# US-101 MOBILITY

ACTION PLAN

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US-101 Mobility Action Plan Project Management Team

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List of Figures

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In late 2018, representatives from San Francisco, San Mateo, and Santa Clara Counties, the Metropolitan Transportation Commission, Caltrans, and TransForm convened to identify complementary non-infrastructure investments to improve travel time reliability, expand use of 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) is a transportation demand management (TDM) plan aimed at maximizing the impact of planned infrastructure projects in the study area. In addition to enhancing local and regional transit, the 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 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 performance against the project metrics. The chapter also provides guidance on action readiness, relative cost, and approach to implementing with equity. 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 steps taken to complete this study and 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 A provides an overview of the planning and policy context for the study, including critical transit expansion and capital projects that are currently being planned or that have recently been implemented

- Appendix B outlines the travel behavior analysis approach

- Appendix C identifies the potential for each action to influence certain performance metrics

- Appendix D provides guidance for how each mobility action can be implemented with equity

- Appendix E includes an overview of the relative cost, readiness, and likely implementing entities for each action

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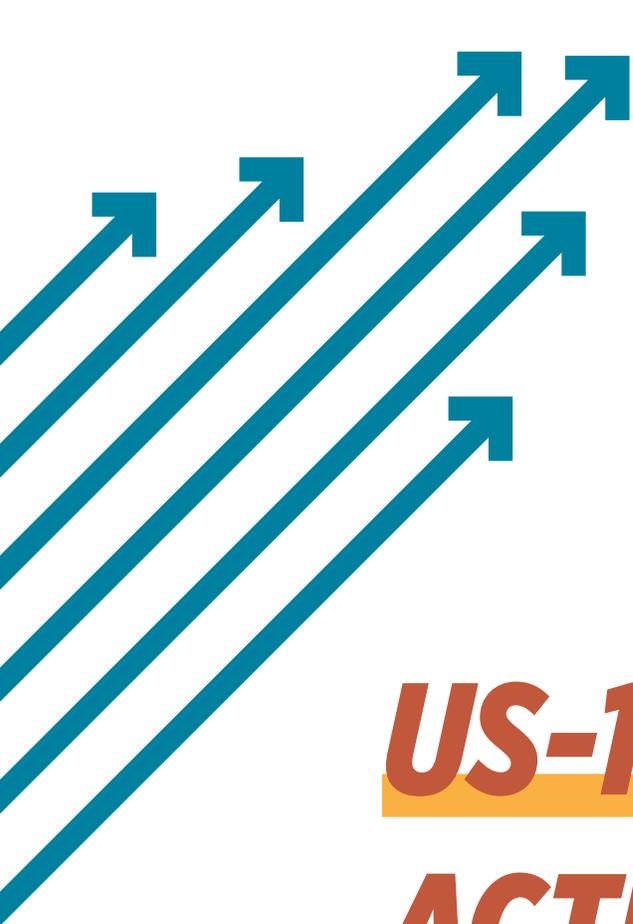
US-101 MOBILITY ACTION PLAN

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 access and 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 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 access to jobs***
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 caregivers 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 moved 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

Single-occupant vehicles make up 75% of vehicles on the corridor while transporting only 52% of passengers[1]

Legend: SOV, HOV2, HOV3+, Vanpool, Motorcycle, Truck, Bus
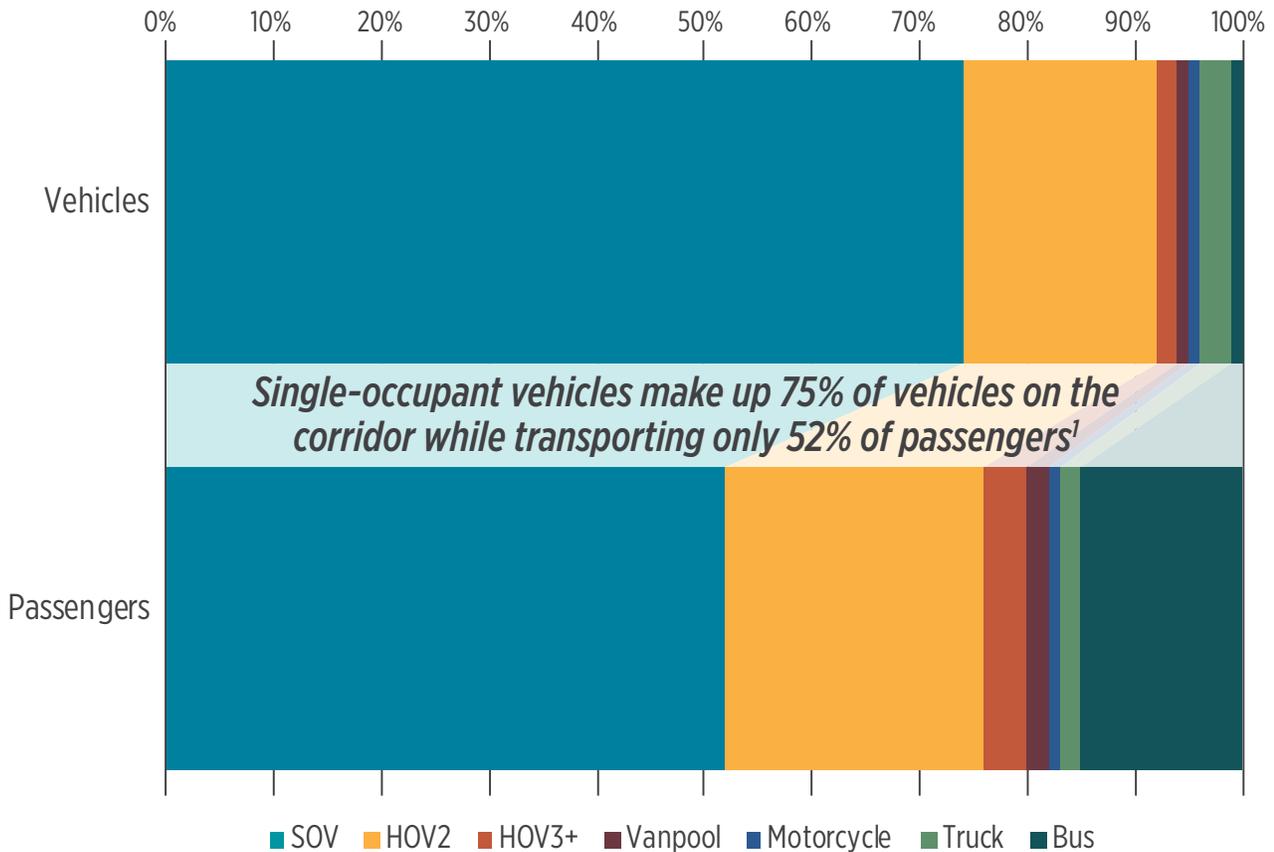
AT THE PEAK HOUR, 78% OF ALL VEHICLES ON US-101 ARE CARRYING ONLY ONE PERSON [2]

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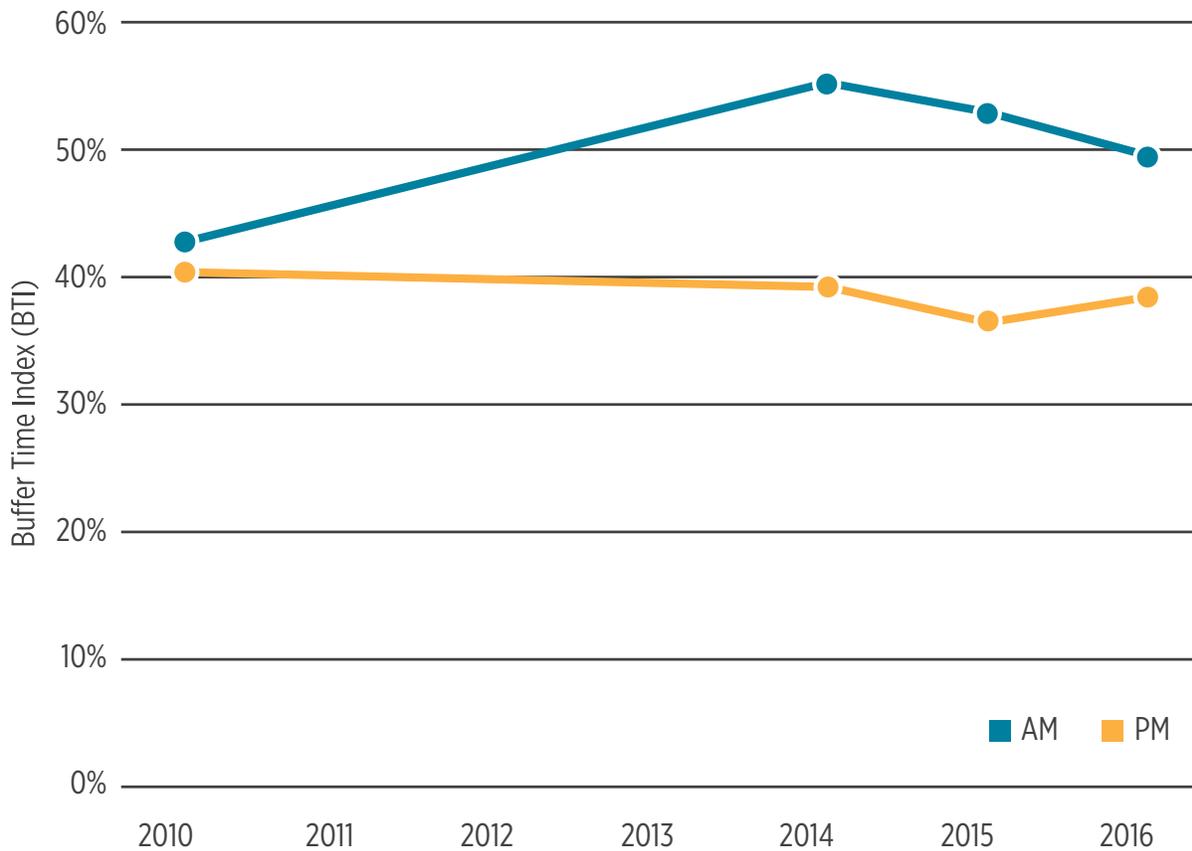
TRAVELERS DRIVING ON US-101 TYPICALLY ADD 25% TO 55% MORE TRIP TIME TO ENSURE THEY ARRIVE ON TIME [3]

Problem 3: Worsening congestion reduces access to jobs

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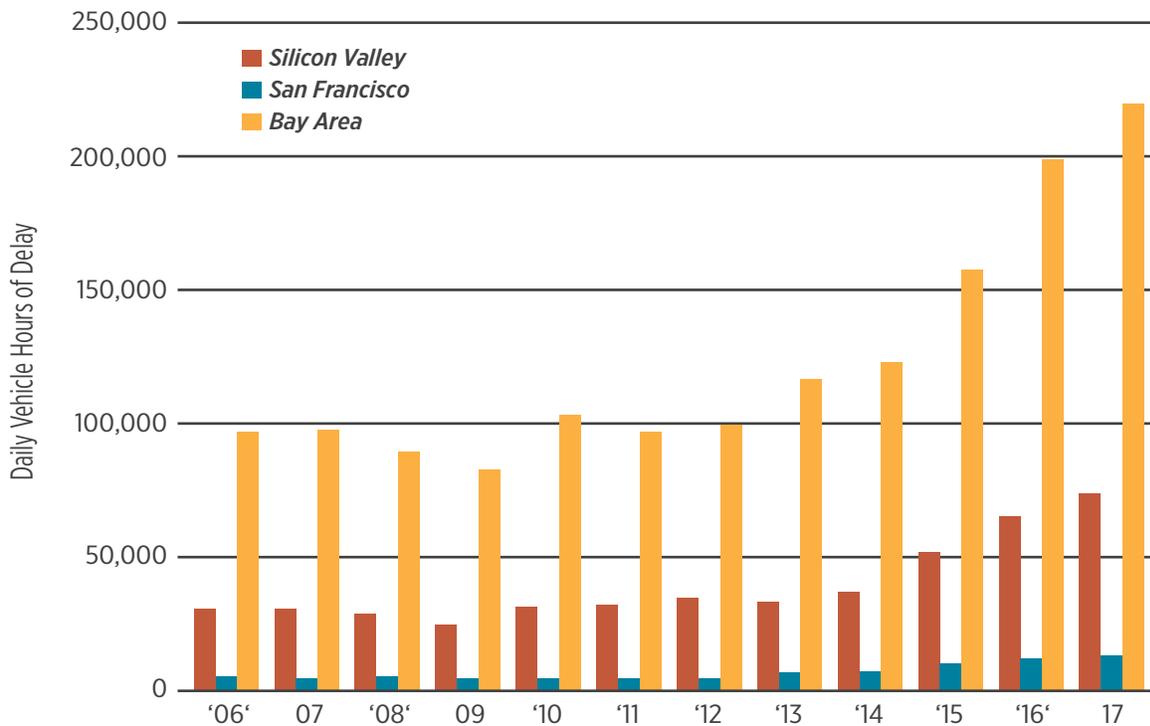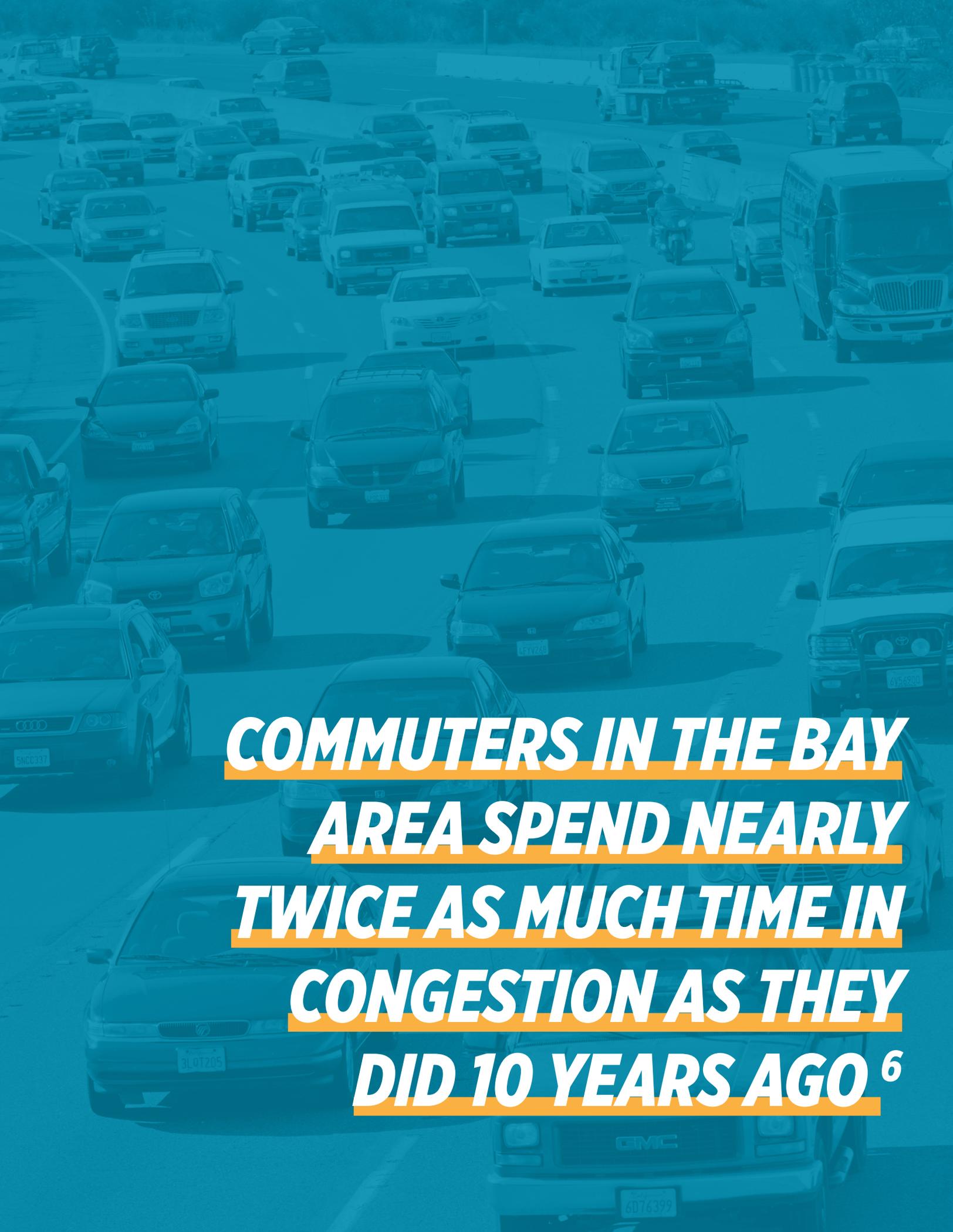
COMMUTERS IN THE BAY AREA SPEND NEARLY TWICE AS MUCH TIME IN CONGESTION AS THEY DID 10 YEARS AGO [6]

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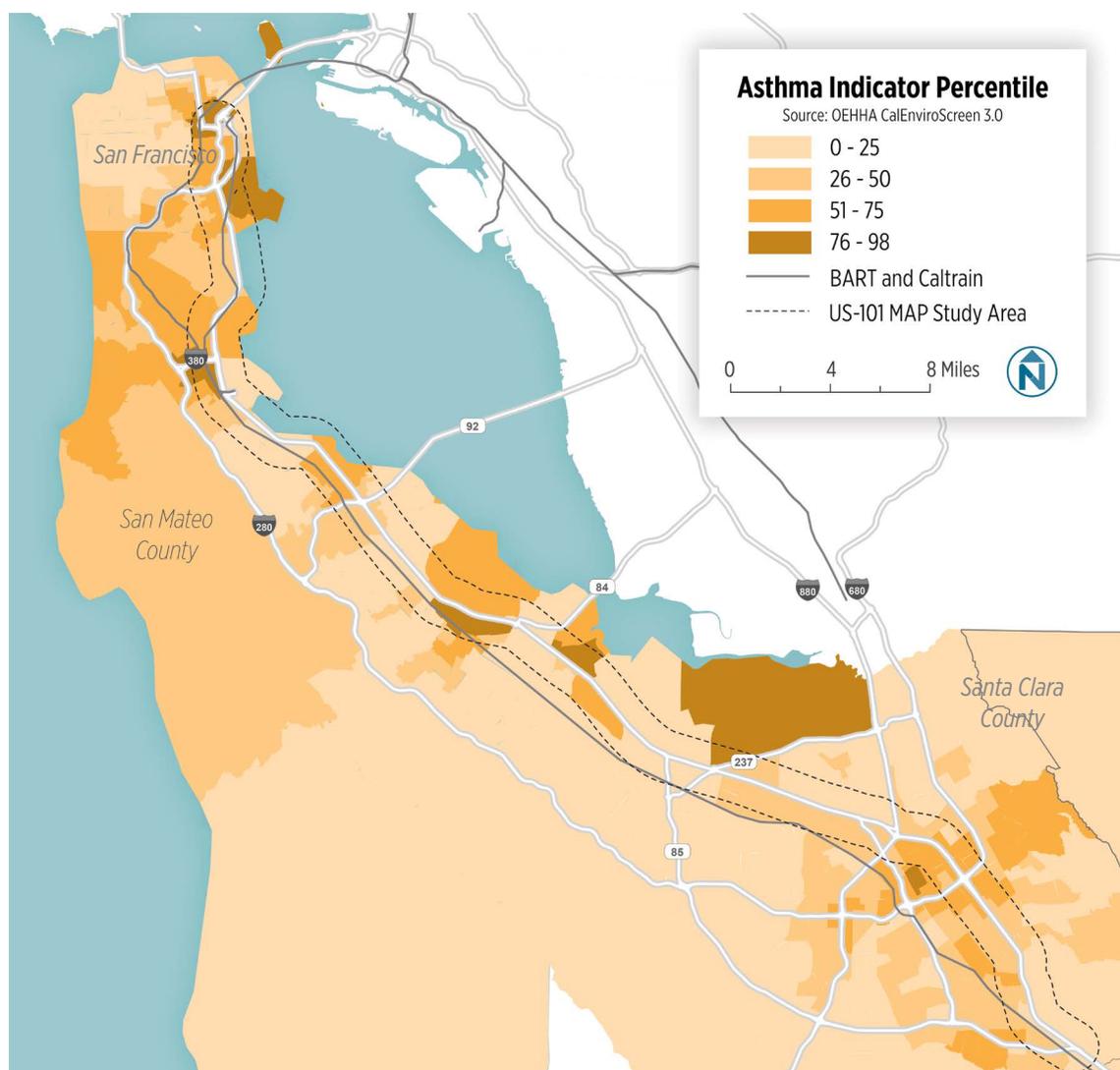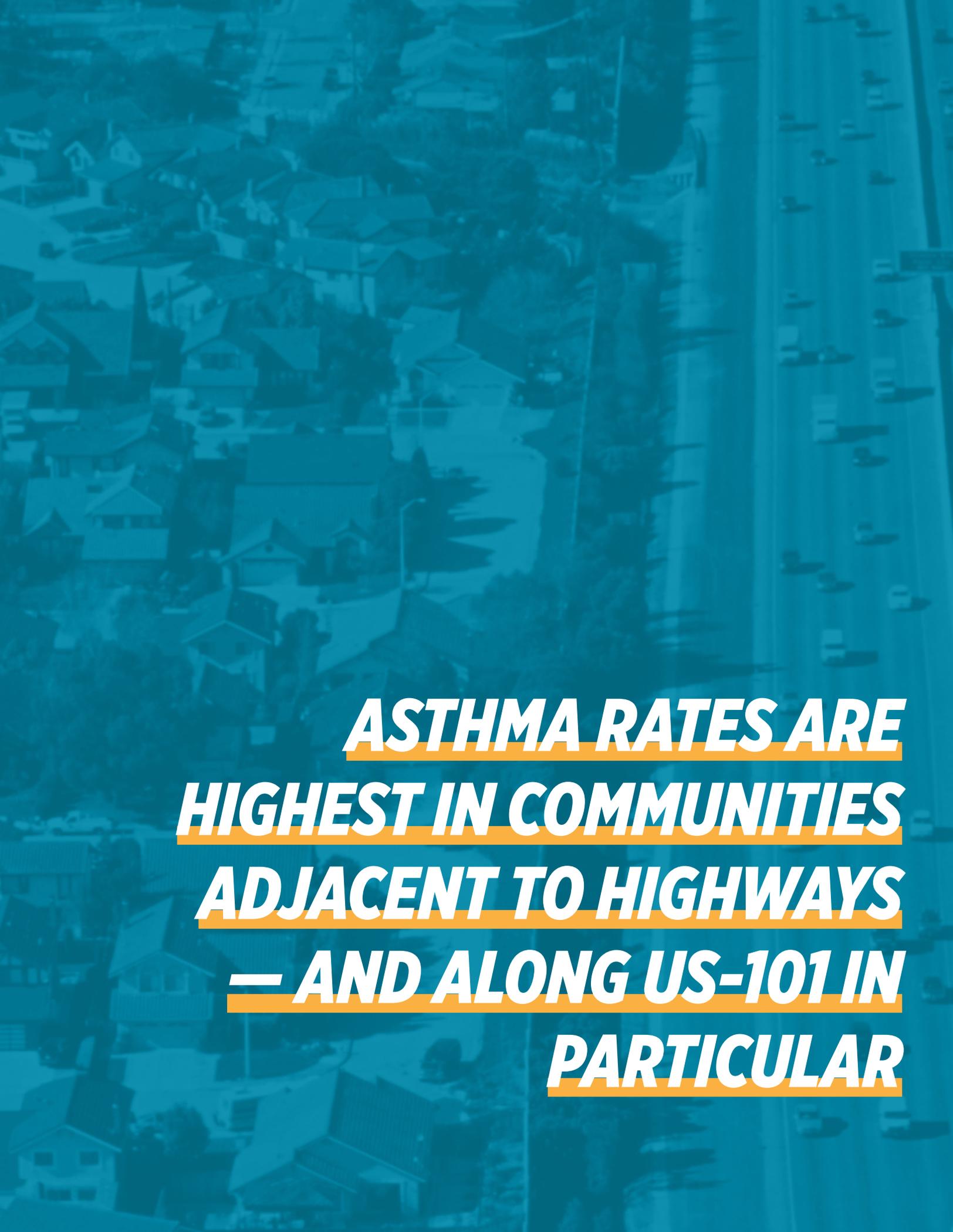
ASTHMA RATES ARE HIGHEST IN COMMUNITIES ADJACENT TO HIGHWAYS — AND ALONG US-101 IN PARTICULAR

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

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

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 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 with 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
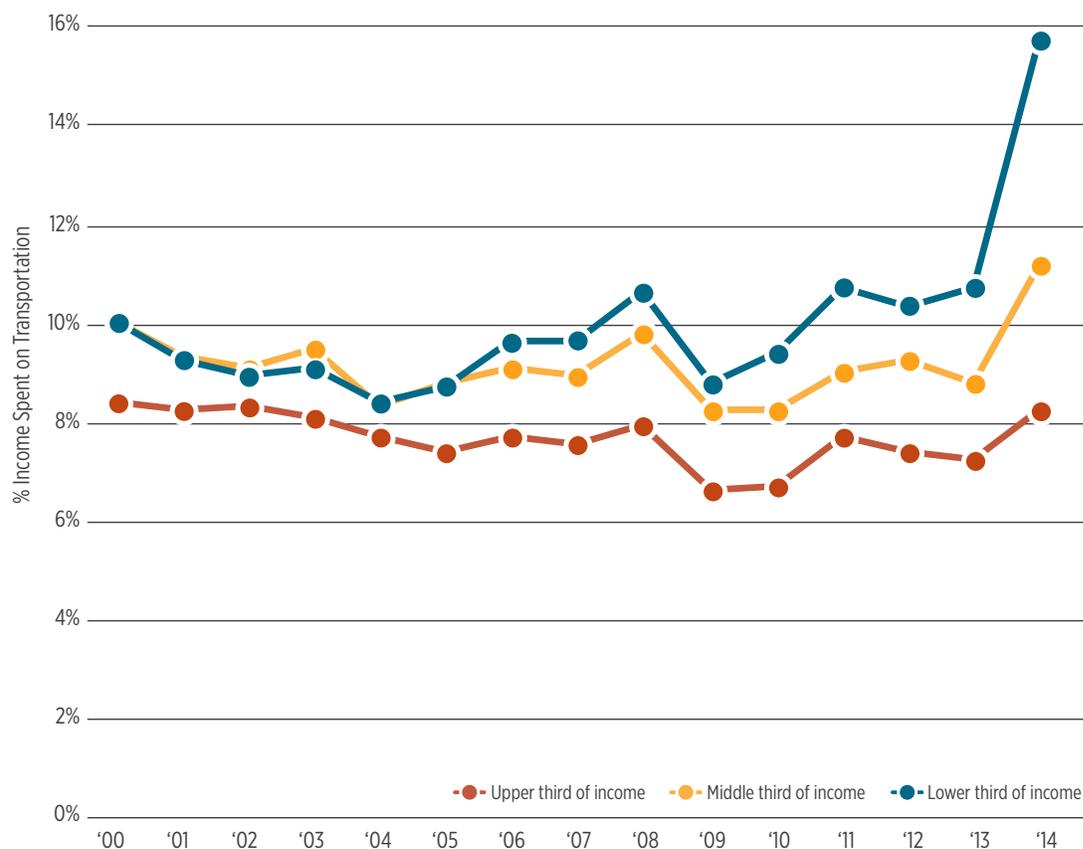
The Need for Action on Equity

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)

	SF/SM County Line	Millbrae	Ralston	SM/SC County Line
More than 40 miles	5%	3%	2%	2%
30-40 Miles	11%	10%	9%	10%
20-30 Miles	25%	25%	29%	23%
10-20 Miles	33%	39%	28%	36%
5-10 Miles	21%	14%	14%	19%
Less than 5 miles	6%	8%	17%	10%

Legend: Less than 5 miles, 5-10 Miles, 10-20 Miles, 20-30 Miles, 30-40 Miles, More than 40 miles
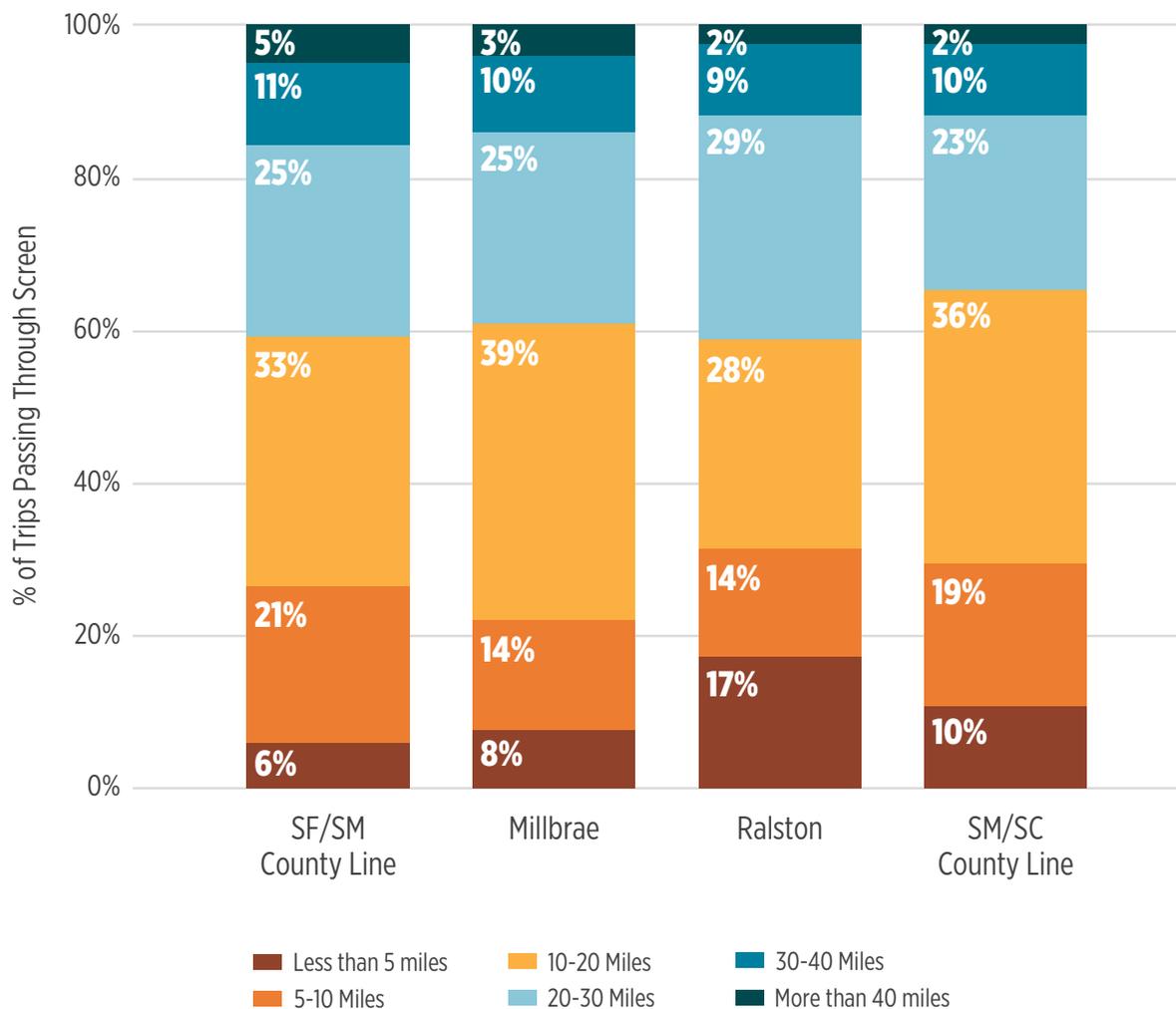
- **Long distance commuters (40 miles or more) make up a small portion of US-101 users.** The percent of long-distance trips at four different sample points was 5% or less of the total travelers at each location. The number of short distance travelers (under five miles) was higher than long-distance 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.

Transit and Infrastructure Projects in Progress

US-101 MAP is a large-scale transportation demand management (TDM) project aimed at maximizing the impact of planned transit expansion and infrastructure projects in the study area. Many of the mobility actions identified in Chapter 5 are reliant upon or assume the completion of either infrastructure projects or transportation service improvements. Below are the key planned transit expansion plans and infrastructure projects that are essential to the mobility actions. **Appendix A**, Planning and Policy Context summary, has a full description of these planned, complementary, and ongoing projects.

- **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

- **SamTrans' El Camino Real Bus Speed & Reliability Study**, launched in January 2021, is identifying operational and infrastructure-based improvements to increase transit speeds, improve bus reliability, and enhance service quality on the El Camino Real corridor through San Mateo County.

- **The San Francisco 101/280 Express Lanes and Bus Project**, currently in the environmental planning phase, is taking a combined look at managed lanes (HOV and/or express) and bus service improvements north of SFO, in southeast San Francisco.

- **San Francisco Muni Route 15**, which launched in January 2021 and provides new express service between Bayview and Hunters Point and Downtown.

- **San Francisco Downtown Extension (DTX)**, is in the design phase and will extend Caltrain into Downtown and improve overall rail access.

- **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.
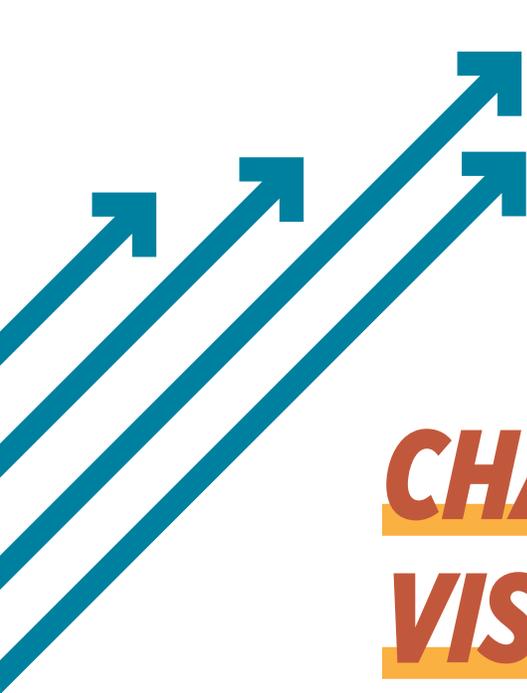
CHAPTER 2: PROJECT VISION AND GOALS

The US-101 MAP recognizes the need for equitable access along the corridor. The project goals are based on the core values of travel reliability, prioritizing high-capacity modes, and healthy communities. These goals allow for focused strategies that, through implementation, will increase access for the most vulnerable users of the corridor.

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 is described on the following pages.

Baseline performance metrics

The MAP views actions 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
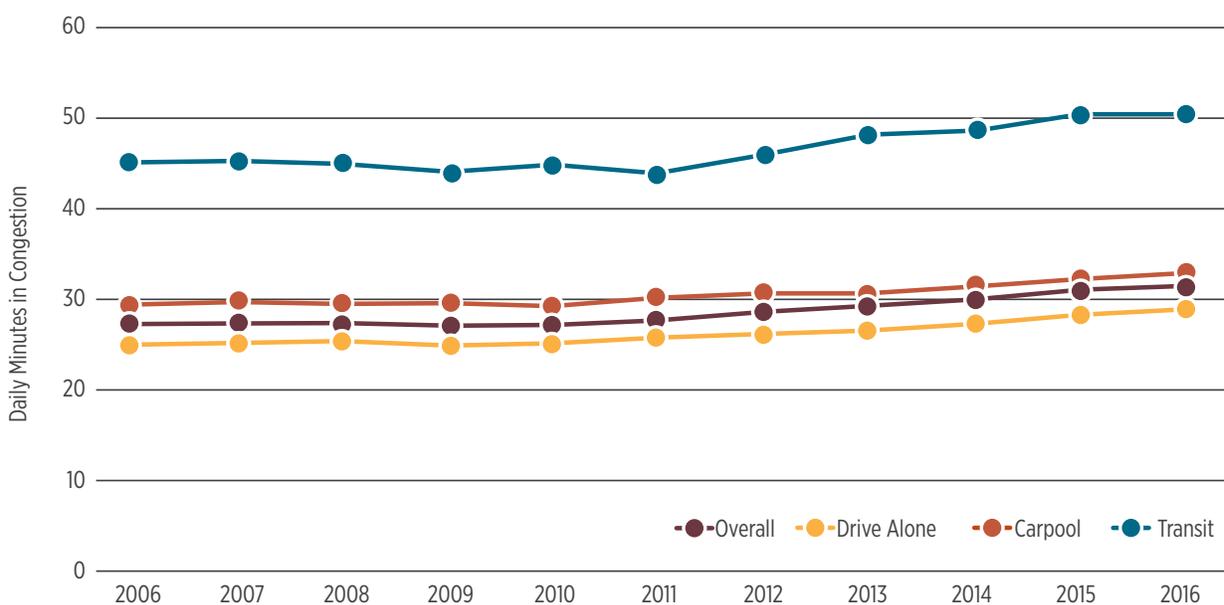
Figure 9. Daily AM Peak Vehicle Delay on Bay Area Highways
Source: MTC, INRIX

660 hours of delay
Southbound

1340 hours of delay
Northbound

210 hours of delay

450 hours of delay
Northbound

1590 hours of delay
Southbound

4230 hours of delay

20 hours of delay

20 hours of delay

3970 hours of delay

90 hours of delay

1590 hours of delay

Alameda County

San Mateo County

Santa Clara County

Santa Cruz County

DAILY AM PEAK VEHICLE DELAY
Source: MTC, INRIX

— US-101 segment within the top 150 most congested segments in the Bay Area

— Other congested highway segments

— BART and Caltrain

0   4   8 Miles

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 (50%) 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 publicly 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

Ridership estimates are the sum of annual ridership on the light rail and bus systems in Santa Clara and San Mateo Counties (SamTrans and Santa Clara Valley Transportation Authority), and rides on Caltrain and Altamont Corridor Express.

Figure 11. Ongoing or Upcoming Express Lane Projects on US-101
Source: Caltrans
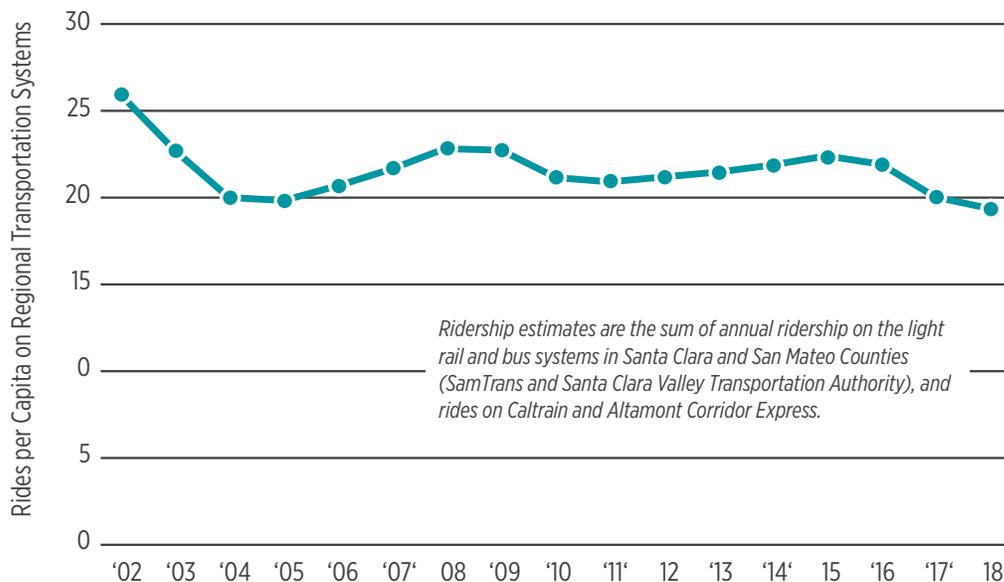
Baseline Performance Metrics for Goal 2: High-Capacity Options

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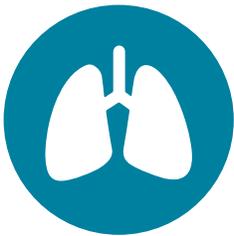
Children are especially vulnerable to air pollution impacts as their lungs are still developing—and children living near busy roads are more likely to have asthma symptoms and bronchitis[30]

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

Traffic Density Percentile
Source: OEHHA CalEnviroScreen 3.0

- 1 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- BART and Caltrain
- US-101 MAP Study Area

0   4   8 Miles
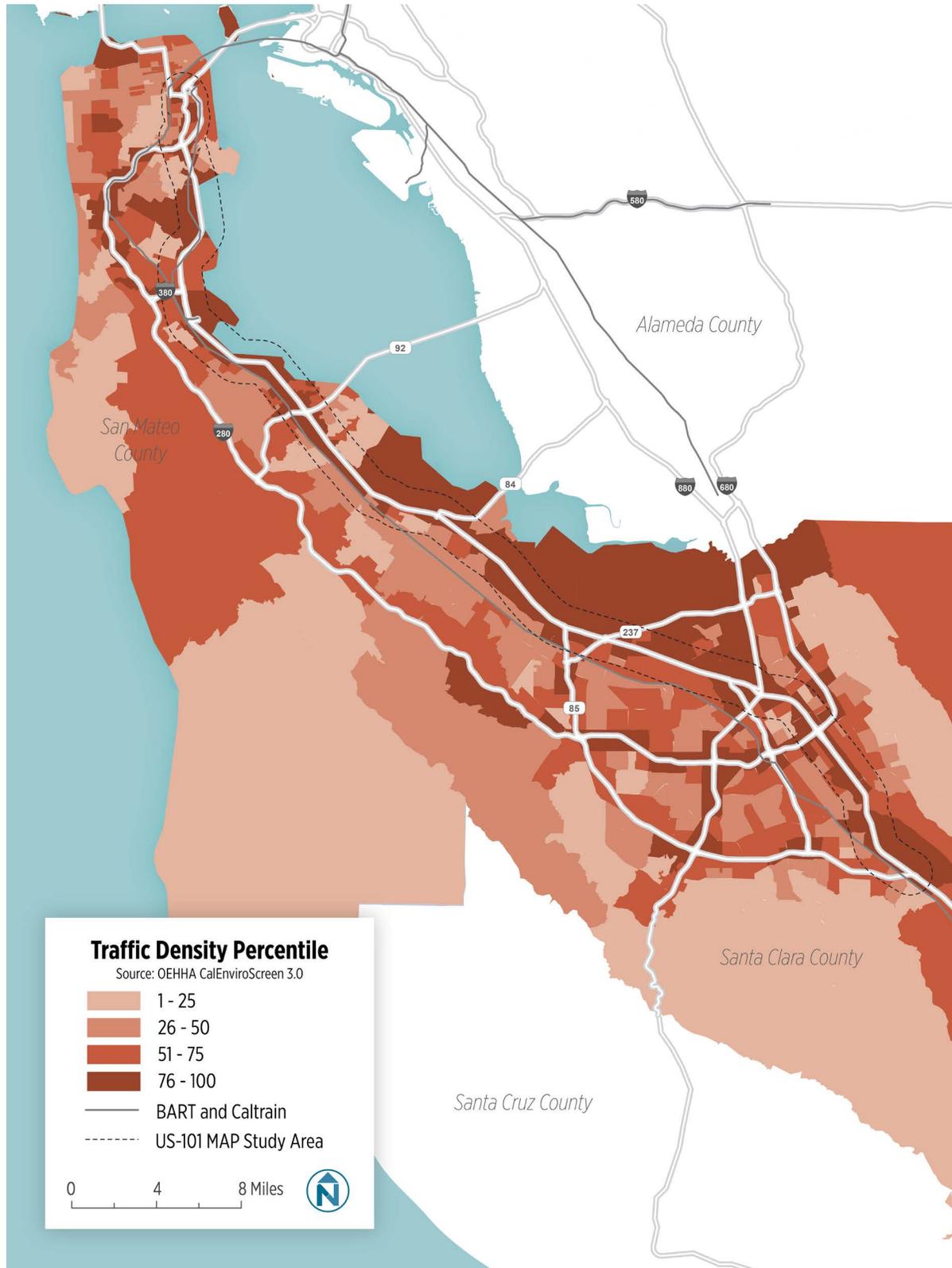
Baseline Performance Metrics for Goal 3: Healthy and Sustainable Communities

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**

What We Heard

Respondents are receptive to strategies that encourage higher vehicle occupancy, like carpooling and public transit.

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

Travelers make travel decisions based on travel time, reliability, and convenience 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. The team adopted the factors MTC uses to designate regional Communities of Concern throughout the San Francisco Bay Area to guide equity-focused outreach.

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. Through these conversations, along with lessons from other planning efforts and resources, our team came to understand that equity must be addressed in the details of implementation. The Equity Action list that accompanies this document Appendix D provides equity guidance for the implementation of the actions identified in the Mobility Action Plan.

The input gathered through the engagement process was used to develop the complete list of actions in Chapter 4.

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
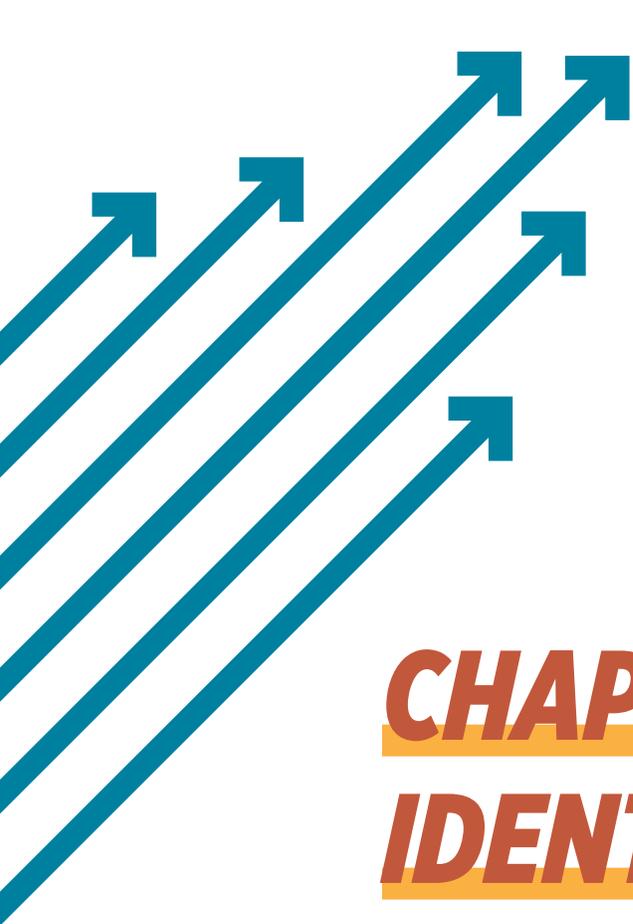
CHAPTER 4: IDENTIFYING THE ACTIONS

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.

2018 – 2019

Project Need

Vision & Goals

Early Summer 2019

Mobility Action Concepts
Surveys, best practices and community engagement

Late Sum

Refi

Performan

**Incorporat
A**

TAC and SAG Input Point

Public Survey

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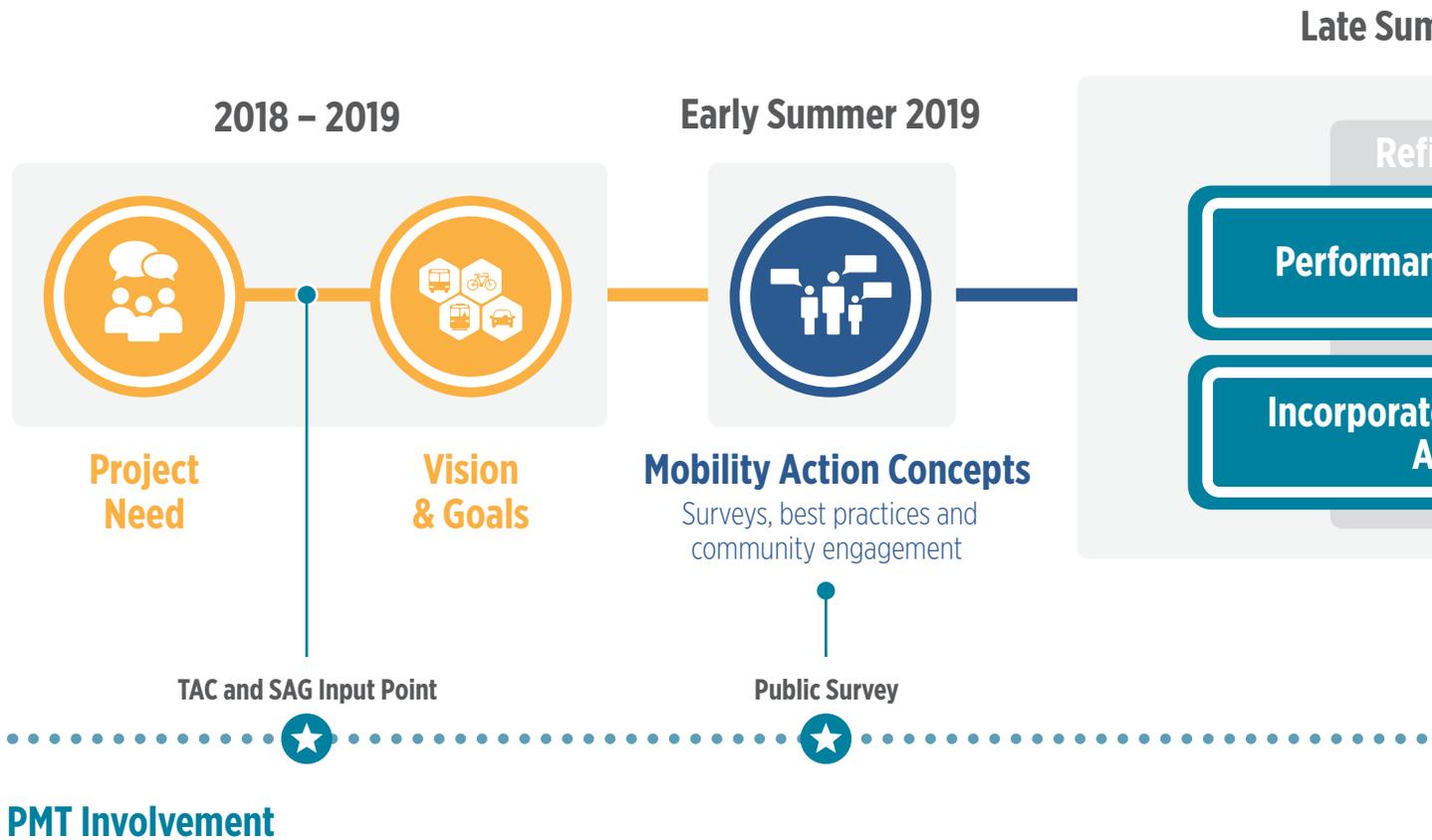
The mobility action process was supported by multiple stakeholders at each step. The PMT guided the direction and reviewed technical progress throughout the action development process, and the TAC and SAG shared input at key transition points indicated below.

mmer 2019

inement

ce Assessment

e Equity-Driven ctions

Fall 2019

Initial List of Actions

Winter 2019 – 2020

Feasibility Assessment

2020 – 2025

Multi-party Implementation

TAC and SAG Input Point

TAC and SAG Input Point
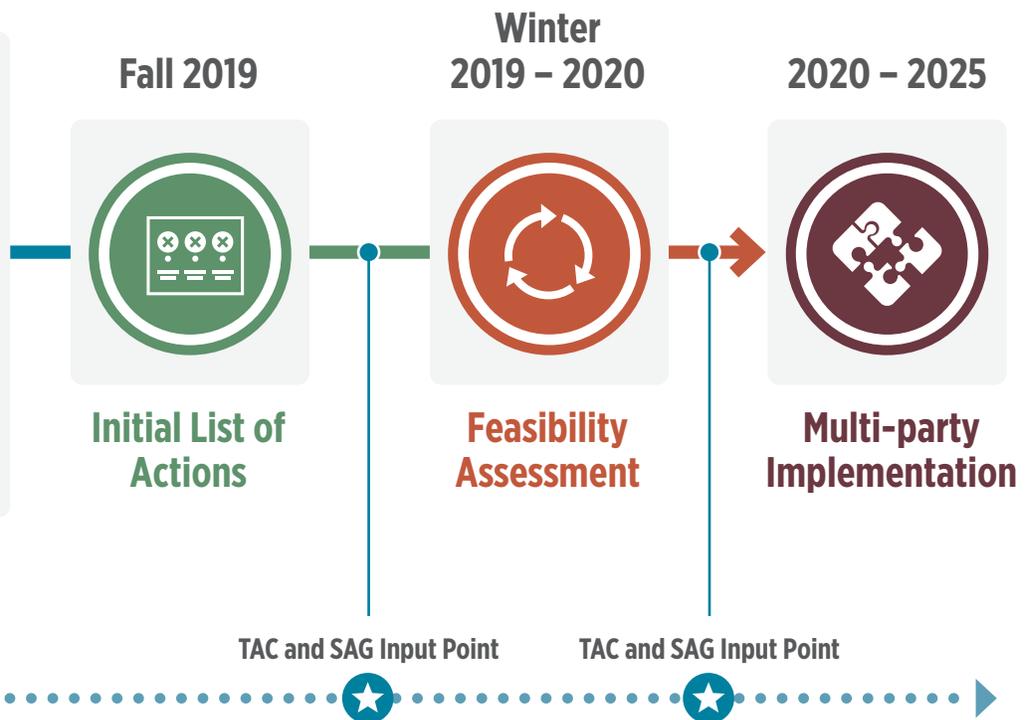
Identifying the Mobility Actions

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 transportation demand management (TDM) programs and near-term policy changes that address existing travel barriers on US-101 and support the three project goals.

Although each identified action contributes primarily to one of the three project goals, many would ultimately advance more than one goal. The Performance Metric Assessment section of this plan describes the assessments of each action against the study metrics. The assessments are described starting on page 54, and "mobility performance scores" for each action's effectiveness are included in Appendix C. Specific equity actions implementers should take when implementing mobility actions, as well as the cost, readiness, and implementing entities for each action, are detailed in Appendix D and E, respectively.

Goal 1: Offer reliable travel times

Normalize travel times

1. Conduct education campaign about safer, more efficient driving habits.

2. Expand freeway operational strategies to support freeway efficiency, including incident management, ramp metering, real time traveler information, and clearing of vehicle breakdowns, conflicts, etc.

3. Incentivize safer driving behavior through benefits or rebates to drivers who demonstrate responsible driving.

4. Support policies or demonstration projects related to bus priority on freeway (e.g., bus-on-shoulder or HOV-priority on-ramps) or on parallel corridors such as El Camino Real or I-280 North.

5. Support ongoing planning projects to create a continuous managed lane (HOV/express) on US-101 from South San Jose to downtown San Francisco.

6. Improve enforcement of managed lanes, including carpool & express lanes, through available automated technologies.

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 US-101, El Camino Real, and other parallel roadways to provide more long-distance service and shift 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.

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 options for bulk transit pass program eligibility (e.g Caltrain GoPass) 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. Implement a "transportation credit" program that serves as a transit pass accumulator (automatically providing a monthly pass when the value of a pass has been spent on individual rides) and creates an integrated payment system to enable travelers to accumulate credits for sustainable travel and use credits for payment across the entire transportation system.

17. Introduce means-based fare structures on all transit providers throughout study area, through regional programs such as MTC's Clipper Start Means Based Fare pilot.

18. Offer free or reduced-price transportation for youth, seniors, and people with disabilities, or other promotional or marketing initiatives, where not offered now.

19. Improve transfers/synchronization of multiple transit providers and to park-and-ride lots 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).

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

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.

26. Provide hotel/venue customers with transit vouchers (e.g., $20 Clipper card that must be returned) and free BART passes for return to airport by bundling fares with room bookings/event tickets.

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.

Incentivize carpool/vanpool

29. Incentivize the use of pay-as-you-go insurance plans for drivers.

30. Subsidize ride-matching through real-time matching apps (Scoop or another similar platform).

31. Expand, improve, and promote the regional vanpool subsidy program with ridership tracking and improve vanpool ride-matching.

32. Create regional, sub-regional, or local carpool matching program for school-age children.

33. Encourage employers to provide incentives for regular carpoolers.

34. 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.

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

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

36. Create regionally-consistent TDM developer requirements and incentives for specific land use types.

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

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

39. 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 to encourage larger companies to provide public transit passes or carpool subsidies and/or use of alternative modes by employees one day per week

    c. Incentivizing employers to charge for parking, or to shift from monthly to daily parking fees

    d. Encouraging employers to formalize a policy for employees to work from home or use alternate work schedules

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

41. Support the development of new and expanded TMAs across study area in high employment areas such as Oyster Point (SSF), Foster City, Redwood Shores (Redwood City), East Palo Alto, Mountain View, Sunnyvale..

Goal 3: Foster Healthy and Sustainable Communities

Reduce traffic burden on local streets and in neighborhoods

42. Enact trip caps or congestion pricing for major employment centers.

43. Assess needs for traffic calming measures in neighborhoods/downtowns with high volume of cut-through traffic.

44. Introduce or increase parking pricing in downtowns, major employment sites, or high traffic areas with transit access and other transportation options.

Prioritize transit-oriented development of both residential and office development in study area.

45. Prioritize transit-oriented development of both residential and office development in the study area.

46. Support completion of the multi-use Bay Trail route and connections to the facility that runs parallel to US-101.

47. Conduct pedestrian/bicycle crossing needs assessment along entire US-101 corridor, prioritizing Vision Zero / high-injury network hotspots.

48. Keep bicycle lanes clear of obstacles, including Uber/Lyft drop-offs, construction, and street-sweeping.

49. Strengthen local TDM requirements to encourage/require bike programs and amenities in new and existing developments.

50. Bring bike share systems to the Peninsula and other locations in the study area.

51. Strengthen/fund Safe Routes to School and other active mobility programs/policies in and between neighboring communities along the corridor.

52. Adopt Local Road Safety Plans in consultation with community groups, utilizing Vision Zero principles, goals, and design guidance.

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

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

54. 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.

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

56. 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.

57. 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.

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

Performance Metric Assessment

The complete set of mobility actions was assessed against a set of performance metrics that align with the project's three goals (see Figure 7). This assessment evaluated the extent to which each mobility action could be expected to directly influence the MAP goals and performance metrics outlined in Chapter 2.

Mobility and Community Impacts

The 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.

The 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 are expected to have 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 HOV-priority on-ramps) or on parallel roadways such as El Camino Real or I-280 North (Action #4)

- Support ongoing planning projects to create continuous HOV/express lane on US-101 from South San Jose to downtown San Francisco (Action #5)

- Expand freeway operational strategies to support freeway efficiency, including incident management, ramp metering, real time traveler information, and clearing of vehicle breakdowns and conflicts (Action #2)

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

- Create options for bulk transit pass program eligibility (e.g., Caltrain GoPass) to include contractors, consultants, interns and temporary employees that work more than 20 hours a week (Action #14)

- Implement a "transportation credit" program that serves as a transit pass accumulator (automatically providing a monthly pass when the value of a pass has been spent on individual rides) and creates an integrated payment system to enable travelers to accumulate credits for sustainable travel and use credits for payment across the entire transportation system (Action #16)

- Improve transfers/synchronization of multiple transit providers and to park-and-ride lots in MAP study area (Action #19)

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

- Enact trip caps or congestion pricing for major employment centers (Action #42)

- Introduce or increase parking pricing in downtowns, employment centers, or high traffic areas with transit access and other modal options (Action #44)

- Strengthen/fund Safe Routes to School and other active mobility programs/policies in and between neighboring communities along the corridor (Action #51)

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.

Looking Ahead to Implementation

Looking toward implementation, the MAP project considered the following questions for each mobility action identified in MAP:

- Equity: What additional steps must be taken to advance equity through the implementation of the mobility actions? How should each mobility action be modified to address spatial, temporal, economic, physiological, and social barriers?

- Implementation and Readiness: How do our mobility actions compare in terms of readiness and relative cost? What entities will play a role in implementing these actions?

These questions resulted in implementation guidance for mobility actions to advance social equity and considerations of the relative cost and readiness of each mobility action. These two pieces of guidance are described on the next few pages and specific recommendations and learnings for each individual mobility action are provided in Appendix D & E.

Taking Action on Equity

Experience and research have shown that equity can be maximized or lost in the many choices and details of how a program is implemented. Implementing with equity to make a program available to all can make the difference in a widely-utilized and effective program.

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

For each action, the MAP team asked, **how can this action be improved or adjusted to make it beneficial to households impacted by one or more of the five STEPS disadvantage factors?** The result of

this inquiry is a set of equity actions for each mobility action, based of the STEPS model, organized by the type of barrier they might seek to reduce.

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 along the US-101 corridor, including new mobility services that may enter the transportation network, inclusive and accessible to everyone in our communities.

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.

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

- Offer a path to participation that does not require use of the internet, or a computer, mouse, keypad, or smartphone.

- Ensure apps and webpages are ADA accessible and have a range of accessible communication functions, including native apps known to users, short message services (SMS)/text message, voice-activated functionality, and audio dial-in for landline users.

- Ensure all pages are available in many language by investing in direct, professional translation services instead of relying on Google translate, which can be unreliable for accurate translations.

- Ensure that enforcement is not implemented without appropriate bias training and, if done through automation, or with automation support, anti-bias algorithms.

"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)

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 to identify 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 ranks the actions least reliant on operational funding higher because it can be relatively difficult for implementing entities to identify sustainable sources of operational funding compared to capital dollars. This is especially true for federally funded projects and is often true for private sector implementers. The best score (3) is for actions where only capital funds are needed or that only require 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) is for actions that 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).
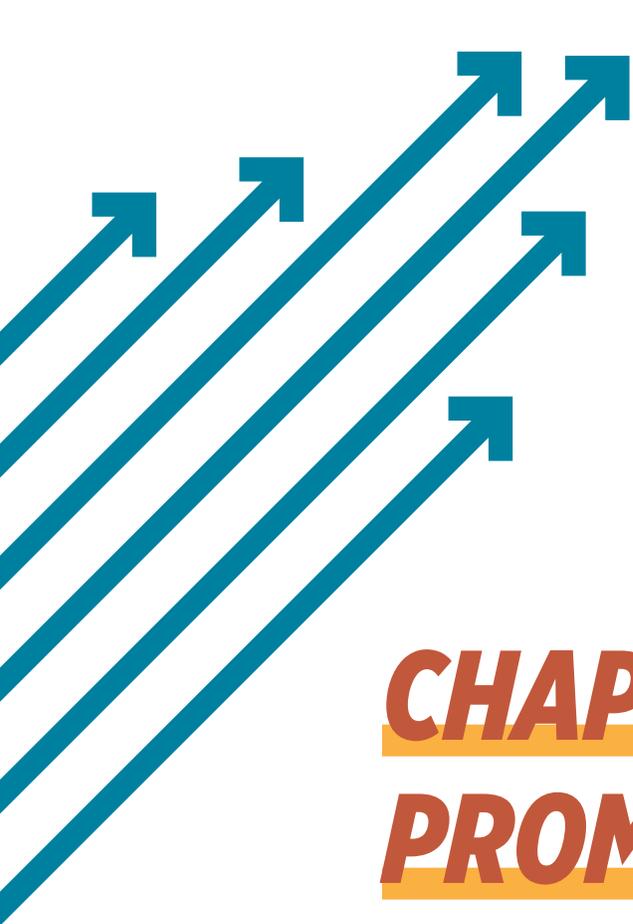
CHAPTER 5: PROMOTING AND ADVANCING THE 101-MAP ACTIONS

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. Because affordability is a critical element of transportation equity, the PMT will continue to add best practices to improve affordability and community engagement for each action in Appendix D. The PMT will also 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 ongoing 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 MTC will also be conducting a means-based express lane tolling pilot as part of an examination of the role of express lanes in the region. The pilot will include a focus on advancing equity generally and as part of any new tolling in the region. The MAP PMT will monitor the pilot program to understand the impacts and benefits of discounted toll fares for low income users.

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 several 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:

- Developing the San Francisco 101/280 Express Lanes and Bus Project, which will explore bus-on-shoulder or HOV-priority on-ramps and encourage mode shift to carpool and transit (Actions 5 and 6)

- Developing plans for the 15-Third bus line to support expanding transit service parallel to I-280 in San Francisco (Action 11)

- Applying San Francisco's Transportation Demand Management Program to make it easier for residents, tenants, employees, and visitors to new developments to get around by sustainable travel modes (Actions, 3, 35, and 40)

- Completing the Downtown Congestion Pricing Study, which will reduce vehicular traffic coming into the downtown core (Action 45)

- Implementing and expanding the Vision Zero Ramps program, with a goal of improving safety at interchanges and addressing gaps in the city's active transportation network(Action 53)

- Developing and delivering 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 actions 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)

- Launched 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)

- Joined the Clipper START mean-based fares pilot program to provide a 50 percent fare discount to eligible low-income households (Action XX)

- Completing and launching 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)

- Phasing the implementation of 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)

- Piloting means-based Express Lane toll policy

- 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 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.

Additionally, MTC adopted the Final Blueprint strategies of Plan Bay Area 2050 which includes several strategies that align with the US-101 MAP: Enable a Seamless Mobility Experience, Per-Mile Tolling on Congested Freeways with Transit Alternatives, Advance Regional Vision Zero Policy, Allow a Greater Mix of Housing Densities and Types in Growth Areas and Expand Commute Trip Reduction Programs at Major Employers. Full list of final Blueprint strategies here.

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 and reliable transportation network that serves all people and respects the environment. In addition, Caltrans prioritizes community partnerships and equity-focused actions with existing funding frameworks. 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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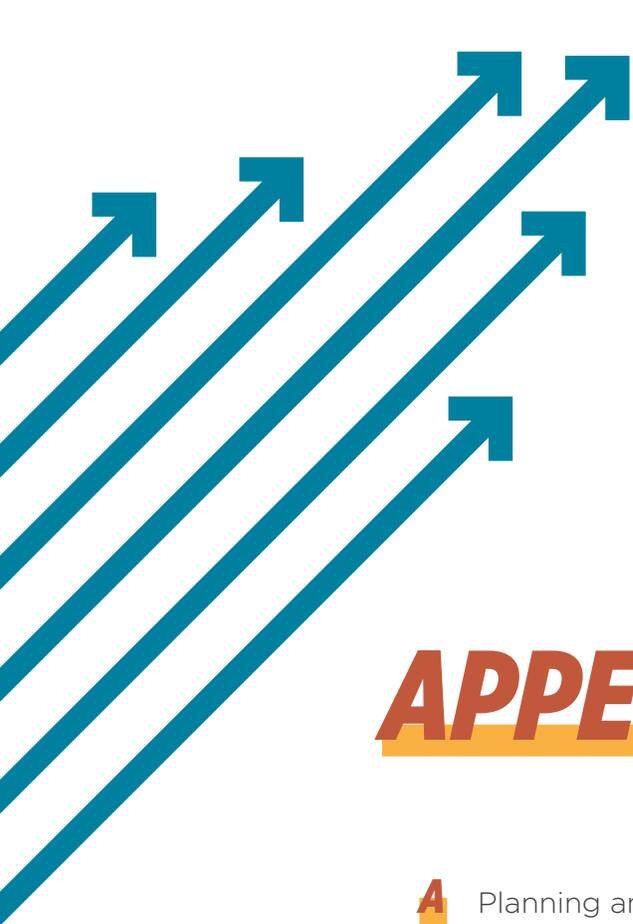
APPENDICES

APPENDIX A:
PLANNING AND POLICY CONTEXT

Current transportation conditions hinder mobility for many, and if these trends continue as the economy grows, access will be even more constrained. Regional plans are focused on investing in projects that support economic growth, equity, environmental health, and efficient transportation. The US-101 MAP project will build on the existing policy context and the planned infrastructure and mobility improvements with near-term policies and programs that address mobility challenges on the corridor today.

State and Regional Framework

The California state legislature has established policies that call for regional coordination to address greenhouse gas emissions with Senate Bill (SB) 375 and SB 743. SB 375, the Sustainable Communities and Climate Protection Act passed in 2008, requires regional metropolitan planning organizations in California to develop long-range plans that align transportation, housing, and land use decisions to reduce greenhouse gas emissions from transportation. As of October 1, 2018, the California Air Resources Board (CARB) set GHG emission reduction targets at 10% by 2020 and 19% by 2035, relative to 2005 levels.

SB 743 (2013) requires a shift in transportation analysis to, "more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions."

To respond to these state mandates and to support expected future growth and economic activity in the Bay Area, the Metropolitan Transportation Commission (MTC) developed the regional transportation plan, Plan Bay Area 2040.

Plan Bay Area's Action Plan has the following objectives:

- **Housing:** Lower the share of income spent on housing and transportation costs, lessen displacement risk, and increase the availability of housing affordable to low- and moderate-income households.

- **Economic Development:** Improve transportation access to jobs, increase middle wage job creation, and maintain the region's infrastructure.

- **Resilience:** Enhance climate protection and adaptation efforts, strengthen open space protections, create healthy and safe communities, and protect communities against natural hazards.

Transportation 2035, the regional transportation plan that preceded Plan Bay Area 2040, launched the Bay Area Express Lane Network.

Future Bay Area Express Lane Network
Source: MTC Express Lanes Program Quarterly Report, 3rd Quarter 2018

FUTURE EXPRESS LANE NETWORK
Source: MTC Express Lanes Program Quarterly Report, 3rd Quarter 2018

- ACTC Lane
- Sunol JPA Lane
- VTA Lane
- BAIFA Lane
- SMCEL-JPA Express Lanes
- Lanes TBD
- BART and Caltrain

0   4   8 Miles
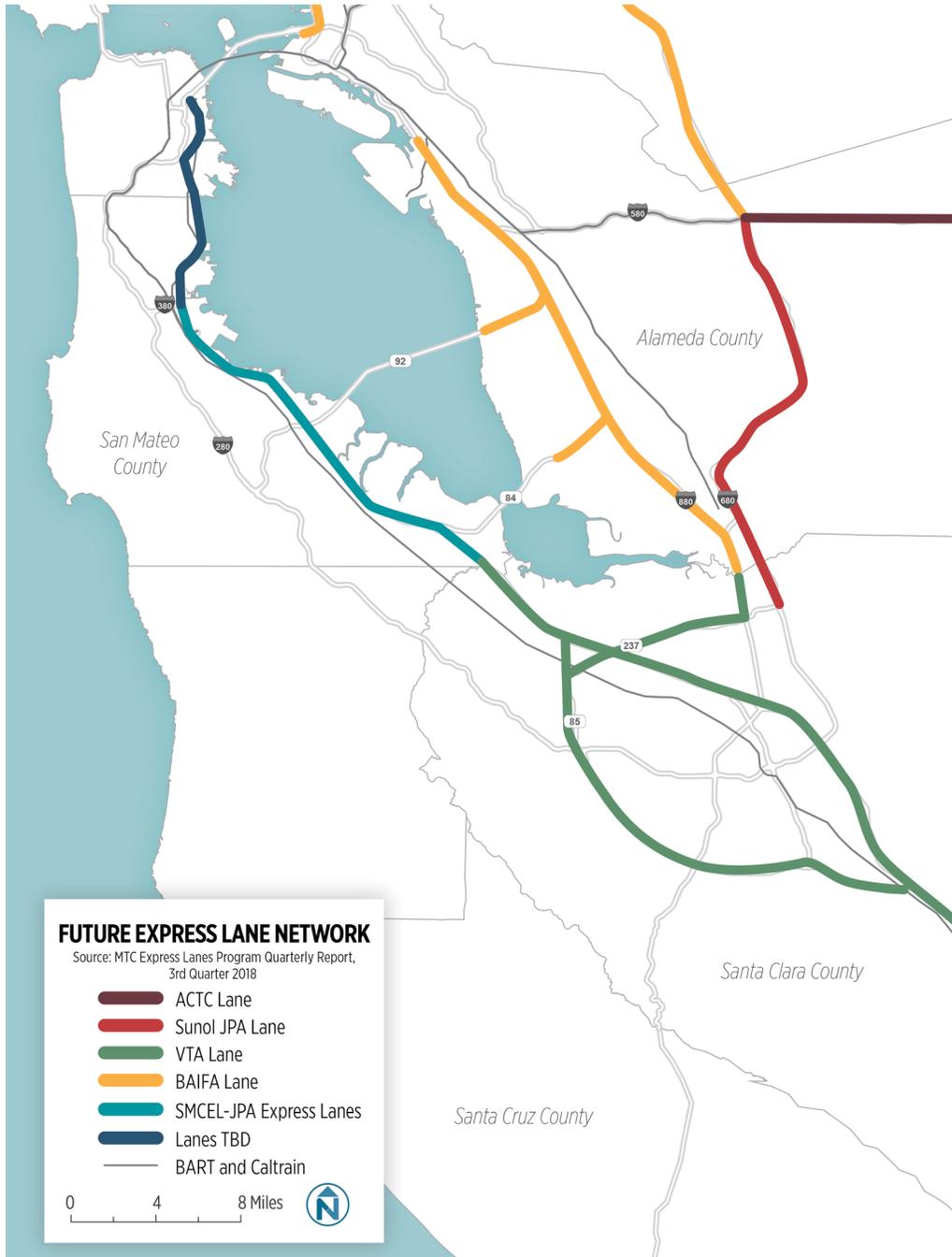
Express Lanes

The Bay Area Infrastructure Financing Authority (BAIFA), a joint powers agreement between the Bay Area Toll Authority (BATA) and the Metropolitan Transportation Commission (MTC), leads and supports express lane efforts in Solano, Alameda, and Contra Costa. Express lanes are carpool lanes that are free for carpools, buses, motorcycles and other eligible vehicles. Solo motorists — who choose to pay a toll — can use express lanes, too.[33]

MTC Express Lane Objectives

- Create a network to encourage carpools, vanpools, and express buses
- Make the best use of HOV lane capacity
- Provide reliable travel times for people driving alone
- Better manage all lanes to keep traffic moving

US-101 Express Lanes

Planning and funding for US-101 Express Lanes is led by the congestion management agency for each county. Caltrans partners on express lane projects, and operates and maintains US-101. Together these efforts represent the potential for future continuous express lanes on US-101 between San Francisco and Morgan Hill. Additional express lanes are planned to connect with US-101 as part of Santa Clara Valley Transportation Authority's (VTA) Silicon Valley Express Lanes on SR-237 and SR-85.

Shared Goals

Each of the express lane studies and projects for US-101 are separate efforts, but together they support shared goals for managing the corridor. Key shared goals of managing lanes are:

- Increase efficiency (increased person throughput)
- Enhance travel choices
- Improve travel reliability
- Support a regional network of express lanes

Express Lane and Express Bus Projects

Project or Study	Key Analysis	Outcome	Schedule
Silicon Valley Express Lanes Program	Lane conversion of current HOV lanes to Express lanes on 101 and 85.	Eventual express lanes for the entirety of 85 and from San Mateo County border to Morgan Hill for 101.	Phase 3 (fully funded) will convert double HOV to Express lanes from San Mateo County Line to 85 exchange and single lane conversion to just past 237 interchange. Construction began in 2019 and will tentatively open in 2021.
San Mateo 101 Express Lanes Project	Managed lane and all general travel lane alternatives were studied. Express lanes were found to have the greatest benefit.	Caltrans will convert existing auxiliary lanes into through lanes and convert far left lanes into express lanes.	Construction began in mid-2019, estimated completion in late-2022.
San Mateo County Express Lanes Project 380 North to San Francisco County Line	PAED will analyze options including adding a lane and converting a lane.	This segment will complete the Express Lane network in San Mateo County from Santa Clara County Line to San Francisco County Line.	PAED will commence in 2020.
San Francisco Freeway Corridor Management Study	Assessed peak hour travel behavior for three alternatives of managed lanes and compared to a no-build scenario.	Lane conversion is feasible, with additional study needed. SFCTA is in the process of studying impacts to low income commuters and understanding who might be impacted by priced lanes.	Project Initiation Document with Caltrans in 2019 followed by additional analysis and environmental clearance.
SamTrans Express Bus Feasibility Study	Proof of concept and market analysis for re-introducing an express bus network to the Peninsula. Developed multiple route concepts for long distance commute trips between San Mateo, San Francisco, and Santa Clara counties.	Recommendation of six routes, five of which travel on US-101 for at least a portion of their trip.	The first route from the Study launched in August 2019 (Route FCX). SamTrans continues to plan for additional routes to begin, including in conjunction with the opening of the San Mateo County Express Lanes Project.

Caltrain Business Plan and Caltrain Modernization

Caltrain runs parallel to US-101 throughout the length of its corridor and plays a significant role in transportation along the Peninsula, carrying over 55,000 per day during morning and afternoon peak commute times alone.[34] Since 2016, the system has over 60,000 average weekday passengers carried on 92 daily train trips. Draft elements of the 2040 Caltrain Business Plan estimate that running Caltrain at similar frequencies to BART would result in a fourfold increase in ridership to 160,000 – 200,000 daily passengers riding approximately 360 trains per day by 2040.[35]

Caltrain electrification is a critical component of the Caltrain Modernization program, which will improve system performance and reach higher train frequencies needed to serve more people. Additional benefits of electrification are reduced noise, lower greenhouse gas emissions, and reduced diesel emissions from replacing the diesel-hauled fleet with electric trains. Passenger service with electric trains is scheduled to begin in 2022 and will enable an increase in peak train service from five to six trains per hour in each direction, a capacity increase of over 7,000 additional passengers each commute peak.

Additional Planned Infrastructure Improvements

Several improvements are planned for the US-101 corridor in addition to express lane projects. These projects are intended to improve traffic flow at interchanges. Additional improvements are designed to reduce barriers for people trying to cross US-101, particularly people walking or riding bikes.

Planned Infrastructure Improvements (as of mid-2019)

Project	Description	Status
US-101 / Broadway Interchange	Wider overcrossing and new ramp connections to US-101	Construction complete, project close out
US-101 / Willow Interchange	Convert cloverleaf interchange to partial-cloverleaf, replace and widen existing Willow Road Overcrossing	Under construction
US-101 / Woodside Road Interchange	Woodside Road widening and realignment of freeway ramps	Design
US-101 / Holly Street Interchange and pedestrian bridge	Convert cloverleaf interchange to partial-cloverleaf, add signalized intersections, add widened sidewalks and bike lanes	Finalizing bid package for construction
US-101 State Route 92 Interchange Project	Near- and long-term safety and operations improvements including direct connector ramps between SR-92 east of US-101 and the San Mateo US-101 express lanes.	Preliminary planning study
US-101 Peninsula Ave Interchange	Modify existing interchange	Traffic analysis
US-101 Produce Ave Interchange	Study alternatives for a new interchange and street to cross US-101 in South San Francisco	Traffic analysis
Redwood City US-101 Pedestrian and Bicycle Undercrossing	Multi-modal crossing of US-101	Under construction
Hillsdale / US-101 pedestrian and bicycle bridge	Multi-modal crossing of US-101	Preliminary design
East Palo Alto pedestrian and bicycle bridge over US-101	Multi-modal crossing of US-101	Opened May 2019
Shoreline / US-101 pedestrian and bicycle bridge	Multi-modal crossing of US-101	Preliminary Design
Mathilda Ave / US-101 interchange	Reconfiguration of freeway ramps, signals, turn lanes, and multi-modal infrastructure	Under Construction
US-101/Trimble Interchange	Modifications to improve mobility and multimodal safety	Design

APPENDIX B: TRAVEL BEHAVIOR ANALYSIS

TRAVEL BEHAVIOR ANALYSIS

KEY FINDINGS

Purpose: to inform strategies and ground the project understanding

- **Short-distance trips are primary.** Most users of US-101 during the morning commute are traveling 10-20 miles in the study area.

- **Long-distance trips are a minority.** Long-distance trips (40 miles or more) are a small portion of trips on US-101 in the study area. The percent of the total is 5% or less of total passengers traveling through the screen lines along the highway.

- **Short trips are more common in the southern end of the corridor.** Trip distance for trips on US-101 varies along the corridor. A higher proportion of short trips pass through Ralston/US-101 and the San Mateo/Santa Clara County border than the two screen lines farther north.

- **The closer someone is to US-101 the more likely the yare to use it.** Trip origins and destinations are proportionally higher in the zones closest to US-101.

2

DATA SOURCES

Context

Building on the travel analysis used to identify potential express bus routes in the SamTrans *Express Bus Feasibility Study (2018),* analysis for the US-101 MAP utilizes the same origin/destination (O/D) data. Understanding how the corridor currently functions informs the baseline performance analysis and creates a shared understanding of the corridor from which to develop strategies. Analyzing the spatial distribution of origins and destinations enables a comparison of the differences in travel behavior along the corridor screen lines.

Data Source and Methodology

- 2018 Streetlight Data (GPS data with adjustments to mitigate sampling bias). The data was purchased for SamTrans' 2018 Express Bus Study.

- 4 screen lines on US-101. Screen lines identify the trips that pass through a set point.

- O/D data mapped by transportation analysis zone (TAZ) in GIS and analyzed by time of day, distance, and number of origins and destinations per TAZ.

3

GEOGRAPHIC SCOPE

Geographic scope:

- Trips starting or ending in San Francisco, San Mateo, Santa Clara, Contra Costa, or Alameda County

Four US-101 screen lines at:

- San Francisco/San Mateo county border
- US-101 and Millbrae Avenue
- US-101 and Ralston Avenue
- San Mateo/Santa Clara county border

Transportation Analysis Zone (TAZ)

- Geographic unit of analysis
- Size varies, with rural and open space areas having large TAZs
- Alameda and Contra Costa counties represented by a single TAZ

4

DATA LIMITATIONS

San Francisco/San Mateo County Line: 59,249 Trips

Millbrae Avenue: 51,326 Trips

Ralston Avenue: 56,669 Trips

San Mateo/Santa Clara County Line: 58,177 Trips

Legend:
- Cities
- US-101
- BART and Caltrain
- Highways
- US-101 Passthrough Screen

Miles 0 4 8

Data Sources: Samtrans, Metropolitan Transportation Commmission

Origin-Destination data shows

- Geographic distribution
- Trip Distance
- Analyzed based on time of day (AM peak)

Limits to the data

- Four mid-point screens on 101
- No screens in Santa Clara County
- Could not combine without double counting
- Streetlight sample shows vehicle trips, not occupancy

5

US-101 TRIPS THAT PASS THE SF/SM COUNTY LINE

Morning Commute Peak (6 – 10 a.m.)
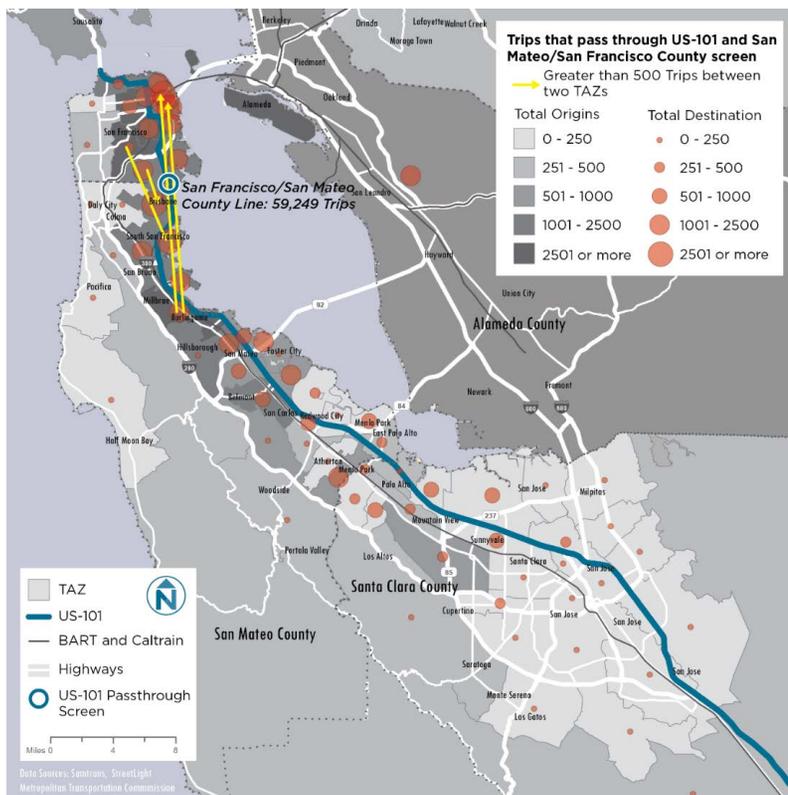
Distribution of Trip Distances
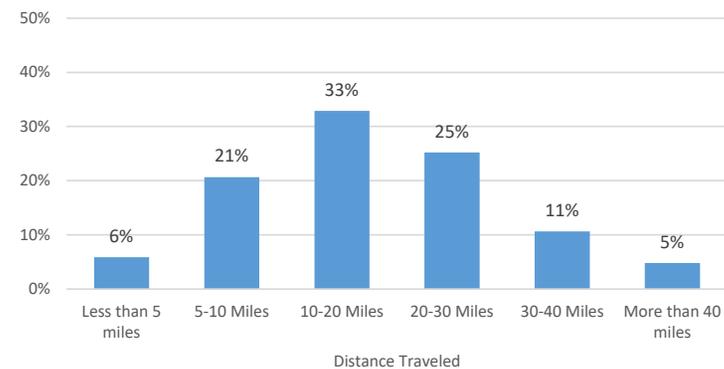
- Limited housing and employment land use near this screen line is reflected in the low number of short trips

- Bi-directional destinations - people travel north to San Francisco and south along the peninsula

- Origins are highest close to the screen line

US-101 TRIPS THAT PASS MILLBRAE AVENUE

Morning Commute Peak (6 – 10 a.m.)

Distribution of Trip Distances
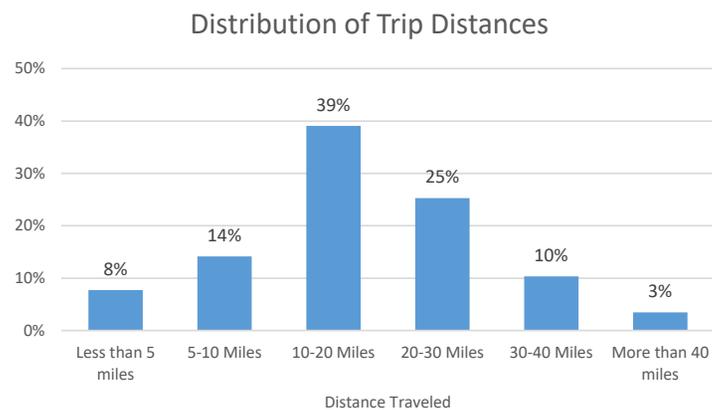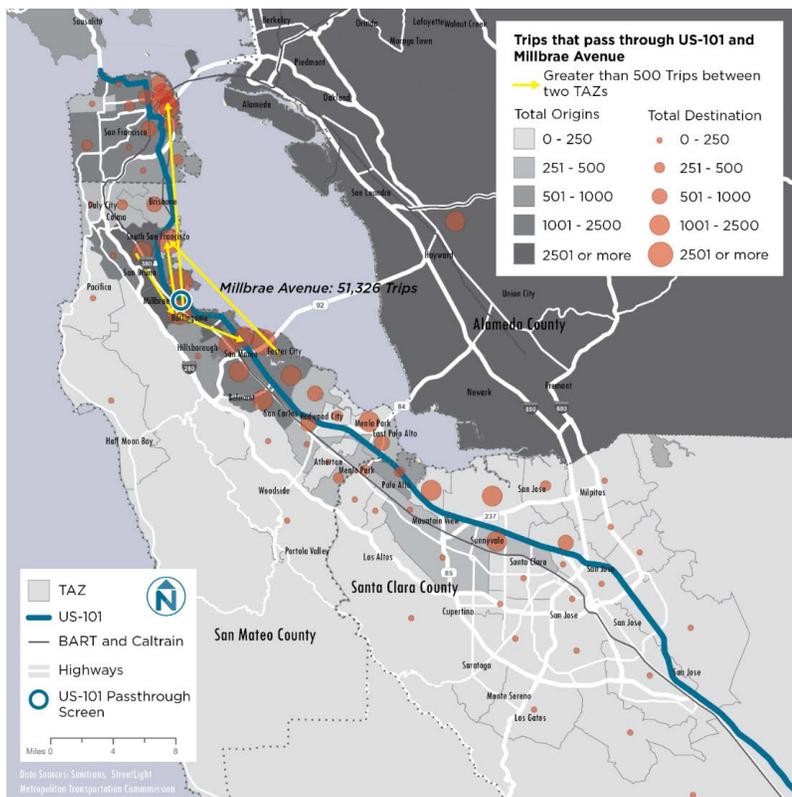
- Highest percentage of 10-20 mile trips among the four screen lines
- Decreasing significance of San Francisco as a destination
- The SFO airport, eastside of South San Francisco, and Foster City are the highest destination zones

7

US-101 TRIPS THAT PASS RALSTON AVE

Morning Commute Peak (6 – 10 a.m.)

Distribution of Trip Differences
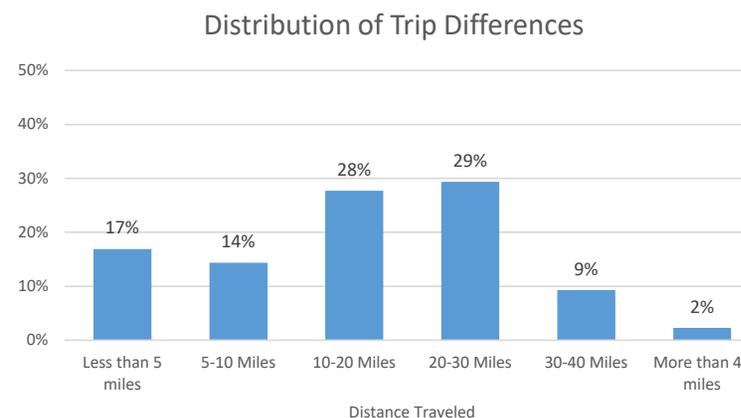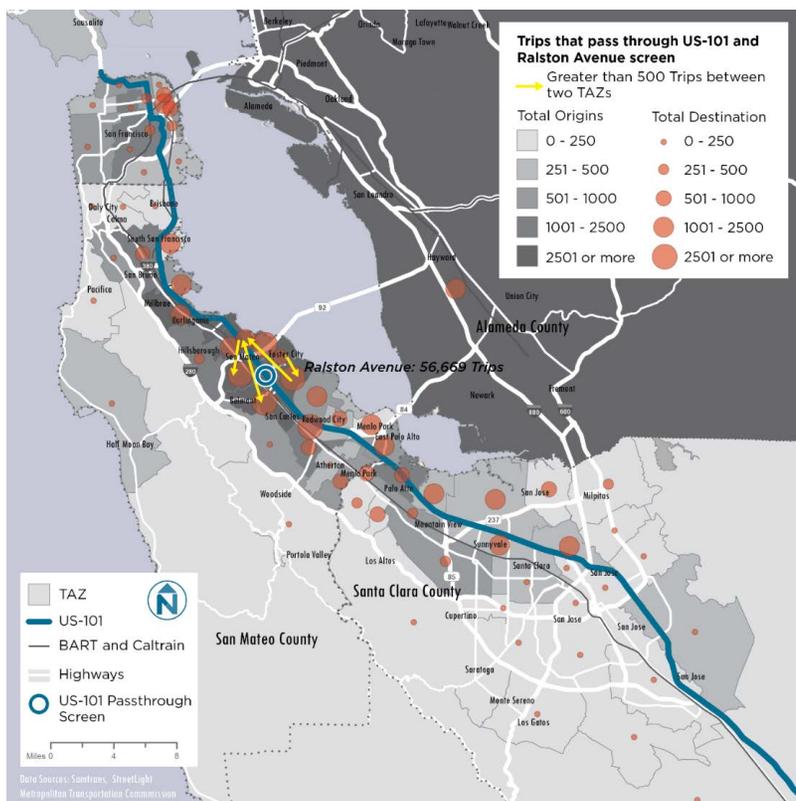
- Highest proportion of short trips among the four screen lines

- Screen line includes higher proportion of Silicon Valley commuters compared to screen lines farther north

- Santa Clara County is an increasingly significant destination

US-101 TRIPS THAT PASS THE SM/SC COUNTY LINE

Morning Commute Peak (6 – 10 a.m.)

Distribution of Trips
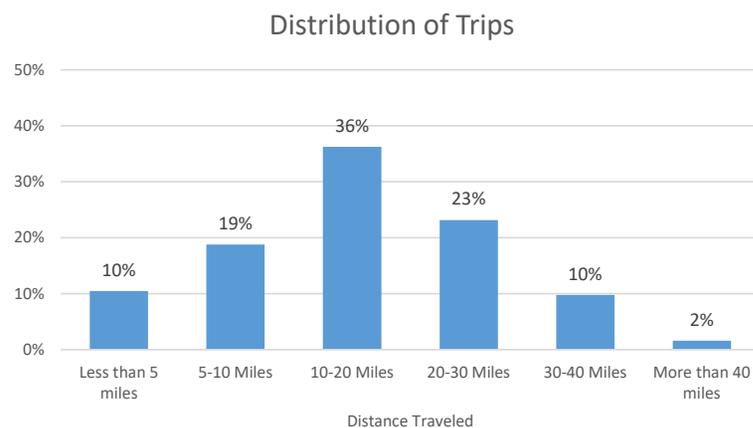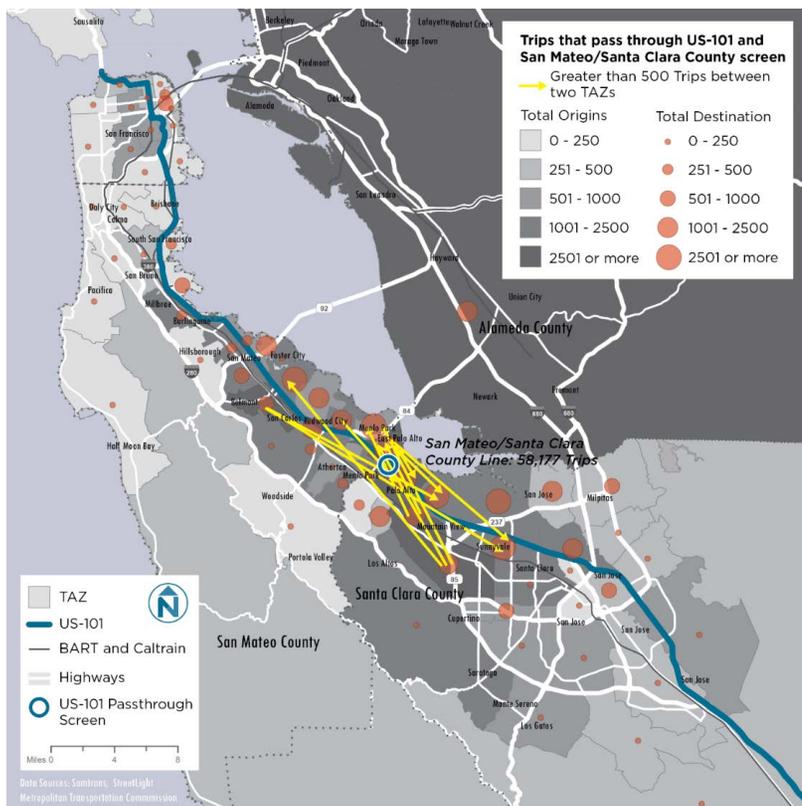
- Comparatively few vehicles going to San Francisco pass through this screen line - people traveling to San Francisco likely take alternative routes or Caltrain

- Local importance: most significant destinations are concentrated within 10 miles of the screen line in both directions

TRAVEL MARKETS

O-D Summary

- Short trips (under 5 miles) make up a greater proportion of total trips than long trips (more than 40 mile).

- Most users of US-101 during the morning commute are traveling 10-20 miles in the study area.

Morning Commute Trip Distance on US-101

Legend:
- More than 40 miles
- 30-40 Miles
- 20-30 Miles
- 10-20 Miles
- 5-10 Miles
- Less than 5 miles

X-axis: US-101 Screen Points (SF/SM County Line, Millbrae, Ralston, SM/SC County Line)
Y-axis: % of Trips Passing Through Screen

Distance	SF/SM County Line	Millbrae	Ralston	SM/SC County Line
More than 40 miles	5%	3%	2%	2%
30-40 Miles	11%	10%	9%	10%
20-30 Miles	25%	25%	29%	23%
10-20 Miles	33%	39%	28%	36%
5-10 Miles	21%	14%	14%	19%
Less than 5 miles	6%	8%	17%	10%

Note: Ralston also shows 17% at the lowest band.

10

Goal	Subcategory	No.	Actions	Goal 1: Reliability — Consistency of average travel time at AM Peak (25%)	Percentage of time Express Lanes operate >45mph (25%)	On-Time Performance of transit using US-101 (25%)	Customer-perceived reliability of US-101 (25%)	Goal 2: High-Capacity Options — Person throughput (General Purpose lanes) (25%)	Person throughput (Express Lanes) (25%)	Average Vehicle occupancy (25%)	Transit Ridership on parallel North-South corridors (25%)	Goal 3: Healthy & Sustainable Communities — Collisions, including bike and ped, at highway access points (20%)	Biking mode share (20%)	Walking mode share (20%)	Rate of asthma attacks (20%)	Traffic density (20%)	Overall Action Score	Subtotal Goal 1	Subtotal Goal 2	Subtotal Goal 3
1	Normalize travel times	1	Conduct education campaign about safer, more efficient driving habits.	1	1	1	3	0	0	0	0	1	0	0	0	0	1.7	1.5	0.0	0.2
1	Normalize travel times	2	Expand freeway operational strategies to support freeway efficiency, including incident management, ramp metering, real time traveler information, and clearing of vehicle breakdowns, conflicts, etc.	3	1	1	3	1	3	0	0	1	0	0	0	0	3.2	2.0	1.0	0.2
1	Normalize travel times	3	Incentivize safer driving behavior through benefits or rebates to drivers who demonstrate responsible driving.	0	0	0	1	0	0	0	0	1	1	1	0	0	0.9	0.3	0.0	0.6
1	Normalize travel times	4	Support policies or demonstration projects related to bus priority on freeway (e.g., bus-on-shoulder or HOV-priority on-ramps) or on parallel corridors such as El Camino Real or I-280 North.	1	1	3	1	1	1	1	1	0	0	1	1	1	4.1	1.5	1.0	0.6
1	Normalize travel times	5	Support ongoing planning projects to create a continuous managed lane (HOV/express) on US-101 from South San Jose to downtown San Francisco.	3	3	3	1	1	3	1	0	0	0	0	0	0	3.8	2.5	1.3	0.0
1	Normalize travel times	6	Improve enforcement of managed lanes, including carpool & express lanes, through available automated technologies.	1	3	3	1		1	1	0	0	0	0	0	0	2.5	2.0	0.5	0.0
1	Normalize travel times	7	Work with Google Maps or other traffic apps to delineate travel time differences between general purpose lanes and managed lanes.	1	0	0	3	1	1	1	0	0	0	0	0	0	1.8	1.0	0.8	0.0
1	Normalize travel times	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.	1	0	1	3	0	0	3	3	0	0	0	0	0	2.8	1.3	1.5	0.0
1	Normalize travel times	9	Work with private sector app providers to incorporate more real-time information on accidents, construction, etc.	3	1	1	3	1	1	0	0	-1	0	0	0	-1	2.1	2.0	0.5	-0.4
1	Normalize travel times	10	Integrate multimodal information whenever possible on freeway travel time signs, including transit and if possible parking availability at transit stations.	1	1	3	1	1	0	0	3	0	0	0	1	1	3.2	1.5	1.3	0.4
2	Increase average vehicle occupancy of US-101	11	Improve transit speeds and transit priority on US-101, El Camino Real, and other parallel roadways to provide more long-distance service and shift short trips off the freeway.	1	1	0	1	1	3	0	3	1	1	1	1	1	3.3	0.8	1.8	0.8
2	Increase average vehicle occupancy of US-101	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.	1	1	0	1	1	1	1	1	1	1	1	0	0	2.2	0.8	1.0	0.4
2	Increase average vehicle occupancy of US-101	13	For employers and public transit agencies who operate and charge for parking, shift monthly permits/fees to daily rates.	1	1	0	1	3	1	1	1	0	0	0	0	0	2.7	0.8	1.5	0.4
2	Incentivize transit	14	Create options for bulk transit pass program eligibility (e.g. Caltrain GoPass) to include contractors, consultants, interns and temporary employees that work more than 20 hours a week.	1	1	0	1	0	3	3	3	0	1	1	3	3	5.4	0.8	2.3	1.4
2	Incentivize transit	15	Expand eligibility for bulk transit pass programs to include TMAs, neighborhood associations, colleges.	1	1	0	1	0	3	3	3	0	0	1	3	3	5.4	0.8	2.3	1.4
2	Incentivize transit	16	Implement a "transportation credit" program that serves as a transit pass accumulator (automatically providing a monthly pass when the value of a pass has been spent on individual rides) and creates an integrated payment system to enable travelers to accumulate credits for sustainable travel and use credits for payment across the entire transportation system	1	1	0	1	0	3	3	3	0	0	1	3	3	5.4	0.8	2.3	1.4
2	Incentivize transit	17	Introduce means-based fare structures on all transit providers throughout study area, through regional programs such as MTC's Clipper Start Means Based Fare pilot.	1	1	0	1	0	3	3	3	0	0	1	3	3	5.4	0.8	2.3	1.4

Goal	Subcategory	No.	Actions	Consistency of average travel time at AM Peak (25%)	Percentage of time Express Lanes operate >45mph (25%)	On-Time Performance of transit using US-101 (25%)	Customer-perceived reliability of US-101 (25%)	Person throughput (General Purpose lanes) (25%)	Person throughput (Express Lanes) (25%)	Average Vehicle occupancy (25%)	Transit Ridership on parallel North-South corridors (25%)	Collisions, including bike and ped, at highway access points (20%)	Biking mode share (20%)	Walking mode share (20%)	Rate of asthma attacks (20%)	Traffic density (20%)	Overall Action Score	Goal 1	Goal 2	Goal 3
2	Incentivize transit	18	Offer free or reduced-price transportation for youth, seniors, and people with disabilities, or other promotional or marketing initiatives, where not offered now.	1	1	0	1	0	3	3	3	0	0	1	3	3	5.4	0.8	2.3	1.4
2	Incentivize transit	19	Improve transfers/synchronization of multiple transit providers and to park-and-ride lots in MAP study area.	1	0	3	1	0	3	3	3	0	0	1	3	3	5.9	1.3	2.3	1.4
2	Incentivize transit	20	Conduct comprehensive study of the public and private shuttle system to identify opportunities for coordination.	1	0	1	0	0	1	1	1	0	0	1	1	1	1.9	0.5	0.8	0.6
2	Incentivize transit	21	Open private employer shuttles to all on-site employees regardless of classification.	1	0	0	1	1	3	3	0	0	0	1	1	1	3.9	0.5	1.8	0.6
2	Incentivize transit	22	Explore opportunities for coordination/partnership on long-haul commute routes between employers, such as sharing/selling excess capacity on bus trips.	1	0	0	1	1	3	3	0	0	0	1	1	1	3.9	0.5	1.8	0.6
2	Incentivize transit	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).	1	0	0	1	1	3	3	3	0	0	1	1	1	4.6	0.5	2.5	0.6
2	Incentivize transit	24	Create one fare product for trips to high traffic locations (Caltrain + VTA pass for 49ers game, Caltrain + BART pass to SFO).	1	1	0	1	1	3	3	3	0	0	1	1	1	4.9	0.8	2.5	0.6
2	Incentivize transit	25	Ensure employees of all classifications have access to non-surcharge BART fare at SFO.	1	1	0	0	0	0	0	3	0	0	1	1	1	2.9	0.5	0.8	0.6
2	Incentivize transit	26	Provide hotel/venue customers with transit vouchers (e.g., $20 Clipper card that must be returned) and free BART passes for return to airport by bundling fares with room bookings/event tickets.	1	0	0	1	0	1	1	3	0	0	1	1	1	2.4	0.5	1.3	0.6
2	Incentivize transit	27	Offer family / group discounted fares on weekends on transit.	0	0	0	0	0	0	3	3	0	0	1	1	1	3.1	0.0	1.5	0.6
2	Incentivize 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.	1	0	0	1	0	0	0	3	1	3	3	1	1	3.1	0.5	0.8	1.8
2	Incentivize carpool/vanpool	29	Incentivize the use of pay-as-you-go insurance plans for drivers.	1	0	0	0	0	0	0	0	0	1	1	1	1	1.3	0.3	0.3	0.8
2	Incentivize carpool/vanpool	30	Subsidize ride-matching through real-time matching apps (Scoop or another similar platform).	1	0	0	1	0	3	3	0	0	0	0	1	1	2.7	0.5	1.8	0.4
2	Incentivize carpool/vanpool	31	Expand, improve, and promote the regional vanpool subsidy program with ridership tracking and improve vanpool ride-matching.	1	0	0	1	1	3	3	0	0	0	0	0	1	3.7	0.5	1.8	0.4
2	Incentivize carpool/vanpool	32	Create regional, sub-regional, or local carpool matching program for school-age children.	1	0	0	1	1	3	3	0	0	0	0	1	1	2.7	0.5	1.8	0.4
2	Incentivize carpool/vanpool	33	Encourage employers to provide gas incentives for regular carpoolers.	1	0	0	1	3	1	1	0	0	0	0	1	1	3.2	0.5	1.3	0.4
2	Incentivize carpool/vanpool	34	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.	1	1	1	1	0	1	1	0	0	0	0	-1	1	1.5	1.0	0.5	0.0
2	Strengthen existing TDM programs	35	Decrease parking minimums/adopt parking maximums/allow for shared parking at multi-use development as part of city developer requirements.	0	0	0	1	1	1	3	3	1	0	3	1	3	4.1	0.3	2.0	1.8
2	Strengthen existing TDM programs	36	Create regionally-consistent TDM developer requirements and incentives for specific land use types.	0	0	0	1	1	1	1	1	0	1	1	1	1	2.1	0.3	1.0	0.8

Goal	Subcategory	No.	Actions	Consistency of average travel time at AM Peak (25%)	Percentage of time Express Lanes operate >45mph (25%)	On-Time Performance of transit using US-101 (25%)	Customer-perceived reliability of US-101 (25%)	Person throughput (General Purpose lanes) (25%)	Person throughput (Express Lanes) (25%)	Average Vehicle occupancy (25%)	Transit Ridership on parallel North-South corridors (25%)	Collisions, including bike and ped, at highway access points (20%)	Biking mode share (20%)	Walking mode share (20%)	Rate of asthma attacks (20%)	Traffic density (20%)	Overall Action Score	Goal 1	Goal 2	Goal 3
2	Strengthen existing TDM programs	37	Develop regional branding/marketing program for TMA/TDM programs.	0	0	0	0	0	1	1	1	0	1	1	0	0	1.2	0.0	0.8	0.4
2	Strengthen existing TDM programs	38	Develop a platform for developments to share current mode split, encouraging trip reduction and a friendly competition.	0	0	0	0	0	0	1	1	0	1	1	1	1	1.3	0.0	0.5	0.8
2	Strengthen existing TDM programs	39	Strengthen Bay Area Air Quality Management District (BAAQMD) employer TDM expectations for large employers (50+) by, for example:																	
2	Strengthen existing TDM programs	39a	Enforcing the requirements and penalize employers not in compliance.	3	1	0	1	1	1	3	3	0	1	1	3	3	4.9	1.3	2.0	1.6
2	Strengthen existing TDM programs	39b	Expanding the potential mitigation options beyond pre-tax commuter costs to encourage larger companies to provide public transit passes or carpool subsidies and/or use of alternative modes by employees one day per week.	1	0	1	0	1	3	3	3	0	0	0	3	3	4.2	0.5	2.5	1.2
2	Strengthen existing TDM programs	39c	Incentivizing employers to charge for parking, or to shift from monthly to daily parking fees.	1	0	0	1	0	1	1	3	0	1	1	1	1	2.6	0.5	1.3	0.8
2	Strengthen existing TDM programs	39d	Encouraging employers to formalize a policy and encourage employees to work from home or alternate work schedules.	1	0	0	1	0	0	0	0	1	0	0	1	1	1.4	0.5	0.3	0.6
2	Strengthen existing TDM programs	40	Support small companies in funding and offering virtual meeting services software to facilitate remote work.	1	0	0	1	0	0	0	0	1	0	0	1	1	1.4	0.5	0.3	0.6
2	Expand Transportation Management Associations (TMAs)	41	Support the development of new and expanded TMAs across study area in high employment areas such as Oyster Point (SSF), Foster City, Redwood Shores (Redwood City), East Palo Alto, Mountain View, Sunnyvale.	1	1	1	1	1	1	1	1	1	1	1	1	1	3.0	1.0	1.0	1.0
3	Reduce traffic burden on local streets in adjacent communities	42	Enact trip caps or congestion pricing for major employment centers.	1	1	1	1	1	1	1	1	3	1	1	3	3	4.2	1.0	1.0	2.2
3	Reduce traffic burden on local streets	43	Assess needs for traffic calming measures in neighborhoods/ downtowns with high volume of cut-through traffic.	0	0	0	0	0	0	0	0	3	1	1	3	3	2.2	0.0	0.0	2.2
3	Reduce traffic burden on local streets	44	Introduce or increase parking pricing in downtowns, major employment sites, or high traffic areas with transit access and other transportation options.	1	0	1	1	1	0	1	1	3	1	1	1	3	3.3	0.8	0.8	1.8
3	Reduce traffic burden on local streets	45	Prioritize transit-oriented development of both residential and office development in study area.	0	0	0	0	0	0	0	3	1	1	1	1	3	2.4	0.0	1.0	1.4
3	Improve multimodal options and safety	46	Support completion of the multi-use Bay Trail route and connections to the facility that runs parallel to US-101.	0	0	0	0	0	0	1	1	1	3	3	3	3	2.9	0.0	0.3	2.6
3	Improve multimodal options and safety	47	Conduct pedestrian/bicycle crossing needs assessment along entire US-101 corridor, prioritizing Vision Zero / high-injury network hotspots.	0	0	0	0	0	0	0	0	1	1	1	1	1	1.0	0.0	0.0	1.0
3	Improve multimodal options and safety	48	Keep bicycle lanes clear of obstacles, including Uber/ Lyft drop-offs, construction and street-sweeping.	0	0	0	0	0	0	0	0	1	1	0	0	0	0.4	0.0	0.0	0.4
3	Improve multimodal options and safety	49	Strengthen local TDM requirements to encourage/require bike programs and amenities in new and existing developments.	0	0	0	0	0	0	0	0	0	3	0	1	1	1.0	0.0	0.0	1.0
3	Improve multimodal options and safety	50	Bring bike share systems to the Peninsula and other locations in the study area.	0	0	0	0	0	0	0	0	0	3	0	1	1	1.0	0.0	0.0	1.0
3	Improve multimodal options and safety	51	Strengthen/fund Safe Routes to School and other active mobility programs/ policies in and between neighboring communities along the corridor.	1	0	0	1	0	0	0	0	1	3	3	3	3	3.1	0.0	0.5	2.6

Goal	Subcategory	No.	Actions	Goal 1: Reliability				Goal 2: High-Capacity Options				Goal 3: Healthy & Sustainable Communities					Overall Action Score	Subtotals		
Weight				25%	25%	25%	25%	25%	25%	25%	25%	20%	20%	20%	20%	20%		Goal 1	Goal 2	Goal 3
				Consistency of average travel time at AM Peak	Percentage of time Express Lanes operate >45mph	On-Time Performance of transit using US-101	Customer-perceived reliability of US-101	Person throughput (General Purpose lanes)	Person throughput (Express Lanes)	Average Vehicle occupancy	Transit Ridership on parallel North-South corridors	Collisions, including bike and ped, at highway access points	Biking mode share	Walking mode share	Rate of asthma attacks	Traffic density				
3	Improve multimodal options and safety	52	Adopt Local Road Safety Plans in consultation with community groups, utilizing Vision Zero principles, goals, and design guidance.	0	0	0	0	0	0	0	0	3	1	3	3	3	2.6	0.0	0.0	2.6
3	Address environmental, air quality and health outcomes	53	Transition public and private bus and shuttle fleets to zero emission vehicles.	0	0	0	0	0	0	0	0	1	1	1	3	1	1.4	0.0	0.0	1.4
3	Address environmental, air quality and health outcomes	54	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.	1	0	0	0	0	0	0	0	1	1	1	3	1	1.7	0.3	0.0	1.4
3	Address environmental, air quality and health outcomes	55	Explore opportunities to provide high quality air filtration systems to residents and/or schools located in close proximity of US-101.	0	0	0	0	0	0	0	1	0	1	1	3	1	1.5	0.0	0.3	1.2
3	Address environmental, air quality and health outcomes	56	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.	0	0	0	0	0	0	0	1	0	1	1	3	1	1.5	0.0	0.3	1.2
3	Address environmental, air quality and health outcomes	57	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.	0	0	0	0	0	0	0	1	3	3	3	3	1	2.9	0.0	0.3	2.6
3	Address environmental, air quality and health outcomes	58	Develop an incentive/rebate program for residents along the corridor to purchase E-bikes.	0	0	0	0	0	0	0	0	0	3	0	1	1	1.0	0.0	0.0	1.0

APPENDIX D: EQUITY ACTION LIST

Mobility and Equity Actions

The following table lists all mobility actions identified through Phase 1 of the 101-MAP effort, alongside each of the methods that the Project Management Team will leverage to advance equity through implementation within communities in the project area. The list of actions and guidance for implementation holistically advance the STEPS equity areas. Some Mobility Actions do not yet have Equity Actions identified to support equitable implementation; these are marked with "--". This matrix is intended to be a working document and new Equity Actions should be incorporated with further input from community partners and other stakeholders.

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
1		Conduct education campaign about safer, more efficient driving habits.	Conduct campaign across entire length of corridor	--	--	Include communication across multiple platforms	Conduct campaign in all relevant Title VI languages in the project area. Conduct campaign using lay language, easy to understand.
2		Expand freeway operational strategies to support freeway efficiency, including incident management, ramp metering, real time traveler information, and clearing of vehicle breakdowns, conflicts, etc.	Clear with equal priority across entire corridor.	Clear with equal priority at all times of day	--	Disability sensitivity training for those clearing breakdowns, when engaging with people in the roadway.	Cultural sensitivity for those clearing breakdowns, when engaging with people in the roadway.
3		Incentivize safer driving behavior through benefits or rebates to drivers who demonstrate responsible driving.	Conduct campaign across entire length of corridor	Include people traveling at all times of day to capture people who commute during off-peak hours	Partner with a wide variety of insurance companies, offering all levels of coverage. Offer access to program not requiring smart phone or use of full data version of app; provide data lite option.	Allow participants to designate someone to be an authorized representative.	Promote program in all relevant languages. Use easy to use, lay language in program communications.
4		Support policies or demonstration projects related to bus priority on freeway (e.g., bus-on-shoulder or HOV-priority on-ramps) or on parallel corridors such as El Camino Real or I-280 North.	Explore equitably throughout entire study area.	Seek projects that provide transit priority benefits throughout the day, not only peak periods. Seek opportunities to advance immediate quick-build and pilot projects.	Prioritize demonstration projects in Communities of Concern or on routes that have a higher proportion of low income riders compared to the system-wide average.	Ensure demonstrations expand service for people with limited affordable and convenient options	Partner with and compensate community ambassadors to help develop the pilot/infrastructure and to provide guidance on changes to the pilot based on results/data and whether the pilot becomes permanent.
5		Support ongoing planning projects to create a continuous managed lane (HOV/express) on US-101 from South San Jose to downtown San Francisco.	Support across entire length of corridor.	--	--	--	--

Goal 1: Reliability   Goal 2: High-Capacity Options   Goal 3: Healthy & Sustainable Communities

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
6	🕐	Improve enforcement of managed lanes, including carpool & express lanes, through available automated technologies.	Enforce equally across entire length of managed lanes	Enforce equally across all times of day, not targeting specific times more than others	Develop education-based violation policy that offers multilingual education to those who repeatedly get violations. Create easy ways to appeal a fine if rules or process not provided in all relevant languages. Study income-based toll and fine structures and develop policies for these in specific Equity studies to be undertaken in support of express lane projects.	Create ways to appeal a fine if rules or process not understandable by everyone.	Distribute usage rules and requirements in all relevant languages proactively. Translate or use symbols and icons on signage in the lanes. Track and utilize enforcement data by race and income. Enforcement staff should be trained in cultural competency.
7	🕐	Work with Google Maps or other traffic apps to delineate travel time differences between general purpose lanes and managed lanes.	--	Ensure information is available for all periods when delays are present	Offer access to program not requiring smart phone or use of full data version of app; provide data lite option of equal quality user experience. Ensure voice-activated mobility app features.	Ensure apps have a range of accessible communication functions, including native apps popular with users, short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions	--
8	🕐	Improve reliability of real-time transit arrival information for transit routes operating on US-101 or on key parallel transit corridors such as El Camino Real.	Prioritize placement of bus-stop based real-time arrival screens in areas with concentrations of people without smart phone or data plan access.	Strive to provide real-time transit arrival information throughout the day but especially during late night or overnight hours when safety concerns are heightened.	Offer access to program not requiring smart phone or use of full data version of app; provide data lite option of equal quality user experience.	Ensure apps have a range of accessible communication functions, including native apps popular with users, short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.	Use simple, easy to understand language. Translate into all relevant languages in area. Adopt use of univerally-understood icons and symbols.
9	🕐	Work with private sector app providers to incorporate more real-time information on accidents, construction, etc.	--	--	Offer access to program not requiring smart phone or use of full data version of app; provide data lite option of equal quality user experience.	Ensure apps have a range of accessible communication functions, including native apps popular with users, short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.	--
10	🕐	Integrate multimodal information whenever possible on freeway travel time signs, including transit and if possible parking availability at transit stations.	Place equitably across corridor.	Provide information at all times of day, outside of peak periods.	Provide fare information, including for discounted fare products, where possible.	Provide and promote audio-based options. Include ADA access information, where applicable	Use simple, easy to understand language. Translate into all relevant languages in area. Adopt use of univerally-understood icons and symbols.

🕐 **Goal 1: Reliability**   🚌 **Goal 2: High-Capacity Options**   ❤️ **Goal 3: Healthy & Sustainable Communities**

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
11	🚌	Improve transit speeds and transit priority on US-101, El Camino Real, and other parallel roadways to provide more long-distance service and shift short trips off the freeway.	Work with cities or other municipalities with responsibility for sidewalk infrastructure to ensure public transportation is accessible for those walking. If reducing bus stops, consider proximity to medical centers and senior populations.	Seek projects that provide transit priority benefits throughout the day, not only peak periods.	--	Work with cities or other municipalities with responsibility for sidewalk infrastructure to ensure public transportation is accessible for those using wheelchairs or other mobility aids. Ensure parent or child-friendly amenities on board public transit such as designated stroller parking, level boarding, places for bags.	Projects that improve travel times between COCs and job centers. Prioritize transit speed improvement projects in communities of concern.
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.	Discourage parking zones or payment structure that designate which employees can park where	Explore variable parking rates based on parking demand at specific times, or that reduce parking fees during hours when transit options are reduced, such as late evening.	Encourage reinvestment parking fee revenue in equitable strategies, such as free transit passes for low income commuters.	--	Extend program eligibility to all those who commute or drive to worksite regularly, including contractors, consultants, vendors, interns, etc.
13	🚌	For employers and public transit agencies who operate and charge for parking, shift monthly permits/fees to daily rates.	Encourage standard parking rates to ensure equal opportunity for those who drive and park to park near their destination.	Explore variable parking rates based on parking demand at specific times, or reduce parking fees during hours when transit options are reduced.	Encourage reinvestment parking fee revenue in equitable strategies, such as free transit passes for low income commuters	Ensure daily parking payment process is accessible and allows for a variety of payment options	Promote program change in all relevant languages. Use easy to use, lay language in program communications.
14	🚌	Create options for bulk transit pass program eligibility (e.g. Caltrain GoPass) to include contractors, consultants, interns and temporary employees that work more than 20 hours a week.	--	Ensure transit service (or other transportation model such as a subsidized rideshare program) includes early morning, midday, and late night service options.	--	Ensure parent or child-friendly amenities on board public transit such as designated stroller parking, level boarding, places for bags.	--
15	🚌	Expand eligibility for bulk transit pass programs to include TMAs, neighborhood associations, colleges.	--	Ensure transit service (or other transportation model such as a subsidized rideshare program) includes early morning, midday, and late night service options.	Offer reduced fee program for affordable housing developers/managers and non-profit institutions.	--	--
16	🚌	Implement a "transportation credit" program that serves as a transit pass accumulator (automatically providing a monthly pass when the value of a pass has been spent on individual rides) and creates an integrated payment system to enable travelers to accumulate credits for sustainable travel and use credits for payment across the entire transportation system (Action #16)	Expand the number and geographic reach of Clipper vendors, especially in Communities of Concern. Incorporate public transit serving express lanes, as well as use of parallel public transportation systems.	Ensure Clipper vendor locations are open outside of normal business hours. Improve the immediacy of Clipper value added online. Credit transit trips taken at all times of day, outside of peak periods.	Distribute necessary transponders or cards (FastTrak and/or Clipper cards) and waive any monthly maintenance fees or minimums for people low-income.	Allow sharing of Clipper cards/accounts for caregivers and/or allow participants to designate an authorized representative. Ensure parent or child-friendly amenities on board public transit such as designated stroller parking, level boarding, places for bags.	Promote program change in all relevant languages. Use easy to use, lay language in program communications. Simplify enrollment process; tie to existing programs with similar eligibility and consider auto-enrollment.

🕐 **Goal 1: Reliability**   🚌 **Goal 2: High-Capacity Options**   💗 **Goal 3: Healthy & Sustainable Communities**

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
17	🚌	Introduce means-based fare structures on all transit providers throughout study area, through regional programs such as MTC's Clipper Start Means Based Fare pilot.	Expand the number and geographic reach of Clipper vendors, especially in Communities of Concern.	Ensure Clipper vendor locations are open outside of normal business hours. Improve the immediacy of Clipper value added online.	Distribute free Clipper cards in low-income areas/Communities of Concern.	Allow participants to designate someone to be an authorized representative. Allow sharing of Clipper cards/accounts for caregivers.	Simplify enrollment process; tie to existing programs with similar eligibility and consider auto-enrollment. Promote program change in all relevant languages. Use easy to use, lay language in program communications.
18	🚌	Offer free or reduced-price transportation for youth, seniors, and people with disabilities, or other promotional or marketing initiatives, where not offered now.	Prioritize implementation and promotion of program in areas with highest truancy rates or where students have the most challenges accessing school regularly.	Make available for use on all routes, all times of day, not just for accessing school.	--	Ensure parent or child-friendly amenities on board public transit such as designated stroller parking, level boarding, places for bags.	Simplify enrollment process; tie to existing programs with similar eligibility and consider auto-enrollment. Promote program change in all relevant languages. Use easy to use, lay language in program communications.
19	🚌	Improve transfers/synchronization of multiple transit providers and to park-and-ride lots in MAP study area.	Prioritize areas with high transfer rates currently.	Strive to provide real-time transit arrival information throughout the day but especially during late night or overnight hours when safety concerns are heightened.	--	--	--
20	🚌	Conduct comprehensive study of the public and private shuttle system to identify opportunities for coordination.	--	Explore additional service to accommodate employees who commute outside of peak hours.	--	Ensure private and public shuttles are accessible at all times.	--
21	🚌	Open private employer shuttles to all on-site employees regardless of classification.	Consider routes for contractors and part-time employees who live in areas not easily connected by existing transit services.	--	--	Ensure private and public shuttles are accessible at all times.	--
22	🚌	Explore opportunities for coordination/partnership on long-haul commute routes between employers, such as sharing/selling excess capacity on bus trips.	--	--	Prioritize partnerships with nearby small and disadvantaged businesses.	--	--
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).	--	--	Offer to all ticket-holders at all levels. Provide option for utilizing the perk without a smart phone.	--	Promote program change in all relevant languages. Use simple, clear language in program communications.
24	🚌	Create one fare product for trips to high traffic locations (Caltrain + VTA pass for 49ers game, Caltrain + BART pass to SFO).	--	--	Offer bulk passes as part of existing ticket product.	--	Promote program change in all relevant languages. Use simple, clear language in program communications.
25	🚌	Ensure employees of all classifications have access to non-surcharge BART fare at SFO.	--	--	--	--	Promote program change in all relevant languages. Use simple, clear language in program communications.

🕐 **Goal 1: Reliability**   🚌 **Goal 2: High-Capacity Options**   ❤ **Goal 3: Healthy & Sustainable Communities**

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
26	🚌	Provide hotel/venue customers with transit vouchers (e.g., $20 Clipper card that must be returned) and free BART passes for return to airport by bundling fares with room bookings/event tickets.	--	--	No fees for lost/stolen cards; reward for returned cards.	--	Promote program change in all relevant languages. Use simple, clear language in program communications.
27	🚌	Offer family / group discounted fares on weekends on transit.	--	--	Distribute free Clipper cards in low-income areas/Communities of Concern.	--	Promote program change in all relevant languages. Partner with and compensate community ambassadors to help develop and promote the program. Use simple, clear language in program communications.
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.	Require or enter into risk-sharing agreements with shared mobility operators to locate in neighborhoods with gaps in the transportation network, specifically Communities of Concern, as a condition for operating in public right-of-way or entering into a contract with the public sector.	Ensure new mobility vehicles are available 24 hours a day.	Deploy shared mobility kiosks to allow access for users without smart phones; ensure availability of non app or data-lite apps with equal user experience quality. Defray annual membership costs or sign-up fees for low-income users. Require tiered membership costs by income.	Ensure apps have a range of accessible communication functions, including native apps popular with users, short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.	Simplify enrollment process; tie to existing programs with similar eligibility and consider auto-enrollment. Promote program change in all relevant languages. Use easy to use, lay language in program communications.
29	🚌	Incentivize the use of pay-as-you-go insurance plans for drivers.	Conduct campaign across entire length of corridor	--	Partner with a wide variety of insurance companies, offering all levels of coverage. Offer access to program not requiring smart phone or use of full data version of app; provide data lite option.	Allow participants to designate someone to be an authorized representative.	Promote program in all relevant languages. Use easy to use, lay language in program communications. Prevent sociodemographic profiling within mobility apps.
30	🚌	Subsidize ride-matching through real-time matching apps (Scoop or another similar platform).	Extend to all employees regardless of home location.	Encourage ride-matching between companies to maximize matches for all work shifts	Offer access to program not requiring smart phone or use of full data version of app; provide data lite option. Prioritize available funding, if limited, for matching funds to be provided to lower income employees.	Ensure apps have a range of accessible communication functions, including native apps popular with users, short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.	Extend to all workers at the site, including contractors, vendors, interns, etc. Prevent sociodemographic profiling within mobility apps. Conduct marketing and promotions specifically to multilingual or disadvantaged populations among employees. Provide carpool matching services exclusively for women.

🕐 **Goal 1: Reliability**   🚌 **Goal 2: High-Capacity Options**   💗 **Goal 3: Healthy & Sustainable Communities**

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
31	🚐	Create regional vanpool subsidy program with ridership tracking and improve vanpool ride-matching.	Extend to all employees regardless of home location.	Promote the availability of guaranteed ride home available to all workers/residents through commute.org.	Explore income-based subsidies to reduce financial barriers for participation	Ensure accessible vehicles, including wheelchair accessible. Ensure booking options include a range of accessible communication functions such as short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.	Extend to all workers at the site, including contractors, vendors, interns, etc. Provide, as an extra service, carpool matching services exclusively for women.
32	🚐	Expand, improve, and promote the regional, sub-regional, or local carpool matching program for school-age children.	Prioritize implementation and promotion of program in areas with highest truancy rates or where students have the most challenges accessing school regularly.	--	Subsidize program participation for low-income households.	Ensure the availability of accessible vehicles	Promote program in all relevant languages. Use easy to use, lay language in program communications. Prevent sociodemographic profiling within mobility apps.
33	🚐	Encourage employers to provide gas incentives for regular carpoolers.	--	--	Prioritize available funding, if limited, for incentive funds to be provided to lower income employees.	--	Extend to all workers at the site, including contractors, vendors, interns, etc.
34	🚐	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.	--	--	Where EV vehicle discounts are applied to tolls, establish a tiered system to allow greater discounts to low-income EV drivers. Reinvest any EV toll revenues into incentives and sustainable transportation system improvements.	--	--
35	🚐	Decrease parking minimums/adopt parking maximums/allow for shared parking at multi-use development as part of city development requirements.	Supplement with high quality transit service, particularly in Communities of Concern.	--	--	--	--
36	🚐	Create regionally-consistent TDM developer requirements and incentives for specific land use types.	--	Build requirements that provide transportation solutions 24 hours per day.	Encourage subsidized transit passes/memberships for new mobility services for affordable housing residents.	--	--
37	🚐	Develop regional branding/marketing program for TMA/TDM programs.	--	Ensure communications include off-peak travel information.	Include TMA/TDM program information that includes cost.	--	Promote program in all relevant languages. Use easy to use, lay language in program communications.
38	🚐	Develop a platform for developments to share current mode split, encouraging trip reduction and a friendly competition.	--	--	Encourage the inclusion of the development TDM program details, including subsidies and incentives.	--	--

🕐 **Goal 1: Reliability**   🚐 **Goal 2: High-Capacity Options**   ❤️ **Goal 3: Healthy & Sustainable Communities**

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
39	🚐	Strengthen Bay Area Air Quality Management District (BAAQMD) employer TDM expectations for large employers (50+) by, for example:	Extend to all employees regardless of home location.	Promote the availability of guaranteed ride home available to all workers/residents through commute.org.	--	Ensure accessible vehicles, including wheelchair accessible. Ensure booking options include a range of accessible communication functions such as short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.	Extend to all workers at the site, including contractors, vendors, interns, etc. Provide carpool matching services exclusively for women.
39 a	🚐	Enforcing the requirements and penalize employers not in compliance.	Enforce equitably throughout region.	--	Conduct widespread education campaign to all employers but particularly smaller employers more around the 50 employee threshold.	--	Communicate program requirements in all relevant languages; use clear, simple language.
39 b	🚐	Expanding the potential mitigation options beyond pre-tax commuter costs to encourage larger companies to provide public transit passes or carpool subsidies and/or use of alternative modes by employees one day per week.	--	--	Provide separate discounted pricing structure for non-profit organizations and small businesses to purchase transit passes.	--	Simplify employee reimbursement for transit programs.
39 c	🚐	Incentivizing employers to charge for parking, or to shift from monthly to daily parking fees.	Discourage zone based pricing models that charge different rates for proximity to office entrances.	--	Encourage pricing schemes that provide options for employees of all income levels.	--	--
39 d	🚐	Encouraging employers to formalize a policy and encourage employees to work from home or alternate work schedules.	--	--	Allow flexibility to accommodate employees who many not have home environments suitable for WHF days. Provide stipends for employees to buy wfh equipment	--	--
40	🚐	Support small companies in funding and offering virtual meeting services software to facilitate remote work.	Couple with outreach for small businesses to raise program awareness.	--	Subsidize for small businesses	--	Promote program in all relevant languages; proactively promote among minority-owned businesses.
41	🚐	Support the development of new and expanded TMAs across study area in high employment areas such as Oyster Point (SSF), Foster City, Redwood Shores (Redwood City), East Palo Alto, Mountain View, Sunnyvale.	Ensure communities of concern are represented in TMAs.	--	Prioritize programs for low-income workers within these TMA areas. Encourage variable membership pricing to encourage small business participation. Encourage TMAs to provide a level of support for very small businesses/non profits	--	--
42	❤️	Enact trip caps or congestion pricing for major employment centers.	--	--	Evaluate how trips re allocated to ensure a portion of trips are reserved for those with fewest options.	--	--
43	❤️	Assess needs for traffic calming measures in neighborhoods/downtowns with high volume of cut-through traffic.	Prioritize in areas with highest rate of pedestrian/bicycle collisions, especially in Communities of Concern.	--	--	--	--

🕐 Goal 1: Reliability　　🚐 Goal 2: High-Capacity Options　　❤️ Goal 3: Healthy & Sustainable Communities

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
44	❤	Introduce or increase parking pricing in downtowns, major employment sites, or high traffic areas with transit access and other transportation options.	--	Ensure transit and other multimodal options are available including midday and late night hours, otherwise adjust pricing scheme accordingly to be cheaper when other options are not as plentiful.	Focus revenues on investing in transportation benefits for low wage workers such as free transit passes or improving multimodal transportation options to the area.	--	Communicate program requirements in all relevant languages; use clear, simple language.
45	❤	Prioritize transit-oriented development of both residential and office development in study area.	--	--	Enact strong requirements for affordable housing and subsidized transit passes within those developments.	--	Work closely with the community and local jurisdictions to support anti-displacement policies and practices.
46	❤	Support completion of the multi-use Bay Trail route and connections to the facility that runs parallel to US-101.	Focus on gaps in Communities of Concern.	Add lighting to the trail to make it feel safe for use in evenings and early mornings when there isn't as much daylight.	Explore bicycle donation or subsidies for nearby communities.	--	Promote trail's availability to all communities in all relevant languages. Consider bicycling training for nearby communities.
47	❤	Conduct pedestrian/bicycle crossing needs assessment along entire US-101 corridor, prioritizing Vision Zero / high-injury network hotspots.	Focus on crossing needs for Communities of Concern.	Add lighting to crossings to ensure they are and feel safe for use at all hours.	--	Ensure sidewalk facilities are accessible, safe and dependable for those using a wheelchair or other mobility aid.	--
48	❤	Keep bicycle lanes clear of obstacles, including Uber/Lyft drop-offs, construction, and street-sweeping.	Focus on bicycle lanes in Communities of Concern and along key routes between communities of concern and nearby employment areas.	--	Avoid fine-based enforcement mechanisms for double-parked cars, focusing on education first.	--	Consider bicycle training for nearby communities.
49	❤	Strengthen local TDM requirements to encourage/require bike programs and amenities in new and existing developments.	--	--	Explore bicycle donation or subsidies for nearby communities.	--	Consider bicycle training for nearby communities.
50	❤	Bring bike share systems to the Peninsula and other locations in the study area.	Require shared mobility operators to locate in neighborhoods with gaps in the transportation network as a condition for operating in public right-of-way or entering into a contract with the public sector Consider risk-sharing partnerships in exchange for locating services in potentially less profitable areas	Ensure bike share is available 24 hours per day. Ensure docking locations are well-lit.	Subsidize program participation (annual fees or one-time sign-up fees) for low-income households. Deploy shared mobility kiosks to allow access for users without smart phones. Ensure ways to participate that don't require smart phone or offer a "data lite" version of the booking app.	Promote availability of bike share to all communities in all relevant languages. Consider bicycling training for nearby communities. Hire community ambassadors to promote and educate about bike share in local communities. Hire staff locally for bike share program. Prevent sociodemographic profiling within mobility apps.	Ensure apps have a range of accessible communication functions, including native apps popular with users, short message services (SMS), voice-activated functionality, audio dial-in for landline users, and desktop-friendly browser versions.
51	❤	Strengthen/fund Safe Routes to School and other active mobility programs/policies in and between neighboring communities along the corridor.	Prioritize funds for SRTS programs in Communities of Concern or areas with highest pedestrian collisions.	--	--	--	Communicate program details in all relevant languages; use clear, simple language; hire local ambassadors to lead and promote the program from within the community.

🕐 **Goal 1: Reliability**   🚌 **Goal 2: High-Capacity Options**   ❤ **Goal 3: Healthy & Sustainable Communities**

#	Goal	Actions	Spatial	Temporal	Economic	Physiological	Social
52	♥	Adopt Local Road Safety Plans in consultation with community groups, utilizing Vision Zero principles, goals, and design guidance.	Prioritize road safety improvements in areas with highest bike and pedestrian collisions, especially in Communities of Concern.	--	--	--	Include plans for training enforcement staff in cultural competency and tracking enforcement data by race and income
53	♥	Transition public and private bus and shuttle fleets to zero emission vehicles.	Prioritize placement of these vehicles on routes that serve schools and/or neighborhoods with highest asthma rates.	--	--	--	--
54	♥	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.	Prioritize areas with highest asthma rates.	Policies should be effect 24 hours per day.	--	--	--
55	♥	Explore opportunities to provide high quality air filtration systems to residents and/or schools located in close proximity of US-101.	Prioritize areas with highest asthma rates.	--	Provide at no or low cost for low income households.	--	Simplify enrollment process. Promote program in all relevant languages. Use simple, clear language in program communications.
56	♥	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.	Work with communities to define how funding should be used and related project details	--	--	--	--
57	♥	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.	Prioritize green infrastructure in Communities of Concern.	--	Provide subsidies for lower income communities to adopt and implement green infrastructure.	--	--
58	♥	Develop an incentive/rebate program for residents along the corridor to purchase E-bikes.	Prioritize rebates in Communities of Concern near the freeway.	--	Identify methods to support charging costs.	--	Simplify enrollment process. Promote program in all relevant languages. Use simple, clear language in program communications.

Goal 1: Reliability   Goal 2: High-Capacity Options   Goal 3: Healthy & Sustainable Communities

APPENDIX E: IMPLEMENTATION SCORECARD

Goal	No.	Actions	Feasibility Assessment			
			Readiness	Potential Lead Implementors	Cost	Potential New Revenue
🕐	1	Conduct education campaign about safer, more efficient driving habits.	3	Regional Agencies, CMAs, Advocates	3	None
🕐	2	Expand freeway operational strategies to support freeway efficiency, including incident management, ramp metering, real time traveler information, and clearing of vehicle breakdowns, conflicts, etc.	3	Managed Lanes Agencies, Regional Agencies	3	None
🕐	3	Incentivize safer driving behavior through benefits or rebates to drivers who demonstrate responsible driving.	1	Managed Lanes Agencies, Private Sector, Regional Agencies, CMAs	2	None
🕐	4	Support policies or demonstration projects related to bus priority on freeway (e.g., bus-on-shoulder or HOV-priority on-ramps) or on parallel corridors such as El Camino Real or I-280 North.	3	State, Regional Agencies, Transit agencies, Advocates	3	Not directly, could increase ridership (and fare revenue)
🕐	5	Support ongoing planning projects to create a continuous managed lane (HOV/express) on US-101 from South San Jose to downtown San Francisco.	3	State, CMAs, Regional Agencies, Managed Lanes Agencies	3	None
🕐	6	Improve enforcement of managed lanes, including carpool & express lanes, through available automated technologies.	2	Managed Lanes Agencies	1	Ticket revenue
🕐	7	Work with Google Maps or other traffic apps to delineate travel time differences between general purpose lanes and managed lanes.	2	Private Sector, Regional Agencies, Managed Lanes Agencies	3	Not directly, could increase Express Lane use (and toll revenue)
🕐	8	Improve reliability of real-time transit arrival information for transit routes operating on US-101 or on key parallel transit corridors such as El Camino Real.	2	Transit agencies	2	Not directly, could increase ridership (and fare revenue)
🕐	9	Work with private sector app providers to incorporate more real-time information on accidents, construction, etc.	2	Private Sector, Managed Lanes Agencies, Regional Agencies	3	None
🕐	10	Integrate multimodal information whenever possible on freeway travel time signs, including transit and if possible parking availability at transit stations.	3	State	3	
🚌	11	Improve transit speeds and transit priority on US-101, El Camino Real, and other parallel roadways to provide more long-distance service and shift short trips off the freeway.	3	State, Transit agencies, Cities, CMAs	1	Not directly, could increase ridership (and fare revenue)
🚌	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.	3	Employers, Cities, TMAs, Regional Agencies	2	Parking revenue
🚌	13	For employers and public transit agencies who operate and charge for parking, shift monthly permits/fees to daily rates.	3	Cities, TMAs, Employers, Transit Agencies	3	Revenue neutral
🚌	14	Create options for bulk transit pass program eligibility (e.g. Caltrain GoPass) to include contractors, consultants, interns and temporary employees that work more than 20 hours a week.	2	Transit agencies, Regional Agencies, Employers	3	Not directly, could increase ridership (and fare revenue)

🕐 **Goal 1: Reliability**　　🚌 **Goal 2: High-Capacity Options**　　❤ **Goal 3: Healthy & Sustainable Communities**

Goal	No.	Actions	Feasibility Assessment			
			Readiness	Potential Lead Implementors	Cost	Potential New Revenue
🚌	15	Expand eligibility for bulk transit pass programs to include TMAs, neighborhood associations, colleges.	3	Transit agencies	3	Not directly, could increase ridership (and fare revenue)
🚌	16	Implement a "transportation credit" program that serves as a transit pass accumulator (automatically providing a monthly pass when the value of a pass has been spent on individual rides) and creates an integrated payment system to enable travelers to accumulate credits for sustainable travel and use credits for payment across the entire transportation system (Action #16)	2	Regional Agencies, Transit agencies, Managed Lanes Agencies, Regional agencies	2	Could increase ridership but might result in fare revenue loss
🚌	17	Introduce means-based fare structures on all transit providers throughout study area, through regional programs such as MTC's Clipper Start Means Based Fare pilot.	2	Regional Agencies, Transit agencies	2	Could increase ridership but might result in fare revenue loss
🚌	18	Offer free or reduced-price transportation for youth, seniors, and people with disabilities, or other promotional or marketing initiatives, where not offered now.	2	Transit agencies, Regional Agencies, Advocates, County Departments	1	None
🚌	19	Improve transfers/synchronization of multiple transit providers and to park-and-ride lots in MAP study area.	2	Transit agencies, Regional Agencies	2	Not directly, could increase ridership (and fare revenue)
🚌	20	Conduct comprehensive study of the public and private shuttle system to identify opportunities for coordination.	3	Transit Agencies, Regional Agencies, Cities, TMAs, Employers	3	None
🚌	21	Open private employer shuttles to all on-site employees regardless of classification.	3	Employers, TMAs	3	None
🚌	22	Explore opportunities for coordination/partnership on long-haul commute routes between employers, such as sharing/selling excess capacity on bus trips.	3	Regional Agencies, TMAs, Employers	3	None
🚌	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).	2	Regional Agencies, Transit Agencies, Cities, TMAs, Private Sector	2	Not directly, could increase ridership (and fare revenue)
🚌	24	Create one fare product for trips to high traffic locations (Caltrain + VTA pass for 49ers game, Caltrain + BART pass to SFO).	2	Transit agencies, Regional Agencies, Cities, Private Sector	2	Not directly, could increase ridership. Could results in revenue loss depending on sharing model.
🚌	25	Ensure employees of all classifications have access to non-surcharge BART fare at SFO.	3	Transit agencies, Regional Agencies, SFO	3	Not directly, could increase ridership (and fare revenue). Could result in revenue loss for BART.
🚌	26	Provide hotel/venue customers with transit vouchers (e.g., $20 Clipper card that must be returned) and free BART passes for return to airport by bundling fares with room bookings/event tickets.	2	Regional Agencies, Cities, Transit Agencies, Private Sector	1	Not directly, could increase ridership (and fare revenue)

🕐 **Goal 1: Reliability**   🚌 **Goal 2: High-Capacity Options**   ❤ **Goal 3: Healthy & Sustainable Communities**

Goal	No.	Actions	Feasibility Assessment			
			Readiness	Potential Lead Implementors	Cost	Potential New Revenue
🚌	27	Offer family / group discounted fares on weekends on transit.	3	Transit agencies	2	Not directly, could increase ridership. Might result in revenue loss.
🚌	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.	2	Cities, Transit agencies	2	Permit fees
🚌	29	Incentivize the use of pay-as-you-go insurance plans for drivers.	3	Cities, Regional Agencies, TMAs, Employers	3	None
🚌	30	Subsidize ride-matching through real-time matching apps (Scoop or another similar platform).	3	CMA, Regional Agencies, Cities, TMAs, Employers	2	None
🚌	31	Expand, improve, and promote the regional vanpool subsidy program with ridership tracking and improve vanpool ride-matching.	3	Regional Agencies, TMAs	1	None
🚌	32	Create regional, sub-regional, or local carpool matching program for school- age children.	2	Regional Agencies, Cities, CMAs	2	None
🚌	33	Encourage employers to provide gas incentives for regular carpoolers.	3	Cities, TMA, Regional Agencies, Employers	2	None
🚌	34	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.	3	Managed Lane agencies, Regional Agencies	3	Toll revenue
🚌	35	Decrease parking minimums/adopt parking maximums/allow for shared parking at multi-use development as part of city development requirements.	2	Cities	3	None
🚌	36	Create regionally-consistent TDM developer requirements and incentives for specific land use types.	2	Regional Agencies, CMAs, Cities	3	None
🚌	37	Develop regional branding/marketing program for TMA/TDM programs.	2	Regional Agencies, TMAs	3	None
🚌	38	Develop a platform for developments to share current mode split, encouraging trip reduction and a friendly competition.	2	Advocates, Cities, TMA	2	None
🚌	39	Strengthen Bay Area Air Quality Management District (BAAQMD) employer TDM expectations for large employers (50+) by, for example:				
🚌	39a	Enforcing the requirements and penalize employers not in compliance.	2	Regional Agencies, Employers	2	Fees
🚌	39b	Expanding the potential mitigation options beyond pre-tax commuter costs to encourage larger companies to provide public transit passes or carpool subsidies and/or use of alternative modes by employees one day per week.	2	Regional Agencies, Employers	1	None
🚌	39c	Incentivizing employers to charge for parking, or to shift from monthly to daily parking fees.	1	Regional Agencies, Employers	3	None
🚌	39d	Encouraging employers to formalize a policy and encourage employees to work from home or alternate work schedules.	1	Regional Agencies, Employers	3	None

🕐 **Goal 1: Reliability** 🚌 **Goal 2: High-Capacity Options** ❤ **Goal 3: Healthy & Sustainable Communities**

Goal	No.	Actions	Feasibility Assessment			
			Readiness	Potential Lead Implementors	Cost	Potential New Revenue
🚌	40	Support small companies in funding and offering virtual meeting services software to facilitate remote work.	3	Employers, Regional Agencies, CMAs	3	None
🚌	41	Support the development of new and expanded TMAs across study area in high employment areas such as Oyster Point (SSF), Foster City, Redwood Shores (Redwood City), East Palo Alto, Mountain View, Sunnyvale.	3	Cities, Regional Agencies	3	Revenue neutral
💗	42	Enact trip caps or congestion pricing for major employment centers.	2	Cities	2	Fees
💗	43	Assess needs for traffic calming measures in neighborhoods/ downtowns with high volume of cut-through traffic.	3	Cities, State, Regional Agencies	3	None
💗	44	Introduce or increase parking pricing in downtowns, major employment sites, or high traffic areas with transit access and other transportation options.	3	Cities	2	Parking revenue
💗	45	Prioritize transit-oriented development of both residential and office development in study area.	3	Cities, Regional Agencies	3	
💗	46	Support completion of the multi-use Bay Trail route and connections to the facility that runs parallel to US-101.	3	Regional Agencies, Cities, State	3	None
💗	47	Conduct pedestrian/bicycle crossing needs assessment along entire US-101 corridor, prioritizing Vision Zero / high-injury network hotspots.	3	Managed Lanes agencies, CMAs, Regional Agencies	3	None
💗	48	Keep bicycle lanes clear of obstacles, including Uber/ Lyft drop-offs, construction, and street-sweeping.	3	Cities	2	None
💗	49	Strengthen local TDM requirements to encourage/require bike programs and amenities in new and existing developments.	3	Cities, Advocates	3	None
💗	50	Bring bike share systems to the Peninsula and other locations in the study area.	2	Cities, CMAs, Regional Agenices	2	None
💗	51	Strengthen/fund Safe Routes to School and other active mobility programs/ policies in and between neighboring communities along the corridor.	3	CMAs	2	None
💗	52	Adopt Local Road Safety Plans in consultation with community groups, utilizing Vision Zero principles, goals, and design guidance.	3	Cities, Counties	3	
💗	53	Transition public and private bus and shuttle fleets to zero emission vehicles.	3	Transit Agencies, TMAs, Employers	2	None
💗	54	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.	3	Cities, Counties	3	None
💗	55	Explore opportunities to provide high quality air filtration systems to residents and/or schools located in close proximity of US-101.	2	Cities, Counties	2	None

🕐 **Goal 1: Reliability**   🚌 **Goal 2: High-Capacity Options**   💗 **Goal 3: Healthy & Sustainable Communities**

Goal	No.	Actions	Feasibility Assessment			
			Readiness	Potential Lead Implementors	Cost	Potential New Revenue
♥	*56*	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.	3	Cities, Counties, Regional Agencies	3	None
♥	*57*	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.	3	Cities, Counties	2	None
♥	*58*	Develop an incentive/rebate program for residents along the corridor to purchase E-bikes.	3	Cities, Counties, TMAs, Employers	2	None

🕐 **Goal 1: Reliability**   🚎 **Goal 2: High-Capacity Options**   ♥ **Goal 3: Healthy & Sustainable Communities**

APPENDIX F: ASSESSMENT METHODOLOGY

MEMORANDUM

To: 101-MAP Project Team

From: Nelson\Nygaard

Date: March 30, 2020

Subject: 101-MAP Actions Assessment Scoring Protocols

Introduction

Phase One of the 101-MAP identifies over 50 actions to address project goals through programs policies. To inform the future implementation of each action, the MAP team assessed the directness of each action's impact on each of 13 performance metrics associated with project goals.

Figure 1   Performance Metrics

Goal	Metric
Reliability: Offer reliable travel times for all people regardless of how they travel on US-101	▪ Consistency of average travel time at AM peak (+) ▪ Percentage of time Express Lanes operate at >45 mph (+) ▪ On-time performance (OTP) of transit using US-101 (+) ▪ Customer-perceived reliability of US-101 (+)
High-capacity options: Prioritize high-capacity mobility options for all, such as buses and carpools	▪ Person throughput in general purpose lanes on US-101 (+) ▪ Person throughput in Express Lanes on US-101 (+) ▪ Average vehicle occupancy on US-101 (+) ▪ Transit ridership on parallel corridors (such as El Camino Real, I-280, Potrero Ave, Bayshore Blvd, 3rd Street in SF) (+)
Healthy and sustainable communities: Foster healthy and sustainable communities near US-101	▪ Collisions, including bike and pedestrian, at highway access points (-) ▪ Biking mode share (+) ▪ Walking mode share (+) ▪ Rate of asthma attacks (-) ▪ Traffic density (-)

To inform the ultimate prioritization and implementation details of each action, the MAP team also identified several "readiness" factors for each action. These include:

- Implementation readiness
- Cost factors
- Potential implementing entities

Performance Scoring

Because many of the actions have not yet been tested on the US-101 corridor, the assessment process relies on research, case studies, example pilot programs in other locations, and professional judgement to estimate the impact of each action on the performance metrics. These estimates of likely impact are represented with a numerical score that can be compiled and summed for each goal, ranging from -1 to 3, according to the following score definitions:

Actions' Impact on Performance Metrics

- **DETRACTS (-1)** – Evidence to suggest this strategy may negatively impact the desired outcome for this metric
- **NEUTRAL (0)** – No known impact from this strategy on the outcome of the metric, or there is evidence to suggest this strategy has no impact
- **INDIRECT (1)** – Evidence to suggest this strategy has a measurably positive but secondary or peripheral impact on the outcome for this metric
- **DIRECT (3)** – Evidence to suggest this strategy has a measurably positive and primary impact on the outcome of this metric

Each action gets an extra point when survey responses indicate support for the idea. Each action can receive up to 10 total points in this framework.

To create an aggregate score of each action, performance metric have equal weighting within each goal, and each goal has equal weight to one another. For example, Goal 1 (Reliability) includes four performance metrics, each of which is weighted 25 percent toward the overall Goal score. For each strategy, scores are aggregated by goal and overall.

To score each of the 50+ actions according to their likely impacts on the 13 metrics, the project team developed scoring criteria for each metric. These are summarized below, grouped by goal, with a definition for each of the four possible number scores. The -1 score was not commonly assigned in the scoring process; as such, "N/A" is noted for metrics that did not receive any -1 scores.

Figure 2   Assessment Score Definitions

Goal	Score definition			
Metric	**DETRACTS** **-1**	**NEUTRAL** **0**	**INDIRECT** **1**	**DIRECT** **3**
Reliability				
Consistency of average travel time at AM peak (+)	Makes average travel time less consistent (N/A)	Has no known or potential impact on average travel time	Supports high-occupancy transit modes that could shift vehicle trips off the freeway	Directly reduces unpredictability of peak travel

Goal	Score definition			
Metric	**DETRACTS** **-1**	**NEUTRAL** **0**	**INDIRECT** **1**	**DIRECT** **3**
Percentage of time Express Lanes operate at >45 mph (+)	Makes Express Lane travel slower (N/A)	Has no known or potential impact on Express Lane operations	Supports high-occupancy transit modes that could shift vehicle trips off the freeway and reduce competition for Express Lane space	Directly expands continuity/improves operations of Express Lane network
On-time performance of transit using US-101 (+)	Makes Express Lane travel slower (N/A)	Has no known or potential impact on transit service operations	Supports transit operations on streets and highways	Directly addresses transit operations on streets and highways
Customer-perceived reliability of US-101 (+)	Creates a perception of additional traffic on US-101 (N/A)	Has no known or potential impact on perception of US-101 operations	Supports predictability of travel times	Visibly reduces elements that make travel time unpredictable Involves a high-profile program that has widespread applicability or eligibility
High-Capacity Options				
Person throughput in general purpose lanes on US-101 (+)	Induces additional single occupancy vehicle (SOV) trips (N/A)	Has no known or potential impact on mode choice or operational efficiencies on US-101	Increases convenience of carpool of 2+ passengers in general purpose lanes	Directly incentivizes carpool of 2+ passengers or directly increases operational efficiency
Person throughput in Express Lanes on US=101 (+)	Induces additional SOV trips (N/A)	Has no known or potential impact on mode choice on US-101	Potential ability to increase convenience of 3+ passenger carpool trips or transit use	Directly incentivizes carpool (3+ passengers) or transit use or directly increases operational efficiency of Express Lanes
Average vehicle occupancy on US-101 (+)	Induces additional SOV trips (N/A)	Has no known or potential impact on mode choice on US-101	Increases convenience of higher capacity modes	Financially incentivizes highest capacity modes

Goal	Score definition			
Metric	**DETRACTS -1**	**NEUTRAL 0**	**INDIRECT 1**	**DIRECT 3**
Transit ridership on parallel corridors (+)	Disincentivizes transit use or reduces transit efficiency (N/A)	No known or potential ability to address attractiveness or efficiency of transit	Supports but does not directly affect transit use	Directly incentivizes more transit trips
Healthy and sustainable communities				
Collisions, including bicycle and pedestrian, at highway access points (-)	Increases vehicle speeds and traffic exposure (N/A)	No known or potential ability to impact traffic patterns or multimodal access on local street network	Increases awareness for safe driving at highway access points and local streets	Reduces speed and severity of traffic conflicts (impacting all modes) at highway access points and local streets
Biking mode share (+)	Disincentivizes bike trips (N/A)	No known or potential ability to address local street operations for people on bikes	Encourages or incentivizes bicycle use	Protects and enhances bicycle use and access
Walking mode share (+)	Incentivizes shift away from walk trips (NA)	No known or potential ability to address local street network for people walking	Encourages walking	Protects and enhances walking
Rate of asthma attacks (-)	Increases pollution from vehicle emissions by decreasing electric vehicle incentives or increasing SOVs	Has no known or potential impact on pollution levels from vehicle emissions	Encourages shift to high-occupancy modes, especially for regular commute trips that use US-101	Measurably reduces traffic density on local streets or vehicle emissions levels on highway or local streets

Goal	Score definition			
Metric	DETRACTS -1	NEUTRAL 0	INDIRECT 1	DIRECT 3
Traffic density (-)	Incentivizes dispersal of SOV trips across local street network	Has no known or potential ability to change traffic patterns on local street network	Encourages shift to high-occupancy modes primarily on US-101	Reduces vehicle volumes on local streets and incentivizes shift to high-occupancy modes in communities adjacent to the highway

Readiness Scoring

The MAP team also assessed each action's readiness for implementation by examining two main factors. The approach is summarized in Figure 3. The outcomes of this assessment are included in the MAP Scorecard.

Note that this readiness assessment does not include a judgment of political readiness. Each action's political readiness should be assessed by the lead implementing agency closer to the time of implementation as contextual variables can change quickly.

Figure 3   Readiness Scoring Protocol

	Low Score = 1	Moderate Score = 2	High Score = 3
Readiness How ready is this action for implementation? What external variables might impact its readiness?	▪ Action requires a regulatory or state-level legal change ▪ Action requires a technology that does not yet exist	▪ The implementing entity would need to be created ▪ Implementation would require new coordination between multiple existing entities ▪ The technology has been implemented elsewhere	"Shovel ready" ▪ No new technology or legislative changes required ▪ Action is ready to start in the next two years but for funding identification
Cost How easy will it be to identify funding for this action? Does the action highly rely on operational or capital funding?	▪ High cost (operating and capital)	▪ More capital or one-time costs than annual operating costs	▪ Only capital/one-time costs ▪ No operating costs

Identification of Potential Implementing Entities

Many of the 101-MAP actions identified in Phase One are inherently multidisciplinary and could require multiple implementing entities to start making impact. The process of identifying specific lead agencies for each action is outside the scope of Phase One of the project. As such, the

scorecard identifies potential leaders to be considered in Phase Two. These potential lead agencies include:

- Transit agencies
- Transportation Management Associations (TMAs)
- Managed Lanes agencies (includes the JPA, MTC, VTA, Alameda CTC, SFCTA)
- Regional agencies (includes MTC, BATA, ABAG, BAAQMD, Caltrans District 4)
- Employers
- Cities
- Advocates / community organizations
- Congestion Management Agencies (CMAs)
- County departments (e.g., County Office of Education)
- State agencies (e.g. Caltrans, state legislature, CARB, Coastal Commission)