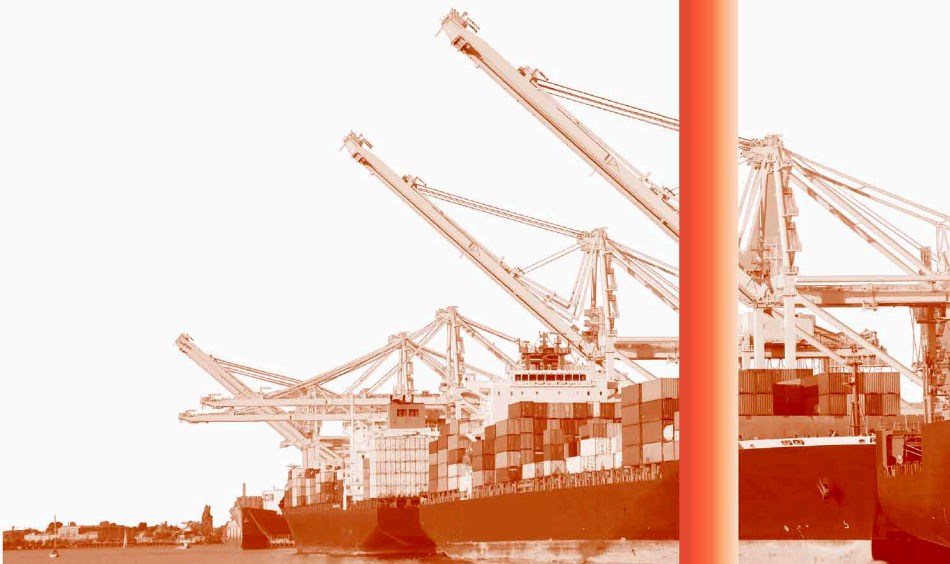
THE FUTURE OF TRANSPORTATION AND URBAN PLANNING

A CALIFORNIA 100 REPORT ON POLICIES AND FUTURE SCENARIOS

CALIFORNIA 100

VISION & STRATEGY FOR THE NEXT CENTURY



ABOUT CALIFORNIA 100

The California 100 Initiative envisions a future that is innovative, sustainable, and equitable for all. Our mission is to strengthen California's ability to collectively solve problems and shape our long-term future over the next 100 years.

California 100 is organized around 15 policy domains and driven by interrelated stages of work: research, policy innovation and engagement with Californians. California 100's work is guided by an expert and intergenerational Commission. Through various projects and activities, California 100 seeks to move California towards an aspirational vision—changing policies and practices, attitudes and mindsets, to inspire a more vibrant future.

This California 100 Report on Policies and Future Scenarios was produced as part of California 100's research stream of work, in partnership with 20 research institutions across the state. California 100 sponsored grants for data-driven and future-oriented research focused on understanding today and planning for tomorrow. This research, anchored in California 100's 15 core policy domains, forms the foundation for the initiative's subsequent work by considering how California has gotten to where it is and by exploring scenarios and policy alternatives for what California can become over the next 100 years.

The California 100 initiative is incubated through the University of California and Stanford.

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READ MORE ABOUT THE FUTURE OF TRANSPORTATION AND URBAN PLANNING IN CALIFORNIA

For additional background information, read the related Facts-Origins-Trends report at California100.org. The Facts-Origins-Trends report contains all of the references and citations to support the content of this report.

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This Report is one of 15 reports that will be released in 2022 as part of the California 100 Initiative. We are proud to partner with the following research centers and institutes across California on our work:

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ABOUT THE UCLA INSTITUTE OF TRANSPORTATION STUDIES

The UCLA Institute of Transportation Studies (UCLA ITS) supports and advances cutting-edge research, the highest-quality education, and meaningful and influential civic engagement on the many pressing transportation issues facing our cities, state, nation and world today. The institute is part of the University of California Institute of Transportation Studies, a four-campus consortium that includes UC Berkeley, UC Davis and UC Irvine. UCLA ITS is also a proud partner of the Pacific Southwest Region 9 University of Transportation Center, a federally funded research network with seven other universities.

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The Institute of Transportation Studies at UCLA acknowledges the Gabrielino/Tongva peoples as the traditional land caretakers of Tovaangar (the Los Angeles basin and So. Channel Islands). As a land grant institution, we pay our respects to the Honuukvetam (Ancestors), ‘Ahiihirom (Elders) and ‘Eyoohiinkem (our relatives/relations) past, present and emerging.

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FOREWORD

"As California Goes, So Goes the Nation, Alas." That was a headline from a *Los Angeles Times* opinion column on April 30, 1989, which noted that, even though "Californians have long considered their state the cutting edge of social and political change… [it] no longer seems the vanguard of political innovation. Other states rarely look to California for policy initiatives."

Fast-forward to 2022, and few would proclaim that California lacks in policy innovation. Quite the contrary. The state has enacted a variety of policies ranging from expansions in immigrant rights and voting rights to health care and higher education, and from large-scale experiments in guaranteed income to ambitious moves towards net-zero emissions in a variety of sectors. And despite the periodic waves of "doom and gloom" reporting about the state, California's economic output over the last 25 years has grown faster than the national average, and on par with GDP growth for the state of Texas.

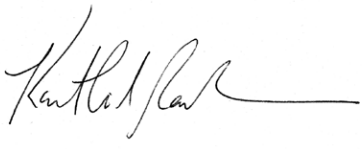
Even so, much remains to be done. While the state has embraced diversity in many ways, the California Dream has been marred by periods of intense racial exclusion. And the Dream remains out of reach for millions in the state today—whether measured by health outcomes, unaffordable housing, or massive disparities in income and wealth. California also recognizes that future progress depends on recognizing and correcting historical wrongs. Its Truth and Healing Council, for example, will provide recommendations aimed at prevention, restoration, and reparation involving California Native Americans and the State. If California's racial diversity represents America's demographic reality by 2100, our work is essential—not only for the long-term success of the state, but also for our country's innovative and equitable future.

This future-focused work is especially pressing today. The COVID-19 pandemic has scrambled a state and nation already undergoing significant changes in economics, politics, and society. The harmful consequences of climate change are at our doorstep,

with forest fires and droughts that grow in frequency and intensity each year. The weakening of local media and the growth of disinformation threaten both our civic health and our public health. And staggering inequities in income and wealth, home-ownership and health, threaten the state's reputation as a haven for migrants, domestic and international alike.

In addition to immediate threats that affect our long-term future, we also see plenty of opportunity. Record increases in federal and state spending mean that billions of additional dollars are flowing to state, local, and tribal governments in California. Many jurisdictions are looking to invest in infrastructure that meets the long-term needs of their communities. Philanthropic institutions and individual donors are also looking to make transformative investments that have enduring impact. We have an opportunity to inform and enrich all of these plans and conversations.

Most institutions and organizations in California are focused on immediate challenges, and don't have the luxury of time, dedicated talent, and resources to focus on long-term futures. California 100 is grateful for the opportunity to provide added value at this critical time, with actionable research, demonstration projects, and compelling scenarios that help Californians—government agencies, stakeholder groups, and residents alike— to envision, strategize, and act collectively to build a more innovative and equitable future.



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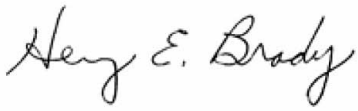
Executive Director



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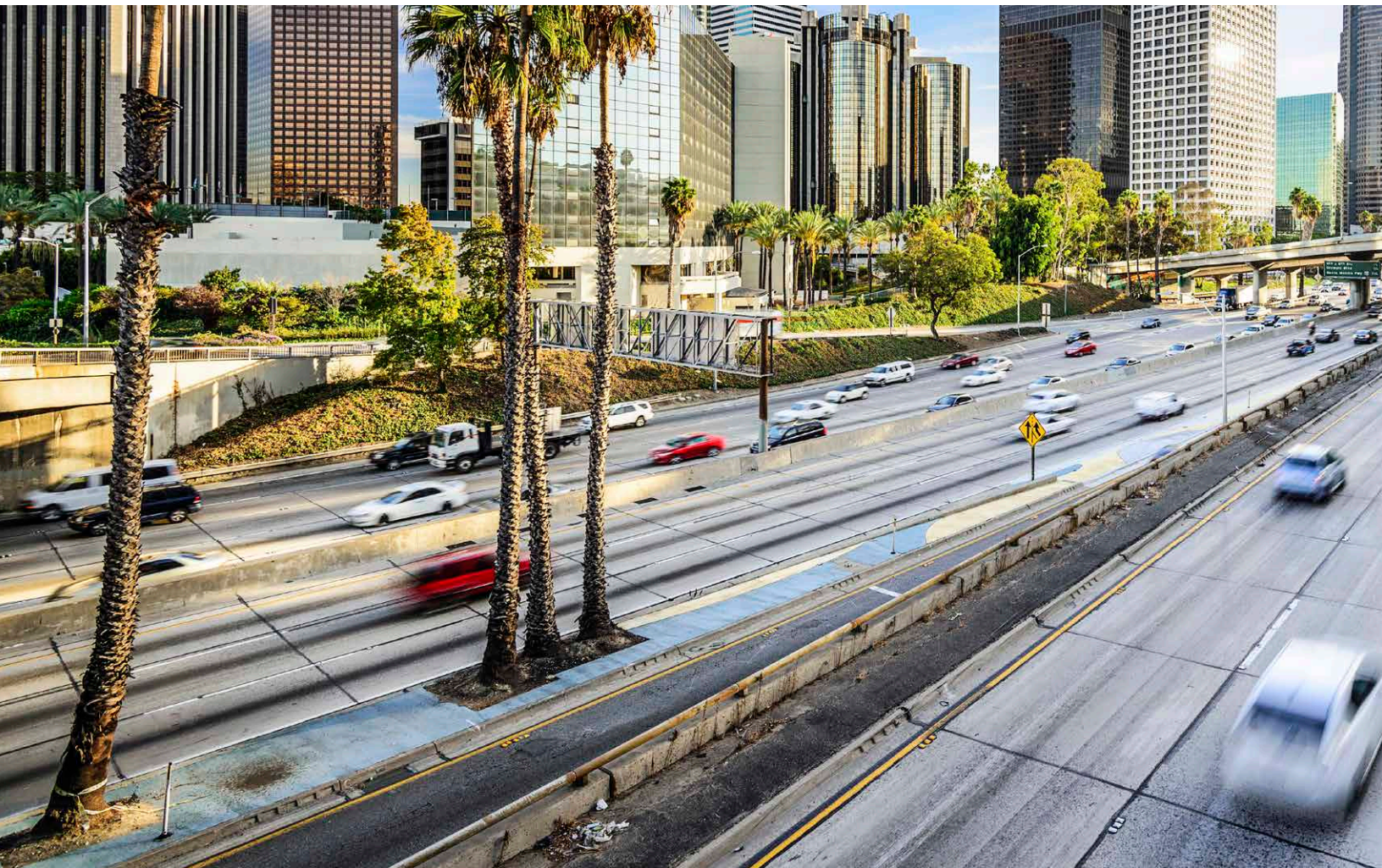
WHAT'S DRIVING CALIFORNIA?

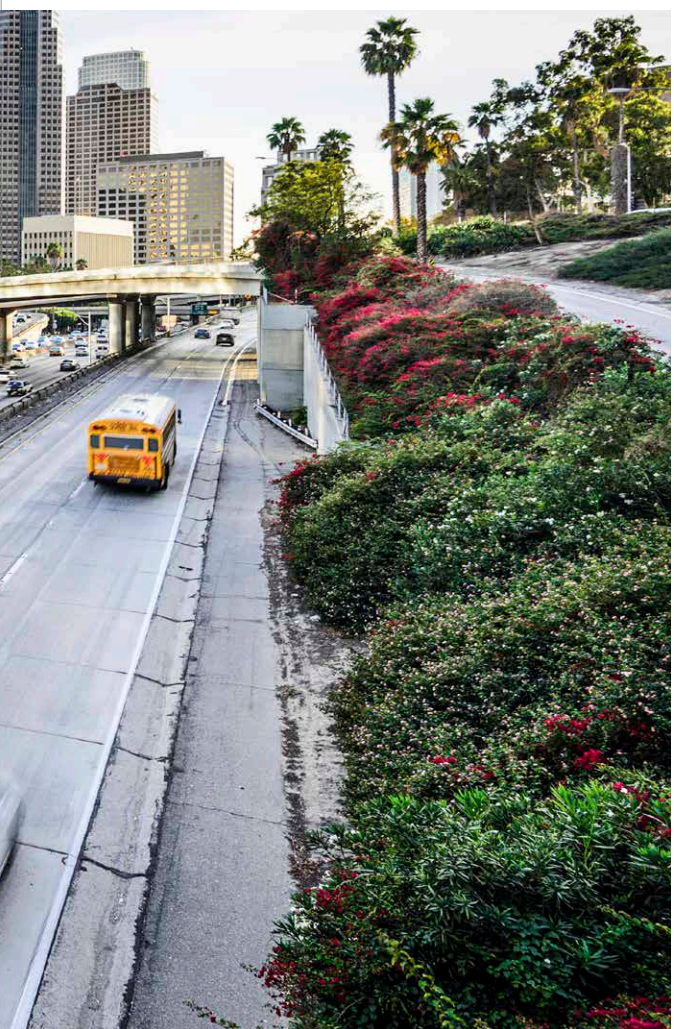
Context

Nearly every aspect of social, economic, and political life in California is linked by its transportation systems. These systems can be seamless and somewhat transparent when they work well, but their failings can be glaring and deeply problematic when they leave people, goods, or places behind. Given this essential function of transportation, this report examines the state of, history of, and prospects for transportation in California.

In March 2020, the world's streets, highways, railroads, ports, and airports grew eerily quiet. In a few short weeks, the global pandemic cast the central role of transportation systems in seemingly every aspect of life in the sharpest possible relief. In California, observers initially lauded plummeting emissions and vanquished traffic congestion, but these proved short-lived.



Californians are highly reliant on personal vehicles to get around, though actually less so than the residents of most other U.S. states.



Fully 18 months after the onset of the pandemic, transportation problems in California were front-page news. The state's mammoth twin Ports of Long Beach and Los Angeles were so deeply backlogged that store shelves across the country grew increasingly bare at times in the fall of 2021 and winter of 2022.

While millions of California workers shifted to remote work during the pandemic, millions more still need to travel to their jobs in health care, food retailing, and other essential sectors. Indeed, working from home did not obviate the need for travel but in many ways simply shifted it to other forms of transport such as delivery services. By the fall of 2021, the state's streets and roads were gradually refilling with workers, shoppers, and truckers, bringing its many transportation problems back to the fore: chronic traffic congestion, increasing separation of home and work locations, falling transit use, worsening emissions and noise pollution, heightened vulnerability to climate change, and more.

Californians are highly reliant on personal vehicles to get around, though actually less so than the residents of most other U.S. states. The vast majority of personal travel in California is by car across all socio-economic groups, though lower-income and other households of color depend somewhat more frequently on other travel modes. Similarly,

commercial travel in the state is mostly done by truck. Although public transit plays an important role in the centers of the biggest metropolitan areas, particularly in San Francisco, it is much less prevalent elsewhere, especially in rural areas. Even though most transit users are low-income, most low-income travelers get around in automobiles.

All of this car and truck travel is no accident. Today's transportation problems originate, in significant part, from yesterday's land use decisions. Decades of public and private land development and transportation system investment decisions have decisively shaped the current state of play. The state's massive investments in freeways—both between and within cities—and most local land use policies have been highly complementary to driving. Low-density land uses, exemplified by dispersed single-family housing and lots of free parking, have encouraged automobile ownership and use, resulting in suburban living and universal automobile access for most of the population, at the cost of increasing travel distances, isolation for those unable to drive, chronic traffic congestion, health- and environment-threatening vehicle emissions, and a severe housing affordability crisis.

TRANSPORTATION ACCESSIBILITY, MOBILITY, AND EQUITY

A number of key concepts are used throughout this report, including accessibility, mobility, and equity.

Accessibility is the ability of people, households, firms, or institutions to avail themselves of goods, services, activities, and opportunities. Access is, in essence, the *raison d'être* of transportation systems. Access often entails travel, such as by walking to a café, driving to a grocery store, or taking a bus to work, but the internet enables access as well, without travel. **Mobility,** by contrast, refers to the ability to move about. Walking for ten minutes to reach a drugstore 500 meters away or driving for ten minutes to reach a drugstore five kilometers distant both convey similar levels of drugstore access, but entail vastly different levels of mobility. So, while mobility—be it 500 meters or five kilometers—often conveys access, more mobility does not necessarily mean more access. In fact, traveling long distances can result in lower levels of access, as time spent traveling to destinations is time away

from activities at destinations. Transportation policy, planning, and engineering is in the midst of a significant, albeit gradual, shift from a mobility focus to an accessibility focus, on the grounds that access is the ultimate goal of transportation systems, and that mobility is a means to that end, not the end in itself.

Transportation equity is a critical concept as well, and one that is both waxing in importance and evolving in definition. Transportation equity can be evaluated with respect to individuals, classes or interests (such as how Latinos/as, women, cyclists, or truckers fare relative to others), or geographies (such as how various neighborhoods or municipalities compare). Transportation equity includes both the distribution of the benefits of travel and the distribution of the costs and burdens of travel (financial, health and safety, environmental, etc.). It considers not only those who are traveling, but those living close to transportation facilities and those not traveling at all because they are excluded from desired activities or social resources. These benefits and costs, in turn, can be evaluated in terms of outcomes, outputs, or markets. Outcomes are things such as food access or the incidence of asthma adjacent to highways, outputs are things such as levels of walking or driving, and markets are things such as the balance of payments for and benefits received from travel. In addition, and importantly, transportation equity is also evaluated in terms of who (across individuals, classes or interests, and geographies) has a voice and influence over transportation system decision-making and whose voices, both presently and historically, are or have been excluded.

TRANSPORTATION POLICY AND PLANNING IN CALIFORNIA

In addition to the key concepts of accessibility, mobility, and equity, it is important to understand the political and administrative context of transportation decision-making in California as well.

First, the federal government sets broad public policy for transportation, including our focus here on "surface" transportation. Vehicle safety, emissions, fuel-efficiency standards, and more are all subject to federal regulation. The federal government is also a major funder of highways, public transit, and even biking and walking facilities, mostly through formula matching-grant programs administered through the Federal Highway Administration and Federal Transit Administration under the U.S. Department of Transportation.

The California State Legislature sets transportation policy for the state, including establishing major programs like cap-and-trade and raising the state's fuel taxes in 2017. In the executive branch, the California State Transportation Agency (CalSTA) is a cabinet-level agency that oversees the operations of several state departments including the California Department of Transportation (Caltrans), Department of Motor Vehicles, High-speed Rail Authority, and Highway Patrol.

CalSTA is responsible for the preparation of the state's federally-required statewide long-range transportation plan, the most recent version of which, the California Transportation Plan 2050, was published in February 2021. The plan established the state's transportation goals over the next three decades in the areas of equity, accessibility, safety, climate, health, economy, infrastructure, and the environment. Among the goals are reducing automobile and truck travel, increasing the use of alternative modes, including walking, biking, and transit, and reducing air pollution, while promoting economic growth.

At the regional level, metropolitan planning organizations (MPOs) are responsible for preparing and periodically updating regional transportation plans that implement the state's overall vision. There are 18 MPOs covering nearly all areas of the state, governed by boards of mostly local elected officials. Funding for metropolitan and local transportation projects, whether repair, retrofit, or new construction, comes from myriad sources, including federal and state funds (largely collected from gasoline and other fuel taxes), local property taxes, and increasingly local option

sales taxes (LOSTs) levied at the county level. Finally, at the local level cities and counties control and maintain most local streets and roads, as well as the traffic signals, street parking, bike and transit lanes, and sidewalks that adorn them. Local governments also control most land use regulations and decision-making, including the review and approval of new and substantially remodeled developments. Thus, nearly every level of government in California—federal, state, regional, and local—shapes urban development in the state and the myriad transportation systems that serve them.

TRAVEL IN THE GOLDEN STATE

CALIFORNIANS DRIVE A LOT

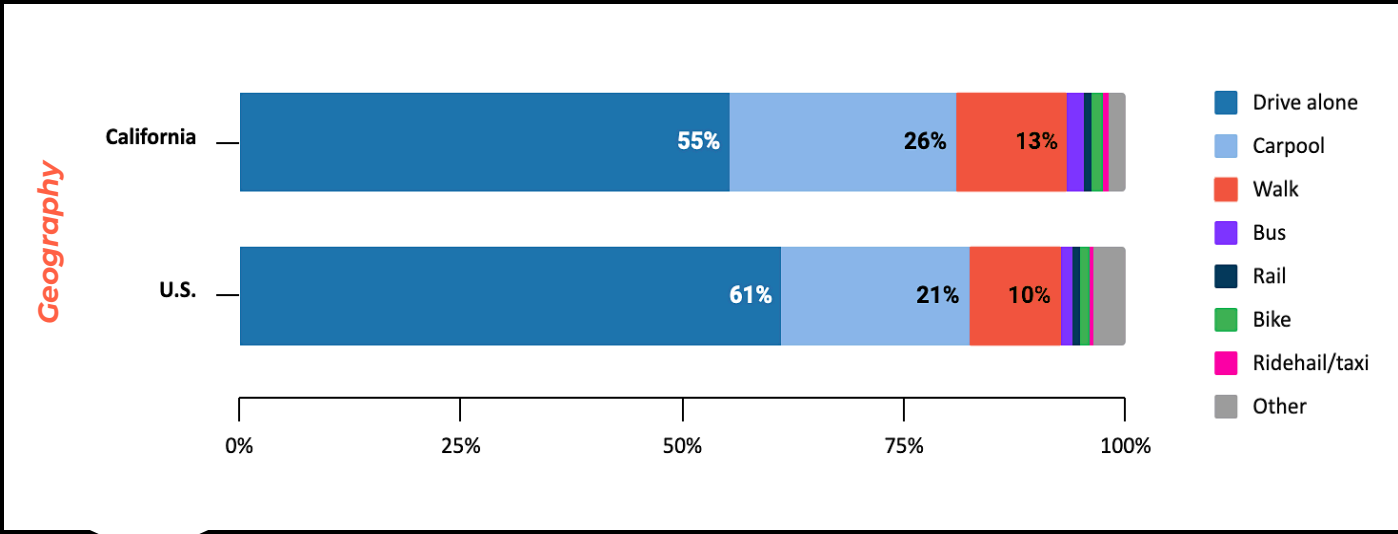
While the typical Californian drives less than the average American, there are many people living in California, and together they drive a lot. Considering both personal and commercial travel, total vehicle miles of travel in the state continue to climb due to overall population and employment growth. This includes a substantial rebound following unprecedented drops in all forms of travel in the spring of 2020 at the outset of the pandemic.

Californians today own more cars and trucks—25 million—than ever before. Indeed, more than four in five trips statewide are via car, truck, or motorcycle, and well over half of those trips involve driving alone (See Figure 1). By comparison, Californians took just 3.4 percent of trips on public transit and for-hire (ridehail, taxi, and limousine) vehicles combined in 2017, the most recent year with complete data. Not surprisingly, overall vehicle travel in the state has been increasing since 2010.

Despite this growth in aggregate vehicle travel, individual travel per Californian has actually been decreasing. But while individuals are driving less, on average, their reduced vehicle travel for personal trips has been more than offset by increases in commercial travel, including small package deliveries that are replacing many household shopping trips.

Automobile ownership and driving are less common in low-income households. However, most low-income Californians—78 percent—commute by car, whether it is their own or someone else's. Remarkably, 27 percent of Californians with no household vehicles nonetheless drive alone to work, by borrowing cars from non-family members, non-household relatives, etc. About two-thirds of those in households with just one vehicle drive alone to work, while about three-quarters of those with two or more household vehicles do so.

Figure 1 **Californians Make Most Trips by Car, though Less than the U.S. Overall**



DATA SOURCE: FHWA 2017

HOW AND WHY CALIFORNIANS TRAVEL: TRIP LENGTH, DURATION, AND SPEED

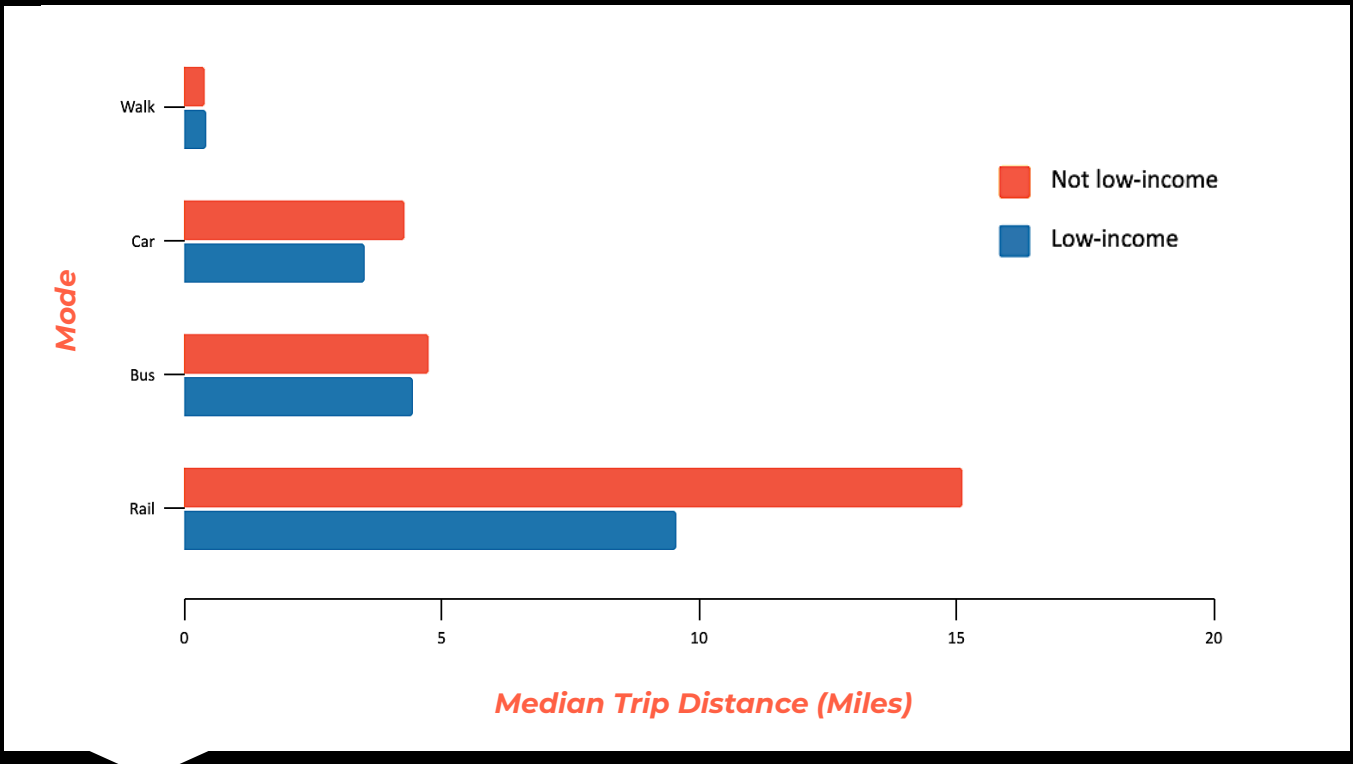
Californians travel for all sorts of reasons. While commutes to work are often the center of transportation analyses and we have the best data on these trips, household-serving travel—shopping and family/personal business travel—are the most common trip purposes both in the state and nationally. Indeed, trips to and from work make up fewer than one in five (18%) of all trip-taking in California.

While it accounts for a relatively low share of Californians' trips, commuting to and from work has an outsized influence on traffic, as commuting trips are concentrated at peak periods and in peak directions. Moreover, across the state's regions and demographic groups, commutes have lengthened, as people have, on average, moved farther away from their jobs (or taken jobs farther from home) and have used cars more for their travel. Over the past two decades, the average one-way commute travel time rose modestly from 28 minutes to 30 minutes. Travelers of color tend to have longer commute times than white Californians, in part due to lower levels of access to automobiles and greater use of slower modes of transportation, like public transit. These commute time differ-

ences reflect structural inequities in access to jobs and transport and represent a barrier to social mobility due to time lost to commuting.

Overall, Californians tend to spend more time on each trip than the national average, despite comparable travel distances by mode. Most trips in California (62%), though, do take less than 20 minutes. The median car trip is just over 4 miles, and the median walk just under half a mile. Within California, travel time and distance differences across demographic groups are generally small. Broadly, though, low-income travelers take shorter trips by slower modes, in part as a function of geography as low-income people tend to live in denser, more congested areas better served by public transit. The median distance for a car trip for a low-income traveler is 3.5 miles, compared to 4.3 miles for someone more affluent. Bus and particularly rail trips by low-income travelers are also shorter. On the other hand, walk trips tend to be a bit longer as well as taking up more time: the average time a low-income traveler spends walking is 19 minutes compared to 16 minutes for someone who is not low-income (See Figure 2).

Figure 2 **Low-Income Travelers Take Shorter Trips by Slower Modes**

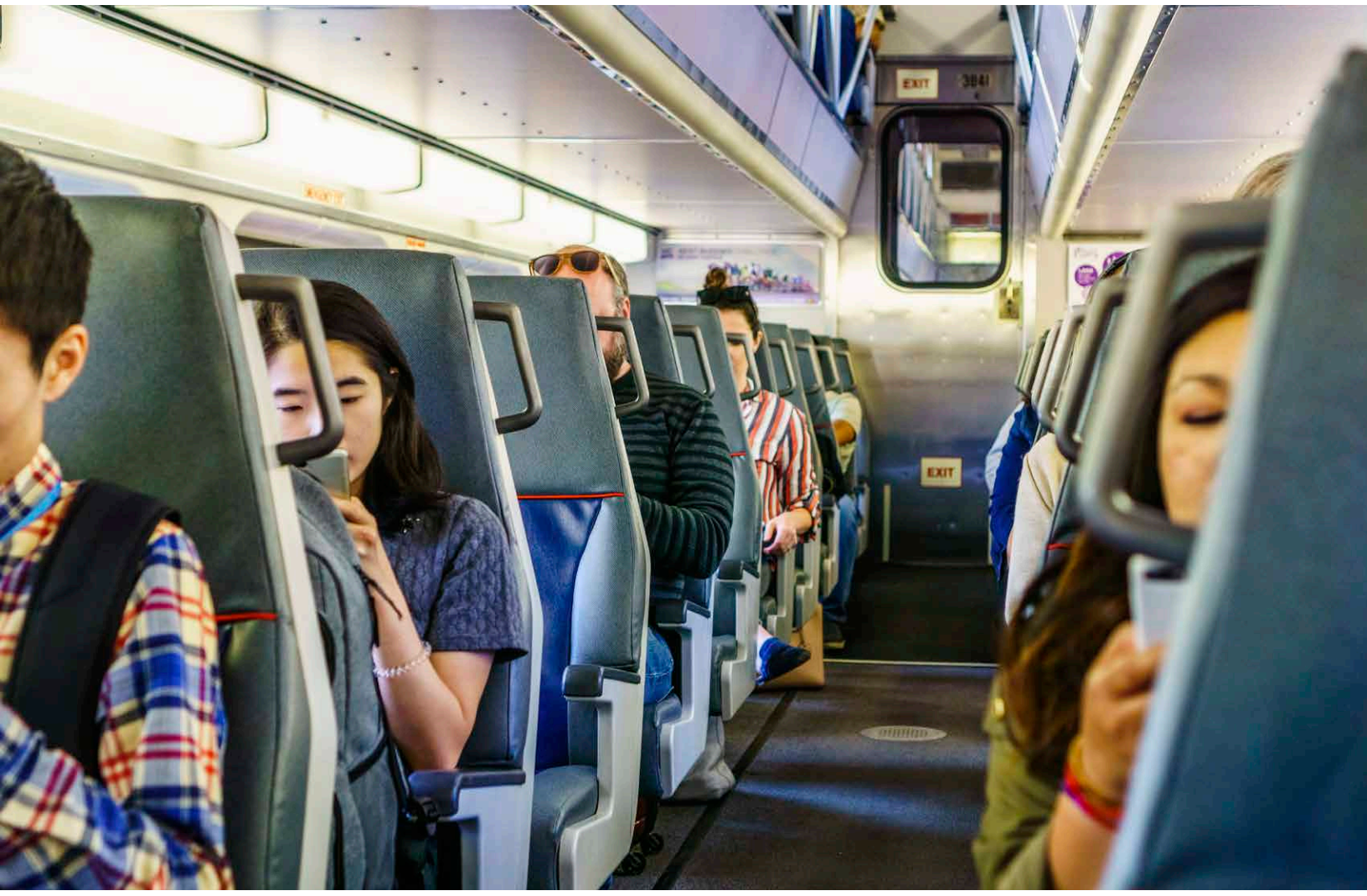


DATA SOURCE: FHWA 2017

TRAVEL BY MEANS OTHER THAN DRIVING IN CALIFORNIA

Californians walk (13% to 10%) and ride transit (3% to 2%) more than the average American. Perhaps surprisingly, walking is—by far—the second most common means of travel after driving. While the popular and political focus has often been on public transit as the principal alternative to driving, walking to destinations is an important, albeit often overlooked, means of travel—particularly in densely-developed places like San Francisco and West Hollywood. Walking trips (for the whole way to a destination, as opposed to walking to one's car, walking to a transit stop, or going on a recreational walk) are four times greater than all trips by bus and rail.

While non-automobile travel is relatively uncommon, non-white, female, and low-income Californians take a larger share of their trips by other modes. For instance, Black Californians use buses at over twice the rate of other racial/ethnic groups and Asians use rail at slightly higher rates. Women tend to drive



more often than men, perhaps because driving allows them to juggle more domestic responsibilities and because they may feel safer driving than using other travel modes. However, the starkest differences in travel are by income. Purchasing, insuring, maintaining, and fueling vehicles is expensive, as are trips by ridehail or taxi. Given this, low-income Californians drive much less, on average, than those with higher incomes; instead, they walk and ride transit more. Nevertheless, even low-income Californians still make the overwhelming share of their trips by car (72%, compared to 83% for higher-income travelers).

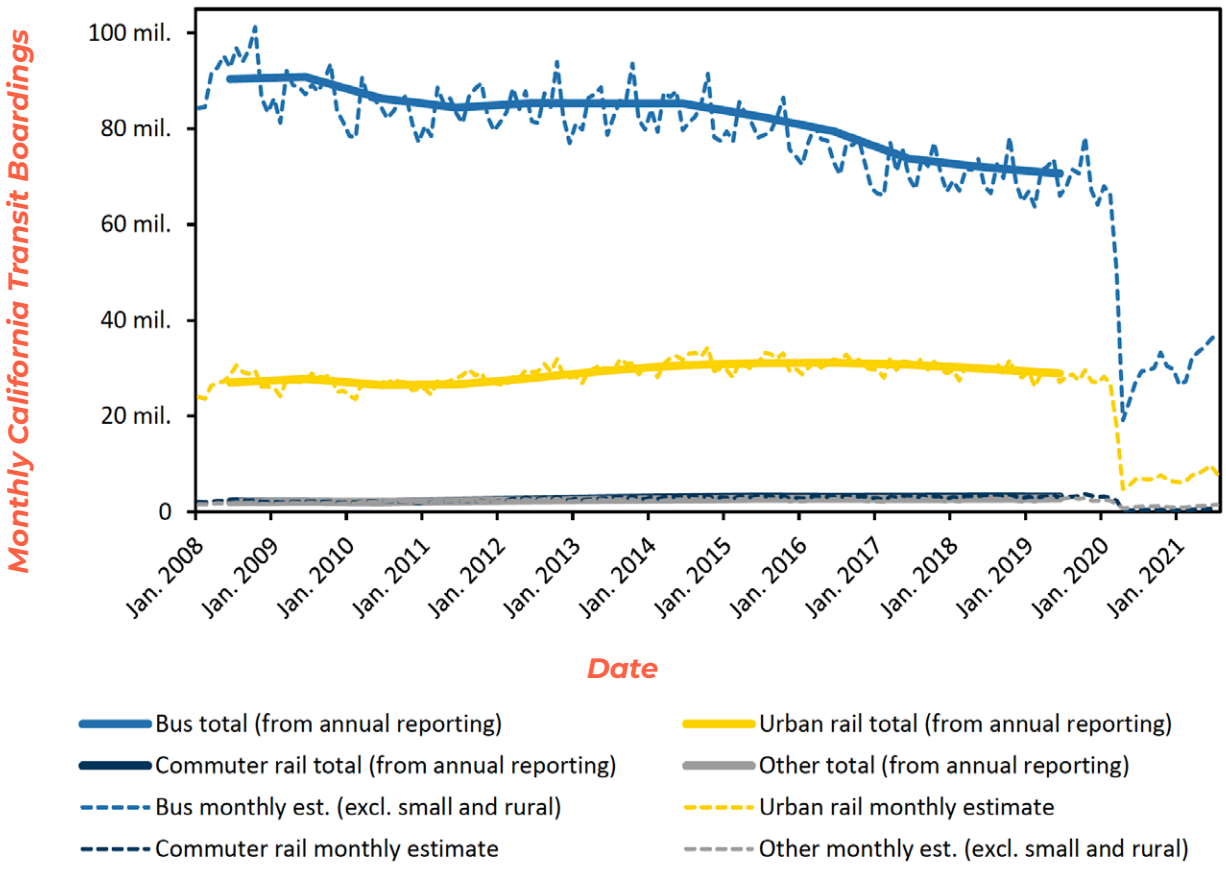
THE PUBLIC TRANSIT PICTURE

Though Californians, on average, ride public transit far less than they drive or walk, transit is a particular focus of the state's transportation policy and spending. It is a key element of state plans to reduce greenhouse gas emissions as well. Despite this policy and financial emphasis, transit ridership declined in the second half of the 2010s across the state (See Figure 3), though with somewhat different contours and causes in the state's different regions.

The majority of California's ridership losses occurred in the South Coast region, primarily from steep declines on Los Angeles Metro buses and trains, though most California systems sustained losses. The Bay Area proved a partial exception, with patronage rising until 2016 and falling less steeply than the rest of the state thereafter. In the Bay Area, ridership losses were concentrated in outlying areas, in non-commute directions, and at off-peak times.

Ridership losses across the state in the 2010s, though, pale in comparison to those of 2020, when the pandemic caused transit ridership in California and around the globe to plunge staggeringly to about a quarter of normal in April 2020 (See Figure 3). Since then, ridership has recovered, but at a substantially slower rate than driving, walking, or biking. As ridership unevenly recovers, the long-term impact of COVID-19 on transit use is hard to predict, especially if many continue to work from home and the public remains leery of confined crowded spaces.

Figure 3 **Transit Ridership Dropped Since 2010—and Plummeted During the COVID-19 Pandemic**



DATA SOURCE: FTA 2021

Transit ridership declines are not unique to California. Across the nation, while transit service increased in the decade prior to the pandemic, ridership began falling consistently in 2014 nationally. Research has shown that factors external to the transit industry, such as population density, household income, employment, immigration, increased access to private automobiles, and increased use of ridehailing (like Lyft and Uber) all likely had depressing effects on transit demand.

Yet in other ways, California's transit landscape is distinctive, matching its varied geography. Whereas many states have a single large transit system serving a given metropolitan area, along with many rural transit providers, California—with its numerous cities and regions—has

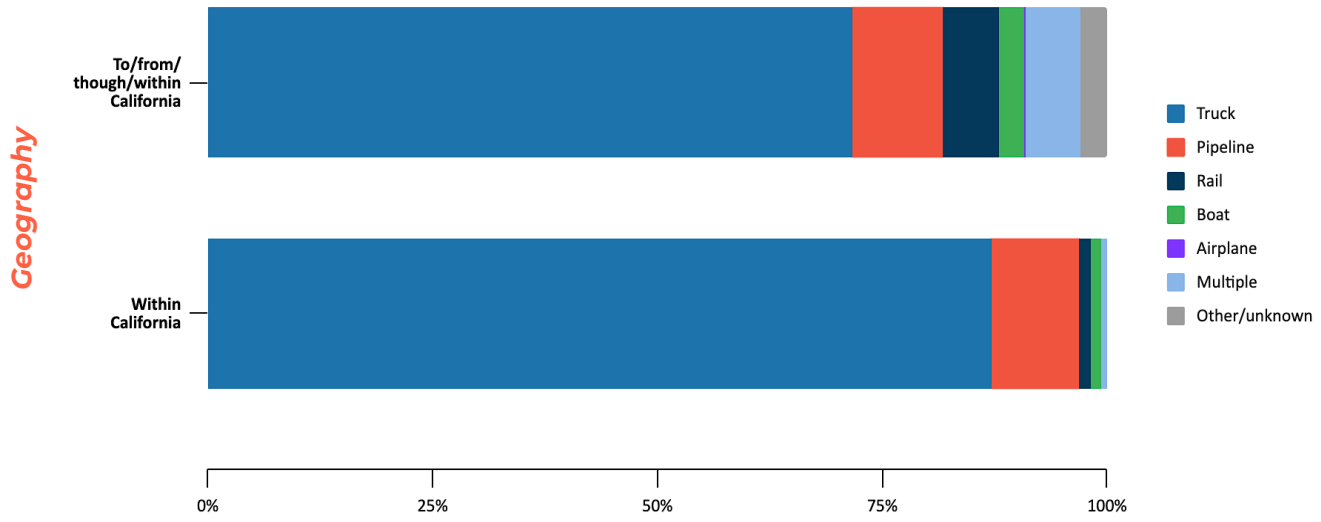
many large metropolitan systems in addition to a multitude of transit services in rural areas. Moreover, even accounting for its high number of urbanized areas, California has an unusually large, splintered number of public transit providers. At the same time, the share of operating funds that transit operators receive from the state is relatively low in California.

CALIFORNIANS RELY ON TRUCKS FOR COMMERCIAL GOODS

California stands out for commercial travel as well as personal. The Ports of Long Beach and Los Angeles are, combined, the largest in the Western Hemisphere, handling about 40 percent of the container imports in the U.S., as California has become a major center in pan-Pacific shipping and trade. Its central role in global trade has given rise to inland logistics centers outside of metropolitan cores and caused freight rail and truck traffic to increase dramatically.

Despite California's considerable seaport, airport, and railroad infrastructure, trucking remains the primary means by which goods are transported in the state (See Figure 4). Trucking accounts for 72 percent of all freight flows, and will likely remain so in the future.

Figure 4 **Trucks Are the Dominant Mode of Freight Travel in and through California**



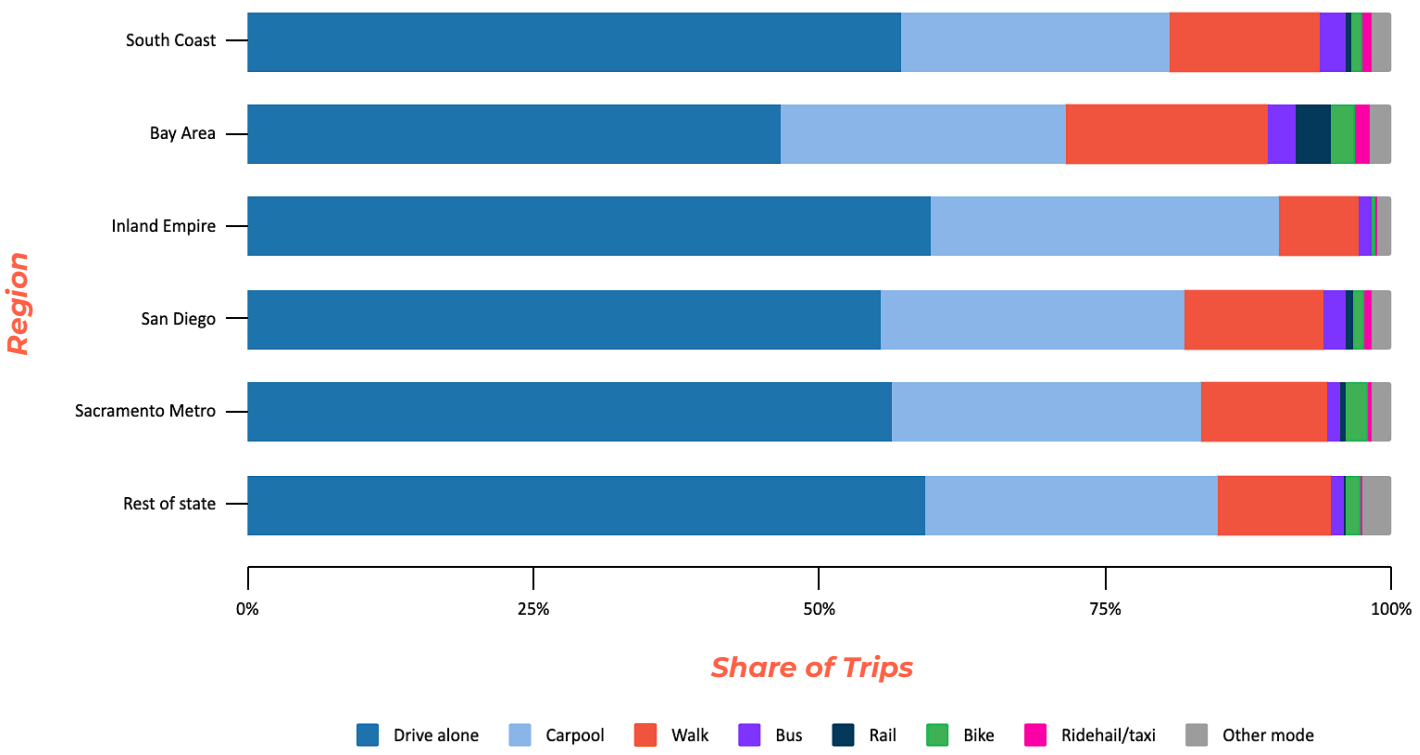
DATA SOURCE: Caltrans 2020

The dominance of trucking over other modes of freight transportation parallels the dominance of private automobiles in passenger transportation in both its point-to-point flexibility and its negative environmental and public health effects. Here too, the dominance of trucks in goods movement is abetted by the state's extensive system of freeways and other highways.

REGIONAL TRAVEL DIFFERENCES ACROSS CALIFORNIA

While the personal and commercial travel patterns described above characterize the state overall, how Californians across the state travel varies widely (see Figure 5). In general, in the more urbanized parts of the state, travelers tend to drive less. With a more transit-friendly and walkable structure and built environment, particularly in the central cities of San Francisco, Oakland, and Berkeley, the Bay Area hosts by far the highest levels of walking (19%) and public transit use (6%) and lowest levels of automobile use (70%) in the state. At the other end of the spectrum, the Inland Empire is the state's most auto-oriented region; nine in ten trips are by car, which is higher even than in non-metropolitan California.

Figure 5 **Despite Regional Differences in Travel, Driving Alone Remains the Most Prevalent Form of Travel in California**



DATA SOURCE: FHWA 2017

In parts of the state where people drive for a greater share of trips, they also travel further distances and for longer times; even their non-driving trips are further and longer. Average automobile travel distances for non-work trips are longest in the Inland Empire and South Coast regions in metropolitan Los Angeles, while residents of the Inland Empire and outside the major metropolitan areas tend to spend the most time per transit trip. As we discuss below, this points to the importance of land use: a car-oriented landscape spreads destinations further apart, to the point that driving is often the only reasonable option. In these more car-oriented regions, people even take fewer social trips: whereas approximately a quarter of trips in the Bay Area and South Coast are for social purposes, only 21 percent of trips in Riverside and 20 percent of trips outside of major urban regions are for social purposes. At the same time, automobiles offer far more mobility than

other modes. A resident of the Inland Empire spends far less time making a short trip by car (6.5 minutes) than a driver in Los Angeles (8.7 minutes).

Commute travel patterns likewise differ across the state. They do, though, mostly share a trend towards greater automobility: over the past 20 years, most parts of California saw increased rates of solo driving to work. The Inland Empire had the highest increase, while the Bay Area proved the exception, with a four-percentage-point decrease in driving alone to work. The South Coast has the second-highest rates of commuting by bus, yet it experienced a drop since 2000, part of the larger decline in Southern California transit ridership described below.

Despite the difference in land use and modes of transportation to work, the Inland Empire and the Bay Area both have the longest duration commutes, with an average of about 32 minutes. The Bay Area has the lowest share of people with commutes of less than 10 minutes (17%). This last figure may seem counter-intuitive, as the Bay Area is home to some of the state's densest and most transit-friendly areas, but recall that transit trips (because of the extra walking, waiting, transferring, and multiple stops en route) tend to be much slower than driving.

Overall, Californians are highly dependent on automobile use across all regions. Yet people in sprawling, auto-friendly environments, like the Inland Empire, tend to drive the most, while people in denser, transit- and pedestrian-friendly environments, like the Bay Area, tend to use transit or active transportation at higher levels than the rest of the state.

HOW WE GOT HERE: KEY DRIVERS IN CALIFORNIA'S TRANSPORTATION PAST

Today's transportation problems stem, in significant part, from yesterday's land use and transportation infrastructure decisions. Californians' heavy dependence on cars and trucks is due substantially to the state's massive investments in freeways and its land use policies and governance structures that have enabled and supported building cities *out* rather than *up*. Suburban living and near-universal automobile access came at the cost of increasing travel distances (especially for commuting), chronic and worsening traffic congestion in many places, health- and environment-threatening vehicle emissions, and a statewide crisis in housing affordability.

THE INEQUITABLE ORIGINS OF CALIFORNIANS' HEAVY USE OF CARS

More than a century ago, streetcars permitted residential development to spread from city centers. Then, as automobiles grew more popular in the early decades of the 20th century, suburbs were no longer tethered to rail tracks and could spread even further from cities. The population, housing, and automobile boom following the Second World War saw even greater separation of land uses, abetted by local zoning and other land use controls favoring low-density, racially exclusive, single-family housing.

Both California and the federal government spurred this decentralization further by funding an enormous highway construction boom, first with state funding beginning in the late 1940s, followed by federal funding of the Interstate Highway System beginning in the late 1950s. Freeways, including those running in and through cities, were typically designed to rural superhighway standards—limited access, high-speed, grade-separated—and bulldozed disproportionately through low-income, urban neighborhoods of color, where economic and political costs were lower and resistance more easily ignored. Planners in the post-war era often justified freeway development as a means to cure "urban blight." Freeways were frequently routed through disinvested neighborhoods, causing the very blight they were supposed to eliminate and forcing businesses and residents to move to other areas.

As distances between residential, commercial, and employment locations widened, suburban households became increasingly dependent on automobiles. As jobs began to follow residents to the suburbs, central city residents, especially Black Californians, found themselves increasingly separated from em-

ployment opportunities. All told, the legacy of the state and federal highway policy has been a predominance of car-oriented, spread-out, large-lot, single-family suburbs; shopping malls replacing downtown commercial districts; and, perhaps ironically, increasingly congested roadways.

CONSEQUENCES OF BUILDING CALIFORNIA AROUND THE CAR

Decades of land use and transportation investments have combined to confer significant personal benefits on those able to drive, including improved employment and other well-being outcomes and greater travel flexibility. To enjoy these benefits of car travel, though, poor drivers must contend with the relatively high costs of automobile ownership and use.

These problems have been exacerbated by land use regulations that, with some exceptions, continue to favor low-density development, a housing affordability crisis that limits suitable housing close to jobs, an environmental review process that adds to the cost of housing and has historically favored expanding road capacity instead of limiting vehicle travel, and stringent parking requirements that add to housing costs, limit the number of units that can be constructed, and subsidize the cost of driving.

While the last half of 20th century California was characterized by suburban growth paired with central city disinvestment, the first two decades of the 21st century witnessed continued suburban expansion but amidst reinvestment and expansion of many, though not all, central city neighborhoods. This back-to-the-city movement has increased population, development, and incomes in many central city neighborhoods, and reduced dependence on driving relative to new suburban developments in the process. But this urban expansion has also raised the specter of gentrification, wherein more affordable urban neighborhoods, which are disproportionately home to people of color, become more expensive and may displace lower-income, Black, and Latino/a residents to less transit-friendly, more car-oriented areas.

CALIFORNIA'S BIG INVESTMENTS IN PUBLIC TRANSIT

High density, transit-friendly urban communities are one way to increase accessibility (by putting destinations closer together) and diversify mobility (by increasing the practical options for getting around). To support such communities and reduce dependence on driving, the state and its regions, counties, and cities have collectively invested substantially in improving and expanding public transit since the 1970s.

After public transit systems transitioned from private to public ownership in the middle of the 20th century, transit operators needed public subsidies to maintain, expand, and operate their systems. With capital expenditures subsidized largely by the federal government but operating expenditures covered by farebox revenues, transit agencies struggled to run and maintain their growing systems. Operations funding shortfalls led to funding commitments from the State of California to help subsidize operations with the passage of the Transportation Development Act (TDA) in 1971. Its hard-won passage involved compromises necessary to address opposition from both freeway users and rural and suburban areas, to meet Governor Ronald Reagan's interest in "local control," and to assuage state senators' concerns over weakening "fiscal discipline" by subsidized transit operators. The result of these compromises, including funding transit through sales taxes rather than fuel taxes and adding many complicated criteria (and later exemptions to them), remains in the structure of the TDA, a foundational program that is still a major source of funding for the state's transit operators.

Since 1976, much of the increased funding for public transit in California has come from local option sales taxes, which are incremental increases (usually an added 0.5 or 1 percent of each purchase) to sales taxes, combined with transportation expenditure plans, put before county voters. Today, LOSTs generate nearly $5 billion per year for transportation, much of it for public transit, though substantial shares go to highways as well, depending on the county.

TRENDS UNDERLYING CALIFORNIA'S FUTURE TRANSPORTATION SCENARIOS

INCREASING AUTOMOBILE OWNERSHIP AND DRIVING, LAGGING PUBLIC TRANSIT USE

Behind the continued high use of automobiles and the recent drops in transit ridership are rising levels of vehicle ownership, particularly outside of the San Francisco Bay Area. Although households without private vehicles in California make over five times as many transit (including buses, light rail, subway, and commuter rail) trips as those in households with private vehicles, the share of California households with no vehicles is falling. The demographic and economic forces that help explain the rise of automobile ownership in turn explain much of the transit ridership decline in California. Ridership would likely have remained steady in much of the state since 2000 if vehicle ownership had not risen. Absent dramatic policy shifts, these trends are likely to continue, causing higher demand for streets and highways and lower demand for public transit.

THE EVOLVING TRANSPORTATION FUNDING LANDSCAPE

While funding for motor vehicle infrastructure still dwarfs that for other modes, California's financial and political commitment to a multimodal future provides a substantial countervailing force to historic transportation expenditure patterns, especially at the local level. In particular, California pioneered local option sales taxes for transportation, and its cities and counties increasingly rely on them. Despite concerns about their regressivity and the disconnect between who pays for versus who uses transportation systems, LOSTs and their largely fixed transportation project lists are likely to shape California's transportation systems for many years to come.

SHIFTING PATTERNS OF JOBS AND HOUSING, GOODS MOVEMENT, AND DISASTER RESILIENCE

As housing in California remains chronically undersupplied, the separation between jobs and housing has grown. As a result, average commute distances in California increased 1.7 miles—14 percent—between 2002 and 2015 alone, which contributes to worsening congestion, increasing vehicle emissions, and shifting transit riders into more auto-oriented, less transit-friendly areas.

The robust growth of goods movement, driven by population and economic growth,

international trade, and e-commerce, has led warehousing facilities to sprawl away from ports and airports to other parts of the state. The growing demand for rapid shipping has increased freight vehicle travel (and hence greenhouse gas emissions, other pollution, and noise) as shipments are becoming smaller and more frequent. Reducing these impacts might entail, for example, greening trucks, shifting more freight onto rail, and optimizing shipment routing.

With climate change intensifying wildfires and their human and monetary costs, the regulation of development both in wild-land-urban interfaces—and, perhaps just as importantly, in less fire-prone urban areas where people could live instead—will be of great importance.

MILLENNIALS, GEN Z, AND THE FUTURE OF TRAVEL

Meanwhile, younger Californians are traveling differently than older generations, though not as much as one might imagine. For instance, Millennials are more likely than older generations to live in denser neighborhoods and central cities, drive less (especially in those areas), own fewer cars, and use new, shared mobility services. However, research in the early 2010s suggested that these differences were due more to the economic effects of the Great Recession (that affected all travelers) than to generational differences per se. In addition, most Millennials still drive for most trips and live in suburban areas (and in fact may be more likely to drive alone to work, all else equal). And while Millennials are more likely than members of older generations to live in dense urban neighborhoods, most Millennials live in suburbs. Many older Millennials who live in urban areas surveyed at the end of the Great Recession reported planning to purchase a new vehicle in the near future. Thus, their low vehicle ownership rates and different travel patterns may be largely due to Millennials reaching traditional life milestones (like marriage and children) and greater financial stability later in life compared to earlier generations. Many observers hoped that Millennials' preferences would, on their own, turn the tide against suburban living and driving to most destinations, and some hold out hope that Gen Z following them may still do so. But research suggests that generational factors, on their own, appear unlikely to bring about substantive location and travel behavioral changes, absent sustained changes in transportation and land use policies.

REVOLUTIONS IN TECHNOLOGY

Four simultaneous technological revolutions may shape California travel in the years ahead. Consumer demand for electric vehicles, app-based ridesharing, self-driving vehicles, and increased acceptance of remote work may transform car ownership and commute behaviors.

First, if prices of elective vehicles begin to again decrease (following the pandemic-induced spike in car prices), if their driving ranges further increase, and if regulations of internal-combustion engine vehicles continue to tighten, consumer demand for electric vehicles is likely to accelerate throughout

the 2020s. While this will not transform how travelers make trips, electric vehicles integrate immediately into present travel mode preferences while lowering transportation emissions. They will also require a new or expanded infrastructure of charging stations and repair shops that have transitioned from knowledge of internal combustion engines to electric motors.

Second, app-based ridesharing, led by Lyft and Uber, allows travelers to purchase automobility one trip at a time. Despite its meteoric rise, the effect of ridesharing on private vehicle ownership and public transit travel, the longer-term viability of the business model, and how it may fit into the state's multimodal transportation system all remain uncertain.

Third, partially and fully self-driving vehicles have great *potential* to transform transportation in the future, but how far in the future remains a hotly debated question. The cost and environmental benefits of autonomous vehicles (AV) depend in large part on the degree to which AVs are shared, both serially and with pooled rides. In a scenario where there are fully autonomous vehicles (where no human intervention is required), more travelers may choose to subscribe to car services rather than own their own vehicles. Further, autonomous vehicles may reduce some car infrastructure, particularly parking, while increasing the demand for road space as circling vehicles may replace parked ones. However, advances in vehicle automation to date, while impressive in many ways, make clear that full vehicle automation remains many years off. Further, given the temporal peaking in the demand for travel (described earlier), subscription services would either need to charge very high prices for peak vehicle access, or maintain costly fleets of surplus vehicles operated for only a few hours each day. In either case, the cost of reliable automated vehicle access is likely to be high, making it uncertain whether fully automated vehicles will motivate lower levels of auto ownership than, say, Lyft or Uber do now.

Finally, technology is also permitting more employees to skip the daily commute altogether, particularly in the pandemic. Although it is still not clear how many people will work part of the time or fully remotely using new information technologies, it is clear that it is increasingly possible for people to work remotely and that this will have an impact on the need for transportation. It appears likely that we can expect substantially higher levels of at least part-time "telecommuting" in the future, potentially affecting on commuting patterns and vehicle ownership in much of the state.

THE WAXING CHALLENGES OF CLIMATE CHANGE AND RESILIENCY

Economic globalization and advancing supply chain management rely on globally integrated transportation systems to enable just-in-time production, reduce inventories, and serve just-in-time consumption. California is a global center of such an integrated global logistics system. But in squeezing as much productivity as possible out of systems of production and consumption, transportation

networks are stretched thin and becoming increasingly vulnerable to disruption. As a result, disaster recovery, safety and evacuation planning will be increasingly critical.

The COVID-19 pandemic has cast the consequences of transportation network disruptions in California for global supply chains and commerce in the sharpest possible relief. At points in the fall of 2021, dozens of cargo vessels queued up outside of the Ports of Long Beach and Los Angeles for weeks at a time, waiting to load and unload. The result was frequent spot shortages of goods, leading to price jumps and contributing to rising inflation. In addition, public health protocols at transportation hubs and warehouses meant to protect workers have also contributed to freight bottlenecks. And, if that were not enough, trucking capacity has also been strained due to increased demand for goods, food, and medical supplies on one hand, and labor shortages on the other.

Building more resilient transportation systems will require addressing an array of challenges: climate change contributing to chronic droughts, frequent wildfires, rising sea levels, and electrical grid breakdowns will likely affect transportation networks increasingly in the future. In addition, the ever-present threat of earthquakes is unpredictable and occasionally catastrophic. Rather than simply focusing on the speed and price of travel, resilient transportation systems of the future will have to respond and adapt to shocks and disruptions of all sorts.

With respect to the transportation sector's contribution to climate change, it was responsible for almost 40 percent of California's total greenhouse gas emissions in 2019, and passenger vehicles accounted for about three quarters of that. Lowering greenhouse gas emissions in the transportation sector depends both on greening (and, in particular, electrifying) the personal and commercial vehicle fleet, as well as by increasing travel by means other than driving, including public transit, as well as active transportation modes like walking and bicycling.

As we have noted throughout, transportation systems do not meaningfully exist apart from the land uses they connect, and sprawling, low-density urban forms that increasingly reach into fire and flood risk zones around the state typically require driving—and lots of it—to function. Accordingly, reducing our almost exclusive dependence on private vehicle travel for access is an important climate change mitigation challenge—not only for emissions reductions in the near term but also the long term, because manufacturing zero-emission vehicles can still generate substantial amounts of greenhouse gas emissions. Moreover, reducing driving dependence has additional benefits such as improved health and safety, as well as less burden on transportation infrastructures.

CONSIDERATIONS FOR THE FUTURE

Transportation policymakers in California, by fits and starts, have struggled with how best to cope with all of the state's driving. On one hand, those with access to cars enjoy high levels of both mobility and access to opportunities. But on the other, as the state has grown larger and denser, traffic congestion has become chronic, and those without cars are increasingly left behind.

Debates over how to address the state's long-standing focus on serving automobile travel continue to rage. Should California invest in new public transit systems to lure drivers out of their cars and onto gleaming, new rail lines and low-/no-emission buses? Or should it mandate plenty of free parking at every new development to make it easy for drivers to reach their destinations without traffic-snarling searches for parking? Should we increasingly rely on the emerging mobility service providers to ease parking hassles and improve access to public transit? Or should we discourage these disruptive new services in favor of more traditional means of travel? The answers to the questions may seem obvious when considered in isolation, but when taken together they can collectively result in outcomes that undercut one another.

The car-friendly answers to these questions aim to give Californians access primarily by improving auto-mobility, while the travel-alternatives-friendly policies aim to provide access by de-emphasizing auto-mobility. Note that these policies are not limited to transportation but entail land use and development policies as well. Transportation policies that favor driving encourage land developments designed to accommodate cars. Conversely, land uses that put destinations close together encourage travel by means other than cars.

Sorting out which of these policies to pursue in which urban, suburban, and rural contexts will go a long way toward determining the transportation future of California.

Once a traveler buys, insures, and fuels a car, we do little to manage the crush of cars on our roads or in our government-mandated parking lots. Road pricing—where drivers pay more to travel during peak traffic hours and directions, to drive more polluting vehicles, or to drive heavy vehicles (like trucks) that do disproportionate damage to roads—have been touted by transportation analysts for years as the best long-term solution to transportation problems. Road pricing sends a clear price signal to motorists both to be judicious in their consumption of scarce road space and to shift their travel to other times, routes, modes (such as public transit), or destinations for lower-priority trips—and to cleaner and lighter vehicles as well. Meanwhile, even in the lowest-density California suburbs, eliminating government-mandated parking requirements would make it easier for builders to increase housing and commercial densities and shift California's many suburbs toward becoming more diverse, affordable, and multimodal places.

Sprawling, low-density urban forms that increasingly reach into fire and flood risk zones around the state typically require driving—and lots of it—to function. Next generation, demand-responsive public transit vanpool services, as well as ridesharing services, hold promise to increase access for those without cars in California's many low-density suburbs. Over the longer term, more compact, mixed-use urban development can increase opportunities to walk, bike, or scooter to nearby destinations instead of driving, and they are

congruent with and help facilitate bus and rail travel as well.

In tandem, the concept of "complete streets" is becoming more widespread in California's cities, which entails configuring streets for all users, and not just drivers. Complete streets improvements can include wider sidewalks; easier-to-use and safer crosswalks; "traffic calming" measures to reduce motor vehicle speeds; new lanes for bikes and scooters; devoting more curb space for transit stops, small package deliveries, and ridehail pick-ups and drop-offs; and repurposing street parking for outdoor dining, which has expanded greatly as a result of the COVID-19 pandemic.

Reducing driving dependence while maintaining high levels of access to destinations poses an enormous challenge to California's planners and policymakers. Done well, it can confer benefits on both individual travelers and the state as a whole, including those without automobile access who are increasingly left behind.

Shifting from our historic patterns of low-density development and single-family housing to increased development densities and much more multi-unit (and affordable) housing and shifting from encouraging driving and parking to managing both are nearly always met with fierce opposition from homeowners and drivers reluctant to share their neighborhoods with more residents and their streets with other modes. But the costs—economic, social justice, and environmental—of remaining on our current land use and transportation paths will only continue to grow with time.

THE FUTURE OF TRANSPORTATION AND LAND DEVELOPMENT IN CALIFORNIA

FOUR ALTERNATIVE SCENARIOS

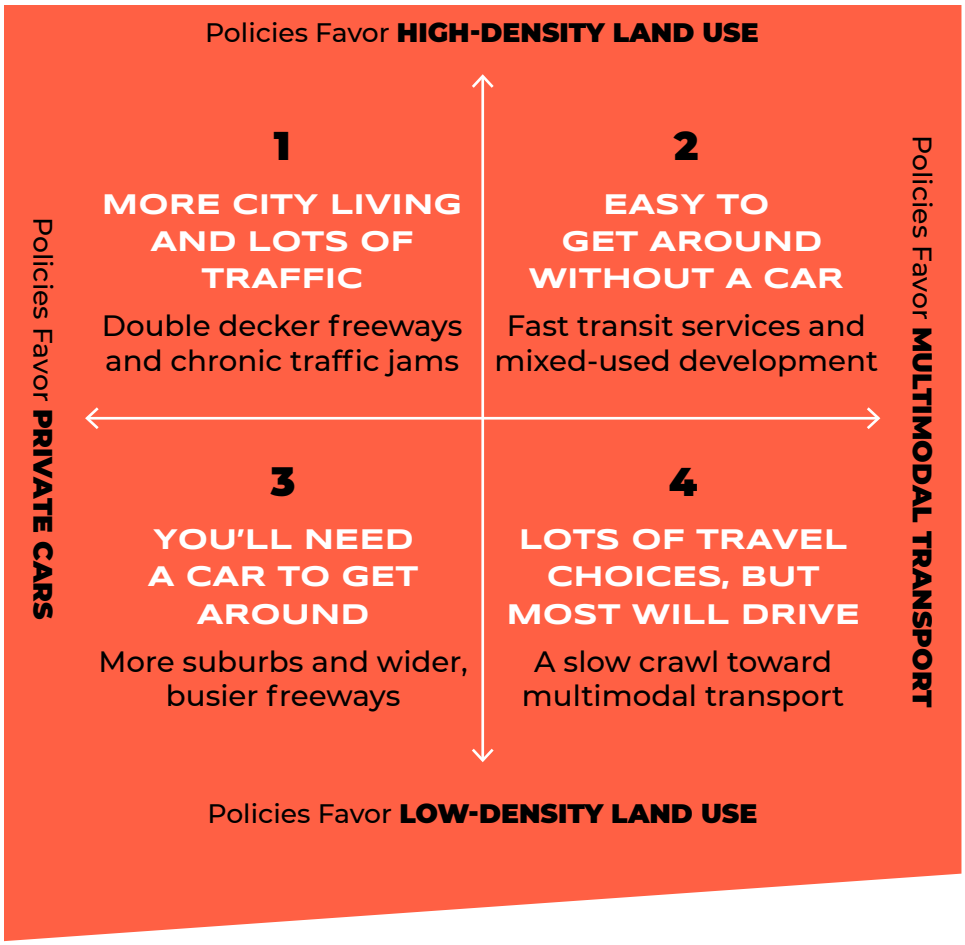
SCENARIOS FROM THE FUTURE

TRANSPORTATION AND LAND DEVELOPMENT

Foresight practitioners use scenarios to help make future possibilities more vivid and tangible, immersing the reader in the particular details of a future world so that they can imagine what it might be like to live there. Without scenarios, the signals, trends, and other research that underlie strategic foresight can feel distant and abstract. Scenarios can also be used to center a group conversation in a positive, concrete picture of a future state so that stakeholders can pursue a shared vision for how to work toward that future, or mobilize to avoid it.

Two important, related transportation concepts shaped the scenarios that we explored: access and mobility, as discussed in the introduction to this report. In these scenarios we explore how access and mobility may be affected by the intersecting consequences of land use policies and transportation policies in California.

To help us explore the dimensions of uncertainty and possibility across our scenarios, we assembled a panel of 18 experts with professional experience covering a wide range of disciplines, and who touch on transportation and land use in diverse ways. Panelists participated in two panel discussions and three surveys, which informed the scenario descriptions and policy implications below.



YOU'LL NEED A CAR TO GET AROUND

More suburbs and wider, busier freeways (More Mobility, Less Accessibility)

This is the historic norm in California that still describes most suburban areas. Building densities are low, land uses are separated, streets are wide, parking is abundant, and almost every trip is made by motor vehicle for those with cars. Single-family neighborhoods, for those who can afford them, are pleasant, but travel distances are long and many arterials and most freeways are chronically congested. Most new transportation investments support increasingly electric and autonomous vehicles, ever-widened freeways frequently re-congest, and new housing continues to be built primarily on the fringes of metropolitan areas.

HISTORICAL PRECEDENTS

1920s-1970s: Zoning laws enshrine single-use land uses, facilitating sprawl.

1940s-1970s: Federal and state highway funding incentivizes freeway construction through cities; many neighborhoods (and disproportionately disadvantaged communities) were permanently damaged by them.

2000-present: Household car ownership in California has steadily increased; the state added almost one new vehicle for every new resident.

FUTURE DRIVERS

NIMBYism: Many residents of resource-rich areas oppose zoning reforms to allow new housing in their neighborhoods ("not in my backyard"), which pushes new housing away from where it is most demanded out to the suburban fringes.

Environmental laws: The California Environmental Quality Act (CEQA) is frequently invoked to stall housing and transportation projects.

Zoning policies: Cities continue to enable/encourage car trips by separating land uses and mandating that developments provide off-street parking, driving up housing costs and commercial rents, increasing car dependency, and worsening congestion.

SIGNALS

Legislation fails to increase housing density near public transit

WHAT: Multiple statewide proposals to override local zoning to enable denser development near transit have ultimately failed to pass.

SO WHAT: These proposals' failures highlight the tension between the state's climate and housing affordability goals versus forces to maintain land development patterns, and prevent housing growth to match population growth.

nytimes.com

California's population declines for the first time

WHAT: In 2020, the state's population fell for the first time, due to decreased international immigration and out-migration to other states. Surveys suggest that high housing prices motivate a substantial share of those moving to other states.

SO WHAT: Out-migration may ease traffic and demand for (newer, denser) housing, though in a manner that hurts the state economically and burdens lower-income households.

calmatters.org; economist.com; sfist.com

More people own more cars

WHAT: The rate of car ownership has increased steadily in recent years, as has the number of cars per household.

SO WHAT: A continued shift to cars spells trouble ahead for transit ridership and keeping a lid on greenhouse gas emissions from transportation.

escholarship.org; sciencedirect.com; escholarship.org; transportgeography.org

LOTS OF TRAVEL CHOICES, BUT MOST WILL DRIVE

A slow crawl toward multimodal transport (More Mobility, Variable Accessibility)

This is the new normal in much of metropolitan California, where transportation investments go increasingly toward walking, biking, scootering, and public transit infrastructure, though most trips are still made by car. Looking ahead, multimodal options continue to expand, while policies to rein in unfettered driving—such as improved and expanded public transit service and pricing driving to reduce congestion and emissions and encourage multimodal travel—are gradually phased in. However, outside of already built-up central cities, most development remains dispersed and housing undersupplied, poorly served by modes other than driving.

HISTORICAL PRECEDENTS

1930s-1970s: Federal housing policy demarcates areas of lesser insurability based on racist ideas (redlining) and encourages "white flight" by diverting housing subsidies into suburbs.

1960s-present: Federal funding allows regions to build transit systems, but funding for operating them is less forthcoming.

1980s-present: State, regional, and local governments have increased funding for public transit and active travel, like biking and walking.

FUTURE DRIVERS

Greater public investment: Transportation investments increasingly go to support walking, biking, and transit.

Improved pricing technologies: New technologies make it possible to more easily add tolls on roadways and in cordon areas to manage congestion and raise revenue for non-car transportation modes.

Continued land use separation: Cities continue to enable/encourage car trips by separating land uses, making distances between destinations greater, despite investments in transit and other modes.

SIGNALS

Home sales strong despite limited supply, high prices

WHAT: Although high and rising costs are usually cited as evidence of the need for more housing, the continued strong sales of homes may, for better or worse, reduce pressure on policymakers to push for more housing.

SO WHAT: California's decades-long undersupply of housing could continue, slowing the transformation to newer, denser development.

car.org

President signs Infrastructure Investment & Jobs Act

WHAT: The $1.2 trillion Infrastructure Investment and Jobs Act includes $39 billion to modernize public transit and billions more to reconnect communities bisected by freeways. California is expected to receive $45.5 billion in funds related to this bill.

SO WHAT: The bill signals strong federal alignment with California's climate and transit goals.

calmatters.org

LA doubles down on rail transit

WHAT: Following successive transportation-specific sales tax hikes that leveraged even more state and federal dollars, five major rail projects are currently under construction in Los Angeles and three more are slated to start construction within this half of the decade.

SO WHAT: Rail transit options will be available to more people in the state's largest metropolitan area, though likely with few changes in land use patterns around stations.

labusinessjournal.com

MORE CITY LIVING AND LOTS OF TRAFFIC

Double decker freeways and chronic traffic jams (Variable Mobility, Less Accessibility)

Under this scenario, policymakers prioritize urban infill development and limit suburban expansion into fire-prone and agricultural areas. Development densities increase in central cities and inner-ring suburbs, raising the supply of housing and affordable housing. But rather than investing in multimodal travel, public officials accede to popular calls to widen boulevards and freeways (even double-decking the most heavily trafficked ones) and build parking decks to store the mass of cars in central areas. Walking increases, but chronic traffic slows cars and buses to a crawl, increases emissions, and prompts calls for expanded road and parking capacity.

HISTORICAL PRECEDENTS

Mid-1800s: During the Gold Rush, the state's population grows and urbanizes rapidly, particularly in places with ports, mines, and farms nearby.

Late 1940s-late 1950s: California pioneers the mass production of freeways, which evolve into large, multi-laned, federally-subsidized facilities built both between and within cities.

Late 1950s-1980s: "Freeway revolts" over the projects' displacement and environmental impacts, increasing costs, and lagging revenues curtail California's ambitions for a dense freeway network.

FUTURE DRIVERS

Transit-oriented development (TOD): The relatively new form of development concentrated around major transit stations and stops will continue to appear in cities and will increase urban density somewhat, though with risks of displacement as well.

Demographics: New urban housing will continue to be more expensive than older stock and will draw wealthier residents who are more likely to own cars and less likely to ride transit.

Car ownership: Car ownership will continue to remain high, as even TODs provide easy, cheap parking and as roads are widened and free.

SIGNALS

California (gently) ends single-family zoning

WHAT: Senate Bill 9 accelerates the approval of duplexes and accessory dwelling units on lots formerly zoned for single-family homes only.

SO WHAT: SB 9 and similar local actions could lead to denser neighborhoods without greatly altering California's car-centered landscape.

latimes.com; yieldpro.com

Affordable housing streamlining allowed and upheld over local objections

WHAT: Senate Bill 35 (2017) requires localities that have failed to meet housing targets to streamline approval of multifamily residential developments with subsidized affordable housing.

SO WHAT: More affordable, multifamily residential developments.

californialandusedevelopmentlaw.com

State and regional bodies hold cities to housing goals

WHAT: State and regional bodies are moving toward stronger accountability during the latest cycle of the Regional Housing Needs Assessment.

SO WHAT: New housing and denser neighborhoods in California cities and suburbs.

scag.ca.gov; natlawreview.com; mercurynews.com

EASY TO GET AROUND WITHOUT A CAR

Fast transit services and mixed-used development (Less Mobility, More Accessibility)

This scenario entails the biggest break from current patterns, wherein the multimodal-focused transportation policies in the "Lots of Travel Choices, but Most Will Drive" scenario are combined with the higher-density land use policies of the "More City Living and Lots of Traffic" scenario. Road and parking access are managed to substantially reduce congestion (making driving both better and rarer) and emissions. Fast, frequent transit service reduces waits and makes riding more attractive. Denser, mixed-use development puts more destinations in walking distance and more affordable housing where it is most demanded.

HISTORICAL PRECEDENTS

1980s-present: Voters in many California regions elect to fund major transit projects and improvements through higher local sales taxes; in some areas, multiple sales taxes pass.

1990s-present: Transit-oriented development attempts to fuse higher-density development around major transit stops and stations.

2000s-present: State policies such as cap and trade (AB 32, 2006) and fuel tax increases (SB 1, 2017) substantially increased funding for transit and active transportation projects.

FUTURE DRIVERS

Funding for transit: Ongoing, stable funding will aid and grow transit and active transportation projects.

Transit-supportive policies: Incentivizing denser development near transit, abolishing minimum parking requirements, and giving transit priority on streets will maximize the return from investments.

Housing-supportive policies: Enabling more multi-family and mixed-used development will allow for more housing in resource-rich areas where transportation infrastructure already exists.

SIGNALS

Cities given easier path to densify around transit

WHAT: Passed in 2021, Senate Bill 10 makes it easier for cities to upzone substantially on parcels that are transit-adjacent or part of urban infill development. Whether cities actually pursue this option remains to be seen, though Todd Gloria, San Diego's mayor, who has led recent major land use reform, has stated his intention to use SB 10 in future development projects.

SO WHAT: In cities that choose to use SB 10—or do so in order to meet regional housing targets—more people can live closer to transit.

latimes.com; 10news.com

Environmental review standards changed, improving how projects account for vehicle travel and parking

WHAT: Following a change in state law (Senate Bill 743 in 2013), localities are now revamping the way the traffic impacts of new development are assessed under environmental review. Instead of a focus on traffic level of service (LOS), which measures the ease of local vehicular traffic flow at nearby road segments and intersections, projects are now to be assessed on how they affect overall vehicle miles of travel. Likewise, an August 2021 court decision clarified that the loss of parking is not in itself an environmental impact, which "paves the way" for repurposing parking lots for housing and other uses.

SO WHAT: State law is taking steps away from auto-oriented policies and toward infill development.

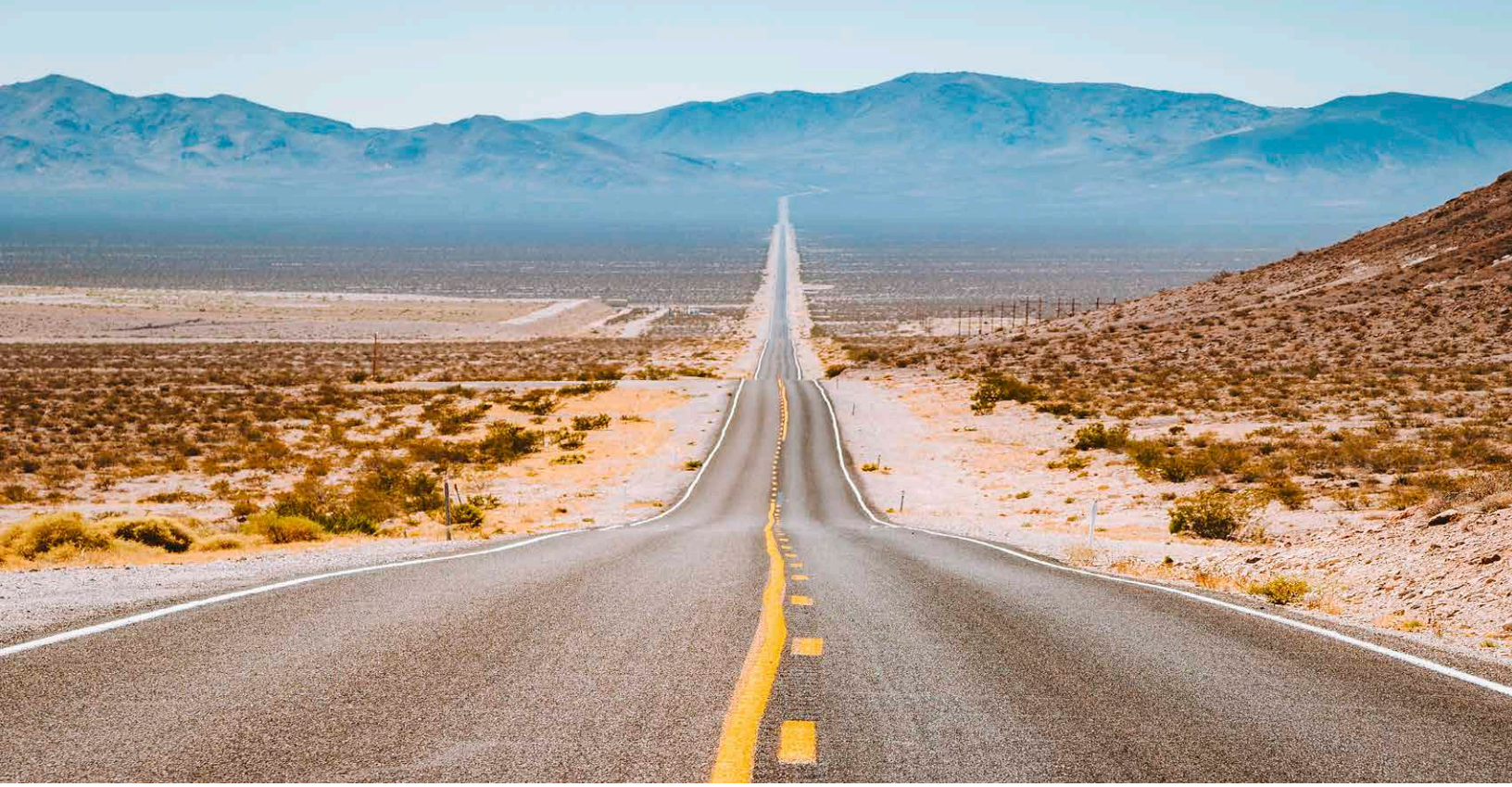
Research in Transportation Business and Management; Journal of Planning Literature

FUTURE TRANSPORTATION POLICIES IN CALIFORNIA

Choices among governmental policies depend partly upon which future scenarios seem most attractive to us, but they also depend upon our perspectives on the proper role of government, on the resources available to government, and on the likelihood that government will succeed in its endeavors. Doing nothing is sometimes the best policy option, but doing nothing often uncritically accepts the current mix of policies and the future they entail without considering the alternatives. Over the past seventy-five years in California, that meant accepting discriminatory racial housing covenants, restrictive zoning laws, few restrictions on air or water pollution, "separate but equal" schooling, the dismantling of transit systems, and many more things that are now thought to have been wrong or misguided. We have also seen aggressive policy measures in California that have had unintended consequences, from the impacts of Proposition 13 on local government budgets to the way the California Environmental Quality Act has affected housing supply and manufacturing.

Because we are thinking about the future and we do not want to be hemmed in by the status quo or a lack of imagination, we put forth an array of alternative policies, and we tie them to different scenarios. Readers can decide which ones (or combinations of them) they prefer, but, as a team and in interviews with stakeholders across the state, most prefer the "Easy to Get Around Without a Car" future. Our policy suggestions favor this scenario, and look critically at approaches that do not include both more multimodal transportation options and accessibility. Readers should consider which scenario best captures the California they want to live in, and evaluate which policy recommendations they believe will get us there.

America's transportation and urban development policies have historically supported the car-centered, low-density scenario "You'll Need a Car to Get Around," and this was especially true over the past three-quarters of a century when California quadrupled its population from about 10 million to 40 million people. California became the poster child for dispersed single-family homes, multi-lane freeways ("L.A. is a great big freeway," says the song), air pollution, and congested highways. Now for California to attain its pressing economic, social, and climate goals and to better serve all of its future residents, the state needs to pursue policies that support a scenario with more multimodal transportation in higher-density land use contexts.



The discussions of the other three scenarios demonstrate that California cannot thrive with its traditional car-centered, low-density approach. The increasingly common multimodal, low-density approach of "Lots of Travel Choices, but Most Will Drive" gives people more ways of getting around, but most will still drive, because unchanged, low-density land use means cars are still the fastest, and most convenient way to commute and travel. The alternative car-centered, higher-density approach of "More City Living and Lots of Traffic" would require more and more freeways and parking and with them more and more traffic and air pollution. Although the multimodal, higher-density (MMHD) scenario, "Easy to Get Around without a Car," entails the biggest break from current patterns, it holds the greatest promise to manage congestion, reduce air pollution and greenhouse gasses, and put more affordable housing where it is most demanded.

THE POLICY RECOMMENDATIONS TOWARD THIS END ARE DRAWN FROM A SCENARIO EXERCISE WITH OUR EXPERT PANELISTS AND FALL INTO FOUR CATEGORIES:

1. **Preparing for external changes that would influence all plausible scenarios,**
2. **Instituting changes prerequisite for the multimodal, higher density scenario,**
3. **Implementing policies that steer the state's transportation and land use toward the best outcomes for the multimodal, higher density scenario, and**
4. **Avoiding the unintended and undesirable consequences of pursuing that scenario.**

These recommendations are designed to increase trust in the state government and in a shared vision for California. This trust is essential if projects with shared costs and collective but dispersed benefits (such as the transportation and land use projects described in the MMHD scenario) are to succeed.

PREPARING FOR EXTERNAL CHANGES AND INSTITUTING PREREQUISITE CHANGES

Preparing for External Changes: Improve resilience for multimodal, higher-density settings

California will continue to experience shocks related to climate change, as well as other economic, political, and biological shocks. To complement existing federal resources (such as those from Federal Emergency Management Agency), the state should consider its own "Resilient Communities" grant program to help California's cities and towns develop bottom-up disaster mitigation plans specifically for the multimodal, higher-density scenario. Denser development and a less-car oriented transportation system demand different strategies for evacuation, for example, than other scenarios around which most conventional disaster management plans are currently oriented.

Instituting Prerequisite Changes: State agencies and local governments must work to build trust

Improving the quality of engagement with communities on transportation and land use issues, especially disadvantaged communities, is an urgent and necessary first step. Research shows that government agencies can increase trust by committing to actions including (among others): demonstrating fairness (humanity), sharing clearly decisions and the motives and data behind them (transparency), creating well-designed programs (capability), and delivering on them consistently and dependably (reliability).

Critically, this priority of building trust must be reflected in the state's budget. The state legislature should create and, critically, fund a "Your California" program specifically for training staff at all levels of government to conduct more engaged,

respectful, meaningful, and ongoing engagement with stakeholders and communities, with an emphasis on including traditionally excluded voices, interests, and communities, to infuse the work that they do with a focus on building trust. The program should also provide flexible and easy-to-receive grant funding for public entities throughout the state to improve the transparency of their budgets (through, for example, better websites, reports, media engagement) and community engagement with their planning (through, for example, outreach at community events, engagement with communities, etc.).

Instituting Prerequisite Changes: Facilitate collaborative planning processes

To facilitate a shared vision for California, the state legislature should address laws that make planning processes unnecessarily adversarial. For example, the California Environmental Quality Act (CEQA) compels government agencies to address most public concerns through formal comments only; the legal risk is such that agencies tend to minimize engagement in public meetings (e.g., responding to comments only months later and in legal reports) and actively avoid the responsive and collaborative dialogue with stakeholders that is necessary for effective visioning and trust building. The state legislature should therefore consider amendments to CEQA that give public agencies that meet certain standards for public engagement an opportunity to make records of good-faith collaborative engagement efforts in certain project-related public meetings either inadmissible in a CEQA lawsuit without substantial evidence of agencies' bad faith from the plaintiff or simply inadmissible.

Instituting Prerequisite Changes: Repair injustices of past governmental action, particularly in transportation and land use

Many communities in California remain scarred by urban renewal and freeway projects of the past century. These efforts, often conducted in concert, did lasting damage to many Black, Latino/a, and poor communities and much to erode trust

in government. Accordingly, the state should develop and fund a specific, targeted program to rebuild these harmed communities through public investment and transportation projects aimed at improving access and mobility, as shaped by engagement with members of and organizations in those communities. Though the panel was divided on the equity implications of roadway congestion pricing, any means of collecting revenues for transportation—sales taxes, fuel taxes, road user charges, or congestion charges—should be designed specifically to address questions of equity in both the collection and distribution of funds, which is generally not done with our current system of transportation finance.

IMPLEMENTING POLICIES THAT FACILITATE A MULTIMODAL, HIGHER-DENSITY SCENARIO AND AVOIDING ITS PITFALLS

Policies that Facilitate MMHD: Increase funding for public transit operations and integration

Public subsidies of transit tend to favor capital expenditures (for new vehicles, stations, etc.) over service delivery. For decades, spurred by federal funding incentives, many counties and localities have advanced initiatives to build new rail transit lines, but funding to operate and maintain these rail lines is harder to come by. Meanwhile, bus service (which constitutes most transit service on most California systems) is often mired in traffic and overlooked. To address this, the state should begin to prioritize funding specifically for transit service improvements, including bus-only lanes, increased service frequencies, better real-time communications with passengers, and more demand-responsive transit services in outlying suburban areas to give more Californians better options for travel without a car and to facilitate less car-dependent land development that will help the state meet its climate goals.

The state should also develop an equitable mobility-as-a-service platform that fully integrates trip information, payment, multimodal, multi-provider mobility

services, and the physical transportation network. Single-provider or non-integrated systems risk creating separate and unequal mobility networks that limit the effectiveness of such solutions to be an accessible alternative to car ownership.

Policies that Facilitate MMHD: Prohibit minimum parking requirements that require the provision of parking in developments

Planning research has shown definitively that cities' ubiquitous minimum parking requirements lead to a glut of parking and have the pernicious consequences of encouraging and subsidizing driving, increasing pollution, fostering poor urban design, and burying the costs of driving and parking in rents, goods, and services. This zoning-mandated oversupply results in more parking than most developers would otherwise build. The state legislature should prohibit minimum parking requirements, which are mostly required by local governments, across the state to stop governments from requiring that land owners and renters to pay for parking in order to underwrite the cost of driving. Doing so would allow more land currently devoted to parking to be used for more productive purposes such as housing, commerce, or recreation and would significantly improve ease of access to goods, services, and other activities by means other than driving (as less parking availability results in less separation of land uses). Eliminating minimum parking requirements is foundational to facilitating the multimodality and higher density of Scenario 4.

Policies that Facilitate MMHD: Fundamentally restructure land use regulation in California

The state's transportation problems are inextricably linked to its housing crisis. By abolishing zoning that limits development to a single residential unit per lot and taking other steps to enable and encourage multi-family and mixed-use developments, the state could make it easier and cheaper for developers to build more housing in more areas, closer to jobs and other destinations. Since single-use zoning (and environmental review laws) are often used as a cudgel to inhibit even modest infill development or incremental increases in density, their abolition would

significantly improve housing opportunities and start to address inequities inherent in a system that, through Proposition 13 and other state and federal tax laws, strongly favors wealth-building from homeownership, which is financially out of reach for increasing numbers of residents in California's areas of economic opportunity.

Avoiding Failures and Fallbacks: Meet affordable housing needs

Our panelists indicated clearly that the overrepresentation of wealthier Californians' interests in transportation and land use decision-making is a major impediment to the successful implementation of the MMHD scenario. Accordingly, California legislature should enshrine housing as a basic human right and curtail as necessary the land use authority of all cities (and not just those on metropolitan fringes with large swathes of undeveloped land), in order to increase the supply of housing broadly, and shelter, transitional, and permanent supportive housing in particular. Increased market-rate, affordable, and publicly-developed housing must be planned for, funded, and built and current renters and low-income residents better protected in order for the MMHD scenario to attain its stated goals. Without sufficient affordable housing, particularly in already built-up areas with multimodal transportation options, the scenario becomes potentially more inequitable, as people displaced and/or unable to afford housing must commute farther and incur larger transportation costs and as vehicle miles traveled on state roads rise.

Avoiding Failure and Fallbacks: Elevate safety as a state goal for land use

Some of the concerns our panelists raised about Scenario 4 involved an increased risk to personal safety. Some panelists perceived that the MMHD scenario's multimodal transportation and higher development densities could correlate with increased exposure of residents to crime, trafficking ("hidden in plain sight"), violence, police brutality, and car/pedestrian and car/bike collisions. While improv-

ing transportation safety is one of the state's goals, we found no state goal that seeks to improve safety through land use. This is a serious omission, since research is rife with evidence that built form can have profound effects on crime reduction and safety, showing, for example, that (past a certain point) higher levels of commercial and residential and population density are associated with reductions in violent crimes. We recommend that state legislators cite "land use safety"—i.e., zoning land use for safety—as a goal in future legislation and include safety zoning in programming and funding eligibility criteria, to make future higher-density areas safer by design.