

Transportation

Driving Change

Policies to expand on employer-based Mobility on Demand pilot programs and reduce drive-alone commuting in the Bay Area.

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This white paper is one in a series of publications that lay the groundwork for the SPUR Regional Strategy.

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Executive Summary

The Fair Value Commuting (FVC) Demonstration project began in Silicon Valley in mid-2018 to help an innovative region address challenges that have plagued cities and regions for decades: Too many people drive alone to work, and as a result roads are clogged with traffic, people and employers lose time and productivity, air quality is degraded and streets are unsafe.

The project tests a package of strategies to tackle these challenges. First, from July through December 2019, four public-sector employers (the cities of Palo Alto, Menlo Park, Mountain View and Cupertino) piloted parking cash-out — giving cash, transit credits or other subsidies to employees who do not drive alone to work. These commuter benefits were communicated through software called a commuter wallet. Trips were then tracked and summarized for employees and employers alike through another software system. Second, the FVC project will include an analysis of commutes and the barriers to choosing options other than driving alone — for example, the limited number of ways to travel the last mile(s) between a transit station and an employer's front door. Lastly, this white paper examines the role of public policy in supporting FVC pilots and shifting workers out of drive-alone commutes.

This paper outlines many of the underlying factors that shape the challenges the FVC project aims to address. The region's sprawling nature and lack of affordable housing near many job sites make it particularly difficult for employers to shift workers out of drive-alone commutes.

The FVC project comes at a time when many large employers offer workers pre-tax transit benefits or subsidized transit passes and when many large employment districts provide free shuttles from major transit stops, incentives to carpoolers and more. Yet these efforts have not been enough to stem the region's congestion, emissions and unsafe roads during commute hours. When it ends and can be evaluated, the FVC project stands to offer more insight on how employer-based parking cash-out can be implemented to complement existing employer-based efforts.

In the meantime, this paper offers information and insight that will help employers to continue their FVC efforts beyond the pilot's closure at the end of 2019, include more workers in the pilot offering, encourage new employers to set up parking cash-out programs and ultimately shift more workers out of drive-alone commutes.

In particular, this paper also offers two large regional policy ideas and several supporting policy ideas.

Regional policy ideas for discussion:

- **Regional baseline parking charges:** Amid competition for talented workers, the four pilot sites found it difficult to charge for parking as a way to shift drive-alone behavior and create a revenue stream to fund parking cash-out subsidies. A regional baseline parking charge could level the playing field for employers and potentially provide a powerful tool in the ongoing effort to stem drive-alone commute rates.
- **Regional transportation demand management requirements:** While many employers in newer developments have transportation demand management policies, many other employers do not. A regional mandate that employers help expand the commute options for their workers — through providing greater incentives to carpool, better communication of benefits and more — could go a long way in shifting workers out of drive-alone commutes.

To complement either of these regional policies, this paper outlines additional strategies to:

- Create better commute monitoring and data so that pilots and policies can be better evaluated
- Create a regional parking database that can serve as a tool to employers and policymakers at the city, county and regional levels
- Ensure that employees of small employers have access to the same transportation demand management incentives as those of larger employers
- Establish software platforms to streamline travelers' payments across parking, transit, tolls and more
- Ensure coordination on parking pricing between cities and employers
- Continue ongoing work to improve transit, biking and other alternatives to driving alone

The work to design, pilot and implement these policies is real. Charging for parking that has always been free is particularly difficult. However, it may prove harder for the Bay Area to live with the consequences of doing nothing. Staggering traffic congestion has peaked at all-time highs, emissions from cars is the single largest source of climate emissions, and pollution from cars settles in low-income communities and communities of color, contributing to higher rates of heart and respiratory disease. Not only are these negative impacts large, they are widespread and often fall not on the people who drive but on those taking the bus or living in neighborhoods near freeways. While creating policies to shift workers out of drive-alone commutes will come at a cost, it is important to remember that we are already paying for drive-alone commutes in these other ways.

This paper celebrates the work of employers in the FVC project and encourages policymakers and employers to continue the conversation about how to reduce drive-alone commutes and help make our region less congested, cleaner and healthier for all who live and work here.

1. Introduction

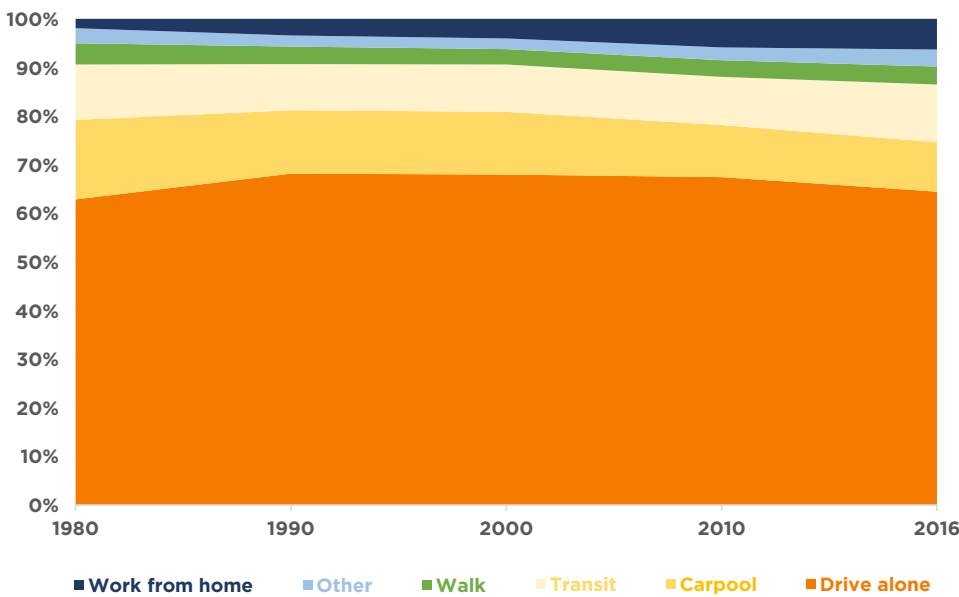


FIGURE 1
For decades, two-thirds of Bay Area commuters have driven alone to work
 Percentage of commute trips in the nine-county Bay Area taken by each mode

Since 1980, the percentage of people who drive alone to work has hovered around 66%, and the rate for those who take transit has held at about 11%. Meanwhile, the carpool rate has dropped from 16% to 10%, and the work-from-home rate has risen from 2% to 6%.

For Bay Area residents, the decision about how to get to work is a simple one. Most get in their cars and drive alone. This decision is often so automatic that it’s more of an assumption than a choice. This assumption is reflected back to commuters by the physical environment around them: the wide roads, long distances and abundant parking lots that stretch between home and work. And it is reinforced by the fact that it’s often faster and cheaper to drive alone than to take transit, not to mention more convenient and comfortable than walking, biking or carpooling.

It’s no surprise that driving alone has been the dominant commute choice for Bay Area workers over the last several decades, as seen in Figure 1 above.

Despite how easy it is for most to drive alone to work compared to other modes, it is not without consequence. Passenger vehicles remain the region’s and state’s single largest source of climate emissions and a major source of local air pollution, which contributes to lung and respiratory disease.¹ Local air degradation and its health impacts also concentrate in low-income communities and communities of color, exacerbating long-standing racial and economic inequities that erode the quality of life in the region. In addition, with more drivers on the road, the potential for injury and death across drivers, passengers, pedestrians, cyclists and bus riders goes up. Lastly, travel throughout the region has come to cost people more and more of their time and productivity, as seen in Figure 2 on page 7.

The serious and widespread problems that come with our region's reliance on driving alone are not new. Policymakers have invested millions in critical transit infrastructure and services throughout the region, and cities and employers have taken steps to encourage commuters away from driving alone through some of the most comprehensive transportation demand management (TDM) programs in the country. While important, these efforts have simply not been enough to reverse the growth of congestion, pollution and safety threats from cars. Innovative solutions and leadership in overcoming our entrenched drive-alone patterns are still sorely needed.

The Fair Value Commuting (FVC) project and this paper aim to test and help scale a package of strategies to reduce drive-alone commute trips.³ While commutes are not the only type of trip people take, they do represent up to a third of all trips taken in the Bay Area,⁴ and because they mostly cluster around certain hours, they cause more congestion than other trips and often lead to greater safety threats and increased emissions from idling cars. So while commutes do not constitute the majority of trips, encouraging commuters out of cars can go a long way to mitigating the collective and harmful impacts of driving.

The FVC project is a package of interventions with five main elements:

- 1 Voluntary pilot programs at employer sites.** In all pilots, employers have chosen subsidies as a way to encourage commuters not to drive alone. The most popular subsidy, called parking cash-out, offers commuters who do not drive alone to work a cash payment. Another popular offering is a first mile/last mile subsidy that can be used in conjunction with an employer-provided benefit such as a preloaded transit or Clipper fare card. Pilots were created at four employers in Silicon Valley — the cities of Palo Alto, Menlo Park, Mountain View and Cupertino.
- 2 Commute data tracking software.** Enterprise commute trip reduction (ECTR) software enables employers and employees alike to see dashboards that track and summarize commute choices over time. It also enables the pilot site employers to offer competitions among employees, with prizes and rewards to encourage employees not to drive alone to work. This project uses the platform RideAmigos to record all employee commute trip activity, provide leaderboards and administer commute competitions.
- 3 Commuter wallet software.** The commuter wallet is a mobile and desktop software platform that commuters can use to plan intermodal (e.g., bike-to-transit, drive-to-transit) trips in real time, to view benefits offered by their employer's pilot program and, as an integration feature, to facilitate the recording of selected trips into the ECTR software.
- 4 Commute gap filling measures.** This part of the project aims to analyze how alternatives to driving alone can be bolstered for specific commuters. For example, this analysis may lead to recommendations for subsidizing ride-hailing trips; providing e-bikes, e-scooters or micro-transit; or improving the bike network to get commuters between major transit stops and employer sites.
- 5 Policy options and systemic barriers.** This white paper provides the fifth element of this project. It complements the components above by investigating and outlining how the FVC demonstration project can inform future public policy to reduce drive-alone commute rates, as well as how public policy can further support innovative efforts like the FVC project.

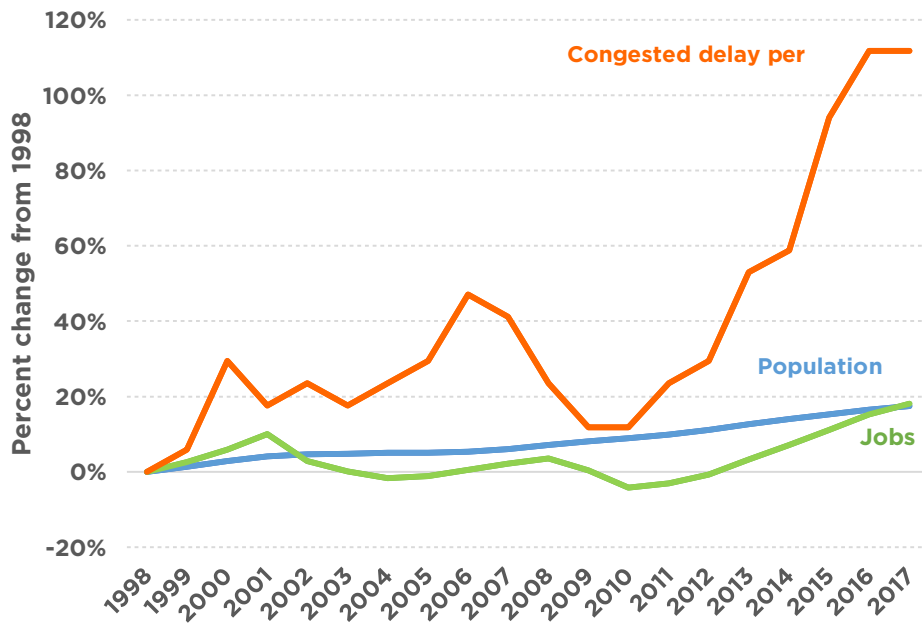


FIGURE 2
Congested delays have plateaued at all-time highs
 Percent change in jobs, population and congested delay per worker since 1998²

While population and workers in the nine-county Bay Area have risen by 17% and 18%, respectively, since 1998, the congested delay per worker has risen by 112%, demonstrating that our transportation system cannot fit more solo commuters without costing everyone time. The congested delay per worker trend line also mirrors (and exaggerates) jobs lost in the Great Recession (2007 to 2010) and the climb in jobs after the economic recovery (2010 to 2017).

At the inception of this project, the FVC team anticipated that in addition to providing parking cash-out and other incentives, employer pilot sites would opt to charge for parking. The FVC team promoted the idea of a “feebate,” where employers charge for parking and use the revenue to fund the incentives for not driving alone to work. In the process, parking charges could generate a revenue source to keep parking cash-out going after the pilot programs ended. However, it proved infeasible for employers to charge for existing parking in the pilot time frame, either alone or as part of a feebate. While it did not make its way into the FVC pilots, in numerous other applications charging for parking has been shown to be an effective way to reduce drive-alone rates and create a sustainable revenue source for parking cash-out and other incentives. Even though parking charges have not been incorporated into FVC pilots, they hold promise, need further policy investigation and are discussed throughout this white paper.

As part of the Mobility on Demand FVC project, this paper has a wide audience. It is intended for employers and policymakers at various levels of government who are interested in how employer-based efforts and public policy can work together to reduce drive-alone commute rates. It is also intended for those generally invested in the Bay Area’s commute conditions, policies and employer-provided benefits and in how each can be improved to ease congestion and emissions and ensure greater commute options for more people.

Overall, this paper brings together in one place the broader conditions and public policies that set the region’s current commute context (Section 2). It discusses existing employer-based efforts to reduce drive-alone commute rates in the Bay Area, giving examples of both parking pricing and incentives and exploring barriers employers face in providing each (Section 3). It also outlines and synthesizes lessons learned from key public policies that affect Bay Area employer-based commuter benefits (Section 4). The paper then outlines two major regional policy ideas and a set of supporting policies that could help employers scale the types of commuter benefits offered through the FVC pilots (Section 5).

2.

The Bay Area's Context: Why Commuters Drive Alone

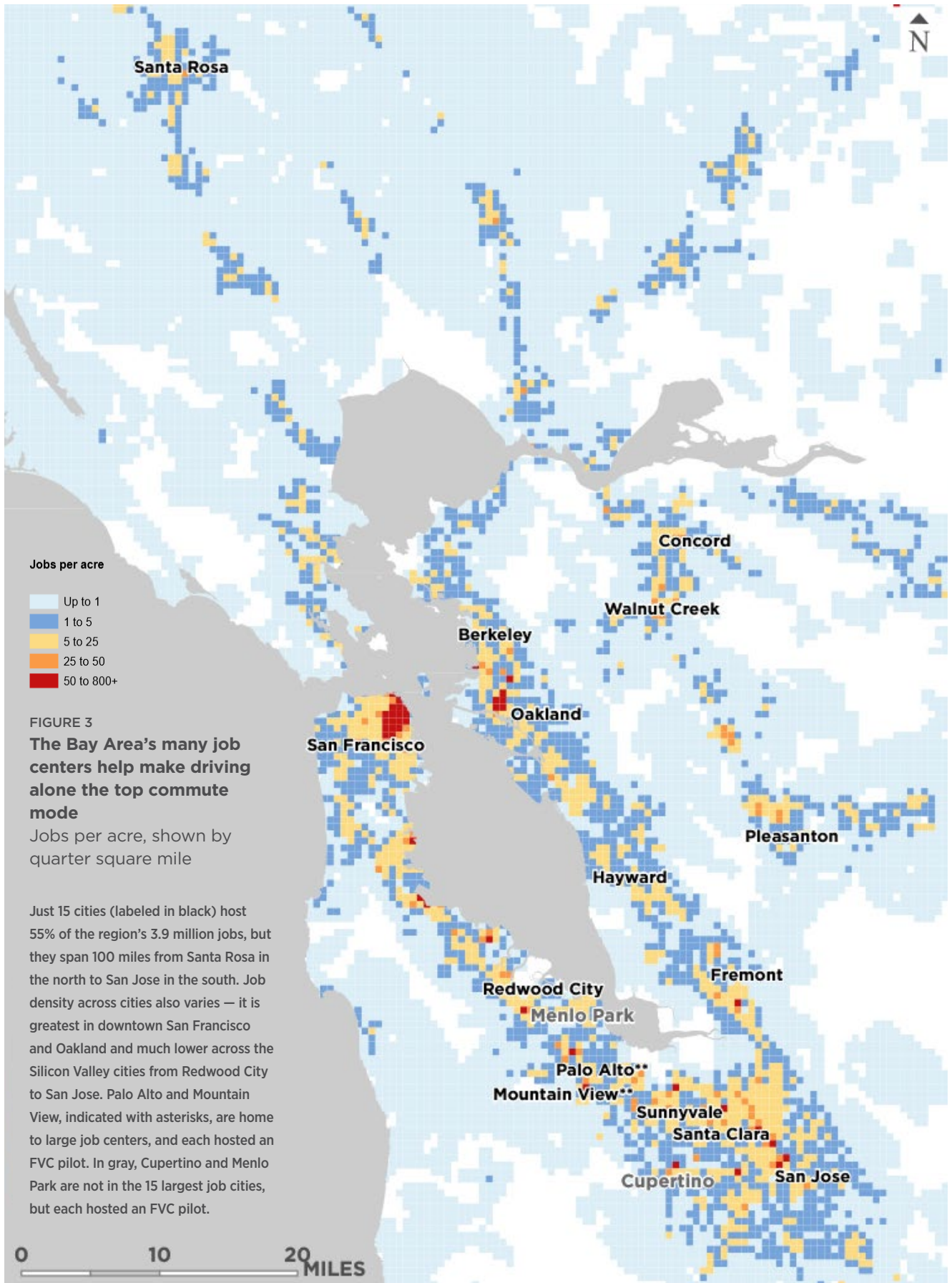
As described briefly above, there are important reasons why so many in the Bay Area drive alone to work. The spread-out nature of job centers and residential neighborhoods across the Bay Area, the high cost of housing and the lack of viable alternatives to driving alone play key roles. These patterns are important to highlight, as they illustrate the particular challenges that employer-based programs like the FVC pilots aim to help overcome. Innovations from the FVC pilots that ultimately shift workers out of drive-alone commutes should be highlighted and supported through additional public policy.

Regional land use patterns and housing market forces reinforce the drive-alone commute.

Instead of organizing around a primary central business district, the San Francisco Bay Area has multiple job centers spread out across nine counties and separated by a 550-square-mile bay, larger in area than Los Angeles or San Jose and San Diego combined.⁵ It is harder logistically and costlier to provide alternatives to driving, such as high-frequency transit, across so many disparate job centers compared to a single job core.

In addition, many of the Bay Area's job centers and residential neighborhoods were built after car use became widespread. They were designed at low densities around large blocks that are most quickly comfortably navigated by car. Unfortunately, this kind of environment makes for slower, less convenient travel for those using transit, walking and other modes. In fact, only about 20% of jobs are within a walkable half-mile of the most-used regional rail operators, BART and Caltrain.⁶

The region's fierce competition for scarce and expensive housing, and its competition for knowledge workers to support its near-full employment, also means that more and more people commute to work across greater distances, which are most often faster and cheaper to cover by car. These trends vary over the region's large expanse, but they are particularly pronounced in Silicon Valley and along the peninsula that connects it to San Francisco. This nexus of the peninsula and Silicon Valley is where the FVC pilots are taking place.



	Average commute in miles		Percent change 2002-2017
	2002	2017	
San Francisco	28	38	35%
San Jose	24	34	39%
Oakland	22	31	42%
Fremont	25	39	56%
Santa Clara	28	36	26%
Palo Alto*	23	34	47%
Sunnyvale	24	35	48%
Mountain View*	23	28	24%
Pleasanton	42	44	5%
Hayward	28	44	58%
Santa Rosa	19	31	59%
Redwood City	24	39	58%
Walnut Creek	32	39	24%
Berkeley	16	26	67%
Concord	27	37	40%
Cupertino**	22	26	18%
Menlo Park**	20	32	60%

FIGURE 4
Across job centers, Bay Area commutes have gotten much longer in the last 15 years
 Average commute in miles (2002 and 2017)

The cities at right are listed in order of largest to smallest job center. Most cities have seen the average commute grow in miles by more than 30%.⁷

*Indicates cities in the top 15 that are host to an FVC pilot

**Indicates cities not in the top 15 but that are host to an FVC pilot

Alternatives to driving alone are often slower and costlier.

Even in the areas where an alternative to driving alone is possible, solo driving is often faster and cheaper. For example, transit trips are often longer than car trips because over two dozen transit agencies serve the Bay Area, often requiring travelers to transfer from one transit operator to another. Even without transfers, buses often get stuck in traffic, and both bus and train service can be infrequent, making it faster to drive much of the time. In addition, it is often more expensive to pay a single long-distance fare, or multiple fares on multiple transit legs, than to pay for fuel and free parking as a solo driver. For the Bay Area’s workers who commute to work outside of peak hours, transit service is sparse and infrequent. Given this context, it’s no wonder that roughly two-thirds of commuters drive alone to work.⁸

3.

Existing Employer Efforts to Reduce Drive-Along Rates

All kinds of employers — from public agencies to Silicon Valley tech firms, from medical providers to restaurants and hotel owners — are acutely aware of how difficult it can be for their employees to get to work. The Bay Area commute affects employers' ability to hire and retain workers, as well as to maintain or grow operations.

Many employers in the Bay Area must compete for talented workers, especially in the past several years of near-full employment.⁹ Because Bay Area commutes are among the toughest, many employers try to attract talent by offering commute benefits and perks, even providing shuttles or ferry services themselves. Providing shuttles or ferries is easier for larger companies with more capital, while family-owned businesses and service-industry employers cannot offer such high-price-tag perks. In many cities in Silicon Valley, hiring retail, restaurant and hospitality workers has become increasingly difficult given that housing there is far too expensive for the wages such jobs pay, and employers either cannot attract such employees from the distances where there is affordable housing or cannot offer commute benefits that would make it worthwhile.

In some places across the Bay Area, groups of employers have come together to enhance the transit, bike and other drive-alone alternatives for workplace destinations. Some employers have organized themselves under transportation management associations (TMAs), and in other cases, cities have mandated that in particular areas, developers and new employers put in place transportation demand management (TDM) measures as a condition of building new commercial, retail or other job sites. Across most of these efforts, employers use some kind of benefit to encourage their employees not to drive alone to work. These benefits come in the form of free shuttles between regional rail stations and employer sites (e.g., Emeryville's Emery Go-Round and Stanford's Marguerite shuttles), bike parking and showers at employer sites, priority parking for vanpools and carpools and more. See the sidebar on page 12 for more on TMAs and TDM programs in the Bay Area.

Because employers know so much about where employees are coming from and what it's like to commute to a particular campus, building or set of sites, employer-based TDM programs can offer more tailored incentives and programs than most other policies to reduce drive-alone commute rates. This is a unique advantage. It is also one of the reasons it is so important to capture the lessons learned from existing TDM programs, as well as from the FVC pilots, and to create public policies that will help scale their most beneficial elements.

Examples of transportation demand management across the Bay Area

What are transportation management associations (TMAs)?

TMAs are nonprofit organizations that offer transportation services for a particular area, such as an industrial office park, a medical campus, a mall or retail outlet, or an entire employment district. In most cases, they are run by the member businesses with support from local government. Often bolstered by city policy, TMAs help provide transportation demand management (TDM) programs across a number of member businesses, which can lower the overall cost of the program and ensure that small employers can offer the same benefits as larger employers.¹⁰

What kinds of TDM programs exist throughout the Bay Area, and what have they helped to achieve?

The summary table to the right lists some of the TDM programs provided across the five most urbanized Bay Area counties, noting the context under which each operates, the notable TDM features of each and, if measured, the drive-alone commute rates they help to achieve.

In Figure 5, drive-alone rate goals represent quantitative targets set by cities, TMAs or universities. Stanford's goal is not a precise percentage; rather, the university aims not to add any more commute trips over time. One of the most popular TDM measures listed here is free shuttle service to major BART, Caltrain or ACE passenger rail stations. "Parking management" refers to policies to unbundle parking from workplaces in commercial leases or to limit the amount of new parking developed. Carpool incentives range from subsidies offered through Waze or Scoop apps to subsidies for vanpools and preferred parking for carpoolers. Even though offering some kind of carpooling benefit is fairly common, carpooling rates still hover around only 11% across the Bay Area.²⁷ "Trip challenges" refers to contests or rewards that commuters can participate in by using platforms like RideAmigos to log commute trips they make using modes other than driving alone; in doing so, they can earn rewards or become eligible to win prizes.

The effect of these area-wide TDM efforts on drive-alone commute rates is sometimes tracked and reported through surveys. While it appears that the Emeryville TMA does a worse job than the rest of the county at helping workers get to work using modes other than driving alone, it's important to remember that many other job centers in Alameda County are much better served by BART (e.g., downtown Oakland, Hayward and San Leandro). The Mission Bay TMA and the TDM efforts across Stanford University and Stanford Research Park have been effective at reducing drive-alone commute rates compared to the county average.

FIGURE 5
TDM programs across the Bay Area are numerous and varied in their offerings

While not intended to be a complete list, this table shows a range of the region's TDM offerings across the Bay Area's five most urbanized counties. In addition to what's listed here, many of these programs also offer commuter information, guaranteed rides home for nondrivers, bike incentives and more.

County	TDM manager(s)	Context	TDM measures					TMA drive-alone rate	County drive-alone rate ¹¹
			Drive-alone rate goal	Free shuttle to rail	Parking management	Carpool incentives	Trip challenges		
ALAMEDA	Emeryville TMA and City of Emeryville	Mixed-use employment district along I-80 freeway corridor with approximately: 9,000 residents 27,000 employees ¹²	X	✓	✓	X	X	77% ¹³	69%
	Hacienda Business Park and City of Pleasanton	Large mixed-use development along I-680 freeway corridor with approximately: 4,000 residents 17,500 employees ¹⁴	55% ¹⁵	✓	X	✓	X	--	
CONTRA COSTA	Bishop Ranch and City of San Ramon	Large business park along I-680 freeway corridor with approximately: 30,000 employees ¹⁶	X	✓	X	✓	X	--	71%
SAN FRANCISCO	Mission Bay TMA	Urban mixed-use development with approximately: 14,000 residents 15,000 jobs and growing large event centers ¹⁷	X	✓	✓	✓	X	-20% ¹⁸	34%
SAN MATEO	Commute.org	Countywide TDM service for all San Mateo employers and commuters, approximately: 770,000 residents 374,000 employees ¹⁹	X	X	X	✓	✓	71%	71%
SANTA CLARA	Stanford Research Park (SRP) TMA and Stanford University	An employment center and large university with approximately: 29,000 SRP employees ²⁰ 17,000 university students ²¹ 13,000 university employees ²²	✓	✓	✓	✓	✓	-43% ²³	75%
	Mountain View TMA and City of Mountain View	Office parks and large job centers with approximately: 83,000 residents ²⁴ 79,000 employees ²⁵	45% ²⁶	✓	✓	✓	X	--	

A seemingly effective but far less popular strategy for employer-based programs is to use a stick instead of a carrot, either putting restrictions on the number of parking spaces offered to employees or charging for parking. Large institutions such as Stanford and UC Berkeley do charge faculty, employees and students to park on campus, but they are the exception to the rule of largely abundant, free parking.

There is evidence that reducing parking supply and charging for it could effectively limit drive-alone commutes. For example, surveys of San Francisco commuters showed that for those with free parking, 75% drove alone while for those without, only 37% did.²⁸ A recent study of parking pricing across California found that a 10% increase in parking prices would reduce drive-alone rates by 1% to 2%.²⁹ The lower response to price increases on the state level reflects that in San Francisco, transit is a real substitute for driving. Not surprisingly, in metro areas across the United States, other researchers have found that commuters are more likely to respond to parking pricing and other incentives when transit is perceived as a viable alternative to driving.³⁰

In addition to lowering drive-alone rates, charging for parking offers employers a stream of revenue to pay for parking cash-out and other commuter benefits. For employers with a large or growing number of employees, parking cash-out and other incentives are likely cost-prohibitive without some kind of parking charge.

Despite the fiscal sustainability that parking charges can provide for parking cash-out programs, and the evidence that parking charges can help reduce drive-alone rates, most employers don't charge for parking. As discussed in interviews and workshops with Bay Area employers, there are multiple reasons why this is the case today. It's important to note that while these barriers are real, given enough time, thought and effort, they can be overcome.

Reasons Bay Area employers don't typically charge for parking³¹

Competition for workers.

Employers compete for the well-paid knowledge workers who make their businesses, operations and missions possible. Employers tend to believe that charging for parking when other employers don't will limit their ability to attract talented employees. In addition, free parking has been ubiquitous among Bay Area employers for decades. An employer charging for parking risks standing out as punitive in a competitive recruitment and retention environment.

Bargaining agreements.

Many employers, especially public agencies, have often agreed to free parking in collective bargaining agreements with unions. Opening the prospect of charging for parking would require labor contract negotiations, which would complicate the issues at the bargaining table and compete for time among human resource departments' other priorities. (While cumbersome, this is not impossible. The City and County of San Francisco did renegotiate labor contracts and eliminate free parking for employees as the start of its SFpark program in 2010.³²)

Lease agreements.

While some Bay Area employers own their own buildings and campuses, most lease their worksites, and parking is often bundled into the lease already. In addition, parking is frequently managed by the property owner instead of the employer. Both bundled leases and the lack of property management make it more difficult, and at times impossible, for employers to implement parking charges for employees.

The logistics of collecting parking charges.

Many agencies and companies offer parking for customers or for fleet operations alongside employee parking. As such, charging for employee parking can often mean rethinking entire parking operations and management. In addition, the initial planning and capital needed to set up gates and payment infrastructure limits employers' ability to charge for parking and enforce parking rules.

Enforcement challenges.

Employers face challenges in enforcing parking charges, maintaining dedicated parking for vanpools or carpools and preventing cheating in trip-planning apps. For small and medium-size employers, dedicating staff time to enforcement is hard to justify given other competing priorities. Perhaps even more importantly, the first priority for employers of all sizes is to get their employees to work. Penalizing workers who don't pay a parking charge or park incorrectly is generally perceived as bad for morale and productivity.

Carrots versus sticks.

Employers and policymakers alike find it much easier politically to offer commuters cash, subsidies and direct transit service than to charge drivers to park.

While these barriers are numerous and real, the potential benefits of charging for parking can be substantial for employers as well. For example, some estimate that each space in a parking structure costs roughly \$33,000 in construction and soft costs such as architectural and legal fees.³³ The land value of parking varies, but is very high for all kinds of development in the Bay Area. In addition, operating parking facilities can carry costs such as insurance, landscaping, maintenance, property taxes or rent, security, utilities and more. Employers that plan, own and build their own parking structures are well aware of the cost of such structures and may be more likely to charge for parking or to dedicate resources that encourage their employees to give up drive-alone commutes, just to avoid the cost of building and maintaining parking.

In deciding whether to charge for parking, employers must weigh the benefits of avoiding all these costs and gaining parking revenue, against the costs that will be incurred to overcome the long list of barriers above. Employers also must assess the advantages of parking charges versus incentives alone. For the FVC pilots, it was not worth charging for parking in the near term.

Policymakers and public policy also influence the costs and benefits employers face in deciding whether or not to offer commute incentives and/or to charge for parking. Unlike employers, policymakers must consider the costs and benefits to society — in the form of congestion or emissions — as opposed to one particular employer and set of employees. The next section illustrates how policy has set the context for employer efforts to encourage workers out of drive-alone commutes. It also shows how the FVC pilots fit into existing policy efforts.

4.

Commuter Benefits, Regulations and Laws

Over the past few decades, various regulations, laws and voluntary efforts have directed or influenced how Bay Area employers encourage their workers to commute. Some policies and programs have sought to encourage employers to shift their workers out of drive-alone commutes, while a couple have aimed to limit policymakers' influence over commute choice. In addition, voluntary efforts have tested parking cash-out. This history and context offer clues about the degree to which FVC pilots might shift workers out of drive-alone commutes, as well as how future public policy might best support and help scale the innovations and benefits of the FVC pilots.

FIGURE 6
The FV project comes after numerous laws, regulations and past efforts to shape drive-alone commute patterns through employer-based benefits and programs

Organized in chronological order, this table summarizes key laws, regulations and voluntary efforts that have shaped how commuters get to work. While the effect of these efforts on drive-alone commute rates has been studied in some cases, evaluating the FVC pilots could offer more insight to employers and policymakers alike.

Policy or program	Date created	Type of policy or program	Description	Effects on drive-alone behavior
CA parking cash-out law (AB 2109)	1992	California law	Applies to employers of 50 or more; mandates that commuters who do not drive alone get benefits or cash in lieu of subsidized parking provided to drivers.	Across eight employer sites in Southern California, drive-alone commute rates dropped an average of 17% right after this law took effect. ³⁴
Trip reduction requirements (Air District Regulation 13-1)	1992	Bay Area regulation	For different zones in the Bay Area, sets a minimum number of carpoolers per car for each employer and raises the minimum over time. ³⁵	Unknown
Qualified commuter credit (SB 437)	1995	California law	Essentially undoes the Bay Area's trip reduction requirements and makes it illegal for the state to mandate commute carpool rates.	Unknown
Alameda County parking cash-out pilots	Late 1990s	Pilot program	Included four public-sector employers that offered parking cash-out at a rate of \$1.25 per trip, \$1.50 to \$2.00 per day or \$40 per month.	The percentages of commuters not driving alone went from 3%–5% to 19%–23% among pilot participants. ³⁶
San Francisco Commuter Benefits Ordinance	2009	San Francisco ordinance	Requires employers with 20 or more employees to offer a pre-tax benefit; monthly subsidy for transit, vanpool or carpool; or employer-provided transit.	Unknown
Bay Area Commuter Benefits Ordinance (SB 1339, SB 1128)	2013	Bay Area ordinance	Requires that employers provide the same benefits as the San Francisco ordinance above, but applies only to employers of 50 or more.	Unknown
Federal Tax Cuts and Jobs Act	2017	Federal law	Makes all employer-provided commute benefits taxable.	Unknown
FVC parking cash-out pilots	2018	Pilot program	Establishes parking cash-out pilots at four public-sector employers in Silicon Valley; uses a combination of incentives and benefits and trip-tracking and planning software.	Not yet evaluated

Parking cash-out and trip caps in California

In 1992, California passed AB 2109 to require California employers with 50 or more employees that offer free parking to also provide a cash payment or subsidy to employees who do not drive. For employers to offer cash in lieu of free parking, the parking they provide must be unbundled from their building lease, and they must be able to calculate the daily subsidy given to employees in the form of a free parking space. Given all these stipulations, and that the law is “self-implementing,”³⁷ the percentage of California employers who do comply with it is likely relatively small. However, through case studies of eight Southern California employers that began complying with the law, researchers estimated that in the near term, drive-alone rates went down by 17%, parking use dropped by 11% and carpooling, transit and active modes (walking and biking) went up by 64%, 50% and 33%, respectively.³⁸

Also in 1992, the Bay Area began its trip reduction requirements for large employers. This policy essentially put a cap on the number of vehicles that could arrive to each employer site in a given hour or day — often called a “trip cap.” For different zones in the Bay Area, the trip reduction requirements set a minimum number of carpoolers per car for each employer and raised the minimum over time.³⁹ The targets didn’t mean everyone had to carpool, just that a minimum percentage did. However, just three years after the Bay Area began its trip reduction requirements, California passed SB 437, which prohibits the state from mandating trip caps for employers.⁴⁰

However, SB 437 does not apply to cities or employers that opt to set their own trip caps, and there are different examples of trip caps at Stanford University, in Mountain View’s North Bayshore area and in the Bayfront area of Menlo Park. Stanford’s has been set up as a condition of its General Use Permit: The university cannot add any more commute trips during peak hours as it adds more buildings to its campus. Thanks to a suite of TDM policies — such as parking management, free shuttles to Caltrain stations, a Commute Club, biking amenities and more — the campus has seen its drive-alone rate fall from 69% to 43% between 2003 and 2017.⁴¹ The North Bayshore Precise Plan in Mountain View sets a district-wide target of no more than 45% drive-alone trips and a limit of 18,000 vehicle trips in the morning peak period (7 a.m. to 10 a.m.) at its three entry points combined.⁴² If the employers in the precise plan area do not meet the trip cap, they may have to adopt additional TDM strategies, pay fines or be subject to congestion charging.⁴³ Menlo Park’s trip caps apply to different areas within the Bayfront area at different hours of the day, but there is a total daily maximum as well.⁴⁴

In all cases, the areas with trip caps are popular destinations at peak hours, and the programs have defined enough entry points that the vehicles entering the area can be accurately counted. A simple but profound conclusion can be drawn from these policies. When a policy includes a measurable target for drive-alone commute rates, especially with real enforcement, drive-alone rates can be accurately tracked. With commuter benefits and tax policies, it is hard — at times impossible — to measure whether the policies are shifting commuter behavior, how many commuters they shift, whether or not shifts in behavior are temporary reactions or lasting changes, and how overall street and transit patterns are affected.

Measuring and monitoring commute trips can perhaps also be accomplished through the RideAmigos voluntary trip-tacking feature available through the FVC pilots.

Regional commuter benefits

Commuter benefit ordinances constitute another set of important regulations. San Francisco led the charge by establishing its ordinance in 2009.⁴⁵ The Bay Area Commuter Benefits Ordinance was created as a pilot by SB 1339 in 2013 and made permanent by SB 1128 in 2016.⁴⁶ Both the San Francisco and regional ordinances require employers of a certain size (20 employees in San Francisco and 50 across the region) to offer one of four commute benefits: a pre-tax benefit for transit or vanpool, a monthly transit or carpool subsidy, employer-provided transit or any combination of these.⁴⁷ Unlike the California parking cash-out law, these benefits must be provided regardless of whether or not employers offer subsidized parking.

Outreach to employers for the regional commuter benefits ordinance is done through the Metropolitan Transportation Commission (MTC), and employers submit an annual form that lists the benefit they are offering. Enforcement of the ordinance is handled by the Bay Area Air Quality Management District (BAAQMD), since this ordinance was set up as an air pollution management policy. Enforcement is challenging because BAAQMD staff do not have access to complete records that list the employer size, exact location and contact information for all employers throughout the Bay Area.

Incentives tested in the FVC pilots could help inform whether or not additional employer-provided benefits should qualify as compliance measures under the Bay Area Commuter Benefit Ordinance. A more widespread use of platforms like RideAmigos, along with data-sharing agreements between employers and BAAQMD, could help with enforcement of the law.

Federal commuter benefits tax policy

The federal policy that throws all employer benefits into some question is the 2017 Federal Tax Cuts and Jobs Act and the accompanying IRS guidance on it. Prior to these, private and nonprofit employers could write off parking and transit pass benefits provided to employees, effectively lowering their overall tax burden. Now, parking and transit benefits will be taxable at the employer level, as will bike and active-mode improvements at employer sites.

Some have argued that because many companies received other large tax breaks as part of the 2017 law, they can afford to pay more for commuter benefits now. However, it is not at all mandatory for most U.S. employers to provide commuter benefits, and they still face a choice in which providing them is less beneficial than it was before. Regardless of other tax breaks, the incentive to provide all kinds of commuter benefits has diminished, and doing so is now more expensive.⁴⁸ Left unclear is how employers will respond to these increased costs. Will they cut benefits where they can? Will they pass the costs on to employees in some form? And most of all, how will employer offerings change the way people commute to work, and what effects will they have on transit ridership, road congestion, emissions, equity and more? In the Bay Area, where employers with 50 or more employees must comply with the Bay Area Commuter Benefits Ordinance, large employers may continue to offer transit and other benefits at the higher tax cost, while those with fewer than 50 employees may choose to cut benefits. From a commuter's perspective, eliminating pre-tax transit passes would effectively be a 25% fare increase and could have significant ramifications.⁴⁹

Voluntary parking cash-out pilots

Over time, there have also been a few Bay Area pilots that have sought to test and demonstrate how parking cash-out programs would operate, as well as how they would help shift people out of drive-alone commutes. In the late 1990s, the Alameda County Transportation Commission set up parking cash-out pilots with four public-sector employers: the County of Alameda and the cities of Albany, Pleasanton and Oakland. All employers offered cash in lieu of parking, at a rate of \$1.25 per trip, \$1.50 to \$2.00 per day or \$40 per month in commuter checks. Before the pilot, when there was no incentive, only 3% to 5% of employees did not drive alone, but that range grew to 19% to 23% among pilot participants.⁵⁰

Lessons learned

Across these laws, regulations and voluntary efforts, a few insights can be drawn.

First, as seen in the last column of Figure 6, measurements of the direct effect of these various efforts on drive-alone commute rates are difficult to come by. This is largely due to a lack of readily available data on commute patterns at a fine enough geography (e.g., for each employer site). To evaluate the impact of various initiatives on drive-alone commute rates, careful evaluation design has to be built into laws and programs. Another option is to make measurement a central tenet of the effort — as is the case with enforceable trip caps that mandate, track and enforce the maximum percentage of drive-alone commutes allowed to particular destinations.

The FVC pilot programs' evaluation may help shed more light on how these efforts affect drive-alone commuting behavior, particularly when paired with mobility on demand software, which is a new innovation among the Bay Area parking cash-out pilots discussed above. Participants in the FVC pilot programs have the option to track commutes directly in the RideAmigos app. Establishing trip tracking as the default setting, or encouraging commuters to track trips, can help create more data. If enough commuters track trips, and data can be anonymized and shared for research purposes, policymakers could assess and better tailor commuter benefit policies to reduce overall congestion, emissions and other externalities associated with drive-alone commutes.

Second, where measurable results are available, it appears that incentives work to shift some employees out of drive-alone commutes, as shown by studies that examined the immediate response to the California parking cash-out law and the parking cash-out pilots in Alameda County. This is promising and makes it reasonable to expect that the FVC pilots will also have a real effect on commuter behavior.

Third, recent changes to the federal tax law and the law that limits the state's ability to mandate trip caps (SB 437) bring to the fore how important employer-provided commuter benefits could be in the push to reduce drive-alone commute rates. The federal tax cuts beg the question of whether or not more people would drive if employers limit transit commuter benefits, and what that would do to roadways, congestion and emissions from cars. The fact that SB 437 prohibits the state from setting trip caps makes it all the more important that cities, regions and employers work together to enact these policies where they make sense.

Lastly, parking cash-out efforts at employer sites are important in proving the concept and testing the operations of incentives. The pilot hosts for the FVC project shared that gathering and distilling their policies for display in the commuter wallet helped them organize and communicate commuter benefits in a more effective and user-friendly way than ever before. Combining the commuter wallet with commute competitions through the RideAmigos platform, employers were able to raise awareness about alternatives to driving to work alone,

both among pilot project staff and employees in general. The commuter behavior data provided by RideAmigos dashboards also helped employers support decisions to make commute incentives a priority at employer sites.

On the other hand, some FVC pilot employers interviewed for this paper remarked on the difficulty of the pilots' short-term nature. Pilots require setting up new systems and dedicating staff time to managing new projects, only to time out, often because funding for the pilot is not reauthorized. This limits the pilots' effectiveness in appealing to wider groups of employees and creating lasting change in commute habits. However, broader public policy can help scale pilot programs over time and across employer sites. Public policies that build on existing knowledge, laws and regulatory efforts can help employers expand and continue the innovations coming out of the FVC pilots, which will help ease congestion and clean the region's air.

5. Policies for Scaling Up Employer-Based Pilot Programs

There are several policies that could leverage the early lessons learned from the FVC pilots, help expand them and further reduce drive-alone commutes in the region.

In general, while employers have a unique role to play in reducing drive-alone rates — they have more information about commute options and how employers respond to commute benefit incentives than policymakers — there is also a natural limit to what they can achieve on their own. For one, the benefits of the pilots are likely to end if employers choose not to keep funding parking cash-out programs and other incentives. There are also feedback effects to consider. As individual employers successfully move commuters out of drive-alone commute trips, they free up capacity on highways and streets, which can simply make it easier for other drivers to take more car trips, in effect encouraging more driving. While there is no substitute for lessons learned from pilots and actions taken by employers, there is also no substitute for policies that level the playing field across all travelers.

Employers' experiences at pilot sites suggest that regional policy can in some ways be more promising than city and county policy. Employers in the FVC program agree that recruiting and maintaining talented workers means competing with employers across the region. Policies that codify elements of the FVC pilots and require employers to offer more incentives or to charge for parking at the city or county scale may only shift *where* people choose to work, as opposed to lowering drive-alone commute rates. Because of this, Section 5 focuses first on policies to help scale the FVC pilots at a regional level.

Employers in the FVC pilots had difficulty charging for parking. Regional policies that draw from and support the FVC pilots could take two broad forms — one that offers incentives to commuters who do not drive alone (carrots) or one that imposes parking charges (sticks). In other words, Bay Area policy makers could:

- Create a regional TDM program, and/or
- Create a regional baseline parking charge for employers

It is also worth noting that there is always the option of living with the status quo — a choice we make by taking no action.

Additional supporting policies might be needed to complement any regional effort. These include creating a regional database of parking of all kinds, coordinating regional support for cities to enact parking policies in tandem with employers, furthering work to create open payment platforms to streamline commuter incentives, and continuing the ongoing work to make seamless regional transit competitive with driving.

REGIONAL OPTION 1

Establish minimum regional parking charges at employer sites

In interviews with Bay Area employers, including those participating in the FVC pilots, it became clear that no one employer is likely to begin charging for parking on their own. The barriers are too many and the concern that parking charges would deter talented workers is too great a risk. On the other hand, the continuation of any FVC pilot efforts after 2019 may require funding, which parking charges could provide. Parking charges could also help shift commuters into carpooling, transit, biking and walking and bring down congestion, emissions and safety threats from cars. So that employers and individual cities do not have to assume all the risk of pioneering parking charges, the Bay Area could establish a policy that employers over a certain size charge a daily minimum for the parking they provide. This could also extend to property managers that supply parking for large employers.

There are many important policy features to consider in creating a minimum parking price for employers: how to phase in such a policy over time, what the minimum employer size should be, what the minimum charge should be, how to make the charge equitable and fair for employees of all incomes and employers of all sizes, how to collect and enforce parking charges and how to reinvest revenues. In addition, policymakers would need to solve for unintended consequences: how to dissuade drivers from parking on unpriced streets or from choosing single-occupancy ride-hailing services instead of driving. Lastly, policymakers would need to decide which agencies would ultimately be responsible for administering and enforcing the program.

How to phase in a regional baseline parking charge over time

The FVC project highlights important implementation lessons — the barriers employers face in charging for parking, the value of having a commuter wallet to better communicate commute benefits across employees and more. Because charging for parking at employer sites is so rare today, pilots that test how the parking charges could be implemented, and how commuters respond to them, would be invaluable. A regional parking charge could begin with a pilot phase and help answer the following questions:

- **The right parking price(s).** At what parking price would employees decide to switch from driving alone to carpooling or another mode? Are employees of different income levels more responsive at different price points?
- **City-employer collaboration.** How would pricing parking at large employer sites affect where commuters

park? Would they continue to drive but park in neighborhoods or at other free curbside space? How could cities and employers coordinate on parking policy to avoid this?

- **Equity across people of different incomes.** Recognizing that some workers cannot absorb parking charges, how can employers (and cities) identify lower-income workers and either waive their parking charges or refund them?
- **Effective implementation.** Pilots are a great way to test policy implementation. How should policymakers design the following to ensure effectiveness at a reasonable cost: communication of the policy to commuters, ease of payment, monitoring of drive-alone rates and enforcement of parking charges?

Pilots to charge for parking could begin at employment districts, similar to the scale at which TMAs are organized. They could continue and extend to the regional scale as these questions are answered and other lessons are learned. In addition, such pilots could make tangible any benefits to charging for parking at employer sites. In general, the out-of-pocket costs and barriers are far more personal and real for drivers and employers than the society-wide benefits of reduced congestion, saved time and improved air quality from parking charges. Making benefits more real could help make parking charges more politically viable.

Who would a regional baseline parking charge apply to?

Regarding employer size, there are three examples to choose from. The San Francisco Commuter Benefit Ordinance sets the minimum at 20 employees, but the city is uniquely rich in public transit. For the entire nine-county Bay Area, a minimum of 20 is likely too low. The minimum could start at 50 employees, equivalent to that in the Bay Area Commuter Benefits Ordinance, or it could start at 100, as Seattle's Commute Trip Reduction Program does.⁵¹ In any case, smaller employers could be included as part of a TMA that would help streamline and scale the administration of parking charges across multiple employers in the same area (see supporting policy idea 3 on page 29). In addition, parking charges could be limited to employers along corridors or arterials that are critically congested or to employers that meet a certain job density requirement.

How much should the charge be?

The amount of the charge could start as small and simple as a dollar a day. To change drive-alone rates, what may matter more than the amount of the charge is having a visible charge at all.⁵² If pilot programs teach us more about the price that is optimal to shift drive-alone commuters, then the price could be adjusted. In addition, making parking charges daily (as opposed to monthly) could be important in influencing commute choice. For example, once a monthly or yearly parking permit is paid for, drivers have no incentive to take other options on the days when it is possible. Also, for lower- or middle-income travelers, smaller, more frequent charges are often easier to pay. A daily charge would be better for these populations. To further address equity concerns, charges could be waived or lowered for low-income workers. And to avoid burdening low-wage workers who hold multiple jobs with the task of documenting total income, the policy could stipulate that those making less than a certain amount at any one employer would qualify for the free or discounted parking charges across all parking sites.

Who would administer this policy?

Because MTC and BAAQMD already administer the Bay Area Commuter Benefits Ordinance, they could be the agencies to continue to provide outreach to companies (already done by MTC) and enforcement of a regional employer parking charge (the responsibility of BAAQMD). A portion of the parking revenues could go to these agencies to cover additional administrative costs.

How would this policy be implemented?

Plans for administering parking charges would require careful consideration. Employers or property managers of leased parking could install standard parking infrastructure to manage parking, such as parking gates and payment machines. Another option is to bypass these altogether and rely on an app-based system that charges workers a dollar for each day they do not verify that they rode transit, took a carpool or used another alternative to driving alone. With functioning ECTR software and a commuter wallet like the ones being piloted in the FVC project, this approach could be easier and cheaper to set up than gates and payment machines. This would ease the need for parking enforcement in garages and lots as well. One tricky part of this strategy would be establishing what constitutes a working day for employees with irregular schedules and adjusting the default schedule when employees take time off.

From an equity perspective, making sure that workers without bank accounts could top up their accounts at common retailers would be key. In addition, where possible, TMAs could take responsibility for streamlining the setup and operations of the ECTR software across employers.

How would the revenues be used?

The political path to creating a regional parking charge might depend on how revenues would be dedicated. If all revenues from the charges were spent on employee transit and drive-alone alternatives, then they might be considered a “fee” under California’s Proposition 26. In that case, the program could move forward without a two-thirds vote in the California legislature. If, however, the revenues from the parking charges were used for a general purpose, they might be considered a “tax,” which *would* require a two-thirds majority approval in the state legislature. The option of recycling revenues back to workers in the form of parking cash-out and other benefits is not only politically easier but more equitable. Giving money back to workers helps lower-income workers more than higher-income workers. Employees should have the option to choose the benefit (cash versus transit pass) that helps them the most. This kind of choice would allow low-income workers much needed flexibility in tight budgets.

How would policymakers mitigate unintended consequences?

There are two important unintended consequences of putting a price on employer parking.

The first is the potential for employees to simply park in neighborhoods and at other free curb spaces. Employers and cities would need to work together to begin charging for parking in some parts of their jurisdictions or to set up time limits and permits for residents in the areas likely to be affected. It's also worth noting that as part of their study of downtown Palo Alto, the FVC team found that minimum-wage baristas and restaurant workers are parking in spaces with two-hour time limits and moving their cars multiple times per shift. When they cannot move their cars, they risk getting expensive tickets. Compared to getting tickets, paying a parking charge at a city-controlled kiosk or meter might be better for such workers, especially if low-income workers were charged a lower rate by cities as well as employers.

Second, in suburban areas where transit alternatives to driving alone are not common, employer parking charges might simply encourage workers to take more Uber or Lyft rides alone. To drop off and pick up one worker, a ride-hailing driver would make four trips, as opposed to the two that a single-occupancy driver would make. One way to get around this doubling of trips is to stipulate that ride-hailing commute trips would only qualify as an alternative to driving alone if they were shared and if the car were occupied by more than one passenger for more than half of each trip. Since these details are already tracked in ride-hailing apps, no new information would need to be gathered; existing data would simply need to be shared across an ECTR platform.

REGIONAL OPTION 2

Create a minimum regional TDM mandate

While parking charges create a clear disincentive to driving alone, TDM measures create positive incentives for options other than driving alone. While these are more feasible politically, they can also create unfunded mandates — rules that require employers and agencies to raise new money to keep the programs going.

A minimum regional TDM mandate would be similar to the Bay Area Commuter Benefit Ordinance in that it would require employers or TMAs to establish a set of strategies and offerings to encourage employees out of drive-alone commute trips. However, it would be different in that it could expand and test the list of possible measures beyond current commuter benefits offerings, use newer tools like those piloted in the FVC program and include stronger verification and enforcement mechanisms.

Which employers would the policy apply to?

The criteria for compliance could continue to be based on employer size, as in the above option on parking charges. Similarly, the size limit could stay at 50, be ramped down to 20 as in San Francisco or be increased to 100 as in Seattle. In any case, smaller employers could be included as part of a TMA that could help streamline TDM offerings and administration across multiple employers in the same area.

Which TDM measures would qualify?

As listed in the sidebar on page 12, there are numerous examples of TMAs and TDM policies and practices in the Bay Area. Policymakers could draw from these to create a set of TDM options that would qualify toward the regional mandate. San Francisco's point-based menu of TDM measures that employers can choose from is a particularly helpful example.⁵³ Under this scheme, as long as employers or TMAs reach a certain point total, they could meet the TDM mandate in whatever way best suits their particular context. It is worth noting that a regional TDM mandate could include the option for employers to charge for parking, but given the competition among employers to attract talent through transportation benefits, it is unlikely employers will opt to charge for parking.

How would verification and enforcement work?

Employers could comply with the new mandate by reporting to MTC on an annual basis about the TDM measures they are taking. However, with trip-tracking platforms like RideAmigos, reporting could be made simpler and more frequent. Data-sharing agreements could be set up to automatically send each employer's monthly average commute mode share to MTC. Employer size, location (whether headquarters are in the Bay Area or not) and contact information could also be shared with BAAQMD. With these data more readily available, the agency could enforce the new regional TDM mandate more easily than it can enforce the current ordinance today. BAAQMD could also bolster enforcement through dedicating staff to site visits to verify reported TDM measures. This could be done on an audit basis so that every employer does not need to be verified every year. In addition, penalties for noncompliance could be set. These could be similar to those listed in the San Francisco Commuter Benefits Ordinance and could include fines for the number of days an employer is not in compliance.⁵⁴ Additional regional revenues might need to be raised to cover the increased administrative costs of verification and enforcement.

Supporting policies

There are six policies that could support broader regional efforts to reduce drive-alone commute rates. These supporting policies would be critical under either a minimum regional parking charge at employer sites, a regional TDM program or both.

Supporting policy 1: Trip-monitoring systems for key employment centers

Policy will better serve the overall goal of reducing drive-alone commute rates and scaling innovative FVC efforts if trips to key job centers are better monitored. Major job centers could be defined as areas that have 50 or more jobs per acre (as seen in Figure 3) and have well-defined entry points where trips made during peak commute hours can be easily tracked. Low-cost car-tracking devices could be put in place at these entry points to help monitor and evaluate parking pricing, cash-out or TDM efforts. These devices could gather completely anonymous data to protect privacy, or like toll gates, they could be allowed to track license plate numbers and registered vehicle owners. In addition, data collected through software like RideAmigos in the FVC pilots could help monitor overall driving rates if enough travelers use such platforms. The collection, standardization and public sharing of the data could be done at a regional scale by MTC.

Supporting policy 2: A regional parking database

A standardized inventory of employer-provided, public and private parking does not currently exist but could go a long way toward informing the design of parking pilots and charges. It could also help coordinate charges across different parking providers, serve as an input for policy evaluation and offer employers and drivers better information about driving and parking options.

The Bay Area has several examples of parking inventories. For its SFpark pilot program, San Francisco undertook a parking census — an inventory of all public parking in the city — as the first step in designing parking rates to help drivers better access businesses and to ensure that spaces were available on every block at any given time. In a similar effort, known as goBerkeley, the City of Berkeley took a scaled-back approach to understanding its parking inventory and use. The nonprofit organization TransForm conducted a study of parking space usage at a sample of residential buildings across the Bay Area. The group's GreenTRIP Parking Database helped illuminate that nearly \$2 million has been spent at just 80 residential buildings constructing parking spaces that go largely unused.⁵⁵ While all of these inventories have been large efforts, other low-cost innovations should be considered, such as crowd-sourcing and verifying data (as OpenStreetMaps does), estimating parking supply and location through the use of satellite imagery and machine learning, and more.

A policy framework for standardizing data collection and sharing across various parties would need to be set. MTC could serve as the agency to coordinate the creation and vetting of such a framework. With a framework in place, open application program interfaces (APIs) — a set of rules and protocols that allows the integration

of different data sources, software applications and websites — could facilitate the use of parking data across multiple platforms. For example, travelers could begin to see parking options and prices in trip-planning apps like Google Maps. Employers, TMAs and policymakers could leverage insights from parking data and usage rates to assess how well drive-alone parking charges and other incentives are working and much more.

Supporting policy 3: Broader TDM programs that can support smaller employers

Smaller employers typically don't have the same level of staffing and resources to devote to developing TDM policies and programs, engaging in pilot efforts or exploring new ways to charge for parking. Many of these employers in the Bay Area are not currently members of a larger TMA that could help provide them with these resources.

To help scale TDM and parking pricing options across these employers, outreach to their employees could be streamlined under broader TMA efforts. In San Mateo County, for example, Commute.org provides a platform and incentives for any worker in the county. Such commuters can enroll in challenges and become eligible for prizes when they choose alternatives to driving alone more often. MTC could expand its outreach role under the Bay Area Commuter Benefits Ordinance and help small employers take greater advantage of such programs. MTC could also provide the entire Bay Area with the kind of platform that Commute.org offers in San Mateo County. The agency could allow employees of small employers across the region to earn prizes by planning and tracking commute trips made using modes other than driving alone. MTC could also recommend different kinds of TDM measures that might make sense for groups of small employers clustered in distinct geographic areas and could work with cities, congestion management agencies and employers to help implement them.

Supporting policy 4: Support for city-led public parking charges

MTC is already working to establish a clearinghouse of information and to offer technical assistance for cities interested in conducting parking studies and enacting parking charges. This work complements the FVC pilots and could continue to evolve and be bolstered in strategic ways. For example, outreach to the Bay Area's 101 cities is a heavy lift, and it might be beneficial to hire more staff at MTC to support this work. In addition, MTC could create standardized shortcuts for cities interested in moving forward with parking charges. These could include offering cities pre-vetted contract agreements with the vendors that provide parking pricing studies, technology installation or other services. Because finding and screening vendors and setting up contracts takes time, pre-vetted contract agreements could save cities time and money and perhaps make them more likely to move forward with parking charges. In places where charging for parking could lead workers to seek free spaces on city streets, this could be critical.

Supporting policy 5: Open payment platforms for parking and other transportation services

Right now, commuters have to pay for parking, transit, tolls and other transportation services through separate user accounts or methods. Parking charges are paid for at meters with cash or credit cards, transit fares can be paid using a Clipper card and in some cases cash, and tolls can be paid for through FasTrak account balances. This could be simplified from the user's perspective. All payments could flow through one account, and all of these services could be paid for using one-tap bank cards or a single smartphone app. The idea of a unified user account and payment system for all kinds of travel is often called a mobility wallet. This builds off the FVC pilot programs' commuter wallet software and adds banking and payment features on top of it.

Not only would such a system create ease for travelers, but it also would enable employers and policymakers to access the back end to set rewards and offer incentives to support alternatives to drive-alone commuting. For example, through its mobility wallet TAPForce, LA Metro is considering offering subsidies to drivers who complete a certain number of commute trips on transit in a given time period.

A Bay Area mobility wallet would require continuing work by transit agencies, MTC and the Clipper Executive Board to standardize fare policies across transit agencies and would benefit from lessons learned through the final FVC program evaluation. It would also require establishing data- and revenue-sharing agreements with Bay Area tolling authorities and with parking vendors. Lastly, all of these entities would need to agree to use open payment APIs and to allow the banking and payment industry to manage payment transactions. Creating open APIs for payments would carry the added benefit of allowing tech companies to compete to make the best user-facing payment apps.

For people who don't have bank accounts, the ability to load cash into a mobility wallet at common retailers would be critical.

Lastly, while payments should be easy for travelers of all kinds across all transportation modes, it is important that the per-trip cost of driving alone (tolls, parking, etc.) be as obvious as the cost for transit, bike sharing or car sharing. The price signal of driving alone should not be hidden — otherwise it might not serve as a behavioral tool to help shift drive-alone commuters to other alternatives.

Supporting policy 6: Regional transit and other alternatives to driving alone to work

There are numerous efforts underway to provide faster and more reliable transit so that it can better compete with driving alone, especially in the suburban Silicon Valley context. One major improvement is the recent decision by Caltrain to increase train frequencies along the peninsula.

While some commute times and distances have been growing for workers, many still commute distances of just 5 miles or less. For these employees, driving alone is much faster than transit. This is a group for which biking and other active modes could be real alternatives to driving alone. Continuing city- and county-led investments in protected bike lanes and other bike, scooter and pedestrian infrastructure could go a long way in helping to encourage this group of travelers out of drive-alone commute patterns and would make it easier for employers to continue FVC pilot efforts.

Discussion of policy options: Consequences and trade-offs

The Bay Area is at a crossroads in terms of how to reduce drive-alone commutes and bring about less-congested roads, greater access to more destinations, and improved safety, air quality and health for the region. The FVC experience points to the promise of regional strategies to help scale up FVC pilots, and there are many ways in which lessons learned from these pilots can help inform regional policy design. Overall, regional policy could set baseline employer parking charges, using the revenues to sustain employee incentives not to drive alone, and/or could require regionwide TDM measures.

When considering such policies, it's important to evaluate not just their ability to reduce drive-alone commute rates, congestion and emissions, but also their equity implications, the political lift they require and whether or not they create revenue to reinvest. Figure 7 on page 32 highlights how each of the regional policies might fare across these dimensions. Boxes are shaded red for a negative effect, yellow for a small or uncertain effect and green for a positive effect. The shadings are meant to be relative rather than precise.

As represented in the second column, both a minimum regional employer parking charge and a regional TDM mandate are likely to reduce drive-alone commute rates. In the third and fourth columns, the negative effects of drive-alone commutes — emissions and congestion — track with how much drive-alone commuting decreases. Each policy would bring down drive-alone commute rates in a different way and is context-dependent. To drivers, a parking charge makes the cost of *all* other modes relatively cheaper than driving alone. In contrast, TDM measures make single alternatives faster or cheaper than driving alone. In a commute context with transit, biking, carpool and other alternatives to driving alone, a price on parking could make those other options more attractive all at once and could perhaps be the single most effective way to shift commuter behavior. In a context where driving and carpooling are the only options, creating alternatives through TDM measures — such as free shuttles to the nearest transit station — could be the most effective way to shift workers out of drive-alone commutes. Both approaches are strong regional policy ideas but are likely to have different effects in different places. This is one of the reasons parking charges could start with more pilots and why a rollout of a regional TDM mandate could rely on lessons learned from the FVC and other parking cash-out efforts.

The bigger differences between a regional employer parking charge and a regional TDM mandate are the revenues they raise and the political lift of each (columns five and six in Figure 7). Parking charges come with revenues to reinvest in further TDM measures, address equity concerns and more. In contrast, a regional TDM mandate would require employers to find another sustainable revenue source. Said another way, parking charges could cost employers less for each employee they shift out of drive-alone commutes. However, instituting parking charges is much more costly politically. Employers and political leaders seeking reelection are daunted by the task of charging for parking in places where it is almost ubiquitously free today.

Today's high drive-alone rates create a number of inequities. Emissions from cars degrade air quality and cause heart and respiratory disease in low-income communities and communities of color. Lower-wage workers often face higher penalties from congestion and delays in that they may lose a job if they are late, while tardiness is often not as consequential for higher-wage workers. Reducing drive-alone rates is likely to address some of these inequities, but the exact design of parking charges and TDM mandates would also determine whether or not they further erode or advance equity, particularly among low-wage workers. For example, any flat parking charge is likely to be inequitable because lower-income workers would pay a higher percentage of their income

on it. But if rates were set progressively, or some workers were made exempt, this wouldn't necessarily be the case. In addition, if some portion of revenues from parking charges were given back to all workers via cash-out for carpooling or other perks, these incentives could disproportionately benefit lower-income workers. Because of all of these considerations, the boxes in the last column are yellow, or uncertain. For either parking charges or TDM mandates, an equitable process and distinct equity outcomes would need to be designed for and ensured.

The one thing that is clearest is that no action — the status quo — is by far the easiest option but also the one that leaves Bay Area residents, workers and employers with the worst outcomes.

SCENARIO	DRIVE-ALONE RATES	EMISSIONS	TRAFFIC/TIME WASTED	REVENUES TO REINVEST	POLITICAL LIFT	EQUITY
Status quo	Continue to worsen	Continue to worsen	Continue to worsen	No revenue	Easy	Inequities remain
Minimum regional parking charges for employers	Likely to shift behavior, but the amount is context-dependent	Expected reduction in emissions from passenger cars	Expected reduction in congestion and lost time	Revenue to reinvest	Would require statewide legislation; unpopular for employers, drivers and locally elected policymakers	Reduction in pollution; buses freed from traffic; charges could be inequitable if not income-based or offset
Minimum regional TDM mandate	Likely to shift behavior, but the amount is context-dependent	Some expected reduction in emissions from passenger cars	Some expected reduction in congestion and lost time	No revenue	Would require new regional leadership; compliance difficult to enforce	Reduction in pollution; buses freed from traffic; no extra burden on low-income drivers

FIGURE 7
While the status quo is easiest politically, it comes with the most harmful effects

Trade-offs inherent in broad policy options to help scale employer-based parking pricing and cash-out

The boxes above are shaded red when a scenario is likely to have a negative effect, yellow when it has a small or uncertain effect and green when it has a positive effect. These shadings are meant to show relative merits as opposed to precise measures.

6.

Conclusion

The Bay Area's congestion, air quality and public health are suffering from too many drive-alone trips across a sprawling region. While residents, employers and workers have come to accept this as part of everyday life, it doesn't have to be this way. The FVC project stands as a testament to the kinds of innovation that could help improve the quality of life in our region by bringing down drive-alone commute rates.

While not all the lessons from the FVC pilots could be captured at the time of this writing, the pilots shed light on how employers and policymakers can work together to reach the shared goal of reducing drive-alone rates. In particular, the information sharing, software and lessons learned about offering employer-based incentives versus charging for parking can all help shape how existing employers continue pilot efforts, whether other employers follow suit and how policymakers can complement and further encourage such efforts.

Because employers cannot sacrifice any competitive edge in their pursuit to recruit and retain talented workers, policymakers must play the role of setting minimum rules. These minimum rules will have to be regional in nature to match the commute patterns of the Bay Area. They can take the form of parking charges, further incentives not to drive alone or both. In addition, supporting policies that allow for better monitoring of trips, collecting data on parking supply and use, supporting workers at small employers and more can help further expand the efforts of the FVC pilots and reduce drive-alone commute rates.

While there are various options and trade-offs to consider before adopting the policy ideas presented for discussion in this paper, one thing is clear. Any path forward will require a stronger focus on the common goal of reducing drive-alone commute rates than on the barriers to action. Leaders across companies, nonprofits and public agencies will need to work together to share information, test and pilot new ideas and lead the implementation of strategies. Together such leadership can allow people to get to work in a way that doesn't clog roads or cost time and that leads to cleaner air and safer streets across the Bay Area.

Endnotes

- 1 See pages 5 and 7: https://www.spur.org/sites/default/files/publications_pdfs/SPUR_Fossil_Free_Bay_Area.pdf
- 2 Congested delay per worker is measured in the number of vehicles on the road, multiplied by the time they spend traveling at speeds below 35 miles per hour, divided by the total number of workers: <http://www.vitalsigns.mtc.ca.gov/time-spent-congestion>
- 3 The project has been funded by the Federal Transit Administration through the Mobility on Demand Sandbox Program and aligns with the program's mission to promote efficient, effective, customer-oriented multimodal trips, especially as smartphones and faster data processing change how people get around. See more at: <https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program>
- 4 While commute trips as a percentage of total trips are not measured throughout the Bay Area, survey data from San Francisco gives us this order of magnitude estimate. See page 10: https://www.sfmta.com/sites/default/files/reports/2017/Travel%20Decisions%20Survey%20Summary%20Report%202017_Accessible.pdf. The author assumes about a third considering that some trips to "home" include trips directly from work to home.
- 5 See San Francisco Bay Conservation and Development Commission: https://bccdc.ca.gov/bay_estuary.html
- 6 See page 22: https://www.spur.org/sites/default/files/publications_pdfs/SPUR_Rethinking_the_Corporate-Campus.pdf
- 7 Averages have been weighted by number of jobs.
- 8 Drive-alone commute rate for 2016 based on the Metropolitan Transportation Commission's "Vital Signs" data: <http://www.vitalsigns.mtc.ca.gov/commute-mode-choice>
- 9 See Bay Area Council Economic Institute: <http://www.bayareaeconomy.org/bay-area-job-watch-42/>
- 10 For a fuller description, see: <https://www.vtppi.org/tdm/tdm44.htm>
- 11 Estimated by SPUR using U.S. Census Transportation Planning Products Table A302103, 2012–2016 5-year estimates
- 12 See page 1: <http://www.ci.emeryville.ca.us/DocumentCenter/View/285/Parking-Study?bidId=>
- 13 See page 3-3: <https://www.ci.emeryville.ca.us/DocumentCenter/View/1010/30-Transportation?bidId=>
- 14 See: <https://www.bestworkplaces.org/bwc-employer-spotlight/bwc-spotlight-hacienda-pleasanton-ca/>
- 15 See page 27: https://www.alamedact.org/wp-content/uploads/2018/12/ALAMEDA-TDM-Strategy_final.pdf?x33781
- 16 See: <https://www.bishopranch.com/more-than-80000-sqf-of-office-space-leased-at-bishop-ranch-in-san-ramon/>
- 17 See: <https://www.missionbaytma.org/wp-content/uploads/Mission-Bay-2017-Annual-Report-draft2.pdf>
- 18 *Ibid.*, page 5.
- 19 Population estimate for July 1, 2018, and employment estimate for 2016, both rounded to nearest thousand: <https://www.census.gov/quickfacts/sanmateocountycalifornia>
- 20 See page 73: <https://www.paloaltoonline.com/news/reports/1571414950.pdf>
- 21 See: <https://facts.stanford.edu/>
- 22 See: <https://facts.stanford.edu/administration/>
- 23 Reported for Stanford University alone: <https://gup.sites.stanford.edu/transportation>
- 24 Population estimate for July 1, 2018, rounded to nearest thousand: <https://www.census.gov/quickfacts/mountainviewcitycalifornia>
- 25 Based on SPUR analysis of 2017 U.S. Census Bureau LEHD LODES data.
- 26 See page 98: <https://www.mountainview.gov/civicax/filebank/blobdload.aspx?BlobID=15038>
- 27 Estimated by SPUR using U.S. Census Transportation Planning Products Table A302103, 2012–2016 5-year estimates
- 28 SFMTA, *SFpark: Putting Theory into Practice (Pilot project summary and lessons learned)*, 2014, based on 2005 survey data, http://sfpark.org/wp-content/uploads/2014/06/SFpark_Pilot_Summary.pdf
- 29 Nagwa Khordagui, *Commute Mode Choice, Parking Policies, and Social Influence*, dissertation, 2019. See Chapter 1: <https://escholarship.org/content/qt07z507xf/qt07z507xf.pdf?t=puddbf>
- 30 Allen Greenberg et al., "Transportation Benefits of Parking Cash-Out, Pre-Tax Commuter Benefits, and Parking Surtaxes," webinar, 2017, <https://pdfs.semanticscholar.org/73f0/96c0de2621c8cc2175ce06d3ca7efe3b1ad1.pdf>
- 31 SPUR convened groups of employers in its monthly Transportation Pricing Task Force meetings from June through October 2019 and at a workshop dedicated to discussing employer barriers in parking pricing and cash-out on September 26, 2019.
- 32 SFMTA, *SFpark: Putting Theory into Practice (Pilot project summary and lessons learned)*, 2014, page 38, http://sfpark.org/wp-content/uploads/2014/06/SFpark_Pilot_Overview.pdf
- 33 See: <https://wginc.com/parking-outlook/>
- 34 Donald Shoup, "Evaluating the Effects of Parking Cash-Out: Eight Case Studies," Sept. 1997, https://ww3.arb.ca.gov/research/single-project.php?row_id=55468
- 35 See: <https://ww3.arb.ca.gov/drdb/ba/curhtml/r13-1.htm>
- 36 See page 18: https://www.alamedact.org/wp-content/uploads/2018/12/ALAMEDA-TDM-Strategy_final.pdf?x33781
- 37 See page 7: https://ww3.arb.ca.gov/planning/tsaq/cashout/cashout_guide_0809.pdf
- 38 Donald Shoup, "Evaluating the Effects of Parking Cash-Out: Eight

Case Studies,” Sept. 1997, https://ww3.arb.ca.gov/research/single-project.php?row_id=55468

39 See: <https://ww3.arb.ca.gov/drdb/ba/curhtml/r13-1.htm>

40 See: http://leginfo.ca.gov/pub/95-96/bill/sen/sb_0401-0450/sb_437_cfa_950828_150028_asm_comm.html

41 See: <https://gup.sites.stanford.edu/transportation>

42 See page 98: <https://www.mountainview.gov/civicax/filebank/blobdload.aspx?BlobID=15038>

43 *Ibid.*, page 183.

44 See: <https://www.menlopark.org/DocumentCenter/View/16592/F4---1-Hacker-Way-Facebook-East-Campus-DA-and-CDP-Amendments-Final-Draft?bidId>

45 In addition, cities like Berkeley have established even wider-reaching commuter benefits requirements for employers with 10 or more employees.

46 See: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1128

47 The regional program will also accept reviewed alternatives offered directly or through a TMA. See 14-1-302: www.baaqmd.gov/-/media/files/planning-and-research/commuter-benefits-program/proposed-rule-packet/proposed-rule-reg-141.pdf?la=en

48 The actual amount could vary. For example, IRS guidance to calculate the liability of providing parking could leave employers with tax liabilities anywhere from the full cost of providing parking to nothing at all.

The amount of liability depends on how much parking is provided for employee parking (and no other use) and the cost of operating it. See: <https://www.bestworkplaces.org/wp-content/uploads/2019/02/Parking-Expenses-2-18-19.pdf>

49 See page 2: http://library.rpa.org/pdf/RPA_Commuter_Benefits_Tax_Policy.pdf

50 See page 18: https://www.alamedactc.org/wp-content/uploads/2018/12/ALAMEDA-TDM-Strategy_final.pdf?x33781

51 See page 2: https://www.seattle.gov/Documents/Departments/SDOT/TransportationOptionsProgram/CTR_Final_Plan_20190822.pdf

52 An evaluation of price-based incentives in Alameda County in the 1990s found that any incentive was effective regardless of its amount. ACTC, 2013 Countywide TDM Strategy, page 18, https://www.alamedactc.org/wp-content/uploads/2018/12/ALAMEDA-TDM-Strategy_final.pdf?x33781

53 See pages 12-14: https://default.sfplanning.org/transportation/tdm/TDM_Program_Standards.pdf

54 See: <https://sfenvironment.org/commuter-benefits-ordinance-sf>

55 See: <http://database.greentrip.org/>



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