ACTION: *Realign incentive structures related to workforce development funding.*

Creating new incentives for all stakeholders involved in the workforce development system will go far in addressing workforce needs. There is ample opportunity for aligning incentives across educational institutions, students/workers, and employers.

California funds many workforce and community college programs on a per student basis, meaning these programs have little incentive to align their offerings with the needs of employers. For example, courses in computer-aided design (CAD) may do a better job of fulfilling unmet industry demands when compared to other courses that may have existed for a long time, but community colleges have no incentive to expand their CAD course offerings. Other states provide differential levels of funding depending on the cost of the program and the degree to which it meets industry demand.[43] By realigning the state funding structure, incentives can be created for college and vocational programs to adjust curricula more quickly to match the skills needed by employers.

Even with this incentive on the supply side, students may need a push to actually enroll in these career pathway programs. More state funding dollars can be set aside for tuition and fee reimbursements to students who successfully complete programs in areas of critical skills needs.

Tax incentives for employers that participate in apprenticeship programs—especially in manufacturing—can be useful in bridging the skill and generational gaps going forward. Funding options should also be considered to better integrate industry professionals who possess significant experience into career technical education instructional programs.

ACTION: *Allow community colleges to offer multiple four-year degree programs.*

In early 2015, California community college officials gave approval for 15 community colleges to offer four-year degree programs—joining more than 20 other states in expanding the degree-granting ability of community colleges. It is estimated that these new programs could provide thousands of workers in technical fields at roughly half the cost of attending a California State University campus,[44] creating new opportunities for more students to enter the workforce with a four-year degree. However, each district is limited to just a single four-year degree program, significantly diluting the potential impact of broadening community college offerings. Where appropriate and with proper evaluation, community colleges should be allowed to offer multiple four-year degree programs in order to best match the advancing workforce needs of local industries.

5 Drive Greater Efficiency in the Bay Area's Transportation System

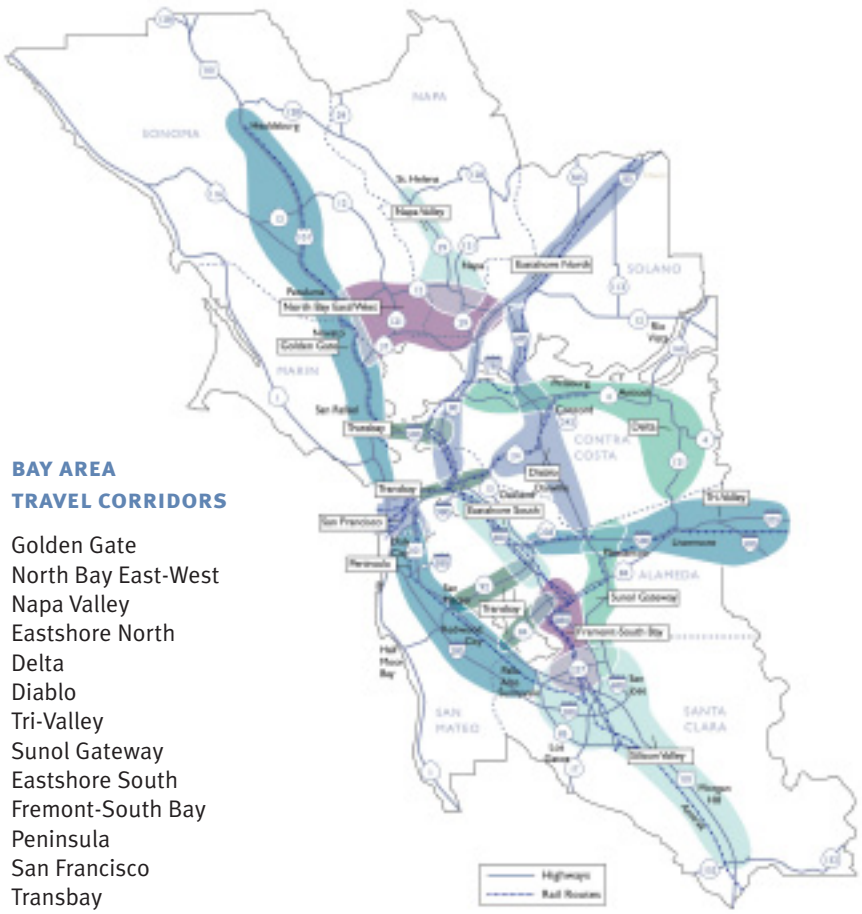
Context and Goals

The transportation system serves multiple economically significant functions—it moves people to their places of work every day and is the network by which goods are moved through supply chains to their end users. If the system serves these functions well, it will enhance economic activity and facilitate a robust economy. When regional transportation systems struggle to seamlessly move goods and people, economic activity is hindered and productivity is lost.

The Bay Area's current transportation system is increasingly plagued by congestion and delays, creating lost time for Bay Area workers and lost dollars for the region's businesses. While congestion is closely linked to strong economic activity—which the Bay Area has exhibited since the Great Recession—the region's transportation systems are overcrowded and becoming a limiting factor for the Bay Area's future economic prosperity. Vehicles in key highway corridors leading to job centers in San Francisco and Silicon Valley are at a near standstill during rush hour. Trucks carrying goods from the Central Valley dot the region's gateway corridors, but are often traveling in heavy traffic. And the region's two major commuter railways—BART and Caltrain—are carrying "crush loads" and confronting maintenance issues at a growing rate. While gridlock continues to worsen, Bay Area transportation operations and improvement remain driven more by adherence to past practice, outdated agency boundaries, and institutional convenience than by a customer-focused imperative with urgency to improve mobility.

Ambitious action and investment in the Bay Area's transportation system is required to position the region for success going forward. Long-term, large-scale transportation solutions—funding mechanisms and specific projects—are highlighted in the section titled Securing the Future through Critical Regional Infrastructure Investment. These ambitious strategies would have significant positive impacts on the Bay Area's global competitiveness and prosperity, but they require long timelines.

In the short and medium term, there is much that can be done to mitigate the growing pressures on the region's transportation system and vastly improve efficiencies. The policy recommendations outlined here focus on near-term opportunities for regional planners to exercise greater leadership in bringing increased efficiency to the transportation network. These recommendations target three key overarching goals. Each goal includes a metric for tracking success. The strategies and actions detailed below are interrelated and will impact more than one defined goal.



BAY AREA TRAVEL CORRIDORS

Golden Gate
North Bay East-West
Napa Valley
Eastshore North
Delta
Diablo
Tri-Valley
Sunol Gateway
Eastshore South
Fremont-South Bay
Peninsula
San Francisco
Transbay

Source: Metropolitan Transportation Commission

As an innovation hub, the Bay Area has an opportunity to leverage cutting-edge technology to improve the performance of our existing infrastructure – such as creating new ways to leverage regional transit systems, carpools and metering.

– Paula Downey

President & CEO, CSAA Insurance Group

GOAL 1: *The Bay Area's transportation system should provide effective regional transportation that enlarges the labor market available to employers and the range of employment opportunities available to workers.*

METRIC 1: *Increase access to jobs within a 45-minute commute.*

One critical function of transportation is to enable efficient labor markets by connecting employees to jobs. A more efficient transportation system allows a worker to commute a greater distance in a given period of time, gaining access to a larger universe of potential jobs. Similarly, a more efficient transportation system effectively increases the available labor market present to an employer, providing greater ability to recruit workers with necessary and valuable skills.

GOAL 2: *The regional transportation system should provide reliable travel times that enhance productivity.*

METRIC 2: *Improve travel time reliability on highways and regional transit by reducing the peak period regional buffer time index by 20%.*[45]

The travel time reliability of the transportation system affects business productivity. When travel times are unreliable, workers will occasionally be late for work, miss meetings, and add unproductive buffers to their travel times. In turn, employers will be deprived of person-to-person collaboration time, and meetings will be rescheduled or duplicated due to absences. Conversely, when travel times are reliable, employees and employers can make more productive use of their time.

GOAL 3: *The regional transportation system should provide reliable inter- and intra-regional goods movement.*

METRIC 3: *Reduce travel time spent in congestion by 20% to increase travel time reliability in key goods movement corridors.*

Movement of goods is a critical, often underappreciated, component of the transportation system that is a real economic driver. The MTC Regional Goods Movement Study Update 2009 reports that 40% of the Bay Area economy is in sectors and activities that are reliant upon goods movement.[46] Over 80% of goods are moved by truck on highways and roads, primarily on the same highways that are heavily congested with commute traffic.[47] Slow and unreliable travel times impose direct costs on movers of goods and their customers. Ultimately, higher goods movement costs and less reliable goods movement travel times have two harmful effects. For sectors such as local-serving retail that are tied to place, the result is higher costs to consumers and lost sales (as was the case with the port slowdown in 2015). For sectors such as manufacturing and distribution that are not necessarily tied to place, inefficient goods movement depresses the attractiveness of the Bay Area as a place to invest and do business.

STRATEGIES AND ACTIONS

STRATEGY #1: *Corridor and System Investment*

As the Bay Area population continues to grow, and travel times and distances grow with it, continued investment is needed to expand transportation capacity and improve operational performance. Efficient regional transportation corridors are of particular economic importance, because labor markets and economic activity occur at the regional level, irrespective of local jurisdictional boundaries. Forty-seven percent of commutes in the region cross at least one county line, and this share has increased over time.[48] This dynamic makes the current transportation governance structure—organized by county lines—incongruous with meeting the demands of a regional system.

The Metropolitan Transportation Commission has identified 14 key travel corridors within the Bay Area. Ten of these corridors cross at least one county line, while just four—San Francisco, Highway 4 (Delta), Eastshore South, and Highway 29 (Napa Valley)—are contained within a single county. One of these corridors, the Tri-Valley I-580 corridor, explicitly extends all the way to Tracy, outside of the official nine-county Bay Area region, in recognition of the reality that many Bay Area workers live in San Joaquin and Stanislaus counties due to their more affordable housing. This dynamic also exists in two other corridors, with large numbers of workers commuting into the Bay Area from the Sacramento region on the Eastshore North corridor and from San Benito and Santa Cruz counties on the Silicon Valley corridor.

These corridors also represent the foundation of the intra-regional goods movement trucking system. Additionally, inter-regional goods movement that facilitates trade with other domestic regions and foreign nations is principally served by two major corridors: Interstate 80 through Alameda, Contra Costa, and Solano counties, and Interstate 880/580 from Alameda County into San Joaquin County.

Improving transportation performance on these commute and goods movement corridors requires that an entire corridor be treated as a system, with a consistent operational vision and a set of mutually consistent and reinforcing investments. Planning and project funding, however, primarily occurs at the county level, overlaid by the planning and funding decisions of individual regional transit agencies. This structure may have been sufficient in an earlier time when labor and economic markets operated at a smaller scale, largely confined within a given county, and when the regional highway and transit system had excess capacity. For decades now, this has not been the case. Transportation planning and funding responsibility and authority can be reformed, through the actions below, to align with the needs of transportation system users.

ACTION 1.1: *Program funds to implement corridor operation and investment plans.*

The Regional Transportation Plan (RTP)—which identifies and funds projects of regional importance—should have a strategic priority to direct investment toward implementing corridor improvement strategic plans that provide a consistent approach and mutually reinforcing strategies along the full length of a corridor and across all of its jurisdictions. For each identified travel corridor, constituent counties and MTC should develop a Corridor Operation and Investment Plan. For the three corridors that serve inter-regional travel, the corridor plan should include the counties and regional transportation agencies outside the MTC region. These plans would be a counterpart to county transportation plans, with a focus on the highway, arterial, and transit systems that service the corridor.

Collaborative development of a corridor plan will ensure that operational and investment strategies are consistent and mutually supportive, and it would also provide an avenue for planning strategies to be developed with jurisdictions outside the nine-county Bay Area. The RTP should give funding priority to those projects included within corridor plans. Implementation of a corridor planning requirement can be reached by agreement among affected jurisdictions, by MTC policy, or by a state law.

ACTION 1.2: *Unite regional transit.*

The Bay Area has 26 separate transit agencies, each with ownership of a service territory defined long ago for political reasons. In many cases, these boundaries represent local transit needs, but—with the exception of a very small number of regional operators—they were not intended to and do not represent or serve the regional transit market. In response, operators have cobbled together an ad hoc regional "system" through arduously negotiated inter-operator agreements. Between these ad hoc regional services and the small number of regional operators, the Bay Area appears to have an extensive regional transit network; however, it is one that is rife with limitation. The network provides no system-wide coordination, inadequate ability to identify and fill regional gaps, narrow ability to optimize or coordinate competing services, underutilization of regional transit assets due to the imposition of competitive restrictions, and no coordinated branding or marketing. Interaction between regional services and local services is further complicated by this fragmentation; as a result, connecting between regional and local transit often requires two separate fare payments, inconsistent discounts, and excessive waiting time due to uncoordinated schedules.

To best identify and most efficiently coordinate regional transit, MTC has the opportunity to exhibit regional planning leadership by engaging more directly with local planning processes and utilizing its transit funding for key connection projects. Every four years, each public transit agency in the Bay Area prepares a Short Range Transit Plan (SRTP). The SRTP lays out the agency's performance goals, operational plans and financial capacity for the upcoming 10 years and is used as an input to regional transportation planning and programming activities. In order to ensure that regional transit services are appropriately coordinated, and that promising transit markets that cross operator boundaries are served, the Metropolitan Transportation Commission should engage in the SRTP processes for all regional transit services in the Bay Area, with the goal of preparing one short range plan for the entire region. A more integrated approach would provide a heightened degree of regional planning for the transit system, which otherwise could only be accomplished through transit agency consolidation.

STRATEGY #2: *Leverage and Improve the Existing Transportation System*

The Bay Area's extensive transportation system—comprising 51,000 lane-miles of highway, 42,600 lane-miles of local streets and roads, 364 miles of passenger rail track, and 4,332 transit vehicles—is the result of tens of billions of dollars of investment over many decades. However, these investments have delivered a system that is not equipped to handle the demands that a robust Bay Area economy places on it. The existing transportation system is not just over used; it is also under maintained, which negatively affects system performance and creates large financial obligations in the future. While it is necessary to continue to invest in system expansion, it is also necessary to begin to focus equally on getting more value from the existing system through maintenance and incremental investments.

ACTION 2.1: *Invest in the most productive transit routes.*

The Bay Area operates, at substantial cost, a very extensive public transit network, but it still struggles to accommodate growing ridership. While several recommendations presented in this document will help create a more customer-friendly transit network, investing to meet existing demands can help to attract greater ridership. In 2013, Plan Bay Area estimated a $46.5 billion expense to rehabilitate and replace worn out transit equipment, a price tag that exceeds the financial ability of the region to fully absorb.[49] Transit capital replacement funds should be targeted at the transit systems and routes that carry the most passengers and that provide the greatest congestion relief for parallel roads. Funds can be further targeted at vehicles and equipment that will ensure on-time performance and relieve overcrowding.

ACTION 2.2: *Use regional funding for adaptive ramp metering.*

A substantial amount of highway congestion is created by vehicles merging into heavy freeway traffic—even where there is sufficient highway capacity for additional vehicles. Ramp meters are a simple, inexpensive, and proven solution, and MTC and county agencies are completing a regional effort to fully deploy ramp metering. Traditional ramp meters that have been installed in the Bay Area use controllers with fixed timing, allowing cars to enter at a fixed rate, regardless of whether highway traffic is heavy or light. Switching to adaptive controllers on ramp meters will substantially improve system performance at minimal cost. MTC should set aside regional funds in the RTP to upgrade all ramp meters to adaptive controllers and should require that all Corridor Operation and Investment Plans include local agreement to upgrade controllers.

ACTION 2.3: *Use regional funding for advanced arterial signalization.*

Local arterial streets are the backbone of the local transportation system for auto and bus trips, often connecting several jurisdictions. Arterial operation is often sub-optimal, however, because traffic signals are poorly timed—both within and across jurisdictions—and traditional signal controllers have limited functionality. Advanced traffic signal controllers can be networked together and receive real-time inputs from traffic monitoring equipment, allowing them to dynamically optimize signal timing across an entire arterial network in response to current conditions. In order to spur advanced signalization efforts, MTC should set aside a pot of regional funds for this purpose in the RTP and should allocate the funds competitively to sub-regional consortia of local governments.

STRATEGY #3: *Move More People on Highways*

Strategic investments in highway capacity and the use of adaptive ramp meters will increase the vehicle throughput of highways, but additional efforts to facilitate higher vehicle occupancy levels can increase the number of people being moved. The biggest opportunity is to encourage carpools, vanpools, regional express buses, and employer shuttles. Fortunately, employers and entrepreneurs have proactively stepped forward to optimize the customer interface for ridesharing through, for example, custom-routed private shuttles and dynamic ridesharing applications. Public transportation agencies can take advantage of these private initiatives and, at relatively little expense, create conditions that will allow ridesharing to flourish.

ACTION 3.1: *Expand Park and Ride.*

Park and Ride lots at convenient locations near busy commute freeways are at capacity, limiting the opportunity for commuters to leave their single-occupant vehicles and join a higher occupancy vehicle. MTC should ensure that all Corridor Operation and Investment Plans evaluate and prioritize opportunities to create new Park and Ride lots, and Caltrans should issue a policy that makes Park and Ride a priority use of vacant or underutilized Caltrans property.

ACTION 3.2: *Increase carpool lane enforcement.*

The Federal Highway Administration has alerted Caltrans that many California carpool lanes are over capacity and are not providing expected travel time-savings to users. In the Bay Area, 52% of carpool lane miles failed to meet federal performance standards for traffic speed in the second half of 2013.[50] One way to address this problem is to make sure that ineligible vehicles are not using carpool lanes. Caltrans should invest in new technologies and systems to significantly increase enforcement against carpool lane violators and should report quarterly to the MTC Operations Committee on the performance of Bay Area carpool lanes.

ACTION 3.3: *Revoke permission for hybrids to use congested carpool lanes.*

In order to encourage adoption of hybrid and electric vehicles, California allows a limited (but large) number of these vehicles to use carpool lanes even when carrying only one occupant. On congested carpool lanes, these hybrid and electric single-occupant vehicles contribute to congestion and erode time savings, without contributing to higher person throughput. State law specifies that Caltrans can revoke permission for these hybrid and electric cars to use congested carpool lanes, but it has yet to do so. If Caltrans does not act, the Legislature should delegate the authority to MTC (and to the respective regional transportation agencies in other parts of the state).

ACTION 3.4: *Increase occupancy requirement and transition to express lanes.*

Where all other strategies—violator enforcement, elimination of hybrid and electric vehicles—are insufficient to maintain a substantial travel time advantage for carpool lane users, Caltrans' final tool is to increase the required occupancy level (for example, requiring three passengers in a carpool rather than two). Caltrans should do so, as needed. If Caltrans does not act, the legislature should delegate the authority to MTC. Where excess capacity is expected after increasing the occupancy requirement, MTC and Caltrans should simultaneously convert to express lane operations that allow other vehicles to pay a toll to use the lane.

STRATEGY #4: *Innovation and Customer Focus*

For at least the past half century, transportation infrastructure and public transit services have been planned, funded, delivered, and operated by government agencies, through processes developed and overseen by government agencies. In many ways, this has been an extraordinarily successful system, connecting urban areas with highways and their neighborhoods with streets and transit. As the transportation challenges of urban areas have become more complex and more difficult and expensive to address, however, and as the economy and employment market—and, hence, commutes—have become more dynamic, the limitations of this unresponsive "central planning" model of transportation are becoming inescapable.

A simple project to add a new express lane by restriping within the existing highway footprint can take eight to 10 years. More complex projects involving structures or earthwork, such as reconstructing an interchange, can easily take 15 years from conception to opening. While the Bay Area has an expansive public transit network, travelers are forced to fit their trips into the routes, fare structures, and transfer policies of over two dozen independent operators, each with its own protected operating territory. Public bus transit is still primarily provided with large buses operating on fixed routes, resulting in low-mile-per-gallon vehicles often hauling empty seats, while travelers find that services that actually meet their needs are not available at the right time or on the right route.

An alternative experience, reflecting a responsive, customer-centric transportation system, is represented by private services such as Lyft, Uber, and Sidecar. These systems are designed not to accommodate the strictures of decades-old government planning and funding programs, but rather are relentlessly focused on understanding and meeting the needs of their customers, even as those needs change from moment to moment. These mobility services help to fill in gaps in the region's transportation system, for example by bridging the last mile when taking public transit. Public transit must confront the challenge of becoming more customer-focused so as to best leverage the public investment in this infrastructure. The region's public transit system needs to identify its unique value proposition and embrace opportunities for collaboration with private services.

ACTION 4.1: *Create an innovation incentive program.*

In order to promote and facilitate the adoption of innovative strategies to improve transportation performance, MTC should set aside funding in the Regional Transportation Plan for a competitive Innovation Incentive Program. Funds should be used to make grants to Bay Area transportation agencies that propose the most compelling, creative, and promising applications of technology, incentives, entrepreneurism, and market mechanisms to improve transportation performance. For example, grants might address some of the following:

- Reducing the cost, and improving the speed, comfort, and convenience, of public transportation services in suburban or rural areas that are costly and difficult to serve through fixed-route transit;
- Use of data to tailor transportation services to customer needs and desires;
- Incentives that encourage travelers to voluntarily change their behavior in ways that benefit system performance;
- Leveraging entrepreneurial providers of transportation information and services;
- Challenge grants, similar to the US Department of Education "Race to the Top," that identify a desired outcome and that grant an award to the agency that has adopted the most creative and effective reforms to achieve that outcome.

In order to ensure that funded projects both reflect the most creative implementation of technology and innovation and can be implemented by the recipient agency, MTC should assemble a review panel comprised of half technology and innovation practitioners and half public agency representatives to judge applications based on customer-facing goals, such as throughput and customer experience. In order to drive timely adoption of innovation, funds should be front-loaded to the first 10 years of the Regional Transportation Plan, rather than being spread thinly across the entire 25-year period.

ACTION 4.2: *Establish systematic approaches for deploying new technologies and practices in transportation systems.*

To best prepare for the future, the Bay Area would benefit from a more coordinated and seamless planning effort across jurisdictions, which can produce rule changes, update operating metrics, and support pilot projects for efficiency-increasing technologies and practices. Such an ongoing regional effort can drive greater efficiencies in planning for smart transportation.

The rapid uptake of electric vehicles in the Bay Area is already creating the need for new infrastructure in the form of charging stations and integration with electric grid operations. Planning has begun for the next wave of transportation technology, as self-driving cars are being pioneered and tested in the Bay Area. A movement toward a usage fee based on vehicle miles traveled—as discussed in the recommendation Securing the Future through Critical Regional Infrastructure Investment—would also utilize new technologies and require new planning processes.

The Bay Area's infrastructure and public policy should better reflect this innovative spirit by supporting the testing and deployment of new transportation solutions. The North San Jose Transportation Innovation Zone, an 11-mile stretch of roadways that has been utilized as the testing ground for new transportation technologies, offers an example of how public agencies can provide opportunities for piloting new technology and practices to better meet users' needs and to help spur innovation and entrepreneurship locally.