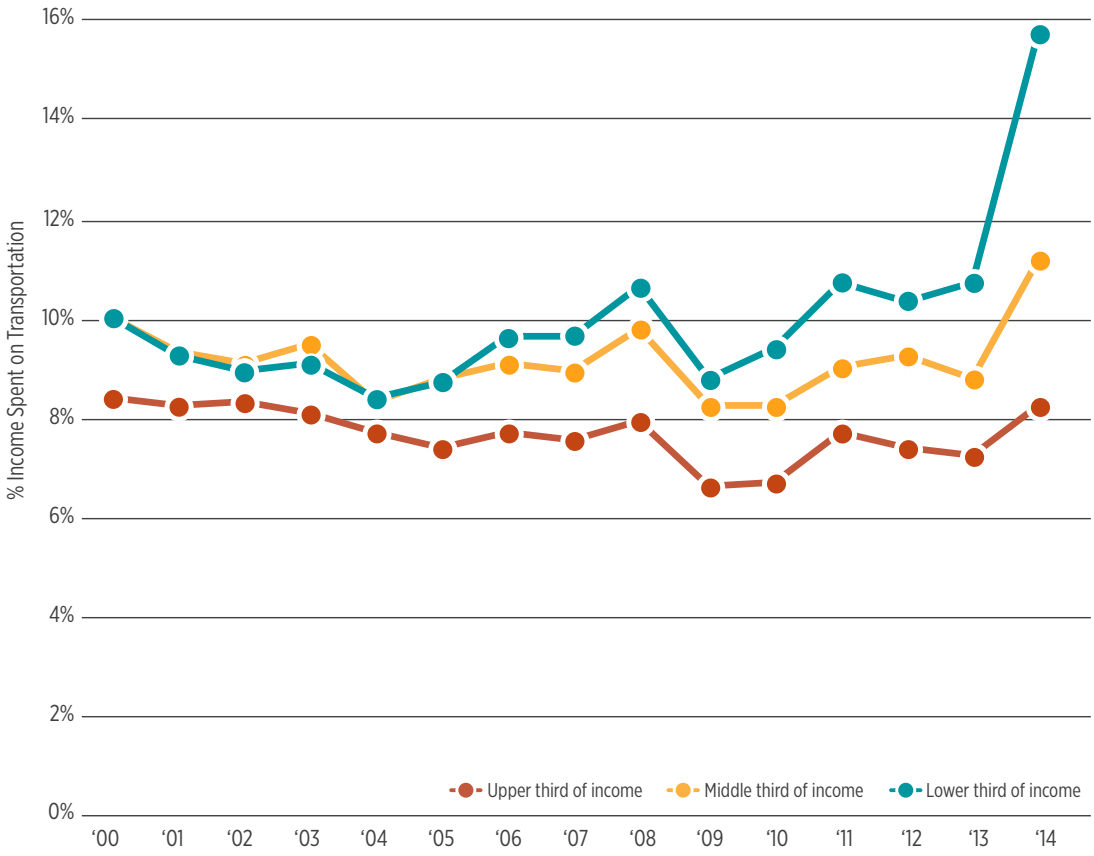
ASTHMA RATES ARE HIGHEST IN COMMUNITIES ADJACENT TO HIGHWAYS — AND ALONG US-101 IN PARTICULAR

Problem 5: Congestion, unpredictability, and limited transportation options present challenges for all – but some groups are more vulnerable

Hourly-wage and shift-based workers tend to have less flexibility in their work schedules than higher-income salary workers, which are disproportionately people of color.[8] Without flexibility to arrive late or adjust work schedules to avoid congestion, these workers are more vulnerable to travel disruptions.

Because of a lack of affordable housing options,[9] particularly for renters, many workers must choose between spending more on housing closer to job opportunities, or living in more affordable areas but with longer commute times and increased transportation costs. As a result, low-income populations are enduring longer transit commutes and spending a larger share of their income on a car to maintain reliable job access. As shown below, households in the lowest third of income spend a much larger share of their income on transportation costs (about 15%) compared to the highest third of earners (around 8%).

Figure 5. Share of Income Spent on Transportation by Income Thirds
Source: The Pew Charitable Trusts



The Need for Action on Equity

The US-101 corridor is a neighbor to diverse communities burdened with an ever increasing cost of living and increased traffic congestion, while also facing the continued need to access jobs and services along the corridor and beyond. People encounter a wide variety of barriers when seeking to access transportation services or programs. Researchers at UC Berkeley posit five types of barriers likely to be faced:

Spatial barriers, related to spatial or geographic disparity in services provided in a certain area

Temporal barriers, related to time of day a service is available or time-sensitive transportation needs

Economic barriers, related to cost of services or cost to access technology needed to use services

Physiological barriers, related to serving users with physical or cognitive challenges, or limited technology proficiency

Social barriers, related to serving low-income communities, minority communities, or people with limited English proficiency

Spatial Barriers

There are numerous spatial factors that can hinder mobility and access to destinations, including the distribution of jobs and lack of public transit. These barriers are often a result of unequal or inadequate provision of public transportation services, but can also be a result of land use patterns. Low-density, suburban land use patterns are not well suited for frequent transit service. However, the ongoing suburbanization of poverty creates conflicts between the priorities to invest in low-income communities while also improving service in geographies best-suited for transit investment. [10]

Access to jobs and destinations is a specific spatial barrier for many. The rate of decline in job accessibility increased twice as much for suburban residents compared to city residents, and the decline was even more pronounced for minority and low-income communities.[11] Transportation agencies and local jurisdictions can use spatial analysis to target transportation investments to high-need populations, such as low-income communities and communities of color.

Temporal Barriers

For many transportation users, including shift based or hourly workers, as well as those in caregiving roles, certain activities are much more time-sensitive than others, such as arriving at a job, childcare, or medical appointment on time. Not arriving at these commitments on time can have real impacts to wages or livelihood.

Additionally, transportation services that prioritize service in the peak commute periods do not benefit those who work atypical hours, attend night classes, or make many midday trips for work or other commitments.

Economic Barriers

Low-income households tend to spend a larger share of their income on transportation. While some public transportation providers offer means-based fares, most of the ongoing costs associated with vehicle ownership do not change based on income.

According to AAA, the average cost to own and maintain a car in the year 2019 was $9,282 for all income groups.[12] This cost would account for 29% of annual income for an individual making $32,000 per year (the equivalent of a full-time job paying $15 per hour) and 9% of income for an individual making $100,000 per year.

Certain technology is also required to make use of many new mobility or transportation programs, including subsidized transportation services. Smartphone ownership has dramatically increased in recent years, with one in five households now reporting as "smartphone-dependent", meaning they do not have a home or personal desktop or laptop computer.[13] However, discrepancies remain in the use of smartphones across certain demographics, including those over 65 years old and those with incomes below $30,000 per year.[14] In addition, recent statistical surveying in San Mateo County found that 22 percent of respondents had no or limited access to a data plan on their smartphone.[15]

Physiological Barriers

People of all abilities have the right to transportation services and benefits. People have varying levels of physical and cognitive abilities that can change over time, and can affect their ability to access and use the transportation system. Populations with physiological challenges can include older adults, people with disabilities, and parents with young children (who are often using strollers, carrying extra baggage, and/or carrying their child).

Public transit agencies are required to provide ADA accessible vehicles and additional paratransit service for those unable to use fixed-route bus service. Most public transit agencies have been successful in complying with ADA regulations.[16] However, because these agencies do not have jurisdiction over local streets and sidewalks, they cannot guarantee that access routes to public transit will be ADA accessible. The varying sidewalk conditions and other infrastructure can make access to transit challenging for people with physiological limitations.

Social Barriers

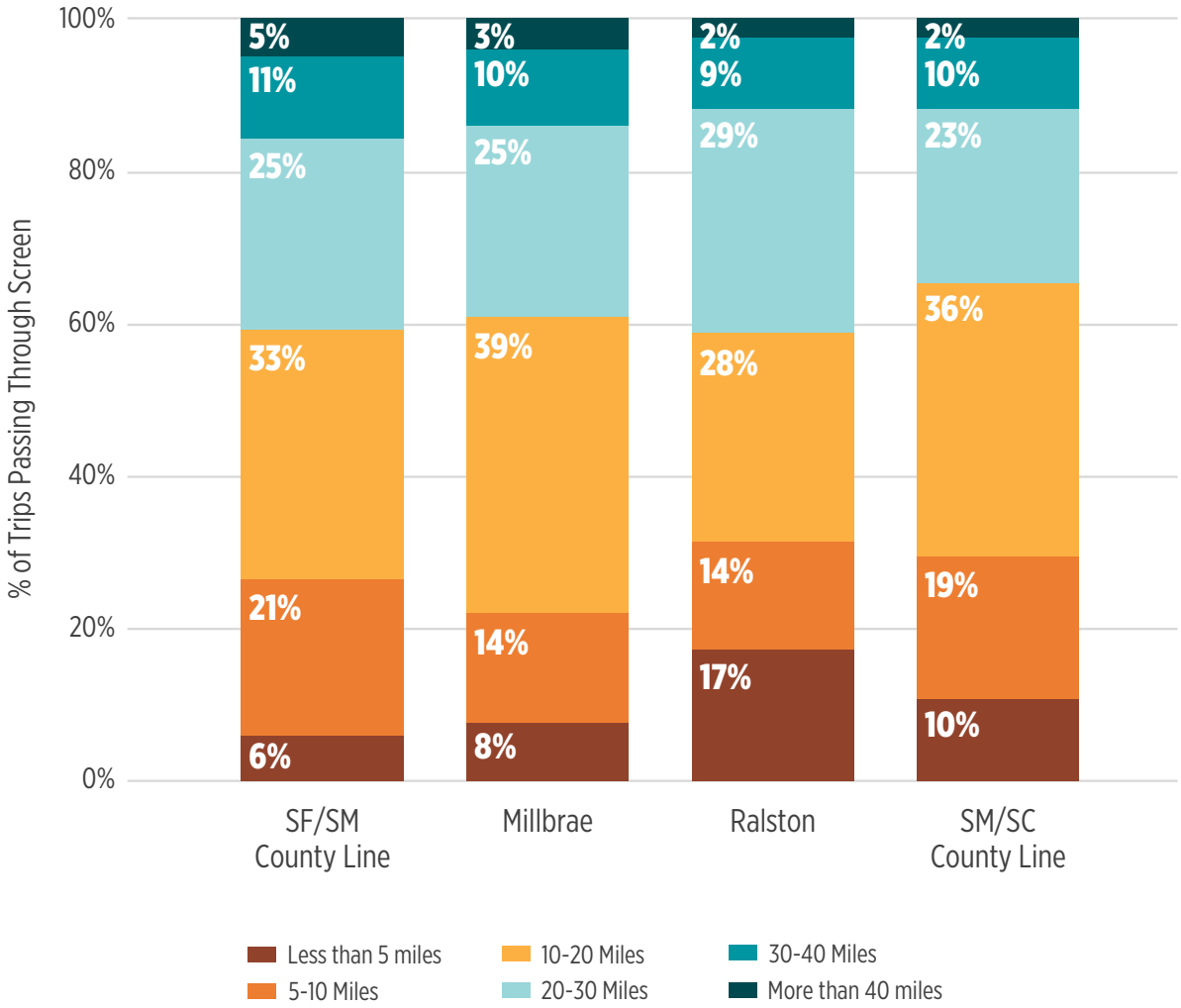
The US-101 corridor is home to a diverse set of communities speaking Spanish, Cantonese, Mandarin, Tagalog, and English, among many other languages. Understanding how to make use of transit services and other transportation programs can be a challenge for those who do not speak English. Further, low-income communities and immigrants often have a more challenging time accessing transportation for essential needs such as medical appointments. A 2013 study of low-income patients in the suburban New York City area found that about one-quarter of patients had missed or been required to reschedule a medical appointment due to lack of reliable public or personal transportation.[17]

Travel on the US-101 corridor today

Understanding how people travel on US-101 today will guide the development of new strategies for the corridor. The MAP analyzed existing policies and planning documents, as well as trip-making data for the morning peak commute period, to identify the following trends:

- **Many vehicle trips on US-101 are relatively short.** The majority of US-101 users in the study area are traveling fewer than 20 miles and 22-31% of trips are less than 10 miles.[18]

Figure 6. Morning Commute Trip Distance on US-101
Source: 2018 SamTrans Express Bus Study (Streetlight Data)



- **Long distance commuters (40 miles or more) make up a small portion of US-101 users.** The percent of long distance trips at four different sample points was 5% or less of the total travelers at each location. The number of short distance travelers (under five miles) was higher than long-distance travelers at every sample point.[19]
- **Localized vehicle trip patterns differ throughout the study area.** Trip distance for travelers on US-101 varies along the corridor with a higher proportion of short trips (less than 5 miles) crossing the Ralston Ave sample point, just south of the San Mateo Bridge.[20]
- **The closer someone is to US-101, the more likely they are to use it.**[21] Most trips on US-101 start and end within a short distance of the corridor.
- **Context matters.** Variation in trip patterns — how far and where people travel — as they pass through different points along the corridor may be explained by differences in the density of homes and jobs, street design, the presence of comfortable places to walk or ride a bike, and the availability of alternative routes.
- **Congestion occurs near interchanges.** US-101 is most congested near San Francisco International Airport, the San Mateo and Dumbarton Bridges, and the CA-85 interchange. This can cause drivers to seek alternative routes through neighborhoods or back ups onto local streets.[22]
- **Existing travel patterns reflect limited transit options or incentives to carpool.** There are only a few public transit routes operating along US-101 and no managed lane to incentivize carpooling or taking transit.

Foundational Problems, Foundational Actions

US-101 MAP is a large-scale transportation demand management (TDM) project aimed at maximizing the impact of planned infrastructure projects in the study area. The strategies identified in MAP are in some cases reliant upon or assume the completion of either infrastructure projects or tangible transportation service improvement programs to be most effective. See the Planning and Policy Context summary in **Appendix A** for a full description of complementary, ongoing projects. Some key projects include:

- **The San Mateo US-101 Express Lanes Project**, which is under construction and will bring express lanes to San Mateo County in 2022
- **The US-101 Express Bus Feasibility Study (SamTrans)**, completed in 2018, which identified express bus routes to launch in conjunction with new express lane facilities
- **The San Francisco 101/280 Express Lanes and Bus Project**, currently in the planning phase, is taking a combined look at express lane and bus service improvements north of SFO in and through San Francisco
- **The Silicon Valley Express Lanes Program**, with projects under construction to expand carpool lane capacity and introduce express lane facilities in multiple phases along US-101 in Santa Clara County
- **The Caltrain Electrification and Modernization programs**, which will improve system performance and allow for higher train frequencies needed to serve more people.

CHAPTER 2: PROJECT VISION AND GOALS

The US-101 MAP developed principles to focus strategies around shared values of equitable access, reliability, prioritizing high-capacity mobility, and fostering safe and healthy communities.

The ideal US-101 corridor through San Francisco, San Mateo, and Santa Clara counties serves the Bay Area equitably in service to these three goals:

- **Goal 1:** Offer **reliable** travel times
- **Goal 2:** Prioritize **high-capacity** mobility options, such as buses and carpools
- **Goal 3:** Foster **healthy and sustainable communities**

A set of performance metrics has been developed to build a comprehensive picture of how US-101 is performing today and to enable ongoing monitoring of travelers' responsiveness to actions implemented as part of this plan. The MAP team identified 13 metrics, each corresponding to one of the three project goals. The current state of these performance metrics are described on the following pages.

Baseline performance metrics

The MAP views strategies as hypotheses to be tested and improved upon, and the first step in this approach is to understand corridor performance today.

The Project Management Team identified 13 performance metrics, each intended to inform the study team on how well the corridor meets — or misses — each of the MAP's three goals. These metrics will be tracked over time as strategies are implemented.

Figure 7. Baseline Performance Metrics

Performance Metric	Desired Trend
Goal 1: Reliability	
Consistency of average travel time for all modes	+
Percentage of time Express Lanes operate above 45 mph	+
On-time performance of transit using the corridor	+
Customer-perceived reliability of using the corridor	+
Goal 2: High-Capacity Mobility	
Person throughput in general purpose lanes	+
Person throughput in Express Lanes	+
Average vehicle occupancy on US-101	+
Ridership on transit on parallel facilities (BART, Caltrain, El Camino Real)	+
Goal 3: Healthy and Sustainable Communities	
Collisions, including bicycle and pedestrian-involved, at highway access points	-
Biking mode share	+
Walking mode share	+
Rate of asthma attacks	-
Traffic density	-

Goal 1: Offer reliable travel times for all people regardless of how they travel on US-101

Ensuring reliable travel times helps corridor users arrive on time to jobs, services, and other destinations. When a corridor is unreliable, travelers may have to add "buffer" time to their trip to avoid being late (see Problem 2 in Chapter 1 for buffer time data). This has the greatest impact on low-wage employees working hourly or shift jobs, which typically require stricter schedules and start times than higher-paid salary positions.

Reliability performance today

Today, travel on the US-101 corridor is not as reliable as it could be — travel delay is both expected and unpredictable. US-101 South has several regularly congested hotspots during peak commute hours, which make travel less reliable. In 2016 during the morning peak, US-101 from SR-85 to I-280/680 was the third least reliable highway segment in the Bay Area. SamTrans Route 398, which operates in mixed-traffic on US-101 rather than dedicated transit lanes, has an on-time performance of 63%.[23] This is significantly less than SamTrans' system-wide on-time performance for fixed-route buses.

Figure 8. Average Daily Minutes in Congestion by Mode
Source: MTC Vital Signs

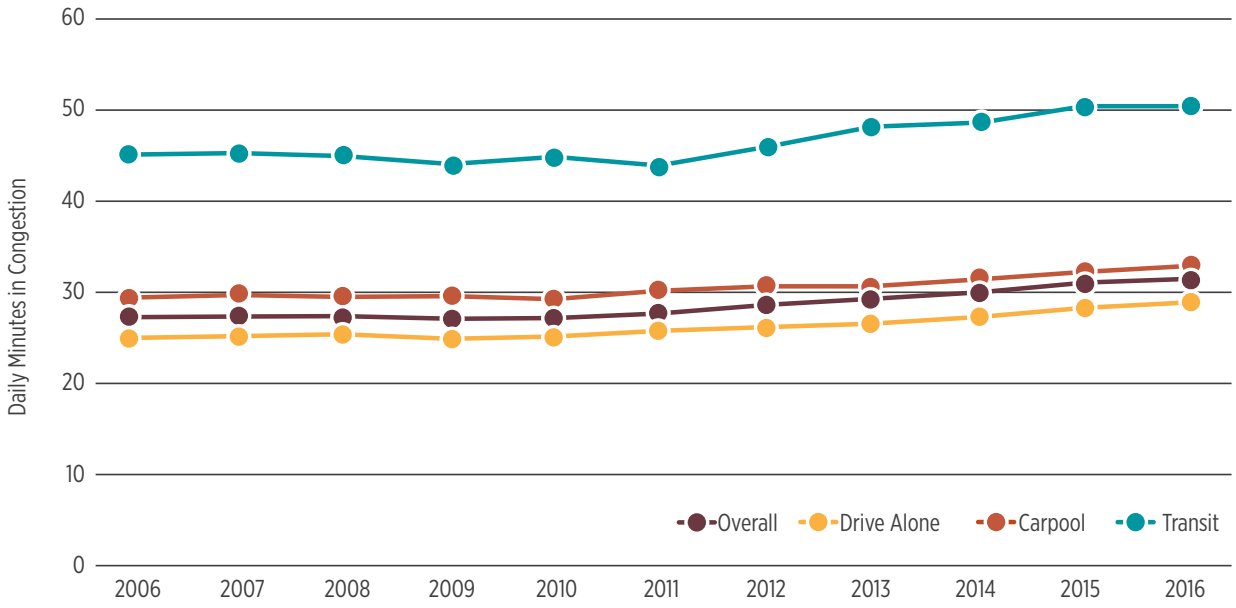
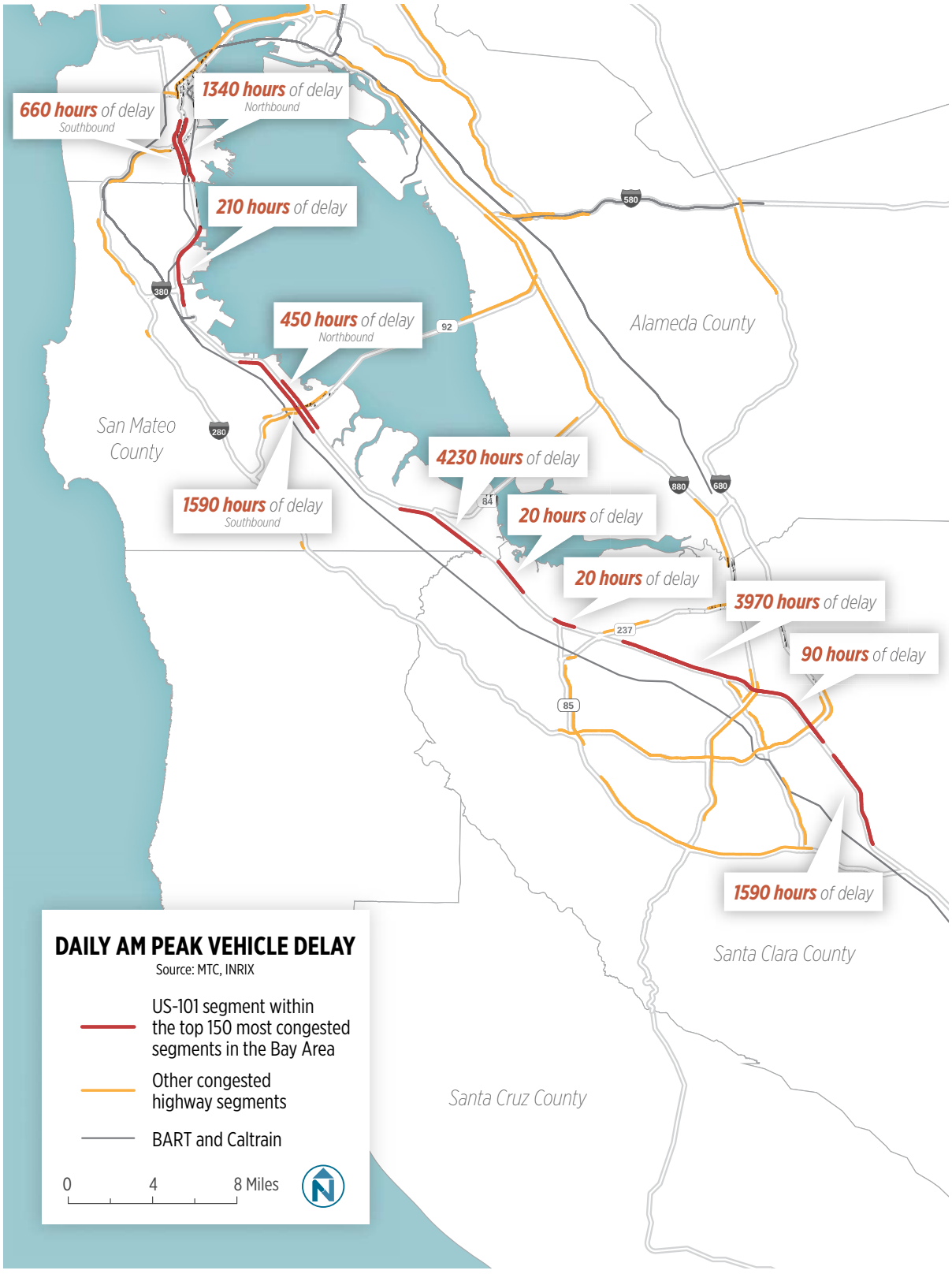


Figure 9. Daily AM Peak Vehicle Delay on Bay Area Highways

Source: MTC, INRIX



Baseline Performance Metrics for Goal 1: Reliability

Consistency of average travel time at AM peak (Buffer Time Index)

Northbound:

55.5% average corridor BTI

Southbound:

26.5% average corridor BTI

Source: Metropolitan Transportation Commission, Vital Signs website (2016)

The Bay Area uses a "buffer time index" to measure reliability of travel time on highways. The buffer time index is the percentage of time beyond a typical commute travel time with which a person has to cushion their trip. A typical 20-minute trip with a buffer time index of 0.5 becomes a 30-minute trip. This data was last tracked and reported by MTC over the 2010-2016 period.

Percentage of time existing HOV Lanes operate above 45 mph

Northbound:

28% of peak hour

Southbound:

52% of peak hour

Source: 2017 Caltrans Degradation Report, page 46

Under federal direction, Caltrans monitors the state of "degradation" of highway facilities. On US-101, high-occupancy vehicle (HOV) lanes with exempted vehicles must operate at or above 45 mph during peak hours no less than 90% of the time over a 180-day period; otherwise, it is deemed degraded.[24] From drivers' or transit passengers' perspective, degraded facilities look and feel congested, and cause additional travel time. This data is reported annually by Caltrans.

On-time performance of transit using the corridor

VTA:

66% (4 routes)

SamTrans:

63% (2 routes)

Muni:

46% (4 routes, 54% systemwide)

Source: SFMTA, VTA, and SamTrans (2019)

Transit reliability is a significant factor in rider attraction and retention – if you cannot be confident you will arrive on time, you are less likely to take transit. Low reliability also means riders must add buffer travel time, which is especially challenging for lower-income riders. While "on-time performance" can be measured slightly differently across agencies, it is the measure of transit reliability, and it is impacted by overall traffic congestion on shared facilities like highways. The on-time performance goals for each agency are Muni - 85%, SamTrans - 85%, and VTA - 82%. This data is tracked in an ongoing manner by each transit agency. In this summary, it is aggregated across routes, by agency. It includes only existing express routes that use US-101.

Customer-perceived reliability of using the corridor

>75% indicate it's stressful to drive on US-101

>70% indicate it's hard to know how long a trip will take on US-101

>40% indicate congestion on US-101 limits access to job opportunities

Source: US-101 Mobility Action Plan Survey (June-July 2019)

Measuring customer-perceived reliability of the corridor requires surveying of individuals, regardless of the frequency with or way in which they use the corridor. Transit agencies often conduct customer satisfaction surveys, but there is no corollary for drivers on US-101. The best recent data source is the US-101 MAP survey.

Goal 2: Prioritize high-capacity mobility options for all

Higher-capacity vehicles, such as buses or trains, move many more people than single-occupancy cars while using a similar amount of space. Prioritizing higher-capacity vehicles that are separated from congestion is a more efficient use of limited corridor space. Improving the occupancy of personal vehicles by encouraging carpools also helps move more people. Buses and other high-capacity options should be a viable option for everyone, regardless of income, age, ethnicity, and other socioeconomic factors.

High-capacity transit performance today

US-101 is used primarily by single occupancy vehicles today. Only 13-22% of peak hour vehicles on US-101 have two or more passengers. Ridership and availability of public transit buses on the corridor varies widely. Using ridership figures from early 2020, SF Muni carries about 40,000 boardings per weekday on its four routes that use US-101 in San Francisco. SamTrans serves about 1,400 daily boardings on its two routes that use US-101 and VTA serves about 500 daily boardings on four routes.[25] Caltrain and BART, which provide alternatives to driving on portions of US-101, carry a higher number of transit riders during peak travel periods. Although ridership data from employer shuttles is not always publically available, more than 200 shuttles use US-101 each day.[26] As ride-hailing apps such as Uber and Lyft have increased in use, especially for airport trips, surface congestion in and around airports has increased and transit ridership has decreased.[27]

Figure 10. Regional Transit Ridership

Source: Silicon Valley Indicators

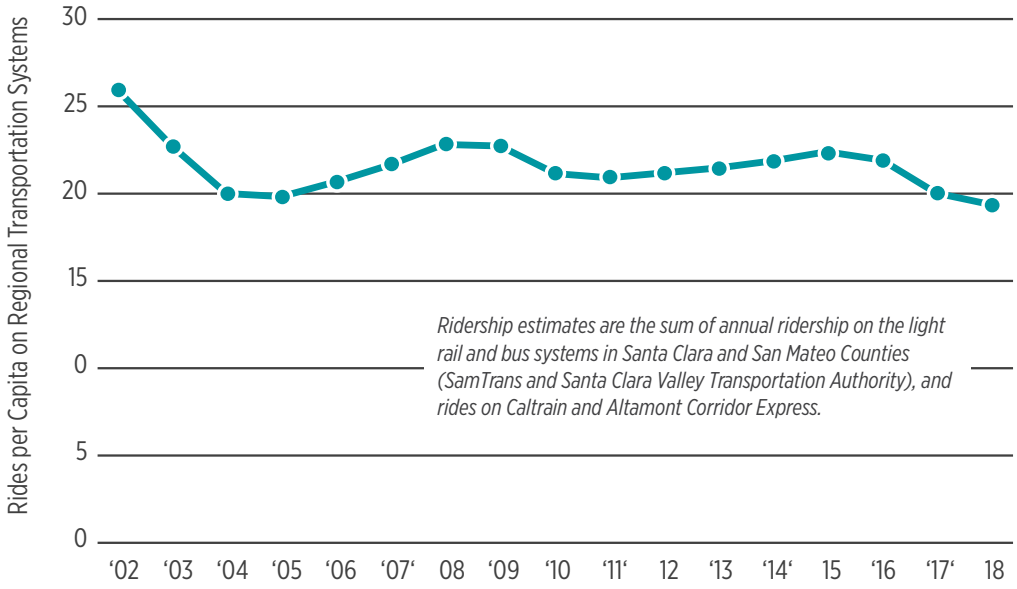
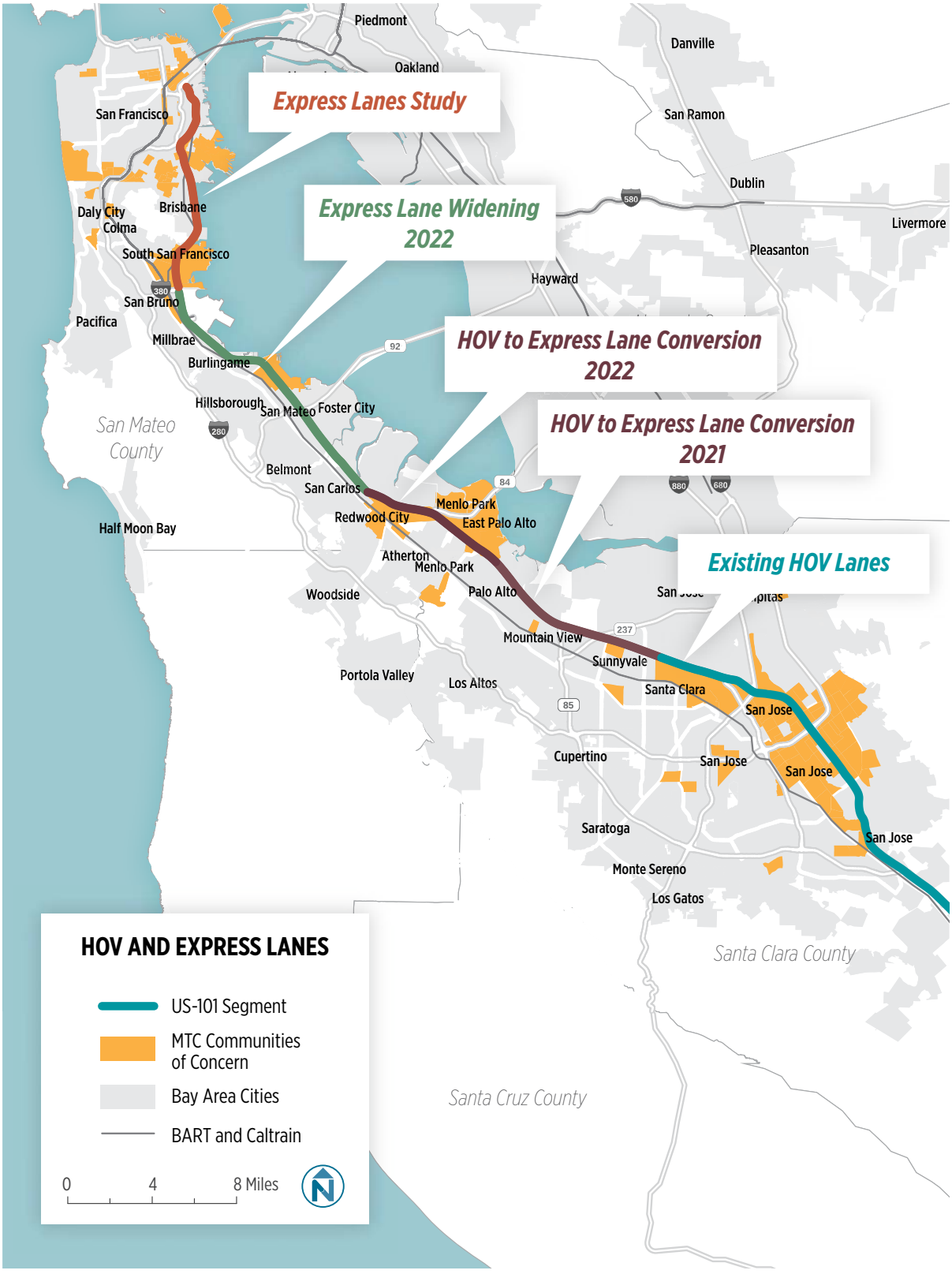


Figure 11. Ongoing or Upcoming Express Lane Projects on US-101

Source: Caltrans



Baseline Performance Metrics for Goal 2: High-Capacity Options

Person throughput in general purpose lanes

~90,000 people in SOVs in the AM peak (6-10 AM)

Source: US 101 Managed Lanes Project Traffic Operations Analysis Report (2017) 2020 no-build scenario

Person throughput in Express Lanes (existing HOV in southern section of corridor)

~50,000 in carpools and buses in the AM peak (6 - 10AM)

Source: US 101 Managed Lanes Project Traffic Operations Analysis Report (2017) 2020 no-build scenario

The 101-MAP project takes a people-first approach to defining ideal outcomes. As our transportation system is able to move more people in more sustainable and efficient ways, we are more successful at achieving better social, economic, and environmental outcomes. The existing SOV numbers are above the highway capacity of approximately 82,000 SOVs with ideal traffic flow, which confirms that current traffic volumes are congested. Compare that to a potential person throughput of 140,000 - 270,000 with high occupancy vehicles using the same number of lanes.

Average vehicle occupancy on US-101

1.25

Source: Bay Area Managed Lane Implementation Plan (2015)

For US-101 to serve more people and facilitate growth in the regional economy without highway expansion, trips must be made in increasingly higher occupancy vehicles. Average vehicle occupancy data is collected occasionally as part of specific project studies, and requires manual counts. The most recent data available are provided by the Metropolitan Transportation Commission from a 2015 data collection effort.

Ridership on parallel transit facilities (BART, Caltrain, El Camino Real)

2018 Caltrain **65,000** average weekday riders

2018 BART **33,000** average weekday riders (calculated from San Mateo County BART Station exits)

2016 SamTrans El Camino Real Routes **13,000** riders per day

2013 VTA El Camino Real Routes **20,000** riders per day

Source: BART and Caltrain ridership reports (2018) and Grand Boulevard Initiative (https://grandboulevard.net/transportation-and-mobility/transit-ridership)

Like overall traffic volume and person throughput, transit ridership is an indicator of economic activity. High ridership volumes indicate a booming economy. Total transit ridership volumes on parallel facilities, in combination with person throughput via higher-capacity modes on the US-101 corridor itself, presents a more comprehensive picture of high-capacity options through the larger corridor. Transit ridership also reflects the attractiveness of the service in comparison to other alternatives, which is part of why rail services see higher ridership than bus services operating in non-dedicated facilities.

Goal 3: Foster healthy and sustainable communities

Heavily traveled highways such as US-101 are significant sources of air pollution, including greenhouse gas emissions and particulate matter. Vehicles entering and exiting freeway access points can pose a danger to people walking and biking, particularly when there are limited and inadequate facilities to cross the highway.

Health and Sustainability Today

Traffic density is a measure of the number of vehicles on the roads in an area, and neighborhoods with more traffic density are also subject to more noise and air pollution from vehicles and busier intersections. These impacts lead to higher asthma rates and other health effects[28] and make it harder to walk and bike on neighborhood streets. The neighborhoods adjacent to US-101 interchanges and directly east of US-101 have the highest traffic density in the corridor, contributing to a less healthy environment and fewer travel choices for local residents.[29]

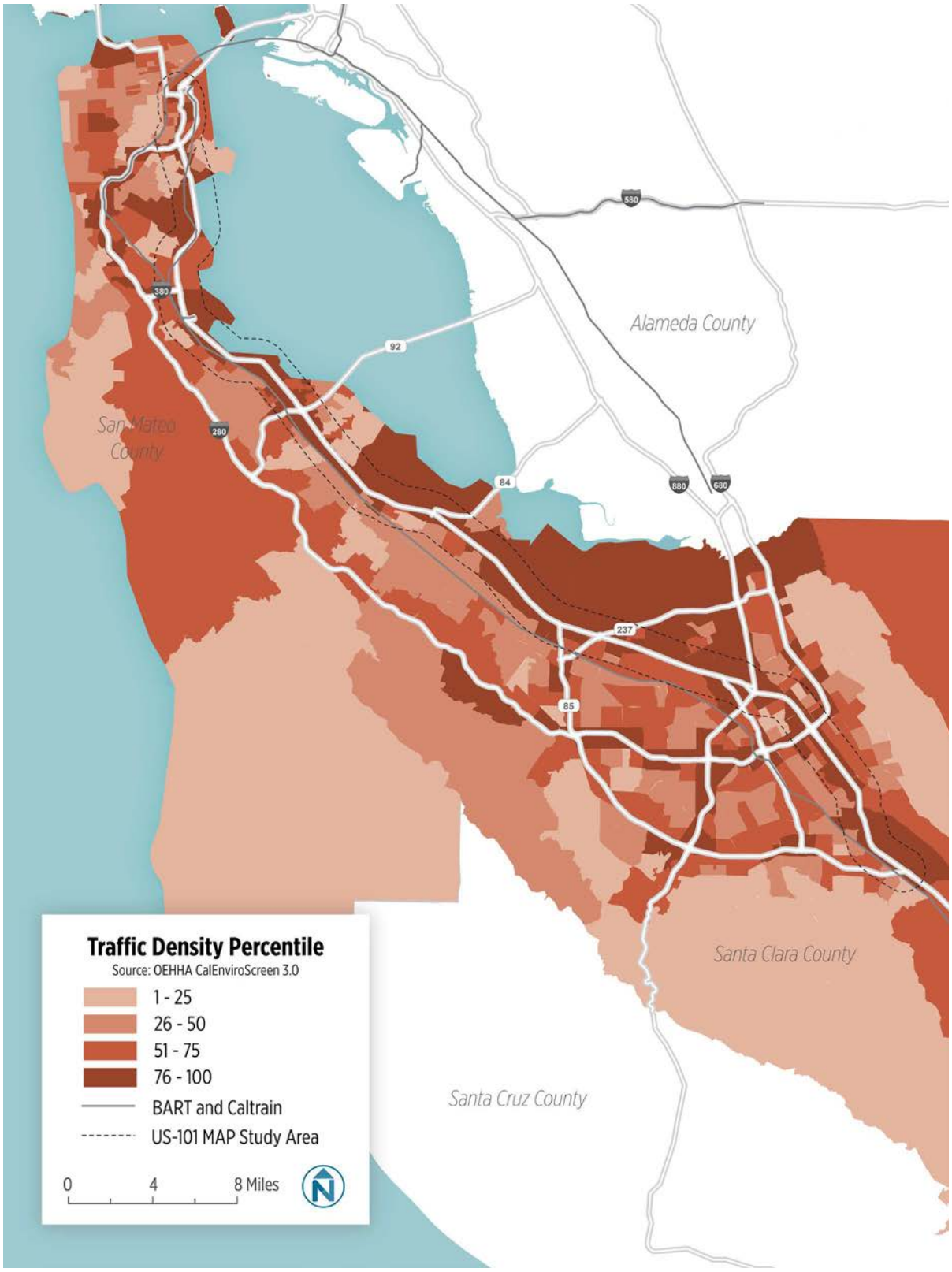
Children are especially vulnerable to air pollution impacts as their lungs are still developing – and children living near busy roads are more likely to have asthma symptoms and bronchitis[30]

Spending time at locations close to and downwind of high traffic locations increases exposure to air pollution—along the US-101 corridor, neighborhoods to the east and southeast of US-101 are downwind of the highway[31]

High speed vehicles exiting from and connecting to highway ramps create an unsafe environment for people walking and biking – this makes it more dangerous to get around without a car if you live near highway ramps[32]

Figure 12. Traffic Density Percentile

Source: California OEHHA CalEnviroScreen 3.0



Baseline Performance Metrics for Goal 3: Healthy and Sustainable Communities

Collisions, including bicycle and pedestrian-involved, at highway access points

Vehicle collisions on 101: **1,329** (22.5/sq mile)

Vehicle collisions on surrounding streets: **1,207** (20.5/sq mile)

Bike collisions on surrounding streets: **195** (3.3/sq mile)

Pedestrian collisions on surrounding streets: **173** (2.9/sq mile)

Source: TIMMS/SWITRS

To measure progress toward the goal of safe communities, this project uses collisions at highway access points as a success metric. Strategies generated by the MAP do not cover infrastructure-based solutions, but they do target increased reliance on non-driving modes such as transit, walking, and biking. In the short term, non-infrastructure based strategies are unlikely to meaningfully shift this metric, but in the medium- to long-term, they will contribute and support the effects of infrastructure-based safety solutions.

Biking mode share for work trips

	Study Area	All County
SC	**1.5%**	**1.8%**
SM	**1.5%**	**1.4%**
SF	**3.3%**	**3.9%**

Source: ACS 2017 5-Year Estimates

The level of biking in a community is considered a key performance indicator in this project because it supports positive environmental, equity, and economic outcomes. The level of biking in each community overall is not consistently measured. Some communities conduct annual in-person counts, some have automated counters installed at key locations, and others do not count at all. The only consistently tracked measure of biking activity is through the US Census's American Community Survey, which asks about residents' primary mode of transportation to work. In San Mateo County, the percentage of people within the study area relying on a bicycle for commuting is higher than for the county overall. The study area is defined as all Census Tracts that intersect with a ½-mile buffer around the US-101 corridor.

Walking mode share for work trips

	Study Area	All County
SC	**<2%**	**2%**
SM	**3%**	**<3%**
SF	**15%**	**11%**

Source: ACS 2017 5-Year Estimates rounded to nearest %

Like biking, walking also supports positive environmental, equity, and economic outcomes. The level of walking in each community overall is not consistently measured. Some communities take efforts to track overall reliance on walking for all trips through surveying techniques, but most do not. The only consistently tracked measure of walking activity is through the US Census's American Community Survey. In San Mateo and San Francisco counties, the percentage of people within the study area relying on walking for commuting is higher than for the county overall.

Rate of asthma attacks (per 10,000 residents)

	Study Area	All County
SC	**40.3**	**31.3**
SM	**41.8**	**40.8**
SF	**70.8**	**45.3**

Source: Cal Enviro Screen 3.0, data from emergency room visits from 2011-2013

https://oehha.ca.gov/calenviroscreen/indicator/asthma

Though exact causes of asthma are unknown, both genetic and environmental factors are involved, and poor air quality can trigger asthma attacks. Black people and people with low incomes visit hospitals for asthma more often than other groups. Living and working near sources of air pollution—such as highways—contribute to incidence of asthma, among other adverse health effects. Notably, in all counties, incidence of asthma is higher in the study area than in the county overall.

Traffic density (vehicle km/hr per km of road length)

	Study Area	All County
SC	**72.0**	**54.8**
SM	**63.6**	**51.1**
SF	**64.4**	**47.2**

Source: Cal Enviro Screen 3.0, data on vehicle volumes and road lengths from 2013

https://oehha.ca.gov/calenviroscreen/indicator/traffic-density

Traffic on roads is a major source of pollution of many types—particulates, chemicals, and greenhouse gases—as well as a source of traffic safety risk. Because traffic is associated with adverse health impacts, and because most of the study area's Communities of Concern are located in a Census Tract that intersects with the US-101 corridor, traffic density is a key indicator of success in achieving safe and healthy communities. In all three counties in the study area, traffic density is higher in the study area than in the county overall.

CHAPTER 3: STAKEHOLDER INPUT

The US-101 MAP study corridor connects three counties, representing a broad spectrum of the Bay Area's diverse communities and economic activity. Developing policies, programs, and technological solutions that improve mobility and address the underlying inequities associated with limited access and congestion requires regional coordination and shared ownership of these challenges. To ensure that the MAP engaged with essential decision makers that will be involved in carrying out improvements, the MAP leadership was built around the following organizational framework:

- **A PROJECT MANAGEMENT TEAM (PMT)** comprised of: C/CAG, Caltrans, MTC, SamTrans, SFCTA, San Mateo County TA, TransForm, VTA
- **A TECHNICAL ADVISORY COMMITTEE (TAC)** comprised of representatives from cities, county and regional agencies, and other transit operators or providers within the study area
- **A STAKEHOLDER ADVISORY GROUP (SAG)** comprised of major employers, employer groups, community based organizations, advocacy groups, new mobility providers, and other stakeholders within the study area

Community Engagement

The US-101 corridor serves and impacts diverse communities and individuals, from public transit passengers to private vehicle drivers, from long-distance commuters to local residents making short connections across their home neighborhoods. To ensure that mobility actions and policy recommendations address the wide variety of mobility challenges, the PMT engaged with the public to identify primary issues, opportunities, ideas for solutions, and essential actions.

Multi-jurisdictional Engagement

The PMT launched a multi-jurisdictional engagement effort, including presentations, meetings, tabling events, E-blasts, flyering, and workshops. Nearly 60 outreach opportunities occurred in communities and neighborhoods throughout the three-county study area.

- **Awareness building.** Information was shared via email distribution lists with elected officials, school principals and leaders, community-based organization leaders, community networks, neighborhood associations, and transit agency and policy advocacy newsletter subscribers. Factsheets, posters and paper surveys were shared via tabling events and other flyer distribution opportunities at major regional employers, local conferences and information fairs, and neighborhood events.
- **Dialogue.** Members of the PMT visited and made presentations directly to community housing sites, neighborhood festivals and events, city chambers of commerce, labor organizations, community-based advocacy organizations, business groups, county and employee commute coordinating agencies and committees, and existing community advisory committees and workshops. Community input was collected in these meetings and the public survey was promoted.

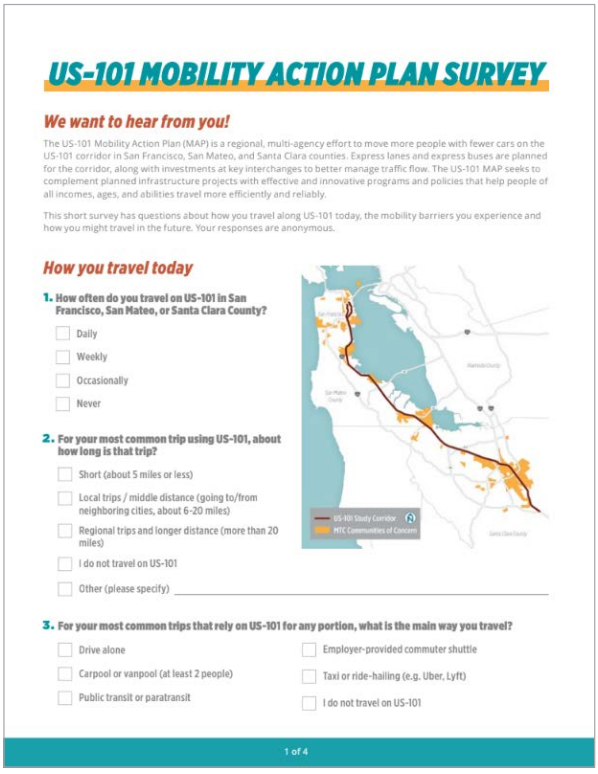
Gathering Input from the Public

The MAP team developed and promoted a public survey with questions about travel along US-101 today, the mobility barriers people experience, and how travel might change in the future. The survey was open June 1 - August 15, 2019 and received 2,355 responses.

The survey was distributed online and via paper copies, available in five languages: English, Spanish, Simplified Chinese, Vietnamese, and Tagalog.

In addition to all the organizations and groups reached through MAP promotion, the survey was also distributed to the residents of affordable housing sites in San Jose that offer free transit passes.

Details about what we heard and who we heard from are included on the 101 MAP project website: **https://www.101mobilityactionplan.com/stakeholder-input**



US-101 MOBILITY ACTION PLAN SURVEY

We want to hear from you!

The US-101 Mobility Action Plan (MAP) is a regional, multi-agency effort to move more people with fewer cars on the US-101 corridor in San Francisco, San Mateo, and Santa Clara counties. Express lanes and express buses are planned for the corridor, along with investments at key interchanges to better manage traffic flow. The US-101 MAP seeks to complement planned infrastructure projects with effective and innovative programs and policies that help people of all incomes, ages, and abilities travel more efficiently and reliably.

This short survey has questions about how you travel along US-101 today, the mobility barriers you experience and how you might travel in the future. Your responses are anonymous.

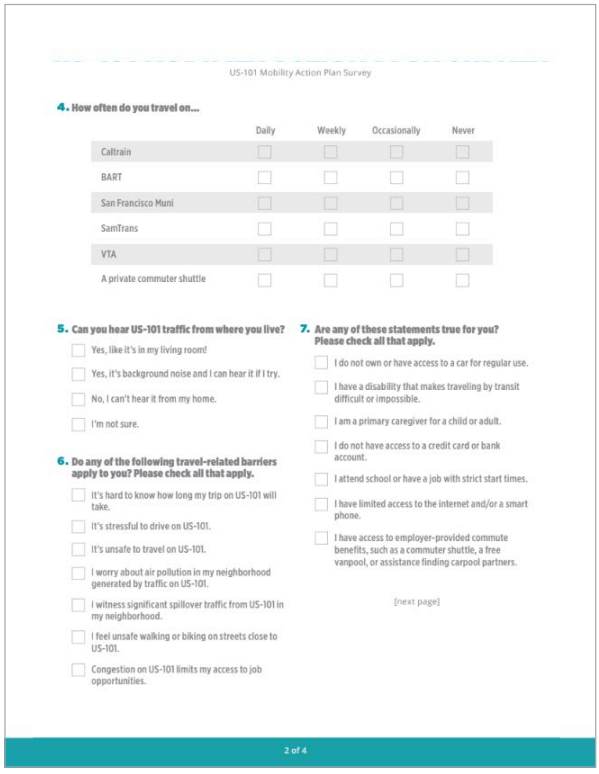
How you travel today

1. How often do you travel on US-101 in San Francisco, San Mateo, or Santa Clara County?
- Daily
- Weekly
- Occasionally
- Never

2. For your most common trip using US-101, about how long is that trip?
- Short (about 5 miles or less)
- Local trips / middle distance (going to/from neighboring cities, about 6-20 miles)
- Regional trips and longer distance (more than 20 miles)
- I do not travel on US-101
- Other (please specify) _____

3. For your most common trips that rely on US-101 for any portion, what is the main way you travel?
- Drive alone
- Carpool or vanpool (at least 2 people)
- Public transit or paratransit
- Employer-provided commuter shuttle
- Taxi or ride-hailing (e.g. Uber, Lyft)
- I do not travel on US-101

1 of 4



US-101 Mobility Action Plan Survey

4. How often do you travel on...

	Daily	Weekly	Occasionally	Never
Caltrain				
BART				
San Francisco Muni				
SamTrans				
VTA				
A private commuter shuttle				

5. Can you hear US-101 traffic from where you live?
- Yes, like it's in my living room!
- Yes, it's background noise and I can hear it if I try.
- No, I can't hear it from my home.
- I'm not sure.

6. Do any of the following travel-related barriers apply to you? Please check all that apply.
- It's hard to know how long my trip on US-101 will take.
- It's stressful to drive on US-101.
- It's unsafe to travel on US-101.
- I worry about air pollution in my neighborhood generated by traffic on US-101.
- I witness significant spillover traffic from US-101 in my neighborhood.
- I feel unsafe walking or biking on streets close to US-101.
- Congestion on US-101 limits my access to job opportunities.

7. Are any of these statements true for you? Please check all that apply.
- I do not own or have access to a car for regular use.
- I have a disability that makes traveling by transit difficult or impossible.
- I am a primary caregiver for a child or adult.
- I do not have access to a credit card or bank account.
- I attend school or have a job with strict start times.
- I have limited access to the internet and/or a smart phone.
- I have access to employer-provided commute benefits, such as a commuter shuttle, a free vanpool, or assistance finding carpool partners.

[next page]

2 of 4

What We Heard

Respondents are receptive to strategies that encourage higher vehicle occupancy, like carpooling, and lowest income travelers are the most likely to directly benefit.

Survey respondents use transit and are interested in investments in transit frequency, reliability, and free transit pass programs.

Travelers make travel decisions based on travel time and reliability and are most motivated to rethink travel decisions when offered tangible incentives.

Respondents experience stress and unpredictability traveling on US-101, and communities near the freeway experience additional stress from pollution and spillover traffic.

Daily travel crosses city and county boundaries, pointing to a need for regional coordination to address mobility challenges.

Informing the Equity Actions – Interviews with Community Leaders

Early on in the MAP project, the team determined that equity was a cornerstone of the project's desired outcomes. To define equity, the team adopted the factors MTC uses to designate regional Communities of Concern throughout the San Francisco Bay Area.

Bay Area Communities of Concern

- **Low-income households**
- **Ethnic or racial minorities**
- **Zero vehicle access households**
- **Limited English proficiency households**
- **Seniors age 75 and over**
- **People with disabilities**
- **Single parent households**
- **Severely rent-burdened households**

The MAP project team undertook **15 conversations** with leaders and practitioners who work with these populations to provide essential services or programs. Our goal was to understand the transportation and program participation barriers faced by these populations, as well as the best practices and lessons learned in reaching these communities to participate in programs of all types. These conversations, along with lessons from other planning efforts and resources, informed the Equity Action list that accompanies this document. The Equity Action List (Appendix D) ties specific equity actions to each of the strategies or mobility actions identified in the Mobility Action Plan.

Led conversations with:

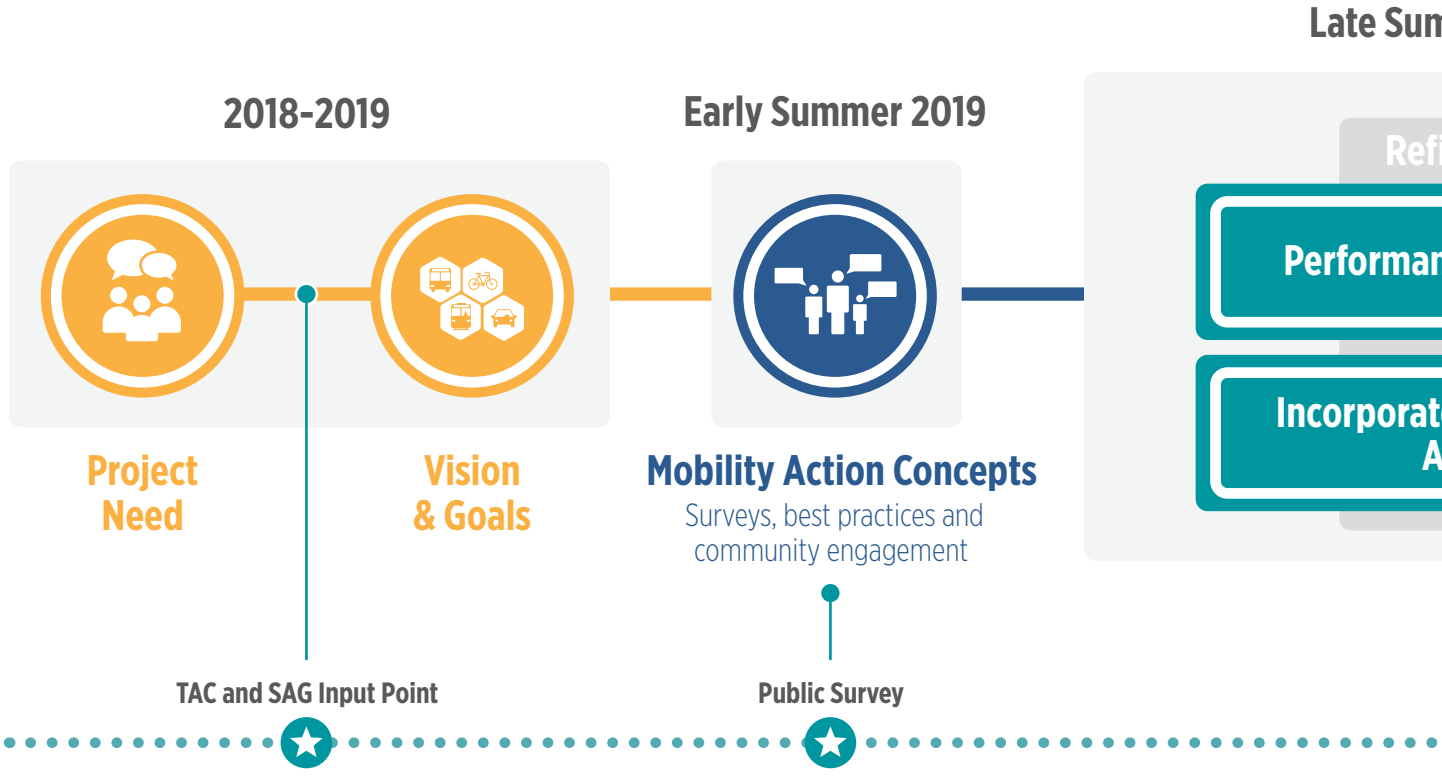
- Social workers and health providers
- Health, housing and social services advocacy organizations
- Community leaders and local advocacy organizations
- Education coordinators and youth advocacy organizations
- Labor and immigration organizers
- Transportation operators and access coordinators

Through this research and these conversations, our team came to understand that equity must be addressed in the details of how a program or service is implemented. Details of how we incorporated this feedback into the current list of actions is provided in Chapter 4.

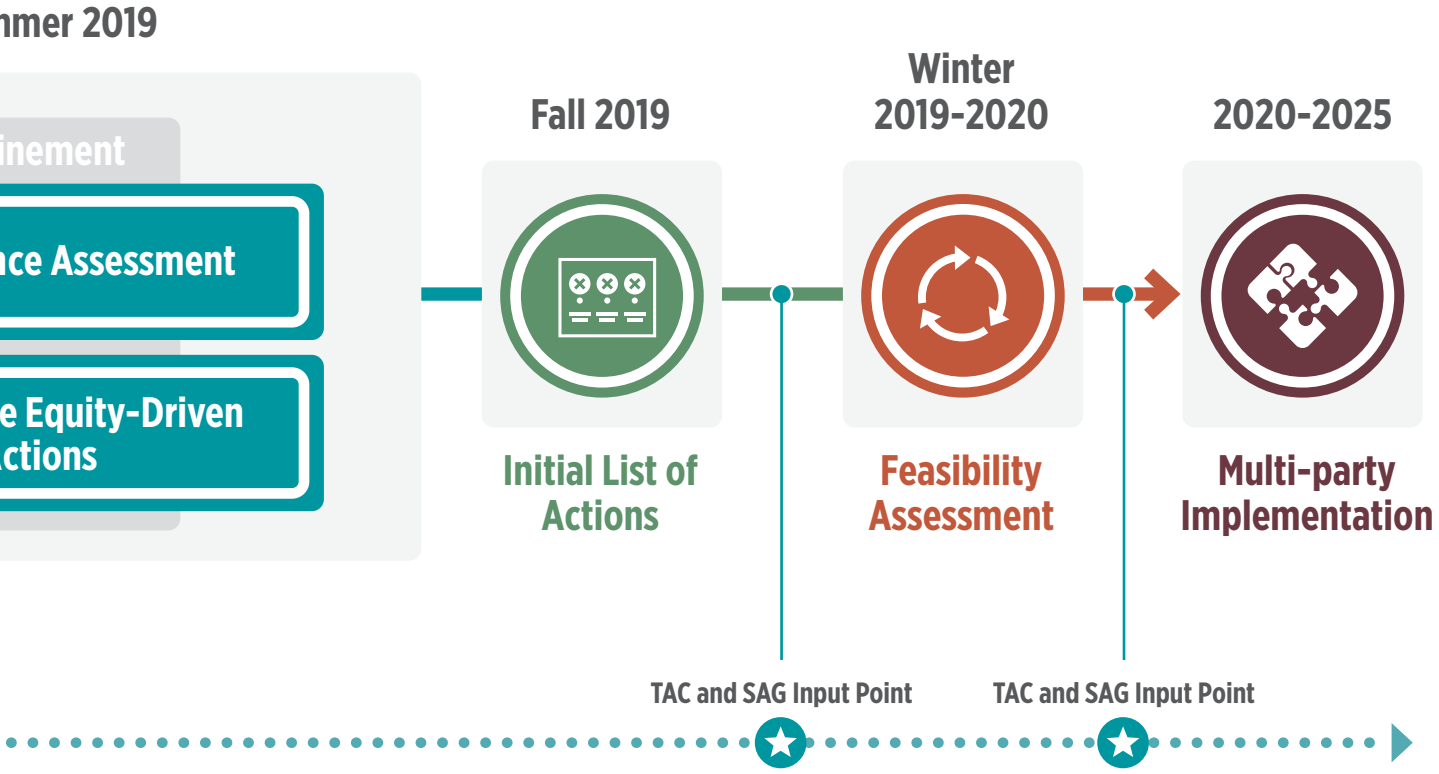
CHAPTER 4: IDENTIFYING THE ACTIONS

Developing the Actions

Input from the public, community leaders, government stakeholders and employers, combined with research about established best practices and innovative new approaches, informed the action development process.



The mobility action process was supported by multiple stakeholders at each step. The PMT guided the direction and reviewed technical progress throughout the action development process, and the TAC and SAG shared input at key transition points indicated below.



Identifying the Mobility Actions

The following list of actions was generated and informed by ideas from our project survey and community engagement, industry best practices, and case studies. These 60 actions represent a set of potential near-term policy changes and transportation demand management (TDM) programs that address existing travel barriers on US-101 and support the three project goals.

Although each action contributes primarily to one of the three project goals, many would ultimately advance more than one goal. Further sections of this plan describe the assessments of the cost, readiness, and implementing entities for each action, as well as specific equity actions implementers should take. These assessments are described starting on page 54, including "mobility performance scores" for each action's effectiveness.

Goal 1: Offer reliable travel times

Normalize Travel times

1. Improve enforcement of managed lanes, including carpool & express lanes, through available automated technologies.
2. Conduct education campaign about safer, more efficient driving habits.
3. Expand freeway service patrol to support clearing of vehicle breakdowns, conflicts, etc.
4. Incentivize safer driving behavior through benefits or rebates to drivers who demonstrate responsible driving.
5. Support policies or demonstration projects related to bus priority on freeway (e.g., bus-on-shoulder or bus-only lanes) or on parallel roadways such as El Camino Real or I-280.
6. Support ongoing planning projects to ensure a continuous express lane on US-101 from South San Jose to downtown San Francisco.

Improve information

7. Work with Google Maps or other traffic apps to delineate travel time differences between general purpose lanes and managed lanes.
8. Improve reliability of real-time transit arrival information for transit routes operating on US-101 or on key transit corridors parallel such as El Camino Real.
9. Work with private sector app providers to incorporate more real-time information on collisions, construction, etc.
10. Integrate multimodal information whenever possible on freeway travel time signs, including transit and if possible parking availability at transit stations.

Goal 2: Prioritize High-Capacity Mobility Options, such as Buses and Carpools

Increase average vehicle occupancy of US-101

11. Improve transit speeds and transit priority on El Camino Real or other parallel roadways, shifting short trips off the freeway.
12. Encourage employers to introduce parking fees and for those who don't park, a cash-out program that puts money into employees' paycheck and/or extra vacation time program.
13. For employers and public transit agencies who operate and charge for parking, shift monthly permits/fees to daily rates.

Case Study

CTA Bus Tracker: Improving reliability of real-time transit information

The CTA, in Chicago, introduced its Bus Tracker system along certain routes from 2006-2009. The Bus Tracker uses GPS to locate city buses and present their current location and expected arrival time on various platforms. At first, Bus Tracker was accessible only through the CTA website, but over time new methods of information sharing were launched. Riders gained the ability to subscribe to email or text message updates for preferred bus stops, and more recently third-party vendors have created a variety of Bus Tracker apps for smartphones and other mobile devices.

Outcomes

The Bus Tracker system was rolled out incrementally, allowing CTA to compare changes in ridership between routes with improved information and routes without that intervention. CTA determined that the Bus Tracker was responsible for a 1.8 to 2.2 percent ridership increase on routes where Bus Tracker is available.

CTA Bus Tracker Website

Source: CTA: http://www.ctabustracker.com/bustime/home.jsp

Incentivize Transit

14. Create option for bulk transit pass program eligibility to include contractors, consultants, interns and temporary employees that work more than 20 hours a week.
15. Expand eligibility for bulk transit pass programs to include TMAs, neighborhood associations, colleges.
16. Introduce monthly transit pass accumulator on Clipper (automatically providing a monthly pass for rest of month when value of pass has been spent on individual rides).
17. Introduce means-based fare structures on all transit providers throughout study area, through regional programs such as MTC's Means Based Fare pilot.
18. Offer free or reduced price transportation for youth, or other promotional or marketing initiatives, where not offered now.
19. Improve transfers/synchronization of multiple transit providers in MAP study area.
20. Conduct comprehensive study of the public and private shuttle system to identify opportunities for coordination.
21. Open private employer shuttles to all on-site employees regardless of classification.
22. Explore opportunities for coordination/partnership on long-haul commute routes between employers, such as sharing/selling excess capacity on bus trips.
23. Create perks for transit users at high traffic locations or special events, such as "cut the line" (TSA at SFO/SJC, security or concessions at Giants, Warriors, Sharks).
24. Create one fare product for trips to high traffic locations (Caltrain + VTA pass for 49ers game, Caltrain + BART pass to SFO).
25. Ensure employees of all classifications have access to non-surcharge BART fare at SFO.

Goal 2: Prioritize High-Capacity Mobility Options, such as Buses and Carpools [continued]

26. Provide hotel customers with transit vouchers (e.g., $20 Clipper card that must be returned) and free BART passes for return to airport.
27. Offer family / group discounted fares on weekends on transit.
28. Expand first mile/last mile transportation options such as bike/scooter/car share at key transit hubs on the Peninsula / in the South Bay.
29. Implement a "transportation credit" program that would provide toll credit for regular transit users, transit credit for regular toll lane users.

Incentivize carpool/vanpool

30. Incentivize the use of pay-as-you-go insurance plans for drivers.
31. Subsidize ride-matching through real-time matching apps (Scoop or another similar platform).
32. Create a regional vanpool subsidy program with ridership tracking and improve vanpool ride-matching.
33. Create regional or sub-regional carpool matching program for school-age children.
34. Encourage employers to provide gas incentive for regular carpoolers.
35. Support regional policies to phase out free use of HOV/express lanes if solo driver in a hybrid or clean air vehicle, or charge a reduced toll.

Case Study

LA Metro Express Lane Transit Rewards Program

The LA Metro Express Lane Transit Rewards Program rewards regular transit riders with free credits to use the Express Lane and is the first program of its kind in the country. The Express Lane project integrated transit planning from the beginning by improving transit service and transit programs in conjunction with the Express Lanes.

The program is intended to provide a direct incentive to taking transit by providing a $5 Express Lane toll credit for people who ride transit 32 times on transit routes that parallel the Express Lanes. To receive the credit, users register and link their transit TAP card (fare card similar to Clipper) and Express Lanes Accounts.

Outcomes

In the first four years of the program, nearly 7,000 people signed up and Silver Line BRT that uses the Express Lanes increased ridership by 60%

Metro Silver Line using the Express Lane
Source: https://www.metroexpresslanes.net/en/about/transit.shtml

Goal 2: Prioritize High-Capacity Mobility Options, such as Buses and Carpools [continued]

Strengthen existing TDM programs

36. Decrease parking minimums/adopt parking maximums/allow for shared parking at multi-use development as part of city development requirements.

37. Create regionally-consistent TDM developer requirements for specific land use types.

38. Develop regional branding/marketing program for TMA/TDM programs.

39. Develop a platform for developments to share current mode split, informing neighboring developments and encouraging a friendly competition.

40. Strengthen Bay Area Air Quality Management District (BAAQMD) and MTC employer TDM expectations for large employers (50+) by, for example:
    a. Enforcing the requirements and penalize employers not in compliance
    b. Expanding the potential mitigation options beyond pre-tax commuter costs, which is not shown to be very effective; instead, require larger companies to provide public transit passes or carpool subsidies and/or use of alternative modes by employees one day per week
    c. Creating an option for employers to charge for parking, or to shift from monthly to daily parking fees
    d. Creating an option for employers to formalize a policy and encourage employees to work from home or use alternate work schedules

41. Support small companies in funding and offering virtual meeting services software to facilitate remote work.

42. Support the development of new and expanded TMAs across study area in high employment areas.

Goal 3: Foster Healthy and Sustainable Communities

Reduce traffic burden on local streets

43. Enact trip caps for major employment centers.
44. Assess needs for traffic calming measures in neighborhoods/downtowns with high volume of cut-through traffic.
45. Introduce or increase parking pricing in downtowns, major employment sites, or high traffic areas with transit access and other transportation options.
46. Support completion of the multi-use Bay Trail route and connections to the facility that runs parallel to US-101.
47. Prioritize transit-oriented development of both residential and office development in study area.

Improve multi-modal options and safety

48. Conduct pedestrian/bicycle crossing needs assessment along entire US-101 corridor.
49. Keep bicycle lanes clear of obstacles, including Uber/Lyft drop-offs, construction, and street-sweeping.
50. Strengthen local TDM requirements to encourage/require bike programs and amenities in new and existing developments.
51. Bring bike share systems to the Peninsula and other locations in the study area.
52. Strengthen/fund Safe Routes to School programs in neighboring communities.
53. Adopt Local Road Safety Plans utilizing Vision Zero principles, goals and design guidance.

Case Study

Marin County Safe Routes to School

Established in 2000, Marin's Safe Routes to School Program encourages walking, biking, transit, and 3+ carpool for students going to and from school. The program was one of the first of its kind in the U.S. and served as a pilot that has since been applied across the country. Safe Routes to School uses a planning framework known as the six Es: education, encouragement, engineering, enforcement, evaluation, and equity. There are many benefits of Safe Routes to School for the students, schools, and community, and by shifting peak morning commute trips away from driving, the program helps reduce congestion from school drop off. Additionally, funding new safe pathways and crossings for walking and rolling as part of Safe Routes to School can be used outside of school trips by the community.

Outcomes

Since 2008, student trips to school in single-student-occupancy private vehicles decreased from 62% to 38%. Carpooling to school increased from 11% to 21% and active (walk, roll) trips to school increased an average of 14%. Over the same timeframe, active transportation trips across the county increased 2%.

Crossing guard and students crossing at a bicycle trail in Marin County
Source: http://www.saferoutestoschools.org/

Goal 3: Foster Healthy and Sustainable Communities [continued]

Address environmental, air quality, and health outcomes

54. Transition public and private bus and shuttle fleets to zero emission vehicles.

55. Develop policies to reduce vehicle idling in areas near schools, youth activity areas, affordable housing, and other areas with high asthma or greenhouse gas emissions rates.

56. Explore opportunities to provide high quality air filtration systems to residents and/or schools located in close proximity of US-101.

57. Allocate investments and funding to communities with higher asthma and greenhouse gas emission rates for programs like San Mateo County Parks Rx, urban tree canopy, and tree-planting programs.

58. Support overall greening efforts related to infrastructure and construction materials and designs, such as the C/CAG Green Streets Pilot Program. Adopt plans and policies for green infrastructure planning at the city or county levels.

59. Develop an incentive/rebate program for residents along the corridor to purchase E-bikes.

How We Assessed Proposed Actions

The complete set of mobility actions was assessed in three ways:

- **Performance Metric Assessment:** How do our actions perform against our goals and metrics?
- **Equity Assessment:** What additional steps must be taken in implementing these actions to advance equity?
- **Implementation Assessment:** How do our actions stack up in terms of readiness and cost? What entities will play a role in implementing these actions?

Each assessment provides details for implementers on how to select the actions best suited to meet certain community or project goals, how to meaningfully incorporate and advance equity through these actions, and how ready each action is for implementation soon.

Perfomance Metric Assessment

Mobility and Community Impacts

The first assessment evaluated the extent to which each mobility action could be expected to directly influence the MAP performance metrics outlined in Chapter 2. Because many of the strategies have not yet been tested on the US-101 corridor, the evaluation process relied on research, case studies, example pilot programs, and professional judgement to estimate the impact of each action.

These estimates of likely impact are represented with a numerical score that is compiled and summed for each goal, ranging from -1 to 3. An action received a score of -1 if it may negatively impact the desired outcome of a metric and a 0 if an action had no impact or is unknown. Scores of 1 and 3 were assigned if evidence exists to suggest that an action would indirectly or directly impact a performance metric, respectively.

Performance Metric Assessment Outcomes

The three highest-scoring actions for each goal are listed below. Based on our methodology, the following actions represent well-rounded actions with the ability to influence multiple performance metrics.

Goal 1: Offer Reliable Travel Times

- Support policies or demonstration projects related to bus priority on freeway (e.g., bus-on-shoulder or bus-only lanes) or on parallel roadways such as El Camino Real or I-280 (Action #5)
- Support ongoing planning projects to ensure continuous express lane on US-101 from South San Jose to downtown San Francisco (Action #6)
- Expand freeway service patrol to support clearing of vehicle breakdowns and conflicts (Action #3)

Goal 2: Prioritize High-Capacity Mobility Options, such as Buses and Carpools

- Create option for bulk transit pass program (e.g., Caltrain GoPass) eligibility to include contractors, consultants, interns and temporary employees that work more than 20 hours a week (Action #14)
- Introduce monthly transit pass accumulator on Clipper, automatically providing a monthly pass for rest of month when value of pass has been spent on individual rides (Action #16)
- Improve transfers/synchronization of multiple transit providers in MAP study area (Action #19)

Goal 3: Foster Healthy and Sustainable Communities Near US-101

- Enact trip caps for major employment centers (Action #43)
- Introduce or increase parking pricing in downtowns, employment centers, or high traffic areas with transit access and other modal options (Action #45)
- Strengthen/fund Safe Routes to School programs in neighboring communities (Action #52)

Interested in how each action faired against our performance metrics? Visit the scorecard in Appendix C to see which actions are most likely to meet the goals of your project or community.

Equity Assessment

Taking Action on Equity

Experience and research has shown that equity can be either maximized or lost in the many choices and details of how a program is implemented. Focusing on equity – and the extra steps it takes to make a program available to all – can make the difference in a widely-utilized and effective program.

For each action, the MAP team asked, **how can this action be improved or adjusted to make it beneficial to households with these disadvantage factors?** The result of this inquiry is a set of equity actions that apply to specific mobility actions, organized by the type of barrier they might seek to reduce. Using the STEPs model, the MAP team proposes actions that could be taken to reduce or diminish the likely barriers faced in each of these categories for each mobility action.

Want to know how to incorporate equity into implementation of each action? See the Equity Action List in Appendix D. This Equity Action List is a working compilation and is not assumed or designed to be exhaustive. This list of equity actions can and should be updated regularly as additional planning efforts explore and identify the steps needed to make transportation services, including new mobility services that may enter the transportation network, inclusive and accessible to everyone in our communities.

STEPS Model of Equity

- **Spatial barriers,** related to spatial or geographic disparity in services provided in a certain area
- **Temporal barriers,** related to time of day a service is available or time-sensitive transportation needs
- **Economic barriers,** related to cost of services or cost to access technology needed to use services
- **Physiological barriers,** related to serving users with physical or cognitive challenges or limited technology proficiency.
- **Social barriers,** related to serving low-income communities, minority communities, or people with limited English proficiency

Incorporating Equity into the Process

Multiple sources, including TransForm, have identified two critical types of equity in planning projects – process equity and outcome equity. Process equity includes efforts to ensure the development of a project or program is equitable and inclusive with representation from all groups at the table. Outcome equity focuses on the impacts of a program on defined performance metrics.

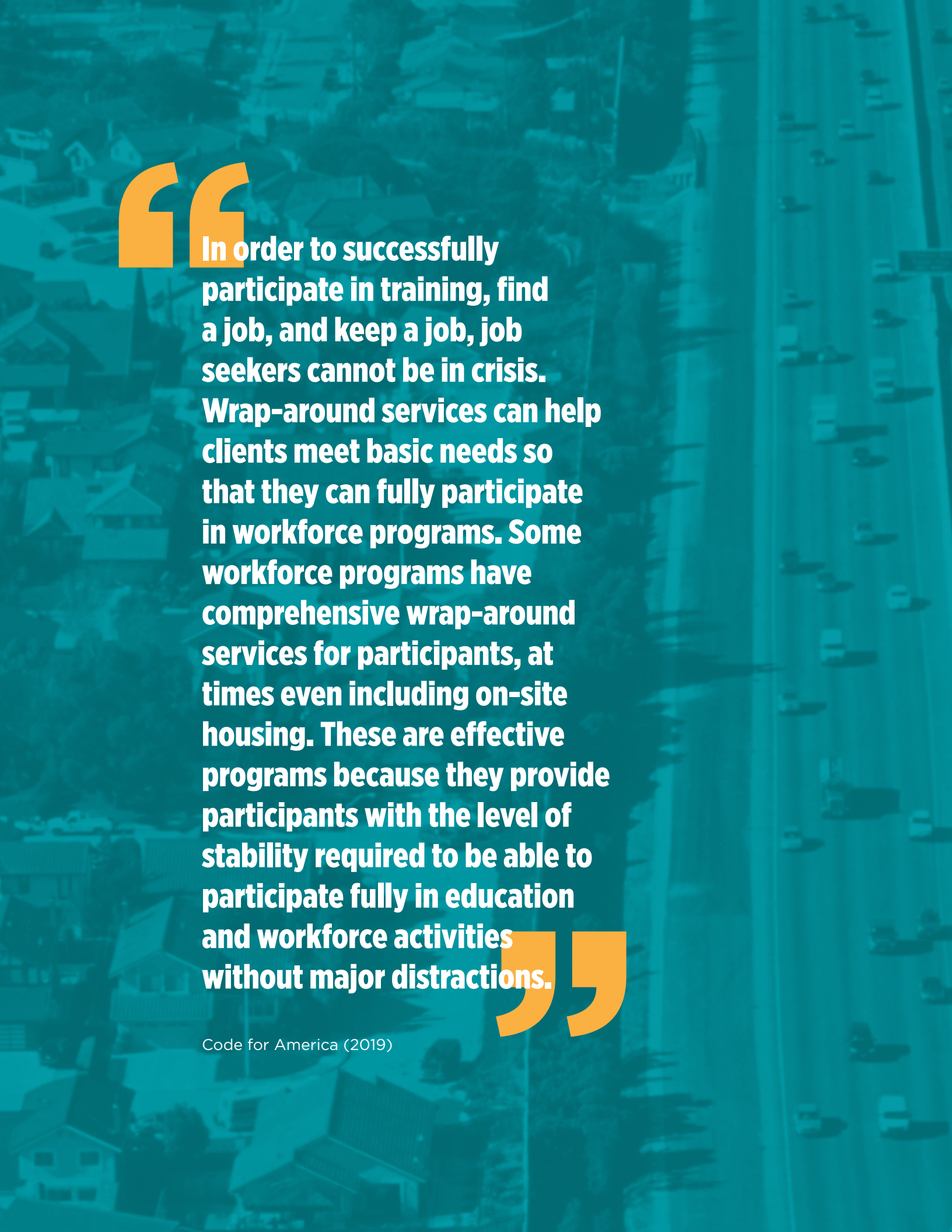
Foundational actions for process equity include efforts to:

- Build relationships with community leaders and organizations trusted by the community; compensate them for their ideas and participation from the beginning of design and development.
- Conduct user-centered research (e.g., survey, conduct focus groups, or test applications) about appropriate and accessible terminology, length, and level of detail in applications, forms, or program information.
- Provide funding for community-based organizations to design and execute community engagement and membership programs in their own communities.
- Explore ways to create local community-based workforce development opportunities through new programs or projects.
- Build transportation benefit programs into workforce programs, job trainings, or other social services through "wrap around services"; reduce the number of outside referral programs and steps required for participants.

Equity and Technology

Technology has the ability to streamline processes that were once cumbersome, making them more efficient to implement and monitor. At the same time, technology has the ability to divide and widen the gap of opportunity and access, if not utilized carefully. The following are some foundational equity actions for all programs utilizing technology and the internet, many recommended by Code for America.

- When designing enrollment processes, minimize the number of pages required to be loaded to complete an application.
- Make registration with log-in and password optional.
- Adopt one-way or two-way text messaging for program reminders or submission of eligibility documents.
- Ensure all informational and program enrollment websites are mobile-friendly.
- Prevent sociodemographic profiling within mobility program apps or websites.
- Ensure apps have a range of accessible communication functions, including native apps known to users, short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.
- Offer a path to participation that does not require use of the internet, or a computer, mouse, or keypad.
- Invest in direct, professional translation services instead of relying on Google translate, which can be unreliable for accurate translations.



In order to successfully participate in training, find a job, and keep a job, job seekers cannot be in crisis. Wrap-around services can help clients meet basic needs so that they can fully participate in workforce programs. Some workforce programs have comprehensive wrap-around services for participants, at times even including on-site housing. These are effective programs because they provide participants with the level of stability required to be able to participate fully in education and workforce activities without major distractions.

Code for America (2019)

Implementation Assessment

Readiness, Cost, and Entities

As a final step, each action was assessed for its implementation potential, which included:

- The action's **readiness** for implementation
- The **costliness** of an action with respect to one-time or ongoing funding
- The types of agencies or entities likely to play a role in **implementing each action**

Looking for insights on how each action performed in the implementation assessment for cost, readiness and implementing entity? See the Implementation Scorecard in Appendix E.

Readiness

MAP's approach to readiness assessment assumes that there is a phased pathway to implementation. First, a legal and technological groundwork must exist to allow the action to be implemented. Once that is in place, there is a phase of coordination – between implementing partners and the general public; between partners and their funders; and between the partners themselves. The final phase is about identifying funding and managing the implementation. Actions that necessitate new legal backing, technological development, or coordination between multiple partners score lowest (1) whereas actions that are in the final phase of simply identifying funding score highest (3).

Cost

MAP's approach to cost assessment places the actions least reliant on operational funding on top due to the relative difficulty implementing entities have in identifying sustainable sources of operational funding as compared to capital dollars. This is especially true for federally funded projects and is often true for private sector implementers as well. The best score (3) is for actions for which funding needs include only capital funds or require only a relatively low one-time cost. A moderate score (2) is for actions that require a combination of operational and capital funding. The lowest score (1) on this metric is for actions which require a large share of operational, ongoing funding or a relatively high amount of capital funding.

Implementing Entities

Many of the MAP actions require a coordinated and multi-party process for implementation. The Implementation Action List identifies the types of entities or agencies that would be likely to play a role in the implementation of each action. These entities include regional agencies, managed lanes agencies, transit agencies, congestion management agencies (CMAs), county agencies, cities, state agencies, private sector and employers, advocates and community-based organizations, and transportation management agencies (TMAs).

CHAPTER 5: PROMOTING AND ADVANCING THE 101-MAP ACTIONS

The US-101 Mobility Action Plan (MAP) brought together dozens of regional and local decision-makers and engaged over 2,000 members of the public to identify more than 60 potential near-term actions. These actions aim to improve travel time reliability, increase high-capacity mobility options, and improve the health and sustainability of communities along and adjacent to the US-101 corridor through San Francisco, San Mateo and Santa Clara Counties. The benefits of each individual action can be amplified when complementary strategies are implemented together.

Our Next Steps

Continue to coordinate efforts regionally across partner agencies.

The US-101 MAP Project Management Team (PMT) will continue to convene bi-annually to discuss progress toward key actions and discuss opportunities to align complementary projects and programs. The PMT will strive to maintain the MAP project website and resources, including updates reflecting progress made and discussed at each convening.

Present US-101 MAP widely to decision-makers, stakeholders, and potential implementers.

In the coming months, staff will present the US-101 MAP project to bodies including, but not limited to, the MTC Bay Area Partnership Board, SamTrans Board of Directors (BOD), C/CAG BOD, San Francisco County Transportation Authority BOD, VTA Congestion Management Program and Planning Committee and BOD, and interested community-based organizations and coalitions.

Seek champions and partners from public, private, and non-profit sectors.

Members of the PMT will continue to make resources widely available and seek partners in implementation of MAP actions from all sectors.

Integrate MAP actions into complementary planning processes and planned capital projects.

Numerous ongoing or upcoming planning and capital projects can benefit from and build upon MAP's work. These include the San Francisco 101/280 Express Lanes and Bus Project, as well as Express Lanes Equity Studies in San Francisco and San Mateo County. Additionally, the upcoming San Mateo County Countywide Transportation Demand Management (TDM) Study will identify strategies that can be funded with San Mateo County local sales tax funds. Many of MAP's fare-related actions will be explored regionally in the Transit Fare Coordination and Integration Study.

The Bay Area Partnership Board's Seamless Subcommittee proposed piloting actions through a corridor approach. The US-101 MAP presents an opportunity to advance the Partnership Board's pilot approach by providing best practices on multi-modal strategies and processes for other corridors to use, including stakeholder involvement and incorporating equity into planning, and piloting coordination on strategy implementation between city, county, and regional agencies.

Advance MAP actions through existing capital projects and through support of TDM implementers.

Coordination and synchronization are critical to effective Transportation Demand Management (TDM). TDM applies strategies and policies to help people use the infrastructure in place for transit, ridesharing, walking, biking, and telework. TDM relies on projects, programs, and strategies working in conjunction for maximum impact. Many of the strategies outlined in the MAP action list would be ineffective or minimally effective without the complementary implementation of others. Implementers should consider the necessity or benefit of certain key actions likely to be particularly high-impact because they either:

- **Provide resources (workforce, funding, etc.) to increase the number of participants and implementers of TDM programming.** For example, creating more transportation management associations (TMAs) will result in a greater number of organizations and companies with the ability to provide TDM programming to more people.
- **Bolster the effectiveness of our existing infrastructure.** For example, parking pricing and management strategies that decrease the availability of free parking have a demonstrated ability[33] to reduce vehicle travel and increase the use of transit, carpooling, walking, or biking.

How can I use MAP's resources in my projects and work?

MAP has identified a set of actions that positions a variety of implementing entities to advance initiatives most relevant to their work. Whether it be regional planning entities, local transit operators, cities, or community-based organizations, there are actions for everyone to work on as a leading entity and/or supporting collaborator.

The Actions Scorecard described in Chapter 4, presented in its entirety in Appendix C, and downloadable from the project website (**www.101mobilityactionplan.com**) can be used immediately by regional planning entities, local transit operators, cities, or community-based organizations to inform near-term plans and investments. The scorecard is interactive and can be sorted by:

- Each performance metric, to identify specific impact areas
- Goal, to identify actions most impactful to certain project goals (reliability, high capacity modes, or healthy and sustainable communities)
- Overall scores, to understand actions with well-rounded impact
- Project readiness, with higher scores indicating projects without major technological, legislative, or governance gaps
- Project cost, with higher scores indicating projects with fewer ongoing operating costs
- Implementing entity, to understand what entities would lead or support implementation of each action

The 101-MAP team hopes this functionality and interactivity assists community leaders in identifying those actions most closely aligned with their organizational mission and potential partnering agencies for implementation.

Though MAP will continue to coordinate and implement regional improvements to transportation, the following pages include statements on the actions each agency is particularly well-suited to advance in the near-term.

San Francisco County Transportation Authority (SFCTA)

SFCTA intends to prioritize many of the mobility actions of the MAP, especially those that align with the mission and goals of the agency and the region. San Francisco projects currently advance a number of the strategies outlined and will continue to expand efforts that reduce traffic congestion along the US-101 corridor and promote equity within the Bay Area. These efforts include:

- Implementing the San Francisco 101/280 Express Lanes and Bus Project, which will encourage mode shift to carpool and transit (Actions 5 and 6)
- Completing the Downtown Congestion Pricing Study, which will reduce vehicular traffic coming into the downtown core (Action 45)
- Expanding the Vision Zero Ramps program, which will improve safety at interchanges (Action 53)
- Constructing the Caltrain Downtown Extension Project, which will improve transfers between transit providers (Action 19)
- Conducting long range planning efforts through the Connect SF program, which will promote many of the strategies including Actions 44, 48, and 58

San Mateo County Transit District (SamTrans)

SamTrans will continue to explore the implementation of mobility actions that align with the transit agency's goals, priorities, and existing efforts. SamTrans currently has a number of projects that directly advance specific mobility actions. These efforts include:

- Completing the San Mateo County Shuttle Study, currently in progress. (Action 20)
- Launching a study of its Way2Go Pass program to explore refining or expanding the agency's bulk transit pass program. (Actions 14 and 15)
- Transitioning to a zero-emissions bus fleet as per the CARB Innovative Clean Transit rules. (Action 54)
- Actively participating in the regional Transit Fare Integration and Coordination Study and will continue to explore changes to its fare structures and payment mechanisms. (Actions 16, 17, 19 and 27)
- Constructing the El Camino Real Transit Signal Priority (TSP) Project to provide travel time and reliability improvements for ECR and other SamTrans buses along El Camino Real (completion in Spring 2021). (Action 8)
- Implementing express bus service aimed at providing additional mobility options as well as improving transit reliability improvements on US-101 and parallel roadways. (Actions 8 and 11)

Santa Clara Valley Transportation Authority (VTA)

VTA provides transit and paratransit services and is responsible for countywide transportation planning, programming, and construction as the County of Santa Clara's Congestion Management Agency. VTA supports the ongoing implementation of the mobility action strategies that align with VTA's Strategic Plan. Strategies identified in the plan that align with VTA's three strategic business lines; Faster Frequent Safe and Reliable Transit; Delivering Projects and Programs; and Comprehensive Transportation Management include:

- Transitioning to a zero-emission bus fleet (Action 54)
- Pursuing and completing Express Lanes on US-101 throughout the County (Action 6)
- Improving access along El Camino Real to shift trips from the freeway by partnering with local jurisdictions through long range transportation planning efforts (Action 11)
- Seek new fare programs to support low income riders through means-based fares (Action 16)
- Forge new relationships with private companies to deliver innovative public-private Express Bus service along the corridor
- Supporting projects which advance bus priority on roadways and freeways (Action 5)
- Implementing VTA's van pool program (Actions 30-35)
- Expanding first/last mile transportation options at transit hubs (Action 28)
- Supporting sustainable transit-oriented communities along the corridor (Action 47)
- Ongoing support for BAAQMD TDM programs for employers (Action 40)

VTA will continue to support projects and programs that make more efficient use of the existing corridor by providing reliable options and improved travel times in all lanes.

Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG)

The Metropolitan Transportation Commission and the Association of Bay Area Governments (MTC/ABAG) currently have several projects that advance the identified mobility actions. The agency is also pursuing pilot programs in other corridors that may be transferable to the US-101 corridor. These efforts include:

- Piloting smartphone app-based system and roadside camera-based systems (Action 1)
- Piloting bus-on-shoulder in the Dumbarton Bridge corridor, including portions of Bayfront Expressway. (Action 5)
- Conducting a regional bus-on-shoulder study to identify potential opportunities on regional highways and possibly a few select major arterial corridors, if feasible. (Action 5)
- Collecting both static and real-time data through 511 SF Bay from operators including BART, Caltrain, SamTrans, Commute.org, and VTA and publishing them through a set of application programming interfaces (APIs) and feeds for third-party data consumers such as Apple, Google, Transit, and many more. 511 SF Bay is also in the process of publishing a Regional General Transit Feed Specification (GTFS) feed that combines static data from all Bay Area operators in one single feed. The Regional GTFS will be accompanied by Historic Regional GTFS feeds and later by a Regional GTFS-Realtime feed. (Action 8)
- Publishing traffic incidents and events data under 511 SF Bay. (Action 9)
- Providing selected employers with funding to help implement a commute management platform that will facilitate parking management and other strategies to reduce drive-alone rates through MTC SHIFT. MTC SHIFT is an employer partnership program and the US-101 corridor is one of the priority corridors. (Action 12)
- Rolling out the Next-Generation Clipper system in 2022, which will update the entire Clipper system and introduce new features such as the ability to integrate with other transportation providers, such as bike share and paratransit. While it might take additional effort to determine administration and delivery of these strategies, the programs described

in Actions 14, 15, 16, 17, 24, 26, 27, 29 are included in the Next-Generation Clipper system's technical scope of work, which MTC and the transit operators will be designing over the next 12 to 18 months.

- Developing a tool to analyze and present transit connectivity gaps/ opportunities between transit services under 511 SF Bay. (Action 19)
- Promoting carpooling through the Bay Area Carpool Program. (Actions 31 and 32)
- Implementing half-price tolls for clean air vehicles on MTC's I-680 and I-880 express lanes when the I-880 express lanes open. Subject to Board approval, Bay Area Express Lane operators are implementing half-price tolls for clean air vehicles that do not meet HOV eligibility (Action 35)
- Creating and enhancing the Commuter Benefits Program materials that highlight the telework and compressed work-week program options under Option 4, the Alternative Commuter Benefit. (Action 40d)
- Supporting the development of policies to reduce vehicle trips during the morning and evening commute hours for a specific development or area, including major employment centers, under the Climate Initiatives Strategies - Trip Cap program in Plan Bay Area 2040. (Action 43)
- Identifying a regional set of mobility hubs to consider for pilot implementation under the Climate Initiatives Strategies - Carshare and Mobility Hubs program in Plan Bay Area 2040. Mobility hubs are usually built on a backbone of frequent and high capacity transit, and offer a safe, convenient, and accessible space to seamlessly transfer across different travel modes and make first/last-mile connections. (Action 28)
- Monitoring road charge developments on the state level and continuing to advocate for road charge pilots leading to the eventual shift to a road use charge. (Action 30)
- Updating the Regional Transit Expansion Program TOD Policy (MTC Res. No. 3434), which focuses on creating transit-supportive development patterns. (Action 47)
- Continue investigating ways to make the region's transit network better coordinated, more affordable, and more attractive through the Transit Fare Coordination and Integration Study.

City/County Association of Governments (C/CAG) of San Mateo County

C/CAG is committed to continued efforts to further the twin goals of reducing traffic congestion and increasing vehicle occupancy rates along the US-101 corridor in San Mateo County through a combination of infrastructure and non-infrastructure investments and strategies, and in promoting equitable outcomes for its residents. In furtherance of these goals, C/CAG's programs include actions to achieve the following:

- Continue to actively support efforts to develop a continuous system of managed lanes along US-101 from San Jose to San Francisco. (Action 6)
- Work to secure funding and advance construction of significant infrastructure improvements along the US 101 corridor within San Mateo County, including new and modified interchanges and pedestrian bridge crossings. (Supports Goal 1)
- Complete an update to the Congestion Management Land Use Impact Analysis Program TDM guidelines to promote alternative modes of transportation on a countywide basis. (Actions 37, 40D, and 50)
- Continue to fund and support high capacity and multi-modal options, including Safe Routes to Schools, Commute.org, first/last-mile transit connections, Lifeline Transportation, development and implementation of local bicycle and pedestrian plans, and other innovative programs to incentivize alternative transportation modes. (Actions 28, 31, 37, 38, 42, 46, 52, and 58)
- Investigate opportunities to promote integration of stormwater improvements and other urban greening into transportation infrastructure projects (Action 58)
- Continue to support 21-Elements and Home for All efforts to encourage balanced and equitable development that supports multi-modal transportation. (Action 47)
- Work to secure funding and continue implementation of the SMART Corridor Program throughout remaining segments in San Mateo County. (Actions 8 and 11)

Caltrans

The US-101 MAP complements Caltrans' mission to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. In addition, Caltrans prioritizes innovation and partnerships. We anticipate that Caltrans can support the US-101 MAP in the following ways:

- Continue to work with partners to plan, design and construct Express Lanes on US-101. (Action 6)
- Continue to support transit, pedestrian, and bicycle improvements on the state transportation network, and regional and local facilities, including the Bay Trail. (Actions 28, 46, 48)
- Caltrans Sustainable Transportation Planning Grant opportunities can help partners develop conceptual plans to advance MAP strategies. (Actions 28 and 48)
- Participate in gathering input from stakeholders on local or regional technical studies to advance MAP strategies. (Various Actions)
- Caltrans could perform preliminary investigations of available studies and research to advance potential MAP strategies. (Various Actions)
- Caltrans Transportation Impact Study Guide provides technical assistance to lead agencies on using vehicle miles traveled to assess project impacts and ultimately reduce greenhouse gas emissions. (Various Actions)
- Continue to operate and maintain park-and-ride lots and work with our partners to identify new park-and-ride opportunities in the US-101 corridor. (Various Actions)

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